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RCRA Facility Investigation

CIBA–GEIGY Facility
Cranston, Rhode Island

Stabilization Investigation Report and Design Concepts Proposal

Volume 2
Appendices

Submitted by:

CIBA–GEIGY Corporation
444 Sawmill River Road
Ardsley, New York 10502

3 May 1993

SEMS DocID 657721

REC'D 5-4-93
F.B.

RCRA Facility Investigation

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and
Design Concepts Proposal

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Appendices

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ABSTRACT 13

DISCLAIMER 14

EXECUTIVE SUMMARY ES-1

1. INTRODUCTION

1.1 OVERVIEW 1-1

1.2 BACKGROUND 1-1
1.2.1 History of the Facility 1-1
1.2.2 History of the Project 1-1
1.2.3 History and Phases of the Stabilization Program 1-2

1.3 OBJECTIVES OF STABILIZATION 1-3
1.3.1 Objectives of the Stabilization Program 1-3
1.3.2 Objectives and Scope of the Investigation Phase 1-3
1.3.3 Objectives and Scope of the Design Phase 1-3
1.3.4 Objectives and Scope of the Implementation Phase 1-4
1.3.5 Assumptions in the Investigation Phase 1-4

1.4 KEY TO PHASE II ACTIVITIES IN STABILIZATION 1-5
1.4.1 Description of the Tables 1-5
1.4.2 Summary of the Phase II Activities in Stabilization 1-6

1.5 ORGANIZATION OF THIS DOCUMENT 1-6

1.6 SUMMARY 1-7

2. PRODUCTION AREA GROUNDWATER: AQUIFER TESTING

2.1 OVERVIEW 2-1

2.2 PHASE I RESULTS AND DATA GAPS 2-1
2.2.1 Phase I Results 2-1
2.2.2 Phase I Data Gaps 2-2

2.3 OBJECTIVES AND STRATEGY FOR AQUIFER TESTING 2-2
2.3.1 Objectives of Aquifer Testing 2-2
2.3.2 Strategy for Aquifer Testing 2-3

2.4 PRELIMINARY ACTIVITIES: METHODS AND ANALYSES 2-3
2.4.1 Installing and Developing Wells and Piezometers 2-4
2.4.2 Performing Groundwater Sampling 2-6
2.4.3 Measuring Water Levels 2-7

2.5 PRELIMINARY ACTIVITIES: RESULTS 2-7
2.5.1 Production Area Stratigraphy 2-8
2.5.2 Groundwater Sampling Results 2-11
2.5.3 Water Level Measurement Results 2-14

2.6 STEP-DRAWDOWN TESTS 2-17
2.6.1 Objectives 2-18
2.6.2 Methods and Analyses for the Step-Drawdown Tests 2-18
2.6.3 Results and Discussion of the Step-Drawdown Tests 2-19

2.7 72-HOUR CONSTANT RATE TESTS 2-20
2.7.1 Objectives 2-20
2.7.2 Methods and Analyses for the 72-Hour Constant Rate Tests 2-20
2.7.3 Results and Discussion of the 72-Hour Constant Rate Tests 2-21

2.8 30-DAY CONSTANT RATE TEST 2-22
2.8.1 Objectives 2-22
2.8.2 Methods and Analyses for the 30-Day Constant Rate Test 2-23
2.8.3 Results and Discussion of the 30-Day Constant Rate Test 2-24

2.9 ADDITIONAL SINGLE-WELL CONSTANT RATE AQUIFER TESTS 2-26
2.9.1 Objectives 2-27
2.9.2 Methods and Analyses for the Additional Constant Rate Tests 2-27
2.9.3 Results and Discussion of the Additional Constant Rate Tests 2-29

2.10 30-DAY FLUSH/SURGE TEST 2-31

2.11 GENERAL DISCUSSION 2-32

2.12 SELECTION OF THE STABILIZATION MEASURE 2-33

2.13 SUMMARY 2-33

3. PRODUCTION AREA GROUNDWATER: TREATABILITY TESTING

3.1 OVERVIEW 3-1

3.2 PHASE I RESULTS AND DATA GAPS 3-1
3.2.1 Phase I Results 3-1
3.2.2 Phase I Data Gaps 3-2

3.3 DISCHARGE LIMITATIONS AND REMOVAL EFFICIENCIES 3-2
3.3.1 Discharge Limitations for Groundwater 3-2
3.3.2 Phase I Results, Discharge Limitations, and Removal Efficiencies 3-3
3.3.3 Overview of the Conceptual Design of the Pretreatment Technology 3-3

3.4 BENCH-SCALE PRETREATMENT TESTING PROGRAM 3-4
3.4.1 Objectives and Strategy for Bench-Scale Testing 3-4
3.4.2 Assumptions for Bench-Scale Testing 3-5

3.4.3 Methods and Analyses for Bench-Scale Testing 3-5
3.4.4 Results of Bench-Scale Testing 3-7

3.5 PILOT PRETREATMENT TESTING PROGRAM 3-8
3.5.1 Objectives and Strategy for Pilot Testing 3-9
3.5.2 Estimates and Assumptions for Pilot Testing 3-10
3.5.3 Process Sequence and Performance Standards for Pilot Testing 3-10
3.5.4 Methods and Analyses for Pilot Testing 3-10
3.5.5 Results of Pilot Testing 3-13

3.6 GENERAL DISCUSSION 3-13

3.7 SELECTION OF THE STABILIZATION MEASURE 3-14

3.8 SUMMARY 3-15

4. SWMU-11 SOIL & GROUNDWATER: HIVAC® EXTRACTION PILOT TEST

4.1 OVERVIEW 4-1

4.2 PREVIOUS RESULTS AND DATA GAPS 4-1
4.2.1 Phase I and Soil Gas Survey Results 4-1
4.2.2 Other Considerations for HIVAC Dual-Phase Technology 4-2
4.2.3 Remaining Data Gaps 4-2

4.3 HIVAC PILOT TEST 4-2
4.3.1 Objectives and Strategy for HIVAC Pilot Testing 4-3
4.3.2 Assumptions and Performance Standards for HIVAC Pilot Testing 4-4
4.3.3 Preliminary Activities for HIVAC Pilot Testing 4-4
4.3.4 Methods and Analyses for HIVAC Pilot Testing 4-7
4.3.5 Results of HIVAC Pilot Testing 4-8

4.4 GENERAL DISCUSSION 4-10

4.5 SELECTION OF THE STABILIZATION MEASURE 4-11

4.6 SUMMARY 4-12

5. CONCEPTUAL DESIGN PROPOSAL

5.1 OVERVIEW 5-1

5.2 CONCEPTUAL DESIGN: GROUNDWATER CAPTURE SYSTEM 5-1
5.2.1 Strategy and Basis for the Conceptual Design 5-2
5.2.2 Conceptual Design Criteria and Performance Standards 5-2
5.2.3 Conceptual Design for the Groundwater Capture System 5-3

HIVAC is a registered trademark of the Xerox Corporation

5.2.4 Modeling and Testing the Conceptual Design 5-4
5.2.5 Preliminary Plans for Performance Monitoring and Confirmatory Sampling 5-6

5.3 CONCEPTUAL DESIGN: GROUNDWATER PRETREATMENT SYSTEM 5-7
5.3.1 Strategy and Basis for the Conceptual Design 5-7
5.3.2 Conceptual Design Criteria and Performance Standards 5-8
5.3.3 Conceptual Design for the Groundwater Pretreatment System 5-8
5.3.4 Preliminary Plans for Performance Monitoring and Confirmatory Sampling 5-12

5.4 CONCEPTUAL DESIGN: SOIL VAPOR EXTRACTION (SVE) SYSTEM 5-13
5.4.1 Strategy and Basis for the Conceptual Design 5-13
5.4.2 Conceptual Design Criteria and Performance Standards 5-13
5.4.3 Conceptual Design for the Soil Vapor Extraction System 5-14
5.4.4 Preliminary Plans for Performance Monitoring and Confirmatory Sampling 5-16

5.5 CONCEPTUAL DESIGN: OVERALL STABILIZATION SYSTEM 5-18

5.6 SUMMARY 5-19

6. PROJECT MANAGEMENT

6.1 OVERVIEW 6-1

6.2 PROJECT ORGANIZATION 6-1

6.3 SCHEDULE 6-1
6.3.1 Design Phase 6-1
6.3.2 Implementation Phase 6-3
6.3.3 Stabilization Program Report Preparation 6-3

6.4 CONTINGENCIES AND CONSIDERATIONS 6-4
6.4.1 Contingencies and Planned Responses 6-4
6.4.2 Critical Success Factors 6-6

6.5 SUMMARY 6-7

LIMITATIONS

REFERENCES

APPENDICES

APPENDIX A — GLOSSARY

APPENDIX B — BORING LOGS

APPENDIX C — WELL INSTALLATION/CONSTRUCTION LOGS

APPENDIX D — GEOTECHNICAL DATA

APPENDIX E — WELL SAMPLING LOGS

APPENDIX F — WATER LEVEL MEASUREMENTS

APPENDIX G — PRECIPITATION DATA

APPENDIX H — STEP-DRAWDOWN TEST DATA AND ANALYSES

APPENDIX I — 72-HOUR CONSTANT RATE TEST DATA AND ANALYSES

APPENDIX J — 30-DAY CONSTANT RATE TEST DATA AND ANALYSES

APPENDIX K — ADDITIONAL CONSTANT RATE TEST DATA AND ANALYSES

APPENDIX L — CAPTURE ZONE MODELING

APPENDIX M — INDUSTRIAL WASTEWATER PERMIT NO. 0321

APPENDIX N — BENCH-SCALE TREATABILITY TESTING: LABORATORY REPORT

APPENDIX O — ANALYTICAL DATA

APPENDIX P — PRELIMINARY ENGINEERING CALCULATIONS

TABLES

Table 1-1 SWMUs, AOCs, and AAOIs
Table 1-2 Key to Phase II Physical Characterization Activities in Stabilization
Table 1-3 Key to Phase II Release Characterization Activities in Stabilization

Table 2-1 Piezometer and Well Installation and Sampling Data Summary
Table 2-2 Locations of Gravelly Sand in Production Area Borings
Table 2-3 Hydropunch Sampling: Organic Data Summary
Table 2-4 Production Area Well Sampling: Organic and Inorganic Data Summary
Table 2-5 In-River Well Sampling: Organic and Inorganic Data Summary
Table 2-6 Production Area Piezometer Sampling: Organic and Inorganic Data Summary
Table 2-7 Comparison of Piezometric Heads near the Bulkhead
Table 2-8 72-Hour Constant Rate Test at RC-1: Drawdown at Monitoring Locations
Table 2-9 72-Hour Constant Rate Test at RC-2: Drawdown at Monitoring Locations
Table 2-10 30-Day Constant Rate Test: Drawdown at Monitoring Locations
Table 2-11 30-Day Constant Rate Test: Sampling Schedule
Table 2-12 Transmissivity Values for Stratigraphic Units
Table 2-13 Storativity Values for Stratigraphic Units
Table 2-14 30-Day Constant Rate Test: Organic and Inorganic Data Summary
Table 2-15 Additional Constant Rate Tests: Monitoring Locations
Table 2-16 Additional Constant Rate Tests: Organic and Inorganic Data Summary

Table 3-1 Bench-Scale Testing: Metals Pretreatment Results
Table 3-2 Bench-Scale Testing: Air Stripping Results
Table 3-3 Bench-Scale Testing: Activated Carbon Adsorption Results
Table 3-4 Bench-Scale Testing: Removal Efficiencies
Table 3-5 Pilot Pretreatment System: Organic Data Summary
Table 3-6 Pilot Pretreatment System: Inorganic Data Summary
Table 3-7 Pilot Pretreatment System: Removal Efficiencies

Table 4-1 Phase I Analytical Data for SWMU-11 Soil and Groundwater
Table 4-2 HIVAC Pilot Test: Air and Water Flow Results
Table 4-3 HIVAC Pilot Test: Analytical Data

Table 5-1 Construction Details for the Proposed Recovery Wells
Table 5-2 Drawdown Estimated for the Proposed Recovery Wells

Table D-1 P-32D Field Sieve Data for the Design of RC-1
Table D-2 P-33D Field Sieve Data for the Design of RC-2

Table F-1 Monthly Water Level Data

Table I-1 Groundwater Level Data — 72-Hour Constant Rate Test on RC-1
Table I-2 Groundwater Level Data — 72-Hour Constant Rate Test on RC-2

Table L-1 QUICKFLOW Modeling Input Parameters

FIGURES

Figure 1-1 SWMUs, AOCs, and AAOIs

Figure 2-1 Well/Piezometer Locations in the Production Area
Figure 2-2 Thickness and Extent of the Gravelly Sand Unit in the Production Area
Figure 2-3 Locations of Cross-Sections
Figure 2-4 Cross-Section F–F′
Figure 2-5 Cross-Section F–FF′
Figure 2-6 Cross-Section G–G′
Figure 2-7 Cross-Section H–H′
Figure 2-8 Cross-Section I–I′
Figure 2-9 Cross-Section J–J′
Figure 2-10 Production Area Groundwater Sampling Results: Organic Data
Figure 2-11 Production Area Groundwater Sampling Results: Inorganic Data
Figure 2-12 Water Table Contours on 26 October 1992
Figure 2-13 Piezometric Surface of the Deep Overburden on 26 October 1992
Figure 2-14 Cross-Sectional Flow Diagram D–D′
Figure 2-15 Step-Drawdown Test Results at RC-1
Figure 2-16 Step-Drawdown Test Results at RC-2
Figure 2-17 72-Hour Constant Rate Test at RC-1: Drawdown at End of Test
Figure 2-18 72-Hour Constant Rate Test at RC-2: Drawdown at End of Test
Figure 2-19 30-Day Constant Rate Test: Maximum Drawdown
Figure 2-20 30-Day Constant Rate Test: Constituent Concentrations at RC-1
Figure 2-21 30-Day Constant Rate Test: Constituent Concentrations at RC-2

Figure 3-1 Well/Piezometer Locations in the Production Area
Figure 3-2 Initial Process Flow Schematic for the Pilot Pretreatment System
Figure 3-3 Final Process Flow Schematic for the Pilot Pretreatment System
Figure 3-4 Mass Balance Diagram for the Pilot Pretreatment System

Figure 4-1 Soil Gas Survey Results and HIVAC Pilot Test Well Locations
Figure 4-2 Process Flow Diagram for the HIVAC Pilot System
Figure 4-3 HIVAC Pilot Test: Groundwater Level Data

Figure 5-1 Proposed Recovery Well Locations for the Full-Scale Groundwater Capture System
Figure 5-2 Proposed Recovery Wells on Cross-Section J–J′ for the Full-Scale Groundwater Capture System
Figure 5-3 Process Flow Diagram for the Full-Scale Groundwater Capture System
Figure 5-4 Process Flow Diagram for the Full-Scale Groundwater Pretreatment System

Figure 5-5 Process Flow Diagram for the Soil Vapor Extraction System
Figure 5-6 Well Locations for the Soil Vapor Extraction System

Figure 6-1 Project Organization for the Stabilization Program
Figure 6-2 Proposed Schedule for the Design Phase of the Stabilization Program

Figure F-1 MW-1S and MW-1D Hydrographs — June 1992
Figure F-2 MW-1S and MW-1D Hydrographs — July 1992
Figure F-3 MW-1S and MW-1D Hydrographs — August 1992
Figure F-4 MW-1S and MW-1D Hydrographs — September 1992
Figure F-5 MW-1S and MW-1D Hydrographs — October 1992
Figure F-6 MW-1S and MW-1D Hydrographs — November 1992
Figure F-7 MW-10S and MW-10D Hydrographs — July 1992
Figure F-8 MW-10S and MW-10D Hydrographs — August 1992
Figure F-9 MW-10S and MW-10D Hydrographs — September 1992
Figure F-10 MW-10S and MW-10D Hydrographs — October 1992
Figure F-11 MW-10S and MW-10D Hydrographs — November 1992
Figure F-12 Stilling Well Hydrograph — July 1992
Figure F-13 Stilling Well Hydrograph — August 1992
Figure F-14 Stilling Well Hydrograph — September 1992
Figure F-15 Stilling Well Hydrograph — October 1992
Figure F-16 Stilling Well Hydrograph — November 1992
Figure F-17 Stilling Well Hydrograph — December 1992
Figure F-18 Stilling Well Hydrograph — January 1993

Figure G-1 Precipitation Data — June 1992
Figure G-2 Precipitation Data — July 1992
Figure G-3 Precipitation Data — August 1992
Figure G-4 Precipitation Data — September 1992
Figure G-5 Precipitation Data — October 1992
Figure G-6 Precipitation Data — November 1992
Figure G-7 Precipitation Data — December 1992
Figure G-8 Precipitation Data — January 1993
Figure G-9 MW-1S and MW-1D Hydrographs and Precipitation Data — August 1992
Figure G-10 MW-10S and MW-10D Hydrographs and Precipitation Data — August 1992
Figure G-11 MW-1S and MW-1D Hydrographs and Precipitation Data — September 1992
Figure G-12 MW-10S and MW-10D Hydrographs and Precipitation Data — September 1992
Figure G-13 MW-1S and MW-1D Hydrographs and Precipitation Data — October 1992
Figure G-14 MW-10S and MW-10D Hydrographs and Precipitation Data — October 1992

Figure H-1 RC-1 Head Loss
Figure H-2 RC-2 Head Loss
Figure H-3 RC-1 Step-Drawdown Test: Drawdown in P-32S
Figure H-4 RC-1 Step-Drawdown Test: Drawdown in P-32D
Figure H-5 RC-2 Step-Drawdown Test: Drawdown in P-33S
Figure H-6 RC-2 Step-Drawdown Test: Drawdown in P-33D

Figure I-1 P-1S Hydrograph — 23 October to 4 November 1992
Figure I-2 P-2S Hydrograph — 23 October to 4 November 1992
Figure I-3 P-2D Hydrograph — 23 October to 4 November 1992
Figure I-4 MW-30S Hydrograph — 23 October to 4 November 1992
Figure I-5 MW-30D Hydrograph — 23 October to 4 November 1992
Figure I-6 P-30D Hydrograph — 23 October to 4 November 1992
Figure I-7 RC-1 Constant Rate Test: Drawdown in RC-1
Figure I-8 RC-1 Constant Rate Test: Drawdown in P-3S
Figure I-9 RC-1 Constant Rate Test: Drawdown in MW-13S
Figure I-10 RC-1 Constant Rate Test: Drawdown in P-13D
Figure I-11 RC-1 Constant Rate Test: Drawdown in MW-29S
Figure I-12 RC-1 Constant Rate Test: Drawdown in MW-29D
Figure I-13 RC-1 Constant Rate Test: Drawdown in MW-P-32S
Figure I-14 RC-1 Constant Rate Test: Drawdown in P-32D
Figure I-15 RC-1 Constant Rate Test: Drawdown in P-33S
Figure I-16 RC-1 Constant Rate Test: Drawdown in P-33D
Figure I-17 P-1S Hydrograph — 10 to 23 October 1992
Figure I-18 P-1D Hydrograph — 10 to 23 October 1992
Figure I-19 P-2S Hydrograph — 10 to 23 October 1992
Figure I-20 P-2D Hydrograph — 10 to 23 October 1992
Figure I-21 MW-30S Hydrograph — 10 to 23 October 1992
Figure I-22 MW-30S Hydrograph — 10 to 23 October 1992
Figure I-23 P-30D Hydrograph — 10 to 23 October 1992
Figure I-24 RC-2 Constant Rate Test: Drawdown in RC-2
Figure I-25 RC-2 Constant Rate Test: Drawdown in MW-31S
Figure I-26 RC-2 Constant Rate Test: Drawdown in MW-31D
Figure I-27 RC-2 Constant Rate Test: Drawdown in P-31D
Figure I-28 RC-2 Constant Rate Test: Drawdown in P-33S
Figure I-29 RC-2 Constant Rate Test: Drawdown in P-33D

Figure J-1 P-1D Hydrograph — 1 to 29 December 1992
Figure J-2 P-2S Hydrograph — 1 to 29 December 1992
Figure J-3 P-2D Hydrograph — 1 to 29 December 1992
Figure J-4 MW-13S Hydrograph — 1 to 29 December 1992
Figure J-5 P-13D Hydrograph — 1 to 29 December 1992
Figure J-6 MW-29S Hydrograph — 1 to 29 December 1992
Figure J-7 MW-29D Hydrograph — 1 to 29 December 1992
Figure J-8 MW-30S Hydrograph — 1 to 29 December 1992
Figure J-9 MW-30D Hydrograph — 1 to 29 December 1992
Figure J-10 MW-31S Hydrograph — 1 to 29 December 1992
Figure J-11 MW-31D Hydrograph — 1 to 29 December 1992
Figure J-12 P-32S Hydrograph — 1 to 29 December 1992
Figure J-13 P-32D Hydrograph — 1 to 29 December 1992
Figure J-14 P-33S Hydrograph — 1 to 29 December 1992
Figure J-15 P-33D Hydrograph — 1 to 29 December 1992

Figure J-16 P-34S Hydrograph — 1 to 29 December 1992
Figure J-17 P-35S Hydrograph — 1 to 29 December 1992
Figure J-18 P-36S Hydrograph — 1 to 29 December 1992
Figure J-19 P-37S Hydrograph — 1 to 29 December 1992
Figure J-20 P-38S Hydrograph — 1 to 29 December 1992
Figure J-21 30-Day Constant Rate Test: Drawdown in RC-1 (Days 1–10)
Figure J-22 30-Day Constant Rate Test: Drawdown in RC-1 (Days 11–30)
Figure J-23 30-Day Constant Rate Test: Drawdown in RC-2 (Days 1–10)
Figure J-24 30-Day Constant Rate Test: Drawdown in RC-2 (Days 11–30)
Figure J-25 30-Day Constant Rate Test: Drawdown in MW-1S (Days 1–10)
Figure J-26 30-Day Constant Rate Test: Drawdown in MW-1S (Days 11–30)
Figure J-27 30-Day Constant Rate Test: Drawdown in P-1D (Days 1–10)
Figure J-28 30-Day Constant Rate Test: Drawdown in P-1D (Days 11–30)
Figure J-29 30-Day Constant Rate Test: Drawdown in P-2S (Days 1–10)
Figure J-30 30-Day Constant Rate Test: Drawdown in P-2S (Days 11–30)
Figure J-31 30-Day Constant Rate Test: Drawdown in P-2D (Days 1–10)
Figure J-32 30-Day Constant Rate Test: Drawdown in P-2D (Days 11–30)
Figure J-33 30-Day Constant Rate Test: Drawdown in MW-13S (Days 1–10)
Figure J-34 30-Day Constant Rate Test: Drawdown in MW-13S (Days 11–30)
Figure J-35 30-Day Constant Rate Test: Drawdown in P-13D (Days 1–10)
Figure J-36 30-Day Constant Rate Test: Drawdown in P-13D (Days 11–30)
Figure J-37 30-Day Constant Rate Test: Drawdown in MW-29D (Days 1–10)
Figure J-38 30-Day Constant Rate Test: Drawdown in MW-29D (Days 11–30)
Figure J-39 30-Day Constant Rate Test: Drawdown in MW-30S (Days 1–10)
Figure J-40 30-Day Constant Rate Test: Drawdown in MW-30S (Days 11–30)
Figure J-41 30-Day Constant Rate Test: Drawdown in MW-30D (Days 1–10)
Figure J-42 30-Day Constant Rate Test: Drawdown in MW-30D (Days 11–30)
Figure J-43 30-Day Constant Rate Test: Drawdown in MW-31D (Days 1–10)
Figure J-44 30-Day Constant Rate Test: Drawdown in MW-31D (Days 11–30)
Figure J-45 30-Day Constant Rate Test: Drawdown in P-32S (Days 1–10)
Figure J-46 30-Day Constant Rate Test: Drawdown in P-32S (Days 11–30)
Figure J-47 30-Day Constant Rate Test: Drawdown in P-32D (Days 1–10)
Figure J-48 30-Day Constant Rate Test: Drawdown in P-32D (Days 11–30)
Figure J-49 30-Day Constant Rate Test: Drawdown in P-33S (Days 1–10)
Figure J-50 30-Day Constant Rate Test: Drawdown in P-33S (Days 11–30)
Figure J-51 30-Day Constant Rate Test: Drawdown in P-33D (Days 1–10)
Figure J-52 30-Day Constant Rate Test: Drawdown in P-33D (Days 11–30)
Figure J-53 30-Day Constant Rate Test: Drawdown in P-34S (Days 1–10)
Figure J-54 30-Day Constant Rate Test: Drawdown in P-34S (Days 11–30)
Figure J-55 30-Day Constant Rate Test: Drawdown in P-35S (Days 1–10)
Figure J-56 30-Day Constant Rate Test: Drawdown in P-35S (Days 11–30)
Figure J-57 30-Day Constant Rate Test: Drawdown in P-37S (Days 1–10)
Figure J-58 30-Day Constant Rate Test: Drawdown in P-37S (Days 11–30)

Figure K-1 MW-1S Hydrograph — 1 to 11 December 1992
Figure K-2 MW-2S Hydrograph — 14 to 28 December 1992
Figure K-3 MW-3S Hydrograph — 20 January 1993
Figure K-4 MW-3S Hydrograph — 21 January 1993
Figure K-5 MW-12S Hydrograph — 19 January 1993
Figure K-6 MW-13S Hydrograph — 11 January 1993
Figure K-7 MW-14S Hydrograph — 12 January 1993
Figure K-8 P-35S Hydrograph — 5 January 1993
Figure K-9 MW-3S Additional Constant Rate Test: Recovery in MW-3S
Figure K-10 MW-12S Additional Constant Rate Test: Recovery in MW-12S
Figure K-11 MW-13S Additional Constant Rate Test: Drawdown in P-13D
Figure K-12 MW-13S Additional Constant Rate Test: Drawdown in P-32S
Figure K-13 MW-14S Additional Constant Rate Test: Drawdown in MW-14S
Figure K-14 MW-14S Additional Constant Rate Test: Recovery in MW-14S
Figure K-15 P-35S Additional Constant Rate Test: Drawdown in MW-2S
Figure K-16 P-35S Additional Constant Rate Test: Recovery in P-35S

Figure L-1 Drawdown for RC-3 Estimated from QUICKFLOW Modeling
Figure L-2 Particle Tracing for RC-3 from QUICKFLOW Modeling
Figure L-3 Drawdown for RC-4 Estimated from QUICKFLOW Modeling
Figure L-4 Particle Tracing for RC-4 from QUICKFLOW Modeling
Figure L-5 Drawdown for RC-5 Estimated from QUICKFLOW Modeling
Figure L-6 Particle Tracing for RC-5 from QUICKFLOW Modeling
Figure L-7 Capture Zones for the Proposed Recovery Wells Estimated from QUICKFLOW Modeling

Figure P-1 Representation of Image Well Theory

Appendix A

A

GLOSSARY

AAOI	See **additional area of investigation.**
AAOI-15	AAOI-15, the Laboratory Building Waste Water Sump, funtioned as part of normal operations in the Laboratory Building. The gravity sump drained to sewer lines that discharged to the publicly owned treatment works.
AAOI-16	See **SWMU-16.**
acceptable intake for chronic exposure	An acceptable intake for chronic exposure (AIC), sometimes called the "acceptable chronic intake", is a list published by the USEPA of acceptable intake levels for various compounds.
ACL	See **alternate concentration limit.**
Act	See **Resource Conservation and Recovery Act.**
additional area of investigation	An additional area of investigation (AAOI) is an area of the facility which may have had the potential for a release. Although not required by the Order, AAOIs were identified by CIBA-GEIGY and were added to the investigation of the facility.
Administrative Order of Consent	The Administrative Order of Consent relevant to the Corrective Action Study of the facility is RCRA Docket No. I-88-1088.
AEI	See **average exposed individual.**
AIC	See **acceptable intake for chronic exposure.**
air stripping	Air stripping is a groundwater treatment procedure that removes volatile constituents in the groundwater by exposing the groundwater to the air, allowing the constituents to be emitted into the atmosphere or into vapor phase pollution control equipment.
air treatment system	An air treatment system is designed to remove constituents from air emissions prior to discharge to the atmosphere. At the facility, an air treatment system was designed as part of the soil vapor extraction system for stabilization of SWMU-11.
alternate concentration limit	An alternate concentration limit (ACL) is a concentration level for a compound that has no ARAR. The ACL is estimated to be the highest acceptable concentration that may be present in an environmental medium, but that will not cause adverse health effects in a chronically exposed individual under defined exposure scenarios.

analyte

In general, an analyte is an organic compound or an inorganic compound or element for which laboratory tests (analyses) are performed to determine whether the chemical is present and, if so, at what concentration. More precisely, an analyte is the identification of a specific parameter which is measured in concentration units.

anisotropic

A medium (e.g., soil) showing a physical property that is not equal in all directions — the property varies with direction. See also **isotropic**.

AOC

See **area of concern**.

AOC-13

AOC-13, the Process Building Area, is the area in which most of the production activities occurred.

AOC-14

AOC-14, the Atlantic Tubing and Rubber Company Property, refers to a parcel of land located west of Mill Street which was purchased by CIBA-GEIGY from Atlantic Tubing in 1978. This property was never used nor developed by CIBA-GEIGY.

Appendix IX

As defined in the Order, "Appendix IX" refers to Appendix IX to 40 C.F.R. Part 264 as amended; see 52 Fed. Reg. 25942 (July 9, 1987; Final Rule).

Appendix IX compounds

Appendix IX compounds are those chemicals listed in Appendix IX to 40 C.F.R. Part 264 as amended; see 52 Fed. Reg. 25942 (July 9, 1987; Final Rule).

Appendix IX VOA

See **Appendix IX Volatile Organic Analysis**.

Appendix IX Volatile Organic Analysis

Appendix IX Volatile Organic Analysis refers to analysis for volatile organic compounds listed in Appendix IX to 40 C.F.R. Part 264 as amended; see 52 Fed 12g 25942 (July 9, 1987; Final Rule).

Applicable or Relevant and Appropriate Requirements

Applicable or Relevant and Appropriate Requirements (ARARs) are those legislated and/or promulgated federal, state, or local standards and requirements of concern, relevance, or interest regarding the site. As listed in the RCRA Facility Investigation Proposal, the ARARs may include:

- MCLs for water quality;
- National Ambient Air Quality Standards;
- Drinking Water Quality Standards;
- National Academy of Science Advisories;
- World Health Ambient Air Quality Standards;
- Rhode Island Ambient Air Standards;
- National Water Quality Criteria;
- Rhode Island Water Quality Standards;
- standards set by Cranston City Ordinances; and
- Cranston POTW Industrial Pretreatment Program standards.

aquifer losses

Aquifer losses are the portion of drawdown attributable to laminar (smooth) flow. Aquifer losses are time-dependent and vary linearly as a function of discharge.

aquifer testing

Aquifer testing is testing that involves pumping a well (or a series of wells) for a period of time and observing the change in hydraulic load in the aquifer. Aquifer testing is conducted to evaluate the capacity of the well(s) and the hydraulic characteristics of the aquifer itself. Aquifer testing has been conducted throughout the RCRA Corrective Action Study at the facility, but additional aquifer testing has been proposed as part of the investigation phase of the stabilization program. The details about the aquifer testing performed for stabilization were presented in this Stabilization Investigation Report and Design Concepts Proposal.

ARAR

See **Applicable or Relevant and Appropriate Requirements.**

area of concern

As defined in the Order, an area of concern is an area at which releases of hazardous waste or hazardous constituents are identified.

Atlantic Tubing and Rubber Company Property

See **AOC-14.**

Atterberg limits

Atterberg limits are geotechnical parameters that correspond to arbitrary moisture contents, established by routine laboratory tests, to determine the boundaries among the states of consistency (i.e., solid, semisolid, plastic, and liquid) for fine-grained soils. The boundaries are termed the shrinkage limit (SL — between the solid and semisolid states), the plastic limit (PL — between the semisolid and plastic states), and the liquid limit (LL — between the plastic and liquid states). The Plasticity Index (I_p) corresponds to the range of water content for which soil is plastic; that is, $I_p = LL - PL$.

average exposed individual

An average exposed individual (AEI) is a conceptual scenario used to evaluate the potential risk to human receptors from various compounds. (See also **reasonable maximum exposed individual.**)

background

Background for any of the media (groundwater, soil, surface water, and sediments) shall mean a representative nearby sample of the media that is not affected by the facility.

background sampling

Background sampling is sampling conducted off-site to determine the "baseline" levels of analytes in Media of Concern in the region or locale. These baseline (or "background") levels are used for comparison against analytes found in samples on-site; that is, background sampling provides a control condition for evaluating constituents found on-site.

baseline

In Phase I, MCLs (maximum contaminant levels) and secondary drinking water standards were used for baseline concentrations of inorganic analytes in groundwater samples and surface water samples from the Waste Water Treatment Area (SWMU-10) pond. For soil, river surface water, and riverbed sediment samples, baseline concentrations were established based on the maximum concentrations of inorganic analytes detected in the same types of samples from background locations. Because sediment in the SWMU-10 pond was soil originally, the soil baselines also were used for the SWMU-10 pond.

baseline level — See **baseline.**

basis of design — The basis of design for a treatment or pretreatment system prescribes the factors underlying (and justifying) the design for the system, such as influent flow rate, constituent concentrations and loadings, effluent quality requirements, and air emission standards.

bathymetric survey — As part of the Phase I hydrological investigation, a bathymetric survey of the Pawtuxet River was conducted to measure the topography of the riverbed along the facility reach.

bench-scale testing — Bench-scale testing involves laboratory tests or simulations of the technologies which may be employed in the conceptual design for a pretreatment or treatment system. Bench-scale tests use small quantities of the Media of Concern to be treated (e.g., groundwater), and typically are performed in batches (often called "jar tests"). The tests systematically vary the treatment conditions or chemistries from one batch to another. The stabilization investigation included three bench-scale tests for groundwater pretreatment — metals removal, air stripping, and activated carbon adsorption.

bioassay analyses — Bioassay analyses are conducted to determine the toxicity of Media of Concern to representative plant and animal species. In general, one or a few species are selected for each of the Media of Concern in an investigation. Each species is tested separately. Individuals of the selected species are introduced into an environment containing a sample of the Media of Concern. Typically, one or two dependent variables may be measured — survival rates and/or reproduction rates. The dependent variables also are measured in control conditions in order to assess the relative effects of the Media of Concern.

biological oxygen demand — See **biochemical oxygen demand.**

biochemical oxygen demand — As defined in the American Public Health Association Standard Methods, biochemical oxygen demand (BOD) is a measure of the oxygen required for the biochemical degradation of organic material (carbonaceous demand), the oxygen used to oxidize inorganic material (such as sulfides and ferrous iron), and possibly the oxygen used to oxidize reduced forms of nitrogen (nitrogenous demand). The BOD is used as an idex of organic pollution in water samples.

BOD — See **biochemical oxygen demand.**

bottom shear stress — See **shear stress.**

BTEX — BTEX is an abbreviation for a group of four compounds: benzene, toluene, ethylbenzene, and xylene.

BTX — BTX is an abbreviation for a group of three compounds: benzene, toluene, and xylene.

bulk density — Bulk density (or total unit weight) is the average of the densities (or unit weights) of the constituent components of a soil or rock and the void spaces.

CAG	See **Carcinogenic Assessment Group.**
CAMU	See **Corrective Action Management Unit.**
capture zone	The capture zone is the region of the aquifer affected by pumping a well, or more specifically, the region from which constituents may be captured by a pump-and-treat system at a well.
Carcinogenic Assessment Group	The Carcinogenic Assessment Group (CAG) is an organization within the USEPA whose members specialize in the assessment of, and protection from, carcinogenic compounds.
CASR	See **Current Assessment Summary Report**.
cation exchange capacity	Cation exchange capacity (CEC) is a measure of a soil's ability to exchange cations (i.e., positively charged ions) with other cations in solution.
C. dubia	See ***Ceriodaphnia dubia.***
CEC	See **cation exchange capacity.**
CERCLA	See **Comprehensive Environmental Responsibility, Compensation and Liability Act.**
Ceriodaphnia dubia	*Ceriodaphnia dubia* is a type of small invertebrate, often called a "water flea", used in bioassay analyses to test the toxicity of surface water and sediment pore water from the Pawtuxet River. Water fleas are small, planktonic, freshwater crustaceans commonly found in lakes and large rivers throughout the world. Water fleas play important roles both as herbivores (feeding on algae) and as prey for many vertebrate species (particularly fish). These characteristics, as well as their relatively short life cycle, make water fleas a useful organism for testing aquatic toxicity.
chemical fate modeling	Chemical fate modeling involves the application of mathematical models that evaluate the movement of contaminants in the environment and the effects that physical, chemical, and biological factors have on how contaminants are distributed among the air, water, and soil or sediment portions of the environment. Chemical fate modeling often is referred to as "contaminant fate modeling".
chemical oxygen demand	As defined in the American Public Health Association Standard Methods, chemical oxygen demand (COD) is a measure of the oxygen equivalent of the organic matter content of a sample that is susceptible to oxidation by a strong chemical oxidant.
Chironomus tentans	*Chironomus tentans* is a type of small insect (midge) used in bioassay analyses to test the toxicity of sediment from the Pawtuxet River. Second instar larvae (i.e., larvae after the first molt) of the midge were used in Phase I bioassay tests. Midge larvae are detritivores that live in sediment and are thereby exposed to toxicants both through feeding and through contact with the sediment.
Chlorosulfonic Acid Release Area	See **SWMU-7.**

CIBA-GEIGY	The CIBA-GEIGY Corporation, headquartered (in the United States) in Ardsley, NY, owns the facility being investigated.
CMS	See **Corrective Measures Study**.
CMS Proposal	See Corrective Measures Study Proposal.
CMS Report	See Corrective Measures Study Report.
COD	See **chemical oxygen demand**.
Comprehensive Environmental Responsibility, Compensation and Liability Act	The Comprehensive Environmental Responsibility, Compensation and Liability Act (CERCLA) of 1980, commonly called "Superfund", is legislation addressing the cleanup of hazardous waste sites. It stipulates that cleanup costs are to be born proportionately by all parties who created the hazards.
conceptual design	The conceptual design for a treatment or pretreatment system illustrates the unit operations, process sequence, and treatment chemistries proposed for the system at a high level, but does not identify or provide the specific equipment (models or vendors), the mass balance, nor the detailed instrumentation and controls that would be needed for the system.
Conceptual Design Plan	See Draft Stabilization Design Documents.
confined aquifer	A confined aquifer is a formation in which the groundwater is isolated from the atmosphere at the point of discharge by impermeable geological formations.
Consent Order	See **Administrative Order of Consent**.
constant-rate aquifer test	A constant-rate aquifer test is a hydrogeological method used to determine aquifer parameters such as transmissivity, storage coefficients or specific yield, and distance-drawdown relationships.
constant rate pump test	See **constant rate aquifer test**.
constituents of concern	Constituents of concern are the chemicals or compounds of interest at and/or near the site because of their toxicity, mobility, and/or persistence.
contaminant fate modeling	See **chemical fate modeling**.
contaminant loading	Contaminant loading is the amount of constituents (in dry weight) expected to be carried by the groundwater per unit of time (e.g., pounds per day).
Corrective Action Management Unit	A Corrective Action Management Unit (CAMU) is an area of two or more SWMUs (and/or AOCs) which require similar remediation and (because of location or other factors) can be remediated as a single unit.
Corrective Action Program	See **RCRA Corrective Action Study**.
Corrective Action Study	See **RCRA Corrective Action Study**.

Corrective Measures Study — A Corrective Measures Study (CMS) constitutes the latter part of a RCRA Corrective Action Study; it proposes cleanup procedures that are designed to meet the Media Protection Standards. The results of a Corrective Measures Study are described in a Corrective Measures Study Report.

Corrective Measures Study Proposal — A Corrective Measures Study Proposal (or CMS Proposal) describes the work proposed to remediate the facility. The CMS Proposal concludes Stage III of a RCRA Corrective Action Study.

Corrective Measures Study Report — A Corrective Measures Study Report (or CMS Report) describes the work that was performed in the Corrective Measures Study; it concludes Stage IV of a RCRA Corrective Action Study.

corrosion/encrustation parameters — See **treatability parameters.**

C. tentans — See ***Chironomus tentans.***

Current Assessment Summary Report — The Current Assessment Summary Report (or CASR) summarized what was known about the facility when the RFI Proposal was written, and was included in Volume 1 of the RCRA Facility Investigation Proposal.

Darcy's Law — Darcy's Law provides an equation that can be used to compute the quantity of water flowing through an aquifer.

Dense Non-Aqueous Phase Liquids — Dense Non-Aqueous Phase Liquids (DNAPLs) are liquids that are denser than water and that are not soluble in water (such as trichloroethylene — TCE). DNAPLs are important because they sink through water (e.g., groundwater) to form layers or pockets. (See also **Light Non-Aqueous Phase Liquids.**)

density logging — See **gamma-gamma logging.**

Design Concepts Proposal — This report (submitted at the end of the investigation phase of the stabilization program) that describes, at a high level, what treatment technologies are proposed for the design phase of stabilization. The design phase begins when the USEPA reviews and provides comments on this Design Concepts Proposal.

design phase — The second phase of the stabilization program, design provides the detailed plans and procedures needed for constructing and implementing actions or treatments in the areas of the facility targeted for stabilization. The design phase is based on the results obtained in the investigation phase, and concludes with submission to the USEPA of the Final Stabilization Design Documents. See also **stabilization, stabilization program, investigation phase, implementation phase.**

dewatering — Dewatering is simply the process of allowing a medium of concern to "dry out", or to be dried out using mechanical or thermal means, so that constituents (e.g., solids) in the medium may be separated from the medium itself.

Director — As defined in the Order, "Director" refers to the Director of the Waste Management Division for the EPA Region I or his/her designee.

discharge limitations — Discharge limitations specify the maximum levels of constituents that are acceptable (without violation) for wastewater discharged to a POTW. Because the groundwater pretreated at the facility is being discharged to the Cranston POTW, the discharge limitations for the groundwater at the facility are the pretreatment standards prescribed by the Cranston POTW in CIBA-GEIGY's Industrial Wastewater Discharge Permit No. 0321. See also **pretreatment standards.**

discharge rate — Discharge rate (usually symbolized "Q") is the volume of water discharged (i.e., flowing or pumped out of a well, aquifer, or other hydraulic source) per unit of time (e.g., gallons per minute or per day).

discharge survey downstream point — The "discharge survey downstream" (DSD) point is the downstream (eastern) transect at which water discharge and suspended sediment discharge were measured in the Phase IA hydrological investigation.

discharge survey upstream point — The "discharge survey upstream" (DSU) point is the upstream (western) transect at which water discharge and suspended sediment discharge were measured in the Phase IA hydrological investigation.

dissolved oxygen — Dissolved oxygen (DO) is the amount of oxygen dissolved in a specific quantity of water (at a specified temperature and pressure). Dissolved oxygen is an important water quality parameter because of oxygen transfer, production, and consumption in aquatic environments.

DNAPLs — See **Dense Non-Aqueous Phase Liquids.**

DO — See **dissolved oxygen.**

downhole logging — See **downhole geophysical logging.**

downhole geophysical logging — Downhole geophysical logging is a set of geophysical techniques that provide stratigraphic information over depth; downhole techniques may be based on either electrical or nuclear measurements. Nuclear techniques (proposed for Phase II) measure the emissions or reflections of certain types of atomic particles in geological strata. Some downhole logging techniques (such as natural gamma logging) passively measure particle emissions; other techniques (such as gamma-gamma logging and neutron logging) actively bombard the strata with particles and measure the proportion of particles reflected (and thereby, the proportion absorbed by the strata).The techniques rely on the fact that different types of strata may have different rates of particle emission or reflection. The measurements are made by moving a detector down a boring or well, and continuously logging the emissions/reflections. Downhole logging techniques are useful for obtaining a continuous index of geology as a function of depth. (See also **natural gamma logging, gamma-gamma logging**, and **neutron logging.**)

downstream reach — The downstream reach is the segment (or "reach") of the Pawtuxet River that is downstream of the facility but is being studied as part of the Facility Investigation.

Draft Stabilization Design Documents — The report (submitted toward the end of the design phase of the stabilization program) that describes in detail what treatment technologies are proposed for the implementation phase of stabilization, as well as the construction plans and the operations and maintenance procedures that will be used to install and run the treatment systems. The Draft Stabilization Design Documents will be delivered to the USEPA three months after receiving comments from the USEPA on this Design Concepts Proposal. The USEPA will review and provide comments on the Draft Stabilization Design Documents.

drawdown — Drawdown is the distance that the water level in a well falls when the well is pumped. The drawdown in a pumped well has two components — aquifer losses and well losses. (See also **aquifer losses** and **well losses.**)

DSD — See **discharge survey downstream point.**

DSU — See **discharge survey upstream point.**

dual-phase extraction — See **HIVAC technology.**

effectiveness — Effectiveness is one criterion used to evaluate the feasibility of a treatment at a particular site. In general, effectiveness addresses whether installing the treatment system at the site is likely to remove or reduce the constituents of concern to targeted and/or acceptable levels. See also **feasibility.**

efficiency — See **well efficiency.**

electrical resistivity survey — Electrical resistivity is a geophysical survey method used as a reconnaissance tool to infer the thicknesses and depths of geological layers and their respective soil or rock types. The method is based on the fact that soil and rock have distinctive electrical resistivity contrasts between bedding layers. An electrical resistivity survey of the facility was conducted as part of the Phase I physical characterization.

environmental assessment — In Phase II, an environmental assessment is proposed to provide information needed for the Public Health and Environmental Risk Evaluation (PHERE). The environmental assessment proposed for Phase II includes toxicity identification evaluations, characterizations of the ecosystem and aquatic populations, identification of terrestrial receptor populations, assessments of exposure and risk, and a risk characterization and uncertainty analysis.

environmental characterization — See **release characterization.**

environmental media — As defined in the RCRA Facility Investigation Proposal, environmental media include soil, groundwater, surface water, and sediment. (See also **Media of Concern.**)

environmental setting — As defined in the RCRA Facility Investigation Proposal, the environmental setting includes the geography, climate, geology, hydrogeology, and hydrology of a site or facility. (See also **physical characterization.**)

EPA — See **United States Environmental Protection Agency.**

equipotential — An equipotential is a line along which the pressure head of groundwater in an aquifer is the same.

facility — The "facility" refers to the CIBA-GEIGY facility at Cranston, Rhode Island that is being investigated. As defined in the Order, the facility includes all contiguous land and structures, other appurtenances and improvements on the land, not limited to solid or hazardous waste management areas used for treating, storing, or disposing of hazardous waste.

Facility Assessment — See **RCRA Facility Assessment.**

facility boundary — As defined in the RCRA Facility Investigation Proposal, the facility boundary defines that portion of land owned by CIBA-GEIGY which encompasses all of the plant operating units. The facility boundary is within the legal boundaries of the property.

Facility Investigation — See **RCRA Facility Investigation.**

Facility Investigation Proposal — See **RCRA Facility Investigation Proposal.**

Facility Investigation Work Plan — The Facility Investigation Work Plan described the work proposed for the Facility Investigation and was included in Volume 1 of the RCRA Facility Investigation Proposal.

facility reach — The facility reach is the segment (or "reach") of the Pawtuxet River that is adjacent to (i.e., bordered by) the facility and is being studied as part of the Facility Investigation.

fathead minnows — See ***Pimephales promelas.***

feasibility — Feasibility is an evaluation of the usefulness of a particular treatment technology/procedure at a particular site. Feasibility involves three general criteria — the *effectiveness* of the technology for treating the particular constituents of concern at the site, the *implementability* of the technology at the site, and the *cost* of installing and using the technology at the site. See also **effectiveness, implementability.**

field blank — A field blank is a type of control sample used to ensure that contamination of samples did not occur in the field (i.e., during sample collection).

field screening — Field screening is a category of analytical procedures conducted in the field (e.g., during sample collection). Field screening procedures may be used to provide preliminary or estimated analytical data or to select samples for additional testing. Phase I field screening procedures included collecting HNu readings in test pits, conducting headspace analysis, and examining samples under ultraviolet light.

Final Design Plan

See **Final Stabilization Design Documents**.

Final Stabilization Design Documents

The revised and expanded version of the Draft Stabilization Design Documents that describes in detail what treatment technologies are proposed for the implementation phase of stabilization, as well as the construction plans and the operations and maintenance procedures that will be used to install and run the treatment systems. The Final Stabilization Design Documents will address comments received from the USEPA on the Draft Stabilization Design Documents, and will be delivered to the USEPA three months after receiving comments on the Draft Stabilization Design Documents. The implementation phase will begin 30 days after receiving comments from the USEPA on the Final Stabilization Design Documents.

fingerprint compounds

As defined in the RCRA Facility Investigation Proposal, fingerprint compounds are major chemical compounds which were manufactured at the facility and which have been selected on the basis of volume and duration of production, toxicity, and environmental mobility. Fingerprint compounds are specific and unique to the facility, and are not Appendix IX compounds. Some of the site's fingerprint compounds are Imipramine (Tofranil), phenylbutazone (Butazolidin), Propazine, and Tinuvin 327.

flow net analysis

Flow net analysis is a hydrogeological method used to determine the pattern and rate of groundwater flow in an aquifer by dividing the aquifer into a grid-like series of "flow tubes" that comprise the "flow net", and analyzing the groundwater flow in each "tube".

flow regime

The flow regime of a river or stream refers to a range of streamflows exhibiting similar bedforms, resistances to flow, and modes of sediment transport. Knowing a river's flow regime helps toward making inferences about the transport of sediment (and contaminants) in the river. The flow regime of a river can be estimated either from bedforms or by calculations.

fraction

A fraction is a group of elements or compounds (or more generally, analytes) that are similar chemically.

full-scale groundwater capture system

See **full-scale groundwater capture and pretreatment system.**

full-scale groundwater capture and pretreatment system

A full-scale groundwater capture and pretreatment system is proposed in order to facilitate stabilization of groundwater in the Production Area at the facility. The system would produce a reversal of the groundwater gradient at the bulkhead (preventing further migration of groundwater from the shallow overburden aquifer into the Pawtuxet River), capture groundwater from the shallow overburden aquifer in AOC-13 and SWMU-11, and pretreat the groundwater to levels below the discharge limitations. The pretreated groundwater would be discharged to the Cranston POTW. See also **pilot testing.**

full-scale groundwater pretreatment system

See **full-scale groundwater capture and pretreatment system.**

gamma-gamma logging

Gamma-gamma logging (sometimes called "density logging") is a downhole geophysical logging method that actively bombards strata with gamma particles and measures the proportion of particles reflected by the strata. Because the proportion of gamma particles reflected depends on the electron density of the material in a stratum, the gamma particle counts recorded provide a rough indication of the bulk density of the stratum. In general, the higher the density, the lower the porosity of the stratum. The method is especially useful because it provides a continuous measurement of stratigraphic density over depth.

geological investigation

Part of the physical characterization of the site, the Phase I geological investigation helped establish the environmental setting of the facility and contributed to the site model. The Phase I geological investigation involved a literature review, geological mapping of bedrock exposures, and an on-site geological study (that included drilling and sampling subsurface soils and bedrock).

geometric mean

The mean of n positive numbers obtained by taking the nth root of the product of the numbers. For example, the geometric mean of 2 and 8 is 4.

geophysical investigation

Part of the physical characterization of the site, the Phase I geophysical investigation helped establish the environmental setting of the facility and contributed to the Site Model. The Phase I geophysical investigation included seismic refraction, electrical resistivity, and ground-penetrating radar surveys.

GPR

See **ground-penetrating radar survey**.

grab sample

A grab sample is either 1) a sample obtained with a grab sampler, or 2) a sample of rock or sediment collected more or less at any place.

grab sampler

A grab sampler is a type of sampling apparatus with movable jaws that close after the sampler is dropped to the bottom of a river, pond, or other water body. A grab sampler was used in the Phase I investigations to obtain subaqueous samples of river bottom sediments.

ground-penetrating radar survey

A ground-penetrating radar (GPR) survey is a geophysical survey method used as a reconnaissance tool for 1) locating natural and man-made subsurface features that may aid or impede the flow of groundwater, and 2) avoiding objects while drilling. The method is based on the fact that soil and rock layers (as well as other subsurface features that could affect groundwater flow or contaminant migration) reflect radar signals from surfaces between layers having a high conductivity contrast. It is most useful in areas containing resistive materials (such as dry rocks, or clean sands that have been saturated with fresh water); it is much less useful in areas having conductive materials (such as clay or rocks with conductive pore fluid). A GPR survey of the facility was conducted as part of the Phase I physical characterization.

groundwater

As defined in the Order, groundwater refers to water below the land surface in the subsurface zone, below which all pore space is filled with water (i.e., the saturated zone).

groundwater extraction system See **full-scale groundwater capture and pretreatment system.**

groundwater pretreatment Pretreatment of groundwater is that treatment which occurs at (or near) the facility and is conducted by an entity other than the POTW (i.e., CIBA-GEIGY) prior to discharge of the groundwater to the POTW. At this time, groundwater pretreated at the facility must comply with the discharge limitations prescribed in the discharge permit issued to CIBA-GEIGY by the Cranston POTW. See also **discharge limitations** and **pretreatment standards.**

groundwater treatability testing Groundwater treatability testing (including both bench-scale testing and pilot pretreatment system testing) was conducted as part of the investigation phase of the stabilization program. The details about the groundwater treatability testing for stabilization were presented in this Stabilization Investigation Report and Design Concepts Proposal.

H&S Guidelines See Health and Safety Guidelines.

hazard index A hazard index (HI) for a particular compound is the ratio of the intake at the exposure point to the reference dose; that is:

$$\mathbf{HI} = \frac{\textbf{Intake at Exposure Point}}{\textbf{RfD}}$$

Hazard indices are used to characterize the health effects of non-carcinogenic compounds.

hazardous constituents As defined in the Order, hazardous constituents include those constituents listed in Appendix VIII to 40 C.F.R. Part 261 and Appendix IX to 40 C.F.R. Part 264.

hazardous waste As defined in the Order, hazardous waste is a term used as defined in § 1004 (5) of RCRA, 42 U.S.C. § 6903 (5).

Hazardous Waste Storage Area See **SWMU-1.**

head See **hydraulic head.**

head loss Head loss is the portion of head energy (pressure) which is lost because of friction as water flows.

headspace Headspace is the space above the soil or sediment sample in a sample jar; the space is occupied by vapors that are tested using headspace analysis.

headspace analysis Headspace analysis is a field screening procedure for the preliminary identification of volatile organic compounds in soil or sediment samples. Headspace analysis measurements can be made either with an organic vapor analyzer (OVA) or an HNu meter.

Health and Safety Guidelines — The Health and Safety Guidelines described the guidelines proposed in order to ensure the health and safety of personnel during the Corrective Action Study of the facility. These guidelines constituted Volume 3 of the RCRA Facility Investigation Proposal.

health-based criteria — As defined in the Order, health-based criteria shall refer to those health-based standards that, in order of preference, have been either promulgated by EPA in regulation form, adopted by EPA in guidance form, or approved by the Director.

HHEM — See **Human Health Evaluation Manual.**

HI — See **hazard index.**

HIVAC — See **HIVAC technology.**

HIVAC® technology — HIVAC technology is a proprietary dual-phase soil vapor and groundwater treatment technology that was pilot tested for stabilization of SWMU-11 at the facility. In general, a HIVAC treatment system works similarly to a standard soil vapor extraction system, except that a high vacuum is used. The high vacuum not only reduces the concentrations of volatile constituents in the groundwater, but also causes "micro-fractures" in the soil. These micro-factures permit reducing the concentrations of volatile constituents in the soil by exposing them to the air in the micro-fractures. HIVAC extraction is a relatively new procedure, but (in certain situations) has shown an order-of-magnitude improvement in removing volatile constituents. The details about the HIVAC pilot test performed for stabilization were presented in this Stabilization Investigation Report and Design Concepts Proposal.

HNu — See **headspace analysis.**

HSWA — As defined in the Order, HSWA refers to the Hazardous and Solid Waste Amendments of 1984.

Human Health Evaluation Manual — The Human Health Evaluation Manual (HHEM) is a USEPA publication that describes the procedures and methods for evaluating various risks to human health.

hydraulic conductivity — Hydraulic conductivity is a hydrogeological measure of groundwater movement and is defined as the rate of groundwater flow through a one-foot-square cross-sectional area under a unit hydraulic gradient.

hydraulic gradient — The hydraulic gradient is the rate of change of pressure head per unit distance; hydraulic gradients may be measured vertically or horizontally, and may be upward or downward. A horizontal hydraulic gradient of zero is flat — the groundwater surface is level.

hydraulic head — Head is the amount of energy (pressure) in an aquifer or well and is measured using the water level in the aquifer or well.

hydraulic loading — Hydraulic loading is the volume of groundwater expected per unit of time — for example, gallons per minute (gpm) or gallons per day (gpd).

hydrochemical facies

Hydrochemical facies are a way to represent the chemical composition of waters, and especially a way to compare the chemical compositions of different samples of waters quickly and visually. In essence, the chemical "face" of a sample is represented by plotting the concentrations of three positive and three negative ionic groups on two trilinear (triangular) diagrams (one for positive and one for negative ions). These two trilinear plots (sometimes called Piper diagrams) can be collapsed into a single parallelogram that presents the hydrochemical facies of the samples.

hydrodynamic modeling

Hydrodynamic modeling involves the use of a numerical model to solve (approximately) the equations governing the movement of water in a river, lake, estuary, or ocean. The model predicts water surface elevations and current velocities, which vary both temporally and spatially.

hydrogeological investigation

Part of the physical characterization of the site, the Phase I hydrogeological investigation helped establish the environmental setting of the facility and contributed to the site model. The Phase I hydrogeological investigation involved installing monitoring wells and piezometers, monitoring groundwater levels, conducting slug tests and recovery tests, conducting step-drawdown tests, and analyzing the chemical composition of groundwater.

hydrological investigation

The Phase I hydrological investigation helped establish the environmental setting of the Pawtuxet River (an off-site area). The Phase I hydrological investigation examined the Pawtuxet River and its association with the facility using a literature review, a bathymetric survey, water discharge monitoring, sediment discharge monitoring, and riverbed sediment sampling and analysis.

implementability

Implementability is one criterion used to evaluate the feasibility of a treatment at a particular site. In general, implementability addresses whether installing the treatment system at the site is possible/reasonable on technical grounds. See also **feasibility**.

implementation phase

The third phase of the stabilization program, implementation involves actually constructing, starting, and operating the actions or treatments in the areas of the facility targeted for stabilization. The implementation phase is performed in accordance with the Final Stabilization Design Documents, and concludes when the performance standards for stabilization have been achieved. See also **stabilization, stabilization program, investigation phase, design phase.**

indicator chemicals

See **indicator compounds.**

indicator compounds

Indicator compounds vary for each SWMU, AOC, and AAOI; they include all analytes detected in Phase I for each of the Media of Concern at a particular SWMU, AOC, or AAOI.

Industrial Discharge Limits

The concentration limits permitted under the Cranston POTW Industrial Pretreatment Program for a number of analytes in wastewater discharged to the Cranston POTW.

investigation phase	The first phase of the stabilization program, investigation provides any additional data needed to design actions or treatments in the areas of the facility targeted for stabilization. The investigation phase is performed in accordance with the Stabilization Work Plan, and concludes with submission to the USEPA of this Stabilization Investigation Report and Design Concepts Proposal. See also **stabilization, stabilization program, design phase, implementation phase.**
isotropic	A medium (e.g., soil) showing a physical property that is equal in all directions. See also **anisotropic.**
Interim Report	See **Phase I Interim Report**.
IT	See **International Technology, Inc.**
International Technology, Inc.	International Technology, Inc., headquartered in Knoxville TN, conducted bioassay analyses and is responsible for the PHERE pursuant to the Corrective Action Study of the facility.
Laboratory Building Waste Water Sump	See **AAOI-15**.
laminar head losses	See **linear head losses.**
library search compound	See **tentatively identified compound.**
Light Non-Aqueous Phase Liquids	Light Non-Aqueous Phase Liquids (LNAPLs) are liquids that have a density lower than water and that are not soluble in water (such as certain oils). LNAPLs are important because they float on water (e.g., groundwater) to form layers or pockets. (See also **Dense Non-Aqueous Phase Liquids.**)
linear head losses	Linear head losses (sometimes called "laminar head losses") are the portion of well losses caused by damage to the aquifer during drilling and completion of the well that is being pumped.
linear well losses	See **linear head losses.**
lithology	Lithology is a description of the characteristics of a rock or stratigraphic unit.
LNAPLs	See **Light Non-Aqueous Phase Liquids.**
loading	See either **contaminant loading** or **hydraulic loading.**
LOAEL	See **lowest-observable-adverse-effect level.**

lowest-observable-adverse-effect level

The lowest-observable-adverse-effect level (LOAEL) for a particular compound is a published concentration value that has the least observable adverse effect on a particular population. As defined in the RCRA Facility Investigation Proposal, the LOAEL is the concentration at which some effects on the exposed population may be observable, but those effects are not considered to be adverse nor to be precursors to specific adverse effects. If there is no NOAEL for a compound, the LOAEL may be used in calculating potential risk. (See also **no-observable-adverse-effect level.**)

Maintenance Department Cleaning Area

See **SWMU-16.**

major ions

Major ions are charged atomic or molecular units and fall into two groups — cations (positively charged) and anions (negatively charged). Most natural waters are composed of four cationic groups (sodium — Na, potassium — K, magnesium — Mg, and calcium — Ca) and four anionic groups (chlorides — Cl, sulfates — SO_4, bicarbonates — HCO_3, and carbonates — CO_3). (See also **hydrochemical facies.**)

maximum contaminant level

The maximum contaminant level (MCL) for a particular compound is the highest acceptable concentration level for that compound in order to meet acceptable water quality standards.

MCL

See **maximum contaminant level.**

media

See **Media of Concern.**

Media of Concern

As defined in the Order, Media of Concern refer to soil and groundwater at the site, as well as to surface water and sediment in both SWMU-10 and in the Pawtuxet River. (See also **environmental media.**)

Media Protection Standards

Media Protection Standards (MPS) are written as part of a RCRA Corrective Action Study to define the standards that must be met in order to protect the Media of Concern at the site.

midge larvae

See ***Chironomus tentans.***

mid-point method

See **USGS mid-section method.**

mid-section method

See **USGS mid-section method.**

Modification of the Order

On 28 September 1992, a Modification of the Administrative Order of Consent was executed between the USEPA and the CIBA-GEIGY Corporation in order to accommodate stabilization activities in the Production Area at the facility.

monitoring well

As defined in the Order, a monitoring well is a well capable of producing groundwater samples that, upon laboratory analysis, can provide a reliable indication of groundwater quality.

Monthly Progress Reports

As required by the Order, Monthly Progress Reports have been submitted describing the activities, samples, jeopardies, anticipated schedule, and changes to the Work Plan,s as well as the problems encountered and how those problems were resolved.

MPS

See **Media Protection Standards.**

National Pollutant Discharge Elimination System

The Federal Water Pollution Control Act (also known as the Clean Water Act, or CWA), as amended in 1987, requires National Pollutant Discharge Elimination System (NPDES) permits for storm water discharge associated with industrial activity. These regulations are contained primarily in 40 C.F.R. Part 122.26; see 55 PR 47990 (November 16, 1990).

natural gamma logging

Natural gamma logging is a downhole geophysical logging method that passively measures gamma particles emitted by strata. The measurements are used to infer the qualitative characteristics of strata, and also to correlate stratigraphic units between borehole locations. The method primarily indicates the presence of clay units, so it indicates the relative porosity and permeability of strata. The method is especially useful because it provides a continuous measurement of porosity and permeability over depth.

neutron logging

Neutron logging is a downhole geophysical logging method that actively bombards strata with neutrons and measures the proportion of neutrons absorbed by the strata. Because neutrons tend to be absorbed by hydrogen atoms, and because the presence of hydrogen is highly correlated with the presence of water, the method indicates the amount of moisture in the saturated zone and indicates the total porosity under saturated conditions. The method is especially useful because it provides a continuous measurement of saturation and porosity over depth.

NOAEL

See **no-observable-adverse-effect level.**

no-observable-adverse-effect level

The no-observable-adverse-effect level (NOAEL) for a particular compound is a published concentration value that has no observable effect on the exposed population. As defined in the RCRA Facility Investigation Proposal, the NOAEL is the highest concentration in an experiment at which there are no statistically or biologically significant increases in the frequency or severity of adverse effects between the exposed population and its appropriate control. The NOAEL is used in calculating the potential risk from a compound. (See also **lowest-observable-adverse-effect level.**)

non-linear head losses

Non-linear head losses (sometimes called "turbulent head losses") are the portion of well losses caused by friction or occurring in zones where flow usually is turbulent.

non-linear well losses

See **non-linear head losses.**

NPDES

See **National Pollutant Discharge Elimination System.**

nutrients — Nutrients such as ammoniates (NH_3), nitrates (NO_3), nitrites (NO_2), and phosphates (PO_4) may be measured in samples as an index of treatability. (See also **treatability parameters**.)

observation well — As defined in the Order, an observation well is a well used to measure water table elevations.

off-site investigation — Part of the Phase I investigation, the off-site investigation provided information about conditions surrounding the facility in off-site areas other than the Pawtuxet River.

O&M — See **operation and maintenance**.

O&M Plans — See **operation and maintenance** and Final Stabilization Design Documents.

operable unit — See **Corrective Action Management Unit**.

operation and maintenance — Operation and maintenance (O&M) of a treatment or pretreatment system begins after construction, start-up, and performance testing of the system, and entails training the operators of the system, operating the system routinely (including record-keeping), monitoring the system's performance routinely, and maintaining the system to ensure that it continues to operate efficiently and effectively. Preliminary plans for O&M of the treatment/pretreatment systems for stabilization of the Production Area will be included in the Draft Stabilization Design Documents; final O&M plans will be included in the Final Stabilization Design Documents.

Order — See **Administrative Order of Consent**.

Ordinance Discharge Limits — The concentration limits permitted under the Cranston City Ordinance for a number of analytes in wastewater discharged to the Cranston publicly-operated treatment works (POTW).

organic vapor analyzer — An organic vapor analyzer (OVA) is an instrument used to detect volatile organic compounds in soil or sediment samples. (See also **headspace analysis**.)

ORTF — See **Over-the-River Tank Farm**.

OVA — See **organic vapor analyzer**.

Over-the-River Tank Farm — The Over-the-River Tank Farm (ORTF) was built in 1970 and 1971; it was comprised of six 7500-gallon tanks and three 3000-gallon tanks. The tanks were enclosed in a reinforced concrete dike which was supported by steel piles. The tanks contained new and recovered solvents including alcohol, toluene, and xylene.

oxidation-reduction potential — Oxidation-reduction potential (often called "redox") is a measure of the potential for the atoms or molecules of a constituent or analyte to lose (oxidation) or gain (reduction) electrons.

PAH — See **polycyclic aromatic hydrocarbon**.

partitioning — In natural water systems, organic chemicals and heavy metals adsorb to solid particles (such as silts and clays). The distribution between dissolved and sorbed phases is termed "partitioning".

PCB — See **polychlorinated biphenyl**.

performance evaluation criteria — See **performance standards**.

performance standards — Performance standards are the levels and measures used to determine when and whether stabilization has been achieved. For example, reduction of the concentration of an analyte (or constituent) in a particular medium of concern to a specified concentration could serve as a performance standard.

permeability — Permeability is a measure of the capacity of a porous rock, sediment, or soil to transmit a fluid, and is positively correlated with hydraulic conductivity.

Phase I — The first half of the CIBA-GEIGY Facility Investigation, Phase I involved both physical characterization and release characterization activities. In general, the objective of Phase I was to develop a physical site model and determine what constituents were present at the site. Phase I was divided into two parts — Phase IA and Phase IB; the results of the Phase I investigation are reported in the Phase I Interim Report (submitted in November 1991).

Phase I Interim Report — The report (submitted at the conclusion of Phase I) describing the objectives, methods, analyses, and results of the Phase I investigation of the facility — including the Phase I physical characterization, the Phase I release characterization, and the Phase I off-site investigation; the Phase I Interim Report constitutes Volume 1 of the Phase I Interim Report and Phase II Proposal (submitted in November 1991).

Phase IA — The first part of the Phase I investigation of the facility, Phase IA was conducted in the Spring and Summer of 1990 and involved mostly physical characterization. The results of the Phase IA investigation were reported in the Phase IA Report.

Phase IA Report — The report describing the objectives, methods, analyses, and results of the Phase IA investigation of the facility; the Phase IA Report was submitted in October 1990 and approved in May 1991.

Phase IB — The second part of the Phase I investigation of the facility, Phase IB was conducted late in 1990 and in the first half of 1991. Phase IB involved both physical characterization and release characterization activities. The results of the Phase IB investigation are reported in the Phase I Interim Report (submitted in November 1991).

Phase II

The second half of the CIBA-GEIGY Facility Investigation, Phase II will involve both physical characterization and release characterization activities. In general, the objective of Phase II is to determine how much of certain constituents is present at the site. The activities proposed for Phase II are described in the Phase II Proposal, Volume 2 of the Phase I Interim Report and Phase II Proposal and in the Phase II Pawtuxet River Proposal; the results of the Phase II investigation will be reported in the RCRA Facility Investigation Report.

Phase II Proposal

The report (submitted at the conclusion of Phase I) describing the objectives, methods, and analyses planned for the Phase II investigation of the facility — including the Phase II physical characterization, the Phase II release characterization, and the Phase II off-site investigation (exclusive of the activities associated with Pawtuxet River investigations); the Phase II Proposal constitutes Volume 2 of the Phase I Interim Report and Phase II Proposal.

Phase II Pawtuxet River Proposal

The report describing the objectives, methods, and analyses planned for the Phase II investigations of the Pawtuxet River.

PHERE

See **Public Health and Environmental Risk Evaluation.**

PHERE Proposal

As part of the RCRA Facility Investigation Proposal, the PHERE Proposal described the plans for collecting, analyzing, and reporting the data for the Public Health and Environmental Risk Evaluation.

PHERE Report

The PHERE Report will describe the methods, analyses, results, and conclusions of the Public Health and Environmental Risk Evaluation. The PHERE Report will be submitted at the conclusion of Phase II in conjunction with the RCRA Facility Investigation Report.

physical characterization

Physical characterization involves activities or studies performed to define or describe the environmental setting of a facility in sufficient detail to develop a site model of the facility's physical environment and to support designing and conducting the release characterization. (See also **environmental setting.**)

piezometer

As defined in the Order, a piezometer is a small-diameter, non-pumping well used to measure hydraulic head at some depth below the water table.

pilot-scale testing

See **pilot testing.**

pilot testing

Pilot testing of a treatment or pretreatment system usually follows bench-scale testing and involves constructing, operating, and evaluating a small-scale version (a "pilot unit") of the (full-scale) treatment system proposed. Pilot tests are intended to simulate the unit operations, process sequence, and treatment chemistries of the full-scale process, and provide a bridge from bench-scale testing to full-scale operation which helps to optimize the design of the full-scale system. Pilot tests typically use scaled-down process equipment (and associated ancillary equipment) installed temporarily at the site for the duration of the test period.

Pimephales promelus	*Pimephales promelus* is a type of fathead minnow used in bioassay analyses to test the toxicity of surface water from the Pawtuxet River. Fathead minnows are a surface water fish with a widespread distribution throughout the United States. They are an important forage fish in the food chain and are readily cultured in the laboratory.
Piper diagrams	See **hydrochemical facies.**
point of exposure	As defined in the Order, a point of exposure is the point at which it is assumed a potential receptor can come into contact, either now or in the future, with hazardous waste and/or hazardous constituents.
polyaromatic hydrocarbon	See **polycyclic aromatic hydrocarbon.**
polychlorinated biphenyl	In general, a polychlorinated biphenyl (PCB) is a category of organic compounds characterized by heavily-chlorinated biphenyl oil compounds. PCBs are used in transformers, heat exchangers, and some hydrostatic equipment.
polycyclic aromatic hydrocarbon	A polycyclic aromatic hydrocarbon (PAH) is a category of organic compounds characterized by molecular structures involving multiple benzene rings.
polynuclear aromatic hydrocarbons	See **polycyclic aromatic hydrocarbons.**
porosity	In general, porosity is a measure of the "voids" in a geological sample or layer. More specifically, porosity is the percentage of the bulk volume of a rock or soil that is occupied by interstices, regardless of whether those interstices are isolated or connected.
POTW	See **publicly owned treatment works.**
P. promelas	See ***Pimephales promelas.***
Preliminary Investigation	As defined in the RCRA Facility Investigation Proposal, a Preliminary Investigation is not part of a RCRA Corrective Action Study but was conducted by CIBA-GEIGY before the Order was signed in order to understand site conditions better.
Preliminary O&M Plans	See **operation and maintenance** and **Draft Stabilization Design Documents**.
Preliminary RCRA Facility Investigation	See **Preliminary Investigation.**
Preliminary RFI	See **Preliminary Investigation.**
pretreatability testing	See **groundwater treatability testing.**
pretreatment	See **groundwater pretreatment.**

pretreatment standards — Pretreatment standards are prescribed by a POTW and specify the maximum levels of constituents acceptable in water discharged to the POTW. Because (at this time) groundwater pretreated at the facility is being discharged to the Cranston POTW, the pretreatment standards prescribed by the Cranston POTW in CIBA-GEIGY's Industrial Wastewater Discharge Permit No. 0321 define the discharge limitations for groundwater pretreated at the facility. See also **discharge limitations.**

PRFI — See **Preliminary Investigation.**

Process Building Area — See **AOC-13.**

Production Area — The Production Area is the portion of the facility west of the Waste Water Treatment Area, east of Mill Street, and north of the Pawtuxet River. Most of the chemical production activities at the facility occurred in the Production Area. About seventeen buildings were located in this area along with trash compactors and above-ground storage tanks. Several constituent releases are known to have occurred in this area. The area has six SWMUs (SWMUs-2, -3, -4, -7, -8, and -11), two AOCs (AOC-13 and -14), and one AAOI (AAOI-15). In Phase I, two Media of Concern — soil (including both surficial and subsurface soils) and groundwater — were investigated at every SWMU, AOC, and AAOI in the Production Area. Stabilization is being conducted at AOC-13 and SWMU-11.

Prussian Blue Release Area — See **SWMU-8.**

Public Health and Environmental Risk Evaluation — A Public Health and Environmental Risk Evaluation (PHERE, also known simply as a "Risk Evaluation") is part of a RCRA Facility Investigation. The PHERE will be conducted in Phase II to evaluate the risks to public health and the environment from the facility. The work proposed for the PHERE relevant to the CIBA-GEIGY facility was described in the PHERE Proposal; the results of the PHERE will be reported in the PHERE Report.

publicly owned treatment works — A publicly owned treament works (POTW) is a municipal wastewater (i.e., sewage) treatment facility.

push core sample — A sample obtained with a push core sampler.

push core sampler — A push core sampler is a hand-operated vertical pipe coring apparatus that was used in the Phase I investigation to collect cores of riverbed sediments.

QA documents — See Quality Assurance Documents.

QA Plan — See Quality Assurance Documents.

QADS — See Quality Assurance Documents: Supplement.

Quality Assurance Documents — The Quality Assurance Documents described the procedures proposed to ensure that the work in the Corrective Action Study of the facility will meet all appropriate standards and conditions. These documents constituted Volume 2 of the RCRA Facility Investigation Proposal.

Quality Assurance Documents: Supplement — This supplement (submitted in January 1992 and revised in December 1992) updated the information in the Quality Assurance Documents and described additional procedures needed to ensure the work in the Corrective Action Study of the facility will meet all appropriate standards and conditions.

QuickFlow model — The QuickFlow model is an analytical computer model used to estimate the capture zone of a recovery well.

RCRA — See **Resource Conservation and Recovery Act.**

RCRA Corrective Action Study — A RCRA Corrective Action Study is a program of investigations conducted toward cleaning up a known or suspected hazardous waste site. In general, a Corrective Action Study has four stages: Stage I is the RCRA Facility Assessment; Stage II is the RCRA Facility Investigation; Stage III is the work culminating in the CMS Proposal; Stage IV is the work culminating in the CMS Report.

RCRA Facility Assessment — A RCRA Facility Assessment (sometimes simply called the "Facility Assessment" or the "RFA") usually is the first stage of a RCRA Corrective Action Study. It is designed to provide an initial or preliminary view of the site's characteristics and potential releases. The results of a Facility Assessment usually are presented in a RCRA FacilityAssessment Report; for the CIBA-GEIGY Corrective Action Study, the results of the Facility Assessment (and the Preliminary Investigation) were summarized in the Current Assessment Summary Report (in Volume 1 of the RCRA Facility Investigation Proposal).

RCRA Facility Investigation — A RCRA Facility Investigation (sometimes simply called the "Facility Investigation" or the "RFI") is the second stage of a RCRA Corrective Action Study. It is designed to provide a comprehensive view of the site's physical characteristics and the impact of potential releases. The design of the Facility Investigation was described in the RCRA Facility Investigation Proposal; the results of a Facility Investigation usually are presented in a RCRA Facility Investigation Report.

RCRA Facility Investigation Proposal — A RCRA Facility Investigation Proposal (or RFI Proposal) describes all aspects of the work planned for a Facility Investigation. The RFI Proposal relevant to the CIBA-GEIGY Corrective Action Study contained the Current Assessment Summary Report, the Strategic Plan, and the Facility Investigation Work Plan in Volume 1, the Quality Assurance Documents in Volume 2, and the Health and Safety Guidelines in Volume 3. The RFI Proposal was submitted in March 1990; Volume 1 was reissued (after approval of the RFI Proposal) in February 1991.

reasonable maximum exposed individual — A reasonable maximum exposed individual (RMEI) is a conceptual scenario used to evaluate the potential risk to human receptors from various compounds. (See also **average exposed individual.**)

recharge rate — Recharge rate (usually symbolized "R") is the rate at which water is added to the zone of saturation.

recovery test — See **water level recovery test.**

redox — See **oxidation-reduction potential.**

reference dose — As defined in the RCRA Facility Investigation Proposal, a reference dose (RfD) is an estimate of the daily exposure level for the human population, including sensitive populations, that is likely to be without appreciable risk of deleterious effects during a lifetime.

release — As defined in the Order, a release includes any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment.

release characterization — As defined in the RCRA Facility Investigation Proposal, a release characterization is a characterization of the nature and extent of chemical releases to environmental media.

removal efficiencies — A removal efficiency is the calculated ratio between the influent concentration for a given constituent *minus* the discharge limitation (i.e., maximum acceptable concentation) for that constituent, divided by the influent concentration detected for that constituent (with this fraction multiplied by 100%). This minimum removal efficiency defines the minimum efficiency (a percentage) that a pretreatment system must afford in order to reduce the concentration of a constituent to a level below the prescribed maximum pretreatment standard. Thus, if a constituent was detected at an average influent concentration of 100 ppb, and the discharge limitation for that constituent is 10 ppb, the removal efficiency required for that constituent is $\{[(100 - 10)/100] \times 100\%\}$, or 90%.

residual drawdown — Residual drawdown is the rise in the water level of a well after pumping stops. It is expressed as the difference between the initial water level before pumping starts and the water level at time *t* after pumping stops.

Resource Conservation and Recovery Act — The Resource Conservation and Recovery Act (RCRA) as amended by the Hazardous and Solid Waste Amendments of 1984, 42 U.S. C. §§ 6901 et seq..

resuspension potential — Resuspension potential is the amount of fine-grained, cohesive sediments which potentially can be resuspended at a particular bottom shear stress.

RFA — See **RCRA Facility Assessment.**

RfD — See **reference dose.**

RFI — See **RCRA Facility Investigation.**

RFI Proposal — See **RCRA Facility Investigation Proposal.**

Rhode Island Department of Environmental Management — The Rhode Island Department of Environmental Management (RIDEM) is the agency in the state of Rhode Island chartered to oversee and protect all aspects of the environment in the state.

RIDEM — See **Rhode Island Department of Environmental Management.**

Risk Evaluation	See **Public Health and Environmental Risk Evaluation.**
River Sediment Storage Area	See **SWMU-5.**
river stage	River stage is the elevation of a river as measured against some standard (usually mean sea level).
RMEI	See **reasonable maximum exposed individual.**
saturated zone	A saturated zone is the portion of a geological unit 1) that occurs below the water table, 2) where the moisture content is equal to the porosity of the formation, and 3) where the fluid pressure is greater than atmospheric pressure.
sediment discharge monitoring	See **sediment discharge survey.**
sediment discharge survey	As part of the Phase I hydrological investigation, a sediment discharge survey was conducted in the Pawtuxet River using the USGS mid-section method.
sediment transport modeling	Sediment transport modeling involves the use of a numerical model to solve (approximately) the equations governing the resuspension, deposition, and fate of sediments (both cohesive and non-cohesive) in a river, lake, estuary, or ocean. The model can predict suspended sediment concentrations and sediment bed elevation changes.
seismic refraction survey	Seismic refraction is a geophysical survey method used as a reconnaissance tool to infer the thicknesses and depths of geological layers and their respective soil or rock types. The method is based on the facts that 1) soil and rock have distinctive seismic wave velocity contrasts between bedding layers, and 2) seismic wave velocity generally increases with depth. A seismic refraction survey of the facility was conducted as part of the Phase I physical characterization.
7500-Gallon, 90-Day Storage Tank	See **SWMU-3.**
shear stress	Shear stress is the force per unit area on a surface due to fluid motion. Of particular importance is the "bottom shear stress", which is the force that moving water exerts on the sediment bed. The bottom shear stress is a controlling factor in the erosion and deposition of sediment.
Shelby tube	A Shelby tube is a type of sampling apparatus that permits obtaining an "undisturbed" soil or sediment sample — one that can be used for geotechnical analyses.
Shelby tube sample	A sample obtained using a Shelby tube — an "undisturbed" sample that is suitable for certain geotechnical analyses (such as hydraulic conductivity).
site	See **facility.**

site model — The site model is a conceptual descriptive model of the site developed based on the results from the geophysical, geological, hydrogeological, and hydrological investigations; the site model helped define the data gaps remaining after Phase I and in developing the proposals for Phase II.

6000-Gallon Hazardous Waste Storage Tank — See **SWMU-2.**

soil vapor extraction — See **vapor extraction.**

solid waste management unit — As defined in the Order, a solid waste management unit (SWMU) is any unit at a facility which contains or contained solid or hazardous wastes, from which hazardous waste or hazardous constituents might migrate, regardless of whether the unit was intended for the management of solid and/or hazardous wastes. A solid waste management unit may include areas at facilities which have become contaminated as a result of routine releases of hazardous waste or hazardous constituents. Examples of SWMUs include (but are not limited to) landfills, surface impoundments, waste piles, land treatment units, incinerators, injection wells, tanks (including 90-day accumulation tanks), container storage areas, transfer stations, and waste recycling operations.

specific retention — Specific retention is the ratio of the volume of water that is retained (i.e., that does not drain due to gravity) from a rock or soil to the total volume of the rock or soil.

specific storage — Specific storage of a saturated aquifer is the volume of water released from storage under a unit decrease in hydraulic head.

specific yield — Specific yield is the ratio of the volume of water that drains (due to gravity) from a rock or soil to the total volume of the rock or soil.

split sample — A split sample is one that has been divided into two (or more) parts so that the parts may be submitted for independent analysis by different laboratories or groups in order to compare and confirm analytical procedures and results. In essence, split samples provide control conditions.

split spoon sample — A sample obtained using a split spoon sampler.

split spoon sampler — A split spoon sampler is a type of sampling apparatus that permits two (theoretically) identical samples to be obtained simultaneously from the same location; these two samples may then be "split" for independent analysis by two different laboratories or groups.

stabilization — Stabilization is new approach for controlling releases at selected RCRA facilities. The intent of stabilization is to prevent or minimize further migration of contaminants while long-term corrective actions are being evaluated. The USEPA envisions that stabilization measures will be identified and implemented under the interim measures authority with the ongoing Facility Investigation activities.

stabilization criteria — See **performance criteria.**

stabilization design	See **design phase.**
stabilization implementation	See **implementation phase.**
stabilization investigation	See **investigation phase.**
Stabilization Investigation Report	This report (submitted at the end of the investigation phase of the stabilization program) that describes the results and implications of the studies conducted in the investigation phase of stabilization.
Stabilization Plan	See Stabilization Work Plan.
stabilization program	The whole series of stabilization activities to be conducted in the Production Area under the auspices of the ongoing RCRA Corrective Action Study. The stabilization program has three phases — investigation, design, and implementation. See also **stabilization, investigation phase, design phase, implementation phase.**
Stabilization Report	The Stabilization Report will be prepared and submitted after the performance standards for stabilization in the Production Area have been met, and will demonstrate that those standards were met.
Stabilization Work Plan	The report (submitted to the USEPA near the beginning of the stabilization program) that describes what studies are proposed for the investigation phase of stabilization.
stage	See **river stage.**
Stage 1	See **RCRA Facility Assessment.**
Stage 2	See **RCRA Facility Investigation.**
Stage 3	See **Corrective Measures Study Proposal.**
Stage 4	See **Corrective Measures Study Report.**
stagnation point	In general, a stagnation point is a place in a groundwater flow field at which the groundwater is not moving. In capture zone analyses, the stagnation point is the point beyond which groundwater will not move toward a recovery well.
step-drawdown test	A step-drawdown test is a hydrogeological method used to determine optimum discharge rates for long-term pumping of a well. Step-drawdown tests allow characterization of a well in terms of the relationship between the discharge and the drawdown as the well is pumped. (See also **discharge** and **drawdown.**)
storativity	Storativity is a parameter that relates the specific yield and the specific storage of the rock or soil in an aquifer as a function of the saturated thickness of the aquifer.
Strategic Plan	The Strategic Plan described the strategies, tactics, logistics, and schedule planned in order to accomplish the work proposed for the Facility Investigation and was included in Volume 1 of the RCRA Facility Investigation Proposal (submitted March 1990 and reissued in approved form in February 1991).

subsurface soil sample — A subsurface soil sample is a sample retrieved from depths of more than 12 inches below ground surface.

Superfund — See **Comprehensive Environmental Responsibility, Compensation and Liability Act.**

surficial soil sample — In general, a surficial soil sample is a soil sample retrieved from depths of 6 to 12 inches below ground surface.

suspended sediment discharge monitoring — See **sediment discharge survey.**

suspended sediment discharge survey — See **sediment discharge survey.**

SWMU — See **Solid Waste Management Unit.**

SWMU-1 — SWMU-1, the Hazardous Waste Storage Area, was designed for a maximum capacity of 768 55-gallon drums. Typically, it stored 300 to 400 drums containing various wastes including flammable liquids and solids, corrosive liquids and solids, organic mixtures and solids, non-hazardous organic mixtures, and chloroform. The area was about 42 by 58 feet, and was asphalt-lined, diked, and surrounded by a 6-foot chain-link fence. The dike was capable of holding 48,000 gallons.

SWMU-2 — SWMU-2, the 6000-Gallon Hazardous Waste Storage Tank, was used to store process wastes containing acetone, toluene, monochlorobenzene, isopropanol, naphtha, xylene, heptane, methanol, and water. The carbon steel tank was 17 feet high, 8 feet in diameter, and was enclosed by an 8000-gallon dike (14.5 by 19 by 4 feet).

SWMU-3 — SWMU-3, the 7500-Gallon, 90-Day Storage Tank, was a vertical above-ground tank used to store flammable liquids for periods of less than 90 days. The stainless steel tank was 17 feet high, 8.5 feet in diameter, and was enclosed by a 25,000-gallon dike (about 28 by 29 by 4 feet).

SWMU-4 — SWMU-4, the Trash Compactor Station, had two trash compactors (30- and 55-cubic yard capacity) and only handled packaging material, paper wastes, and washed fiber drums. The trash compactor station (21 by 36 feet) was concrete-lined and drained to the Waste Water Treatment Plant.

SWMU-5 — SWMU-5, the River Sediment Storage Area, contained about 6630 cubic yards of sediment that had been dredged from the Pawtuxet River as part of removing the original cofferdam/waste water outfall. The sediment was removed from the site in 1976 and the natural grade of the area was restored in 1977.

SWMU-6 — SWMU-6, the Zinc Oxide/Soil Storage Pile, has about 25 cubic yards of soil containing about 10% zinc oxide residue; the residue resulted from a broken railcar. The soil pile is about 50 by 7 by 2 feet.

SWMU-7 SWMU-7, the Chlorosulfonic Acid Release Area, is an area about 10 by 20 feet at which about 500 gallons of chlorosulfonic acid were released.

SWMU-8 SWMU-8, the Prussian Blue Release Area, is an area from which about 300 cubic yards of blue-stained soil (believed to be stained by the release of an unknown quantity of Prussian Blue) were excavated and removed.

SWMU-9 SWMU-9, the Waste Water Pipeline Break — Warwick Area, is where a break in the main raw waste transfer line resulted in the discharge of about 24,000 gallons of waste water. The waste water entered the surface water runoff catchment system and discharged to the Pawtuxet River. The waste water typically contained halogenated and non-halogenated solvents and other organic compounds routinely used in the chemical manufacturing process.

SWMU-10 SWMU-10, the Waste Water Pipeline Break — Waste Water Treatment Area, is where a break in an underground waste water line resulted in a discharge of about 50,000 gallons. The discharge flowed into a small pond on-site and then diverted to the Pawtuxet River. The pH of the released waste water was 8.5; the chemical oxygen demand was 1010 parts per million. This discharge contained acetone (31 pounds), isopropyl alcohol (45 pounds), toluene (7 pounds), xylene (1.7 pounds), zinc (0.25 pounds), and nitrobenzene (0.125 pounds).

SWMU-11 SWMU-11, the Toluene Waste Water Release Area, is where an estimated release of between 9 and 90 pounds of toluene in waste water occurred via a subsurface sump associated with Building 11.

SWMU-12 SWMU-12 is the area formerly occupied by the Waste Water Treatment Plant. Biological trickling towers were used and periodic sump overflows from these towers resulted in discharges to the river. Influent to the towers routinely contained volatile and semi-volatile organic compounds. Additional releases from SWMU-12 in excess of the NPDES permit requirements have been reported for zinc, BOD, and phenols; in two releases, chloroform was discharged to the river.

SWMU-16 SWMU-16, the Maintenance Department Cleaning Area, is where maintenance equipment was steam-cleaned. Rinse water drained to a nearby surface water catch basin. Originally, this area was denoted as AAOI-16.

TAL See **Target Analyte List**.

Target Analyte List The Target Analyte List (TAL) is a list of inorganic analytes specified by the USEPA in their July 1987 Statement of Work for the Contract Laboratory Program. In general, the list of analytes includes cyanide and various metals.

target chemicals See **target compounds**.

Target Compound List — The Target Compound List (TCL) is a list of organic analytes specified by the USEPA in their July 1987 Statement of Work for the Contract Laboratory Program. In general, the list of compounds includes volatile organic compounds, acid/base/neutral semi-volatile extractable compounds, and pesticide/PCB compounds.

target compounds — Target compounds are a subset of indicator compounds selected according to their toxicity and the concentrations observed in the Phase I release characterization. See also **indicator compounds**.

TCL — See **Target Compound List.**

TCLP — See **Toxicity Characteristic Leaching Procedure.**

TDS — An abbreviation for total dissolved solids; see **treatability parameters.**

tentatively identified compound — A tentatively identified compound (TIC), sometimes called a "library search compound", is one that can be identified to be within a particular chemical category, but cannot be identified specifically.

Theim equation — The Theim equation (Theim, 1908) is an equation that relates the discharge of a well to the drawdown from pumping that well, assuming two-dimensional radial flow toward the well.

Theis equation — The Theis equation (Theis, 1935) is an equation for determining the flow of groundwater when a well is pumped in a fully confined aquifer. The equation accounts for the effect of pumping time and distance on the yield from the well.

TIC — See **tentatively identified compound.**

TKN — An abbreviation for total Kjeldahl nitrogen; see **treatability parameters.**

TOC — See **total organic carbon.**

Todd method — The Todd method is an analytical procedure based on a series of equations. The method is used to calculate the capture zone of a recovery well in a uniform groundwater flow field.

Toluene Waste Water Release Area — See **SWMU-11.**

total organic carbon — Total organic carbon (TOC) is a measure of the amount of organic carbon present in compounds (i.e., not in CO_2) in a sample.

total suspended solids — Total suspended solids (TSS) is a measure of the amount of solid material in suspension in a well-mixed sample that is retained on a weighed standard glass-fiber filter. The measure is obtained by filtering the sample, drying the filter, and weighing the material retained on the filter.

total toxic organics — Total toxic organics is a term used in the POTW discharge ordinances to represent the sum of the concentrations of volatile organic compounds, semi-volatile organic compounds, and pesticides.

TOX — An abbreviation for total organic halides; see **treatability parameters.**

Toxicity Characteristic Leaching Procedure — In general, Toxicity Characteristic Leaching Procedure (TCLP) is the USEPA-designated laboratory procedure for extracting leachate from a sample. Specifically, TCLP is a method specified in 40 C.F.R. Part 261, Appendix II, Method 1311 and designed to determine the mobility of organic and inorganic contaminants in liquid, solid, and multiphase wastes. Thus, TCLP is the USEPA laboratory procedure for extracting leachate from a sample. A waste is regarded to be hazardous if the TCLP leachate contains concentrations exceeding the USEPA's prescribed regulatory levels given in 40 C.F.R. Part 261-24.

TPE — Two-phase extraction — see **HIVAC technology.**

TPHC — An abbreviation for total petroleum hydrocarbons; see **treatability parameters.**

transect — A transect is a line surveyed across a river so that various measurements (e.g., bathymetry, discharge) can be made along the transect. Ten transects were surveyed across the Pawtuxet River for the Phase I hydrological investigation.

transmissivity — Transmissivity (usually symbolized 'T') is a measure of the amount of water that can be transmitted through a unit width of an aquifer under a unit hydraulic gradient. Transmissivity equals the hydraulic conductivity times the saturated thickness of the aquifer (i.e., T=Kb). (See also **hydraulic conductivity.**)

Trash Compactor Station — See **SWMU-4.**

treatability parameters — Treatability parameters are chemical characteristics that reflect whether a chemical compound is amenable to on-site treatment and/or treatment at a publicly owned treatment works. Treatability parameters include total petroleum hydrocarbons (TPHC), total Kjeldahl nitrogen (TKN), total organic halides (TOX), total dissolved solids (TDS), as well as nutrients like ammoniates (NH_3), nitrates (NO_3), nitrites (NO_2), and phosphates (PO_4). Sometimes corrosion/encrustation parameters (such as pH, Langlier Index, H_2S, hardness, silica, and alkalinity) also are measured.

treatability testing — See **groundwater treatability testing.**

trilinear diagrams — See **hydrochemical facies.**

trip blank — A control sample used to ensure that contamination of samples did not occur during shipment.

TSS — See **total suspended solids.**

turbulent head losses — See **non-linear head losses.**

two-phase extraction — See **HIVAC technology.**

unconfined aquifer — An unconfined aquifer is an aquifer where the water table is exposed to the atmosphere through openings in the overlying materials.

Unified Soil Classification System — The Unified Soil Classification System (USCS) was developed by Casagrande (1948) but has been adopted and modified by several organizations. This system permits easy classification of soils based primarily on grain size and soil plasticity; soils in any given class exhibit similar characteristics and properties. Classifications are denoted by letter codes and include (among many others) clay (CL), sandy gravel (GP), gravel (GM), silt (ML), silty sand (SM), and clean sand (SP).

United States Environmental Protection Agency — The United States Environmental Protection Agency (USEPA, or simply EPA) is the federal agency charged with protection of all aspects of the environment.

United States Geological Survey — The United States Geological Survey (USGS) is the federal agency responsible for mapping and studying the land and geology of the United States.

uppermost aquifer — As defined in the Order, the uppermost aquifer is the geological formation nearest the natural ground surface that is an aquifer, as well as lower aquifers that are hydraulically interconnected with this aquifer.

upstream reach — The upstream reach is the segment (or "reach") of the Pawtuxet River that is upstream of the facility but is being studied as part of the Facility Investigation. Essentially, findings in the upstream reach may be regarded to reflect background conditions.

USCS — See **Unified Soil Classification System.**

USEPA — See **United States Environmental Protection Agency.**

USGS — See **United States Geological Survey.**

USGS mid-section method — The mid-section method was developed by the USGS for discharge surveys. In general, the distance along a transect is divided into *n* sections, and the mid-point of each section is the point at which measurements (e.g., of flow) are taken. This method of surveying discharge has been shown to give accurate results. The discharge survey conducted in the Phase I hydrological investigation used the USGS mid-section method.

vadose zone — The vadose zone is the region wherein the water table fluctuates — the vadose zone lies above the saturated zone, and is itself saturated when the water table is high, but is not saturated when the water table is low.

vapor extraction — In general, vapor extraction is a technology/procedure used to treat contaminated soil by exposing volatile constituents in the soil to air, allowing those constituents to be emitted to the atmosphere.

varves — Laminations caused by the seasonal deposition of sediments in a body of still water (e.g., a glacial lake). Unconsolidated deposits containing such laminations are said to be "varved".

VOA — See **Appendix IX Volatile Organic Analysis.**

VOC — See **volatile organic compound.**

VOH — See **volatile organic hydrocarbon.**

Volatile Organic Analysis — See **Appendix IX Volatile Organic Analysis.**

volatile organic compound — A volatile organic compound (VOC) is a category of compounds which (characteristically) boil at a very low temperature and are amenable to purge and trap analysis. Some examples of VOCs are acetone, benzene, methylene chloride, toluene, and vinyl chloride.

volatile organic hydrocarbon — A volatile organic hydrocarbon (VOH) is a category of compounds very similar to VOCs except, in general, VOH molecules contain only carbon, hydrogen, and oxygen atoms. Some examples of VOHs include hexane, pentane, and the alkanes and alkenes (more generally). VOHs also include gasoline, fuel oils, and diesel fuels.

Warwick Area — The Warwick Area is the portion of the facility south of the Pawtuxet River and contains SWMUs-1, -5, -6, -9, and -16 (formerly AAOI-16). SWMU-1 is the location where hazardous waste was stored in drums. SWMU-5 is an area where dredged riverbed sediment was stored. SWMU-6 is a soil pile containing residues of zinc oxide. SWMU-9 was the location of a waste water pipeline break that released about 24,000 gallons of raw waste water into the surface water runoff catchment system. SWMU-16 was where the maintenance department steam-cleaned equipment. In Phase I, two Media of Concern — soil and groundwater — were investigated at most of the SWMUs in the Warwick Area.

Waste Water Pipeline Break — Warwick Area — See **SWMU-9.**

Waste Water Pipeline Break — Waste Water Treatment Area — See **SWMU-10.**

Waste Water Treatment Area — The Waste Water Treatment Area (WWTA) is the portion of the facility east of the Production Area and north of the Pawtuxet River. The WWTA contains SWMUs-10 and -12. SWMU-10 was the site of a waste water pipeline break that released about 50,000 gallons of waste water onto the ground surface; the waste water flowed into a pond on-site and subsequently drained into the Pawtuxet River. SWMU-12 encompasses the entire Waste Water Treatment Area. Occasional discharges occurred during the operation of the waste water treatment plant; these releases are the subject of the investigations at SWMU-12. In Phase I, two Media of Concern — soil and groundwater — were investigated at each SWMU in the WWTA. Two additional Media of Concern, surface water and sediment, were investigated at the pond in SWMU-10.

Waste Water Treatment Plant — See **SWMU-12.**

water discharge monitoring — See **water discharge survey.**

water discharge survey — As part of the Phase I hydrological investigation, a water discharge survey of the Pawtuxet River was conducted using the USGS mid-section method to determine the water flow volume in the river under two discharge events.

water fleas — See ***Ceriodaphnia dubia.***

water level recovery test — A water level recovery test is a hydrogeological method used to determine the transmissivity of an aquifer (across the screened interval of a well penetrating the aquifer) by measuring the time it takes for the water level in the well to recover to a baseline (i.e., stable or "normal") level after pumping.

Water Quality Standards — As defined in the Order, Water Quality Standards are provisions of State or Federal law which consist of a designated use or uses for the waters of the United States and water quality criteria for such waters based on such uses. Water Quality Standards are established to protect the public health or welfare, enhance the quality of water, and serve the purposes of the Act.

WCC — See **Woodward-Clyde Consultants.**

well efficiency — Essentially, the efficiency of a well is simply an index of the amount of losses from the well during its discharge. For example, a well that loses only 10% of its head during discharge is much more efficient than one that loses 40%. Efficiency is used to indicate whether a well is suitable for long-term pumping and recovery — the more efficient the well, the more suitable it is as a recovery well (all other things being equal). The concepts underlying, and the calculation of, well efficiencies are discussed in detail in Appendix K in the Phase I Interim Report.

well losses — Well losses are the portion of drawdown *not* attributable to aquifer losses. Well losses are divided into two components — linear (sometimes called "laminar") head losses and non-linear (sometimes called "turbulent") head losses. (See also **linear head losses** and **non-linear head losses.**)

Woodward-Clyde Consultants — Woodward-Clyde Consultants (WCC) is a division of the Woodward-Clyde Group — an international environmental and geosciences engineering and consulting enterprise.

Work Plan — See **RCRA Facility Investigation Proposal.**

zero-flux conditions — In groundwater modeling, zero-flux conditions exist at the stagnation point (i.e., where groundwater is not moving in the aquifer).

Zinc Oxide/Soil Storage Pile — See **SWMU-6.**

zone of contamination

As defined in the Order, the zone of contamination means the three-dimensional extent of contamination that was produced or is being produced from a release of hazardous waste or hazardous constituents from solid waste management units and/or areas of concern. This zone includes solid waste management units and areas of concern and their associated contamination.

Appendix B

B

BORING LOGS

This appendix presents the boring logs prepared during stabilization activities in the Production Area under the RCRA Facility Investigation at the CIBA-GEIGY facility in Cranston, RI. The boring logs are organized by the type of well for which the boring was advanced — either a monitoring well ("MW"), a piezometer — ("P"), or a recovery well ("RC"). For each type of well, the boring logs are presented in numerical order by the identifying number of the well/piezometer for which the boring was advanced (e.g., MW-20S, MW-21S, and so on).

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LOG OF BORING MW-20S SHEET 1 OF 1

PROJECT AND LOCATION: CIBA-GEIGY / Cranston, RI		ELEVATION AND DATUM: 18.83 Orig. Grade	PROJECT NO.: 87X4660
DRILLING AGENCY: Burlington Environmental Inc.	FOREMAN: Tim Crank	DATE STARTED: June 16, 1992	DATE FINISHED: June 16, 1992
DRILLING EQUIPMENT: CME 75 Truck Mounted Rig		COMPLETION DEPTH: 19 ft.	ROCK DEPTH: Not Encountered
SIZE AND TYPE OF BIT: 8 1/4-inch Hollow Stem Augers	SIZE AND TYPE CORE BARREL: NA	NO. SAMPLES: DIST 7	UNDIST —; CORE —
CASING: —		WATER LEVEL: FIRST ~ 6 ft.	COMPL —; 24 HR 7.04 ft.
CASING HAMMER: WEIGHT —	DROP —	BORING ANGLE AND DIRECTION: Vertical	
SAMPLER: 2-inch Split Spoon / 3-inch split spoon			
SAMPLER HAMMER: WEIGHT 140 lb	DROP 30-inch	INSPECTOR: E.M. Hastings	

DESCRIPTION	PIEZOMETER	DEPTH, FT	SAMPLES TYPE NO. LOC	RECOV. FT	PENETR RESIST BL/6IN.	TIME	HNU/PID READINGS (PPM) SAMPLE	AMBIENT AIR	TIME	REMARKS
Blacktop, C gravel, Black C-F Sand, Fill		1	—	—	—	0800	—	0.6 PPM	0800	No Sample Taken.
SP; Brown M-F SAND, Silty-Sand, tr. C-F gravel, roots, dry		2–3	—	1.2'	4 3 3 4	0807	0.6 PPM	0.6 PPM	0809	3-inch spoon, sample collected for PCB (Level II) engineering grade
SP; Tan, gray silty-SAND, tr F-C gravel, moist		4–5	—	1.2'	5 1 4 2	0818			0820	Sample collected for PCB (Level II) engineering grade.
SP; Brown M-F SAND, some F-C gravel, wet		6–7	—	1.2'	6 5 5 4	0825			0827	
SP; Dk. Brown M-F SAND, tr. Silt, tr. gravel, Saturated		8–9	—	0.4'	3 5 5 4	0830			0833	
Same as above		10–11	—	0.6'	1 2 2 2	0839			0842	
SP; Dk. gray M-F SAND, tr. silt, Sm. gravel, Saturated		12–13	—	1.0'	WH 1 2 3	0845			0848	
Same as above		14–15	—	0.6'	WH WH 1 3	0850			0852	
No Samples Taken		16–18	No Samples Taken.							Boring Augered to 19 ft. to install MW-20S.
End of Boring at 19.0 ft		19								

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LOG OF BORING MW-21S

SHEET 1 OF 1

PROJECT AND LOCATION: CIBA-GEIGY / Cranston, R.I.		ELEVATION AND DATUM: 15.82 Orig. Grade	PROJECT NO.: 87X4660
DRILLING AGENCY: Burlington Environmental Inc.	FOREMAN: Tim Crank	DATE STARTED: June 27, 1992	DATE FINISHED: June 27, 1992
DRILLING EQUIPMENT: CME 75 Truck Mounted Rig		COMPLETION DEPTH: 19 ft.	ROCK DEPTH: Not encountered
SIZE AND TYPE OF BIT: 8 1/4-inch Hollow Stem Augers	SIZE AND TYPE CORE BARREL: NA	NO. SAMPLES: DIST 7	UNDIST — CORE —
CASING —		WATER LEVEL: FIRST ~5 ft.	COMPL — 24 HR 5.50 ft.
CASING HAMMER — WEIGHT —	DROP —	BORING ANGLE AND DIRECTION: Vertical	
SAMPLER 2-inch Split Spoon			
SAMPLER HAMMER — WEIGHT 140 lbs	DROP 30-inch	INSPECTOR: E.M. Hastings	

DESCRIPTION	PIEZOMETER	DEPTH, FT	SAMPLES TYPE NO. LOC	RECOV, FT	PENETR RESIST BL/6IN.	TIME	HNU/PID READINGS (PPM) SAMPLE	AMBIENT AIR	TIME	REMARKS
Blacktop, Fill, C-F SAND, gravel		1	—	—	—	0813	—	0.6 PPM	—	No Sample Taken.
Fill, Brown C-M SAND, tr. C. gravel, dry		2–3	—	0.5'	3 3 3 3	0813	0.2 PPM	0.6 PPM	0820	• Sample Collected for PCB (level II) engineering grade • Field Blank done, • HNU not working (Rain).
Fill, Tan-brown C-M SAND, tr. F-C gravel, wet		4–5	—	1.0'	2 3 4 4	0822	—	—	—	• Sample Collected for PCB (level II) engineering grade.
Fill, Gray C-M SAND, Some C-F gravel, saturated, Gray-Green SILT in Tip of Spoon.		6–7	—	0.5'	4 10 10 6	0830	—	—	—	
ML; Gray SILT, Varved, Some F SAND, wet		8–9	—	1.5'	3 3 4 4	0835	—	—	—	
Same as above		10–11	—	1.0'	1 1 2 4	0840	—	—	—	
Same as above		12–13	—	1.3'	1 2 3 4	0845	—	—	—	
SM; Gray-brown F SAND, silty-Sand, wet.		14–15	—	1.6'	2 2 3 4	0850	—	—	—	
No Samples Taken		16–18	No SAMPLES TAKEN							Boring Augered to 19 ft. to install MW-21S.
End of boring at 19 ft.		19								

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LOG OF BORING MW-22S

SHEET 1 OF

PROJECT AND LOCATION	CIBA-GEIGY / Cranston, R.I.
ELEVATION AND DATUM	13.94 Orig. Grade
PROJECT NO.	87X4660
DRILLING AGENCY	Burlington Environmental Inc.
FOREMAN	Tim Crank
DATE STARTED	June 15, 1992
DATE FINISHED	June 15, 1992
DRILLING EQUIPMENT	CME 75 Truck Mounted Rig
COMPLETION DEPTH	18 ft.
ROCK DEPTH	Not encountered
SIZE AND TYPE OF BIT	8¼-inch Hollow Stem Auger
SIZE AND TYPE CORE BARREL	NA
CASING	—
NO. SAMPLES	DIST 8
UNDIST	—
CORE	—
WATER LEVEL	FIRST ~5 ft.
COMPL.	—
24 HR.	3.67 ft
CASING HAMMER	WEIGHT — DROP —
SAMPLER	2-inch Split Spoon
BORING ANGLE AND DIRECTION	Vertical
SAMPLER HAMMER	WEIGHT 140 lbs DROP 30-inch
INSPECTOR	E.M. Hastings

DESCRIPTION	PIEZOMETER	DEPTH, FT	SAMPLES TYPE NO. LOC	RECOV, FT	PENETR RESIST BL/6IN.	TIME	HNU/PID READINGS (PPM) SAMPLE	AMBIENT AIR	TIME	REMARKS
Pavement, Fill, Brown C-F SAND		1								No Sample taken
Fill; Tan C-F SAND, some gravel, dry		2								
		3	—	0.5'	3 3 7 7	1258	0.2 PPM	0.2 PPM	1300	• Sample Collected for PC (level II) engineering grade • No Sample for headspace
SP; Tan C-F SAND, gravelly-Sand, C-F gravel, Saturated		4								
		5	—	1.4'	3 6 11 11	1312			1315	
Same as above		6								
		7	—	0.5'	4 3 2 4	1320			1322	
SP; Top 0.4'- M-F SAND, some gravel, Saturated		8								
ML; Bottom 0.9'- DK. gray SILT, Sandy-silt, some clay, wet		9	—	1.3'	5 4 5 5	1325			1330	
ML; Gray SILT, silty-Clayey, tr. F sands, moist		10								
		11	—	1.5'	5 4 5 4	1335			1339	
SM; Gray F. SAND, silty-Sand, wet		12								
		13	—	1.4'	WH 1 1 1	1345			1352	
SM; Gray F. SAND, some silt, wet		14								
		15	—	1.4'	0 2 2 4	1355			1403	
Same as above		16								
		17	—	1.2'	2 3 3 3	1409			1411	
End of boring at 18.0 ft.		18								
		19								

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LOG OF BORING MW-23S

SHEET 1 OF 2

PROJECT AND LOCATION	CIBA-GEIGY / Cranston, RI
ELEVATION AND DATUM	21.10 Orig. Grade
PROJECT NO.	87X4660
DRILLING AGENCY	Burlington Environmental Inc.
FOREMAN	Tim Crank
DATE STARTED	June 16, 1992
DATE FINISHED	June 17, 1992
DRILLING EQUIPMENT	CME 75 Truck Mounted Rig
COMPLETION DEPTH	23 ft.
ROCK DEPTH	Not encountered
SIZE AND TYPE OF BIT	8 1/4-inch Hollow Stem Augers
SIZE AND TYPE CORE BARREL	NA
CASING	—
NO. SAMPLES	DIST 9
UNDIST	—
CORE	—
WATER LEVEL	FIRST ~ 11 ft.
COMPL	—
24 HR	11.51 ft.
CASING HAMMER	WEIGHT — DROP —
BORING ANGLE AND DIRECTION	Vertical
SAMPLER	2-inch Split Spoon / 3-inch split Spoon
SAMPLER HAMMER	WEIGHT 140 lbs DROP 30-inch
INSPECTOR	E.M. Hastings

DESCRIPTION	PIEZOMETER	DEPTH, FT	SAMPLES TYPE NO. LOC	RECOV, FT	PENETR RESIST BL/6IN.	TIME	HNU/PID READINGS (PPM) SAMPLE	AMBIENT AIR	TIME	REMARKS
Pavement, Fill, SAND, gravel		1						0.6 PPM		No Sample Taken
		2								done for the day 6/16/92
SP; Brown. M-F SAND, Some C-F gravel, dry		3	—	0.9'	3 3 3 2	0800	0.2 PPM	0.6 PPM	0802	Start 6/17/92
SP; Brown-Tan M-F SAND, Some C-F gravel, tr. Silt, dry		4								
		5	—	1.0'	3 4 9 9	0805	0.6 PPM	0.6 PPM	0809	3-inch Spoon. Collected Sample for PCB (level II) engineering grade. MS/MSD taken.
SW; Tan F SAND, dry		6								
		7	—	1.7'	3 4 5 7	0813			0815	Collected Sample for PCB (level II) engineering grade. Dup taken.
SW; Tan-Orange, M-F SAND, moist		8								
		9	—	2.0'	3 4 5 5	0820			0823	
SW; Tan F SAND, with orange F Sand parting, wet		10								
		11	—	1.6'	1 3 4 5	0825			0827	
SP; Grey-tan, M-F SAND, tr. silt, saturated		12								
		13	—	1.9'	2 2 2 3	0832			0835	
SP; Gray F SAND, tr. silt, layer of orange F Sand (14.5'-15'), saturated		14								
		15	—	1.9'	1 2 1 1	0838			0840	
SP; Top 0.7'- Gray F SAND, tr. silt, wet Bottom 0.7'- Orange-brown M-F SAND, saturated, iron staining.		16								
		17	—	1.4'	1 1 3 7	0850			0853	
SP; Orange M-F SAND, saturated		18								
		19	—	1.4'	3 3 2 1	0900			0903	Boring was Augered to 23 ft. No samples were taken from 20'-23'.

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LOG OF BORING MW-24S

SHEET 1 OF 1

PROJECT AND LOCATION: CIBA-GEIGY / Cranston, RI.		ELEVATION AND DATUM: 21.59 Orig. Grade	PROJECT NO.: 87X4660
DRILLING AGENCY: Burlington Environmental Inc.	FOREMAN: Tim Crank	DATE STARTED: June 17, 1992	DATE FINISHED: June 17, 1992
DRILLING EQUIPMENT: CME 75 Truck Mounted Rig		COMPLETION DEPTH: 21 ft.	ROCK DEPTH: Not encountered
SIZE AND TYPE OF BIT: 8 1/4-inch Hollow Stem Augers	SIZE AND TYPE CORE BARREL: NA	NO. SAMPLES: DIST 7	UNDIST —; CORE —
CASING: —		WATER LEVEL: FIRST ~10 ft.	COMPL —; 24 HR 10.32 ft.
CASING HAMMER: WEIGHT —	DROP —	BORING ANGLE AND DIRECTION: Vertical	
SAMPLER: 2 inch split Spoon			
SAMPLER HAMMER: WEIGHT 140 lbs	DROP 30-inch	INSPECTOR: E.M. Hastings	

DESCRIPTION	PIEZOMETER	DEPTH, FT	SAMPLES TYPE NO. LOC	RECOV, FT	PENETR RESIST BL/6IN.	TIME	HNU/PID READINGS (PPM) SAMPLE	AMBIENT AIR	TIME	REMARKS
Blacktop, SAND, gravel		1								No Sample Taken
Brown, C-F SAND, some gravel, dry		2–3	—	1.2	3 9 7 5	1340	0.6 PPM	0.6 PPM	1352	
No Recovery		4–5	—	NR	3 6 10 20	1357	—	0.6 PPM	—	
SP; Brown C-F SAND, gravelly-sand, C-F gravel, dry		6–7	—	1.0'	4 8 13 18	1400	0.6 PPM	0.6 PPM	1402	Collected Sample for PCB (level II) engineering grade.
Same as above, wet in tip of spoon		8–9	—	0.9'	11 25 13 7	1408			1410	
Same as above, Saturated.		10–11	—	1.0'	3 7 8 9	1412			1414	
SP; Gray C-F SAND, gravelly-sand, some gravel, Saturated		12–13	—	0.5'	3 7 6 5	1420			1422	
Same as above		14–15	—	0.5'	7 5 5 5	1425			1428	
Same as above		16–17	—	0.1'	4 7 7 7	1436			1438	
		18–19								Boring augered to 21ft. No Samples were taken from 18 - 21 ft.

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LOG OF BORING P-2D

PROJECT AND LOCATION: CIBA-GEIGY / Cranston R.I.		ELEVATION AND DATUM: 12.96 Orig. Grade	PROJECT NO.: 87X4660
DRILLING AGENCY: Burlington Environmental Inc.	FOREMAN: T. Crank	DATE STARTED: June 14, 1992	DATE FINISHED: June 14, 1992
DRILLING EQUIPMENT: CME 75 Truck Mounted Rig		COMPLETION DEPTH: 53.5 ft.	ROCK DEPTH: 53.5 ft
SIZE AND TYPE OF BIT: 4 1/4" Hollow Stem Augers	SIZE AND TYPE CORE BARREL: NA	NO. SAMPLES: DIST 25	UNDIST — CORE —
CASING: —		WATER LEVEL: FIRST 4.0 ft.	COMPL — 24 HR 4.24 ft.
CASING HAMMER: WEIGHT —	DROP —	BORING ANGLE AND DIRECTION: Vertical	
SAMPLER: 2-inch Split Spoon / 3-inch Split Spoon		INSPECTOR: E.M. Hastings	
SAMPLER HAMMER: WEIGHT 140 lbs.	DROP 30-inch		

DESCRIPTION	PIEZOMETER	DEPTH, FT	SAMPLES: TYPE NO. LOC	RECOV. FT	PENETR. RESIST BL/6IN.	TIME	HNU/PID READINGS (PPM): SAMPLE	AMBIENT AIR	TIME	REMARKS
No Sample, Blacktop, F SAND, f. gravel, tr. C. gravel		1	NO SAMPLE							
SP; loose, Brown-black C-M SAND, some gravel, moist.		2–3		1.0'	5 8 6 5	0844	5.0 ppm	0.2 ppm	0846	3-inch spoon, Sample Collected for PCB (level II) engineering grade
SP; Very loose, Black C-F SAND, Sandy-gravel, Black Staining.		4–5		0.5'	2 1 1 3	0848	0.2 ppm	0.2 ppm	0852	
Top 0.3' - GRAVEL Bottom 0.4' - SILT, Some Wood, moist, St. odor		6–7		0.7'	1 1 1 1	0855	40-50 ppm	0.2 ppm	0857	
No Recovery		8–9		NR	WH WH 1 1	0857	—	—	—	
No Recovery		10–11		NR	WH WH 1 1	0859	—	—	—	
Top-0.3' - Black F SAND, tr roots Bottom-0.3' - Black C-M SAND, gravel, St. odor, Stained, Sheen, Saturated		12–13		0.6'	WH WH 1 1	0905	60-100 ppm	0.2 ppm	0910	
SP; Black-brown, C-F SAND, Silty, sm. gravel St. Odor, Saturated		14–15		0.5'	0 WH 1 2	1005	20 ppm	0.2 ppm	1008	
SM; Gray F. SAND, Sandy-Silt, moist		16–17		1.3'	3 4 5 4	1009	5.0 ppm	0.2 ppm	1010	
Same As Above		18–19		1.3'	2 5 4 4	1014	5.0 ppm	0.2 ppm	1016	Hydropunch sample at 18 ft. Sampled for App. IX VOAs (HP-P2D(1))

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LOG OF BORING P-2D SHEET 2 OF 3

DESCRIPTION	PIEZOMETER	DEPTH, FT	SAMPLES TYPE NO. LOC	SAMPLES RECOV, FT	SAMPLES PENETR RESIST BL/BIN.	SAMPLES TIME	HNU READINGS (PPM) SAMPLE	HNU READINGS (PPM) AMBIENT AIR	HNU READINGS (PPM) TIME	REMARKS
SM; Gray SILT, silty-Sand, F. Sand, tr. Clay, moist		21		1.3'	2 4 5 2	1020	0.2 PPM	0.2 PPM	1023	
Same as above		22–23		2.0'	0 1 1 1	1024			1020	
Same as above		24–25		2.0'	WH ↓	1115			1117	
Same as above		26–27		2.0'	1 2 1 1	1120			1124	
SM; Gray F. SAND, silty-Sand, moist.		28–29		1.6'	1 2 1 1	1124			1126	Hydropunch sample at 28' Sampled for App. IX VOAs (HP-P2D(2))
SM; Gray F. SAND-SILT, Seam of M-F sand at 0.5'		30–31		1.5'	0 1 1 1	1128			1133	
SM; Black-gray C-F SAND, tr silt, Saturated		32–33		1.6'	0 0 1 1	1137			1141	
Same as above		34–35		1.0'	1 1 2 2	1305			1308	
SP; top 0.2' - C. SAND, gravely M-F Sand, Sm. f gravel Bottom 0.3' - Gray SHALE, F. sand, silty-Sand, saturated		36–37		0.5'	8 7 8 6	1314			1318	Hydropunch Sample at 38' for App. IX VOAs (HP-P2D(3))
SM; Top 1.0' - Gray F. SAND, silty-Sand, saturated Bottom 0.4' - C-F SAND, some silt, saturated		38–39		1.4'	3 2 4 5	1320			1323	
SM; Top 0.8' - Gray C-F SAND, tr. Silt, saturated Bottom 0.3' - F. SAND, sm. silt, saturated		40–41		1.1'	0 1 2 3	1329			1328	
SM; Gray F. SAND, Sm. Silt, moist		42–43		0.9'	WH 1 1 2	1339			1338	
(See Sheet 3 of 3 P-2D)		44			WH WH	1445	(See P-2D Sheet 3 of 3)			

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LOG OF BORING: P-2D

DESCRIPTION	PIEZOMETER	DEPTH, FT	SAMPLES TYPE NO. LOC	RECOV, FT	PENETR RESIST BL/BIN.	TIME	HNU READINGS (PPM) SAMPLE	AMBIENT AIR	TIME	REMARKS
SM; Gray F. SAND, sm. Silt, wet				1.5'	1 2	1445	0.2 ppm	0.2 ppm	1447	
SM; Gray F. SAND, Saturated		46		1.9'	1 2 2 2	1453			1456	
SM; Brown-gray SANDY-SILT, Saturated		47		1.2	WH 1 1 3	1458			1500	Hydropunch Sample at 48 ft. For App. IX VOAs (HP-P2D(1)).
SM; Gray SANDY-SILT, tr. gravel		48		0.6	WH 1 3 3	1506			1508	
DK. Gray, dense TILL (weathered)		49		1.0	10 27 40	1513			1515	
End of Boring at 53.5 ft.		50								
		51								
		52								
		53								
		54								
		55								
		56								
		57								
		58								
		59								
		60								
		61								
		62								
		63								
		64								
		65								
		66								
		67								
		68								
		69								

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LOG OF BORING P-13D

SHEET 1 OF 2

PROJECT AND LOCATION: CIBA-GEIGY / Cranston, R.I.		ELEVATION AND DATUM: 15.67 Orig. Grade	PROJECT NO.: 87X4660
DRILLING AGENCY: Burlington Environmental Inc.	FOREMAN: Tim Crank	DATE STARTED: June 13, 1992	DATE FINISHED: June 13, 1992
DRILLING EQUIPMENT: CME 75 Truck Mounted Rig		COMPLETION DEPTH: 42.0 ft.	ROCK DEPTH: 42.0 ft
SIZE AND TYPE OF BIT: 4 1/4-inch Hollow Stem Augers	SIZE AND TYPE CORE BARREL: NA	NO. SAMPLES: DIST 20	UNDIST —; CORE —
CASING: —		WATER LEVEL: FIRST ~ 6.0 ft	COMPL —; 24 HR 5.62 ft.
CASING HAMMER: WEIGHT —	DROP —	BORING ANGLE AND DIRECTION: Vertical	
SAMPLER: 2-inch split spoon / 3-inch split spoon			
SAMPLER HAMMER: WEIGHT 140 lb	DROP 30-inch	INSPECTOR: E.M. Hastings	

DESCRIPTION	PIEZOMETER	DEPTH, FT	SAMPLES: TYPE NO. LOC	RECOV, FT	PENETR RESIST BL/BIN.	TIME	HNU/PID READINGS (PPM): SAMPLE	AMBIENT AIR	TIME	REMARKS
FILL, Brown C-F SAND, some C-F gravel		1		0.9	6 40 14/4"	0732	0.2 PPM	0.2 PPM	0740	
SP; Brown-Black, C-F SAND, some C-F gravel, moist		3		1.0	3 3 3 5	0745	0.2 PPM		0749	
SP; Top 0.6'- C-F SAND, some gravel, moist Bottom 0.5'- Gravely SAND, stained black, saturated		5		1.1'	3 9 9 6	0750	5.0 PPM		0753	3-inch spoon, sample collected for PCB (Level II) engineering grade.
SM; Brown-Dk grey F SAND, silty-Sand, some gravel, saturated		7		1.5'	1 1 2 3	0800	3.0 PPM		0803	
SP; Brown, C-F SAND, gravely-Sand, saturated		9		1.0'	2 1 2 5	0804	0.9 PPM		0806	
No Recovery (Gravel in Tip)		11		NR	5 5 1 2	0810	—		0816	
SP; Brown M. SAND, tr. silt, wet		13		1.4'	WH 1 1 1	0817	1.0 PPM		0819	
SP; Brown F. SAND, tr. silt, wet		15		1.8'	WH WH 1 1	0905	0.2 PPM		0906	
Same as above, saturated		17		1.0'	WH 1 1 1	0910	0.2 PPM		0913	
Same as above		19		1.5'	WH WH 1 1	0916	0.2 PPM		0920	

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LOG OF BORING P-13D SHEET 2 OF 2

DESCRIPTION	PIEZOMETER	DEPTH, FT	SAMPLES TYPE NO. LOC	RECOV, FT	PENETR RESIST BL/BIN.	TIME	HNU READINGS (PPM) SAMPLE	AMBIENT AIR	TIME	REMARKS
SP; Brown F SAND, tr Silt, Saturated		21		1.5'	WH WH 1 1	0922	0.2 PPM	0.2 PPM	0924	
Same as above		22–23		2.0'	WH WH 1 2	0931			0933	
SP; Brown M-F SAND, tr. Silt, tr. gravel, Saturated		24–25		2.0'	1 1 2 3	1020			1022	
SP; Top 0.5' – Brown C-F SAND, gravely Sand, Saturated Bottom 1.1' - Brown F SAND, tr. Silt saturated		26–27		1.6'	2 2 2 3	1029			1032	
SP; Brown F SAND, tr. Silt, saturated		28–29		1.5'	WR 1 1 2	1035			1038	Hydropunch sample at 28 ft. Sample for App IX VOAs (HP-P13D(1))
Same as above		30–31		1.6	WH WH 1 1	1042			1045	
SM; Dk. gray F SAND, some silt, saturated		32–33		2.0'	WH WH 1 2	1050			1053	
Same as above		34–35		2.0'	WH 2 2 3	1135			1139	
SM; Top 1.0' Same as above, moist ML; Bottom 0.8' - Gray SILT, moist		36–37		1.8'	1 2 1 1	1145			1148	
TILL, Gray SILT, silty-Sand, tr Clay, moist		38–39		2.0	1 2 3 6	1150			1154	Hydropunch Sample at 38 ft Sample for App IX VOAs (HP-P13D(2)).
TILL, Top 0.4' - Same as above Bottom 1.0' - Weathered SHALE		40–41		1.4'	2 11 22 28	1200			1204	
End of Boring at 42.0 ft.		42–44								

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LOG OF BORING P-29D

SHEET 1 OF 2

PROJECT AND LOCATION: CIBA GEIGY CRANSTON RI		ELEVATION AND DATUM: NA	PROJECT NO.: 87X4660-2.33
DRILLING AGENCY: BURLINGTON ENVIRONMENTAL	FOREMAN: CHRIS HEBEL	DATE STARTED: 6-16-92	DATE FINISHED: 6-17-92
DRILLING EQUIPMENT: DIEDRICH D-50		COMPLETION DEPTH: 38 ft. below deck	ROCK DEPTH: 38 ft. Below deck
SIZE AND TYPE OF BIT: TRICONE ROLLER	SIZE AND TYPE CORE BARREL: NONE USED	NO. SAMPLES: DIST 16	UNDIST — CORE —
CASING: 4" FLUSH		WATER LEVEL: FIRST —	COMPL — 24 HR —
CASING HAMMER: WEIGHT 300 #	DROP 30"	BORING ANGLE AND DIRECTION: VERTICAL	
SAMPLER: 2" OD SPLIT SPOON		INSPECTOR: M. ZUSI	
SAMPLER HAMMER: WEIGHT 140	DROP 30"		

DESCRIPTION	PIEZOMETER	DEPTH, FT	SAMPLES TYPE NO. LOC	RECOV, FT	PENETR RESIST BL/6IN.	TIME	HNU/PID READINGS (PPM) SAMPLE	AMBIENT AIR	TIME	REMARKS
DECK →										
		1								6' BULKHEAD CAP TO TOP OF DECK
		2								GUAGE 9.1
		3								
		4								
		5								
MUDLINE →		6								
(GM) BLACK SOFT SILT AND DETRITUS GRADING TO GRAVELLY SAND AT BOTTOM OF SPOON. ODOR NOTED		7	SS-1	0.5	PUSHED	0815	0.5	0.5	0815	3" SPLIT SPOON
(GM) BLACK SOFT SILTY COARSE GRAVEL (WASH). ODOR NOTED		8–9	SS-2	0.2	1 1/12" 3	0915				
(SP-SM) LOOSE GRAVELLY C-F SAND, SOME SILT		10–11	SS-3	0.2	1 3 3 5	0927	0.5	0.5	0930	CASING DRIVING EASY
SAME		12–13	SS-4	0.3	6 11 7 5	0951			0951	
NO RECOVERY		14–15	SS-5	0.0	3 20 8 5	1008				F. GRAVEL, C. SAND IN WASH
(SP-SM) V. DENSE, M-F SAND SOME SILT		16–17	SS-6	1.2	20 44 15 14	1030	0.5	0.5	1035	16-18' 3" SPOON NO RECOVERY 2" SPOON DRIVEN TO 18.5'
(SM) DK. GRAY V. LOOSE SILTY M-F SAND		18–19	SS-7	1.0	1 1 2 3		0.5	0.5	1110	

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LOG OF BORING P-29D

DESCRIPTION	PIEZOMETER	DEPTH, FT	SAMPLES TYPE NO. LOC	RECOV, FT	PENETR RESIST BL/6IN.	TIME	HNU READINGS (PPM) SAMPLE	AMBIENT AIR	TIME	REMARKS
(SM) DK. GRAY, LOOSE SILTY M-F SAND, SATURATED.		21	SS-8		PUSHED		0.5	0.5	1410	HYDROPUNCH DRIVEN 20-24'
(SM) DK GRAY, DENSE SILTY F. SAND		22 23	SS-9	1.1	28 31 14 14		0.5	0.5	1505	SS-9 3" SPOON TO CLEAR WASH 2" SPOON DRIVEN FOR SAMPLE
(SM) GRAY LOOSE SILTY F. SAND		24 25	SS-10	0.5	5 3 2 3		0.5	0.5	1520	
SAME		26 27	SS-11	0.6	6 3 6 7		0.5	0.5	1545	
SAME		28 29	SS-12	0.9	3 3 5 7		0.5	0.5	1605	
NO RECOVERY		30 31	SS-13	0.0	3 3 3 4					END 6-16-92 MTZ BEGIN 6-17-92 MTZ HYDROPUNCH DRIVEN 30'-34' 6-17-92
(SM) GRAY M. DENSE SILTY F. SAND GRADING TO GRAY SILT.		32 33	SS-14	0.6	9 8 7 8		0.5	0.5	0840	
(ML) DK. GRAY, HARD, NON-PLASTIC SILT WITH ROCK FRAGMENTS		34 35	SS-15	0.8	11 19 22 23		0.5	0.5	0920	BOTTOM OF CASING
NO RECOVERY		36 37	SS-16		8 59 25/2					
BOTTOM OF BORING 38' BELOW DECK		38 39 40 41 42 43 44								

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LOG OF BORING P-30D SHEET 1 OF 2

PROJECT AND LOCATION: CIBA GEIGY CRANSTON RI		ELEVATION AND DATUM: NA	PROJECT NO.: 87X4660-2.33
DRILLING AGENCY: BURLINGTON ENVIRONMENTAL	FOREMAN: CHRIS HEBEL	DATE STARTED: 6-9-92	DATE FINISHED: 6-11-92
DRILLING EQUIPMENT: DIEDRICH D-50		COMPLETION DEPTH: 44'-6" BELOW DECK	ROCK DEPTH: 44'-6" B.D.
SIZE AND TYPE OF BIT: TRICONE ROLLER	SIZE AND TYPE CORE BARREL: NONE USED	NO. SAMPLES: DIST 20	UNDIST. — CORE —
CASING: 4" FLUSH		WATER LEVEL: FIRST —	COMPL. — 24 HR —
CASING HAMMER: WEIGHT 300 #	DROP 30"	BORING ANGLE AND DIRECTION: VERTICAL	
SAMPLER: 2" OD SPLIT SPOON		INSPECTOR: M. ZUSI	
SAMPLER HAMMER: WEIGHT 140	DROP 30"		

DESCRIPTION	PIEZOMETER	DEPTH, FT	SAMPLES TYPE NO. LOC	RECOV. FT	PENETR RESIST BL/BIN.	TIME	HNU/PID READINGS (PPM) SAMPLE	AMBIENT AIR	TIME	REMARKS
		1								0715 PREPARING TO DRILL. CASING SET TO 6' ON 6-9-92
		2								
		3								
		4								
MUDLINE →		5								END 6-9-92
		6								BOTTOM OF CASING ↓
NO RECOVERY		7	SS-1		1/12" 1 1	0820				BEGIN 6-10-92 MT2
(SM) BLACK, SOFT, SANDY SILT OR SILTY SAND WITH ROOTS		8	SS-2	0.2	2 1 2 1					
(SP-SM) BLACK, LOOSE, M-F SAND, SOME SILT		9								
		10	SS-3	0.5	6 WH 2 2	0920				
SAME		11								
		12	SS-4	0.5	10 7 4 5	0945				
(SM) GRAY, LOOSE, SILTY F. SAND		13								
		14	SS-5	0.8	8 5 3 4					
(SP-SM) GRAY, M. DENSE, F. SAND SOME SILT		15								
		16	SS-6	0.5	11 11 3 3	1035	0.2	0.2		
(SM) GRAY-BLACK, M. DENSE SILTY M-F SAND		17								
		18	SS-7	0.5	10 5 6 6	1055				
		19								

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LOG OF BORING P-30D

DESCRIPTION	PIEZOMETER	DEPTH, FT	SAMPLES TYPE NO. LOC	RECOV, FT	PENETR RESIST BL/BIN.	TIME	HNU READINGS (PPM) SAMPLE	AMBIENT AIR	TIME	REMARKS
(SM) GRAY, M. DENSE, SILTY F. SAND		21	SS-8	0.5	14 8 5 8					
(SM) GRAY, LOOSE SILTY F. SAND tr. C-M SAND		22	SS-9	0.5	5 3 2 4					
(SM) GRAY, LOOSE, SILTY M-F SAND		23	SS-10	1.6	2 2 3 4					
(SP-SM) LOOSE, F. SAND, SOME SILT		24	SS-11	0.8	9 4 3 4	1400				
(SP-SM) GRAY V. LOOSE, F. SAND SOME SILT		25	SS-12	1.4	2 1 2 1					1750 HYDROPUNCH SAMPLE TAKEN PUNCH DRIVEN 30→34' SAMPLE @ 33'-34' END 6-10-92 MTZ
SAME		26	SS-13	2.0	2* 1 2 3	0735				BEGIN 6-11-92 MTZ * HYDROPUNCH DRIVEN
(SM) GRAY, M. DENSE SILTY, F. SAND		27	SS-14	0.8	22* 10 5 5					
(ML) GRAY, BLACK STIFF, NON-PLASTIC SILT, SOME F SAND		28	SS-15	2.0	12 6 3 3					
SAME, GRADING TO GRAY CLAYEY SILT, SOME C-M SAND		29	SS-16	2.0	4 12 7 6					
(ML) GRAY-BLACK, HARD NON-PL. SILT		30	SS-17	1.4	24 24 16 20					
(ML) GRAY-BLACK M. PLASTIC CLAYEY SILT, SOME C-M SAND OR ROCK FRAGMENTS		31	SS-18	0.7	2 6 3 5	1050	0.6	0.6		0954 HYDROPUNCH DRIVEN 3' TO 40→43' SAMPLE @ 42-43'
(ML) GRAY-BLACK, CLAYEY SILT, SOME C-M SAND AND ROCK FRAGMENTS		32	SS-19		4 15 25 29	1130	0.6	0.6		BOTTOM OF CASING
(ML) GRAY-BLACK GRAVELLY CLAYEY-SILT WITH SHALE FRAGMENTS		33	SS-20		100 6"	1200				HARD DRIVING 43-44' FLAKE OF BLACK SHALE IN WASH
BOTTOM OF BORING		34								

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LOG OF BORING P-31D

SHEET 1 OF 3

PROJECT AND LOCATION: CIBA GEIGY CRANSTON RI		ELEVATION AND DATUM: NA	PROJECT NO.: 87X4660-2.33
DRILLING AGENCY: BURLINGTON ENVIRONMENTAL	FOREMAN: CHRIS HEBEL	DATE STARTED: 7-13-92	DATE FINISHED: 7-15-92
DRILLING EQUIPMENT: DIEDRICH D-50		COMPLETION DEPTH: 53'-0" BELOW DECK	ROCK DEPTH: 53'-0"
SIZE AND TYPE OF BIT: TRICONE ROLLER	SIZE AND TYPE CORE BARREL: NONE USED	NO. SAMPLES: DIST 20	UNDIST: – / CORE: –
CASING: 4" FLUSH		WATER LEVEL: FIRST –	COMPL: – / 24 HR: –
CASING HAMMER: WEIGHT 300 #	DROP 30"	BORING ANGLE AND DIRECTION: VERTICAL	
SAMPLER: 2" OD SPLIT SPOON			
SAMPLER HAMMER: WEIGHT 140	DROP 30"	INSPECTOR: M. ZUSI	

DESCRIPTION	PIEZOMETER	DEPTH, FT	SAMPLES TYPE NO. LOC	RECOV, FT	PENETR RESIST BL/6IN.	TIME	HNU/PID READINGS (PPM) SAMPLE	AMBIENT AIR	TIME	REMARKS
DECK →		1								
		2								
		3								
		4								
		5								
		6								
WATER →		7								
GAGE READING 9.3		8								
		9								
		10								
		11								
		12								
MUDLINE →		13								
SS-1A GRAY - BLACK F. SANDY SILT WITH ROOTS		14	SS-1	1.2	1 1 2 1	1400	2.0	0.8		
SS-1B GRAY - BLACK LOOSE SILTY M-F SAND SOME GRAVEL		15								
GRAY, FIRM SILT SOME GRAVEL & BROWN C-F SAND		16	SS-2	0.3	4 4 3 4	1430	0.8	0.8		
		17								
GRAY V. STIFF S. PLASTIC SILT		18	SS-3	1.0	10 6 11 16	1445	0.8	0.8		* 1500 HYDROPUNCH DRIVEN 19 → 23' SAMPLE RETRIEVED END 7-13-92 BEGIN 7-14-92
NO RECOVERY		19			2* 2					

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LOG OF BORING P-31D

SHEET 2 OF 3

DESCRIPTION	PIEZOMETER	DEPTH, FT	SAMPLES TYPE NO. LOC	RECOV. FT	PENETR RESIST BL/6IN.	TIME	HNU READINGS (PPM) SAMPLE	AMBIENT AIR	TIME	REMARKS
			SS-4		1 1					7-14-92 0835 SAMPLE SS-4 TAKEN 19-21'
(ML) GRAY STIFF S. PLASTIC SILT		21								
		22	SS-5	0.5	7* 4 5 5	0858	0.6	0.6	0902	* HYDROPUNCH DRIVEN 19-23'
NO RECOVERY		23								
		24	SS-6	0	6 5 6 3	0915				
(ML) GRAY-BLACK STIFF S PLASTIC SILT		25								
		26	SS-7	1.7	4 8 4 7		0.6	0.6	0940	LOSING WATER WASHING TO 25'
GRAY SOFT S. PLASTIC SILT		27								
		28	SS-8	0.3	1 1 1 4		0.6	0.6	0945	
(SM) DK. GRAY SILTY F SAND		29								1000 DRIVING HYDROPUNCH 29 → 33'
		30	SS-9	2.0	4 7 3 3	1350	0.4	0.4	1355	
(SM) DK. GRAY, DENSE, SILTY M-F SAND		31								
		32	SS-10	1.2	24 28 15 11	1410	0.4	0.4	1415	
(SM) DK. GRAY M. DENSE SILTY M-F SAND tr. C SAND		33								
		34	SS-11	0.2	20 7 5 6	1430	0.4	0.4	1430	
(SP-SM) GRAY, LOOSE, F SAND, SOME SILT		35								
		36	SS-12	0.9	5 3 4 4	1450	0.4	0.4	1455	
SAME, M. DENSE		37								
		38	SS-13	0.5	10 7 4 4		0.4	0.4	1520	
(SP) GRAY LOOSE F. SAND		39								
		40	SS-14	0.8	7 3 3 2		0.4	0.4		
(SP-SM) GRAY, LOOSE, F SAND SOME SILT		41								
		42	SS-15	1.5	3 2 3 5	1630	0.4	0.4	1635	
		43								END 7-14-92 MTZ
SAME										BEGIN 7-15-92 MTZ
		44	SS-16	0.8	15 5 3 4	0849	0.4	0.4	0855	0800 DRIVING CASING TO 43'

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LOG OF BORING P-31D

DESCRIPTION	PIEZOMETER	DEPTH, FT	SAMPLES TYPE NO. LOC	RECOV, FT	PENETR RESIST BL/6IN.	TIME	HNU READINGS (PPM) BAMPLE	AMBIENT AIR	TIME	REMARKS
(SM) GRAY LOOSE SILTY F. SAND		46	SS-17	0.5	10 4 2 4	0915	0.4	0.4		
(SM) GRAY, STIFF, NON-PL. F. SANDY SILT OR SILTY F. SAND		47 48	SS-18	1.0	9 5 8 5	0940	0.4	0.4	0945	
(SM) GRAY SILTY F. SAND		49 50	SS-19		2* 1/12 21	1330	0.4	0.4	1335	* HYDROPUNCH DRIVEN
		51								
(SM) DK GRAY SILTY C-F SAND SOME F. GRAVEL (TILL)		52 53	SS-20		34 50					
BOTTOM OF BORING 53'-0" BELOW DECK		54								
		55								
		56								
		57								
		58								
		59								
		60								
		61								
		62								
		63								
		64								
		65								
		66								
		67								
		68								
		69								

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LOG OF BORING P-32D SHEET 1 OF 2

PROJECT AND LOCATION: CIBA-GEIGY / Cranston, RI.		ELEVATION AND DATUM: 13.91 Orig. grade	PROJECT NO.: 87X4660
DRILLING AGENCY: Burlington Environmental Inc.	FOREMAN: Tim Crenk	DATE STARTED: June 11, 1992	DATE FINISHED: June 12, 1992
DRILLING EQUIPMENT: CME 75 Truck Mounted Rig		COMPLETION DEPTH: 41.5 ft	ROCK DEPTH: 41.5 ft
SIZE AND TYPE OF BIT: 1¼-inch Hollow Stem Auger	SIZE AND TYPE CORE BARREL: NA	NO. SAMPLES: DIST 21	UNDIST —, CORE —
CASING —		WATER LEVEL: FIRST ~ 6.0 ft	COMPL —, 24 HR 5.25 ft.
CASING HAMMER	WEIGHT —	DROP —	BORING ANGLE AND DIRECTION: Vertical
SAMPLER 2-inch split spoon / 3-inch split spoon			INSPECTOR: E.M. Hastings
SAMPLER HAMMER	WEIGHT 140 lbs	DROP 30-inch	

DESCRIPTION	PIEZOMETER	DEPTH, FT	SAMPLES TYPE NO. LOC	RECOV. FT	PENETR RESIST BL/6IN.	TIME	HNU/PID READINGS (PPM) SAMPLE	AMBIENT AIR	TIME	REMARKS
FILL, Brown M-F SAND, dry		1		0.4'	4 14 12 13	1530	0.6 PPM	0.6 PPM	1534	
SP; Tan, brown M-F SAND, Some C-M gravel, moist.		2–3		1.4'	4 11 8 6	1537	0.9 PPM	0.6 PPM	1540	3-inch spoon, sample collected for PCB (Ice+III) engineering grade.
SP; Stained Black M-F SAND, C-M gravel, St. odor, wet		4–5		1.0'	2 4 2 1	1544	100 PPM	0.6 PPM	1546	
ML; Brown SILT, stained, St. Organic odor, wet.		6–7		1.2'	1 2 2 5	1550	4.0 PPM	0.6 PPM	1554	
SP; Black C-F SAND, stained, Some gravel, Some silt, organic odor, wet.		8–9		1.5'	1 2 3 3	1555	10.0 PPM	0.6 PPM	1559	
SP; Black C-M SAND, Some gravel, Stained, wet		10–11		1.0'	1 2 3 3	1605	5.0 PPM	0.6 PPM	1609	
SP; Black – Dk. gray C-F SAND, wet		12–13		1.6'	1 1 1 2	1610	0.8 PPM	0.6 PPM	1614	
SP; Dk. brown M-F SAND, wet		14–15		1.1'	WH 1 1 2	1618	0.6 PPM	0.6 PPM	1620	done for the day 6/11/92
SP; Brown M-F SAND, tr. silt, wet		16–17		2.0'	1 1 3 2	0820	0.4 PPM	0.2 PPM	0823	6/12/92
Same as above		18–19		1.2'	WH 1 2 2	0825	0.2 PPM	0.2 PPM	0828	

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LOG OF BORING P-32D

DESCRIPTION	PIEZOMETER	DEPTH, FT	SAMPLES TYPE NO. LOC	RECOV, FT	PENETR RESIST BL/BIN.	TIME	HNU READINGS (PPM) SAMPLE	AMBIENT AIR	TIME	REMARKS
Same as above		21		1.4'	WH 1 2 2	0827	0.2 PPM	0.2 PPM	0830	
SP; Dk grey F. SAND, tr silt, saturated		22–23		1.6'	1 1 2 2	0829			0837	
Same as above		24–25		1.6'	WH 1 1 2	0840			0842	
Same as above		26–27		1.5'	1 3 1 2	0943			0946	
SP; Dk. Brown M-F. SAND, tr. silt, saturated		28–29		1.0'	WH 1 2 1	0945			0948	
SP; Brown M-F SAND, Some silt, saturated		30–31		2.0'	1 1 2 1	0955			0958	Hydropunch sample at 30 ft for App. IX vols (HP-P32D(1))
SP; Brown F SAND, Silty-Sand, saturated		32–33		2.0'	WH 1 1 2	1002			1005	
SP; Top 1.6' – Brown F SAND tr. silt, saturated Bottom 0.4' – Black SILTY-F. SAND, saturated		34–35		2.0	WR 1 2 3	1009			1011	
SP; Dk. gray F SAND, Silty-Sand, wet		36–37		2.0'	WR 1 1 3	1100			1110	
TILL; Black-Brown F. SAND, silty-Sand, Black-gray weathered till.		38–39		1.8'	1 1 2 9	1110			1112	Hydropunch sample at 40 ft. for App. IX vols (HP-P32D(2))
TILL; fractured, weathered rock (shale) in tip.		40–41		0.3'	50/4"	1120			1124	Spoon bouncing.
End of boring at 41.5 ft		42–44								

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LOG OF BORING P-33D

SHEET 1 OF 3

PROJECT AND LOCATION	CIBA-GEIGY / Cranston R.I.
ELEVATION AND DATUM	13.93 Orig. Grade
PROJECT NO.	87X4660
DRILLING AGENCY	Burlington Environmental Inc.
FOREMAN	Tim Crank
DATE STARTED	June 9, 1993
DATE FINISHED	June 11, 1993
DRILLING EQUIPMENT	CME 75 Truck Mounted Rig
COMPLETION DEPTH	56 ft.
ROCK DEPTH	56.0 ft.
SIZE AND TYPE OF BIT	4¼" Hollow Stem Augers
SIZE AND TYPE CORE BARREL	NA
CASING	—
NO. SAMPLES	DIST — UNDIST — CORE —
WATER LEVEL	FIRST ~7.00 ft. COMPL — 24 HR. 5.16 ft.
CASING HAMMER	WEIGHT — DROP —
SAMPLER	2-inch Split Spoon
BORING ANGLE AND DIRECTION	Vertical
SAMPLER HAMMER	WEIGHT 140 lbs. DROP 30-inch
INSPECTOR	E.M. Hastings

DESCRIPTION	PIEZOMETER	DEPTH, FT	SAMPLES TYPE NO. LOC	RECOV, FT	PENETR RESIST BL/6IN.	TIME	HNU/PID READINGS (PPM) SAMPLE	AMBIENT AIR	TIME	REMARKS
Fill; Brown, F-M SAND, Sm. C Sand. (Top 6-inches fill)		1		1.25'	1 4 8 4	1300	0.6 PPM	0.6 PPM	1302	
Same as above (No fill)		2–3		1.0'	3 3 2 3	1311	0.6 PPM	0.6 PPM	1314	Bottom 6-inches is moist.
Same as above		4–5		1.5'	WOR 1 2 3	1315	1.2 PPM	0.6 PPM	1320	Appears stained Dk. gray to black, wet.
No Recovery (wood in spoon tip)		6–7		NR	1 2 2 2	—	—	—	—	water table @ 7.00 ft.
SM; Black-brown, F. SAND, silt, peat, wet (Wood in Bottom 6")		8–9		<.5'	1 1 1 1	1340	20.0 PPM	0.6 PPM	1340	
Same as above		10–11		2.0'	WOR WOR 1 1	1345	5-15 PPM	0.6 PPM	1345	
SM; Dk Brown, Dk gray F. SAND, tr. wood, wet		12–13		1.3'	1 1 2 1	1350	4.0 PPM	0.6 PPM	1353	
ML; Gray SILT		14–15		1.2'	1 3 4 5	1355	0.6 PPM	0.6 PPM	1357	
ML; Gray SILT, Sm. Clay, moist		16–17		1.9'	WOR 1 3 4	1510	1.0 PPM	0.6 PPM	1515	
ML; Same as above		18–19		1.7	1 3 3 3	1517	0.6 PPM	0.6 PPM	1520	

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LOG OF BORING P-33D

SHEET 2 OF

DESCRIPTION	PIEZOMETER	DEPTH, FT	SAMPLES TYPE NO. LOC	RECOV, FT	PENETR RESIST BL/6IN.	TIME	HNU READINGS (PPM) SAMPLE	AMBIENT AIR	TIME	REMARKS
ML; DK. Gray SILT, Wet		21		1.8'	WOR 1 3 2	1527	0.6 PPM	0.6 PPM	1530	
SM; Black-gray F. SAND, silty-Sand, tr. C. gravel, wet.		22								done for the day 6/9/92
		23		1.1'	9 8 5 4	1035	0.6 PPM	0.6 PPM	1035	6/10/92 Hydropunch sample at 23 ft. for App IX VOAs (HP-P33D(1))
SP; Gray F-M SAND, tr. Silt, wet		24								
		25		0.6'	2 2 4 6	1040	0.6 PPM	0.6 PPM	1050	
Same as above		26								
		27		1.4'	12 6 4 4	1058	0.6 PPM	0.6 PPM	1100	
SM; Gray F. SAND, tr. Silt, wet		28								
		29		1.0'	6 1 3 1	1115	0.6 PPM	0.6 PPM	1118	
Same as above		30								
		31		1.7'	WH 1 3 3	1125	0.6 PPM	0.6 PPM	1128	
SP; Gray F. SAND, tr. Silt, tr. F gravel, wet		32								
		33		1.8'	3 2 2 2	1331	0.6 PPM	0.6 PPM	1333	Hydropunch sample at 33 ft. for App. IX VOAs (HP-P33D(2))
Same as above		34								
		35		1.7'	3 3 3 3	1339	0.6 PPM	0.6 PPM	1340	
Same as above		36								
		37		1.6'	3 2 1 6	1349	0.6 PPM	0.6 PPM	1351	
Same as above		38								
		39		1.6'	WH WH 1 2	1356	0.6 PPM	0.6 PPM	1400	
SM; Gray F. SAND, some silt, wet		40								
		41		2.0'	WH 3 3 3	1610	0.6 PPM	0.6 PPM	1615	
Same as above		42								
		43		1.7'	WH 1 1 1	1625	0.6 PPM	0.6 PPM	1626	Hydropunch Sample at 43 ft for App. IX VOAs (HP-P33D(3))
Same as above		44		1.6	WH 2	1630	0.6 PPM	0.6 PPM	1633	

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LOG OF BORING P-33D SHEET 3 OF 3

DESCRIPTION	PIEZOMETER	DEPTH, FT	SAMPLES TYPE NO. LOC	RECOV, FT	PENETR RESIST BL/BIN.	TIME	HNU READINGS (PPM) SAMPLE	AMBIENT AIR	TIME	REMARKS
See Sheet 2 of 3				1.6'	2 2	1630	0.6 PPM	0.6 PPM	1633	
SM; Black-Brown F. SAND, silty-sand, moist.		46		1.9'	WH WH 2 2	1650	0.6 PPM	0.6 PPM	1653	
SM; Brown F. SAND, Silty-Sand, moist Bottom 0.3'		47		2.0'	WH WH 1 4	1658	0.6 PPM	0.6 PPM	1700	
SC; Gray SILT, wet		48								done for the day 6/10/92
SP; Top 0.4' - Gray F. SAND, wet		49		1.6'	7 16 46 48	0820	0.6 PPM	0.6 PPM	0834	6/11/92
SM; Bottom 1.2' - Black SILT, Some F-M gravel, moist		50								
TILL, Dk. gray SHALE, some silt		51		1.2'	23 27 27 27	0845	0.6 PPM	0.6 PPM	0847	Hydropunch sample at 53 ft. for App. IX VOAs (HP-P33D(4)).
Same as above, weathered, dry		52		1.2'	10 15 20 32	0850	0.6 PPM	0.6 PPM	0852	
END of Boring @ 56.0 ft. on 6/11/92.		53								
		54								
		55								
		56								
		57								
		58								
		59								
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Appendix C

C

WELL INSTALLATION/CONSTRUCTION LOGS

This appendix presents the logs documenting well installation and construction that were prepared during stabilization activities in the Production Area under the RCRA Facility Investigation at the CIBA-GEIGY facility in Cranston, RI. The well installation logs are organized by type of well — either a monitoring well ("MW"), a piezometer — ("P"), or a recovery well ("RC"). For each type of well, the well installation logs are presented in numerical order by the identifying number of the well or piezometer (e.g., MW-20S, MW-21S, and so on).

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CONSTRUCTION OF MONITORING WELL: **MW-20S**

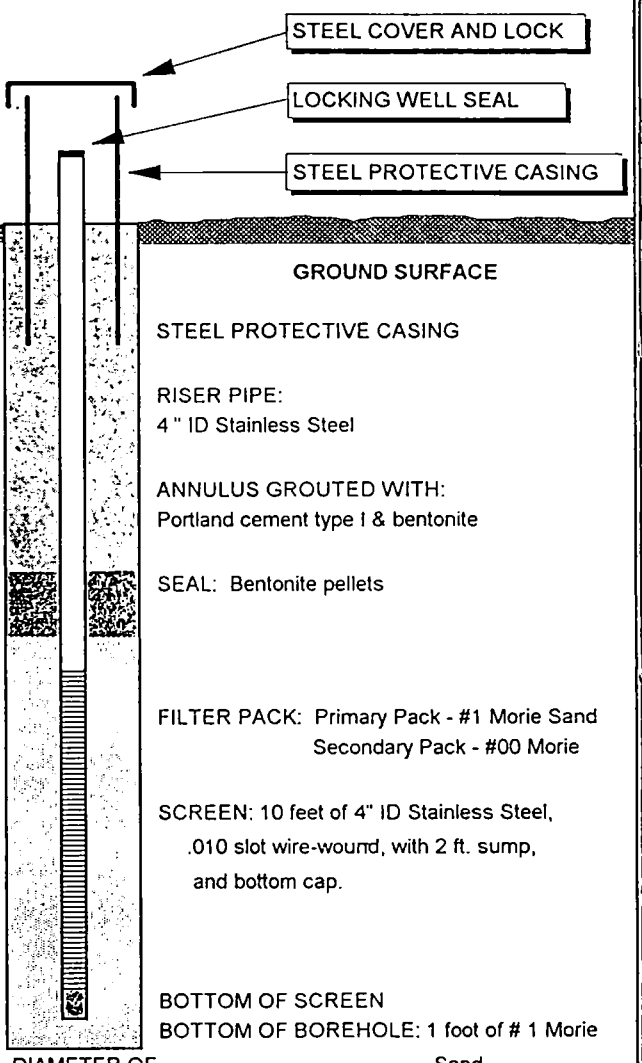
Project name and number CIBA - GEIGY / Cranston R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Environmental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** 18.83 ft
Date of completion 16-Jun-92	***Northing*** 249135.33	***Top of protective steel casing elevation*** 22.24 ft
Inspector E.M. Hastings	***Easting*** 523746.39	***Top of riser pipe elevation*** 21.94 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

GENERALIZED SOIL DESCRIPTION

See MW-20S Boring Log.

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov ground, not to scale)
A	22.24	3.41
B	21.94	3.11
C	18.83	0.00
D	16.83	2.00
E	16.83	2.00
F	15.33	3.50
G	12.83	6.00
H	2.83	16.00
I	-0.17	19.00



DIAMETER OF BOREHOLE: 10 - 12- inches

REMARKS (Installation, development) : Cement apron placed around steel casing. Well was developed on July 18, 1992. Well has a 2 ft. sump from 16.00 to 18.00 ft.

filename: MW20WC.XLT

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CONSTRUCTION OF MONITORING WELL: **MW-21S**

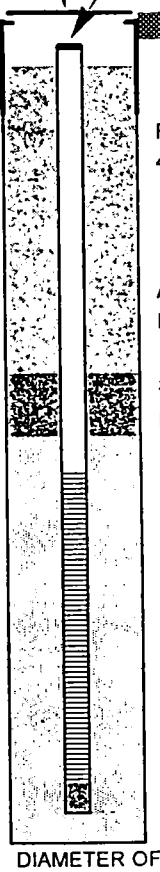
Project name and number CIBA - GEIGY / Cranston R.I. 87X4660		***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Environmental Inc.		***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** 15.82 ft
Date of completion 27-Jun-92		***Northing*** 248833.96	***Top of protective steel casing elevation*** 15.82 ft
Inspector E.M. Hastings		***Easting*** 523754.94	***Top of riser pipe elevation*** 15.42 ft

A = Ground Surface
B = Top of Riser
C = Top of Bentonite Seal
D = Top of Sand Pack
E = Top of Screen
F = Bottom of Screen
G = Bottom of Borehole

GENERALIZED SOIL DESCRIPTION

See MW-21S Boring Log.

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft below ground, not to scale)
A	15.82	0.00
B	15.42	0.40
C	13.82	2.00
D	12.32	3.50
E	9.82	6.00
F	-0.18	16.00
G	-3.18	19.00



DIAMETER OF BOREHOLE: 10 - 12-inches

REMARKS (Installation, development) : Well was developed on July 10, 1992. Well has a 2 ft. sump from 16.00 to 18.00 ft. MW-21S is located on Mill St.

filename: MW21WC.XLT

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CONSTRUCTION OF MONITORING WELL: **MW-22S**

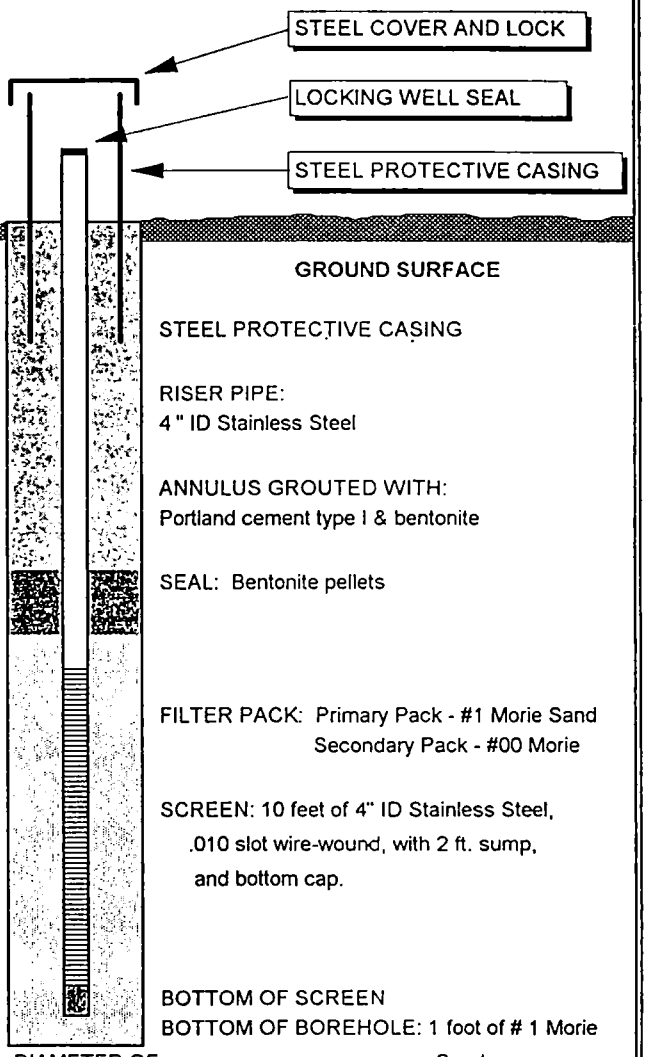
Project name and number CIBA - GEIGY / Cranston R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Environmental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** 13.94 ft
Date of completion 15-Jun-92	***Northing*** 248691.83	***Top of protective steel casing elevation*** 17.31 ft
Inspector E.M. Hastings	***Easting*** 523774.24	***Top of riser pipe elevation*** 16.87 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

GENERALIZED SOIL DESCRIPTION

See MW-22S Boring Log.

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov ground, not to scale)
A	17.31	3.37
B	16.87	2.93
C	13.94	0.00
D	11.94	2.00
E	11.94	2.00
F	10.94	3.00
G	8.94	5.00
H	-1.06	15.00
I	-4.06	18.00



DIAMETER OF BOREHOLE: 10 - 12- inches

REMARKS (Installation, development) : Cement apron placed around steel casing. Well was developed on July 17, 1992. Well has a 2 ft. sump from 15.00 to 17.00 ft.

filename: MW22WC.XLT

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CONSTRUCTION OF MONITORING WELL: **MW-23S**

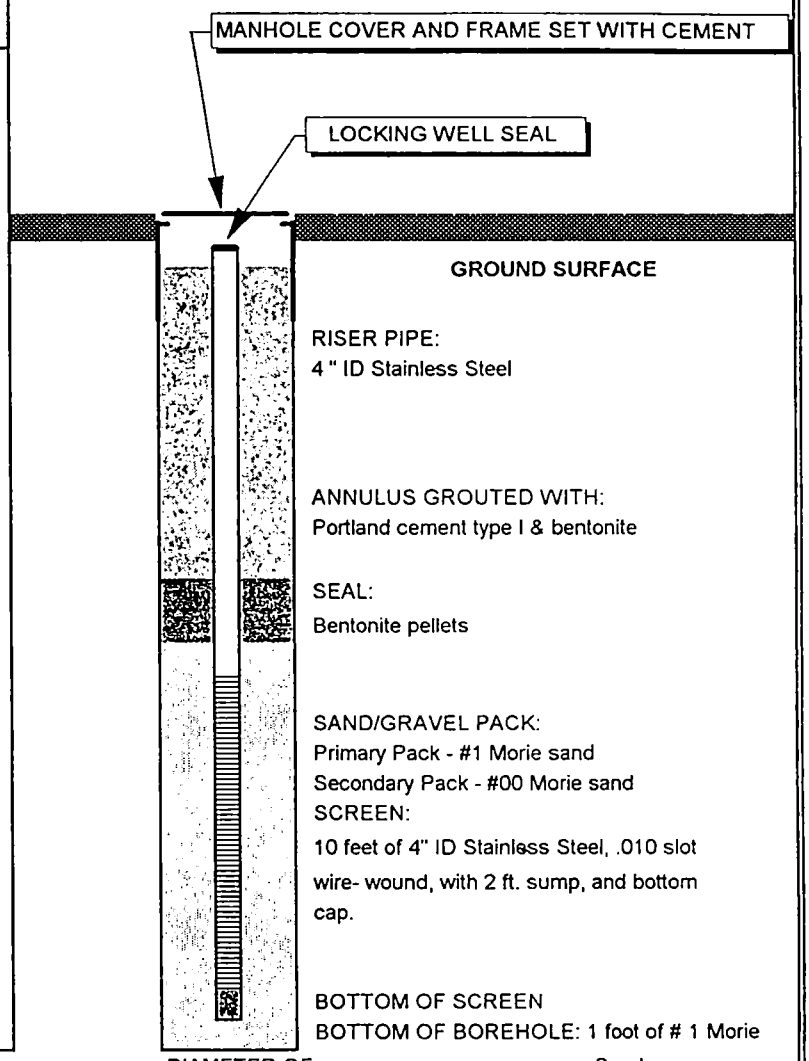
Project name and number CIBA - GEIGY / Cranston R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Environmental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** 21.10 ft
Date of completion 17-Jun-92	***Northing*** 249000.25	***Top of protective steel casing elevation*** 21.10 ft
Inspector E.M. Hastings	***Easting*** 5241116.10	***Top of riser pipe elevation*** 20.71 ft

A = Ground Surface
B = Top of Riser
C = Top of Bentonite Seal
D = Top of Sand Pack
E = Top of Screen
F = Bottom of Screen
G = Bottom of Borehole

GENERALIZED SOIL DESCRIPTION

See MW-23S Boring Log.

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft below ground, not to scale)
A	21.10	0.00
B	20.71	0.39
C	16.10	5.00
D	14.10	7.00
E	11.10	10.00
F	1.10	20.00
G	-1.90	23.00



DIAMETER OF BOREHOLE: 10 - 12-inches

REMARKS (Installation, development) : Well was developed on July 7, 1992. Well has a 2 ft. sump from 20.00 to 22.00 ft.

filename: MW23WC XLT

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CONSTRUCTION OF MONITORING WELL: **MW-24S**

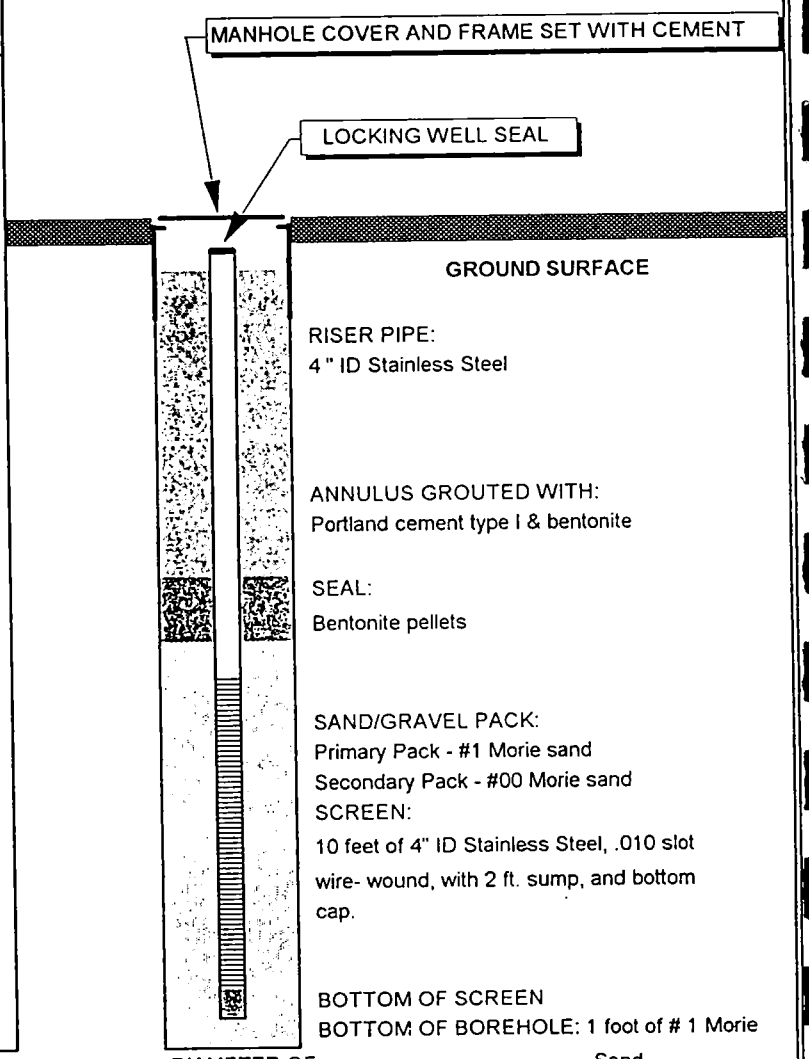
Project name and number CIBA - GEIGY / Cranston R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Environmental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** 21.59 ft
Date of completion 17-Jun-92	***Northing*** 249119.77	***Top of protective steel casing elevation*** 21.59 ft
Inspector E.M. Hastings	***Easting*** 523973.00	***Top of riser pipe elevation*** 21.04 ft

A = Ground Surface
B = Top of Riser
C = Top of Bentonite Seal
D = Top of Sand Pack
E = Top of Screen
F = Bottom of Screen
G = Bottom of Borehole

GENERALIZED SOIL DESCRIPTION

See MW-24S Boring Log.

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft below ground, not to scale)
A	21.59	0.00
B	21.04	0.55
C	18.59	3.00
D	16.59	5.00
E	13.59	8.00
F	3.59	18.00
G	0.59	21.00



DIAMETER OF BOREHOLE: 10 - 12-inches

REMARKS (Installation, development) : Well was developed on July 7, 1992. Well has a 2 ft. sump from 18.00 to 20.00 ft.

filename: MW24WC XLT

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CONSTRUCTION OF RIVER MONITORING WELL: **MW-29S**

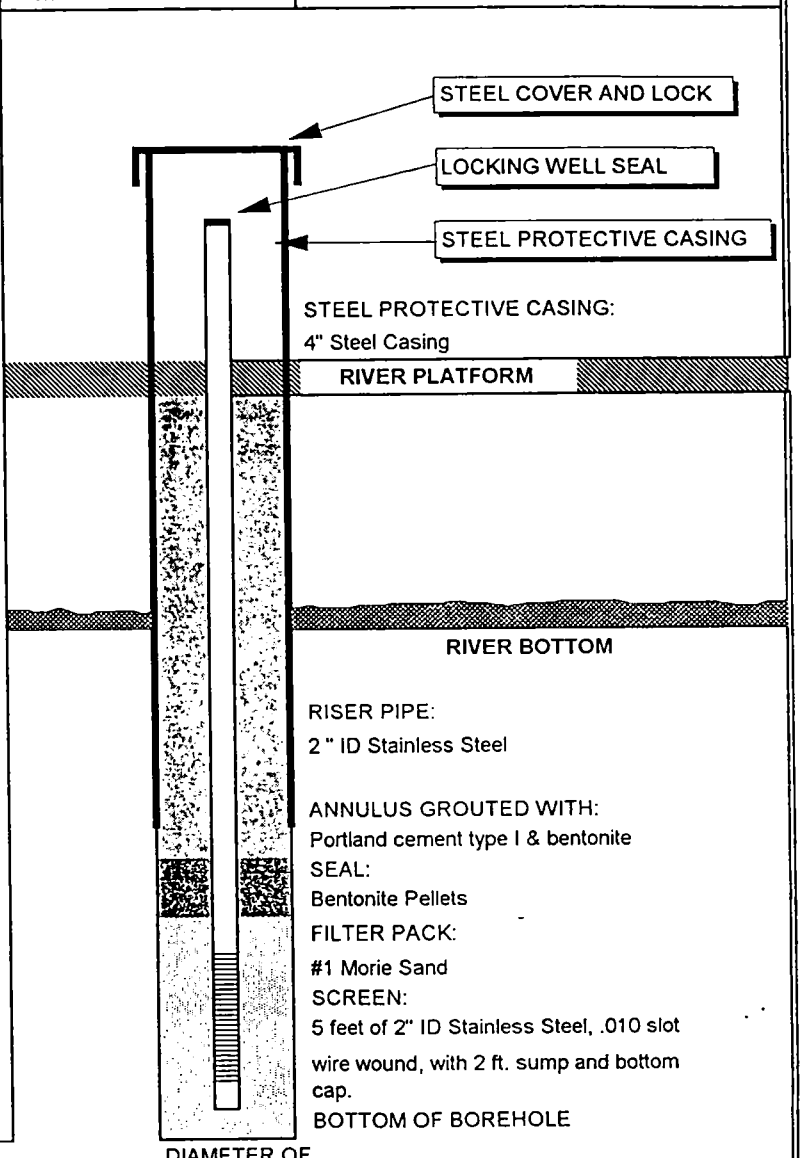
Project name and number CIBA - GEIGY / Cranston, R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Enviromental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** NA ft
Date of completion 25-Jun-92	***Northing*** 248856.71	***Top of protective steel casing elevation*** 16.87 ft
Inspector M. Zusi	***Easting*** 524044.98	***Top of riser pipe elevation*** 16.66 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov riser, not to scale)
A	16.87	0.21
B	16.66	0.00
C	NA	NA
D	-6.34	23.00
E	-6.94	23.60
F	-8.94	25.60
G	-10.94	27.60
H	-15.94	32.60
I	-20.94	37.60

GENERALIZED SOIL DESCRIPTION

See P-29D Boring Log.



REMARKS (Installation, development) : Well was installed using a drive wash technique. Well was developed on July 22, 1992. Well has a 2ft. sump from 32.60 to 34.60 ft.

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CONSTRUCTION OF RIVER MONITORING WELL: **MW-29D**

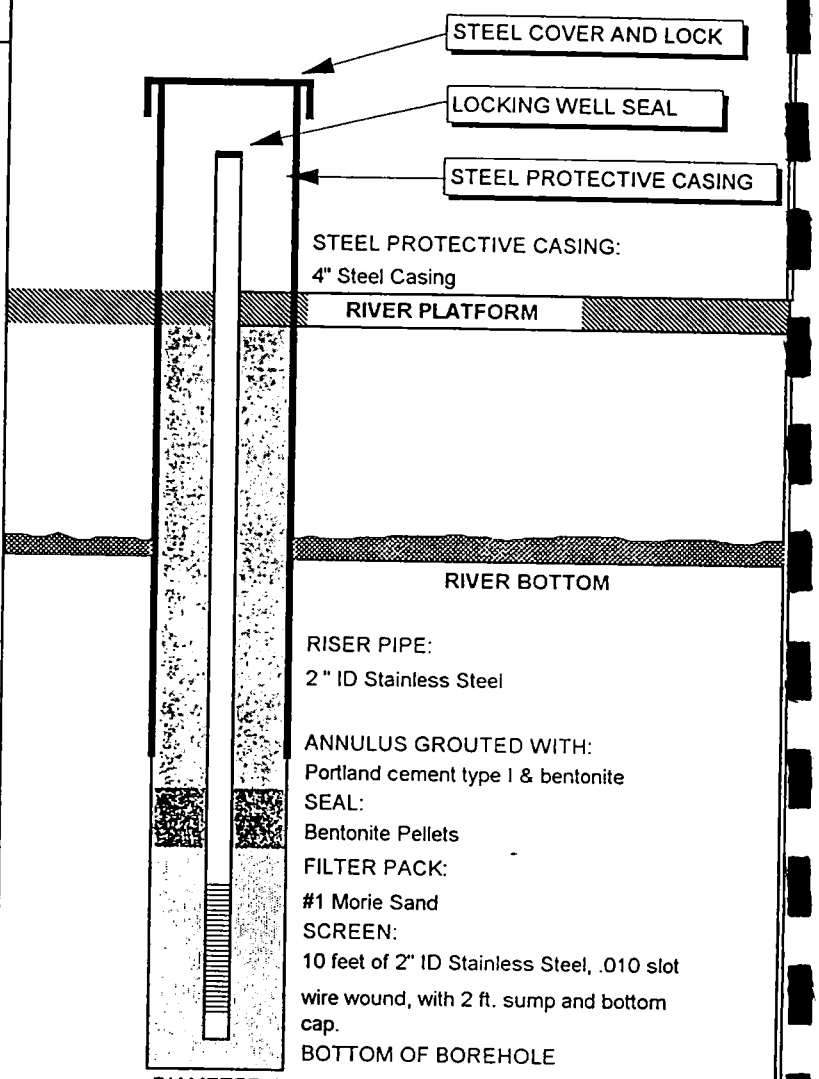
Project name and number CIBA - GEIGY / Cranston, R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Enviromental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** NA ft
Date of completion 26-Jun-92	***Northing*** 248854.03	***Top of protective steel casing elevation*** 16.75 ft
Inspector M. Zusi	***Easting*** 524048.27	***Top of riser pipe elevation*** 16.59 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov riser, not to scale)
A	16.75	0.16
B	16.59	0.00
C	NA	NA
D	-12.41	29.00
E	-12.81	29.40
F	-15.41	32.00
G	-17.41	34.00
H	-27.41	44.00
I	-31.41	48.00

GENERALIZED SOIL DESCRIPTION

See P-29D Boring Log.



DIAMETER OF BOREHOLE: est. 4"

REMARKS (Installation, development) : Well was installed using a drive wash technique. Well was developed on July 22, 1992. Well has a 2ft. sump from 44 to 46 ft.

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CONSTRUCTION OF RIVER MONITORING WELL: **MW-30S**

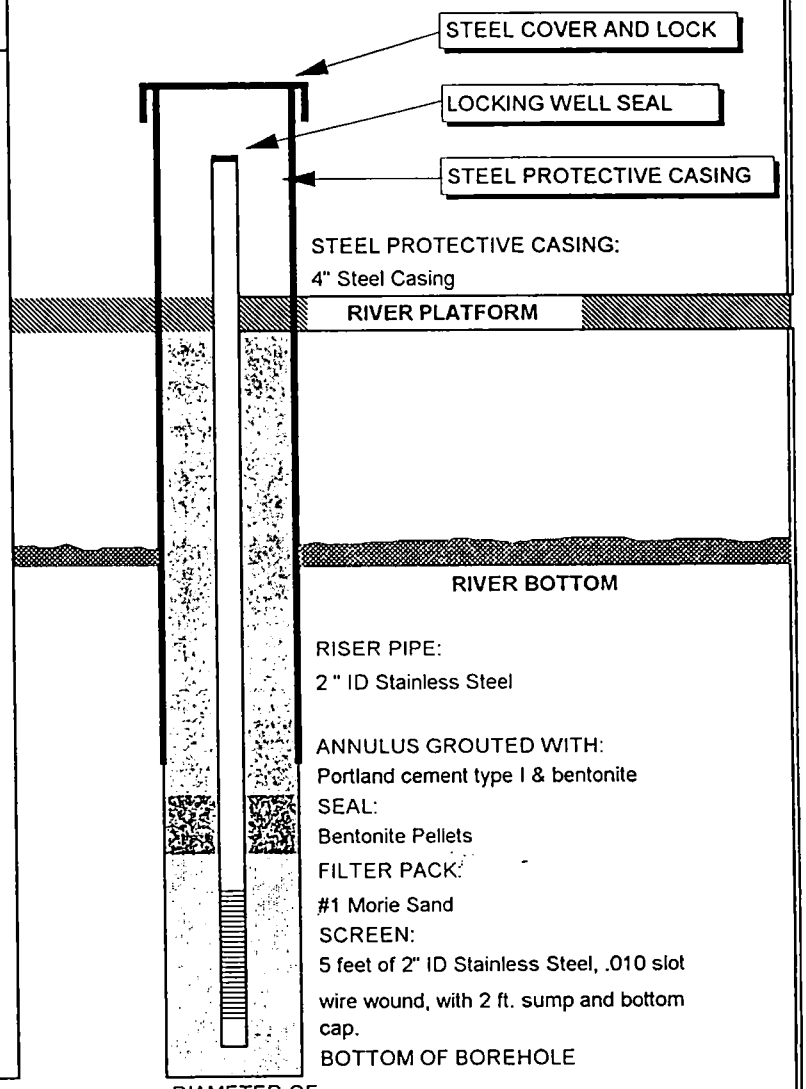
Project name and number CIBA - GEIGY / Cranston, R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Enviromental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** NA ft
Date of completion 13-Jun-92	***Northing*** 248839.11	***Top of protective steel casing elevation*** 16.92 ft
Inspector M. Zusi	***Easting*** 524011.01	***Top of riser pipe elevation*** 16.70 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov riser, not to scale)
A	16.92	0.22
B	16.70	0.00
C	NA	NA
D	-9.30	26.00
E	-9.60	26.30
F	-11.30	28.00
G	-13.30	30.00
H	-18.30	35.00
I	-20.30	37.00

GENERALIZED SOIL DESCRIPTION

See P-30D Boring Log.



STEEL PROTECTIVE CASING:
4" Steel Casing

RISER PIPE:
2 " ID Stainless Steel

ANNULUS GROUTED WITH:
Portland cement type I & bentonite
SEAL:
Bentonite Pellets
FILTER PACK:
#1 Morie Sand
SCREEN:
5 feet of 2" ID Stainless Steel, .010 slot wire wound, with 2 ft. sump and bottom cap.
BOTTOM OF BOREHOLE

DIAMETER OF BOREHOLE: est. 4"

REMARKS (Installation, development) : Well was installed using a drive wash technique. Well was developed on July 22, 1992. Well has a 2ft. sump from 35.00 to 37.00 ft.

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF RIVER MONITORING WELL: **MW-30D**

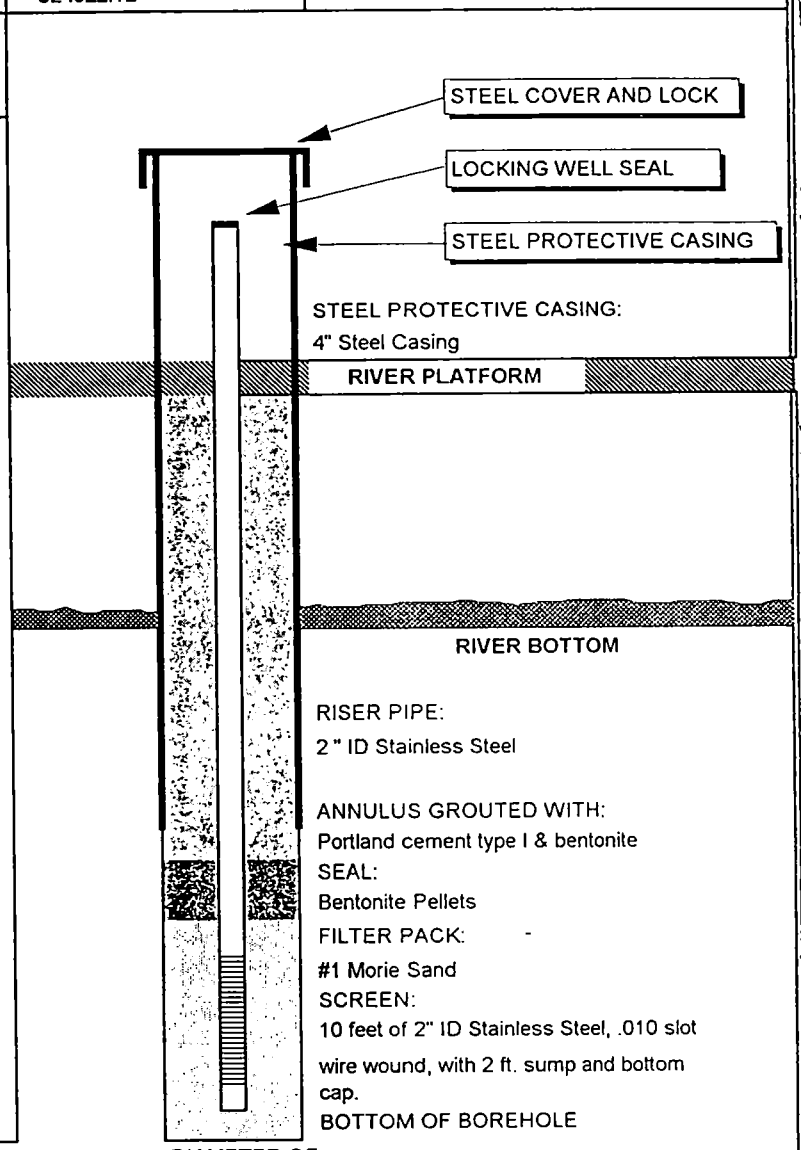
Project name and number CIBA - GEIGY / Cranston, R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Enviromental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** NA ft
Date of completion 15-Jun-92	***Northing*** 248827.11	***Top of protective steel casing elevation*** 16.93 ft
Inspector M. Zusi	***Easting*** 524022.12	***Top of riser pipe elevation*** 16.67 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

GENERALIZED SOIL DESCRIPTION

See P-30D Boring Log.

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov riser, not to scale)
A	16.93	0.26
B	16.67	0.00
C	NA	NA
D	-13.33	30.00
E	-14.13	30.80
F	-17.33	34.00
G	-19.33	36.00
H	-29.33	46.00
I	-31.33	48.00



REMARKS (Installation, development) : Well was installed using a drive wash technique. Well was developed on July 19, 1992. Well has a 2ft. sump from 46 to 48 ft.

filename: MW30D.WC XLT

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF RIVER MONITORING WELL: **MW-31S**

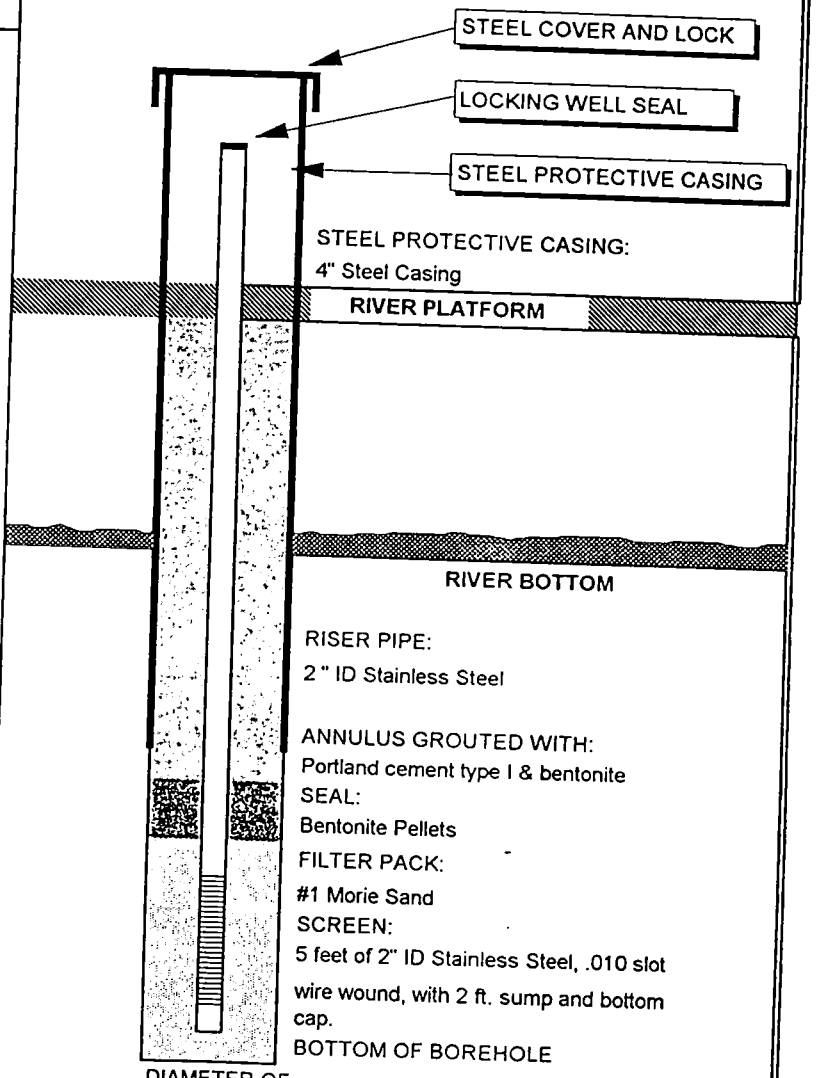
Project name and number CIBA - GEIGY / Cranston, R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Enviromental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** NA ft
Date of completion 16-Jul-92	***Northing*** 248736.09	***Top of protective steel casing elevation*** 16.55 ft
Inspector M. Zusi	***Easting*** 523945.12	***Top of riser pipe elevation*** 16.27 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov riser not to scale).
A	16.55	0.28
B	16.27	0.00
C	NA	NA
D	1.77	14.50
E	1.27	15.00
F	-1.73	18.00
G	-4.23	20.50
H	-9.23	25.50
I	-13.23	29.50

GENERALIZED SOIL DESCRIPTION

See P-31D Boring Log.



DIAMETER OF BOREHOLE: est. 4"

REMARKS (Installation, development) : Well was installed using a drive wash technique. Well was developed on July 21, 1992. Well has a 2ft. sump from 27.50 to 29.50 ft.

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF RIVER MONITORING WELL: **MW-31D**

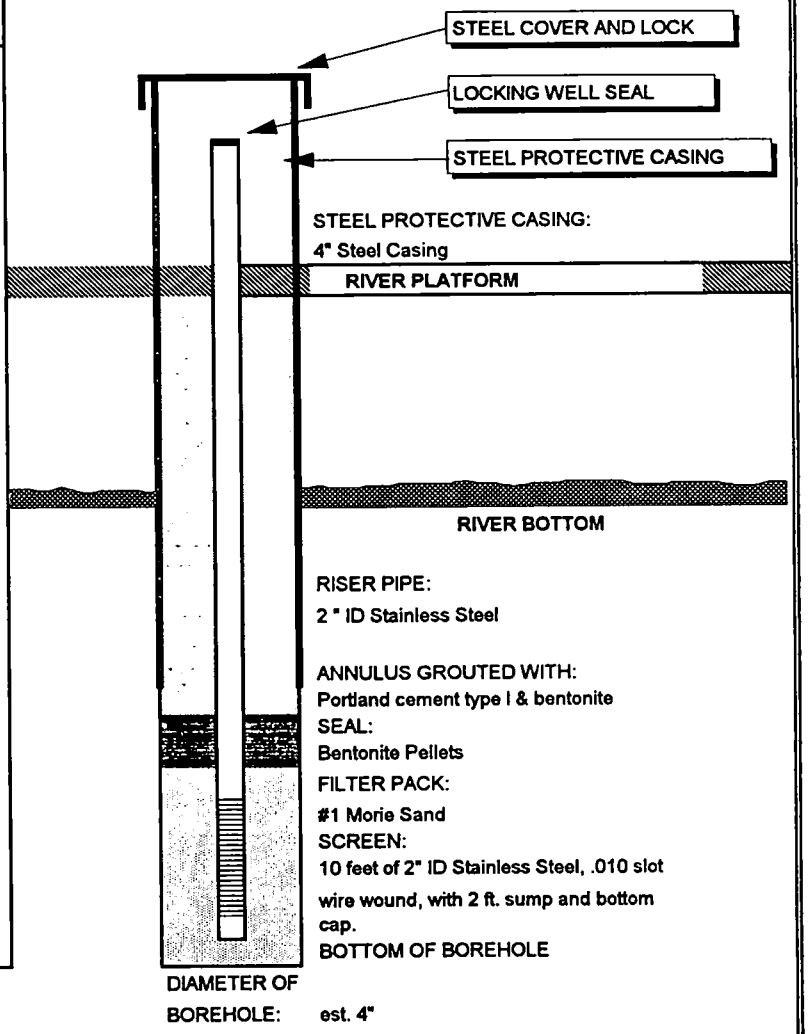
Project name and number CIBA - GEIGY / Cranston, R.I. 87X4660	*Well permit No.* NA	*Elevation datum*
Drilling company Burlington Enviromental Inc.	*Surveyor* Louis Federici and Assoc.	*Ground elevation* NA ft
Date of completion 17-Jul-92	*Northing* 248731.30	*Top of protective steel casing elevation* 16.49 ft
Inspector M. Zusi	*Easting* 523952.59	*Top of riser pipe elevation* 16.21 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov riser, not to scale)
A	16.49	0.28
B	16.21	0.00
C	NA	NA
D	-15.29	31.50
E	-15.79	32.00
F	-17.79	34.00
G	-19.79	36.00
H	-29.79	46.00
I	-31.79	48.00

GENERALIZED SOIL DESCRIPTION

See P-31D Boring Log.



REMARKS (Installation, development) : Well was installed using a drive wash technique. Well was developed on July 20, 1992. Well has a 2ft. sump from 46 to 48 ft.

filename: MW31DWC.XLT

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF PIEZOMETER: **P -2D**

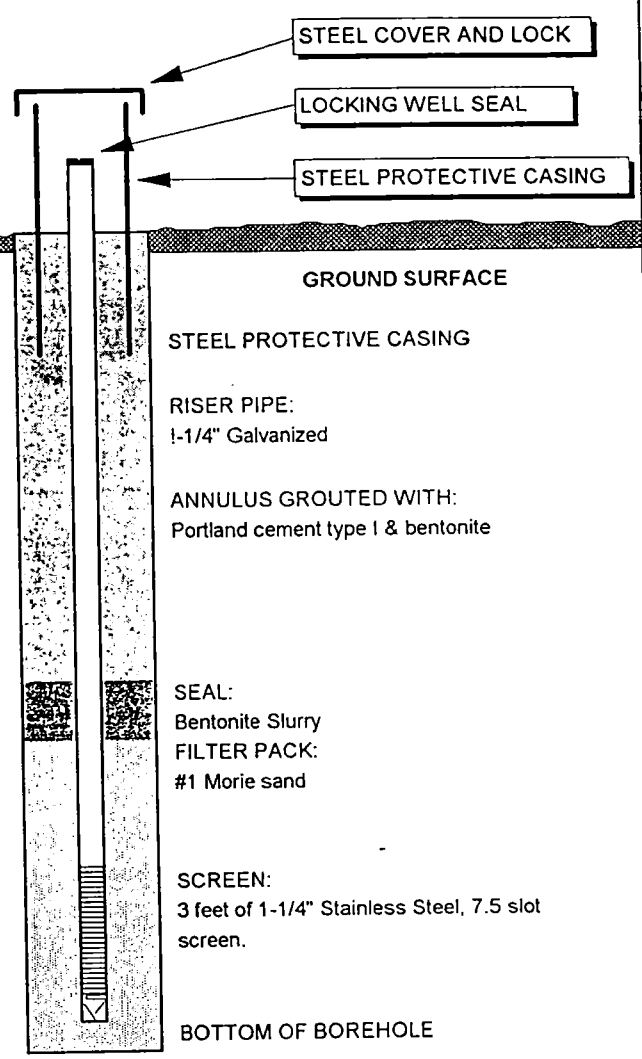
Project name and number CIBA - GEIGY / Cranston R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Environmental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** 12.96 ft
Date of completion 15-Jun-92	***Northing*** 248705.76	***Top of protective steel casing elevation*** 15.72 ft
Inspector E.M. Hastings	***Easting*** 523891.36	***Top of riser pipe elevation*** 16.00 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov ground, not to scale)
A	15.72	2.76
B	16.00	3.04
C	12.96	0.00
D	9.96	3.00
E	-29.04	42.00
F	-31.04	44.00
G	-33.04	46.00
H	-36.04	49.00
I	-39.04	52.00

GENERALIZED SOIL DESCRIPTION

See P-2D Boring Log.



DIAMETER OF BOREHOLE: 6 to 8 - inches

REMARKS (Installation, development) : Cement apron placed around steel casing. Piezometer was developed on June 26, 1992.

filename P2DPC XLT

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF PIEZOMETER: **P -13D**

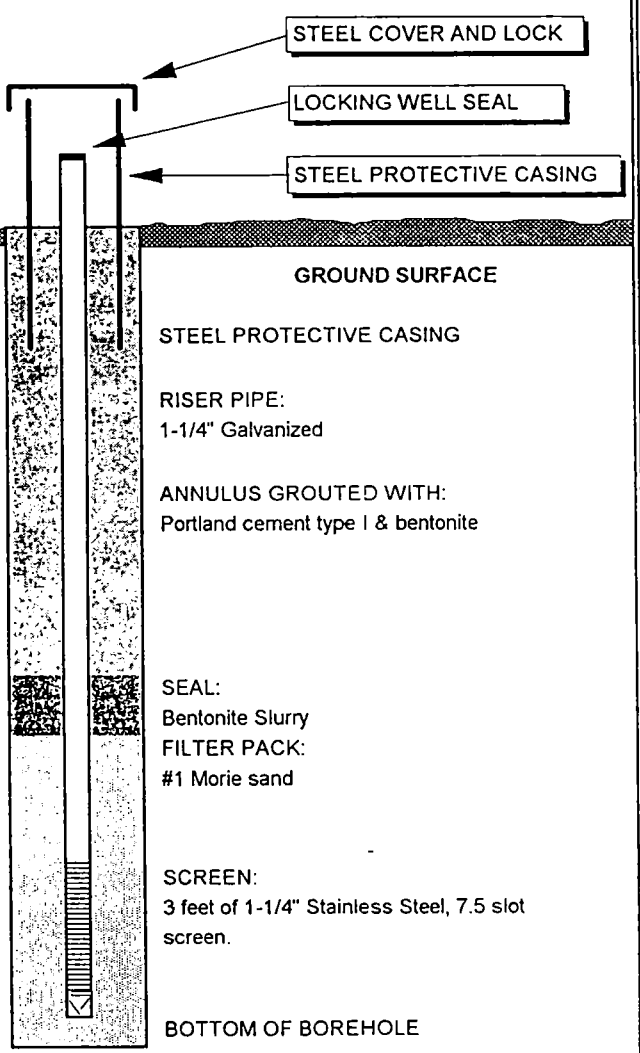
Project name and number CIBA - GEIGY / Cranston R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Environmental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** 15.67 ft
Date of completion 13-Jun-92	***Northing*** 248963.34	***Top of protective steel casing elevation*** 18.79 ft
Inspector E.M. Hastings	***Easting*** 523999.54	***Top of riser pipe elevation*** 18.85 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

GENERALIZED SOIL DESCRIPTION

See P-13D Boring Log.

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov ground, not to scale)
A	18.79	3.12
B	18.85	3.18
C	15.67	0.00
D	12.67	3.00
E	-15.33	31.00
F	-17.33	33.00
G	-19.33	35.00
H	-22.33	38.00
I	-24.33	40.00



DIAMETER OF BOREHOLE: 6 to 8 - inches

REMARKS (Installation, development) : Cement apron placed around steel casing. Piezometer was developed on June 27, 1992.

filename: P13DPC.XLT

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF RIVER PIEZOMETER: **P-29D**

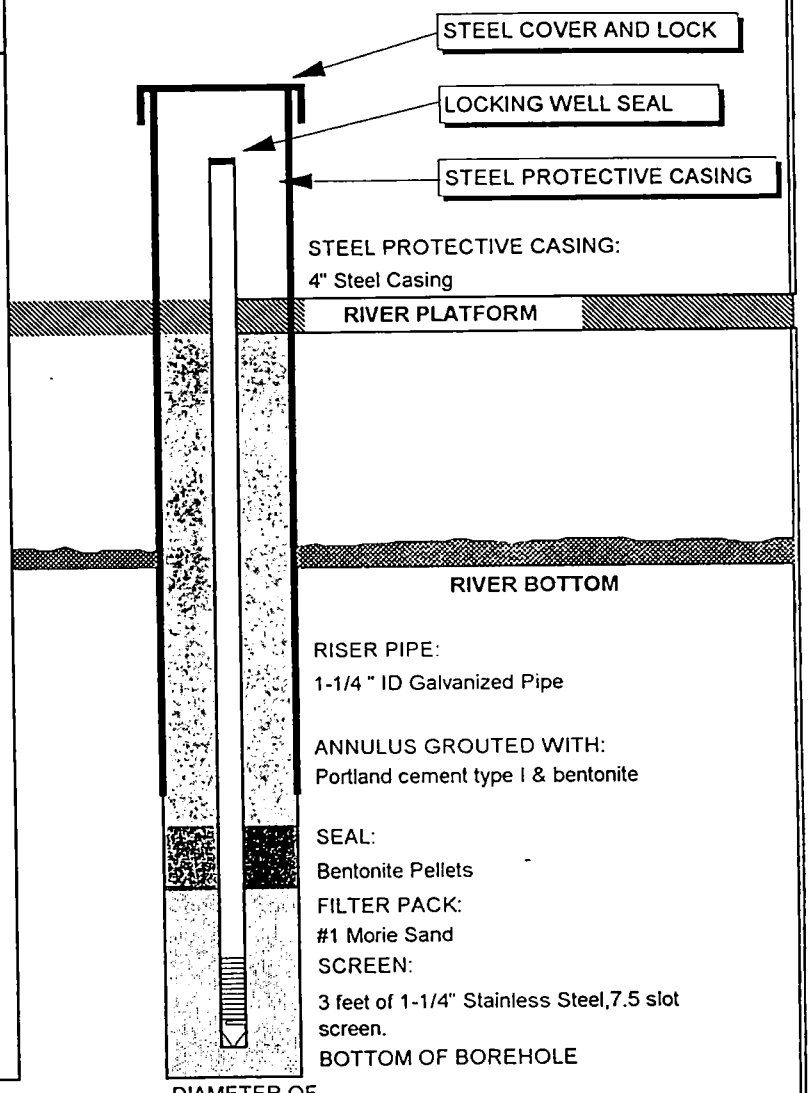
Project name and number CIBA-GEIGY / Cranston, R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Environmental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** NA ft
Date of completion 17-Jun-92	***Northing*** 248870.09	***Top of protective steel casing elevation*** 16.68 ft
Inspector M. Zusi	***Easting*** 524043.57	***Top of riser pipe elevation*** 16.51 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov riser, not to scale)
A	16.68	0.17
B	16.51	0.00
C	NA	NA
D	-17.49	34.00
E	-17.91	34.42
F	-20.31	36.82
G	-22.31	38.82
H	-25.31	41.82
I	-27.31	43.82

GENERALIZED SOIL DESCRIPTION

See P-29D Boring Log.



DIAMETER OF BOREHOLE: 4 - inches

REMARKS (Installation, development) : Piezometer was installed using a drive wash technique. Piezometer was developed on August 11, 1992.

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF RIVER PIEZOMETER: **P-30D**

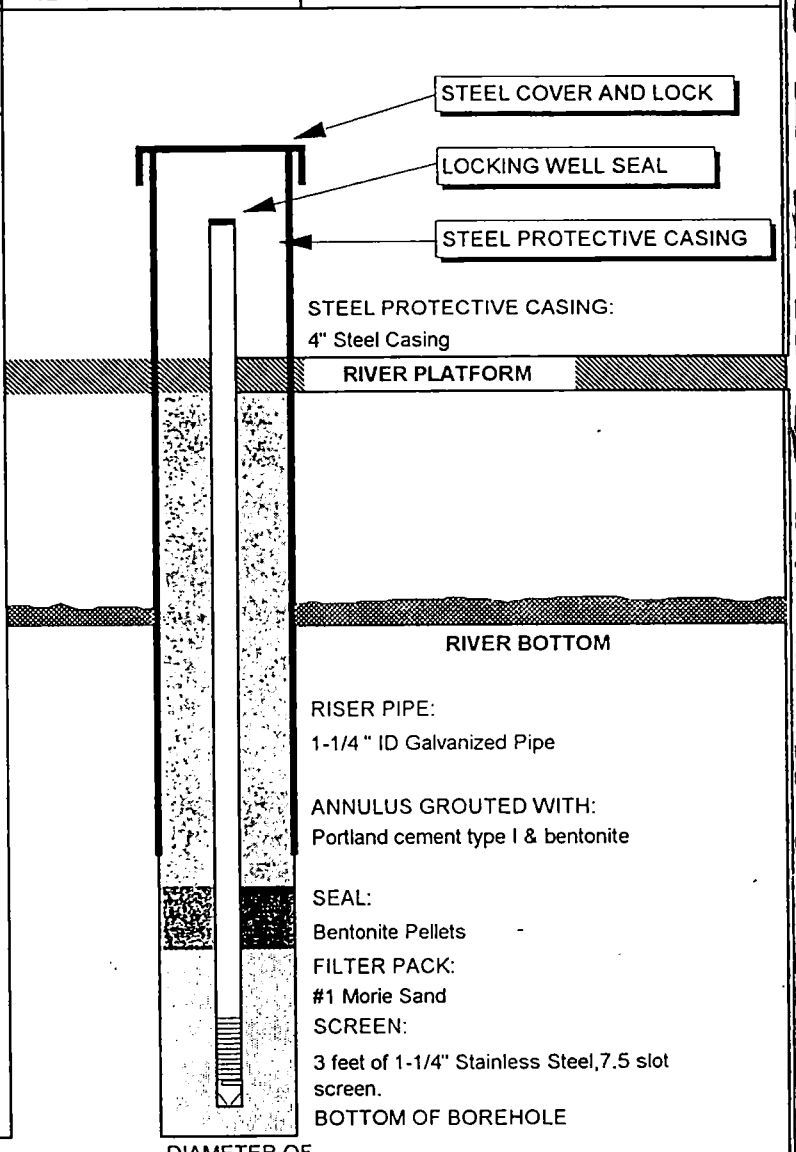
Project name and number CIBA-GEIGY / Cranston, R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Environmental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** NA ft
Date of completion 12-Jun-92	***Northing*** 248845.55	***Top of protective steel casing elevation*** 16.98 ft
Inspector M. Zusi	***Easting*** 524016.41	***Top of riser pipe elevation*** 16.43 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov riser, not to scale)
A	16.98	0.55
B	16.43	0.00
C	NA	NA
D	-23.31	39.74
E	-23.81	40.24
F	-25.81	42.24
G	-27.81	44.24
H	-30.81	47.24
I	-31.81	48.24

GENERALIZED SOIL DESCRIPTION

See P-30D Boring Log.



DIAMETER OF BOREHOLE: 4 - inches

REMARKS (Installation, development) : Piezometer was installed using a drive wash technique. Piezometer was developed on August 11, 1992.

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF RIVER PIEZOMETER: **P-31D**

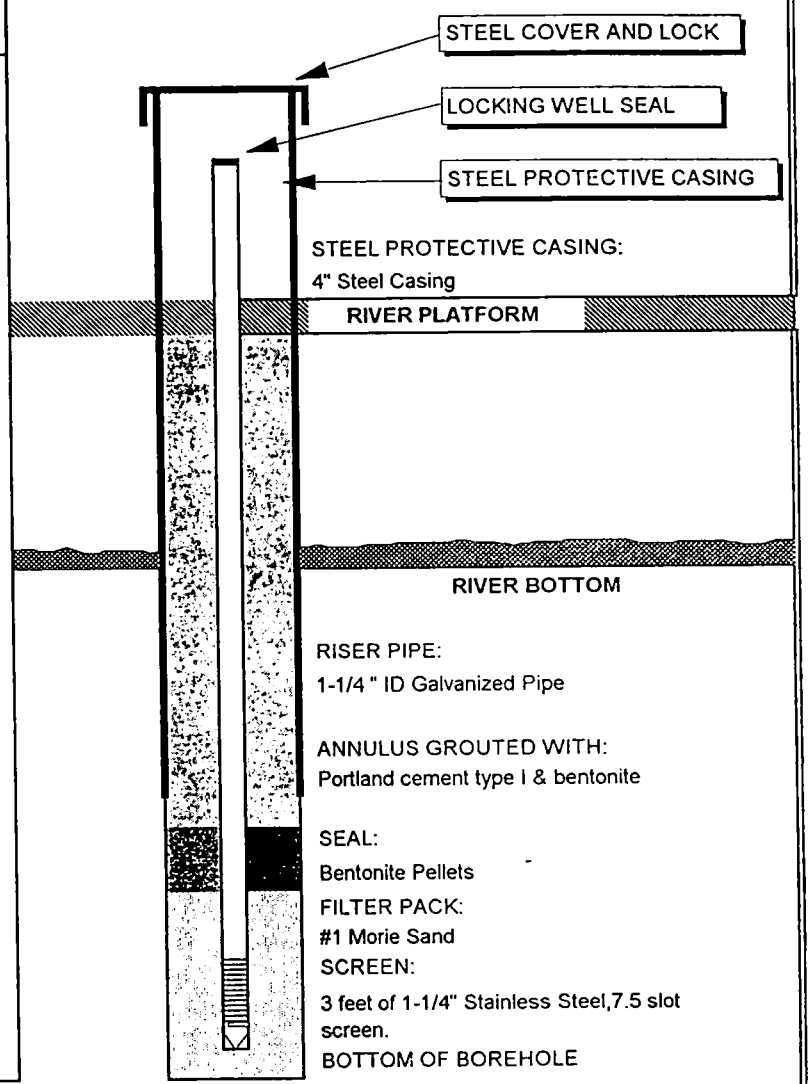
Project name and number CIBA-GEIGY / Cranston, R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Environmental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** NA ft
Date of completion 15-Jul-92	***Northing*** 248736.09	***Top of protective steel casing elevation*** 16.54 ft
Inspector M. Zusi	***Easting*** 523945.12	***Top of riser pipe elevation*** 16.45 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov riser, not to scale)
A	16.54	0.55
B	16.45	0.00
C	NA	NA
D	-21.29	37.74
E	-21.79	38.24
F	-23.59	40.04
G	-33.25	49.70
H	-36.25	52.70
I	-38.55	55.00

GENERALIZED SOIL DESCRIPTION

See P-31D Boring Log.



DIAMETER OF BOREHOLE: 4 - inches

REMARKS (Installation, development) : Piezometer was installed using a drive wash technique. Piezometer was developed on August 10, 1992.

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF PIEZOMETER: **P -32S**

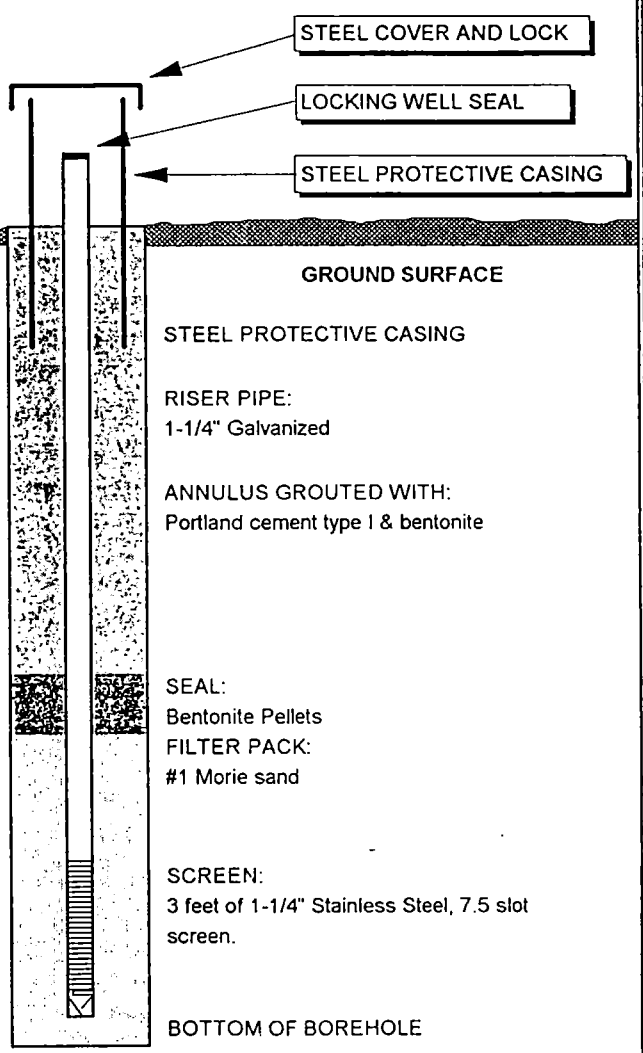
Project name and number CIBA - GEIGY / Cranston R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Environmental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** 13.98 ft
Date of completion 12-Jun-92	***Northing*** 248894.28	***Top of protective steel casing elevation*** 16.94 ft
Inspector E.M. Hastings	***Easting*** 524019.10	***Top of riser pipe elevation*** 17.02 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov ground, not to scale)
A	16.94	3.19
B	17.02	3.19
C	13.98	0.00
D	10.98	3.00
E	6.98	7.00
F	4.98	9.00
G	2.98	11.00
H	-0.02	14.00
I	-0.02	14.00

GENERALIZED SOIL DESCRIPTION

See P-32D Boring Log.



DIAMETER OF BOREHOLE: 6 to 8 - inches

REMARKS (Installation, development) : Cement apron placed around steel casing. Piezometer was developed on July 1, 1992.

filename P32SPC.XLT

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF PIEZOMETER: **P -32D**

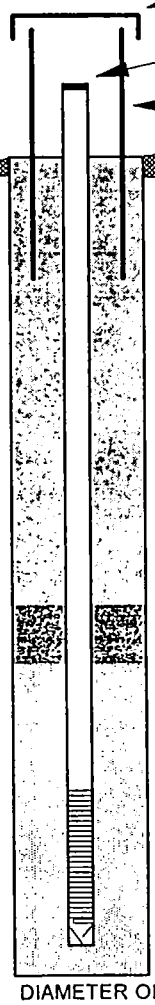
Project name and number CIBA - GEIGY / Cranston R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Environmental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** 13.91 ft
Date of completion 12-Jun-92	***Northing*** 248888.63	***Top of protective steel casing elevation*** 17.10 ft
Inspector E.M. Hastings	***Easting*** 524022.99	***Top of riser pipe elevation*** 17.10 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

GENERALIZED SOIL DESCRIPTION

See P-32D Boring Log.

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov ground, not to scale)
A	17.10	3.19
B	17.10	3.19
C	13.91	0.00
D	10.91	3.00
E	-18.09	32.00
F	-20.09	34.00
G	-22.09	36.00
H	-25.09	39.00
I	-27.59	41.50



DIAMETER OF BOREHOLE: 6 to 8 - inches

REMARKS (Installation, development) : Cement apron placed around steel casing. Piezometer was developed on July 1, 1992.

filename P32DPC XLT

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF PIEZOMETER P -33S

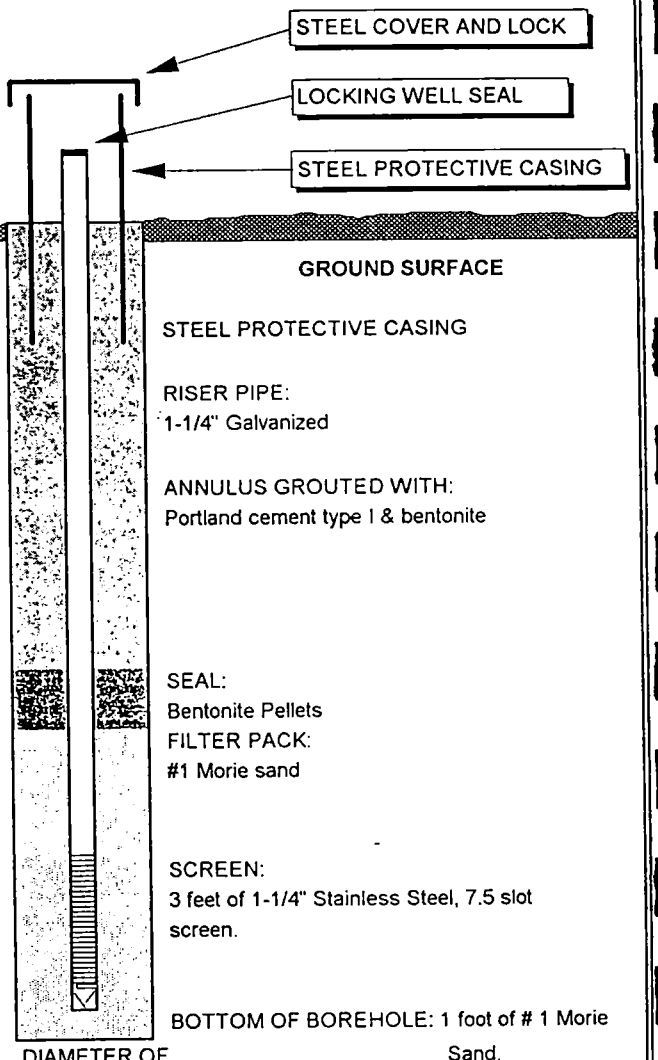
Project name and number CIBA - GEIGY / Cranston R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Environmental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** 14.35 ft
Date of completion 10-Jun-92	***Northing*** 248773.13	***Top of protective steel casing elevation*** 17.73 ft
Inspector E.M. Hastings	***Easting*** 523913.84	***Top of riser pipe elevation*** 17.74 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

GENERALIZED SOIL DESCRIPTION

See P-33D Boring Log.

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov ground, not to scale)
A	17.73	3.38
B	17.74	3.39
C	14.35	0.00
D	11.35	3.00
E	6.35	8.00
F	4.35	10.00
G	2.35	12.00
H	-0.65	15.00
I	-1.65	16.00



DIAMETER OF BOREHOLE: 6 to 8 - inches

REMARKS (Installation, development) : Cement apron placed around steel casing. Piezometer was developed on June 26, 1992.

filename: P33SPC.XLT

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF PIEZOMETER: **P-33D**

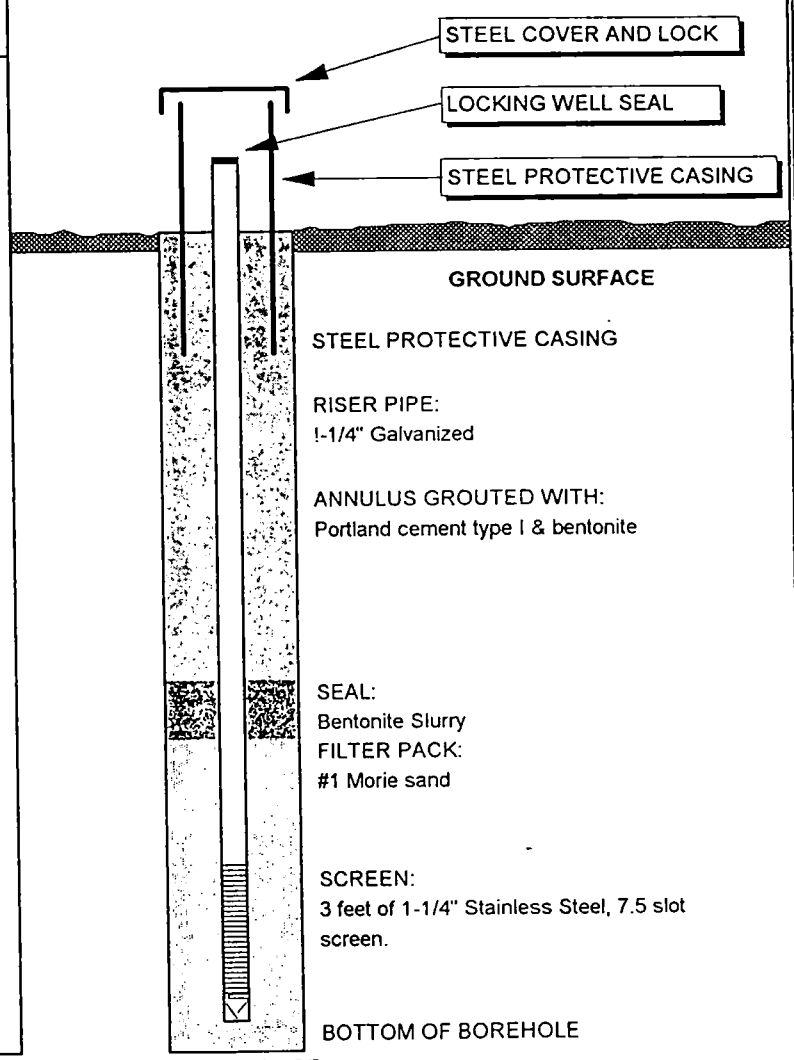
Project name and number CIBA - GEIGY / Cranston R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Environmental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** 13.93 ft
Date of completion 11-Jun-92	***Northing*** 248771.80	***Top of protective steel casing elevation*** 16.88 ft
Inspector E.M. Hastings	***Easting*** 523919.57	***Top of riser pipe elevation*** 16.99 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

GENERALIZED SOIL DESCRIPTION

See P-33D Boring Log.

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov ground, not to scale)
A	16.88	2.95
B	16.99	3.06
C	13.93	0.00
D	10.93	3.00
E	-30.07	44.00
F	-32.07	46.00
G	-34.07	48.00
H	-37.07	51.00
I	-42.07	56.00



DIAMETER OF BOREHOLE: 6 to 8 - inches

REMARKS (Installation, development) : Cement apron placed around steel casing. Piezometer was developed on June 25, 1992.

filename P33DPC XLT

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF PIEZOMETER: **P -34S**

Project name and number CIBA - GEIGY / Cranston R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Environmental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** 14.90 ft
Date of completion 12-Nov-92	***Northing*** 248794.60	***Top of protective steel casing elevation*** 17.30 ft
Inspector E.M. Hastings	***Easting*** 523896.73	***Top of riser pipe elevation*** 17.15 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

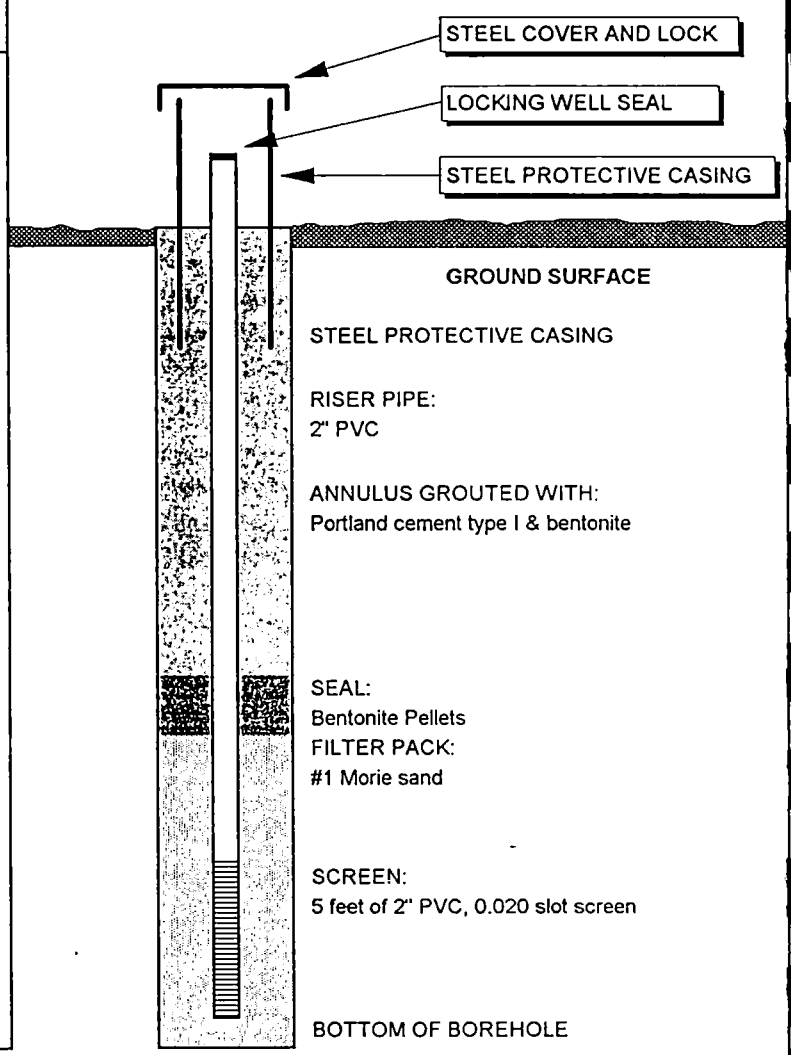
KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov ground, not to scale)
A	17.30	2.40
B	17.15	2.25
C	14.90	0.00
D	12.90	2.00
E	8.40	6.50
F	6.40	8.50
G	4.35	10.55
H	-0.65	15.55
I	-1.10	16.00

GENERALIZED SOIL DESCRIPTION

0 -5 ft.
FILL, Tan M-F SAND,tr. F. gravel
PID = 0.0 ppm

5 -10 ft.
Black - dk. gray F.SAND, some silt, wet at 6 ft.
PID = 0.0 ppm

10 - 16 ft.
Same as above, saturated.
PID = 0.0 ppm



DIAMETER OF BOREHOLE: NA

REMARKS (Installation, development) : Cement apron placed around steel casing. Piezometer was developed on November 16, 1992.

filename: P34SPC XLT

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF PIEZOMETER: **P -35S**

Project name and number CIBA - GEIGY / Cranston R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Environmental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** 13.10 ft
Date of completion 12-Nov-92	***Northing*** 248746.17	***Top of protective steel casing elevation*** 15.48 ft
Inspector E.M. Hastings	***Easting*** 523937.76	***Top of riser pipe elevation*** 15.32 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

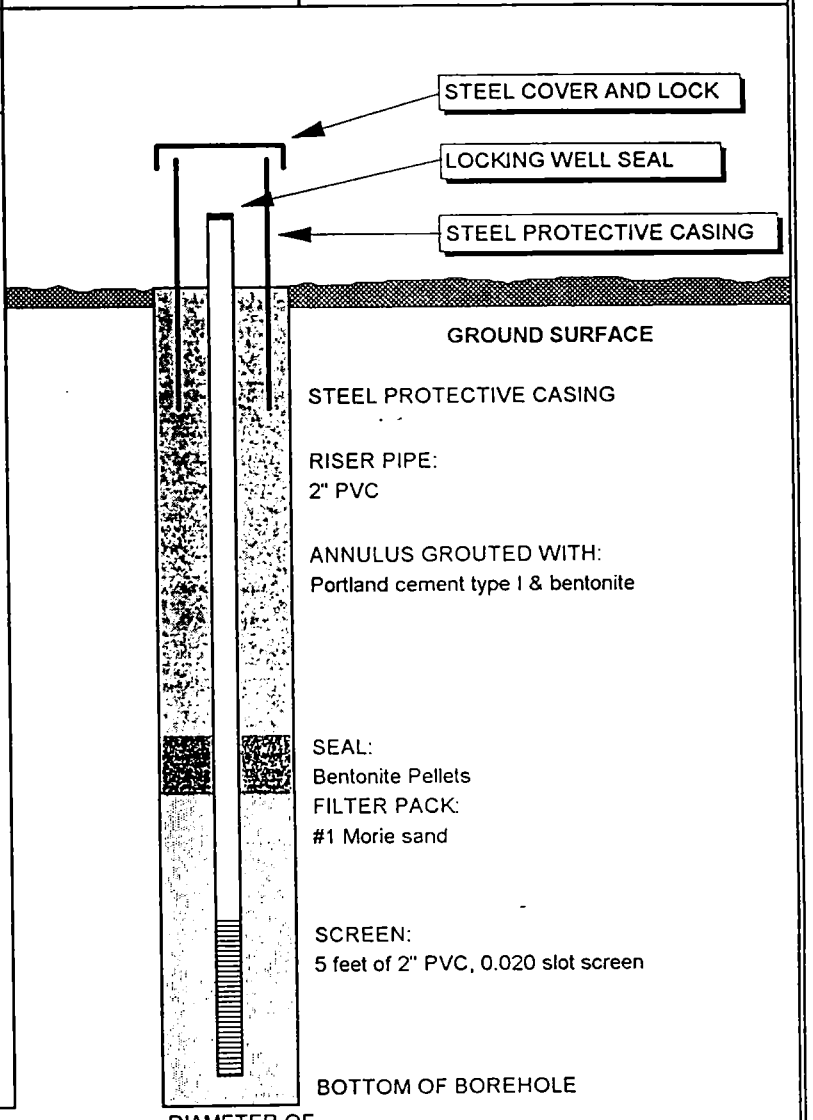
KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov ground, not to scale)
A	15.48	2.38
B	15.32	2.22
C	13.10	0.00
D	11.10	2.00
E	6.60	6.50
F	5.10	8.00
G	3.12	9.98
H	-1.88	14.98
I	-2.40	15.50

GENERALIZED SOIL DESCRIPTION

0 -5 ft.
FILL, Gray, tan-dk. brown,F.-M. SAND, tr. gravel.
PID = 1.0 ppm

5 -10 ft.
Dk. gray F.-M.SAND, tr. gravel, tr. silt, wet at 5 ft.
PID = 0.1 ppm

10 - 15.5 ft.
Black, F. SAND, tr. silt,saturated, St. odor.
PID = 0.1 ppm



DIAMETER OF BOREHOLE: NA

REMARKS (Installation, development) : Cement apron placed around steel casing. Piezometer was developed on November 16, 1992.

filename P35SPC.XLT

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF PIEZOMETER: **P -36S**

Project name and number CIBA - GEIGY / Cranston R.I. 87X4660		***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Environmental Inc.		***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** 13.50 ft
Date of completion 11-Nov-92		***Northing*** 248800.57	***Top of protective steel casing elevation*** 16.09 ft
Inspector E.M. Hastings		***Easting*** 523974.91	***Top of riser pipe elevation*** 15.91 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov ground, not to scale)
A	16.09	2.59
B	15.91	2.41
C	13.50	0.00
D	11.50	2.00
E	7.00	6.50
F	5.50	8.00
G	2.91	10.59
H	-2.09	15.59
I	-2.50	16.00

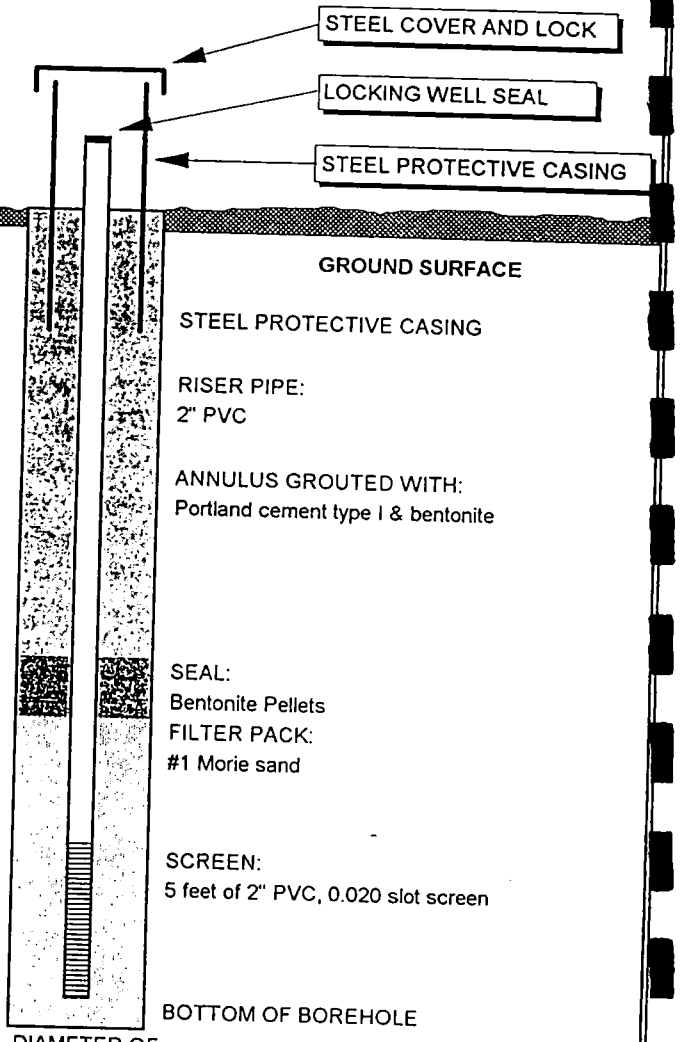
GENERALIZED SOIL DESCRIPTION

0 - 3 ft.
FILL, brown - gray,F.-M. SAND, sm. gravel, cobbles.

3 - 5 ft.
FILL, black,F.-M. SAND, some gravel.
PID= 1.5 ppm

5 - 10 ft.
Dk. brown, F.-M. SAND,some C.-F. gravel,wet at 5 ft.
PID= 1.7 ppm

10 - 16 ft.
Brown and black, F-M. SAND, tr. gravel, saturated
PID= 0.9 ppm



DIAMETER OF BOREHOLE: NA

REMARKS (Installation, development) : Cement apron placed around steel casing. Piezometer was developed on November 16, 1992.

filename. P36SPC XLT

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF PIEZOMETER: **P -37S**

Project name and number CIBA - GEIGY / Cranston R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Environmental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** 13.60 ft
Date of completion 11-Nov-92	***Northing*** 248869.22	***Top of protective steel casing elevation*** 15.88 ft
Inspector E.M. Hastings	***Easting*** 524032.65	***Top of riser pipe elevation*** 15.69 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov ground, not to scale)
A	15.88	2.28
B	15.69	2.09
C	13.60	0.00
D	11.60	2.00
E	6.60	7.00
F	5.10	8.50
G	3.89	9.71
H	-1.11	14.71
I	-2.40	16.00

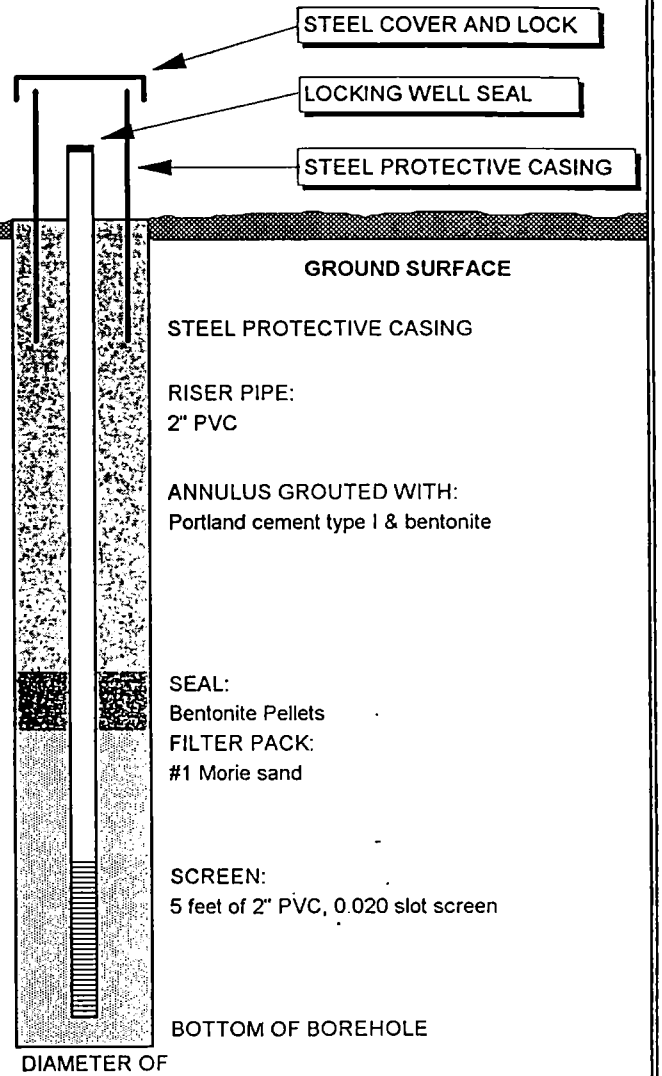
GENERALIZED SOIL DESCRIPTION

0 - 3 ft.
FILL, Black - gray,F.-M. SAND, some C.-F. gravel,tr. brick, and wood.

3 - 5 ft.
FILL, Brown, M. SAND, some gravel.
PID= 0.1 ppm

5 - 10 ft.
Dk. brown, C.-F. SAND,some gravel,wet at 6 ft.
PID= 0.1 ppm

10 - 16 ft.
Same as above, saturated.
PID= 0.1ppm



DIAMETER OF BOREHOLE: NA

REMARKS (Installation, development) : Cement apron placed around steel casing. Piezometer was developed on November 16, 1992.

filename: P37SPC.XLT

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF PIEZOMETER: **P -38S**

Project name and number CIBA - GEIGY / Cranston R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Environmental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** 13.90 ft
Date of completion 11-Nov-92	***Northing*** 248913.61	***Top of protective steel casing elevation*** 16.34 ft
Inspector E.M. Hastings	***Easting*** 524086.13	***Top of riser pipe elevation*** 16.19 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

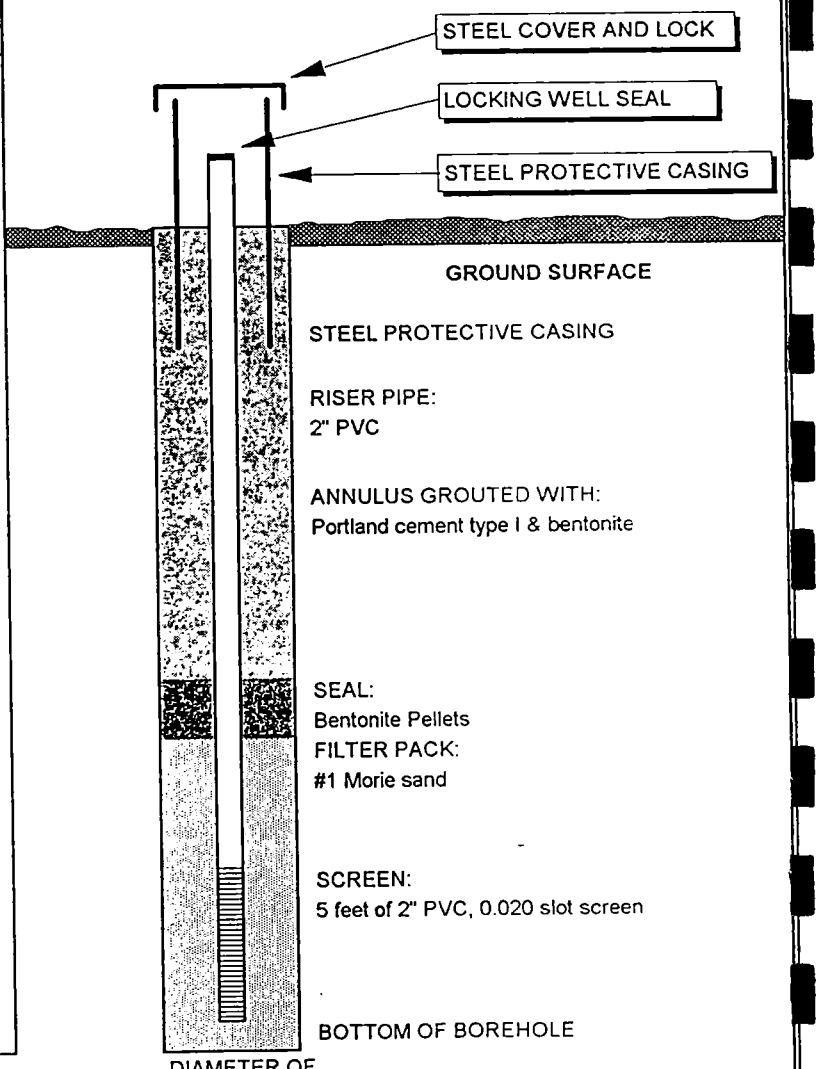
KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov ground, not to scale)
A	16.34	2.44
B	16.19	2.29
C	13.90	0.00
D	11.90	2.00
E	7.90	6.00
F	4.90	9.00
G	3.17	10.73
H	-1.83	15.73
I	-2.10	16.00

GENERALIZED SOIL DESCRIPTION

0 -5 ft.
FILL, Black-gray F.-M. SAND, C. gravel, brick,wood.
PID= 0.1 ppm

5 -10 ft.
Gray-black, F.-M. SAND, trace M. gravel.
PID = 0.4 ppm

10 - 16 ft.
Black-gray,F.-M. SAND,sat.
PID = 0.1 ppm



DIAMETER OF BOREHOLE: NA

REMARKS (Installation, development) : Cement apron placed around steel casing. Piezometer was developed on November 16, 1992.

filename: P38SPC.XLT

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF VAPOR EXTRACTION WELLS: VE-1

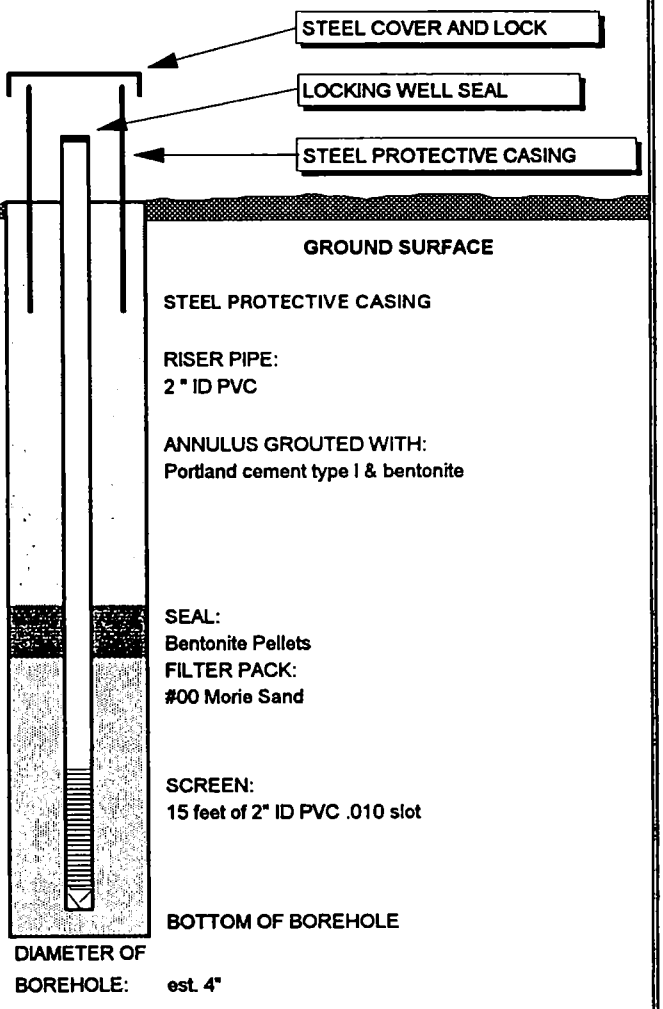
Project name and number CIBA-GEIGY / Cranston, R.I. 87X4660	***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Environmental Inc.	***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** 19.36 ft
Date of completion 21-Jul-92	***Northing*** 249017.03	***Top of protective steel casing elevation*** 21.89 ft
Inspector K. Kievit	***Easting*** 523805.75	***Top of riser pipe elevation*** 21.80 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

GENERALIZED SOIL DESCRIPTION

M-F SAND, tr. silt

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov ground, not to scale)
A	21.89	2.53
B	21.80	2.44
C	19.36	0.00
D	NA	NA
E	16.36	3.00
F	15.86	3.50
G	14.86	4.50
H	-0.14	19.50
I	-0.64	20.00



DIAMETER OF BOREHOLE: est. 4"

REMARKS (Installation, development) : Well developed on August 13, 1992.

filename: VE-1.XLT

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF VAPOR EXTRACTION WELLS: VE-2

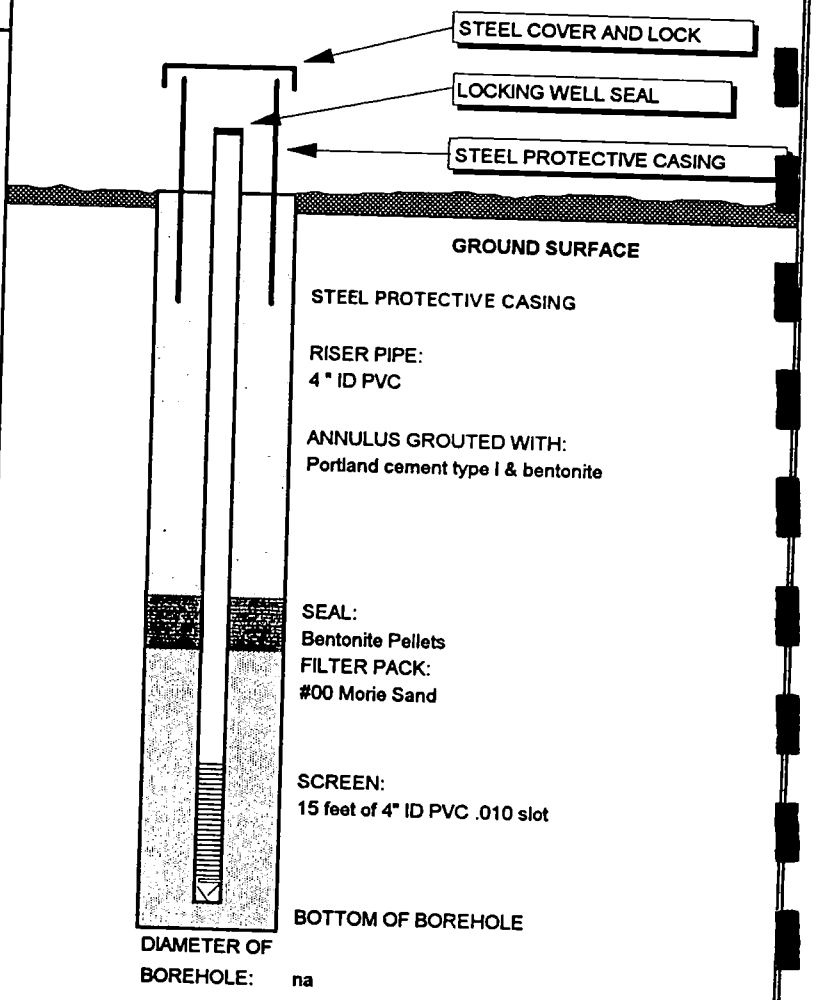
Project name and number CIBA-GEIGY / Cranston, R.I. 87X4660		***Well permit No.*** NA	***Elevation datum***
Drilling company Burlington Environmental Inc.		***Surveyor*** Louis Federici and Assoc.	***Ground elevation*** 19.20 ft
Date of completion 21-Jul-92		***Northing*** 248997.04	***Top of protective steel casing elevation*** 21.61 ft
Inspector K. Kievit		***Easting*** 523810.45	***Top of riser pipe elevation*** 21.59 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov ground, not to scale)
A	21.61	2.41
B	21.59	2.39
C	19.20	0.00
D	NA	NA
E	16.20	3.00
F	15.70	3.50
G	14.70	4.50
H	-0.30	19.50
I	-0.80	20.00

GENERALIZED SOIL DESCRIPTION

M-F SAND, tr. silt



DIAMETER OF BOREHOLE: na

REMARKS (Installation, development) :
Well was developed August 13, 1992. Well pumped dry at est. 4gpm. 60 gallons pumped.

filename: VE-2.XLS

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF VAPOR EXTRACTION WELLS: VE-3

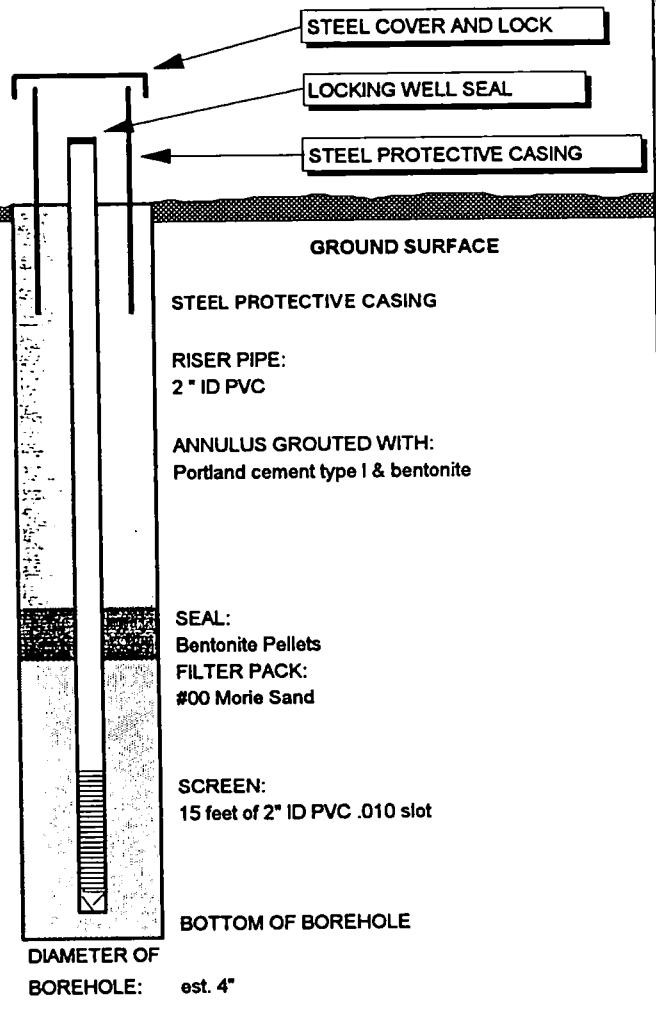
Project name and number CIBA-GEIGY / Cranston, R.I. 87X4660	*Well permit No.* NA	*Elevation datum*
Drilling company Burlington Environmental Inc.	*Surveyor* Louis Federici and Assoc.	*Ground elevation* 18.75 ft
Date of completion 21-Jul-92	*Northing* 248969.25	*Top of protective steel casing elevation* 21.24 ft
Inspector K. Kievit	*Easting* 523817.54	*Top of riser pipe elevation* 21.14 ft

A = Top of Casing
B = Top of Riser
C = Ground Surface
D = Bottom of Outer Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of Borehole

GENERALIZED SOIL DESCRIPTION

M-F SAND, tr. silt

KEY	ELEVATIONS (ft above Mean Sea Level)	DEPTHS (ft bel/abov ground, not to scale)
A	21.24	2.49
B	21.14	2.39
C	18.75	0.00
D	NA	NA
E	15.75	3.00
F	15.25	3.50
G	14.25	4.50
H	-0.75	19.50
I	-1.25	20.00

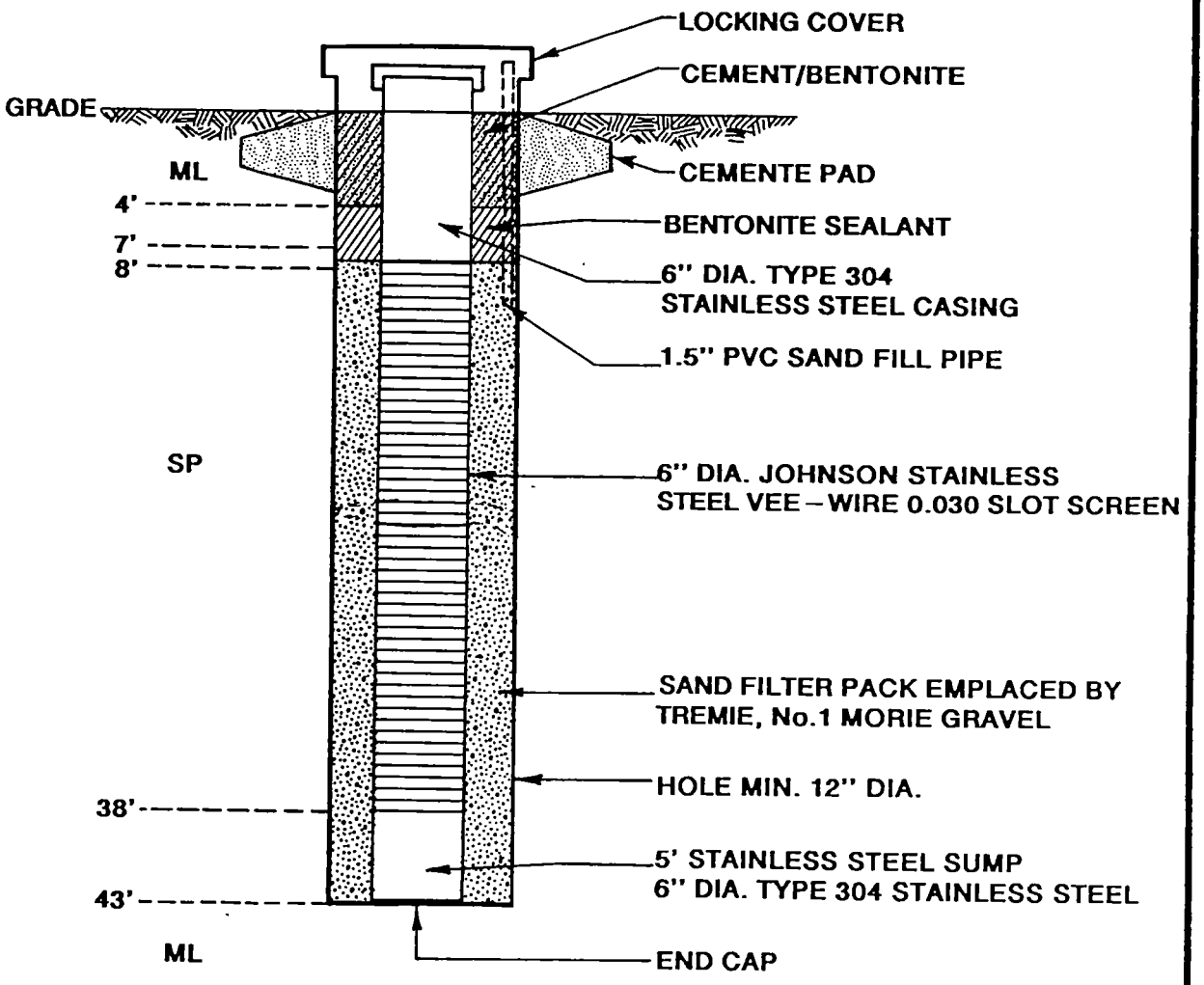


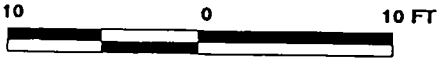
DIAMETER OF BOREHOLE: est. 4"

REMARKS (Installation, development) : Well developed on August 13, 1992. Pumped dry at 7.5gpm. 30 gallons pumped.

filename: VE-3.XLS

WELL CONSTRUCTION DETAILS
RC–1





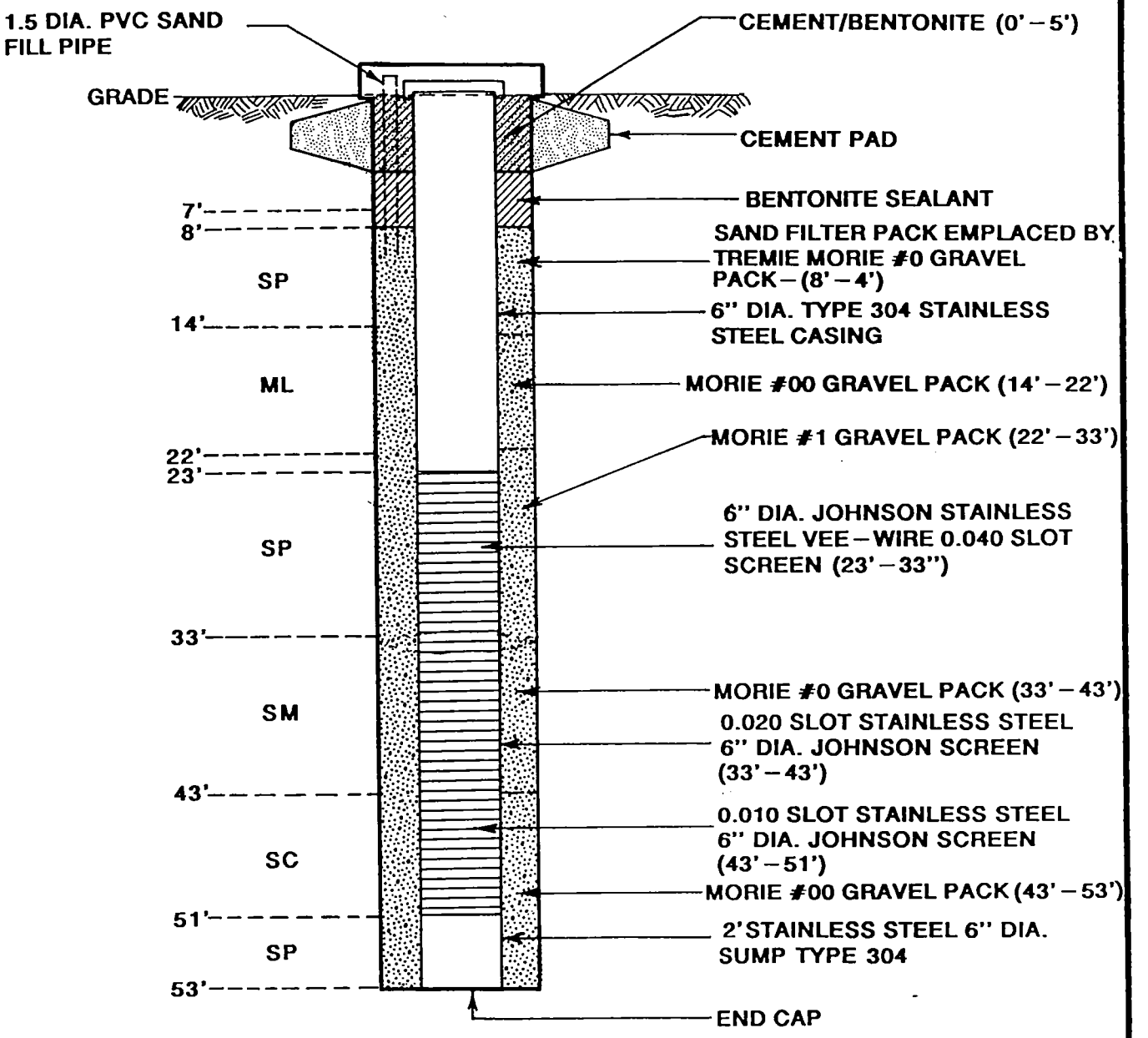
VERTICAL SCALE

WELL CONSTRUCTION DETAILS RC–1
CIBA–GIEGY CORPORATION
CRANSTON, RHODE ISLAND

WOODWARD–CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

DR. BY:	FWD	SCALE:	AS SHOWN	PROJ. NO.:	87X4660
CK'D BY:	TRP	DATE:	22 JUN 1992	FIG. NO.:	1

WELL CONSTRUCTION DETAILS
RC-2



10 0 10 FT

VERTICAL SCALE

WELL CONSTRUCTION DETAILS RC-2
CIBA-GIEGY CORPORATION
CRANSTON, RHODE ISLAND

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

DR. BY:	FWD	SCALE:	AS SHOWN	PROJ. NO.:	87X4660
CK'D BY:	TRP	DATE:	22 JUN 1992	FIG. NO.:	2

Appendix D

D

GEOTECHNICAL DATA

This appendix presents the raw geotechnical data obtained during stabilization activities in the Production Area under the RCRA Facility Investigation at the CIBA-GEIGY facility in Cranston, RI. These geotechnical data include field and laboratory grain size analyses presented in tables and graphs in two main sections. The first section presents the field grain size calculations and graphs, in two sub-sections — the first for the data from the boring for P-32D, the second for the data from P-33D. Within each sub-section (i.e., for each boring), the tables of field sieve data are presented first, followed by the field grain size analysis graphs. Each graph presents grain size distributions for one sample depth at the boring location. The graphs are presented in the order of descending sample depth at the boring location. The second main section presents the laboratory grain size analysis tables and graphs. Selected samples were submitted for laboratory analysis to validate the field grain size analyses. The tables and graphs from the laboratory analyses are presented in a sample-by-sample order (for those samples submitted to laboratory analysis). The sample numbering system was explained in detail in Appendix B ("Data Management") of the Phase I Interim Report and Phase II Proposal (November 1991).

Table D-1. P-32D Field Sieve Data For the Design of RC-1

SAMPLE # SS-6

Depth = 10-12 feet
Total Sample Dry Weight = 67.0 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	21.5	46.1	68
20	14.7	31.4	46
40	15.1	16.3	24
60	8.7	7.6	11
200	5.6	2.0	3
200+	2.0		
	67.6		

SAMPLE # SS-7

Depth = 12-14 feet
Total Sample Dry Weight = 30.4 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	1.3	29.1	96
20	4.9	24.8	80
40	8.4	16.4	53
60	7.1	9.3	30
200	8.2	1.1	3
200+	1.1		
	31.0		

SAMPLE # SS-8

Depth = 14-16 feet
Total Sample Dry Weight = 49.1 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	0.6	48.7	99
20	5.6	43.1	87
40	19.4	23.7	48
60	18.0	5.7	12
200	5.1	0.6	1
200+	0.6		
	49.3		

Table D-1. P-32D Field Sieve Data For the Design of RC-1

SAMPLE # SS-9

Depth = 16-18 feet
Total Sample Dry Weight = 43.1 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	0.7	42.1	98
20	5.3	36.8	86
40	14.3	22.5	53
60	13.4	9.1	21
200	6.9	2.2	5
200+	2.2		
	42.8		

SAMPLE # SS-10

Depth = 18-20 feet
Total Sample Dry Weight = 48.6 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	0.3	48.3	99
20	1.9	46.4	95
40	11.1	35.3	73
60	17.7	17.6	36
200	15.0	2.6	5
200+	2.6		
	48.6		

SAMPLE # SS-11

Depth = 20-22 feet
Total Sample Dry Weight = 45.9 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	0.3	45.3	99
20	0.9	44.4	97
40	8.0	36.4	80
60	25.6	10.8	24
200	9.8	1.0	2
200+	1.0		
	45.6		

Table D-1. P-32D Field Sieve Data For the Design of RC-1

SAMPLE # SS-12

Depth = 22-24 feet
Total Sample Dry Weight = 37.6 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	0.0	37.8	100
20	0.2	37.6	99
40	2.2	35.4	94
60	11.2	24.2	64
200	20.9	3.3	9
200+	3.3		
	37.8		

SAMPLE # SS-13

Depth = 24-26 feet
Total Sample Dry Weight = 38.1 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	0.0	38.1	100
20	0.2	37.9	99
40	4.5	33.4	88
60	15.3	18.1	48
200	16.4	1.7	4
200+	1.7		
	38.1		

SAMPLE # SS-14

Depth = 26-28 feet
Total Sample Dry Weight = 36.4 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	0.0	36.9	100
20	0.3	36.6	99
40	2.3	34.3	93
60	9.7	24.6	66
200	21.4	3.2	9
200+	3.2		
	36.9		

Table D-1. P-32D Field Sieve Data For the Design of RC-1

SAMPLE # SS-18

Depth = 34-36 feet
Total Sample Dry Weight = 35.8 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	0.0	35.8	100
20	0.3	35.5	99
40	2.8	32.7	91
60	11.6	21.1	59
200	15.2	5.9	16
200+	5.9		
	35.8		

SAMPLE # SS-19

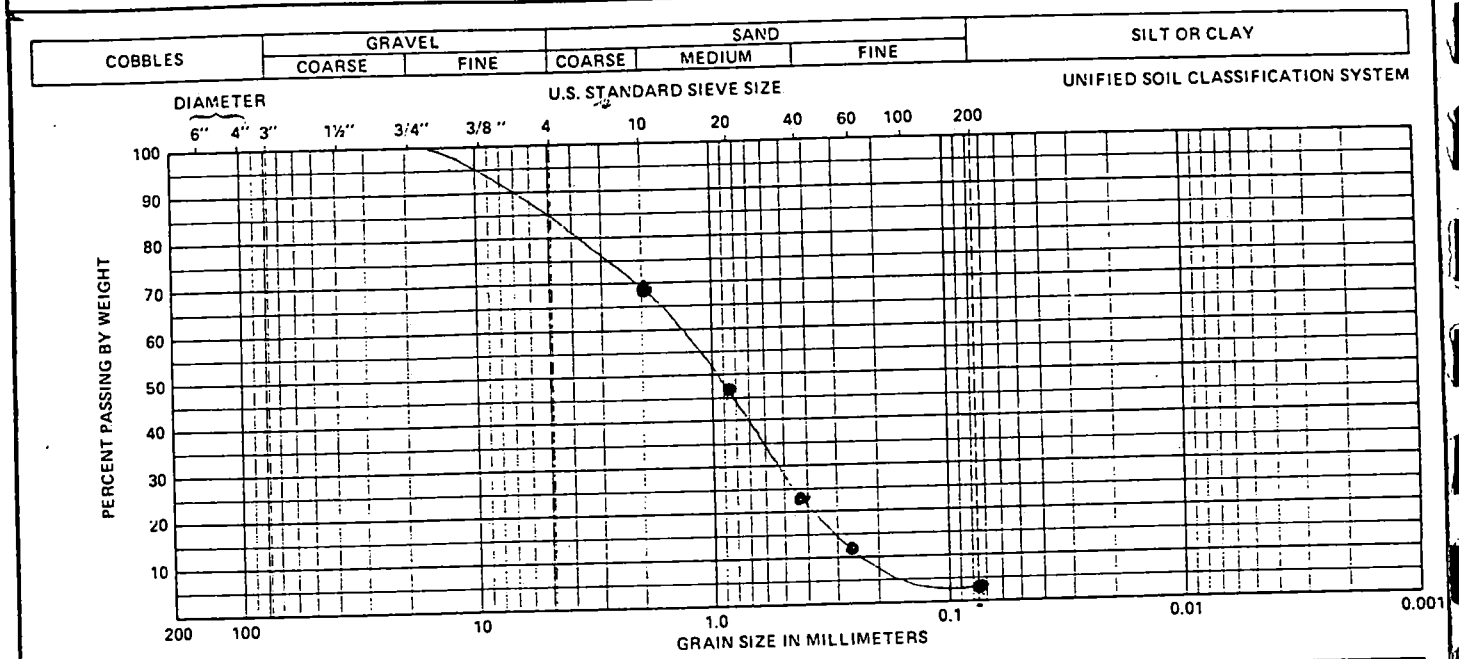
Depth = 36-38 feet
Total Sample Dry Weight = 43.5 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	0.0	43.5	100
20	0.6	42.9	99
40	5.2	37.7	87
60	19.3	18.4	42
200	13.2	5.2	12
200+	5.2		
	43.5		

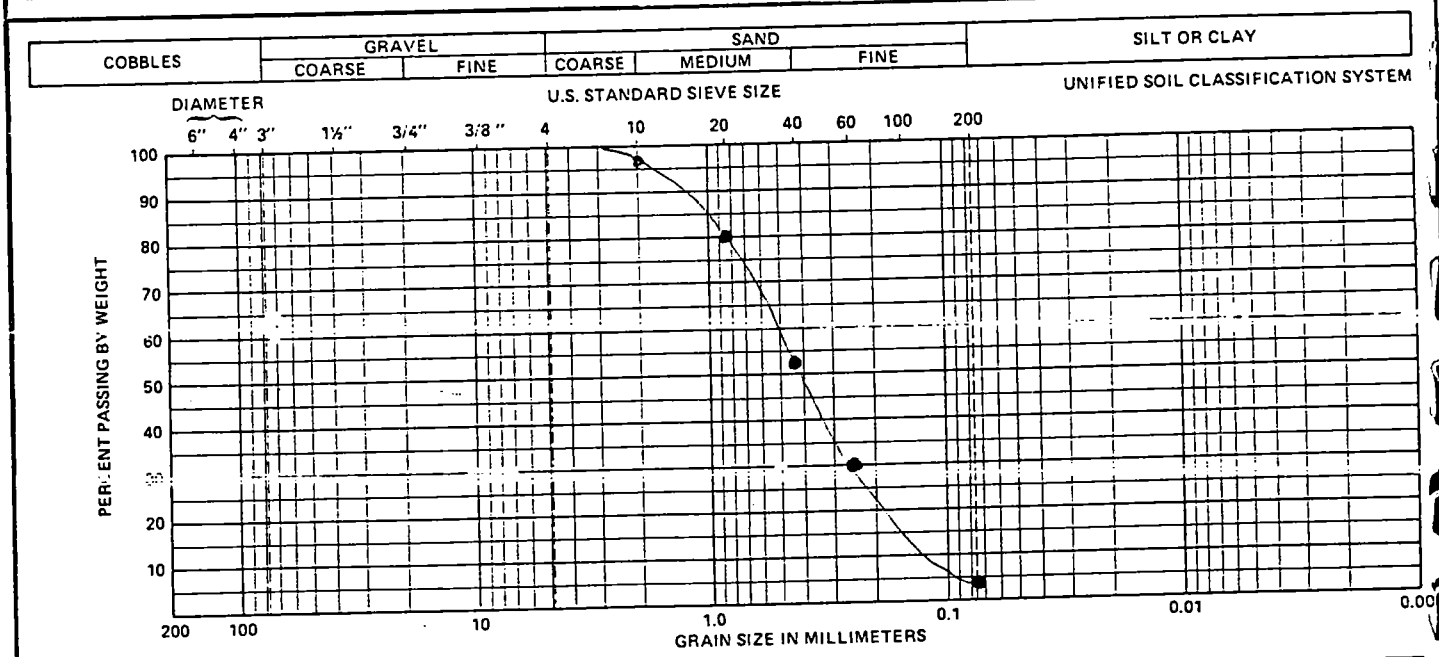
SAMPLE # SS-20 Depth = 38-40 feet = High percentage retained in 200+ sieve
Did not analyze

SAMPLE # SS-21 Depth = 40-41.5 feet = Till unit
Did not analyze

PARTICLE-SIZE DISTRIBUTION



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-32D	SS-6	10-12'	SW	Coarse to fine sand, some gravel			



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-32D	SS-7	12-14'	SP	Medium to fine sand			

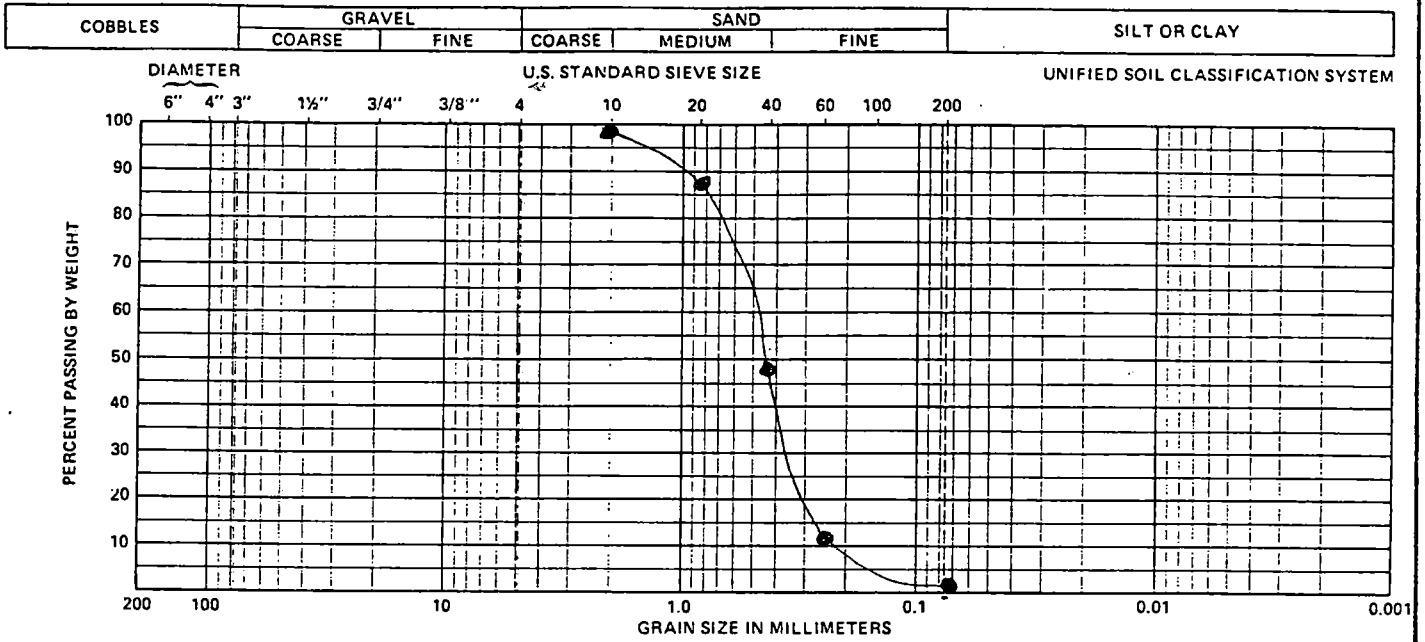
WCCLR-101 (9/88)

REVIEWED BY:

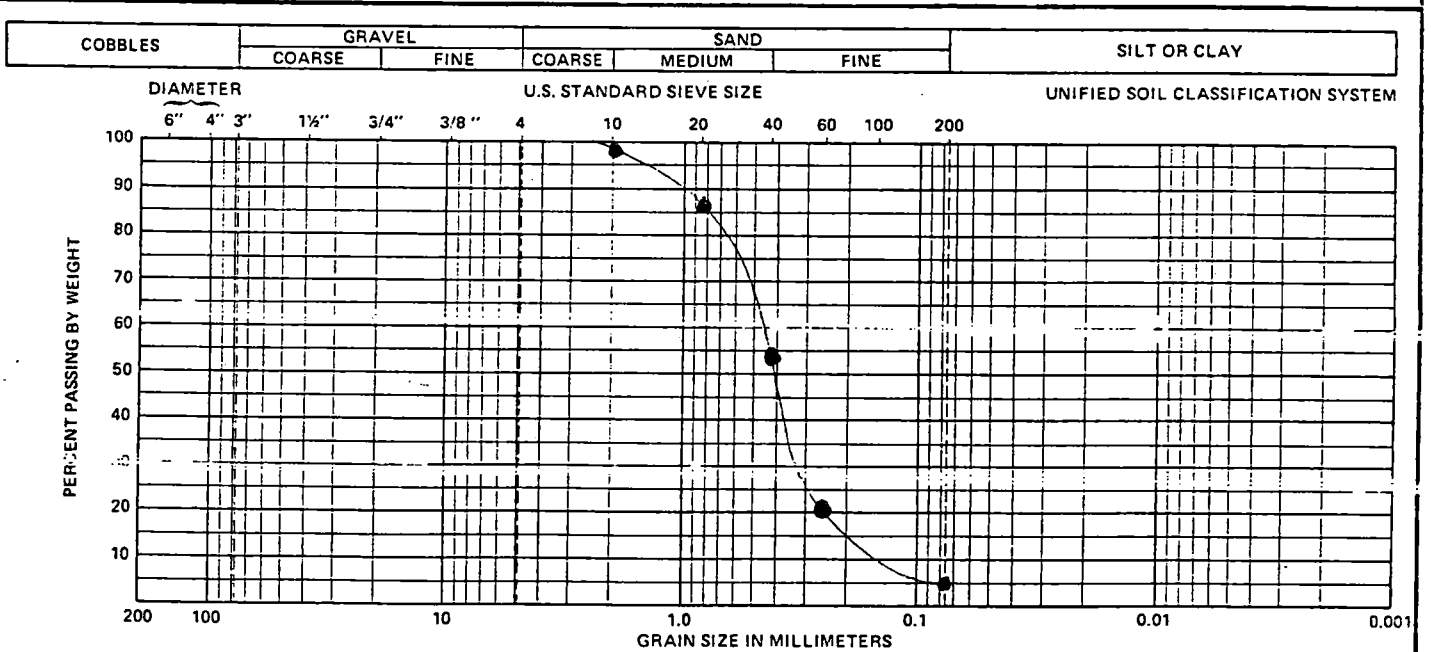
DRAWN BY:

PROJECT NO:

PARTICLE-SIZE DISTRIBUTION

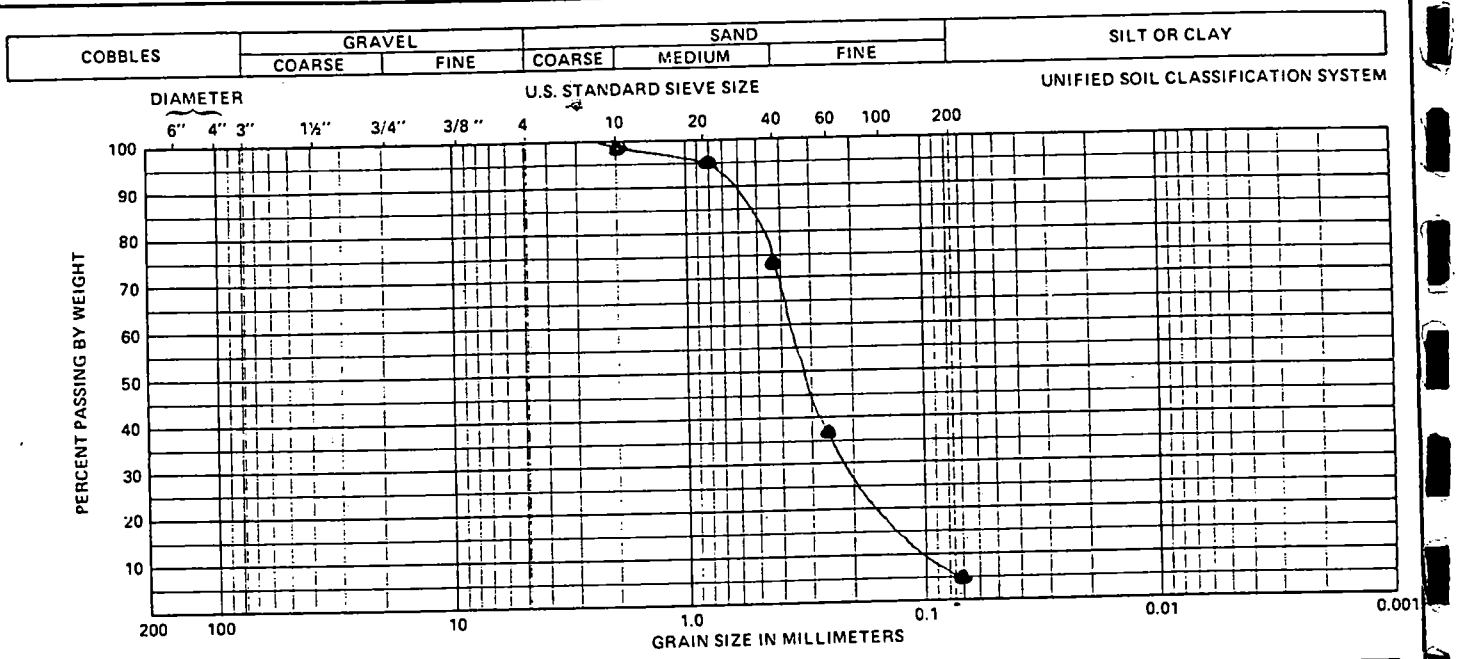


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-32D	SS-8	14-16	SP	medium to fine sand			

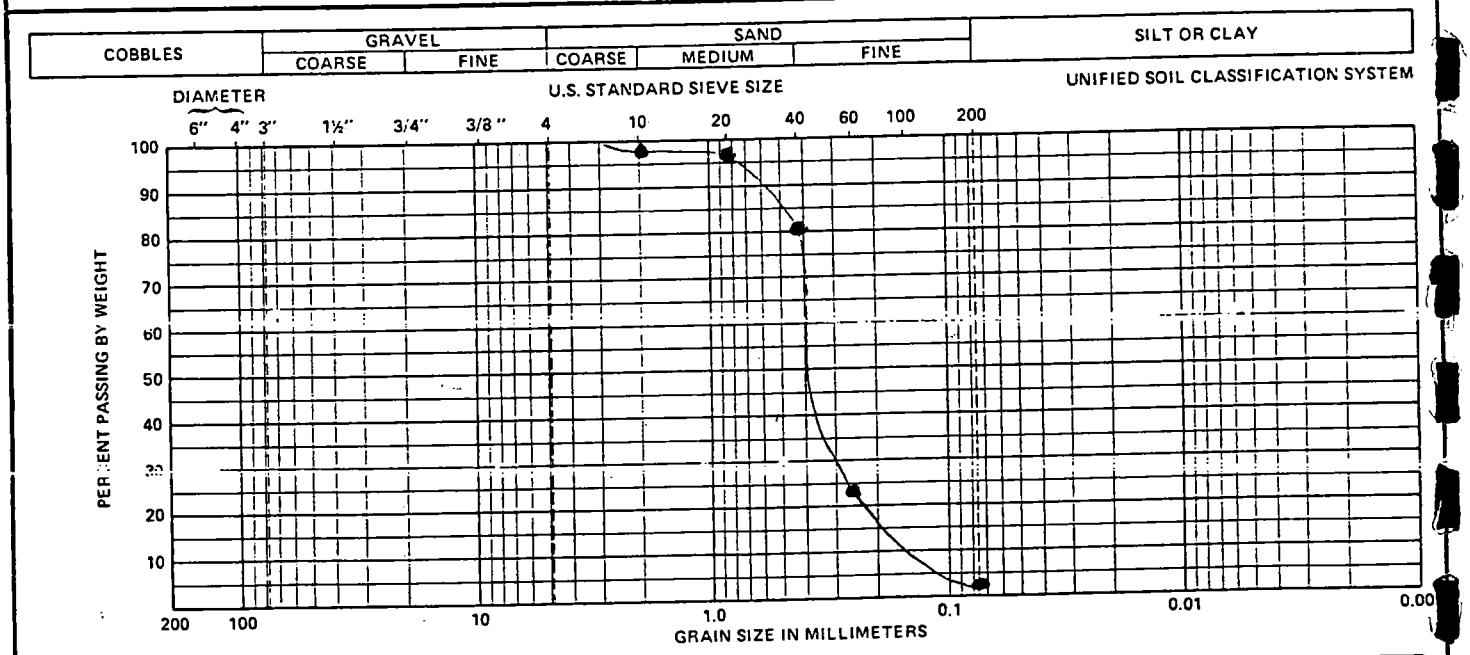


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-32D	SS-9	16-18'	SP	Medium to fine sand			

PARTICLE-SIZE DISTRIBUTION



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-32D	SS-10	18-20	SP	Medium to fine sand			



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-32D	SS-11	20-22	SP	Medium to fine sand			

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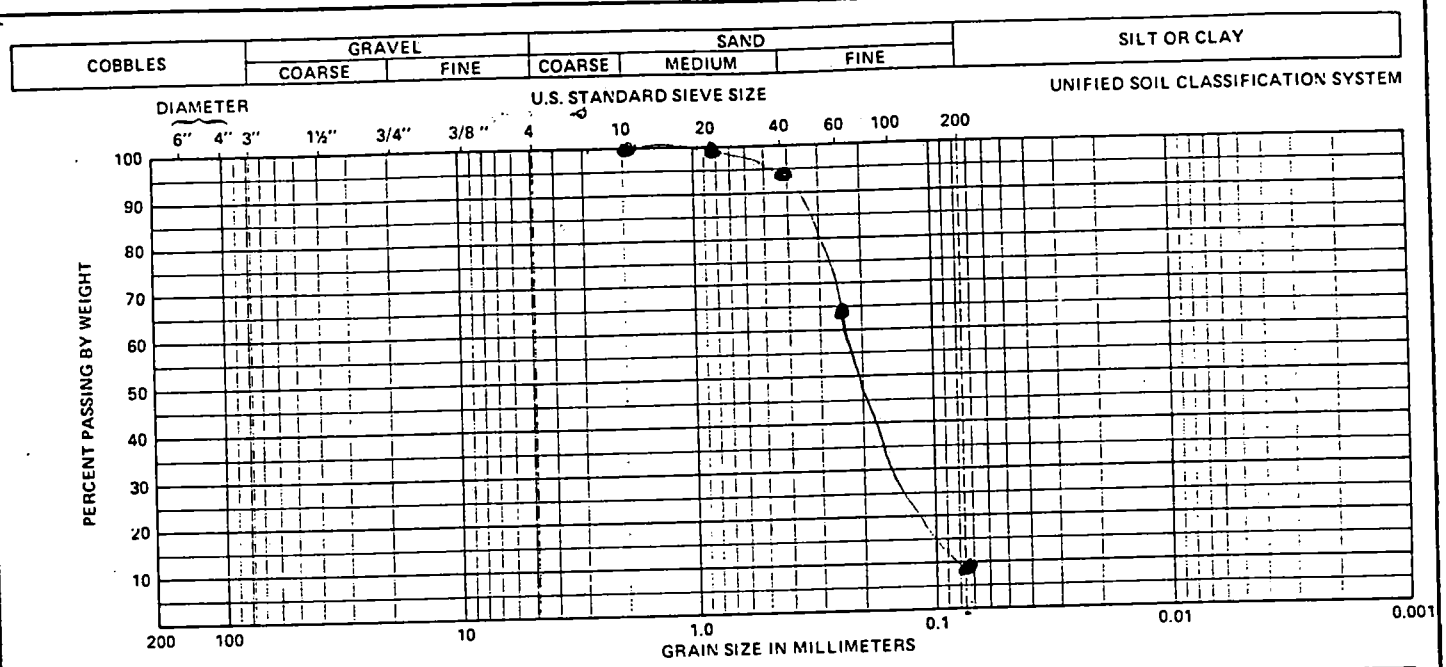
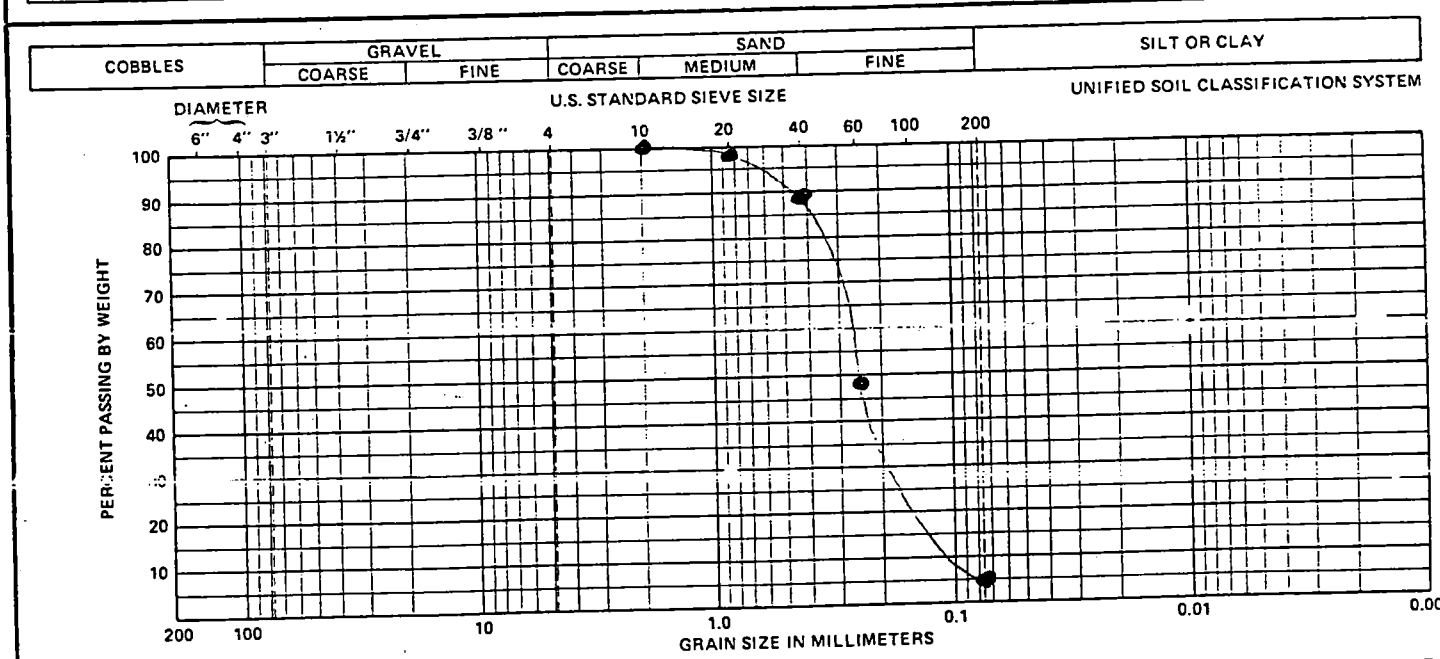


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-32D	SS-12	22-24	SP	Fine sand			



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-32D	SS-13	24-26	SP	Fine sand			

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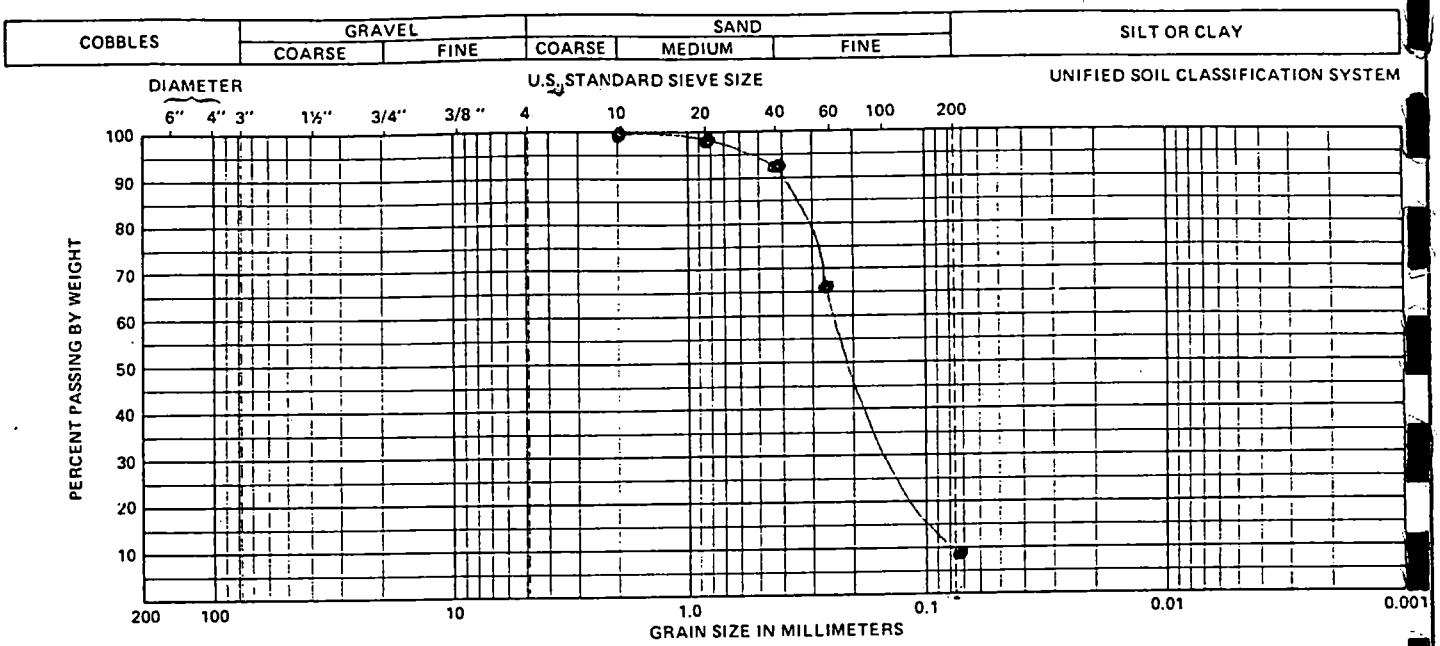
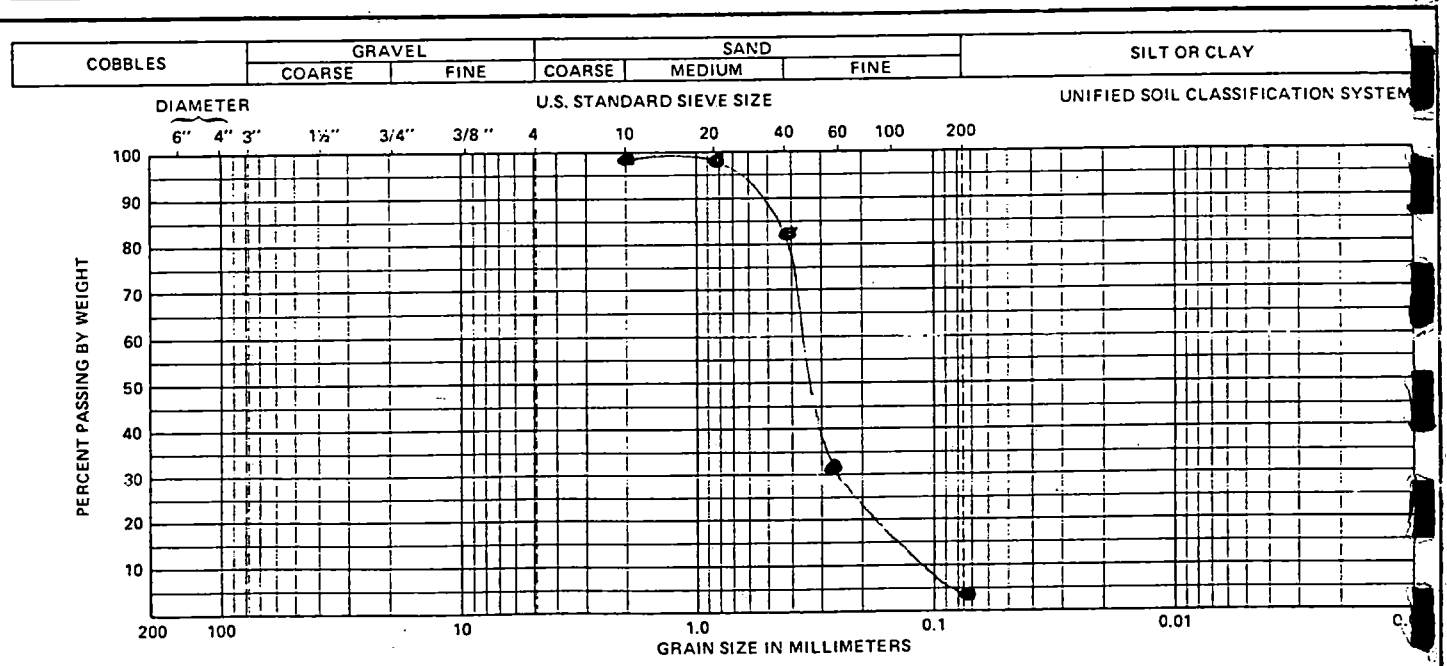


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-32D	SS-14	26-28	SP	Fine sand			



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-32D	SS-15	28-30	SP	Fine sand			

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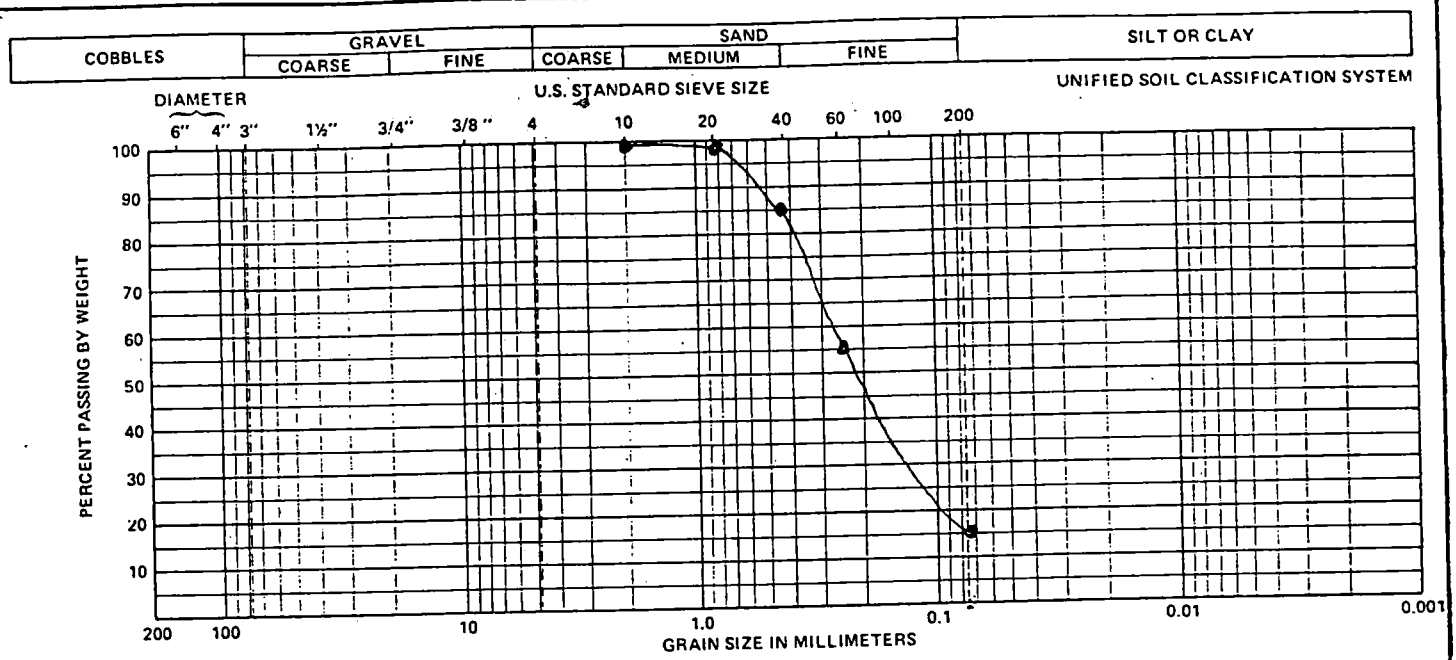
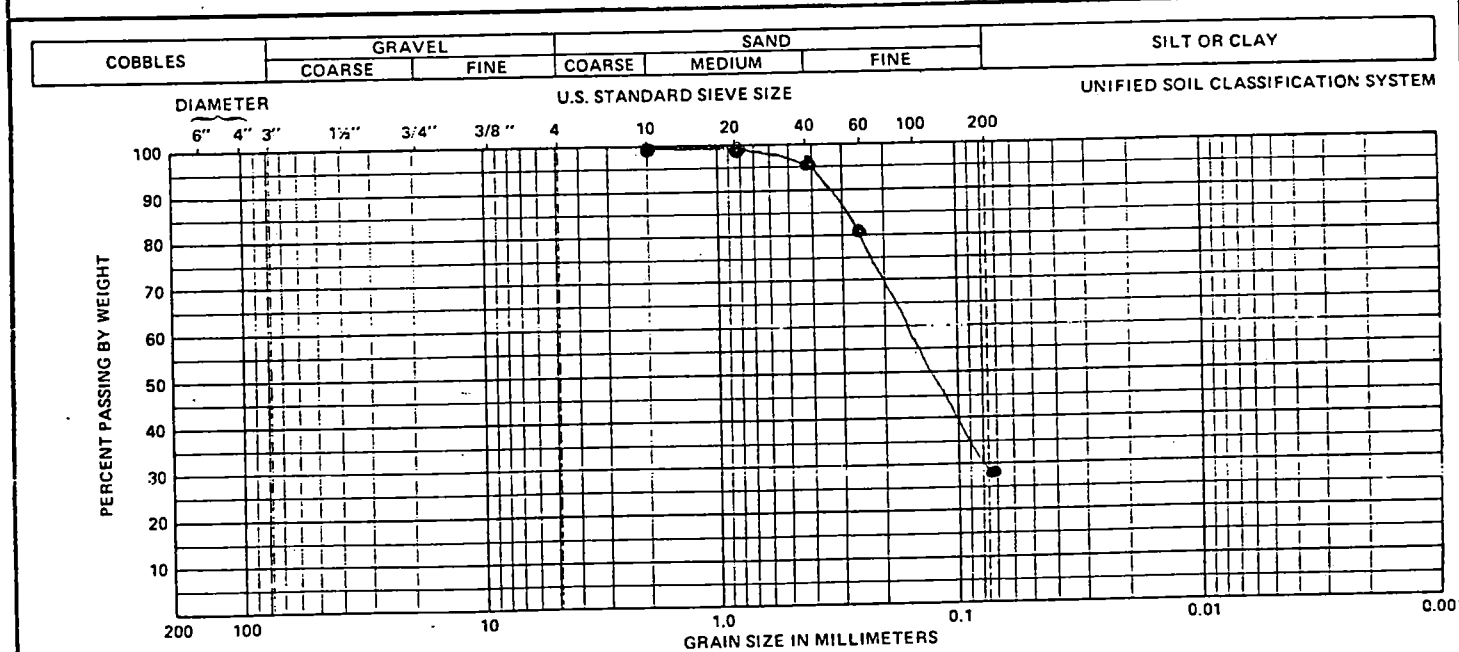


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-32D	SS-16	30-32	SP	Fine sand			



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-32D	SS-17	32-34	SP	Fine sand, some silt			

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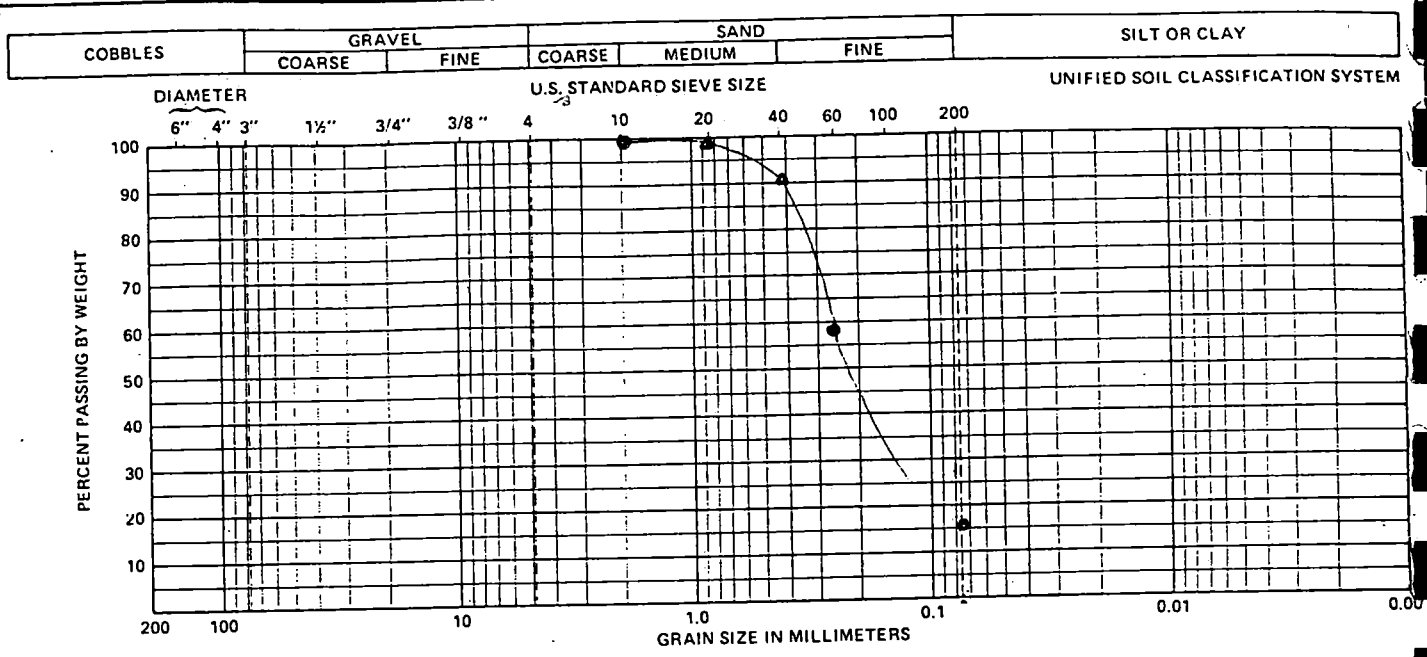
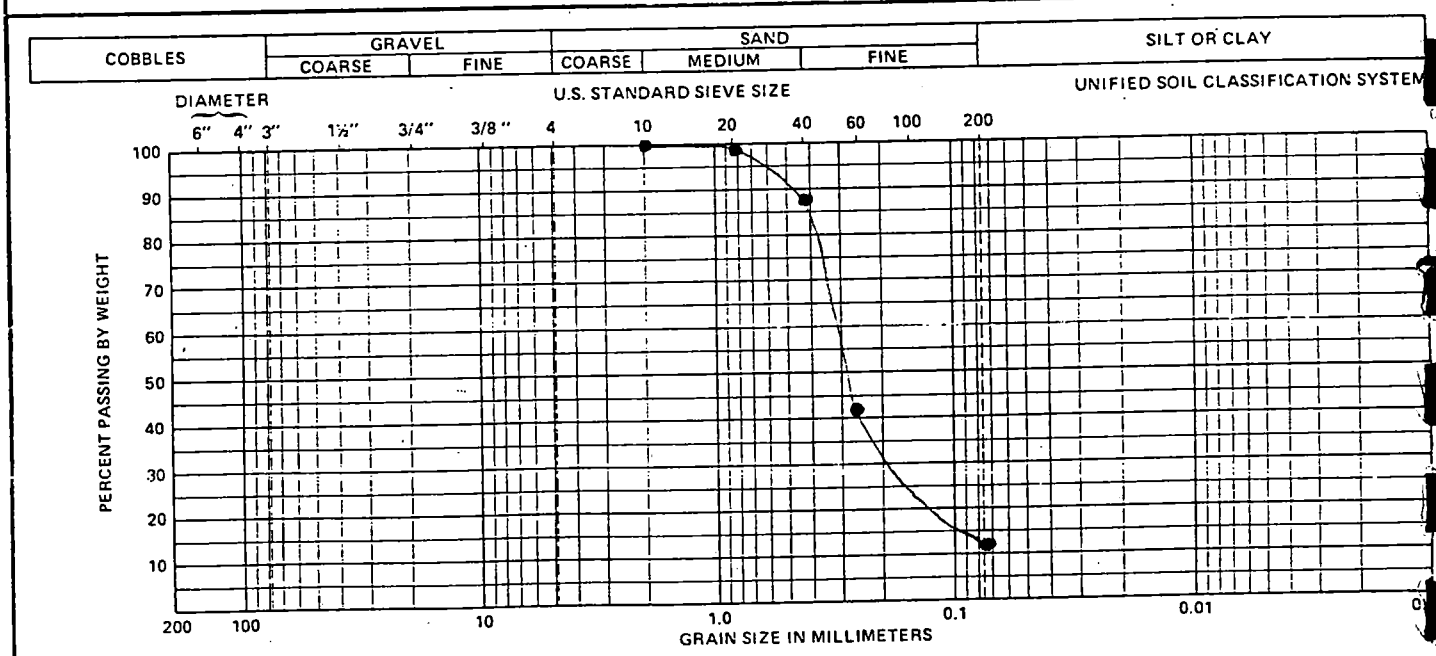


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-32D	SS-18	34-36	SP	Fine sand			



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-32D	SS-19	36-38	SP	Fine sand			

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Table D-2: P-33D Field Sieve Data For the Design of RC-2

SAMPLE # SS-6

Depth = 10-12 feet
Total Sample Dry Weight = 80 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	3.2	74.3	96
20	3.6	70.7	91
40	6.5	64.2	83
60	30.0	34.2	44
200	22.1	12.1	16
200+	12.1		
	77.5		

SAMPLE # SS-7

Depth = 12-14 feet
Total Sample Dry Weight = 45 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	3.0	41.7	93
20	2.7	39.0	87
40	2.0	37.0	83
60	10.1	26.9	60
200	21.9	5.0	11
200+	5.0		
	44.7		

SAMPLE # SS-8

Depth = 14-16 feet
Total Sample Dry Weight = 51.2 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	1.5	49.7	97
20	3.9	45.8	89
40	1.9	43.9	86
60	2.2	41.7	81
200	6.5	35.2	69
200+	35.2		
	51.2		

Table D-2: P-33D Field Sieve Data For the Design of RC-2

SAMPLE # SS-9

Depth = 16-18 feet
Total Sample Dry Weight = 55.3 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	0.5	54.6	99
20	1.9	52.7	96
40	4.4	48.3	88
60	2.4	45.9	83
200	11.4	34.5	63
200+	34.5		
	55.1		

SAMPLE # SS-10

Depth = 18-20 feet
Total Sample Dry Weight = 53.9 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	0.1	53.7	99
20	0.7	53.0	98
40	1.3	51.7	96
60	0.4	51.3	95
200	2.0	49.3	92
200+	49.3		
	53.8		

SAMPLE # SS-11

Depth = 20-22 feet
Total Sample Dry Weight = 41.0 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	0.4	40.6	99
20	1.5	39.1	95
40	1.1	38.0	93
60	0.6	37.4	91
200	6.5	30.9	75
200+	30.9		
	41.0		

Table D-2: P-33D Field Sieve Data For the Design of RC-2

SAMPLE # SS-12

Depth = 22-24 feet
Total Sample Dry Weight = 67.0 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	24.5	42.6	63
20	6.4	36.2	54
40	7.3	28.9	43
60	4.3	24.6	37
200	9.9	14.7	22
200+	14.7		
	67.1		

SAMPLE # SS-13

Depth = 22-26 feet
Total Sample Dry Weight = 49.6 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	0.8	49.4	98
20	3.8	45.6	91
40	17.6	28.0	56
60	16.8	11.2	22
200	8.6	2.6	5
200+	2.6		
	50.2		

SAMPLE # SS-14

Depth = 22-28 feet
Total Sample Dry Weight = 66.6 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	1.9	64.9	97
20	7.9	57.0	85
40	26.7	30.3	45
60	15.7	14.6	22
200	6.9	7.7	12
200+	7.7		
	66.8		

Table D-2: P-33D Field Sieve Data For the Design of RC-2

SAMPLE # SS-15

Depth = 28-30 feet
Total Sample Dry Weight = 59.4 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	0.7	58.9	99
20	1.5	57.4	96
40	9.6	47.8	80
60	34.0	13.8	23
200	10.6	3.2	5
200+	3.2		
	59.6		

SAMPLE # SS-16

Depth = 30-32 feet
Total Sample Dry Weight = 54.1 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	0.3	54.3	99
20	0.4	53.9	99
40	4.4	49.5	91
60	30.4	19.1	35
200	15.8	3.3	6
200+	3.3		
	54.6		

SAMPLE # SS-17

Depth = 32-34 feet
Total Sample Dry Weight = 65.2 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	1.6	63.7	98
20	0.8	62.9	96
40	1.3	61.6	94
60	8.7	52.9	81
200	38.5	14.4	22
200+	14.4		
	65.3		

Table D-2: P-33D Field Sieve Data For the Design of RC-2

SAMPLE # SS-18

Depth = 34-36 feet
Total Sample Dry Weight = 56.8 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	3.7	53.1	94
20	0.2	52.9	93
40	0.3	52.6	93
60	6.8	45.8	81
200	37.0	8.8	15
200+	8.8		
	56.8		

SAMPLE # SS-19

Depth = 36-38 feet
Total Sample Dry Weight = 57.6 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	7.5	49.7	87
20	0.7	49.0	86
40	0.2	48.8	85
60	5.2	43.6	76
200	33.5	10.1	18
200+	10.1		
	57.2		

SAMPLE # SS-20

Depth = 38-40 feet
Total Sample Dry Weight = 72.8 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	9.5	63.4	87
20	0.7	62.7	86
40	1.9	60.8	83
60	5.0	55.8	77
200	40.5	15.3	21
200+	15.3		
	72.9		

Table D-2: P-33D Field Sieve Data For the Design of RC-2

SAMPLE # SS-21

Depth = 40-42 feet
Total Sample Dry Weight = 55.0 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	0.3	55.0	99
20	0.4	54.6	99
40	2.2	52.4	95
60	8.1	44.3	80
200	31.2	13.1	24
200+	13.1		
	55.3		

SAMPLE # SS-22

Depth = 42-44 feet
Total Sample Dry Weight = 62.5 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	0.2	62.7	99
20	0.2	62.5	99
40	1.1	61.4	98
60	3.2	58.2	93
200	37.3	20.9	33
200+	20.9		
	62.9		

SAMPLE # SS-23

Depth = 44-46 feet
Total Sample Dry Weight = 63.2 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	0.0	62.9	100
20	0.1	62.8	99
40	0.4	62.4	99
60	5.0	57.4	91
200	37.9	19.5	31
200+	19.5		
	62.9		

Table D-2: P-33D Field Sieve Data For the Design of RC-2

SAMPLE # SS-24

Depth = 46-48 feet
Total Sample Dry Weight = 50.4 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	0.1	50.4	99
20	1.1	49.3	98
40	0.6	48.7	96
60	0.7	48.0	95
200	20.3	27.7	55
200+	27.7		
	50.5		

SAMPLE # SS-25

Depth = 48-50 feet
Total Sample Dry Weight = 47.7 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	0.4	46.9	99
20	0.7	46.2	98
40	0.4	45.8	97
60	0.9	44.9	95
200	17.1	27.8	59
200+	27.8		
	47.3		

SAMPLE # SS-26

Depth = 50-52 feet
Total Sample Dry Weight = 82.4 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	22.3	60.4	73
20	17.9	42.5	51
40	11.6	30.9	37
60	5.5	25.4	31
200	6.7	18.7	23
200+	18.7		
	82.7		

Table D-2: P-33D Field Sieve Data For the Design of RC-2

SAMPLE # SS-27

Depth = 52-54 feet
Total Sample Dry Weight = 47.6 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	21.7	26.1	55
20	9.7	16.4	34
40	4.9	11.5	24
60	3.1	8.4	18
200	2.3	6.1	13
200+	6.1		
	47.8		

SAMPLE # SS-28

Depth = 54-56 feet
Total Sample Dry Weight = 67.1 g

Sieve Size	Weight Retained (g)	Weight Passing (g)	% Passing
10	25.9	41.0	61
20	13.8	27.2	41
40	9.4	17.8	27
60	2.9	14.9	22
200	3.8	11.1	17
200+	11.1		
	66.9		

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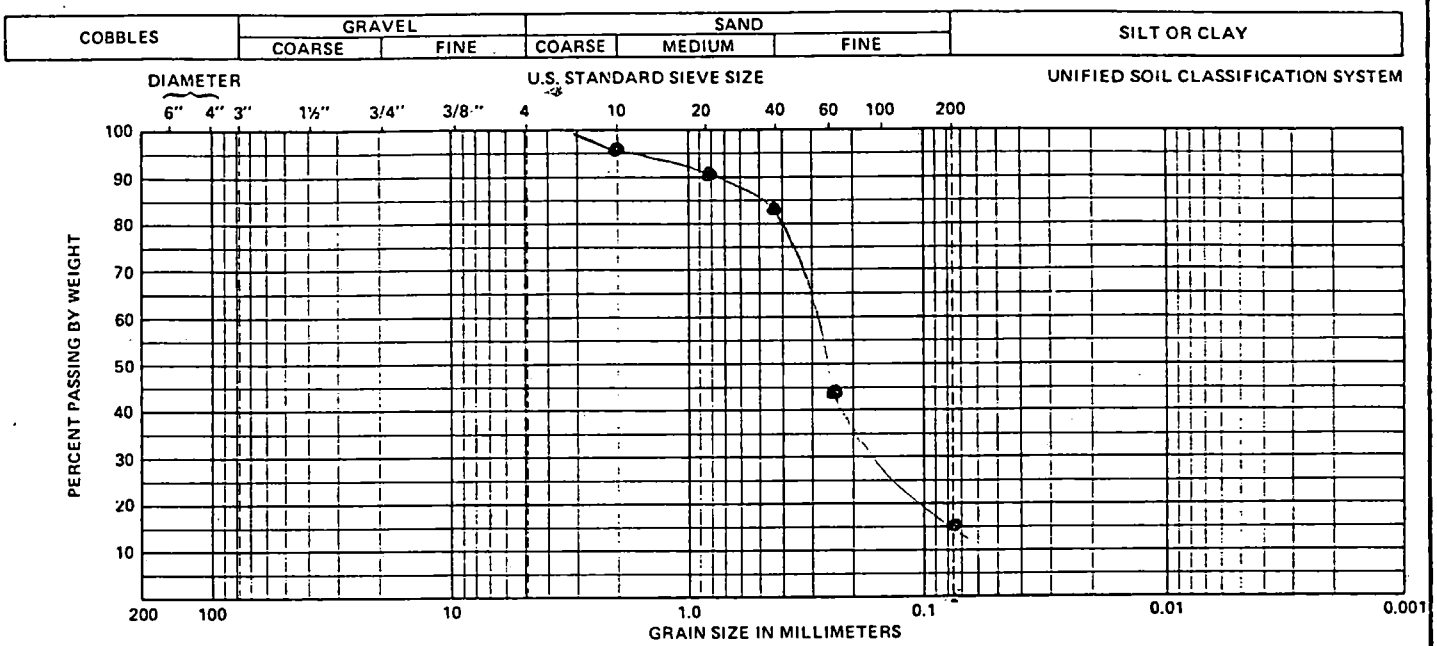
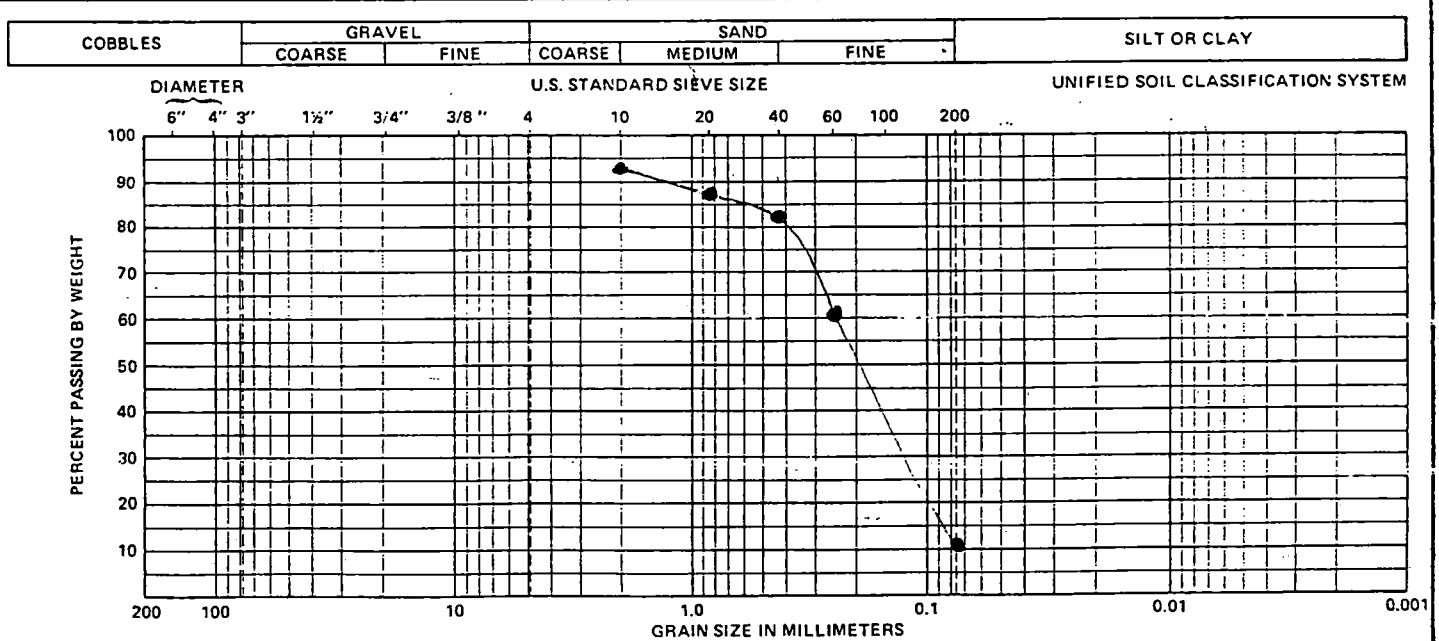


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-33D	SS-6	10-12	SM	Medium to fine sand, some silt			



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-33D	SS-7	12-14	SP	Medium to fine sand			

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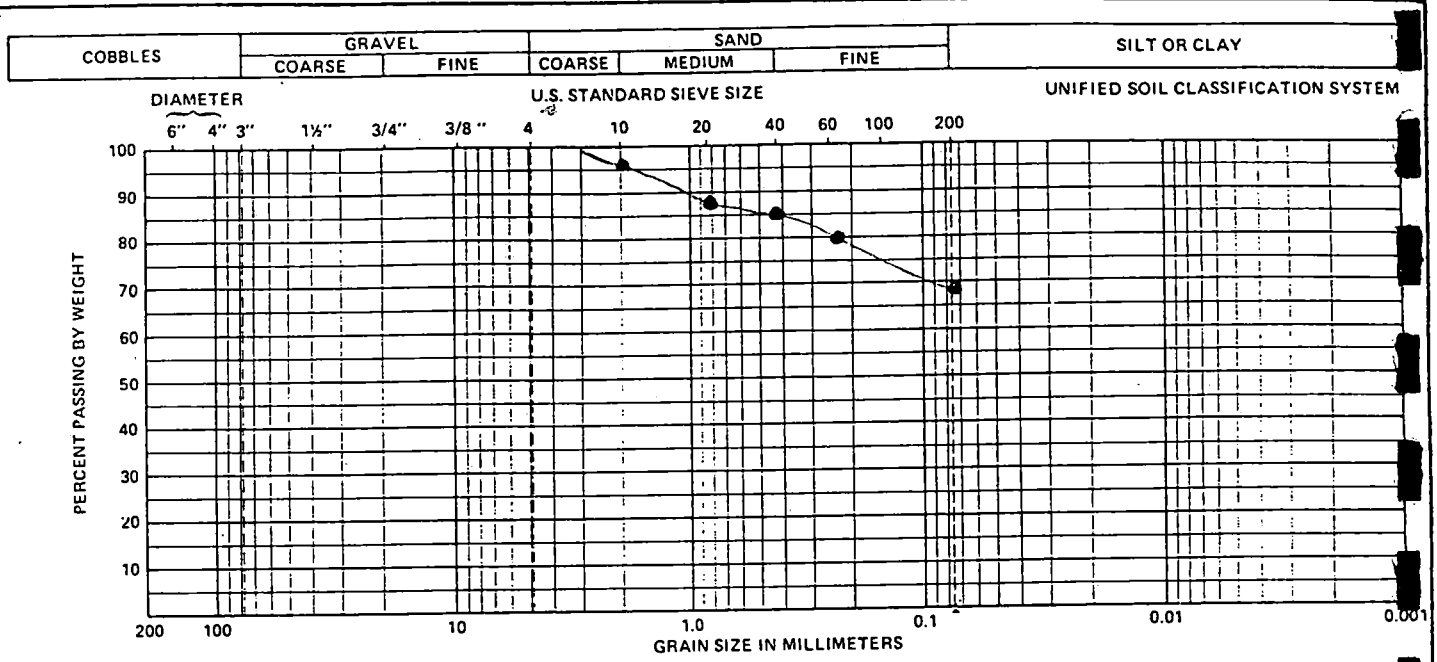
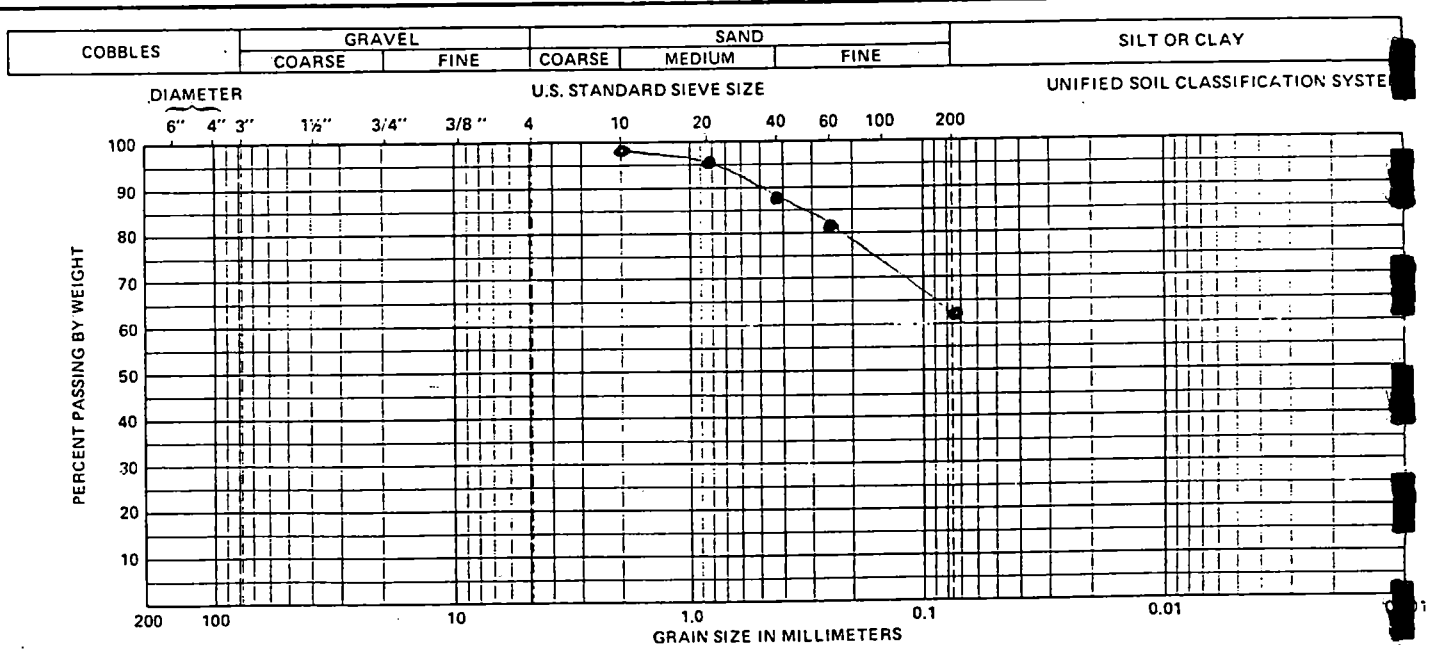


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-33D	SS-8	14-16	ML	Silt, Some Sand			



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-33D	SS-9	16-18	ML	Silt, Some Sand			

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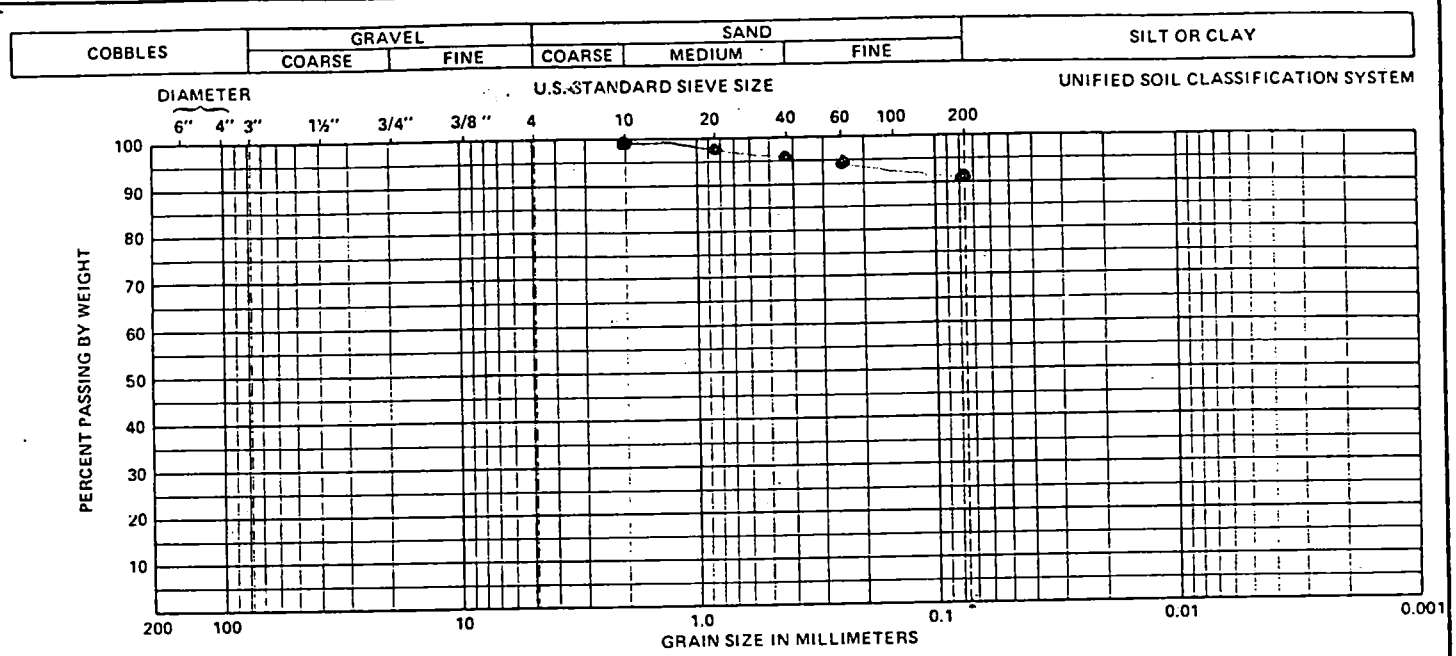

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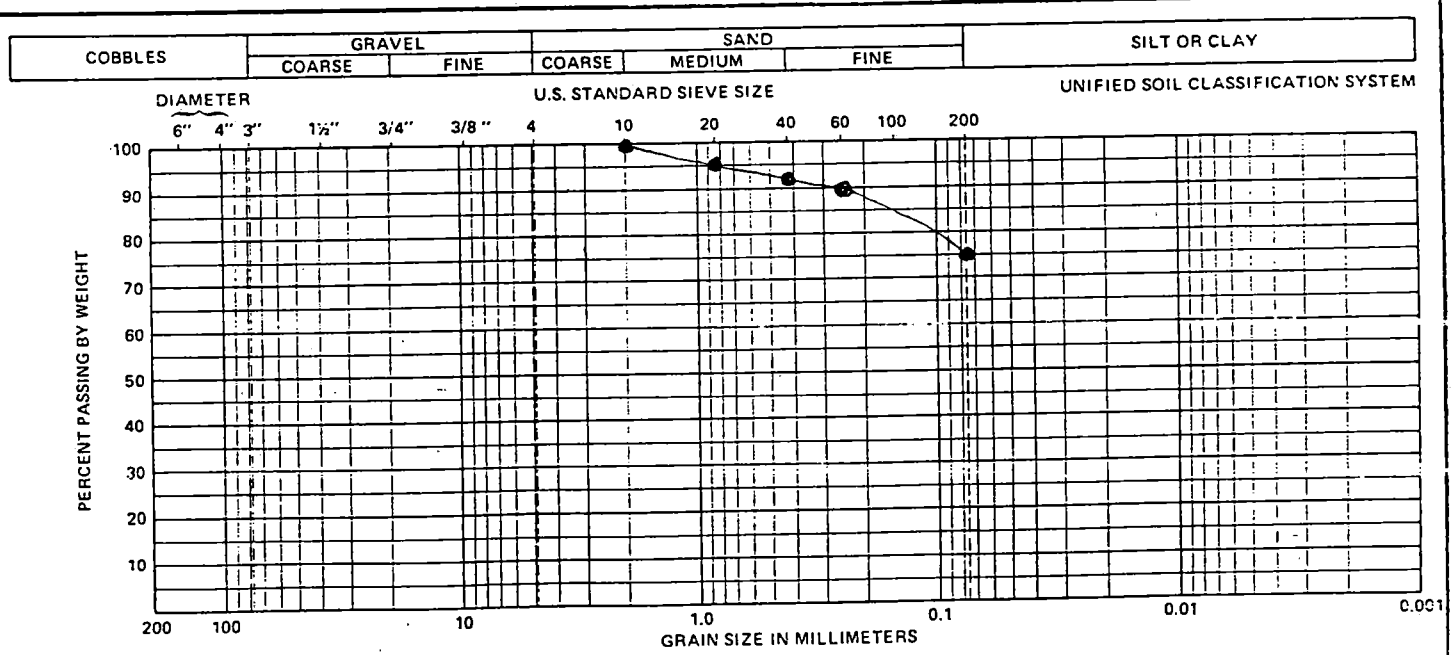
P-33D	SS-10	18-20'	ML	Silt			



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-33D	SS-11	20-22'	ML	Silt			

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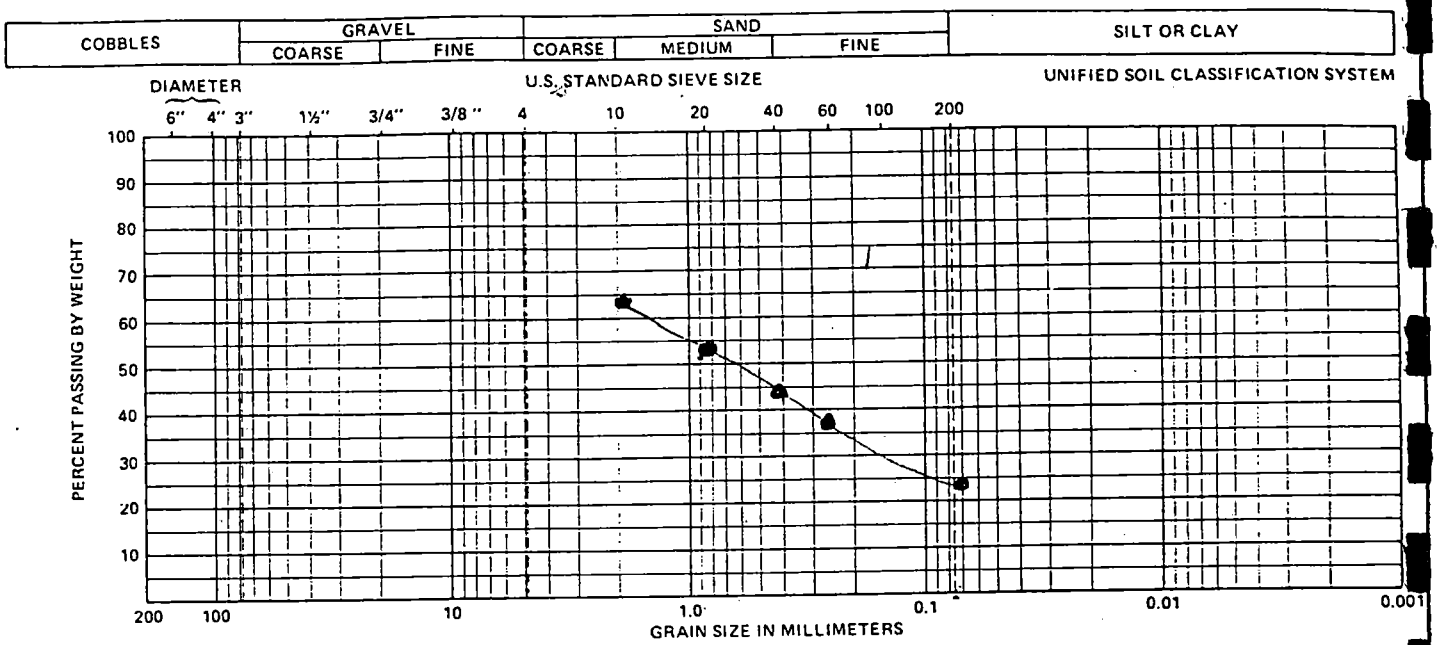
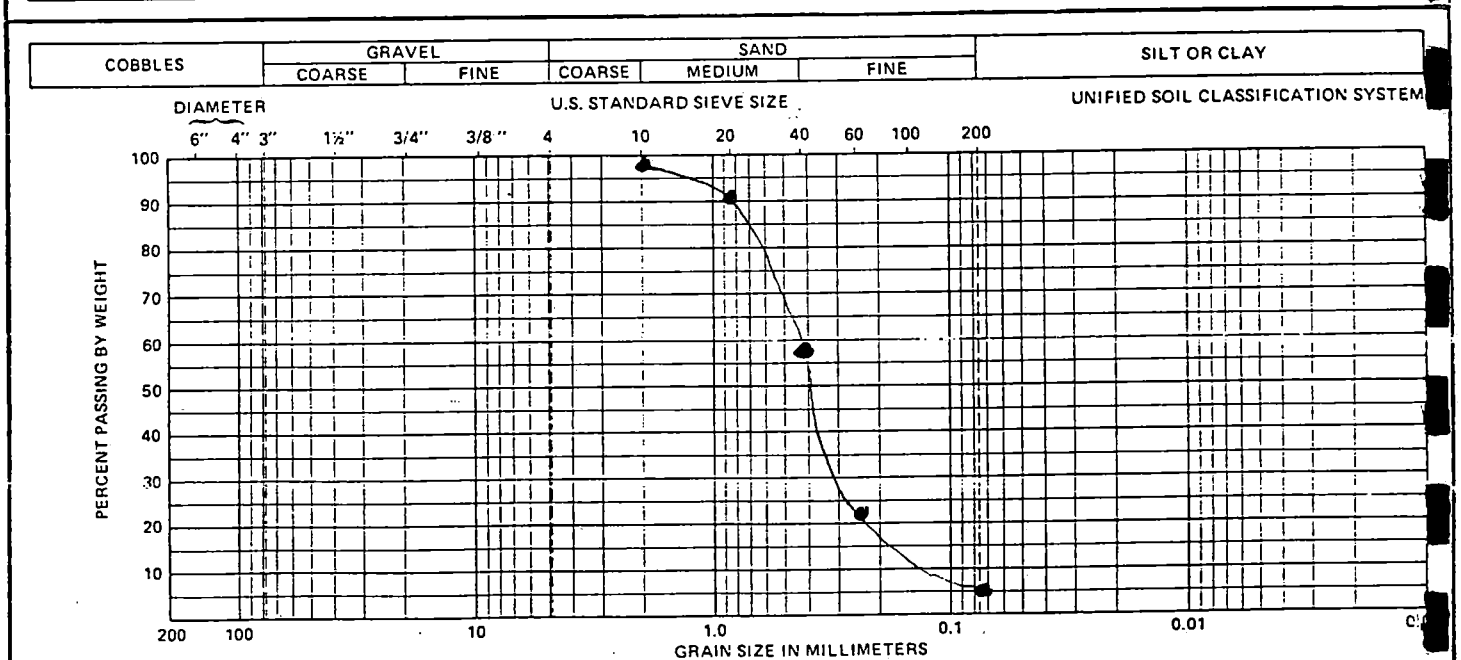


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-33D	SS-12	22-24	SM	Medium to fine silty sand			



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-33D	SS-13	22-26	SP	Medium to fine sand			

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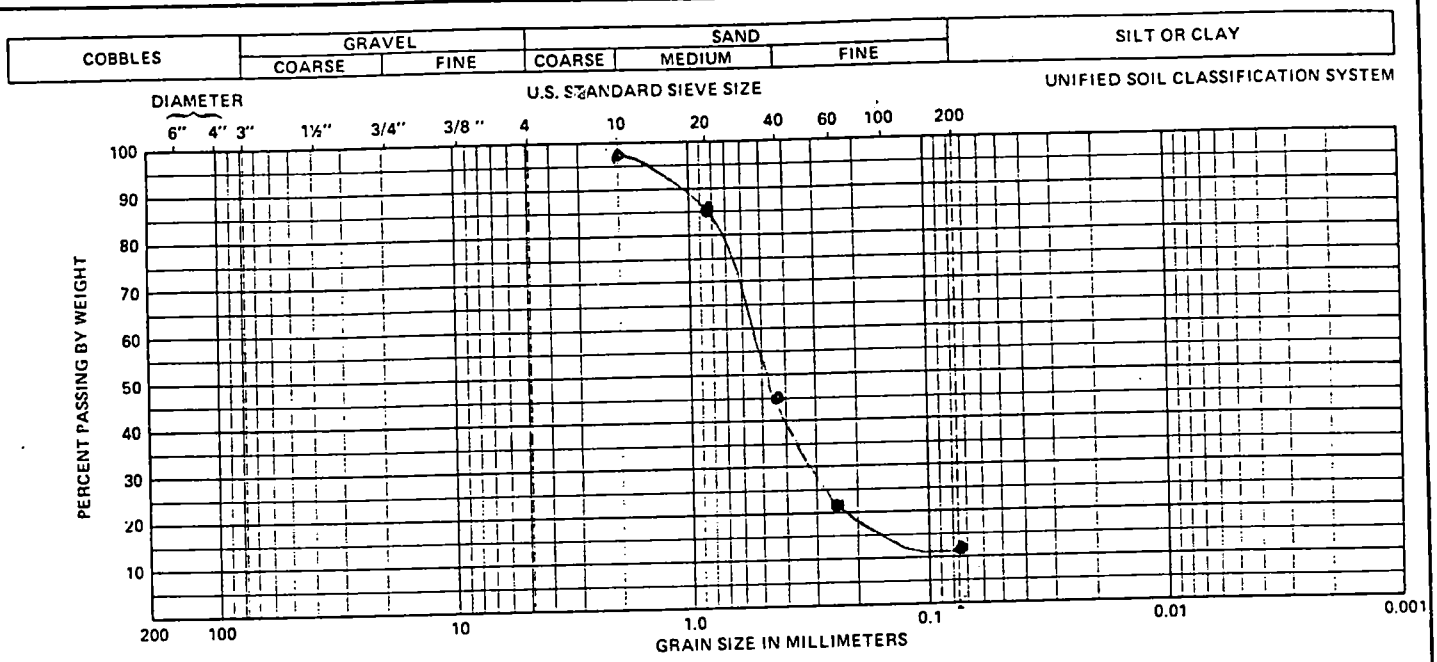
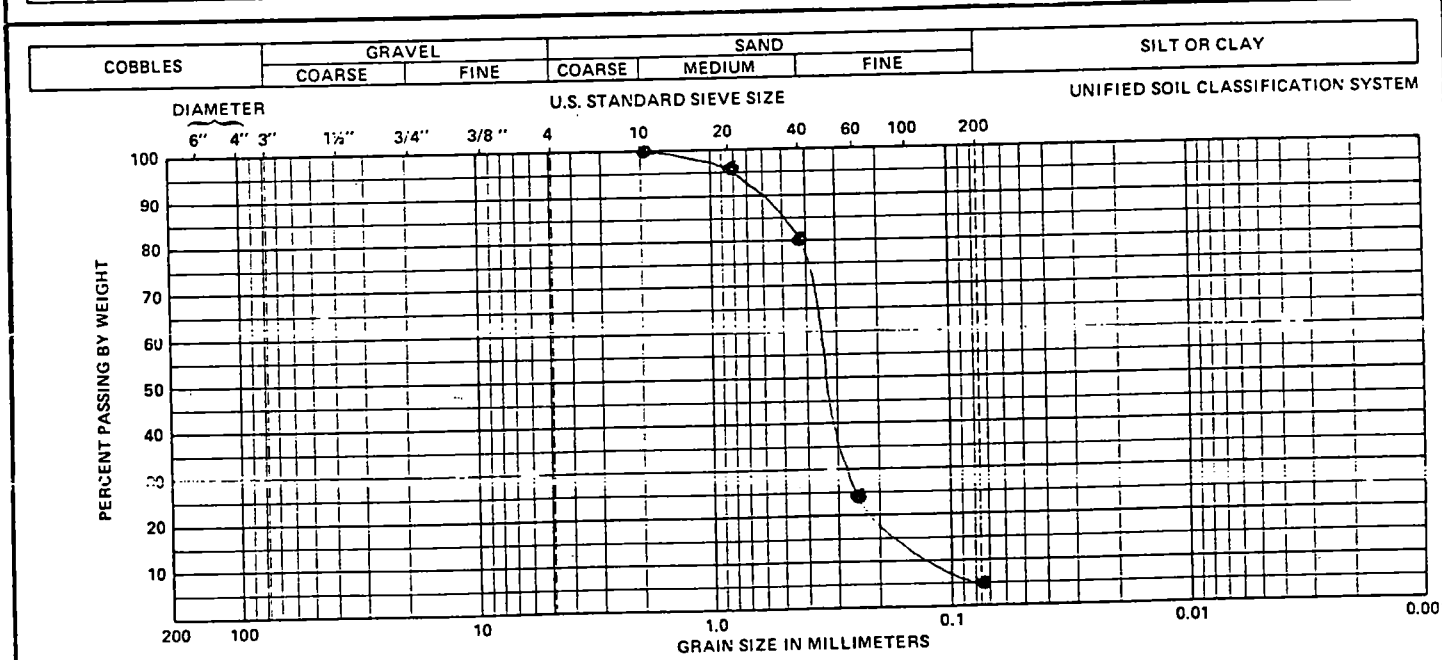
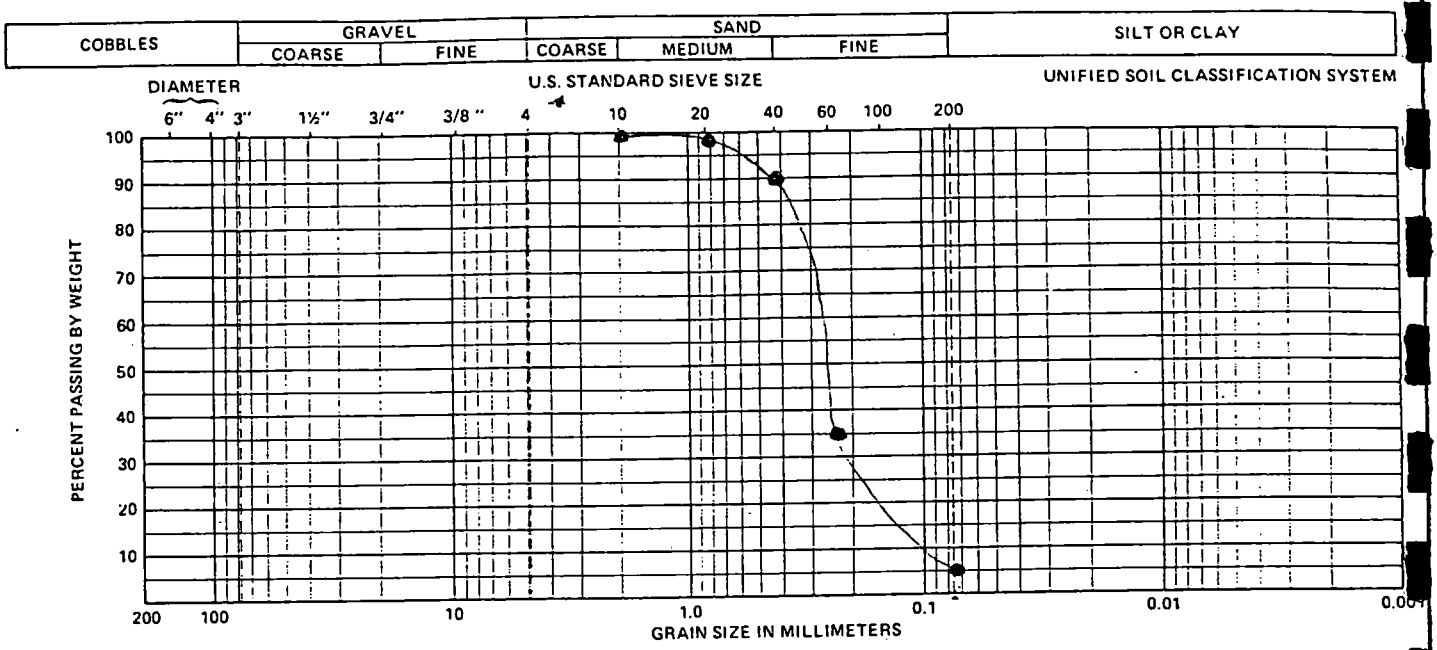


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-33D	SS-14	22-28	SP	Medium to fine sand			

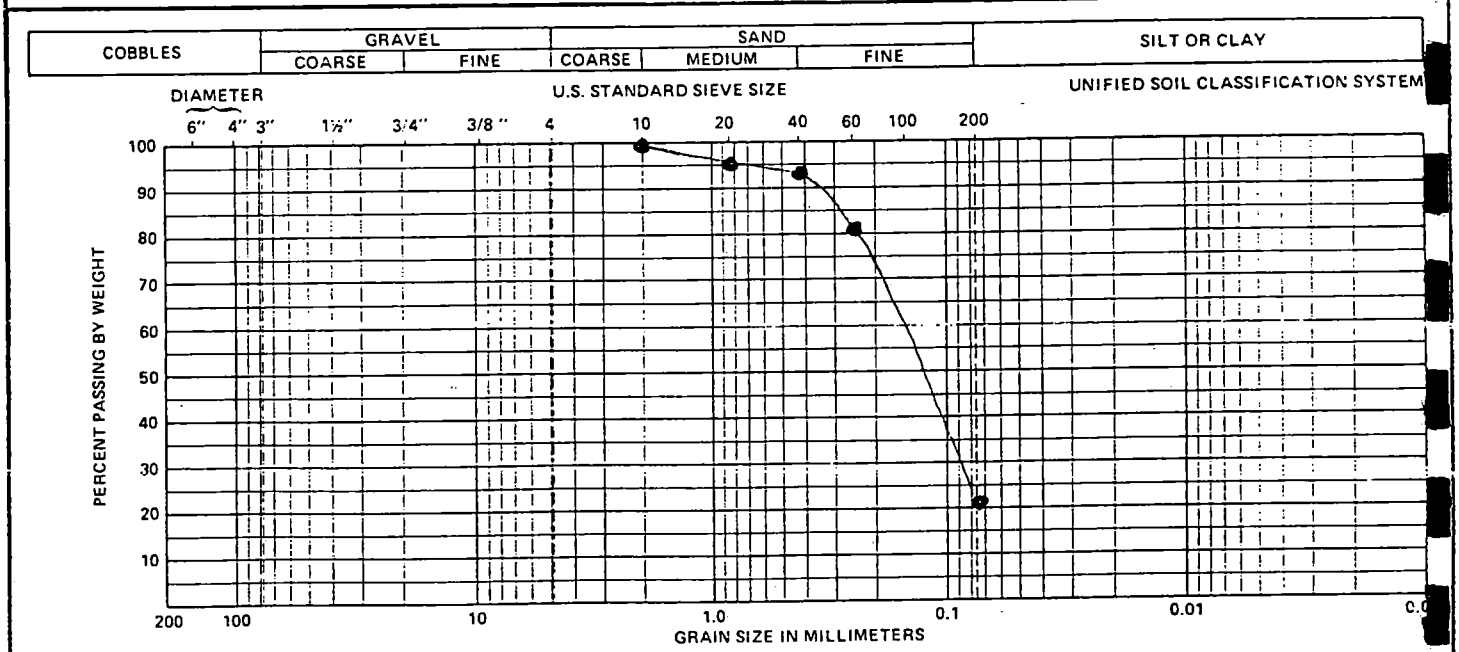


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-33D	SS-15	28-30	SP	Medium to fine sand			

PARTICLE-SIZE DISTRIBUTION



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-33D	SS-16	30-32	SP	Fine sand			



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-33D	SS-17	32-34	SP	Fine sand			

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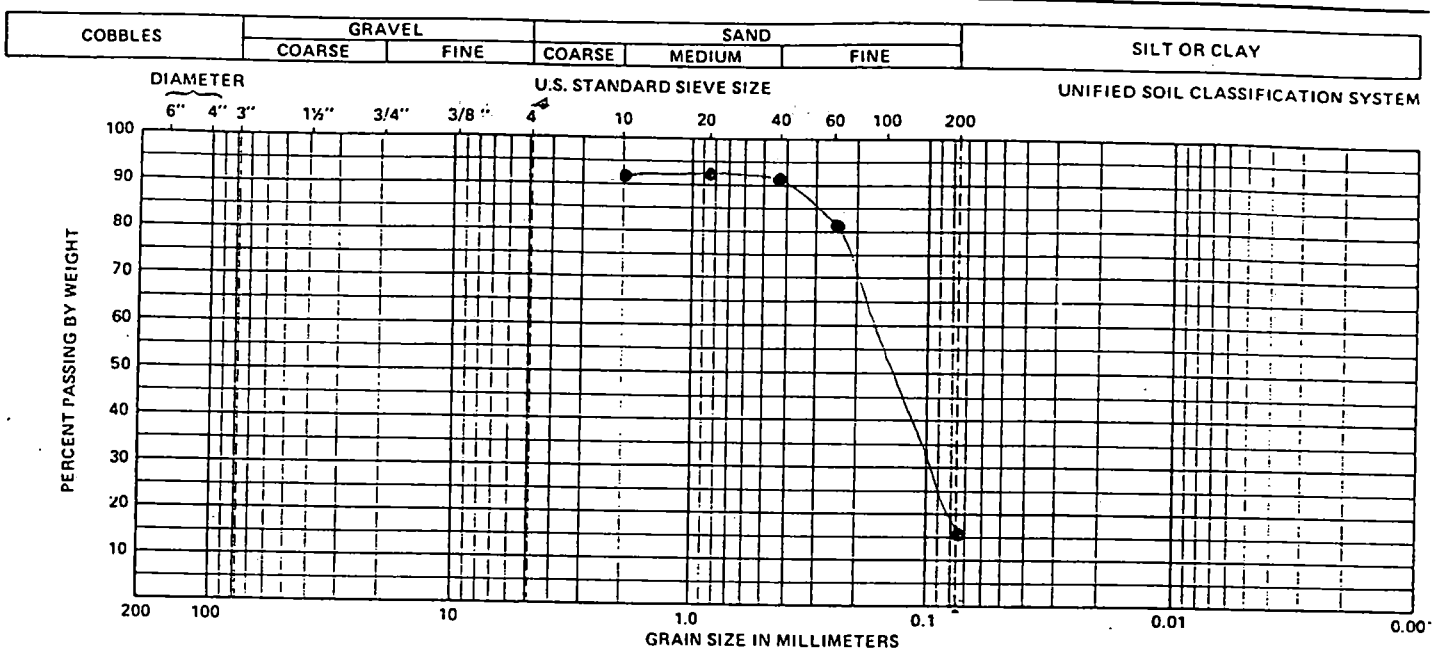
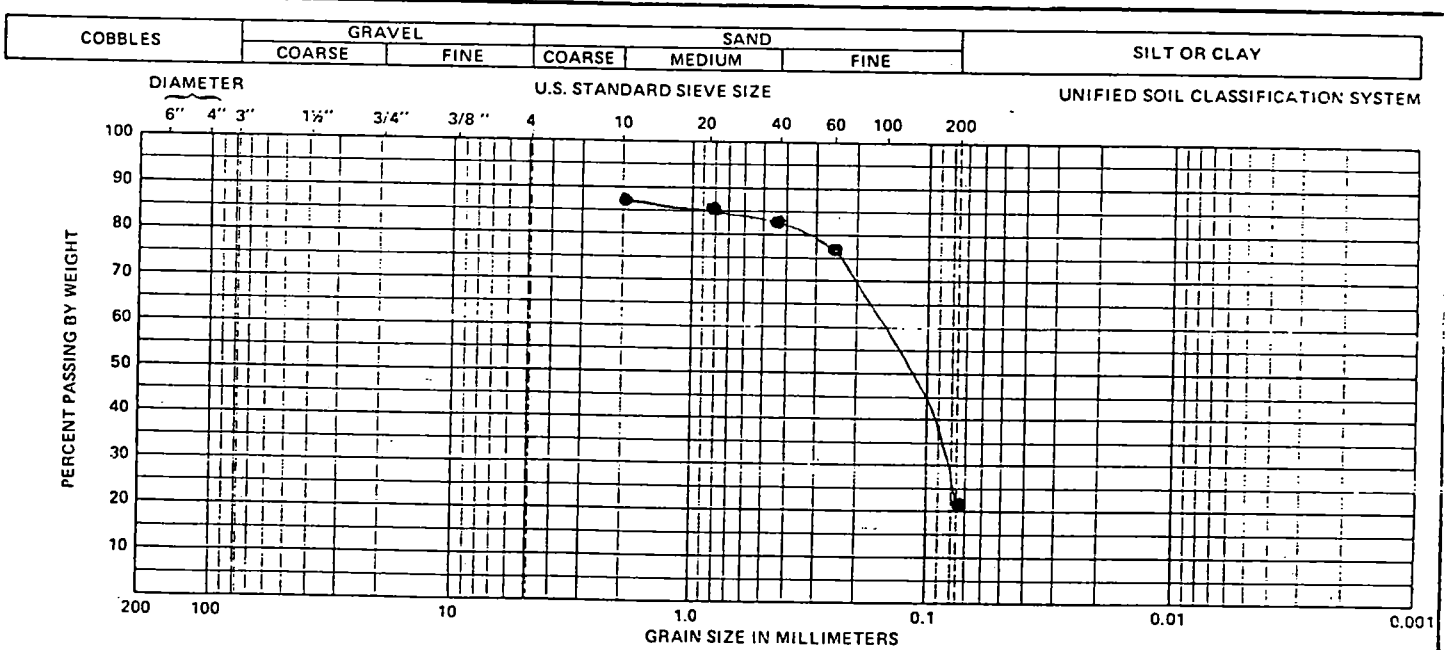
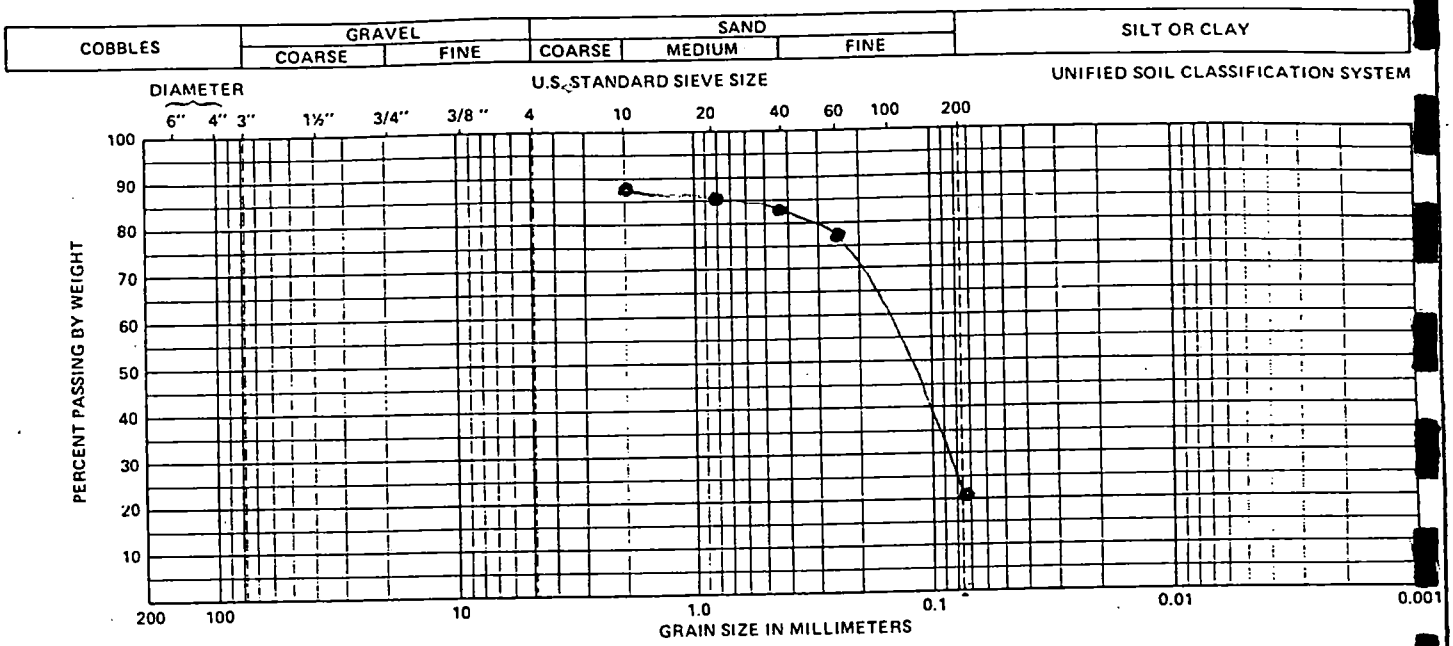


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-33D	SS-18	34-36	SP	Fine sand			

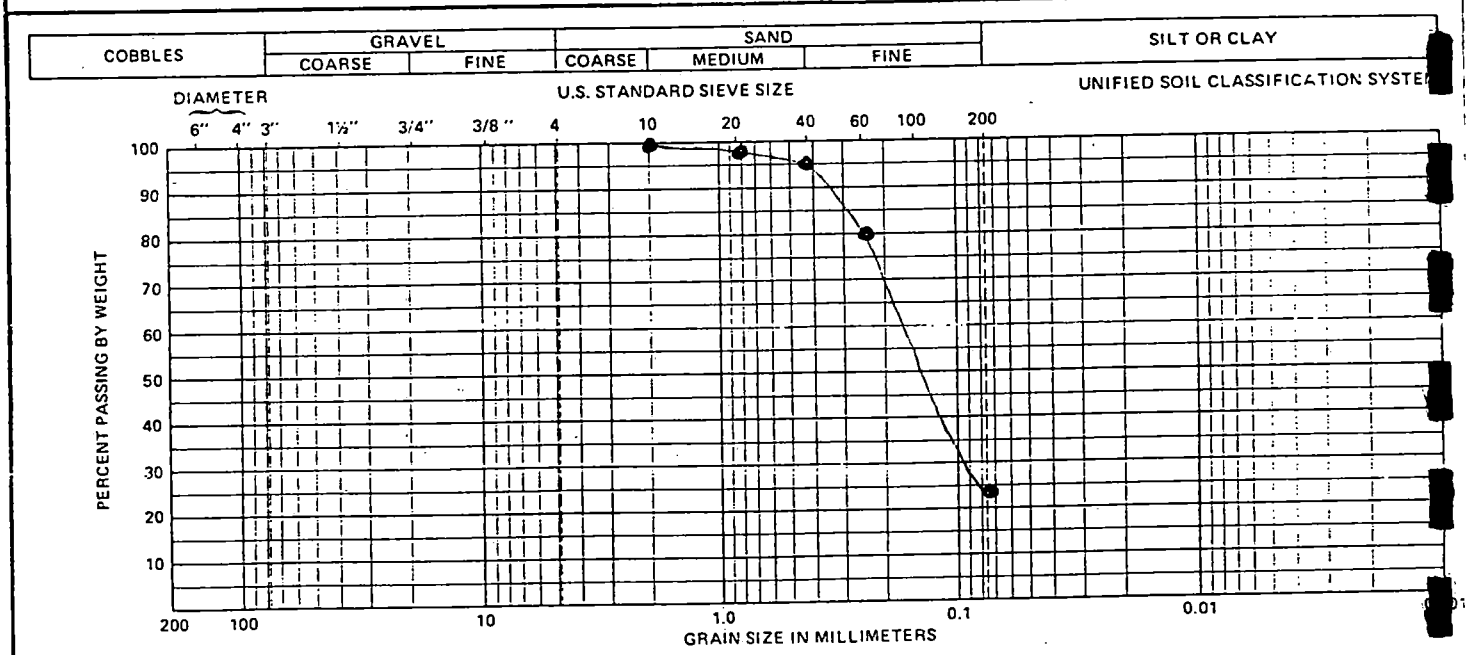


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-33D	SS-19	36-38	SP	Fine sand, some silt			

PARTICLE-SIZE DISTRIBUTION



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-33D	SS-20	38-40	SP	Fine sand, some silt			



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-33D	SS-21	40-42	SP	Fine sand, some silt			

WCCLR-101 (9/80)

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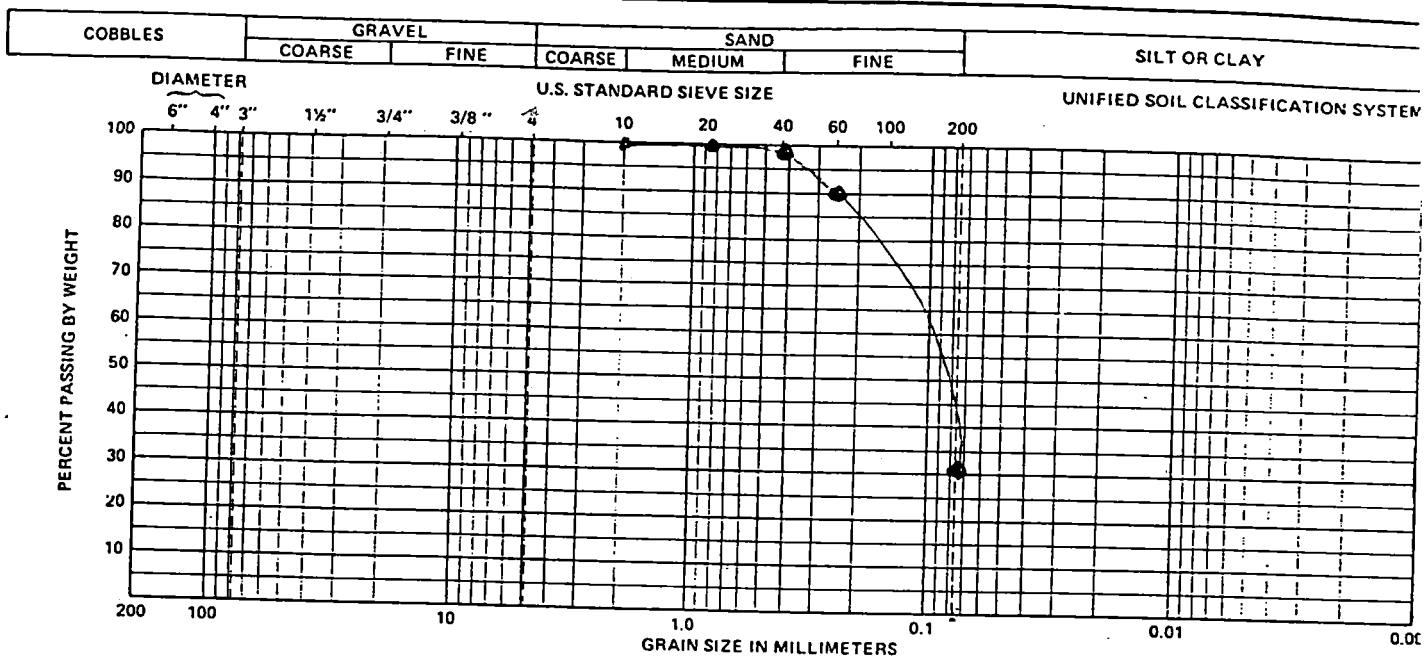
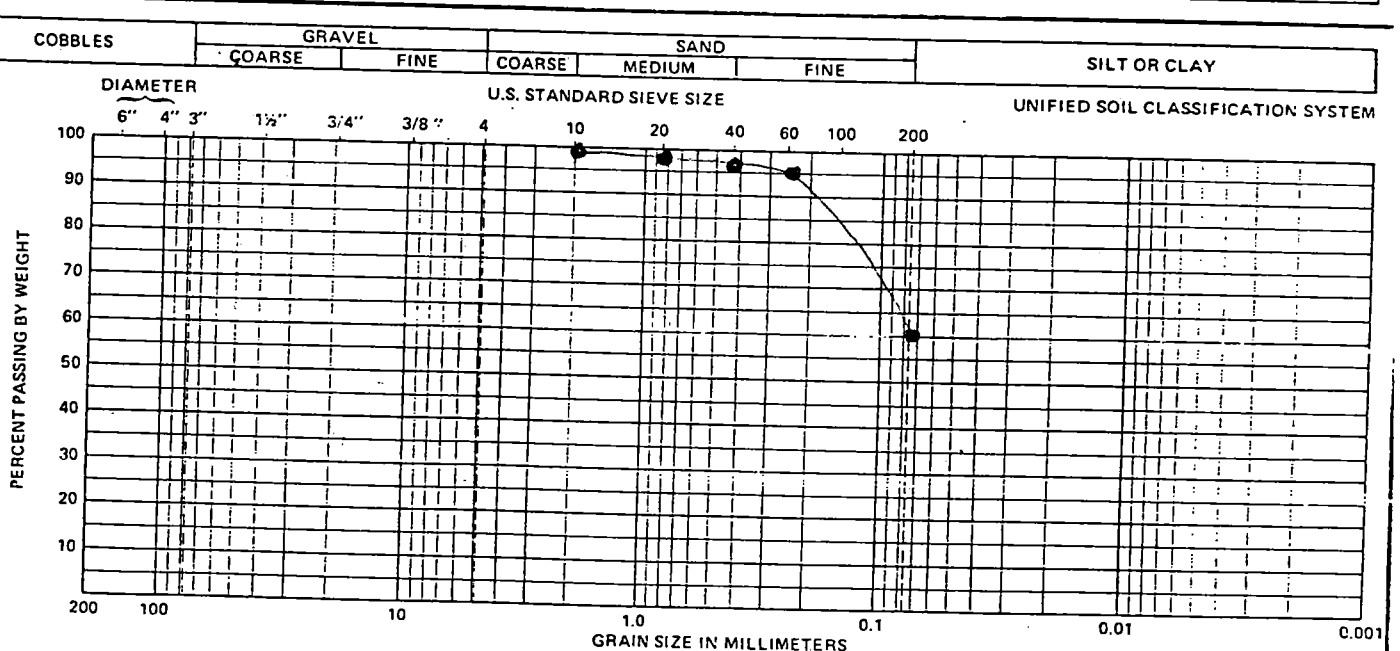
PROJECT NO:

PARTICLE-SIZE DISTRIBUTION

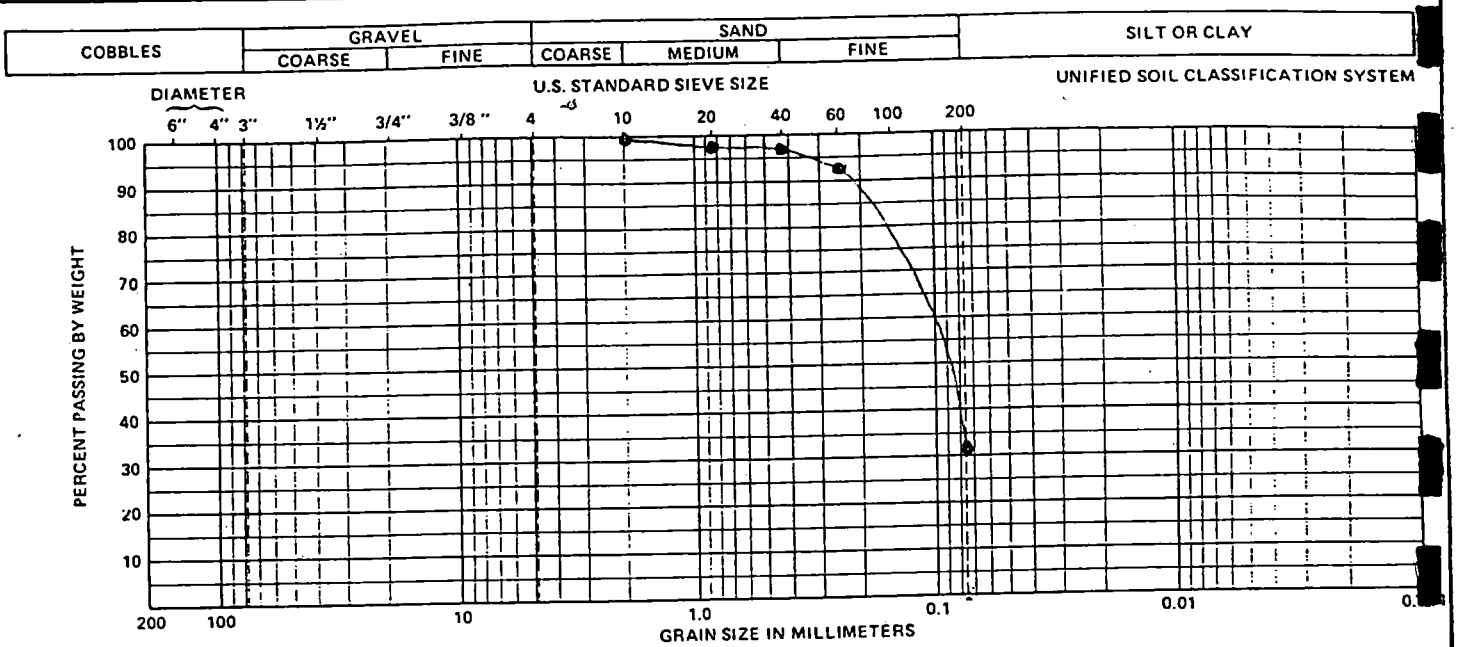


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-33D	SS-23	44-46	SM	Fine sand, some silt			

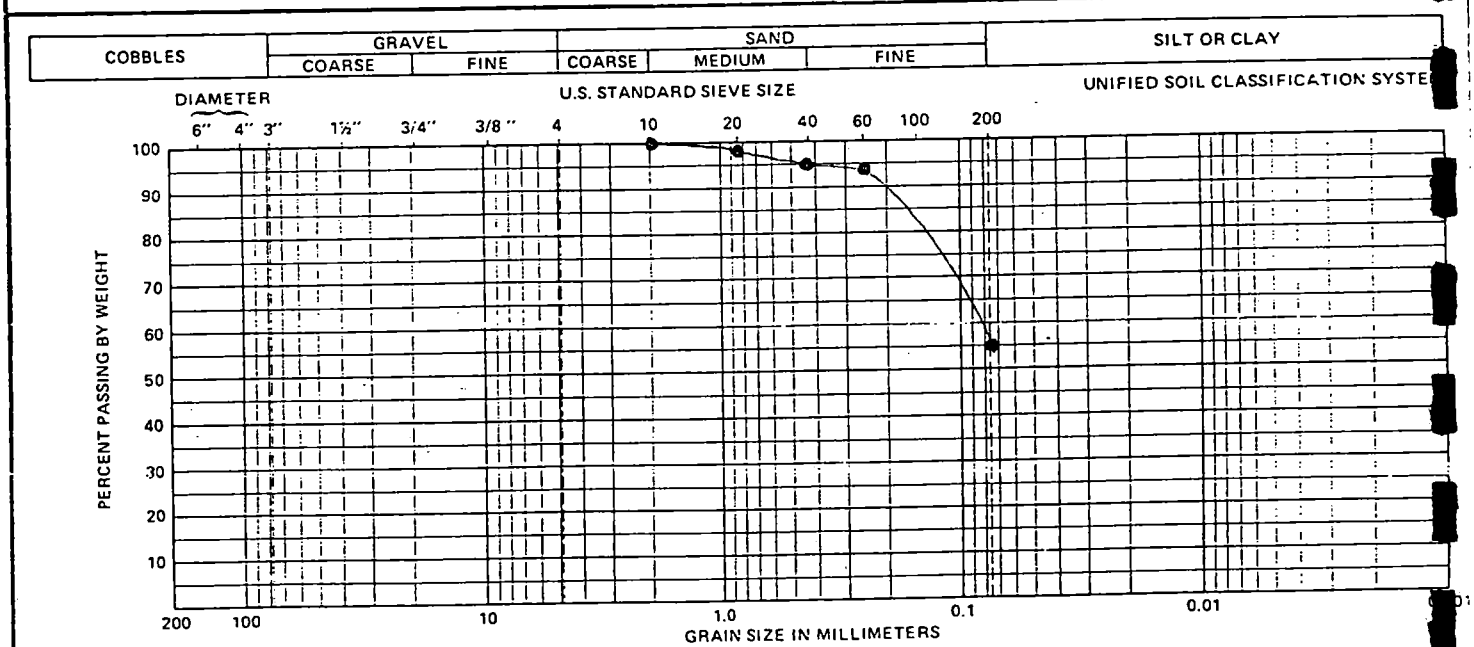


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-33D	SS-25	48-50	ML	Sandy silt			

PARTICLE-SIZE DISTRIBUTION



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-33D	SS-22	42-44	SM	Fine sand, some silt			



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-33D	SS-24	46-48	SM	Fine sand, some silt			

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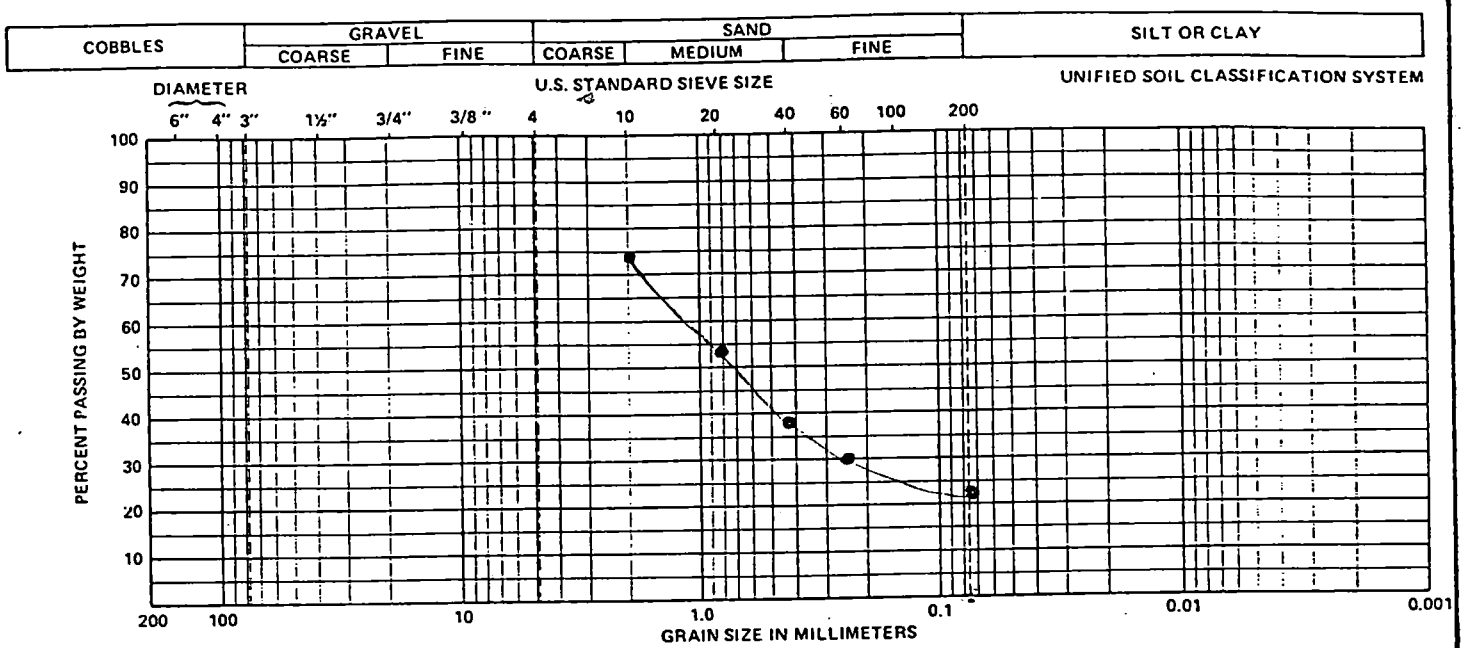
REVIEWED BY:

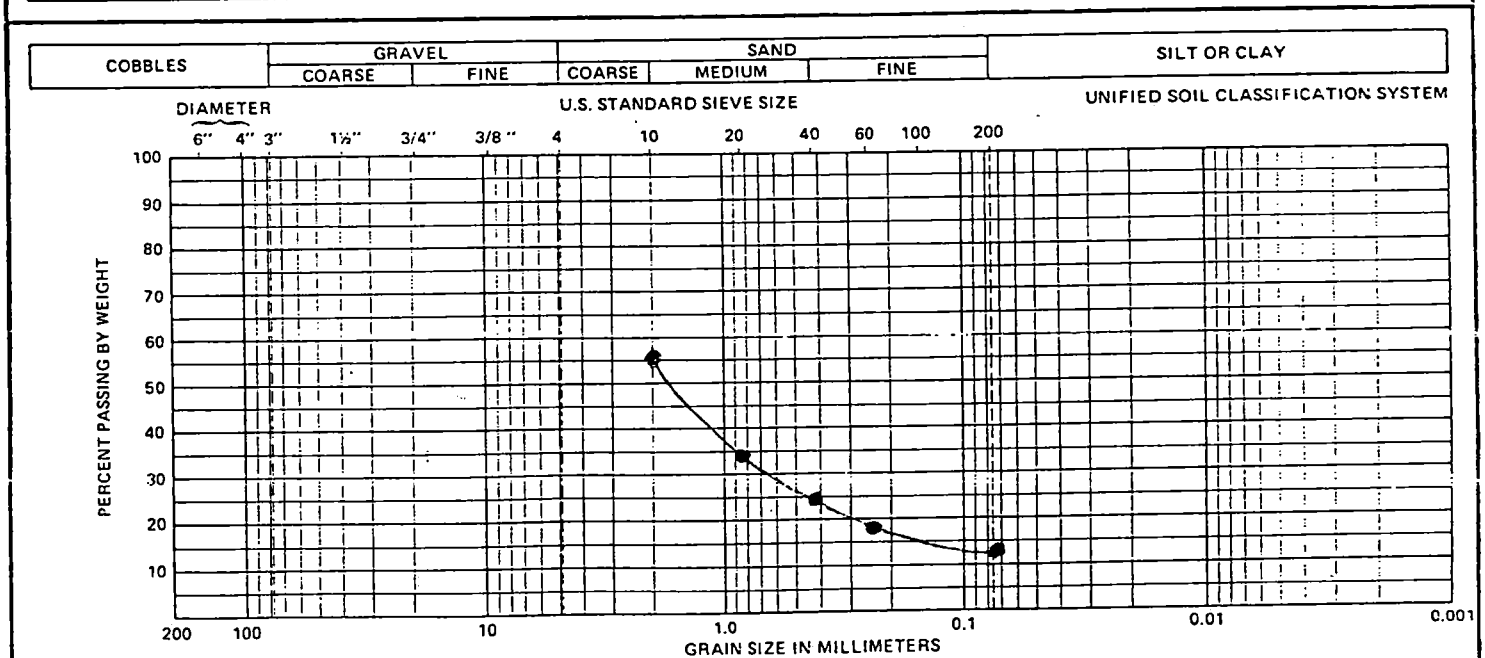
DRAWN BY:

PROJECT NO:

PARTICLE-SIZE DISTRIBUTION

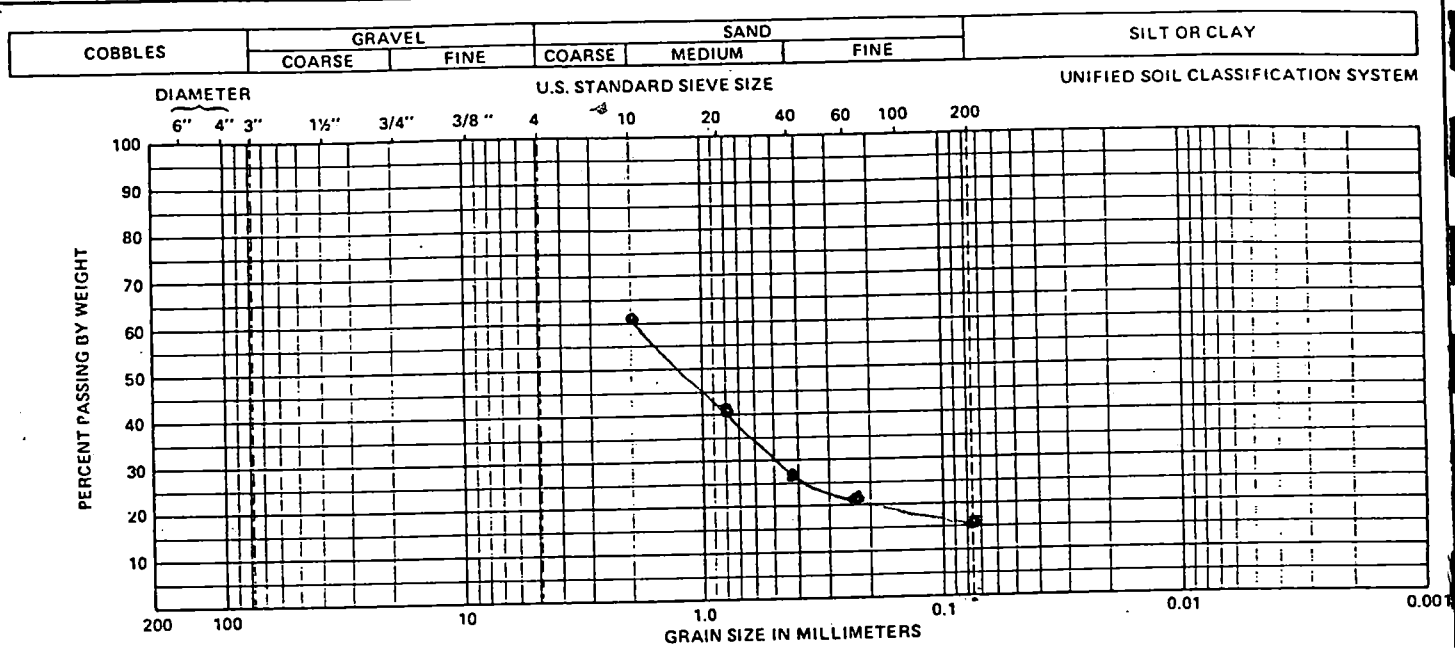


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-33D	SS-26	50-52	SM	Coarse to fine sand, some silt			

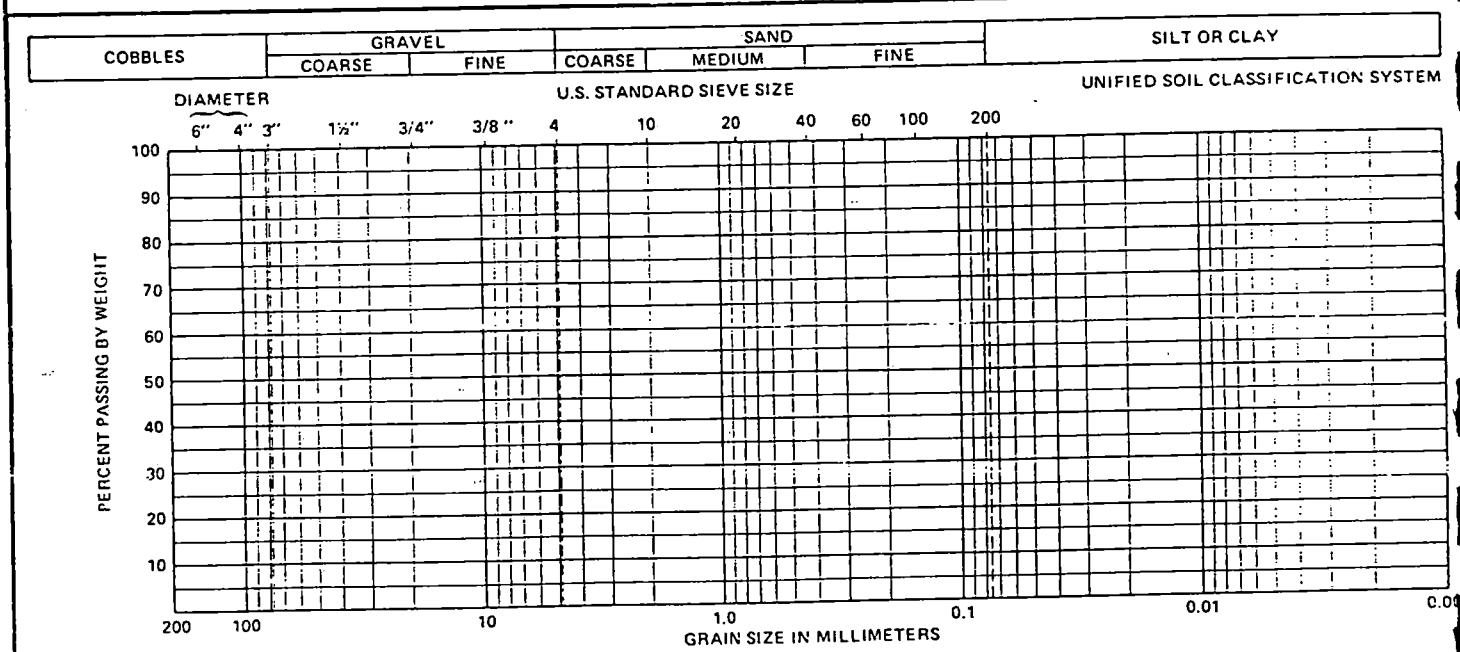


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-33D	SS-27	52-54	SM	Coarse to fine sand, some silt			

PARTICLE-SIZE DISTRIBUTION



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
P-33D	SS-28	54-56	SM	Coarse to fine sand, some silt			



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Mark Houlday
Woodward-Clyde Consultants
201 Willowbrook Blvd.
P.O. Box 290
Wayne, NJ 07470

June 24, 1992

ETDC Project Number: 483500.010.02 J.T.S. Number: 408678.026

This is the Certificate of Analysis for the following samples:

Client Project ID:	**Ciba-Geigy**
Date Received by Lab:	**June 18, 1992**
Number of Samples:	**Seven (7)**
Sample Type:	**Soil**

I. Introduction/Case Narrative

Seven soil samples were received by IT/ETDC on June 18, 1992 for grainsize distribution without hydrometer analysis.

Please see Appendix A, the sample number cross reference list; Appendix B, the analysis results; and Appendix C, the Chain of Custody and Request for Analysis records.

Reviewed and Approved:

Beverly L. Leamon
Project Manager, Geotechnical Services

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II. Analytical Results/Methodology

REFERENCES: Annual Book of ASTM Standards, Section 4, Construction, Volume 04.08, Soil and Rock; Dimension Stone; Geosynthetics.

Grainsize Distribution **ASTM D 422**

III. Quality Control

Quality control checks such as duplicates and spikes (QC samples), are not normally applicable to geotechnical testing. This is due to the inability of obtaining samples with known characteristics, the heterogenous nature of the samples, and Quality Control procedures built-in to the analytical method.

QC measures to ensure accuracy and precision of test results include the following:

- 100% verification on all numerical results - all raw data entries, transcriptions and calculations entered by lab technicians are checked, recalculated and verified. Most data calculations are performed by computer programs.

- Data validation through test reasonableness - summaries of all test results for individual reports are reviewed to determine the overall reasonableness of data and to determine the presence of any data that may be considered outliers.

- Quality control procedures are built into most standardized geotechnical procedures. For example, many analyses routinely call for a re-analysis, specifying an acceptance criteria.

- Routine instrument calibration - all instruments, gauges and equipment used in testing is calibrated on a routine basis. All instrument calibration follows ASTM or manufacturer guidelines.

- Maintenance of all past calibration records - records and certification documents of all instruments, gauges and equipment are updated routinely and maintained in the Quality Control Coordinators Quality/Operations files.

- Use of trained personnel for conducting tests - all technicians are trained in the application of standard

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laboratory procedures for geotechnical analyses as well as the quality assurance measures implemented by IT.

IV. Data Qualification

None.

Mark Houlday
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June 24, 1992
Client Project ID: Ciba-Geigy ETDC Project No.: 483500.010.02

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CROSS-REFERENCE LIST

ETDC SAMPLE NO.	CLIENT SAMPLE NO.
ETDC-2217	P-32D/16-22
ETDC-2218	P-32D/24-30
ETDC-2219	P-32D/32-38
ETDC-2220	P-33D/10-14
ETDC-2221	P-33D/16-20
ETDC-2222	P-33D/28-32
ETDC-2223	P-33D/48-52

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June 24, 1992
Client Project ID: Ciba-Geigy ETDC Project No.: 483500.010.02

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SAMPLE ANALYSIS RESULTS

PROJECT NAME:	CIBA-GEIGY	USCS SYMBOL:	NOT REQUESTED
PROJECT NO.:	483500.010.02	WATER CONTENT, %:	18.2
CUST. SAMPLE NO.:	P-32D/16-22	LIQUID LIMIT:	NOT REQUESTED
ETDC SAMPLE NO.:	ETDC-2217	PLASTICITY INDEX:	NOT REQUESTED
SPECIFIC GRAVITY:	2.6500 (ASSUMED)		

==========SIEVE ANALYSIS==========

SIEVE NO.	DIAMETER (mm)	PERCENT FINER (%)
3.0 in	75.000	100.0
1.5 in	37.500	100.0
0.75 in	19.000	100.0
0.375 in	9.500	99.7
NO. 4	4.750	99.5
NO. 10	2.000	99.2
NO. 20	0.850	98.3
NO. 40	0.425	80.5
NO. 60	0.250	31.7
NO. 140	0.106	4.5
NO. 200	0.075	2.8

Mark Houlday
Woodward-Clyde Consultants
June 24, 1992
Client Project ID: Ciba-Geigy ETDC Project No.: 483500.010.02

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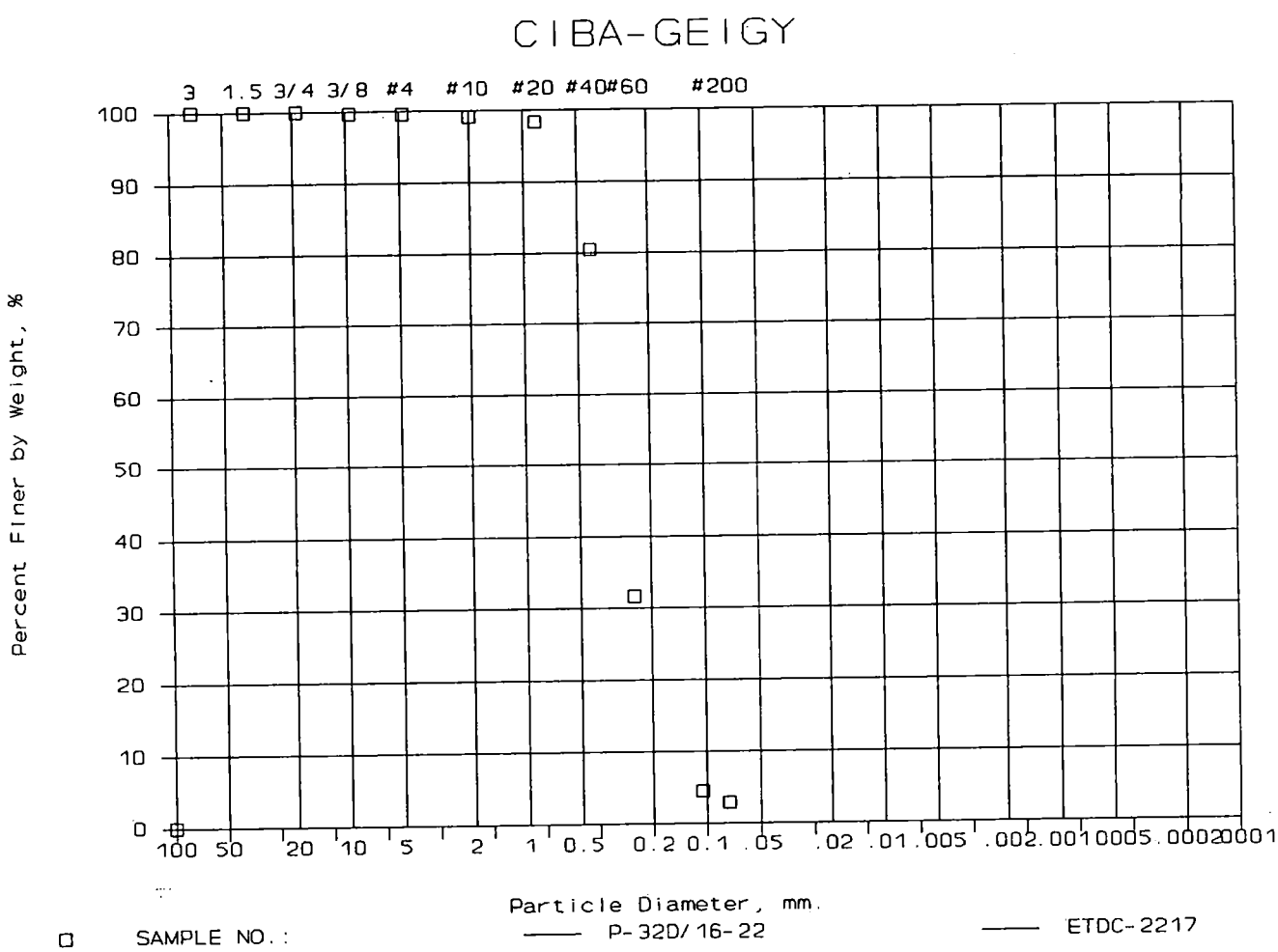

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SAMPLE ANALYSIS RESULTS

PROJECT NAME:	CIBA-GEIGY	USCS SYMBOL:	NOT REQUESTED
PROJECT NO.:	483500.010.02	WATER CONTENT, %:	20.7
CUST. SAMPLE NO.:	P-32D/24-30	LIQUID LIMIT:	NOT REQUESTED
ETDC SAMPLE NO.:	ETDC-2218	PLASTICITY INDEX:	NOT REQUESTED
SPECIFIC GRAVITY:	2.6500 (ASSUMED)		

==========SIEVE ANALYSIS==========

SIEVE NO.	DIAMETER (mm)	PERCENT FINER (%)
3.0 in	75.000	100.0
1.5 in	37.500	100.0
0.75 in	19.000	100.0
0.375 in	9.500	100.0
NO. 4	4.750	100.0
NO. 10	2.000	100.0
NO. 20	0.850	99.9
NO. 40	0.425	82.3
NO. 60	0.250	35.1
NO. 140	0.106	5.8
NO. 200	0.075	2.8

Mark Houlday
Woodward-Clyde Consultants
June 24, 1992
Client Project ID: Ciba-Geigy ETDC Project No.: 483500.010.02

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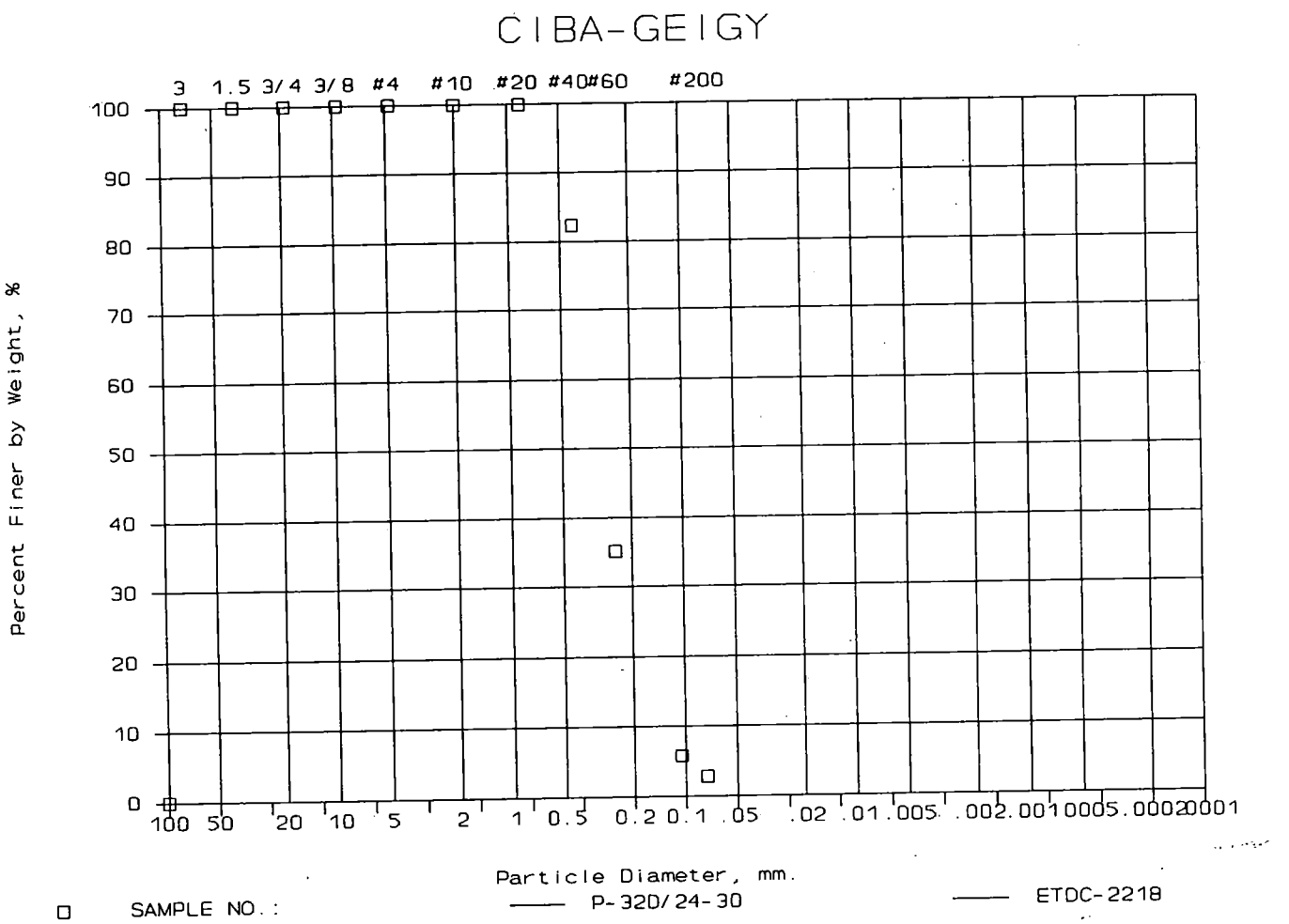

Mark Houlday
Woodward-Clyde Consultants
June 24, 1992
Client Project ID: Ciba-Geigy ETDC Project No.: 483500.010.02

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SAMPLE ANALYSIS RESULTS

PROJECT NAME:	CIBA-GEIGY	USCS SYMBOL:	NOT REQUESTED
PROJECT NO.:	483500.010.02	WATER CONTENT, %:	16.7
CUST. SAMPLE NO.:	P-32D/32-38	LIQUID LIMIT:	NOT REQUESTED
ETDC SAMPLE NO.:	ETDC-2219	PLASTICITY INDEX:	NOT REQUESTED
SPECIFIC GRAVITY:	2.6500 (ASSUMED)		

==========SIEVE ANALYSIS==========

SIEVE NO.	DIAMETER (mm)	PERCENT FINER (%)
3.0 in	75.000	100.0
1.5 in	37.500	100.0
0.75 in	19.000	100.0
0.375 in	9.500	100.0
NO. 4	4.750	99.9
NO. 10	2.000	99.8
NO. 20	0.850	98.1
NO. 40	0.425	82.0
NO. 60	0.250	51.2
NO. 140	0.106	16.5
NO. 200	0.075	9.7

Mark Houlday
Woodward-Clyde Consultants
June 24, 1992
Client Project ID: Ciba-Geigy ETDC Project No.: 483500.010.02

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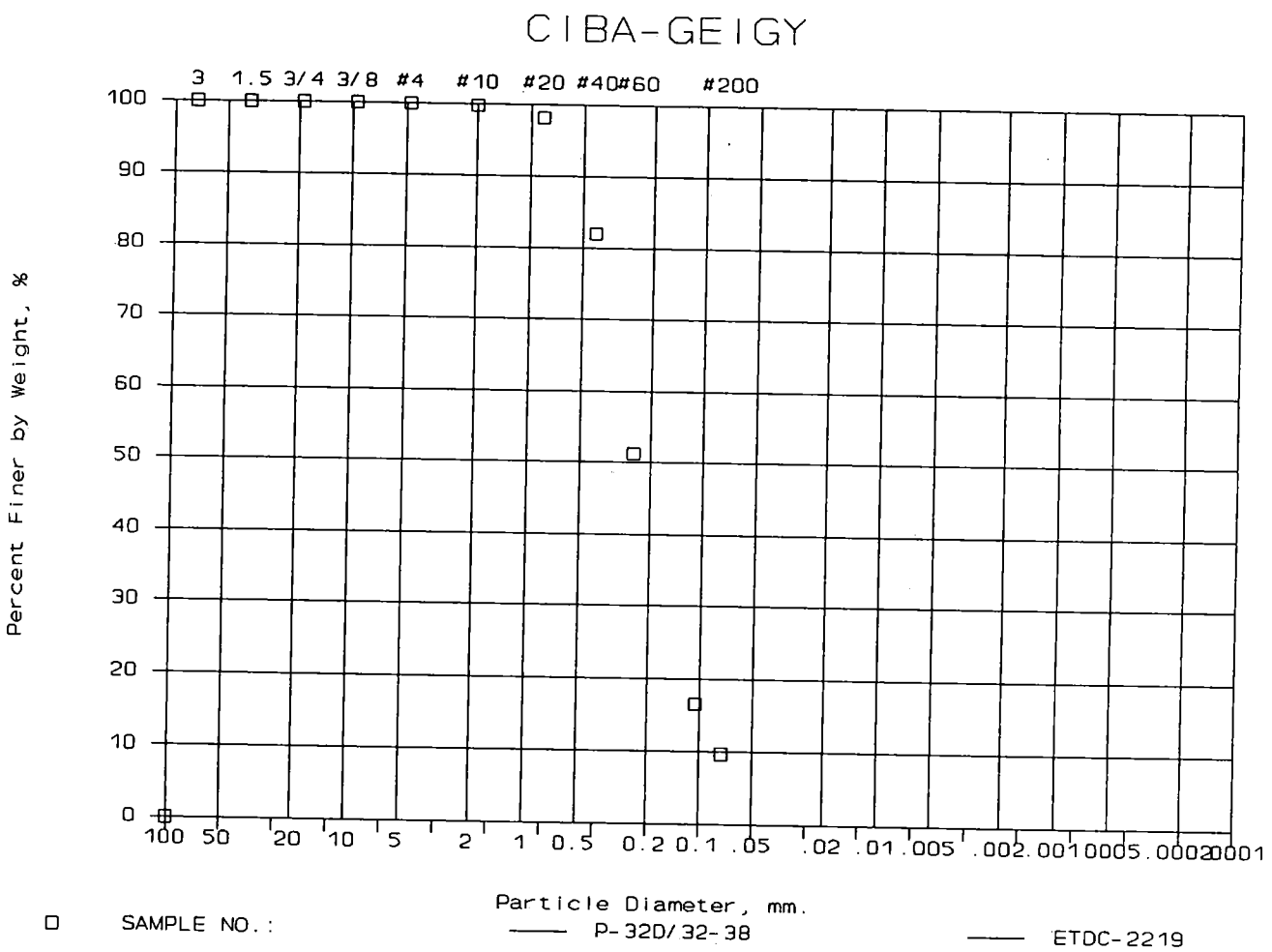

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SAMPLE ANALYSIS RESULTS

PROJECT NAME: CIBA-GEIGY
PROJECT NO.: 483500.010.02
CUST. SAMPLE NO.: P-33D/10-14
ETDC SAMPLE NO.: ETDC-2220
SPECIFIC GRAVITY: 2.6500 (ASSUMED)

USCS SYMBOL: NOT REQUESTED
WATER CONTENT, %: 32.2
LIQUID LIMIT: NOT REQUESTED
PLASTICITY INDEX: NOT REQUESTED

==========SIEVE ANALYSIS==========

SIEVE NO.	DIAMETER (mm)	PERCENT FINER (%)
3.0 in	75.000	100.0
1.5 in	37.500	100.0
0.75 in	19.000	100.0
0.375 in	9.500	97.2
NO. 4	4.750	93.9
NO. 10	2.000	90.6
NO. 20	0.850	88.6
NO. 40	0.425	86.1
NO. 60	0.250	76.8
NO. 140	0.106	24.6
NO. 200	0.075	11.6

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Client Project ID: Ciba-Geigy ETDC Project No.: 483500.010.02

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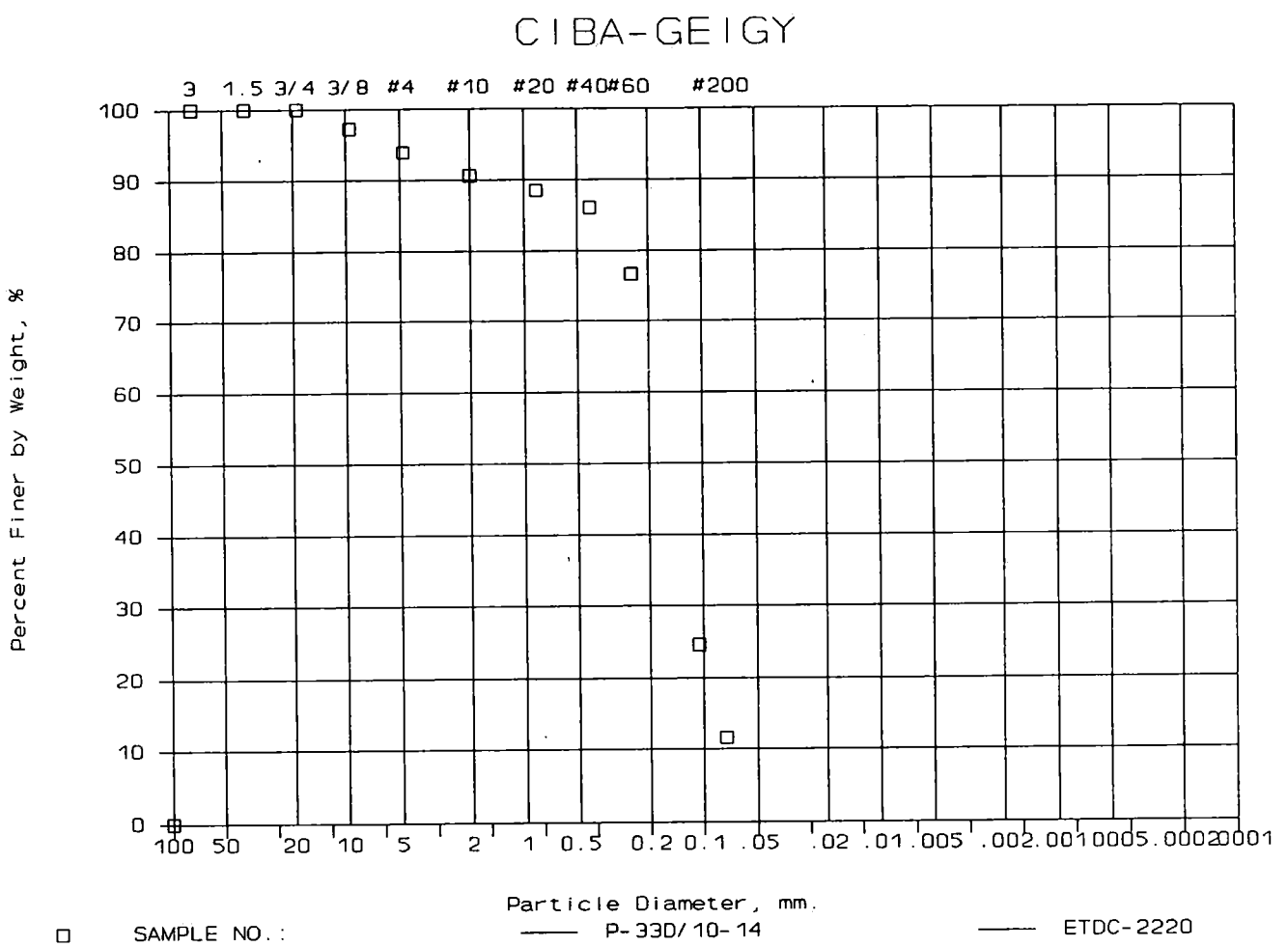

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SAMPLE ANALYSIS RESULTS

PROJECT NAME: CIBA-GEIGY
PROJECT NO.: 483500.010.02
CUST. SAMPLE NO.: P-33D/16-20
ETDC SAMPLE NO.: ETDC-2221
SPECIFIC GRAVITY: 2.6500 (ASSUMED)

USCS SYMBOL: NOT REQUESTED
WATER CONTENT, %: 18.1
LIQUID LIMIT: NOT REQUESTED
PLASTICITY INDEX: NOT REQUESTED

==========SIEVE ANALYSIS==========

SIEVE NO.	DIAMETER (mm)	PERCENT FINER (%)
3.0 in	75.000	100.0
1.5 in	37.500	100.0
0.75 in	19.000	100.0
0.375 in	9.500	100.0
NO. 4	4.750	99.9
NO. 10	2.000	99.8
NO. 20	0.850	99.4
NO. 40	0.425	98.1
NO. 60	0.250	94.1
NO. 140	0.106	83.1
NO. 200	0.075	72.5

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June 24, 1992
Client Project ID: Ciba-Geigy ETDC Project No.: 483500.010.02

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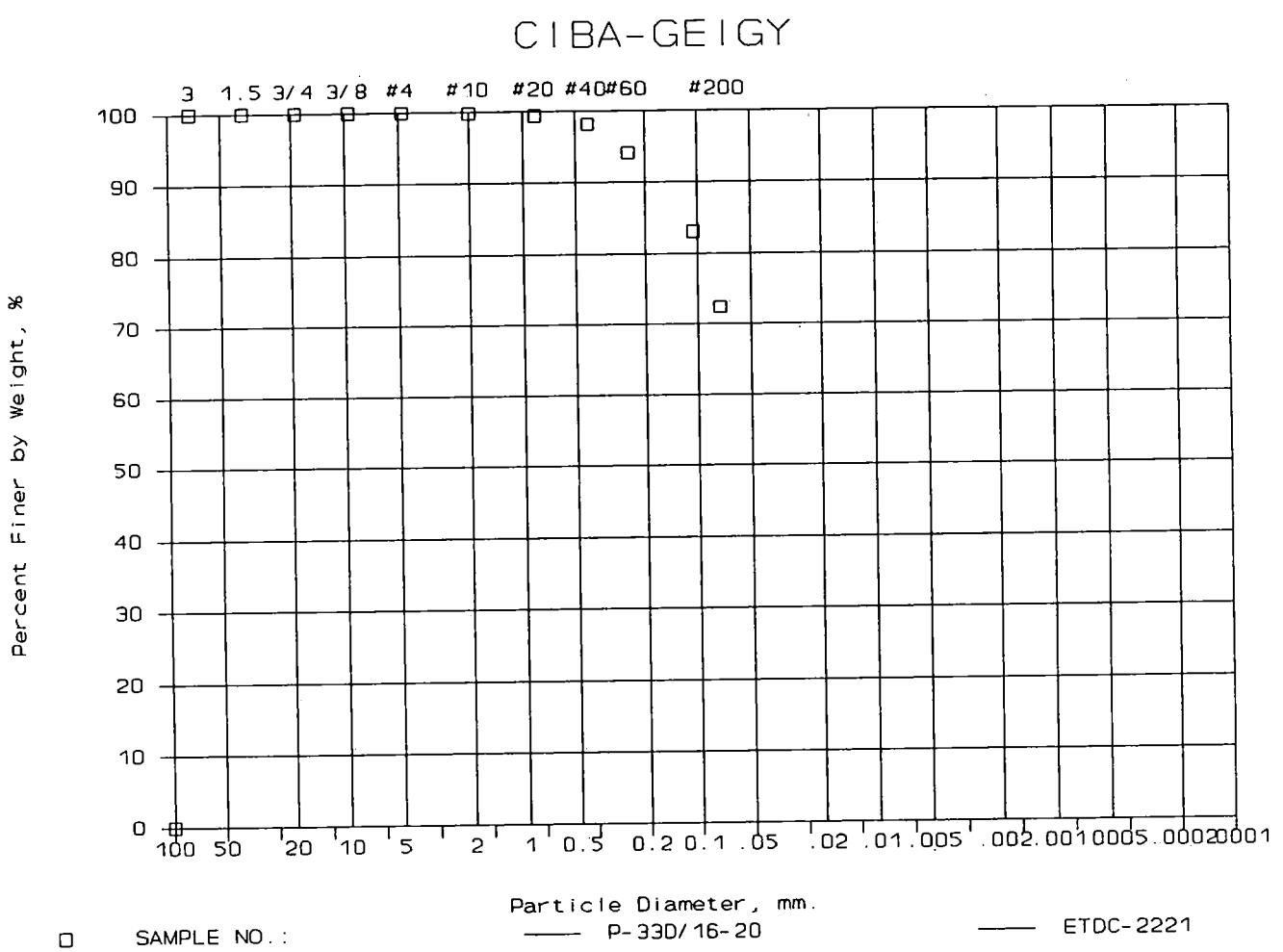

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June 24, 1992
Client Project ID: Ciba-Geigy ETDC Project No.: 483500.010.02

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SAMPLE ANALYSIS RESULTS

PROJECT NAME: CIBA-GEIGY
PROJECT NO.: 483500.010.02
CUST. SAMPLE NO.: P-33D/28-32
ETDC SAMPLE NO.: ETDC-2222
SPECIFIC GRAVITY: 2.6500 (ASSUMED)

USCS SYMBOL: NOT REQUESTED
WATER CONTENT, %: 19.4
LIQUID LIMIT: NOT REQUESTED
PLASTICITY INDEX: NOT REQUESTED

==========SIEVE ANALYSIS==========

SIEVE NO.	DIAMETER (mm)	PERCENT FINER (%)
3.0 in	75.000	100.0
1.5 in	37.500	100.0
0.75 in	19.000	100.0
0.375 in	9.500	99.7
NO. 4	4.750	99.2
NO. 10	2.000	99.0
NO. 20	0.850	98.3
NO. 40	0.425	89.9
NO. 60	0.250	44.2
NO. 140	0.106	5.9
NO. 200	0.075	2.6

Mark Houlday
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June 24, 1992
Client Project ID: Ciba-Geigy ETDC Project No.: 483500.010.02

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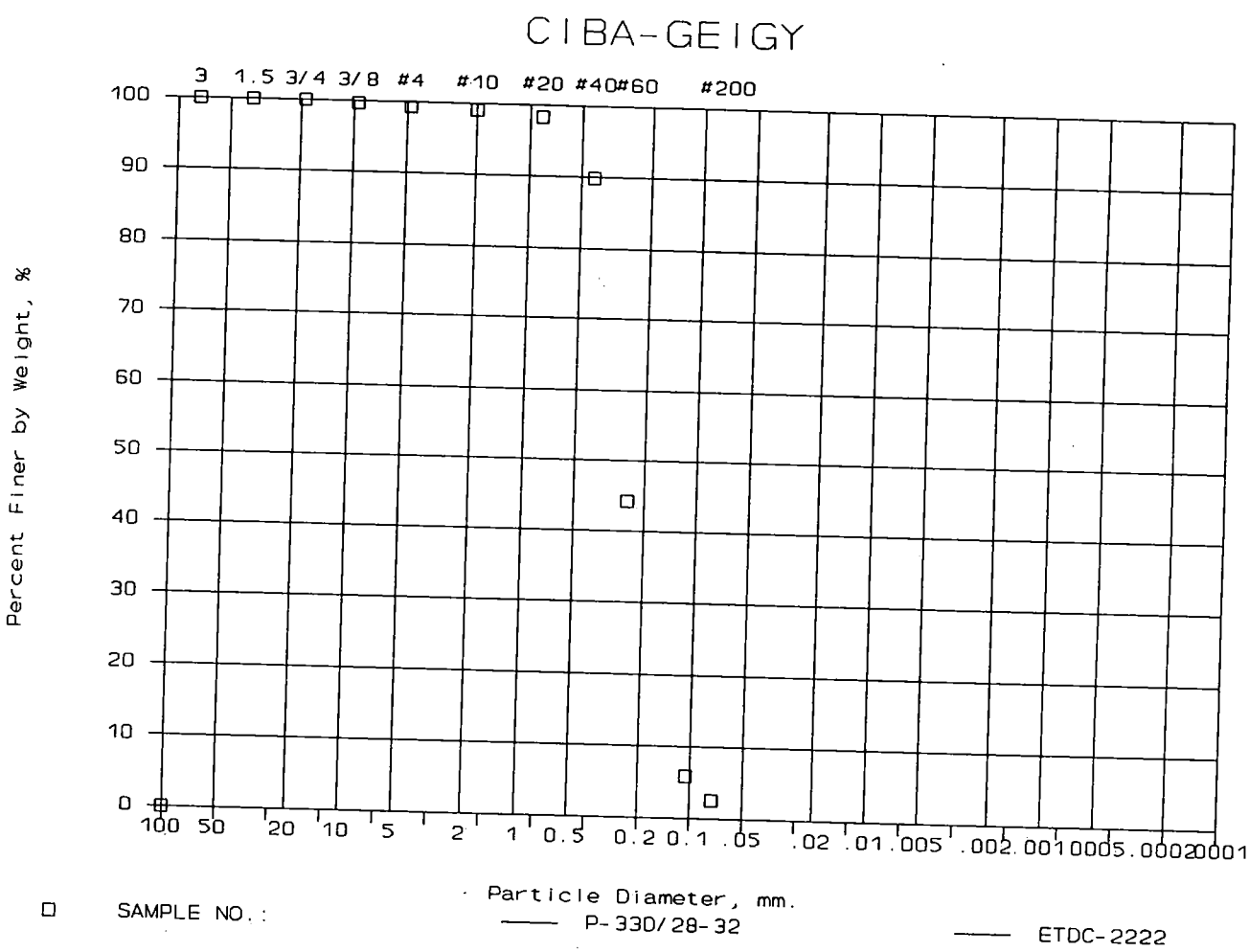

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Woodward-Clyde Consultants
June 24, 1992
Client Project ID: Ciba-Geigy ETDC Project No.: 483500.010.02

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SAMPLE ANALYSIS RESULTS

PROJECT NAME: CIBA-GEIGY
PROJECT NO.: 483500.010.02
CUST. SAMPLE NO.: P-33D/48-52
ETDC SAMPLE NO.: ETDC-2223
SPECIFIC GRAVITY: 2.6500 (ASSUMED)

USCS SYMBOL: NOT REQUESTED
WATER CONTENT, %: 14.0
LIQUID LIMIT: NOT REQUESTED
PLASTICITY INDEX: NOT REQUESTED

==========SIEVE ANALYSIS==========

SIEVE NO.	DIAMETER (mm)	PERCENT FINER (%)
3.0 in	75.000	100.0
1.5 in	37.500	100.0
0.75 in	19.000	100.0
0.375 in	9.500	99.2
NO. 4	4.750	96.9
NO. 10	2.000	93.4
NO. 20	0.850	84.5
NO. 40	0.425	74.7
NO. 60	0.250	67.2
NO. 140	0.106	52.8
NO. 200	0.075	45.7

Mark Houlday
Woodward-Clyde Consultants
June 24, 1992
Client Project ID: Ciba-Geigy ETDC Project No.: 483500.010.02

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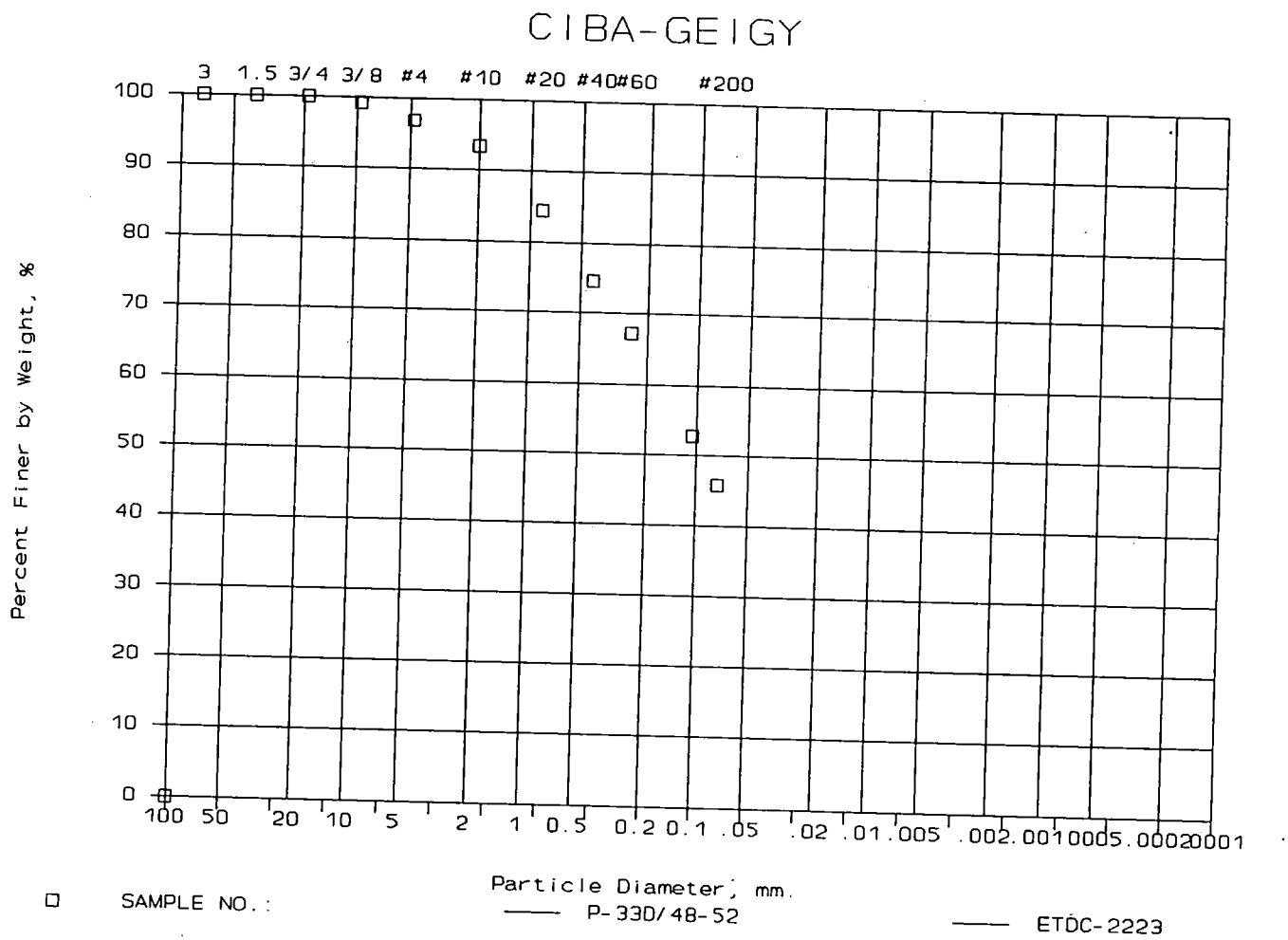

Appendix E

E

WELL SAMPLING LOGS

This appendix presents the well sampling logs prepared during stabilization activities in the Production Area under the RCRA Facility Investigation at the CIBA-GEIGY facility in Cranston, RI. The well sampling logs are organized by type of well — either a monitoring well ("MW"), a piezometer ("P"), or a recovery well ("RC"). For each type of well, the well sampling logs are presented in numerical order by the identifying number of the well (e.g., MW-20S, MW-21S, and so on).

WOODWARD - CLYDE CONSULTANTS
WELL SAMPLING LOG

Date :
August 4,1992
Inspector(s) :
M. Rivers, M. Zusi

Project :
CIBA - GEIGY / Cranston, R.I
Project No :
87X4660 / Stab.

Well ID No :
MW-20S

Well Condition :
Good
Well Type :
Stainless Steel / Overburden
Screened Interval :
Bottom 10 ft. (2 ft. sump)
Lock No. :
EM-D-KAY/444
Reference Pt :
Top of riser
Well Depth / Diameter :
20.90 ft. / 4 - inches
Depth to Water [DTW] :
10.50 ft.
Water Column ; Ht / Vol :
10.40 ft. / 7.12 gallons
Min Purge Volume : 3 well volumes=
21.3 gallons
Purged Volume :
25 gallons
Purge Date / Time(s) :
8-4-92 / 1515 - 1530
Purge Method :
2 - inch Sub. Pump
Purge Depth(s) :
20 ft.
Purge Rates (gpm) :
2.5 gpm
DTW After Purging :
13.30 ft.
Purge Observations (ullage readings,odor,etc.) :
Gray, cloudy, no odor, water clearing @ est. 20 gallons, no immiscible layers encountered.

DTW Before Sampling :
10.51 ft. @ 1650
Sample Date / Time(s) :
8-4-92 / 1655
Sampling Method :
Stainless Steel Bailer
Sampling Depth(s) :
Mid. Screen
Sample Analysis :
Appendix IX, fingerprint compounds, major ions, and treatability. Dioxin/Furan.
Analytical Lab :
Enseco - Cal, Savannah Labs, ETL
Sampling Observations :
NA
Sample Chems. Before / After:

Temp. :	19.4 / 20.5 degrees Centigrade
pH :	7.51 / 7.09 pH Units
Cond. :	235 / 230 micromhos/cm
Turb:	25.5 / 99.0 Nephelometric Units
D.O. :	2.7 / 4.1 Milligrams / Litre

Air Temp. / Weather Cond. :
80 degrees Fahrenheit, overcast, humid
Air Quality Data :
Background : HNU, not working,
Well Head : no readings taken.
Purge Water :
Comments:

METERS USED
Temp : Corning Checkmate
Turb.: HF - Scientific
pH : Corning Checkmate
Cond.: YSI - SCT
D.O.: Corning Checkmate
Hnu / OVA : PID (11.7 ev)

Data Inputted By: EMH
Checked By: CLH

WOODWARD - CLYDE CONSULTANTS
WELL SAMPLING LOG

Date :
August 5,1992
Inspector(s) :
M. Rivers, M. Zusi

Project :
CIBA - GEIGY / Cranston, R.I
Project No :
87X4660 / Stab.

Well ID No :
MW-21S

Well Condition :
Good
Well Type :
Stainless Steel / Overburden
Screened Interval :
Bottom 10 ft. (2 ft. sump)
Lock No. :
EM-D-KAY/444
Reference Pt :
Top of riser
Well Depth / Diameter :
17.60 ft. / 4 - inches
Depth to Water [DTW] :
5.29 ft.
Water Column ; Ht / Vol :
12.30 ft. / 8.03 gallons
Min Purge Volume : 3 well volumes=
24.1 gallons
Purged Volume :
31 gallons
Purge Date / Time(s) :
8-5-92 / 0828 - 0848
Purge Method :
2 - inch Sub. Pump
Purge Depth(s) :
16 ft.
Purge Rates (gpm) :
2.0 gpm
DTW After Purging :
10.45 ft.
Purge Observations (ullage readings,odor,etc.) :
Gray, cloudy, no odor,no immiscible layers encountered.

DTW Before Sampling :
5.32 ft.
Sample Date / Time(s) :
8-5-92 / 1000 - 1130
Sampling Method :
Stainless Steel Bailer
Sampling Depth(s) :
Mid. Screen
Sample Analysis :
Appendix IX, fingerprint compounds, major ions, and treatability. Dioxin / Furan.
Analytical Lab :
Enseco - Cal, Savannah Labs, ETL
Sampling Observations :
NA
Sample Chems. Before / After:

Temp. :	18.5 / 19.0 degrees Centigrade
pH :	6.79 / 7.07 pH Units
Cond. :	1030 / 800 micromhos/cm
Turb:	120 / > 200 Nephelometric Units
D.O. :	1.1 / 2.90 Milligrams / Litre

Air Temp. / Weather Cond. :
NA
Air Quality Data :
Background : HNU, not working,
Well Head : no readings taken.
Purge Water :
Comments:
MW-FB8-5(field blank), MW-Dup(blind dup), MW -21S MS and MSD were done at this well.

METERS USED

Temp : Corning Checkmate
Turb.: HF - Scientific
pH : Corning Checkmate
Cond.: YSI - SCT
D.O.: Corning Checkmate
Hnu / OVA : PID (11.7 ev)

Data Inputted By: EMH
Checked By: CLH

WOODWARD - CLYDE CONSULTANTS
WELL SAMPLING LOG

Date :
August 4,1992
Inspector(s) :
M. Rivers, M. Zusi

Project :
CIBA - GEIGY / Cranston, R.I
Project No :
87X4660 / Stab.

Well ID No :
MW-22S

Well Condition :
Good
Well Type :
Stainless Steel / Overburden
Screened Interval :
Bottom 10 ft. (2 ft. sump)
Lock No. :
EM-D-KAY/444
Reference Pt :
Top of riser
Well Depth / Diameter :
20.40 ft. / 4 - inches
Depth to Water [DTW] :
7.49 ft.
Water Column ; Ht./ Vol :
12.91 ft. / 8.42 gallons
Min Purge Volume : 3 well volumes=
25.0 gallons
Purged Volume :
30 gallons
Purge Date / Time(s) :
8-4-92 / 1410 - 1435
Purge Method :
2 - inch Sub. Pump
Purge Depth(s) :
20 ft.
Purge Rates (gpm) :
2.0 gpm
DTW After Purging :
13.64 ft.
Purge Observations (ullage readings,odor,etc.) :
Lt. gray, cloudy, no immiscible layers encountered.

DTW Before Sampling :
7.43 ft. @ 1528
Sample Date / Time(s) :
8-4-92 / 1530
Sampling Method :
Stainless Steel Bailer
Sampling Depth(s) :
Mid. Screen
Sample Analysis :
Appendix IX, fingerprint compounds, major ions, and treatability. Dioxin / Furan.
Analytical Lab :
Enseco - Cal, Savannah Labs, ETL
Sampling Observations :
NA
Sample Chems. Before / After:

Temp. :	21.0 / 21.0 degrees Centigrade
pH :	6.75 / 7.54 pH Units
Cond. :	470 / 465 micromhos/cm
Turb:	26.0 / >200 Nephelometric Units
D.O. :	1.8 / 4.0 Milligrams / Litre

Air Temp. / Weather Cond. :
80 degrees Fahrenheit, overcast, humid
Air Quality Data :
Background : HNU, not working,
Well Head : no readings taken.
Purge Water :
Comments:

METERS USED
Temp : Corning Checkmate
Turb.: HF - Scientific
pH : Corning Checkmate
Cond.: YSI - SCT
D.O.: Corning Checkmate
Hnu / OVA : PID (11.7 ev)

Data Inputted By: EMH
Checked By: CLH

MW-22(1).XLS

WOODWARD - CLYDE CONSULTANTS
WELL SAMPLING LOG

Date :
August 4,1992
Inspector(s) :
E.M. Hastings, C. Harwood,
M. Rivers

Project :
CIBA - GEIGY / Cranston, R.I
Project No :
87X4660 / Stab.

Well ID No :
MW-23S

Well Condition :
Good
Well Type :
Stainless Steel / Overburden
Screened Interval :
Bottom 10 ft. (2 ft. sump)
Lock No. :
EM-D-KAY/444
Reference Pt :
Top of riser
Well Depth / Diameter :
21.60 ft. / 4 - inches
Depth to Water [DTW] :
11.18 ft.
Water Column ; Ht / Vol :
10.42 ft. / 6.80 gallons
Min Purge Volume : 3 well volumes=
20.4 gallons
Purged Volume :
25 gallons
Purge Date / Time(s) :
8-4-92 / 0918 - 0931
Purge Method :
2 - inch Sub. Pump
Purge Depth(s) :
Surface - Bottom
Purge Rates (gpm) :
1.9 gpm
DTW After Purging :
11.38 ft.
Purge Observations (ullage readings,odor,etc.) :
Clear, sl. silt at first, no immiscible layers encountered.

DTW Before Sampling :
11.18 ft. @ 1051
Sample Date / Time(s) :
8-4-92 / 1100 - 1140
Sampling Method :
Stainless Steel Bailer
Sampling Depth(s) :
Mid. Screen
Sample Analysis :
Appendix IX, fingerprint compounds, major ions, and treatability. Dioxin / Furan.
Analytical Lab :
Enseco - Cal, Savannah Labs, ETL
Sampling Observations :
Clear, no noticeable odor.
Sample Chems. Before / After:

Temp. :	17.0 / 17.0 degrees Centigrade
pH :	5.76 / 5.99 pH Units
Cond. :	275 / 270 micromhos/cm
Turb:	16.9 / 141 Nephelometric Units
D.O. :	0.5 / 3.6 Milligrams / Litre

Air Temp. / Weather Cond. :
70 degrees Fahrenheit, rain.
Air Quality Data :
Background : HNU, not working,
Well Head : no readings taken.
Purge Water :
Comments:

METERS USED
Temp : Corning Checkmate
Turb.: HF - Scientific
pH : Corning Checkmate
Cond.: YSI - SCT
D.O.: Corning Checkmate
Hnu / OVA : PID (11.7 ev)

Data Inputted By: EMH
Checked By: CLH

WOODWARD - CLYDE CONSULTANTS
WELL SAMPLING LOG

Date :
August 4,1992
Inspector(s) :
E.M. Hastings, C. Harwood,
M. Rivers

Project :
CIBA - GEIGY / Cranston, R.I
Project No :
87X4660 / Stab.

Well ID No :
MW-24S

Well Condition :
Good
Well Type :
Stainless Steel / Overburden
Screened Interval :
Bottom 10 ft. (2 ft. sump)
Lock No. :
EM-D-KAY/444
Reference Pt :
Top of riser
Well Depth / Diameter :
19.60 ft. / 4 - inches
Depth to Water [DTW] :
9.94 ft. @ 0949
Water Column ; Ht / Vol :
9.66 ft. / 6.38 gallons
Min Purge Volume : 3 well volumes=
19.14 gallons
Purged Volume :
25 gallons
Purge Date / Time(s) :
8-4-92 / 1002 - 1014
Purge Method :
2 - inch Sub. Pump
Purge Depth(s) :
Surface - Bottom
Purge Rates (gpm) :
2.0 gpm
DTW After Purging :
10.00 ft. @ 1014
Purge Observations (ullage readings,odor,etc.) :
Turbid, brown, silty began to clear after 7 gallons,
no immiscible layers encountered.

DTW Before Sampling :
9.98 ft. @ 1130
Sample Date / Time(s) :
8-4-92 / 1135 - 1220
Sampling Method :
Stainless Steel Bailer
Sampling Depth(s) :
Mid. Screen
Sample Analysis :
Appendix IX, fingerprint compounds, major ions, and treatability. Dioxin / Furan.
Analytical Lab :
Enseco - Cal, Savannah Labs, ETL
Sampling Observations :
Clear - turbid, brown, no noticeable odor.
Sample Chems. Before / After:

Temp. :	19.0 / 20.0 degrees Centigrade
pH :	6.21 / 6.67 pH Units
Cond. :	240 / 250 micromhos/cm
Turb:	65.0 / >200 Nephelometric Units
D.O. :	3.0 / 3.2 Milligrams / Litre

Air Temp. / Weather Cond. :
70 degrees Fahrenheit, rain.
Air Quality Data :
Background : HNU, not working,
Well Head : no readings taken.
Purge Water :
Comments:

METERS USED
Temp : Corning Checkmate
Turb.: HF - Scientific
pH : Corning Checkmate
Cond.: YSI - SCT
D.O.: Corning Checkmate
Hnu / OVA : PID (11.7 ev)

Data Inputted By: EMH
Checked By: CLH

MW-24(1).XLS

WOODWARD - CLYDE CONSULTANTS
WELL SAMPLING LOG

Date :
August 6,1992
Inspector(s) :
M. Rivers, M. Zusi

Project :
CIBA - GEIGY / Cranston, R.I
Project No :
87X4660 / Stab.

Well ID No :
MW-29S

Well Condition :
Good
Well Type :
Stainless Steel / River Well
Screened Interval :
Bottom 5.0 ft. (2 ft. sump)
Lock No. :
EM-D-KAY/444
Reference Pt :
Top of riser
Well Depth / Diameter :
34.60 ft. / 2 - inches
Depth to Water [DTW] :
9.43 ft.
Water Column ; Ht / Vol :
25.2 ft. / 4.10 gallons
Min Purge Volume : 3 well volumes=
12.3 gallons
Purged Volume :
16 gallons
Purge Date / Time(s) :
8-6-92 / 0859 - 0910
Purge Method :
2 - inch Sub. Pump
Purge Depth(s) :
15 ft.
Purge Rates (gpm) :
2.5 gpm
DTW After Purging :
9.46 ft.
Purge Observations (ullage readings,odor,etc.) :
Clear, turned gray, cloudy, no immiscible layers encountered.

DTW Before Sampling :
9.44 ft. @ 1015
Sample Date / Time(s) :
8-6-92 / 1015 - 1055
Sampling Method :
Stainless Steel Bailer
Sampling Depth(s) :
Mid. Screen
Sample Analysis :
Appendix IX, fingerprint compounds, major ions, and treatability. Dioxin / Furan.
Analytical Lab :
Enseco - Cal, Savannah Labs, ETL
Sampling Observations :
NA
Sample Chems. Before / After:

Temp. :	19.0/ 19.0 degrees Centigrade
pH :	5.76 / 5.87 pH Units
Cond. :	315 / 280 micromhos/cm
Turb:	40 / >200 Nephelometric Units
D.O. :	0.0 / 1.0 Milligrams / Litre

Air Temp. / Weather Cond. :
NA
Air Quality Data :
Background : 0.0 ppm
Well Head : 0.1 ppm
Purge Water : 0.1 ppm
Comments:

METERS USED
Temp : Corning Checkmate
Turb.: HF - Scientific
pH : Corning Checkmate
Cond.: YSI - SCT
D.O.: Corning Checkmate
Hnu / OVA : PID (11.7 ev)

Data Inputted By: EMH
Checked By: CLH

WOODWARD - CLYDE CONSULTANTS
WELL SAMPLING LOG

Date :
August 6,1992
Inspector(s) :
M. Rivers, M. Zusi

Project :
CIBA - GEIGY / Cranston, R.I
Project No :
87X4660 / Stab.

Well ID No :
MW-29D

Well Condition :
Good
Well Type :
Stainless Steel / River Well
Screened Interval :
Bottom 10 ft. (2 ft. sump)
Lock No. :
EM-D-KAY/444
Reference Pt :
Top of riser
Well Depth / Diameter :
46.00 ft. / 2 - inches
Depth to Water [DTW] :
9.29 ft.
Water Column ; Ht / Vol :
36.70 ft. / 6.00 gallons
Min Purge Volume : 3 well volumes=
18.0 gallons
Purged Volume :
20 gallons
Purge Date / Time(s) :
8-6-92 / 0826 - 0836
Purge Method :
2 - inch Sub. Pump
Purge Depth(s) :
Surface - Bottom
Purge Rates (gpm) :
2.5 gpm
DTW After Purging :
9.36 ft.
Purge Observations (ullage readings,odor,etc.) :
Dk.gray, cloudy, no immiscible layers encountered.

DTW Before Sampling :
9.36 ft.
Sample Date / Time(s) :
8-6-92 / 0905
Sampling Method :
Stainless Steel Bailer
Sampling Depth(s) :
Mid. Screen
Sample Analysis :
Appendix IX, fingerprint compounds, major ions, and treatability. Dioxin / Furan
Analytical Lab :
Enseco - Cal, Savannah Labs, ETL
Sampling Observations :
NA
Sample Chems. Before / After:

Temp. :	19.0/ 18.5 degrees Centigrade
pH :	5.47 / 5.69 pH Units
Cond. :	700 / 950 micromhos/cm
Turb:	90 / >200 Nephelometric Units
D.O. :	0.0 / 0.6 Milligrams / Litre

Air Temp. / Weather Cond. :
NA
Air Quality Data :
Background : 0.0 ppm
Well Head : 0.1 ppm
Purge Water : 0.1 ppm
Comments:

METERS USED
Temp : Corning Checkmate
Turb.: HF - Scientific
pH : Corning Checkmate
Cond.: YSI - SCT
D.O.: Corning Checkmate
Hnu / OVA : PID (11.7 ev)

Data Inputted By: EMH
Checked By: CLH

WOODWARD - CLYDE CONSULTANTS
WELL SAMPLING LOG

Date :
August 6,1992
Inspector(s) :
M. Rivers, M. Zusi

Project :
CIBA - GEIGY / Cranston, R.I
Project No :
87X4660 / Stab.

Well ID No :
MW-30S

Well Condition :
Good
Well Type :
Stainless Steel / River Well
Screened Interval :
Bottom 5.0 ft. (2 ft. sump)
Lock No. :
EM-D-KAY/444
Reference Pt :
Top of riser
Well Depth / Diameter :
35.00 ft. / 2 - inches
Depth to Water [DTW] :
9.35 ft.
Water Column ; Ht / Vol :
25.6 ft. / 4.20 gallons
Min Purge Volume : 3 well volumes=
12.6 gallons
Purged Volume :
17 gallons
Purge Date / Time(s) :
8-6-92 / 1105 - 1113
Purge Method :
2 - inch Sub. Pump
Purge Depth(s) :
15 ft.
Purge Rates (gpm) :
2.5 gpm
DTW After Purging :
9.36 ft.
Purge Observations (ullage readings,odor,etc.) :
Gray, sl. cloudy, no immiscible layers encountered.

DTW Before Sampling :
9.34 ft.
Sample Date / Time(s) :
8-6-92 / 1215 - 1245
Sampling Method :
Stainless Steel Bailer
Sampling Depth(s) :
Mid. Screen
Sample Analysis :
Appendix IX, fingerprint compounds, major ions, and treatability. Dioxin / Furan.
Analytical Lab :
Enseco - Cal, Savannah Labs, ETL
Sampling Observations :
NA
Sample Chems. Before / After:

Temp. :	21.5/ 19.4 degrees Centigrade
pH :	6.66 / 6.77 pH Units
Cond. :	253 / 260 micromhos/cm
Turb:	14.0 / 136 Nephelometric Units
D.O. :	3.0 / 4.1 Milligrams / Litre

Air Temp. / Weather Cond. :
NA
Air Quality Data :
Background : 0.0 ppm
Well Head : 0.0 ppm
Purge Water : 0.0 ppm
Comments:

METERS USED
Temp : Corning Checkmate
Turb.: HF - Scientific
pH : Corning Checkmate
Cond.: YSI - SCT
D.O.: Corning Checkmate
Hnu / OVA : PID (11.7 ev)

Data Inputted By: EMH
Checked By: CLH

WOODWARD - CLYDE CONSULTANTS
WELL SAMPLING LOG

Date :
August 6,1992
Inspector(s) :
M. Rivers, M. Zusi

Project :
CIBA - GEIGY / Cranston, R.I
Project No :
87X4660 / Stab.

Well ID No :
MW-30D

Well Condition :
Good
Well Type :
Stainless Steel / River Well
Screened Interval :
Bottom 10 ft. (2 ft. sump)
Lock No. :
EM-D-KAY/444
Reference Pt :
Top of riser
Well Depth / Diameter :
46.00 ft. / 2 - inches
Depth to Water [DTW] :
9.38 ft.
Water Column ; Ht / Vol :
36.6 ft. / 6.00 gallons
Min Purge Volume : 3 well volumes=
18.0 gallons
Purged Volume :
21 gallons
Purge Date / Time(s) :
8-6-92 / 1030 - 1040
Purge Method :
2 - inch Sub. Pump
Purge Depth(s) :
Surface - Bottom
Purge Rates (gpm) :
2.5 gpm
DTW After Purging :
9.44 ft.
Purge Observations (ullage readings,odor,etc.) :
Clear, turned gray, cloudy, no immiscible layers encountered, no odor.

DTW Before Sampling :
9.36 ft.
Sample Date / Time(s) :
8-6-92 / 1220 - 1250
Sampling Method :
Stainless Steel Bailer
Sampling Depth(s) :
Mid. Screen
Sample Analysis :
Appendix IX, fingerprint compounds, major ions, and treatability. Dioxin / Furan.
Analytical Lab :
Enseco - Cal, Savannah Labs, ETL
Sampling Observations :
NA
Sample Chems. Before / After:

Temp. :	18.5/ 19.0 degrees Centigrade
pH :	6.85 / 6.51 pH Units
Cond. :	270 / 280 micromhos/cm
Turb:	>200 / 107 Nephelometric Units
D.O. :	2.8 / 3.8 Milligrams / Litre

Air Temp. / Weather Cond. :
NA
Air Quality Data :
Background : 0.0 ppm
Well Head : 0.0 ppm
Purge Water : 0.0 ppm
Comments:

METERS USED
Temp : Corning Checkmate
Turb.: HF - Scientific
pH : Corning Checkmate
Cond.: YSI - SCT
D.O.: Corning Checkmate
Hnu / OVA : PID (11.7 ev)

Data Inputted By: EMH
Checked By: CLH

WOODWARD - CLYDE CONSULTANTS
WELL SAMPLING LOG

Date :
August 6,1992
Inspector(s) :
M. Rivers, C. Harwood

Project :
CIBA - GEIGY / Cranston, R.I
Project No :
87X4660 / Stab.

Well ID No :
MW-31S

Well Condition :
Good
Well Type :
Stainless Steel / River Well
Screened Interval :
Bottom 5.0 ft. (2 ft. sump)
Lock No. :
EM-D-KAY/444
Reference Pt :
Top of riser
Well Depth / Diameter :
27.50 ft. / 2 - inches
Depth to Water [DTW] :
8.12 ft.
Water Column ; Ht / Vol :
19.38 ft. / 3.37 gallons
Min Purge Volume : 3 well volumes=
10.11 gallons
Purged Volume :
23 gallons
Purge Date / Time(s) :
8-6-92 / 1516 - 1525
Purge Method :
2 - inch Sub. Pump
Purge Depth(s) :
Surface - Bottom
Purge Rates (gpm) :
2.5 gpm
DTW After Purging :
11.66 ft.
Purge Observations (ullage readings,odor,etc.) :
Very silty dk. gray, cloudy, no immiscible layers encountered.

DTW Before Sampling :
8.29 ft.
Sample Date / Time(s) :
8-6-92 / 1650
Sampling Method :
Stainless Steel Bailer
Sampling Depth(s) :
Mid. Screen
Sample Analysis :
Appendix IX, fingerprint compounds, major ions, and treatability. Dioxin / Furan.
Analytical Lab :
Enseco - Cal, Savannah Labs, ETL
Sampling Observations :
NA
Sample Chems. Before / After:

Temp. :	25.0/ 22.0 degrees Centigrade
pH :	6.56 / 7.06 pH Units
Cond. :	340 / 320 micromhos/cm
Turb:	90.0 / >200 Nephelometric Units
D.O. :	4.1 / 4.5 Milligrams / Litre

Air Temp. / Weather Cond. :
NA
Air Quality Data :
Background : 0.1 ppm
Well Head : 0.1 ppm (spiked at 0.5 ppm)
Purge Water : 0.0 ppm
Comments:

METERS USED
Temp : Corning Checkmate
Turb.: HF - Scientific
pH : Corning Checkmate
Cond.: YSI - SCT
D.O.: Corning Checkmate
Hnu / OVA : PID (11.7 ev)

Data Inputted By: EMH
Checked By: CLH

WOODWARD - CLYDE CONSULTANTS
WELL SAMPLING LOG

Date :
August 6,1992
Inspector(s) :
M. Rivers, C. Harwood

Project :
CIBA - GEIGY / Cranston, R.I
Project No :
87X4660 / Stab.

Well ID No :
MW-31D

Well Condition :
Good
Well Type :
Stainless Steel / River Well
Screened Interval :
Bottom 10 ft. (2 ft. sump)
Lock No. :
EM-D-KAY/444
Reference Pt :
Top of riser
Well Depth / Diameter :
46.00 ft. / 2 - inches
Depth to Water [DTW] :
8.07 ft.
Water Column ; Ht / Vol :
37.93 ft. / 6.60 gallons
Min Purge Volume : 3 well volumes=
19.8 gallons
Purged Volume :
25 gallons
Purge Date / Time(s) :
8-6-92 / 1435 - 1445
Purge Method :
2 - inch Sub. Pump
Purge Depth(s) :
Surface - Bottom
Purge Rates (gpm) :
2.5 gpm
DTW After Purging :
8.16 ft.
Purge Observations (ullage readings,odor,etc.) :
Lt. brown, cloudy gray, no immiscible layers encountered.

DTW Before Sampling :
8.08 ft.
Sample Date / Time(s) :
8-6-92 / 1550
Sampling Method :
Stainless Steel Bailer
Sampling Depth(s) :
Mid. Screen
Sample Analysis :
Appendix IX, fingerprint compounds, major ions, and treatability. Dioxin / Furan.
Analytical Lab :
Enseco - Cal, Savannah Labs, ETL
Sampling Observations :
NA
Sample Chems. Before / After:

Temp. :	19.0/ 23.0 degrees Centigrade
pH :	6.67 / 6.67 pH Units
Cond. :	330 / 350 micromhos/cm
Turb:	>200 / 115 Nephelometric Units
D.O. :	2.5 / 4.5 Milligrams / Litre

Air Temp. / Weather Cond. :
NA
Air Quality Data :
Background : 0.3 ppm
Well Head : 0.3 ppm
Purge Water : 0.0 ppm
Comments:

METERS USED
Temp : Corning Checkmate
Turb.: HF - Scientific
pH : Corning Checkmate
Cond.: YSI - SCT
D.O.: Corning Checkmate
Hnu / OVA : PID (11.7 ev)

Data Inputted By: EMH
Checked By: CLH

MW31D(1).XLS

WOODWARD - CLYDE CONSULTANTS
WELL SAMPLING LOG

Date :
August 5,1992
Inspector(s) :
M. Rivers, M. Zusi

Project :
CIBA - GEIGY / Cranston, R.I
Project No :
87X4660 / Stab.

Well ID No :
RC - 1

Well Condition :
Good
Well Type :
Stainless Steel / Recovery Well
Screened Interval :
8 ft. - 38 ft. (5 ft. sump)
Lock No. :
EM-D-KAY/444
Reference Pt :
Top of riser
Well Depth / Diameter :
39.0 ft. / 6 - inches
Depth to Water [DTW] :
7.18 ft.
Water Column ; Ht / Vol :
31.80 ft. / 46.70 gallons
Min Purge Volume : 3 well volumes=
140 gallons
Purged Volume :
140 gallons
Purge Date / Time(s) :
8-5-92 / 1605 - 1650
Purge Method :
2 - inch Sub. Pump
Purge Depth(s) :
27 ft.
Purge Rates (gpm) :
5.0 gpm
DTW After Purging :
7.21 ft.
Purge Observations (ullage readings,odor,etc.) :
Clear, sl. odor, no immiscible layers encountered.

DTW Before Sampling :
7.18 ft.
Sample Date / Time(s) :
8-5-92 / 1700 - 1730
Sampling Method :
Stainless Steel Bailer
Sampling Depth(s) :
Mid. Screen
Sample Analysis :
Appendix IX, fingerprint compounds, major ions, and treatability. Dioxin / Furan.
Analytical Lab :
Enseco - Cal, Savannah Labs, ETL
Sampling Observations :
Clear.
Sample Chems. Before / After:

Temp. :	21.9 / 22.0 degrees Centigrade
pH :	6.96 / 7.07 pH Units
Cond. :	288 / 362 micromhos/cm
Turb:	8.0 / 162 Nephelometric Units
D.O. :	2.0 / 3.9 Milligrams / Litre

Air Temp. / Weather Cond. :
NA
Air Quality Data :
Background : HNU, not working,
Well Head : no readings taken.
Purge Water :
Comments:

METERS USED
Temp : Corning Checkmate
Turb.: HF - Scientific
pH : Corning Checkmate
Cond.: YSI - SCT
D.O.: Corning Checkmate
Hnu / OVA : PID (11.7 ev)

Data Inputted By: EMH
Checked By: CLH

WOODWARD - CLYDE CONSULTANTS
WELL SAMPLING LOG

Date :
August 5,1992
Inspector(s) :
M. Rivers, M. Zusi

Project :
CIBA - GEIGY / Cranston, R.I
Project No :
87X4660 / Stab.

Well ID No :
RC - 2

Well Condition :
Good
Well Type :
Stainless Steel / Recovery Well
Screened Interval :
23 ft. - 51 ft. (2 ft. sump)
Lock No. :
EM-D-KAY/444
Reference Pt :
Top of riser
Well Depth / Diameter :
55.8 ft. / 6 - inches
Depth to Water [DTW] :
8.09 ft.
Water Column ; Ht / Vol :
47.70 ft. / 70.10 gallons
Min Purge Volume : 3 well volumes=
210 gallons
Purged Volume :
220 gallons
Purge Date / Time(s) :
8-5-92 / 1355 - 1425
Purge Method :
2 - inch Sub. Pump
Purge Depth(s) :
30 ft.
Purge Rates (gpm) :
10.0 gpm
DTW After Purging :
11.20 ft.
Purge Observations (ullage readings,odor,etc.) :
Clear, sl. odor, no immiscible layers encountered.

DTW Before Sampling :
8.11 ft.
Sample Date / Time(s) :
8-5-92 / 1510 - 1555
Sampling Method :
Stainless Steel Bailer
Sampling Depth(s) :
Mid. Screen
Sample Analysis :
Appendix IX, fingerprint compounds, major ions, and treatability. Dioxin / Furan.
Analytical Lab :
Enseco - Cal, Savannah Labs, ETL
Sampling Observations :
NA
Sample Chems. Before / After:

Temp. :	17.5 / 17.3 degrees Centigrade
pH :	7.12 / 7.26 pH Units
Cond. :	380 / 370 micromhos/cm
Turb:	3.5 / 4.5 Nephelometric Units
D.O. :	1.6 / 3.1 Milligrams / Litre

Air Temp. / Weather Cond. :
NA
Air Quality Data :
Background : HNU, not working,
Well Head : no readings taken.
Purge Water :
Comments:

METERS USED
Temp : Corning Checkmate
Turb.: HF - Scientific
pH : Corning Checkmate
Cond.: YSI - SCT
D.O.: Corning Checkmate
Hnu / OVA : PID (11.7 ev)

Data Inputted By: EMH
Checked By: CLH

WOODWARD - CLYDE CONSULTANTS
WELL SAMPLING LOG

Date :
November 17,1992
Inspector(s) :
E.M. Hastings, M. Rivers

Project :
CIBA - GEIGY / Cranston, R.I
Project No :
87X4660 / Stab.

Well ID No :
P-34S

Well Condition :
Good
Well Type :
PVC / Overburden
Screened Interval :
Bottom 5 ft.
Lock No. :
EM-D-KAY/444
Reference Pt :
Top of riser
Well Depth / Diameter :
17.80 ft. / 2 - inches
Depth to Water [DTW] :
7.20 ft. @ 0909
Water Column ; Ht / Vol :
10.60 ft. / 1.84 gallons
Min Purge Volume : 3 well volumes=
5.52 gallons
Purged Volume :
2.50 gallons
Purge Date / Time(s) :
11-17-92 / 0910 - 0912
Purge Method :
Hydrolift w/ dedicated poly. tubing
Purge Depth(s) :
Surf. - Bottom
Purge Rates (gpm) :
est 1.25 gpm
DTW After Purging :
14.70 ft. @ 0912
Purge Observations (ullage readings,odor,etc.) :
Gray, turbid, no odor, no immiscible layers encountered.
Well purged dry @ 2.5 gallons.

DTW Before Sampling :
7.32 ft. @ 1031
Sample Date / Time(s) :
11-17-92 / 1035
Sampling Method :
Poly. disposable bailer.
Sampling Depth(s) :
Mid. Screen
Sample Analysis :
VOC (8240), and tot. metals.

Analytical Lab :
ETL
Sampling Observations :
Cloudy, sl. odor.
Sample Chems:

Temp. :	12.4 degrees Centigrade
pH :	6.87 pH Units
Cond. :	750 micromhos/cm
Turb:	>200 Nephelometric Units
D.O. :	NA

Air Temp. / Weather Cond. :
5.0 degrees Centigrade, overcast.
Air Quality Data :
Background : 0.2 ppm,
Well Head : 0.4 ppm
Purge Water : 0.4 ppm
Comments:

METERS USED
Temp : Corning Checkmate
Turb.: HF - Scientific
pH : Corning Checkmate
Cond.: YSI - SCT
D.O.: NA
Hnu / OVA : PID (11.7 ev)

Data Inputted By: EMH
Checked By: CLH

WOODWARD - CLYDE CONSULTANTS
WELL SAMPLING LOG

Date :
November 17,1992
Inspector(s) :
E.M. Hastings, M. Rivers

Project :
CIBA - GEIGY / Cranston, R.I
Project No :
87X4660 / Stab.

Well ID No :
P-35S

Well Condition :
Good
Well Type :
PVC / Overburden
Screened Interval :
Bottom 5 ft.
Lock No. :
EM-D-KAY/444
Reference Pt :
Top of riser
Well Depth / Diameter :
17.20 ft. / 2 - inches
Depth to Water [DTW] :
6.54 ft. @ 1048
Water Column ; Ht / Vol :
10.66 ft. / 1.85 gallons
Min Purge Volume : 3 well volumes=
5.55 gallons
Purged Volume :
8.00 gallons
Purge Date / Time(s) :
11-17-92 / 1055 - 1058
Purge Method :
Hydrolift w/ dedicated poly. tubing
Purge Depth(s) :
Surf. - Bottom
Purge Rates (gpm) :
est 2.50 gpm
DTW After Purging :
7.20 ft. @ 1058
Purge Observations (ullage readings,odor,etc.) :
Black, turbid, silty, strong odor, no immiscible layers encountered.

DTW Before Sampling :
6.57 ft. @ 1123
Sample Date / Time(s) :
11-17-92 / 1125
Sampling Method :
Poly. disposable bailer.
Sampling Depth(s) :
Mid. Screen
Sample Analysis :
VOC (8240), and tot. metals.

Analytical Lab :
ETL
Sampling Observations :
Cloudy, st. odor.
Sample Chems:

Temp. :	11.4 degrees Centigrade
pH :	6.47 pH Units
Cond. :	1800 micromhos/cm
Turb:	7.95 Nephelometric Units
D.O. :	NA

Air Temp. / Weather Cond. :
5.5 degrees Centigrade, overcast.
Air Quality Data :
Background : 0.4 ppm,
Well Head : 16.2 ppm
Purge Water : 3.2 ppm
Comments:

METERS USED
Temp : Corning Checkmate
Turb.: HF - Scientific
pH : Corning Checkmate
Cond.: YSI - SCT
D.O.: NA
Hnu / OVA : PID (11.7 ev)

Data Inputted By: EMH
Checked By: CLH

WOODWARD - CLYDE CONSULTANTS
WELL SAMPLING LOG

Date :
November 17,1992
Inspector(s) :
E.M. Hastings, M. Rivers

Project :
CIBA - GEIGY / Cranston, R.I
Project No :
87X4660 / Stab.

Well ID No :
P-36S

Well Condition :
Good
Well Type :
PVC / Overburden
Screened Interval :
Bottom 5 ft.
Lock No. :
EM-D-KAY/444
Reference Pt :
Top of riser
Well Depth / Diameter :
18.00 ft. / 2 - inches
Depth to Water [DTW] :
7.08 ft. @ 1140
Water Column ; Ht / Vol :
10.92 ft. / 1.90 gallons
Min Purge Volume : 3 well volumes=
5.70 gallons
Purged Volume :
7.00 gallons
Purge Date / Time(s) :
11-17-92 / 1147 - 1152
Purge Method :
Hydrolift w/ dedicated poly. tubing
Purge Depth(s) :
Surf. - Bottom
Purge Rates (gpm) :
est 1.40 gpm
DTW After Purging :
10.70 ft. @ 1152
Purge Observations (ullage readings,odor,etc.) :
Black, turbid, silty, strong odor, no immiscible layers encountered.

DTW Before Sampling :
7.15 ft. @ 1212
Sample Date / Time(s) :
11-17-92 / 1215
Sampling Method :
Poly. disposable bailer.
Sampling Depth(s) :
Mid. Screen
Sample Analysis :
VOC (8240), and tot. metals.

Analytical Lab :
ETL
Sampling Observations :
Cloudy, black, st. odor.
Sample Chems:

Temp. :	11.3 degrees Centigrade
pH :	6.84 pH Units
Cond. :	750 micromhos/cm
Turb:	51.00 Nephelometric Units
D.O. :	NA

Air Temp. / Weather Cond. :
5.5 degrees Centigrade, overcast.
Air Quality Data :
Background : 0.4 ppm,
Well Head : 8.6 ppm
Purge Water : 16.8 ppm
Comments:

METERS USED
Temp : Corning Checkmate
Turb.: HF - Scientific
pH : Corning Checkmate
Cond.: YSI - SCT
D.O.: NA
Hnu / OVA : PID (11.7 ev)

Data Inputted By: EMH
Checked By: CLH

WOODWARD - CLYDE CONSULTANTS
WELL SAMPLING LOG

Date :
November 17,1992
Inspector(s) :
E.M. Hastings, M. Rivers

Project :
CIBA - GEIGY / Cranston, R.I
Project No :
87X4660 / Stab.

Well ID No :
P-37S

Well Condition :
Good
Well Type :
PVC / Overburden
Screened Interval :
Bottom 5 ft.
Lock No. :
EM-D-KAY/444
Reference Pt :
Top of riser
Well Depth / Diameter :
16.80 ft. / 2 - inches
Depth to Water [DTW] :
6.33 ft. @ 1338
Water Column ; Ht / Vol :
10.47 ft. / 1.82 gallons
Min Purge Volume : 3 well volumes=
5.46 gallons
Purged Volume :
3.50 gallons
Purge Date / Time(s) :
11-17-92 / 1345 - 1346; 1356 - 1358
Purge Method :
Hydrolift w/ dedicated poly. tubing
Purge Depth(s) :
Surf. - Bottom
Purge Rates (gpm) :
est 1.20 gpm
DTW After Purging :
15.12 ft. @ 1358
Purge Observations (ullage readings,odor,etc.) :
Dk. brown - dk. gray, turbid, silty, strong odor,
no immiscible layers encountered.
Well purged dry @ 2.5 gallons, waited 10 minutes,
and purged 1.0 gallons more.

DTW Before Sampling :
6.40 ft. @ 1439
Sample Date / Time(s) :
11-17-92 / 1445
Sampling Method :
Poly. disposable bailer.
Sampling Depth(s) :
Mid. Screen
Sample Analysis :
VOC (8240), and tot. metals.

Analytical Lab :
ETL
Sampling Observations :
Cloudy, no noticeable odor.
Sample Chems:

Temp. :	11.9 degrees Centigrade
pH :	6.44 pH Units
Cond. :	422 micromhos/cm
Turb:	144 Nephelometric Units
D.O. :	NA

Air Temp. / Weather Cond. :
3.9 degrees Centigrade, drizzle.
Air Quality Data :
Background : 0.5 ppm,
Well Head : 4.9 ppm
Purge Water : 1.9 ppm
Comments:

METERS USED
Temp : Corning Checkmate
Turb.: HF - Scientific
pH : Corning Checkmate
Cond.: YSI - SCT
D.O.: NA
Hnu / OVA : PID (11.7 ev)

Data Inputted By: EMH
Checked By: CLH

WOODWARD - CLYDE CONSULTANTS
WELL SAMPLING LOG

Date :
November 17,1992
Inspector(s) :
E.M. Hastings, M. Rivers

Project :
CIBA - GEIGY / Cranston, R.I
Project No :
87X4660 / Stab.

Well ID No :
P-38S

Well Condition :
Good
Well Type :
PVC / Overburden
Screened Interval :
Bottom 5 ft.
Lock No. :
EM-D-KAY/444
Reference Pt :
Top of riser
Well Depth / Diameter :
18.02 ft. / 2 - inches
Depth to Water [DTW] :
7.04 ft. @ 1455
Water Column ; Ht / Vol :
10.98 ft. / 1.90 gallons
Min Purge Volume : 3 well volumes=
5.70 gallons
Purged Volume :
6.00 gallons
Purge Date / Time(s) :
11-17-92 / 1503 - 1504; 1519 - 1522
Purge Method :
Hydrolift w/ dedicated poly. tubing
Purge Depth(s) :
Surf. - Bottom
Purge Rates (gpm) :
est 1.50 - 2.00 gpm
DTW After Purging :
13.76 ft. @ 1522
Purge Observations (ullage readings,odor,etc.) :
Dk. brown, turbid, silty, no immiscible layers encountered.
Well purged dry @ 3.0 gallons, waited 15 minutes,
and purged 3.0 gallons more.

DTW Before Sampling :
7.05 ft. @ 1540
Sample Date / Time(s) :
11-17-92 / 1545
Sampling Method :
Poly. disposable bailer.
Sampling Depth(s) :
Mid. Screen
Sample Analysis :
VOC (8240), and tot. metals.

Analytical Lab :
ETL
Sampling Observations :
Cloudy, silty.
Sample Chems:

Temp. :	12.1 degrees Centigrade
pH :	6.07 pH Units
Cond. :	478 micromhos/cm
Turb:	171 Nephelometric Units
D.O. :	NA

Air Temp. / Weather Cond. :
3.3 degrees Centigrade, overcast.
Air Quality Data :
Background : 0.4 ppm,
Well Head : 14.4 ppm
Purge Water : 0.8 ppm
Comments:

METERS USED
Temp : Corning Checkmate
Turb.: HF - Scientific
pH : Corning Checkmate
Cond.: YSI - SCT
D.O.: NA
Hnu / OVA : PID (11.7 ev)

Data Inputted By: EMH
Checked By: CLH

Appendix F

F

WATER LEVEL MEASUREMENTS

This appendix presents the water level measurement data obtained during the stabilization investigation in the Production Area under the RCRA Facility Investigation at the CIBA-GEIGY facility in Cranston, RI. These water level measurements include continuous groundwater level and surface water level data collected using AQUISTAR data loggers, as well as monthly groundwater and surface water levels collected manually. These data are organized in two main sections. The first section presents the monthly groundwater levels (measured manually) in a table that lists the well/piezometer identifier (e.g., P-1S) at which manual measurements were obtained, the reference elevation (above ground surface) of the well/piezometer, the depth down the well to the water table (i.e., the depth to the water table from the top of the riser), and the (calculated) groundwater elevation. This section also presents the monthly surface water levels in the river and at other locations (measured manually) in a table. The second section presents the continuous groundwater level data (recorded automatically), in graphs. Within this section, the continuous groundwater level hydrographs are organized by well cluster location — the first set of graphs is for wells MW-1S and MW-1D, the second set is for wells MW-10S and MW-10D. Each continuous groundwater hydrograph shows groundwater levels at one well cluster location for one month in both the shallow and deep wells. This section also presents the continuous surface water level data (recorded automatically) from the stilling well in the Pawtuxet River, in graphs. Again, the continuous surface water level hydrographs are organized by location.

Table F-1. Monthly Water Level Data

LOCATION ID	REFERENCE ELEVATION	DEPTH TO WATER (in feet below Reference Elevation) 6/28/92	8/3/92	9/3/92	10/12/92	10/26/92	11/30/92	2/3/93	GROUNDWATER ELEVATION (in feet MSL) 6/28/92	8/3/92	9/3/92	10/12/92	10/26/92	11/30/92	2/3/93
P-1S	16.41	7.63	7.70	7.46	6.95	7.35	6.55	7.25	8.78	8.71	8.95	9.46	9.06	9.86	9.16
P-1D	16.33	7.84	7.97	7.87	6.53	7.83	7.20	8.15	8.49	8.36	8.46	9.80	8.50	9.13	8.18
P-2S	13.85	5.55	5.63	5.44	5.10	5.38	4.58	4.91	8.30	8.22	8.41	8.75	8.47	9.27	8.94
P-2D	15.72	NP	7.38	7.68	7.04	7.20	6.49	6.59	NA	8.34	8.04	8.68	8.52	9.23	9.13
P-3S	15.45	8.20	8.05	8.08	7.91	8.07	NA	7.54	7.25	7.40	7.37	7.54	7.38	NA	7.91
P-4S	19.92	9.03	6.50	8.32	8.30	8.61	7.71	7.73	10.89	13.42	11.60	11.62	11.31	12.21	12.19
P-5S	21.18	10.26	10.28	10.12	10.16	10.37	7.10	9.52	10.92	10.90	11.06	11.02	10.81	14.08	11.66
P-6S	23.62	12.63	12.68	12.45	12.26	12.74	NA	11.84	10.99	10.94	11.17	11.36	10.88	NA	11.78
P-6M	21.80	10.54	10.00	10.47	10.37	10.72	9.82	9.86	11.26	11.80	11.33	11.43	11.08	11.98	11.94
P-7SA	16.26	6.09	6.06	6.03	5.68	5.80	4.18	5.28	10.17	10.20	10.23	10.58	10.46	12.08	10.98
P-7SB	15.68	5.49	5.46	5.42	5.12	5.32	4.66	4.80	10.19	10.22	10.26	10.56	10.36	11.02	10.88
P-8S	16.21	9.89	9.84	9.64	9.50	9.62	9.12	9.30	6.32	6.37	6.57	6.71	6.59	7.09	6.91
P-9S	16.10	8.21	8.34	8.05	7.98	8.10	9.12	7.20	7.89	7.76	8.05	8.12	8.00	6.98	8.90
P-10S	14.05	7.68	7.64	7.64	7.31	7.43	6.90	7.13	6.37	6.41	6.41	6.74	6.62	7.15	6.92
P-11S	17.95	6.03	6.16	5.93	6.00	6.08	5.72	5.65	11.92	11.79	12.02	11.95	11.87	12.23	12.30
P-12SA	15.29	7.53	7.64	7.38	7.28	7.40	6.40	6.48	7.76	7.65	7.91	8.01	7.89	8.89	8.81
P-12SB	15.32	6.54	6.74	6.60	6.40	6.52	5.60	5.60	8.78	8.58	8.72	8.92	8.80	9.72	9.72
P-13S	26.99	13.73	13.94	13.54	13.71	13.90	12.92	12.86	13.26	13.05	13.45	13.28	13.09	14.07	14.13
P-13D	18.79	NP	8.95	8.71	8.67	8.82	8.00	8.09	NA	9.84	10.08	10.12	9.97	10.79	10.70
P-14S	24.18	9.72	10.00	9.56	9.78	8.96	9.02	8.82	14.46	14.18	14.62	14.40	15.22	15.16	15.36
P-14D	23.95	9.19	9.50	9.08	9.30	8.48	8.54	8.32	14.76	14.45	14.87	14.65	15.47	15.41	15.63
P-15S	15.69	8.99	8.98	8.91	8.58	8.64	8.02	8.26	6.70	6.71	6.78	7.11	7.05	7.67	7.43
P-16S	16.29	9.29	9.31	9.18	8.91	9.00	8.22	8.46	7.00	6.98	7.11	7.38	7.29	8.07	7.83
P-17S	17.07	7.15	7.58	7.39	7.48	NA	6.52	6.59	9.92	9.49	9.68	9.59	NA	10.55	10.48
P-18D	13.27	2.75	2.84	2.75	2.68	2.80	2.32	2.23	10.52	10.43	10.52	10.59	10.47	10.95	11.04
P-19D	17.21	4.14	4.12	4.08	3.92	4.10	2.56	3.30	13.07	13.09	13.13	13.29	13.11	14.65	13.91
P-20S	24.02	13.95	14.02	13.72	13.78	14.10	13.40	13.26	10.07	10.00	10.30	10.24	9.92	10.62	10.76
P-20D	24.30	14.11	13.20	14.00	14.20	14.36	13.84	13.20	10.19	11.10	10.30	10.10	9.94	10.46	11.10
P-21S	16.96	9.89	9.96	9.91	9.63	9.80	8.98	9.15	7.07	7.00	7.05	7.33	7.16	7.98	7.81
P-21D	15.75	5.61	5.73	5.49	5.56	5.55	5.14	4.85	10.14	10.02	10.26	10.19	10.20	10.61	10.90
P-22S	18.75	8.90	9.35	9.02	9.18	9.25	8.08	8.10	9.85	9.40	9.73	9.57	9.50	10.67	10.65
P-22D	17.57	6.37	6.54	6.45	6.46	6.54	6.10	5.45	11.20	11.03	11.12	11.11	11.03	11.47	12.12
P-23D	35.42	18.10	18.36	18.14	18.42	18.54	18.02	17.42	17.32	17.06	17.28	17.00	16.88	17.40	18.00
P-24D	29.43	17.97	14.14	18.00	18.20	18.18	17.64	17.18	11.46	15.29	11.43	11.23	11.25	11.79	12.25
P-25D	16.93	4.82	5.00	4.80	4.86	5.00	4.48	4.00	12.11	11.93	12.13	12.07	11.93	12.45	12.93
P-26S	17.29	7.60	7.85	7.74	7.72	7.97	6.98	7.10	9.69	9.44	9.55	9.57	9.32	10.31	10.19
P-26D	17.59	8.55	8.62	8.55	8.36	8.28	7.88	19.92	9.04	8.97	9.04	9.23	9.31	9.71	-2.33
P-27D	15.76	8.54	8.52	7.95	8.19	8.01	7.64	7.81	7.22	7.24	7.81	7.57	7.75	8.12	7.95
P-29D	16.68	NP	8.84	8.86	8.57	8.75	8.02	7.96*	NA	7.84	7.82	8.11	7.93	8.66	8.72*
P-30D	16.98	NP	8.41	8.28	8.04	8.23	7.35	7.44*	NA	8.57	8.70	8.94	8.75	9.63	9.54*
P-31D	16.54	NP	8.15	8.62	7.94	8.15	7.42	7.32*	NA	8.39	7.92	8.60	8.39	9.12	9.22*

* - Depth to ice in Riser
NA - information not available
NP - Not present at time of measurement

CLH: b:\WTRLVL2.XLS
4/16/93 3:03 PM

Table F-1. Monthly Water Level Data

LOCATION ID	REFERENCE ELEVATION	DEPTH TO WATER (in feet below Reference Elevation)							GROUNDWATER ELEVATION (in feet MSL)						
		6/28/92	8/3/92	9/3/92	10/12/92	10/26/92	11/30/92	2/3/93	6/28/92	8/3/92	9/3/92	10/12/92	10/26/92	11/30/92	2/3/93
P-34S	17.15	NP	NP	NP	NP	NP	6.18	6.47	NA	NA	NA	NA	NA	10.97	10.68
P-35S	15.32	NP	NP	NP	NP	NP	5.97	6.23	NA	NA	NA	NA	NA	9.35	9.09
P-36S	15.91	NP	NP	NP	NP	NP	6.54	6.80	NA	NA	NA	NA	NA	9.37	9.11
P-37S	15.69	NP	NP	NP	NP	NP	5.73	5.93	NA	NA	NA	NA	NA	9.96	9.76
P-38S	16.19	NP	NP	NP	NP	NP	6.52	6.62	NA	NA	NA	NA	NA	9.67	9.57
EP-1	22.90	12.72	12.92	12.60	12.66	12.82	NA	12.00	10.18	9.98	10.30	10.24	10.08	NA	10.90
EP-2	24.52	11.30	11.50	11.12	11.30	11.42	10.50	10.48	13.22	13.02	13.40	13.22	13.10	14.02	14.04
EP-5	15.84	7.90	8.16	7.91	7.80	7.96	NA	4.20	7.94	7.68	7.93	8.04	7.88	NA	11.64
EP-6	11.04	4.52	4.50	4.33	4.10	2.80	3.44	3.18	6.52	6.54	6.71	6.94	8.24	7.60	7.86
EP-7	14.37	6.03	6.43	5.95	6.05	6.30	5.18	5.24	8.34	7.94	8.42	8.32	8.07	9.19	9.13
EP-8A	19.91	7.21	7.44	7.06	7.18	7.32	6.38	6.40	12.70	12.47	12.85	12.73	12.59	13.53	13.51
EP-8B	24.41	DRY	DRY	10.00	10.00	DRY	DRY	NA	NA	NA	14.41	14.41	NA	NA	NA
MW-1S	15.04	AQ	AQ	AQ	AQ	6.22	5.09	5.93	NA	NA	NA	NA	8.82	9.95	9.11
MW-1D	16.28	AQ	AQ	AQ	AQ	7.55	6.82	6.96	NA	NA	NA	NA	8.73	9.46	9.32
MW-2S	14.46	5.66	5.78	5.63	4.82	5.54	4.66	5.35	8.80	8.68	8.83	9.64	8.92	9.80	9.11
MW-3S	16.61	8.44	8.35	8.35	8.60	8.35	7.69	7.82	8.17	8.26	8.26	8.01	8.26	8.92	8.79
MW-4S	21.29	10.21	10.40	10.09	10.17	10.33	9.42	9.52	11.08	10.89	11.20	11.12	10.96	11.87	11.77
MW-5SA	27.23	NP	12.80	12.34	12.56	12.66	11.80	11.60	NA	14.43	14.89	14.67	14.57	15.43	15.63
MW-6S	14.04	7.32	7.38	7.25	7.00	7.12	6.48	6.66	6.72	6.66	6.79	7.04	6.92	7.56	7.38
MW-7S	15.25	8.12	8.12	7.94	7.74	7.88	7.14	7.35	7.13	7.13	7.31	7.51	7.37	8.11	7.90
MW-8S	17.57	11.23	11.20	11.01	10.84	11.00	10.48	10.65	6.34	6.37	6.56	6.73	6.57	7.09	6.92
MW-9S	17.91	6.74	7.68	6.68	NA	NA	6.68	6.00	11.17	10.23	11.23	NA	NA	11.23	11.91
MW-10S	22.62	11.14	AQ	AQ	AQ	11.45	10.28	10.39	11.48	NA	NA	NA	11.17	12.34	12.23
MW-10D	21.61	10.10	AQ	AQ	AQ	10.22	9.29	9.35	11.51	NA	NA	NA	11.39	12.32	12.26
MW-11S	13.67	7.00	7.04	6.85	6.62	5.74	6.04	6.17	6.67	6.63	6.82	7.05	7.93	7.63	7.50
MW-12S	22.54	11.36	NA	NA	NA	11.57	10.55	10.60	11.18	NA	NA	NA	10.97	11.99	11.94
MW-12D	21.23	9.87	9.00	9.70	9.80	9.97	8.97	9.10	11.36	12.23	11.53	11.43	11.26	12.26	12.13
MW-13S	18.44	8.34	8.34	7.26	8.18	8.34	7.51	7.59	10.10	10.10	11.18	10.26	10.10	10.93	10.85
MW-14S	21.39	10.04	10.10	9.92	9.85	10.05	9.14	9.32	11.35	11.29	11.47	11.54	11.34	12.25	12.07
MW-15D	16.65	4.55	4.74	4.59	4.62	4.74	4.24	3.78	12.10	11.91	12.06	12.03	11.91	12.41	12.87
MW-15S	16.99	8.83	8.66	8.71	8.52	8.64	7.60	7.80	8.16	8.33	8.28	8.47	8.35	9.39	9.19
MW-16S	26.00	12.23	12.52	12.10	12.30	12.44	11.60	11.50	13.77	13.48	13.90	13.70	13.56	14.40	14.50
MW-16D	26.44	11.89	12.18	11.74	12.00	12.16	11.28	11.04	14.55	14.26	14.70	14.44	14.28	15.16	15.40
MW-17S	16.75	8.00	8.36	8.04	8.18	8.27	7.20	8.30	8.75	8.39	8.71	8.57	8.48	9.55	8.45
MW-17D	17.29	6.38	6.54	6.43	6.42	6.41	6.04	5.48	10.91	10.75	10.86	10.87	10.88	11.25	11.81
MW-18S	35.28	18.39	18.76	18.62	14.20	19.00	NA	NA	16.89	16.52	16.66	21.08	16.28	NA	NA
MW-19S	29.17	17.75	17.96	17.76	19.20	17.94	17.38	16.86	11.42	11.21	11.41	9.97	11.23	11.79	12.31
MW-20S	22.24	NP	7.54	10.14	10.25	11.82	9.38	9.53	NA	14.70	12.10	11.99	10.42	12.86	12.71
MW-21S	15.82	NP	5.28	4.88	4.93	5.22	4.40	4.40	NA	10.54	10.94	10.89	10.60	11.42	11.42
MW-22S	17.31	NP	7.51	7.24	7.05	7.15	6.24	6.54	NA	9.80	10.07	10.26	10.16	11.07	10.77
MW-23S	21.10	NP	11.03	10.91	10.97	10.95	10.31	10.34	NA	10.07	10.19	10.13	10.15	10.79	10.76

* - Depth to ice in Riser
NA - information not available
NP - Not present at time of measurement

Table F-1. Monthly Water Level Data

LOCATION ID	REFERENCE ELEVATION	DEPTH TO WATER (in feet below Reference Elevation)							GROUNDWATER ELEVATION (in feet MSL)						
		6/28/92	8/3/92	9/3/92	10/12/92	10/26/92	11/30/92	2/3/93	6/28/92	8/3/92	9/3/92	10/12/92	10/26/92	11/30/92	2/3/93
MW-24S	21.59	NP	9.81	9.64	9.58	9.90	9.00	9.01	NA	11.78	11.95	12.01	11.69	12.59	12.58
MW-29S	16.87	NP	9.04	9.33	9.05	9.23	8.36	8.51*	NA	7.83	7.54	7.82	7.64	8.51	8.36*
MW-29D	16.75	NP	9.27	9.15	8.85	9.05	8.40	8.28*	NA	7.48	7.60	7.90	7.70	8.35	8.47*
MW-30S	16.92	NP	9.20	9.23	8.97	9.15	8.53	8.57*	NA	7.72	7.69	7.95	7.77	8.39	8.35*
MW-30D	16.93	NP	9.32	9.32	9.00	9.17	8.53	8.50*	NA	7.61	7.61	7.93	7.76	8.40	8.43*
MW-31S	16.55	NP	8.02	8.42	7.80	8.00	7.25	7.09*	NA	8.53	8.13	8.75	8.55	9.30	9.46*
MW-31D	16.49	NP	8.01	8.42	7.62	7.80	7.25	7.26*	NA	8.48	8.07	8.87	8.69	9.24	9.23*
P-32S	16.94	NP	NP	7.72	7.53	7.56	6.97	7.11	NA	NA	9.22	9.41	9.38	9.97	9.83
P-32D	17.10	NP	NP	8.34	8.14	8.32	7.62	7.76	NA	NA	8.76	8.96	8.78	9.48	9.34
P-33S	17.73	NP	NP	NA	8.10	8.41	7.21	7.79	NA	NA	NA	9.63	9.32	10.52	9.94
P-33D	16.88	NP	NP	NA	8.03	8.20	7.49	7.61	NA	NA	NA	8.85	8.68	9.39	9.27
RW-1	16.52	7.65	7.66	7.53	7.33	NA	NA	6.75	8.87	8.86	8.99	9.19	NA	NA	9.77
RW-2	18.05	6.70	6.84	6.60	6.76	6.88	6.36	5.80	11.35	11.21	11.45	11.29	11.17	11.69	12.25
RW-3	13.49	2.96	3.10	3.00	3.40	3.24	3.12	2.23	10.53	10.39	10.49	10.09	10.25	10.37	11.26
RW-4	23.79	13.67	13.80	18.20	13.60	13.70	13.08	12.92	10.12	9.99	5.59	10.19	10.09	10.71	10.87
RC-1	16.63	NA	7.16	7.00	6.85	7.00	6.13	6.41	NA	9.47	9.63	9.78	9.63	10.50	10.22
RC-2	17.05	NP	8.70	NA	7.77	7.95	7.20	7.37	NA	8.35	NA	9.28	9.10	9.85	9.68
VE-1	21.80	NP	NP	10.30	10.40	10.55	9.67	9.69	NA	NA	11.50	11.40	11.25	12.13	12.11
VE-2	21.59	NP	NP	10.17	10.24	10.42	9.55	10.32	NA	NA	11.42	11.35	11.17	12.04	11.27
VE-3	21.14	NP	NP	5.79	9.85	10.05	9.17	9.21	NA	NA	15.35	11.29	11.09	11.97	11.93
ORTF	10.06	NA	NA	NA	9.70	9.50	10.00	9.60	NA	NA	NA	6.76	6.56	7.06	6.66
Belfont Pond	18.31	1.50	NA	NA	1.20	1.10	NA	2.00	15.81	NA	NA	15.51	15.41	NA	16.31
Roger Wm. Park	29.91	NA	NA	NA	1.83	1.86	NA	NA	NA	NA	NA	28.08	28.05	NA	NA
SG-1 upstream	18.06	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SG-2 downstrea	11.43	NA	NA	NA	6.80	6.60	7.10	7.00	NA	NA	NA	6.73	6.53	7.03	6.93
WWT Pond	16.98	2.35	NA	NA	2.40	2.40	2.40	2.50	14.33	NA	NA	14.38	14.38	14.38	14.48

* - Depth to ice in Riser
NA - information not available
NP - Not present at time of measurement

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4/16/93 3:03 PM

Figure F-1: MW-1S and MW-1D Hydrographs - June 1992

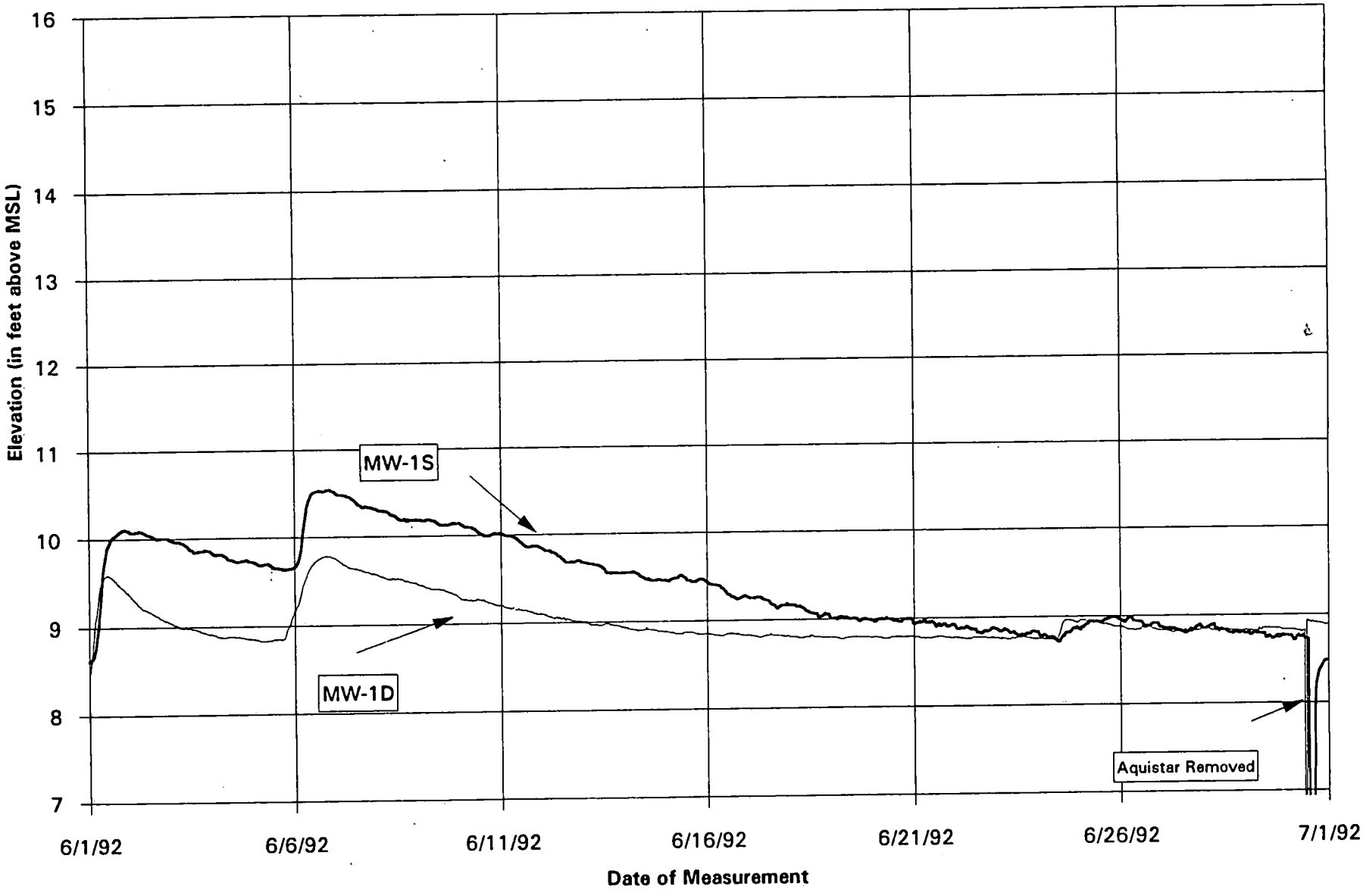

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Figure F-2: MW-1S and MW-1D Hydrographs - July 1992

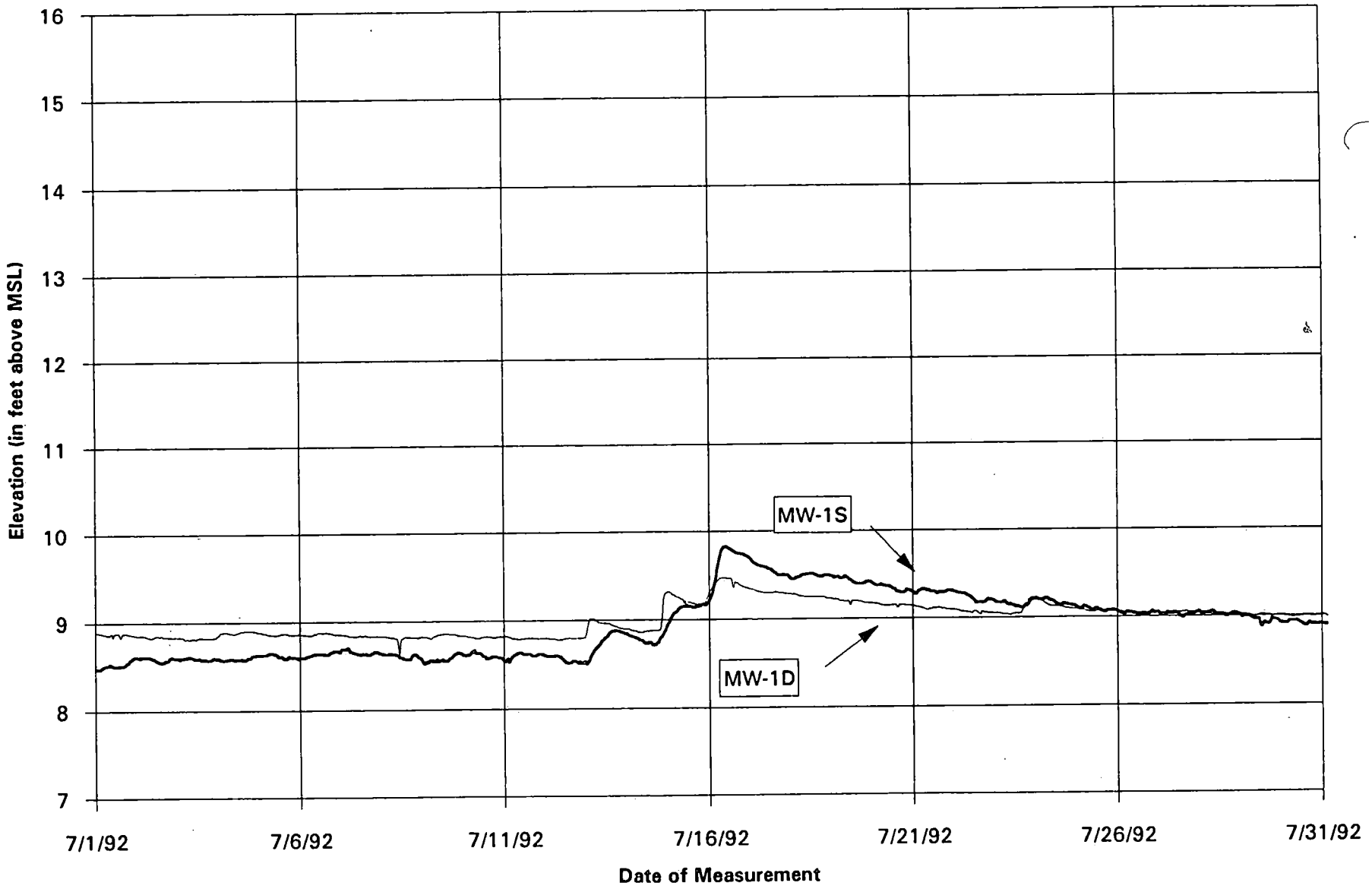

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Figure F-3: MW-1S and MW-1D Hydrographs - August 1992

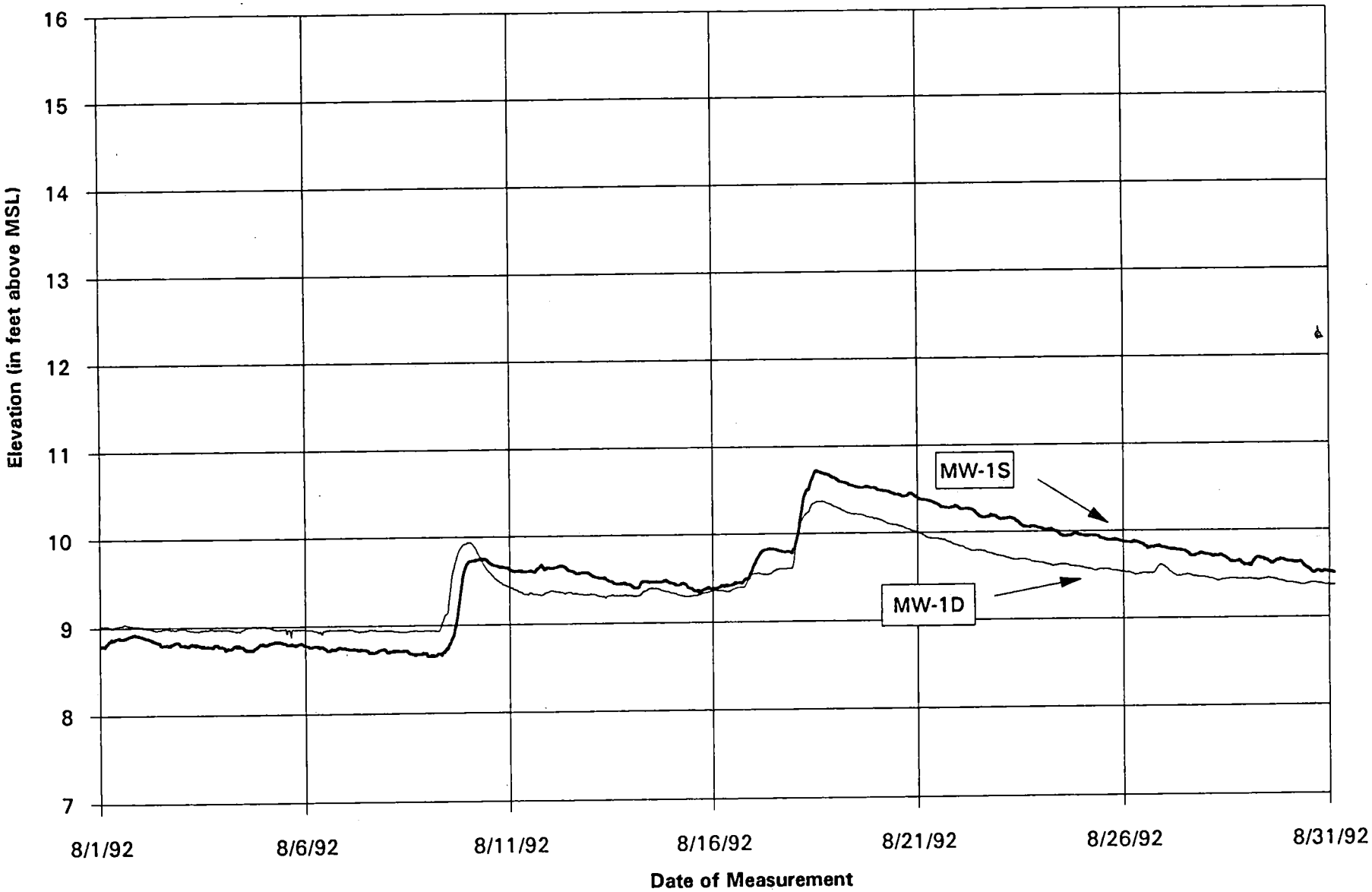

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Figure F-4: MW-1S and MW-1D Hydrographs - September 1992

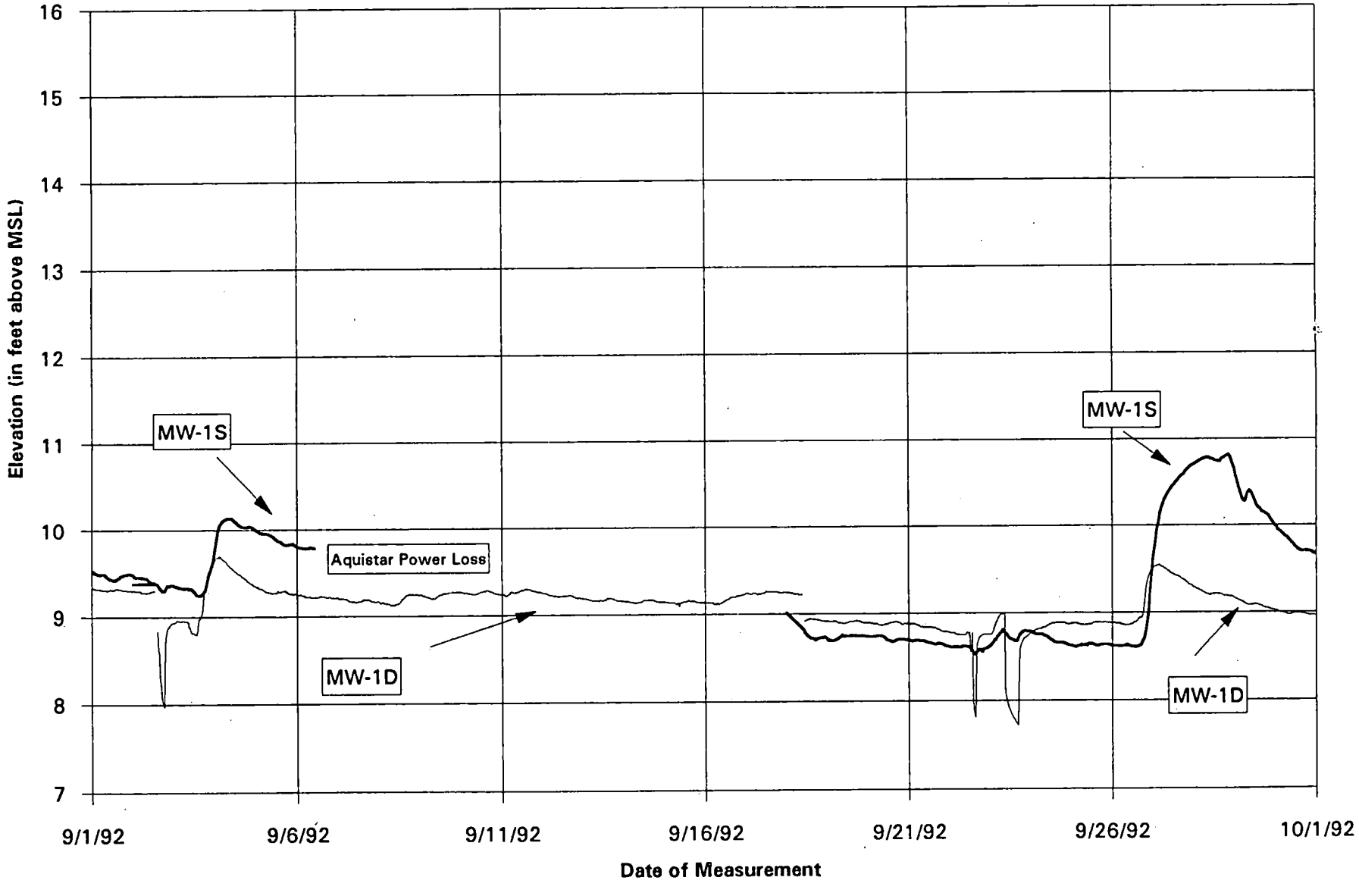

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Figure F-5: MW-1S and MW-1D Hydrographs - October 1992

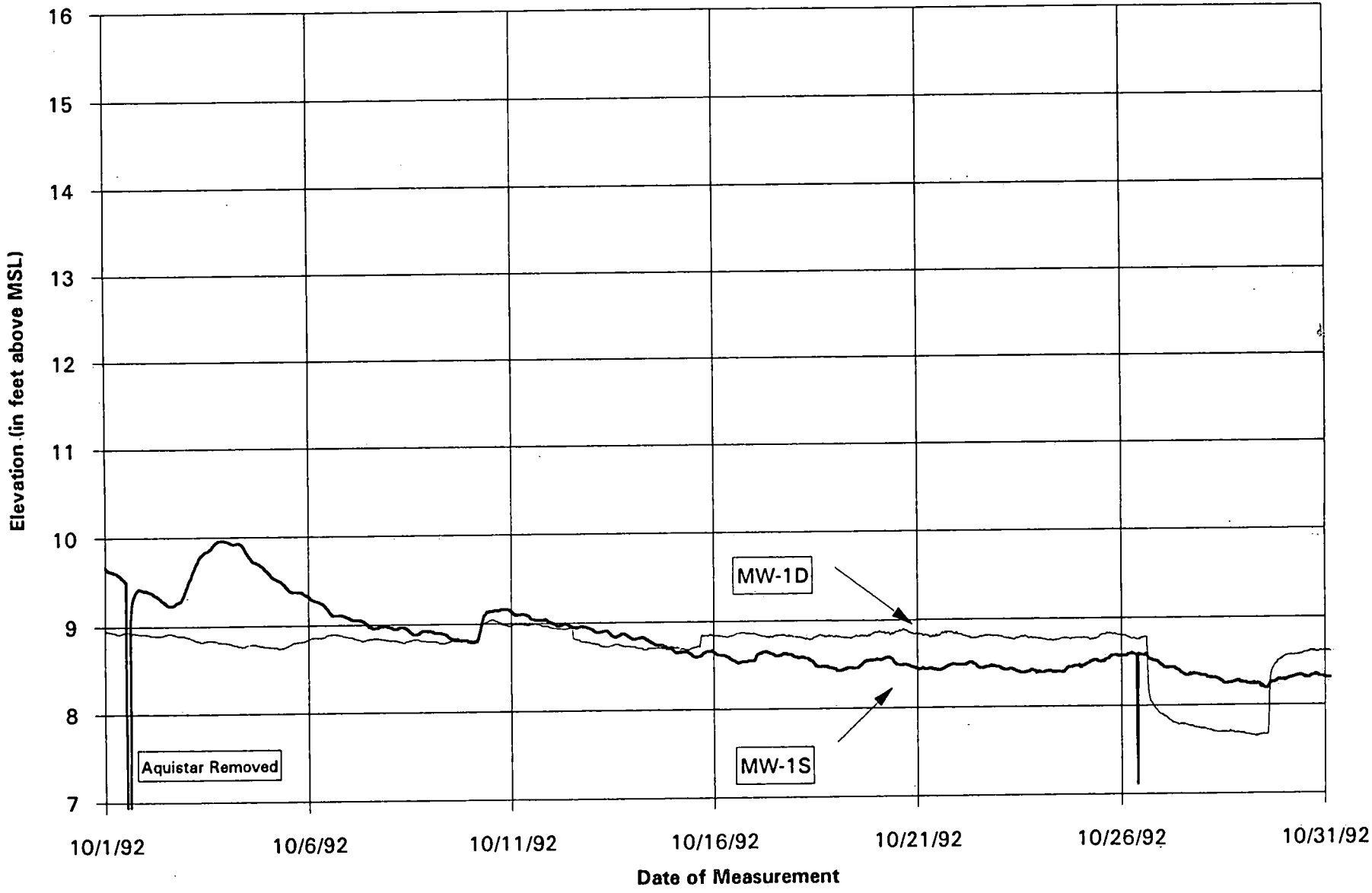

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Figure F-6: MW-1S and MW-1D Hydrographs - November 1992

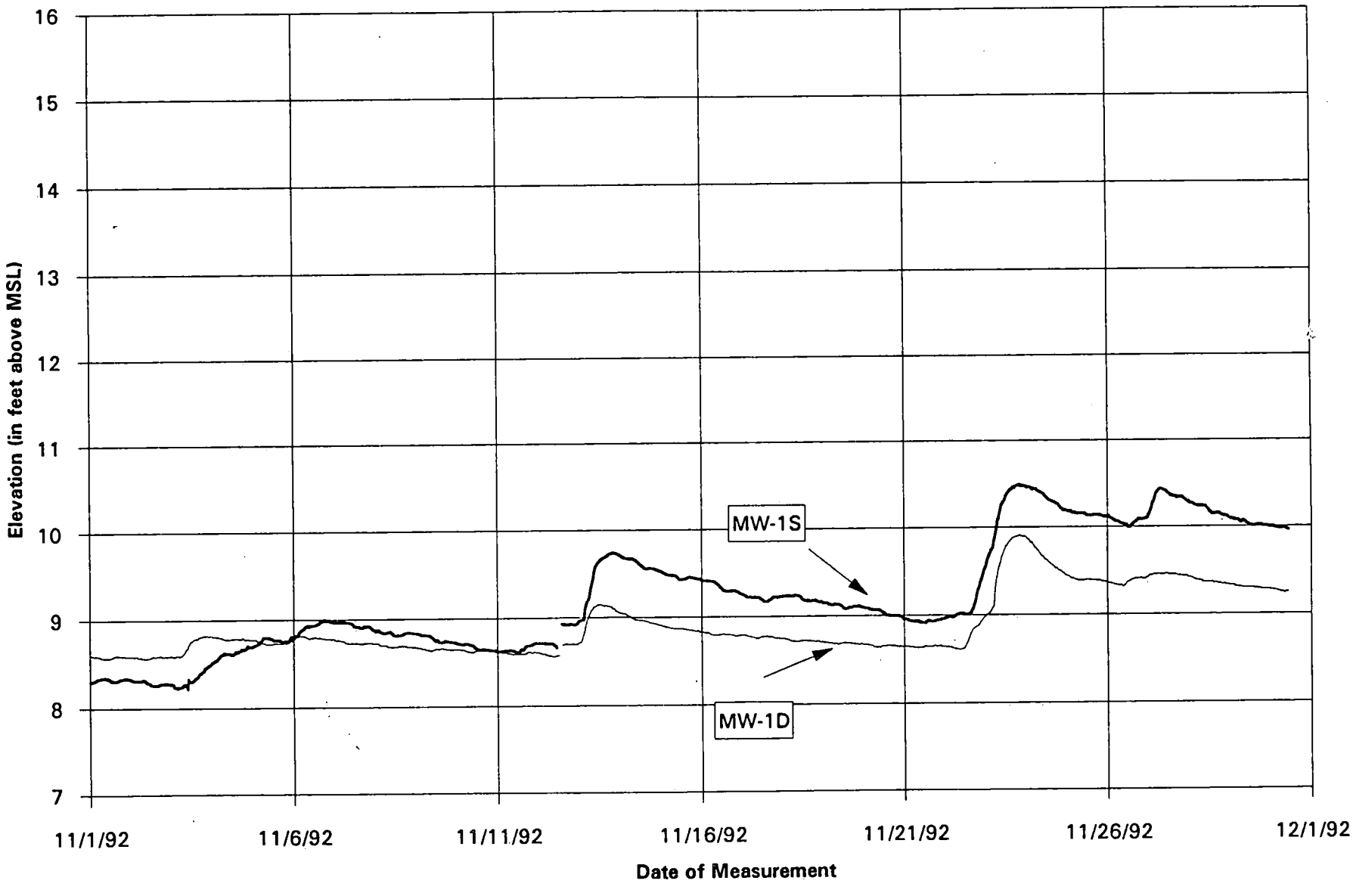

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Figure F-7: MW-10S and MW-10D Hydrographs - July 1992

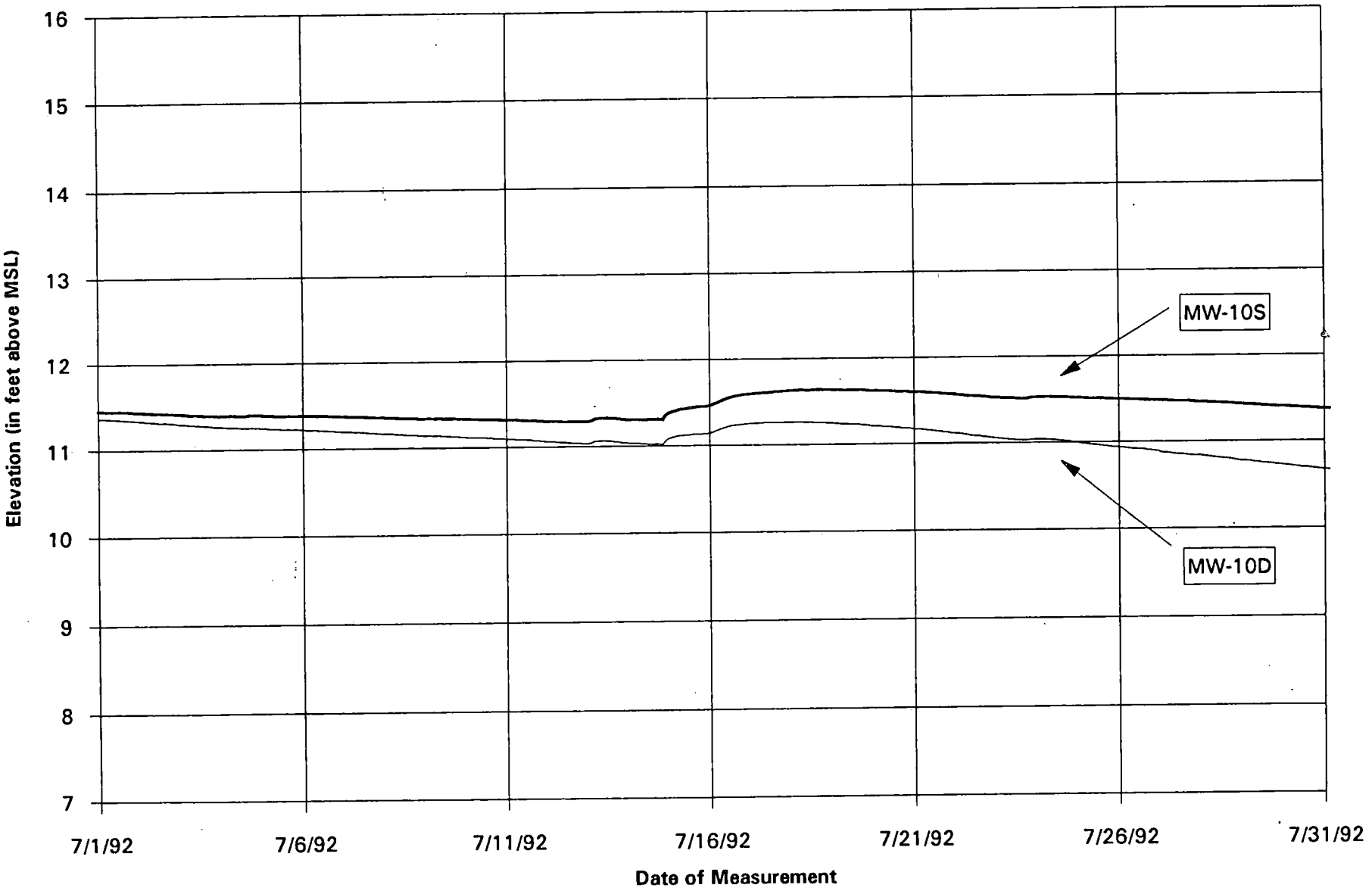

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Figure F-8: MW-10S and MW-10D Hydrographs - August 1992

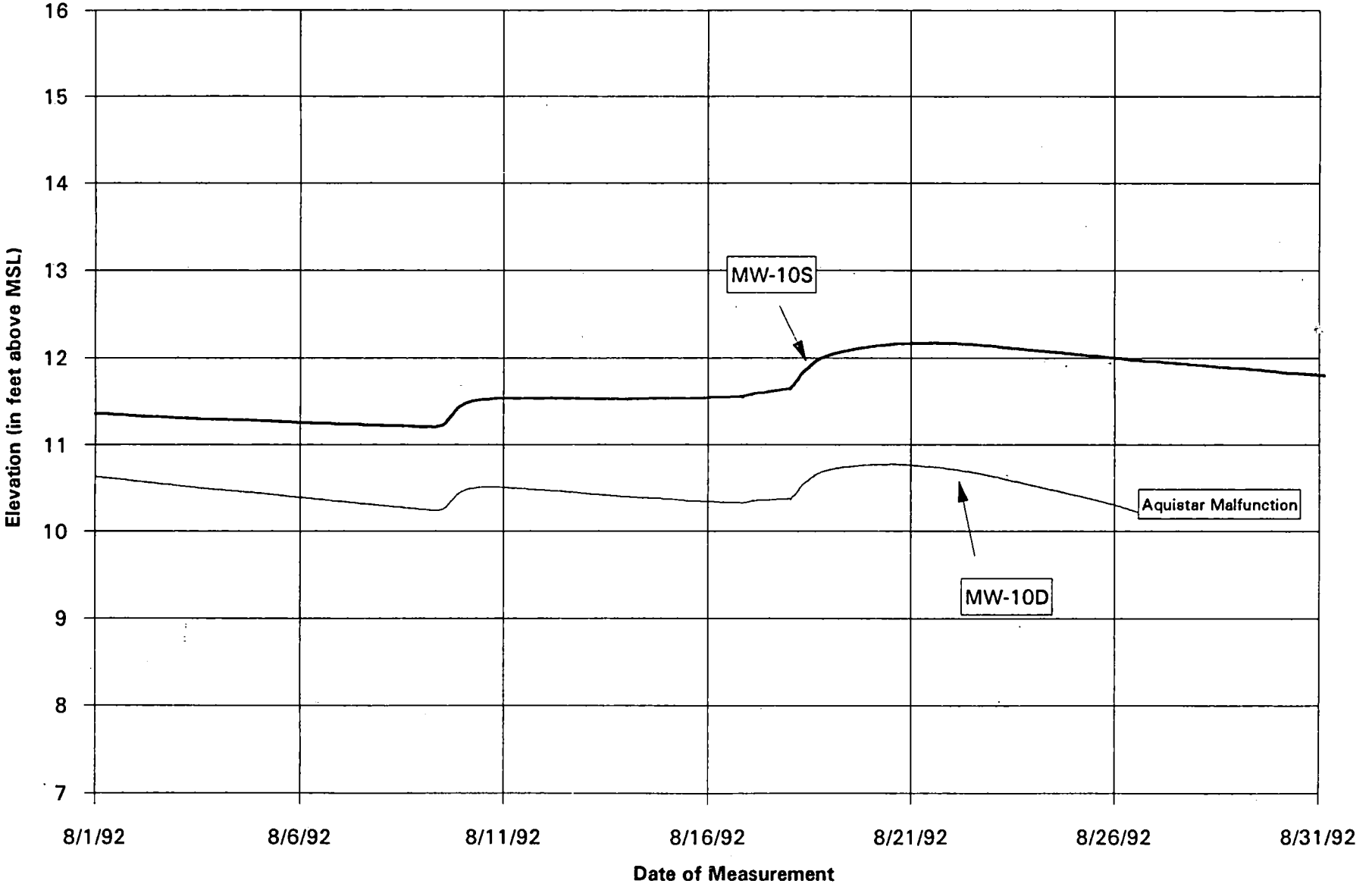

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Figure F-9: MW-10S and MW-10D Hydrographs - September 1992

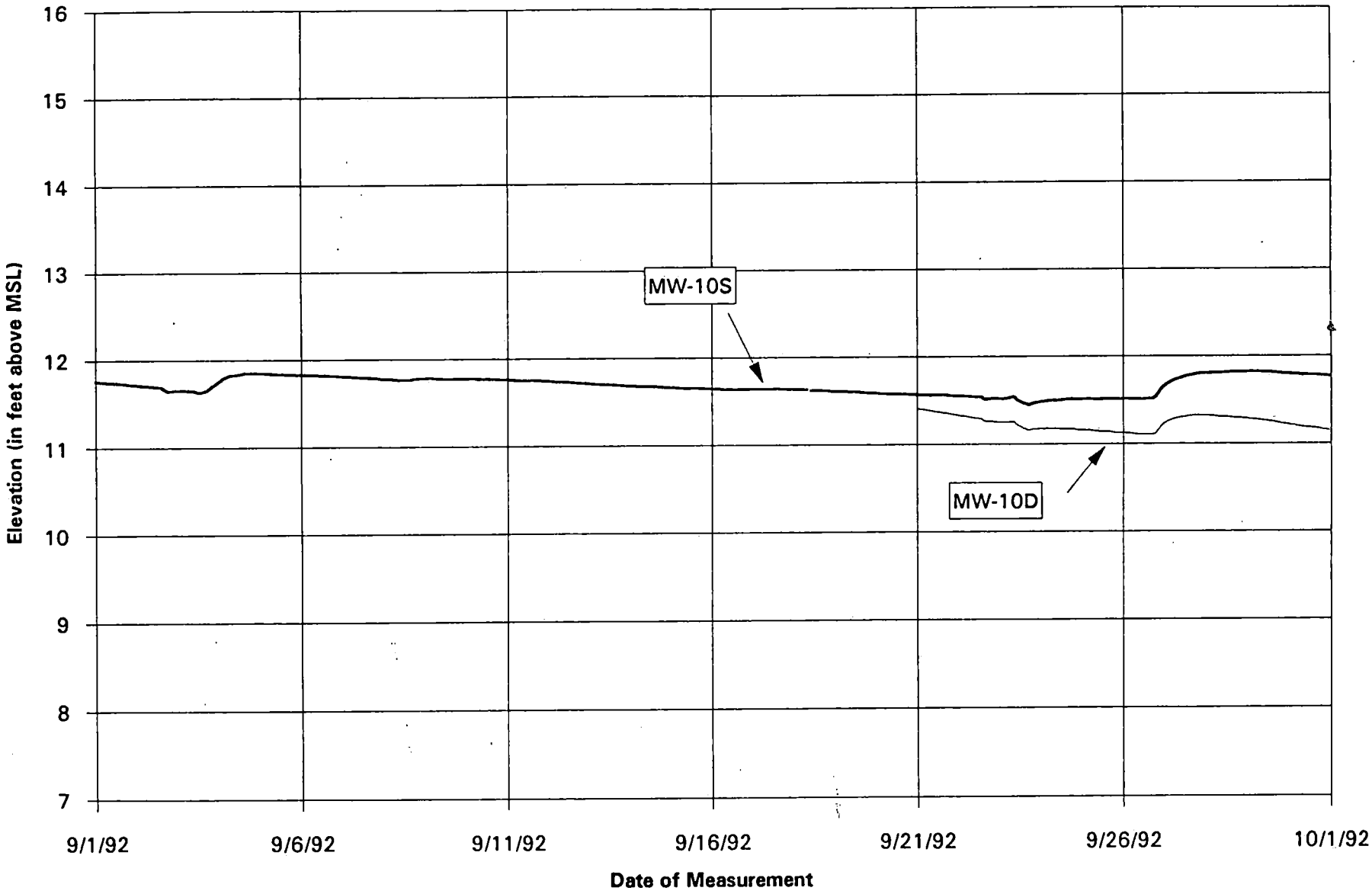

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Figure F-10: MW-10S and MW-10D Hydrographs - October 1992

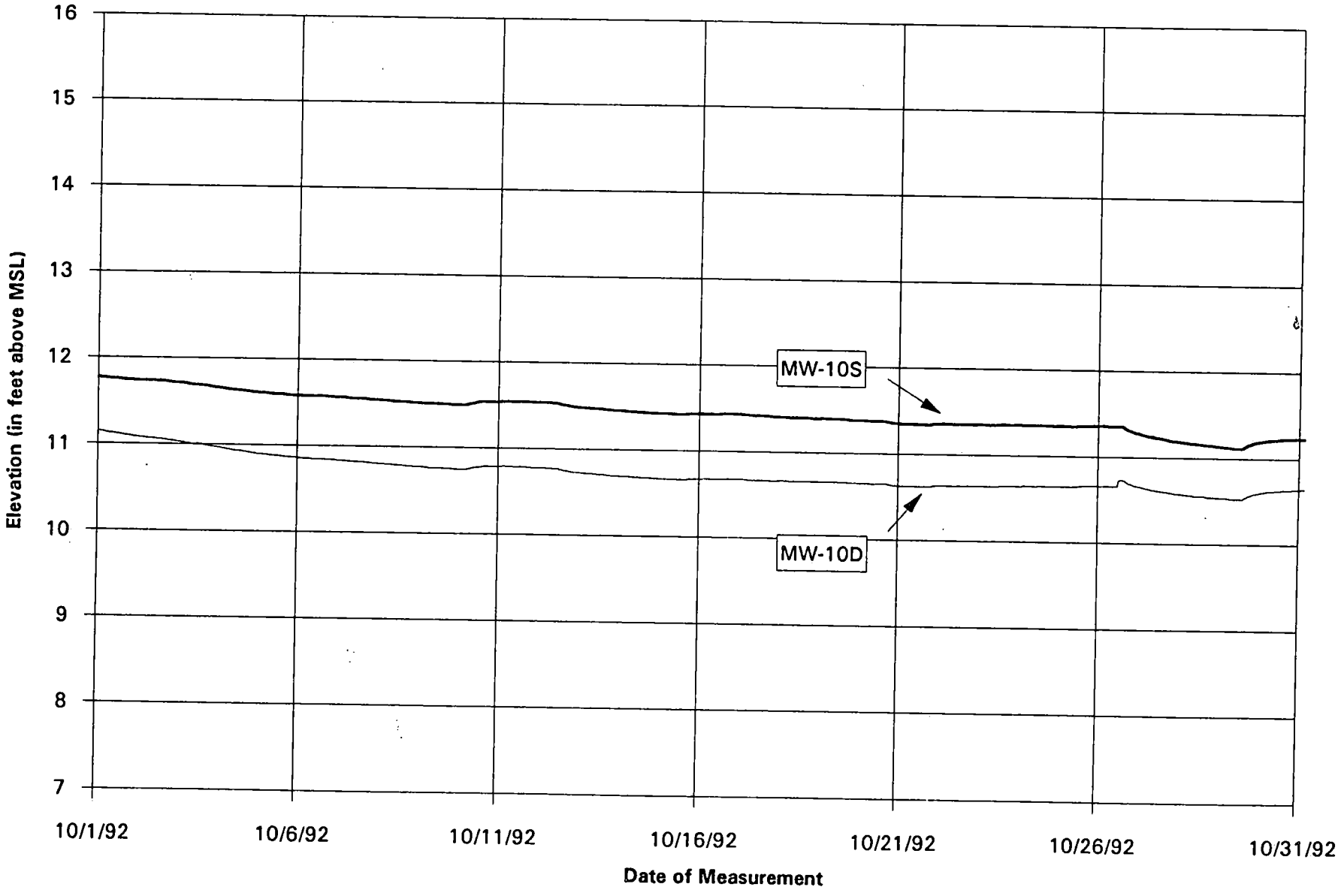

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Figure F-11: MW-10S and MW-10D Hydrographs - November 1992

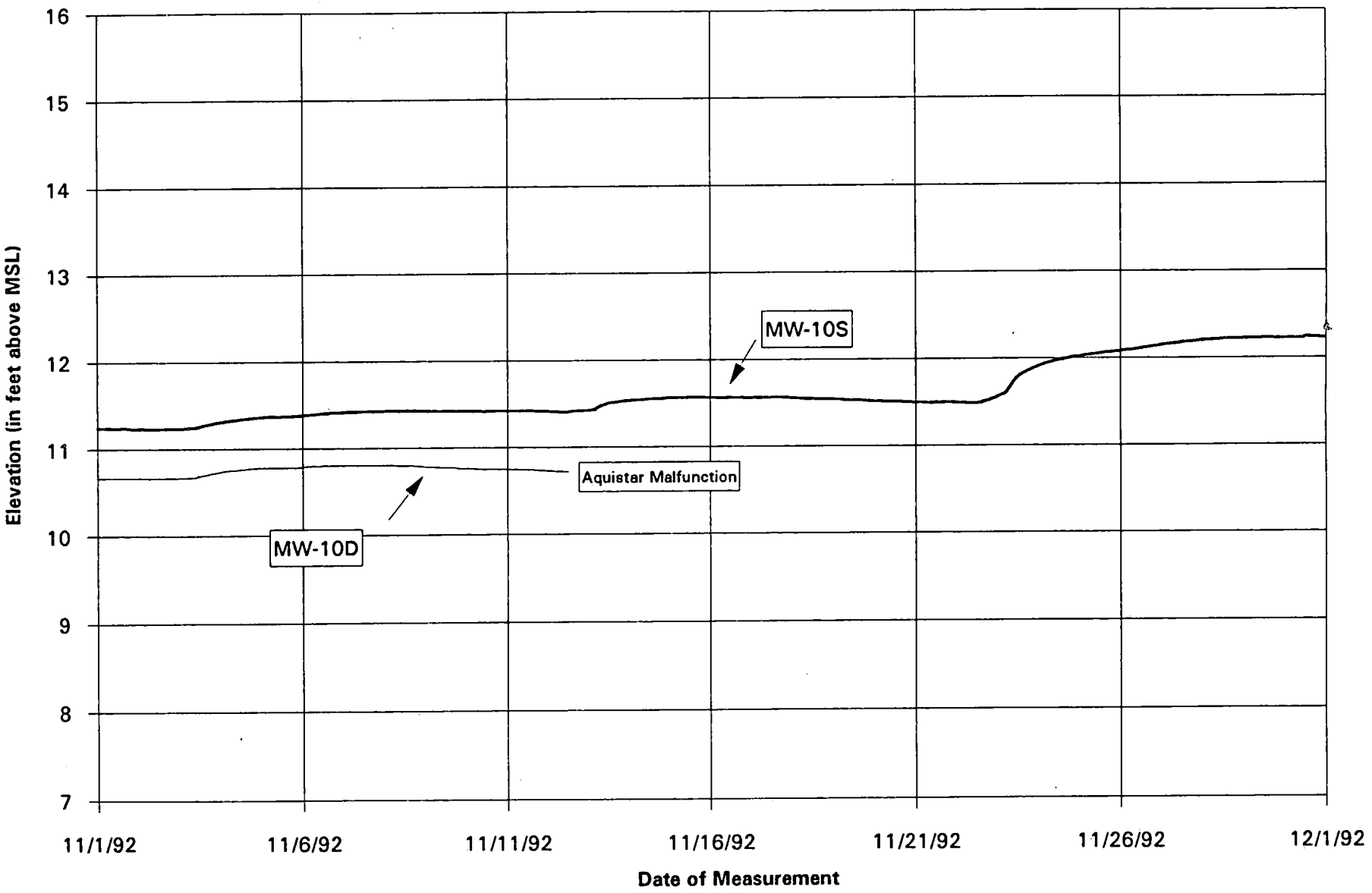

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Figure F-12: Stilling Well Hydrograph - July 1992

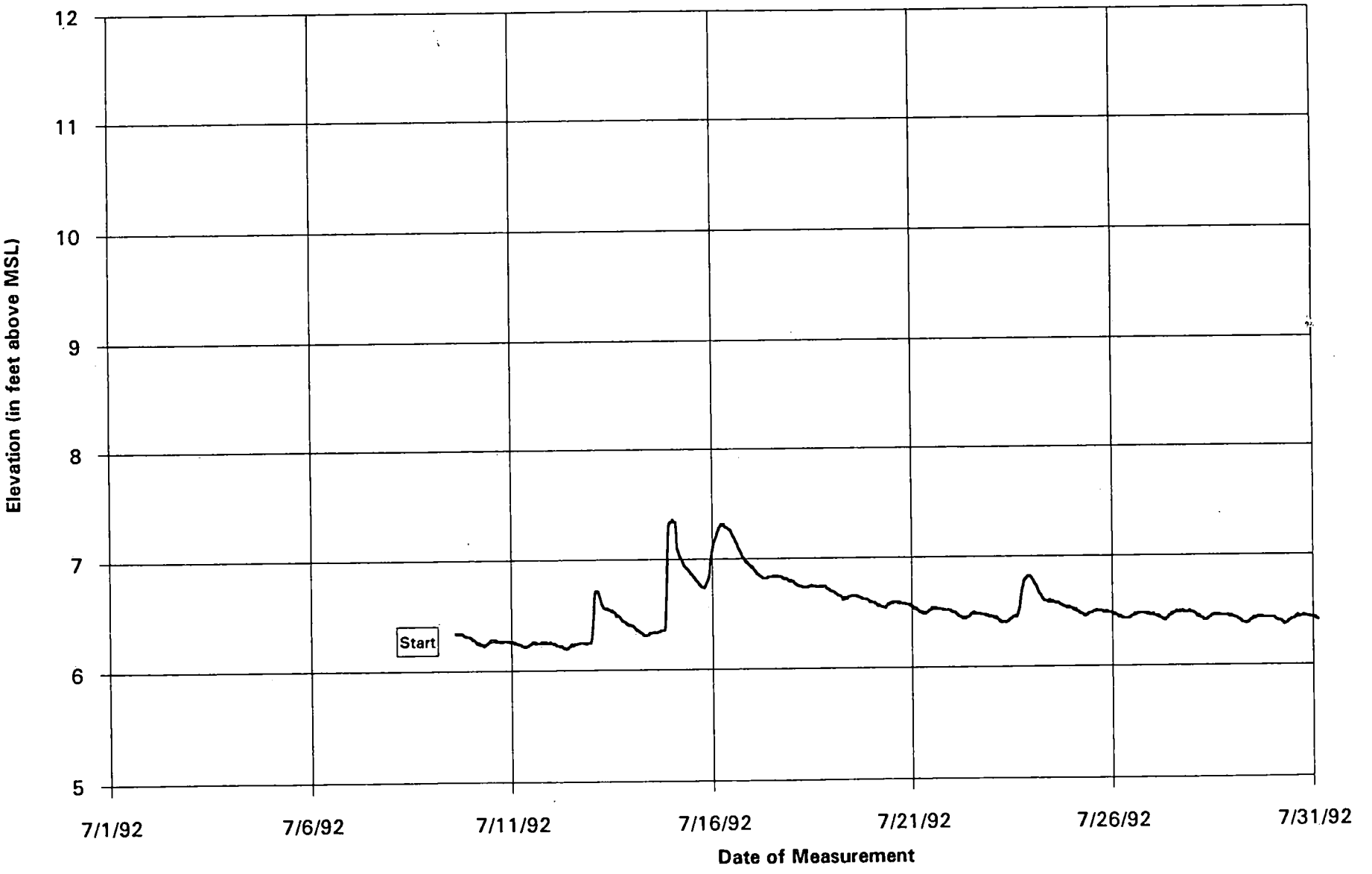

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Figure F-13: Stilling Well Hydrograph - August 1992

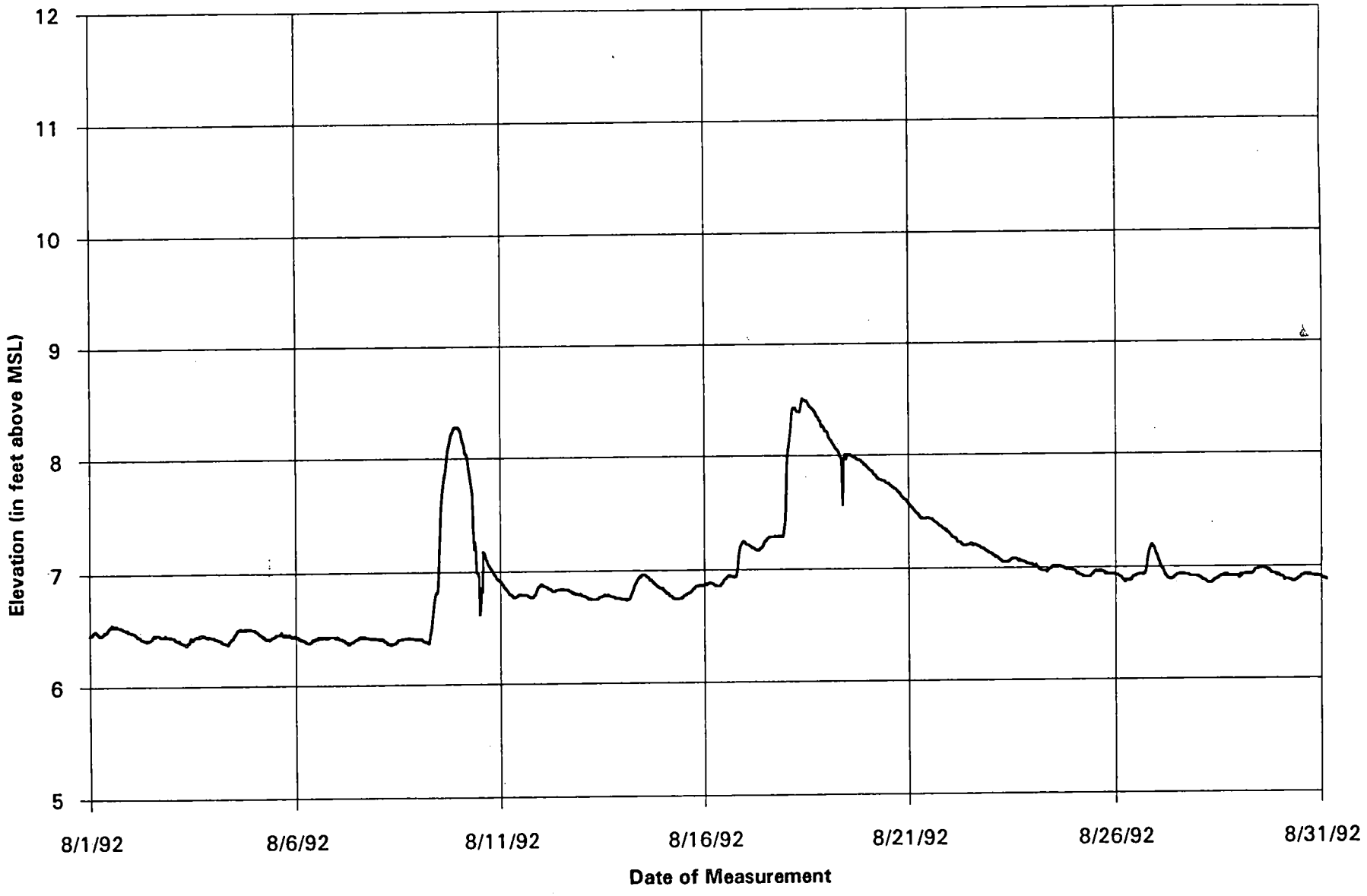

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Figure F-14: Stilling Well Hydrograph - September 1992

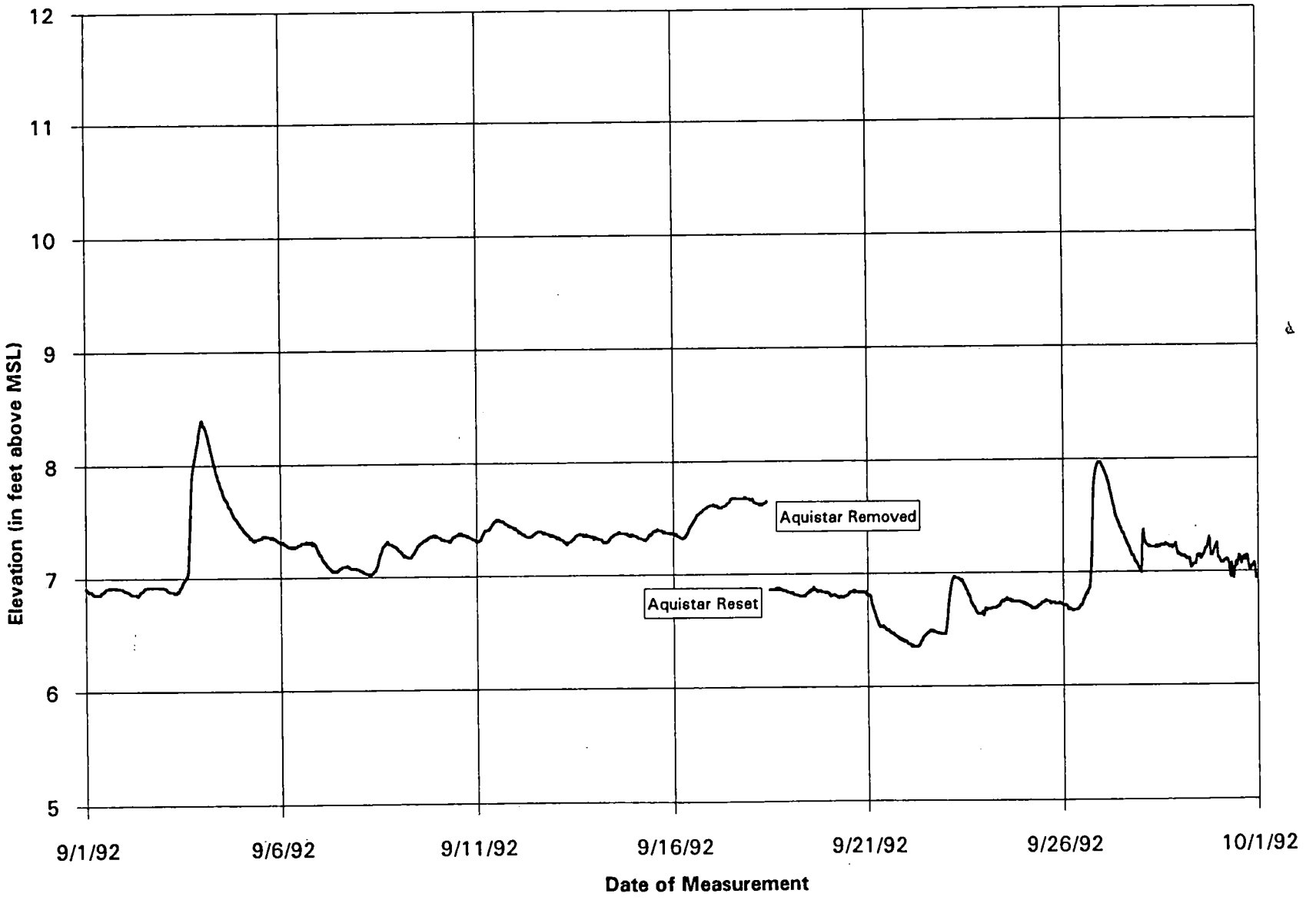

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Figure F-15: Stilling Well Hydrograph - October 1992

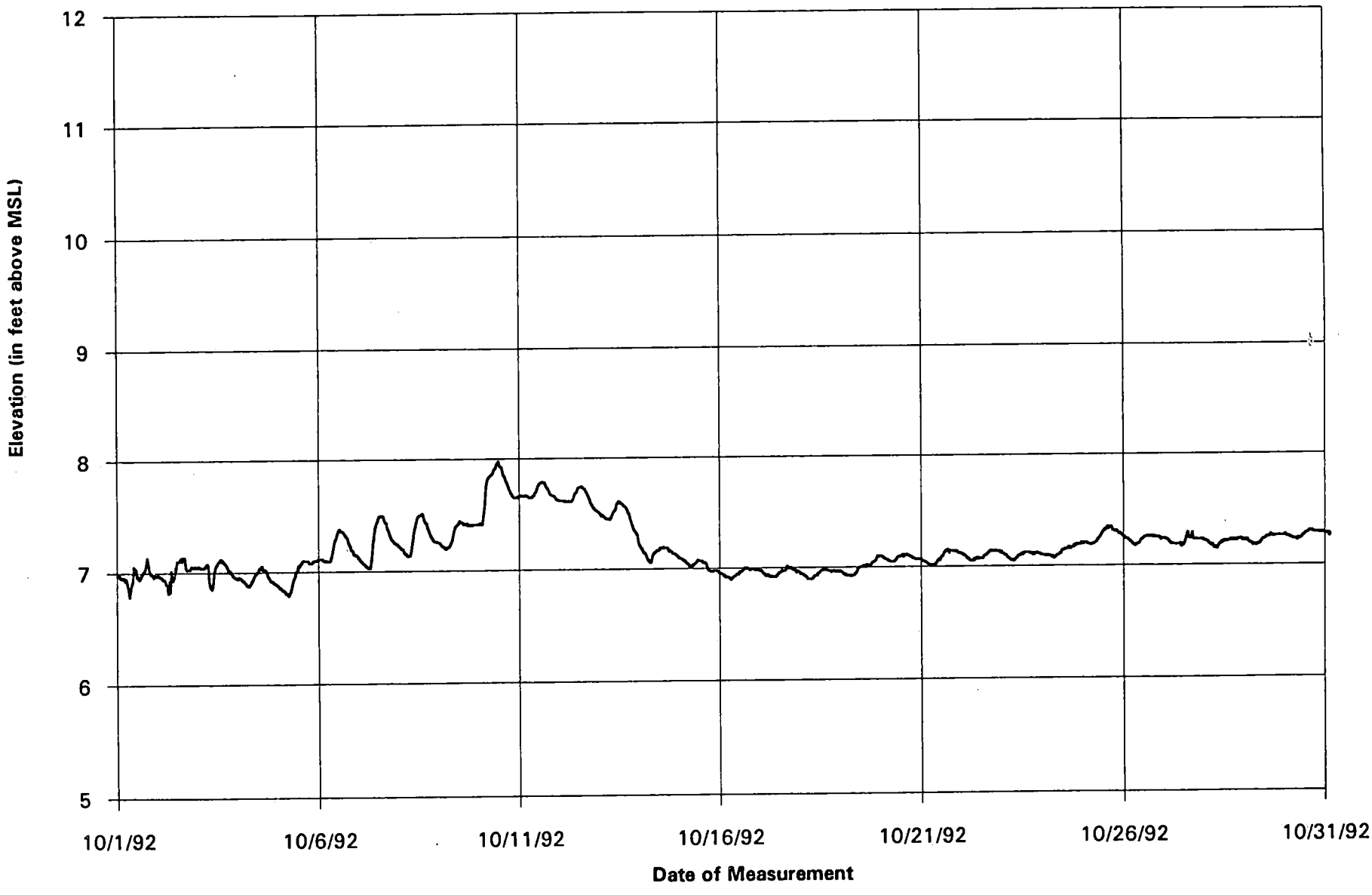

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Figure F-16: Stilling Well Hydrograph - November 1992

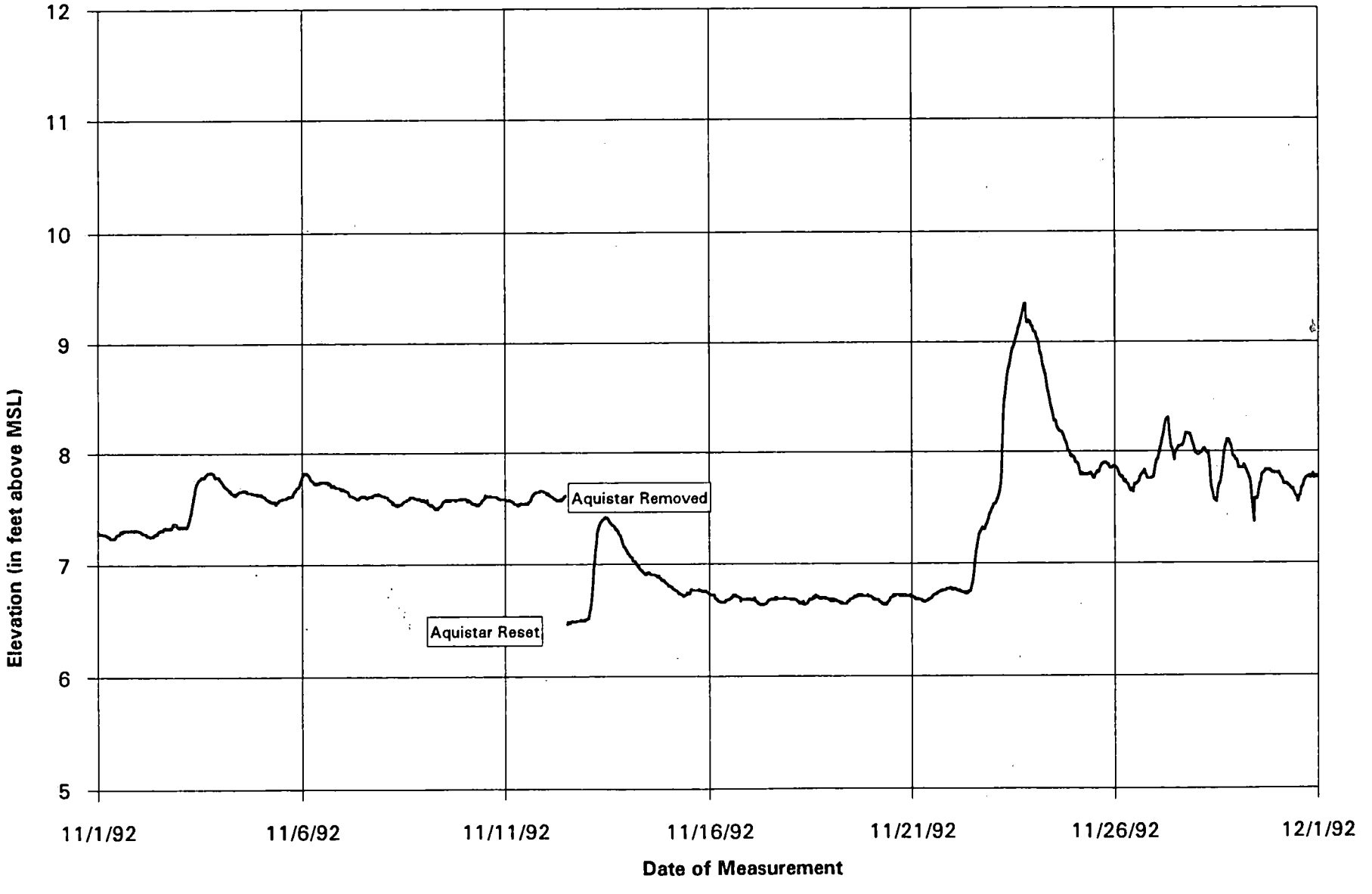

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Figure F-17: Stilling Well Hydrograph - December 1992

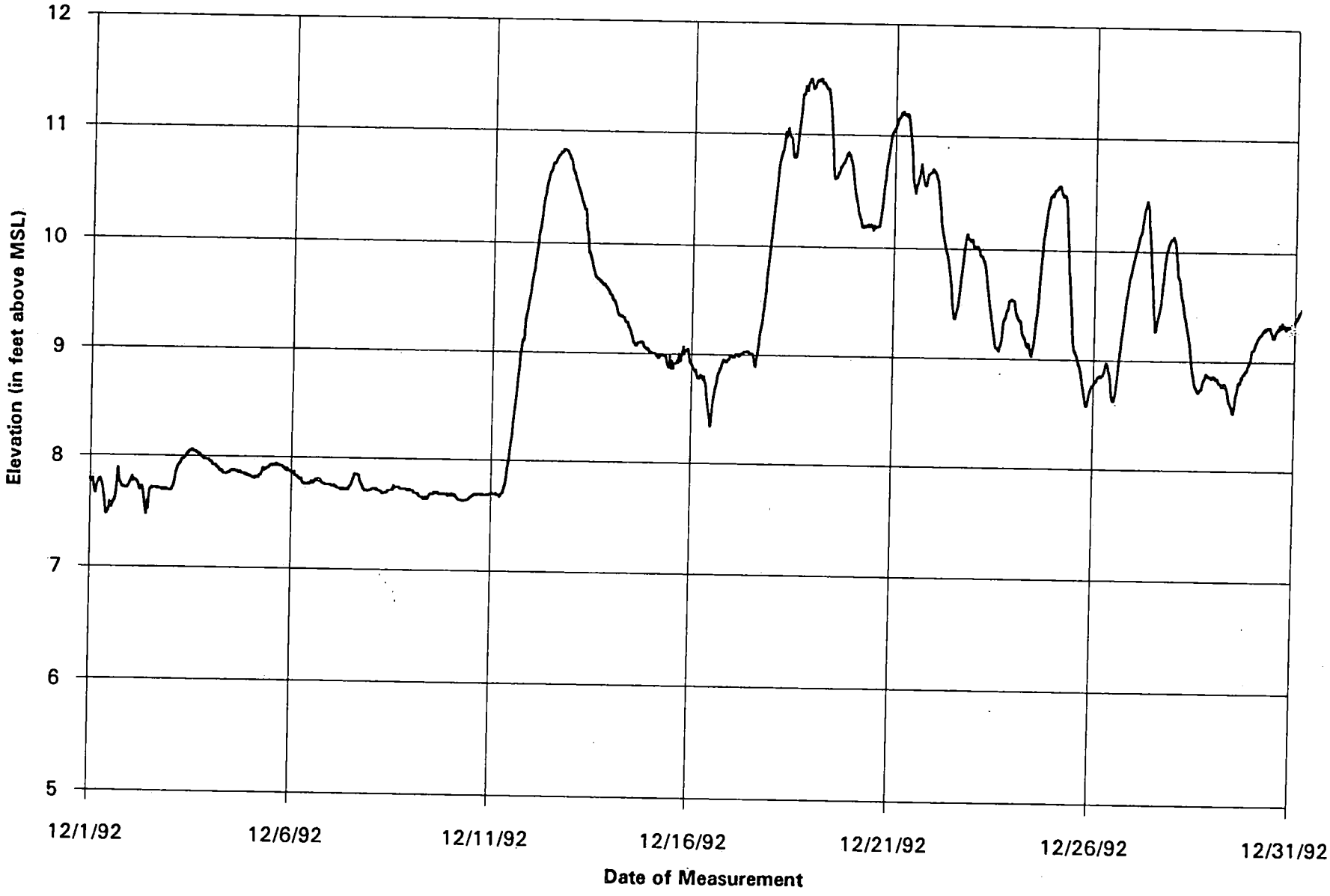

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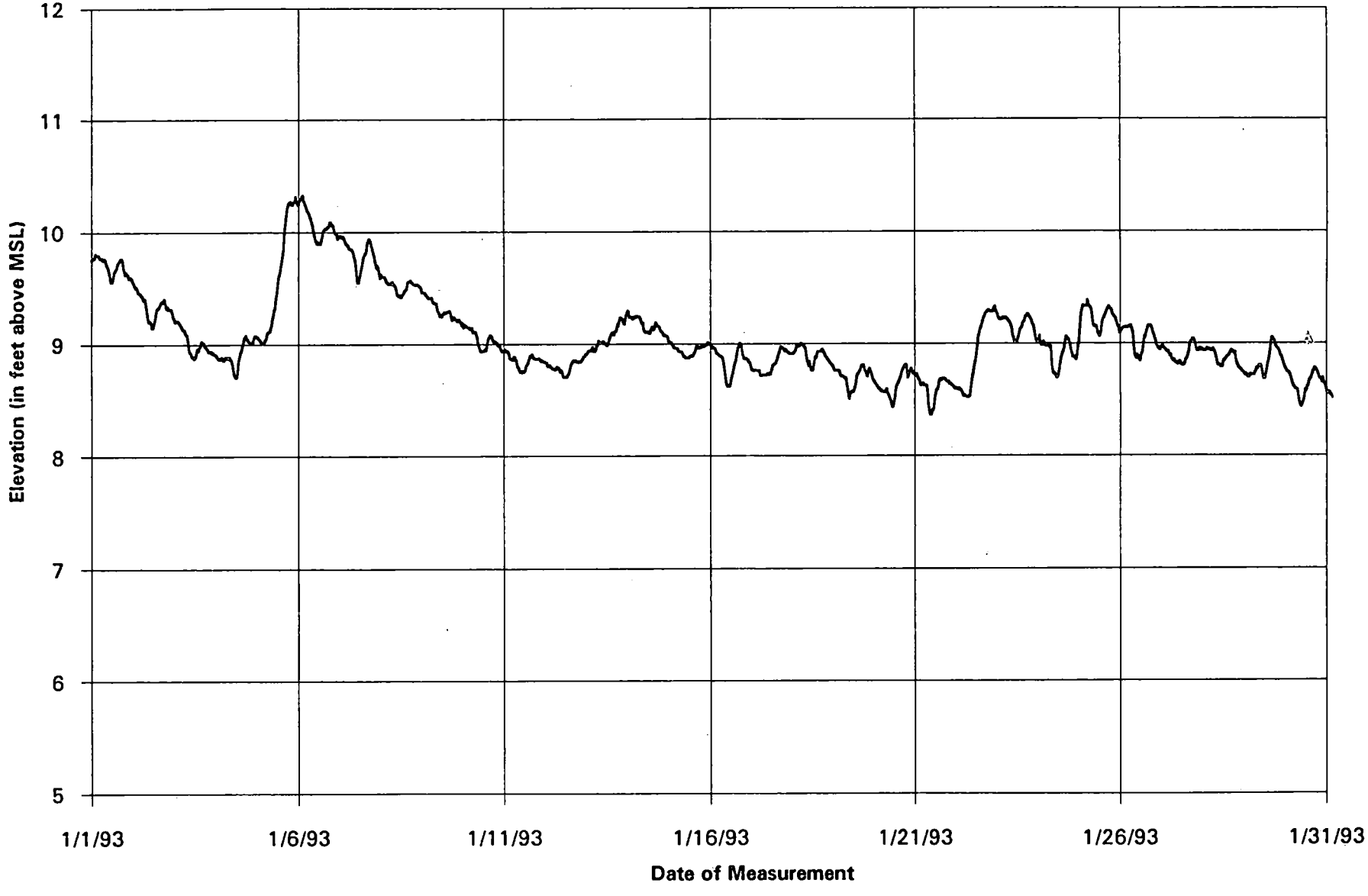
Figure F-18: Stilling Well Hydrograph - January 1993



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Appendix G

G

PRECIPITATION DATA

This appendix presents the precipitation data obtained from the National Climatic Data Center in the National Oceanic and Atmospheric Administration (NOAA) during the stabilization investigation in the Production Area under the RCRA Facility Investigation at the CIBA-GEIGY facility in Cranston, RI. The data were recorded at the T. F. Green Airport (Providence, Rhode Island). These precipitation data are presented in graphs, one graph per month; the graphs are organized chronologically. In addition, the precipitation data for selected months are presented with the hydrographs for MW-1S and MW-1D overlaid on them (for comparing precipitation with groundwater levels).

Figure G-1: Precipitation Data - June 1992

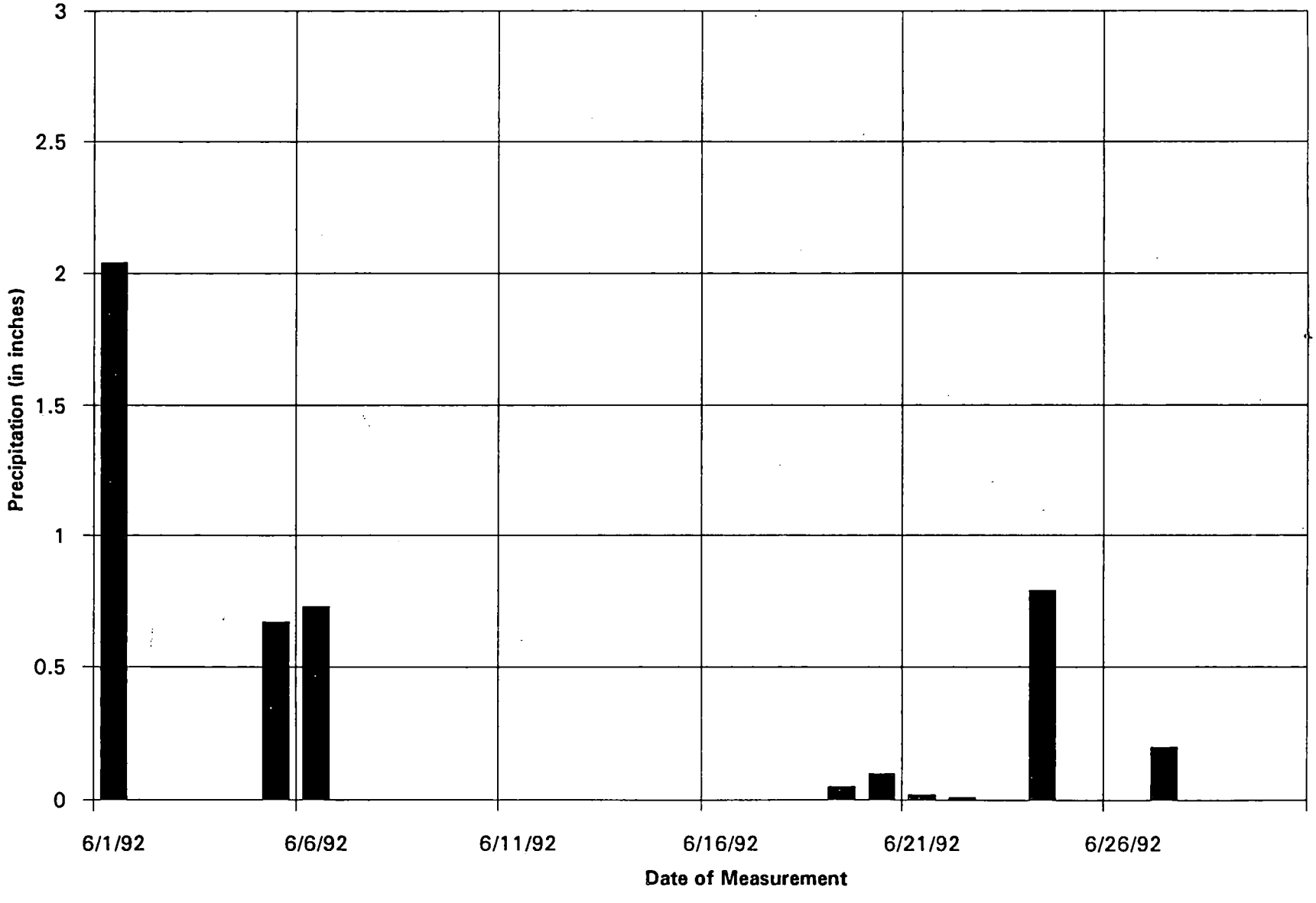

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Figure G-2: Precipitation Data - July 1992

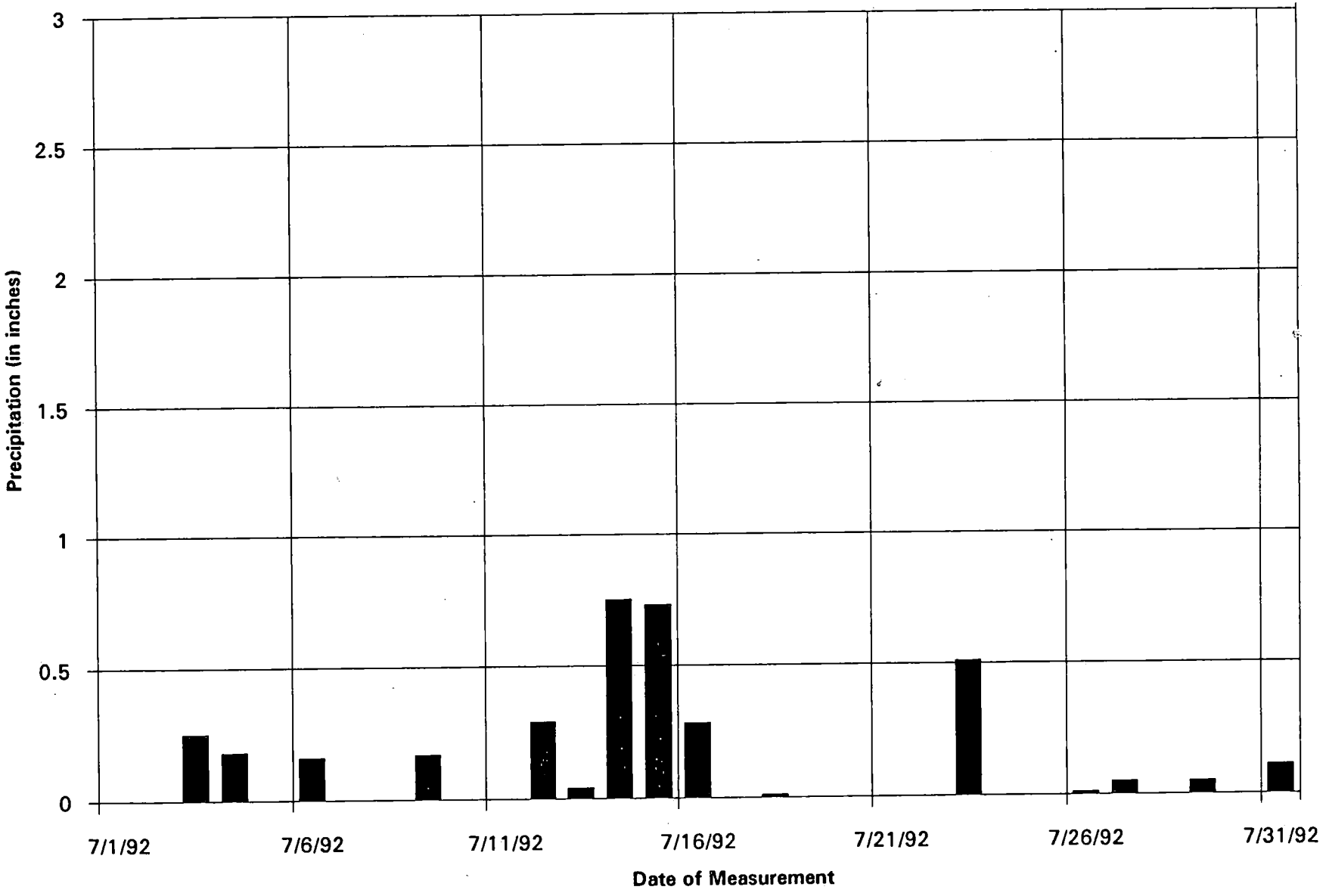

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Figure G-3: Perecipitation Data - August 1992

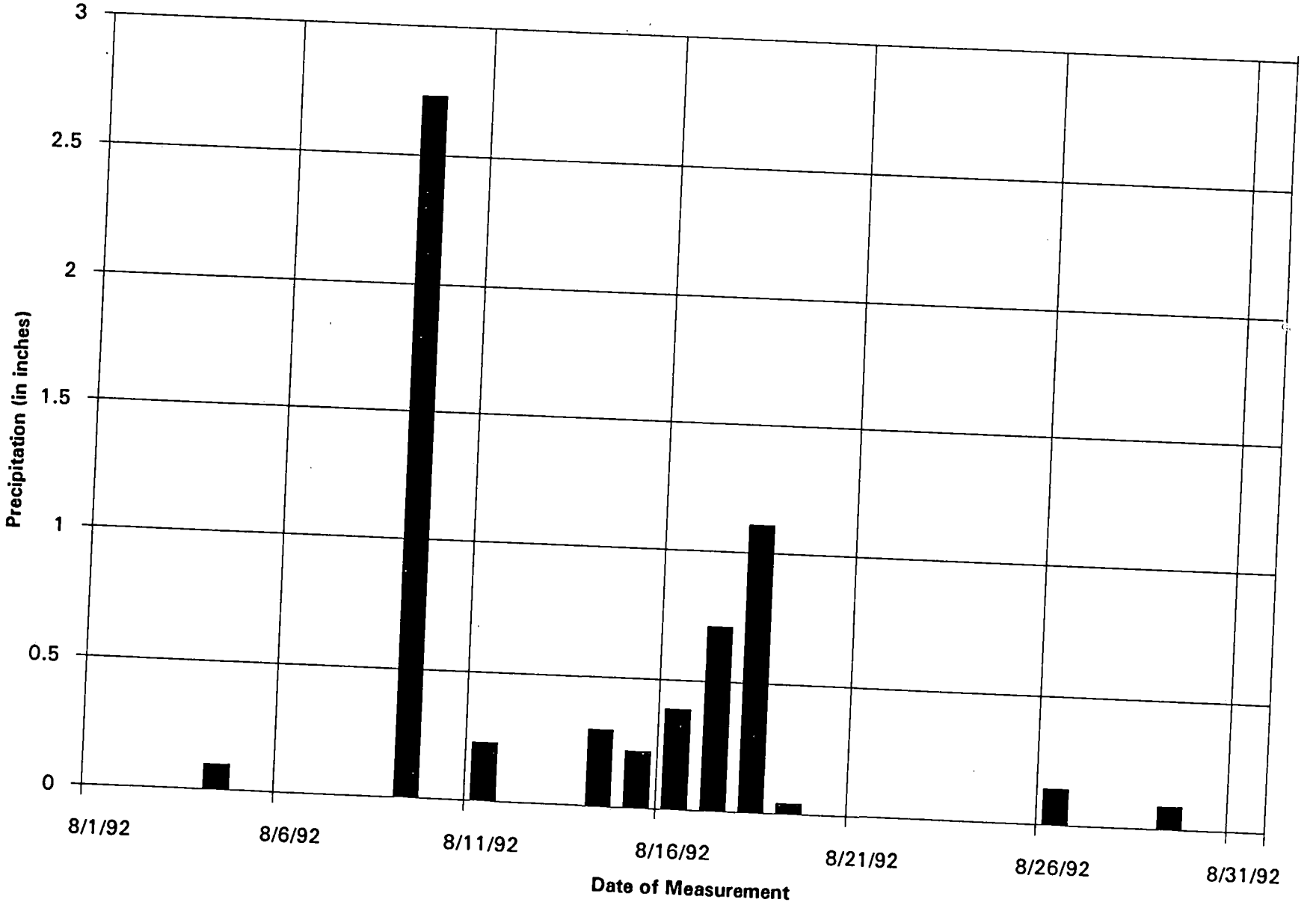

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Figure G-4: Precipitation Data - September 1992

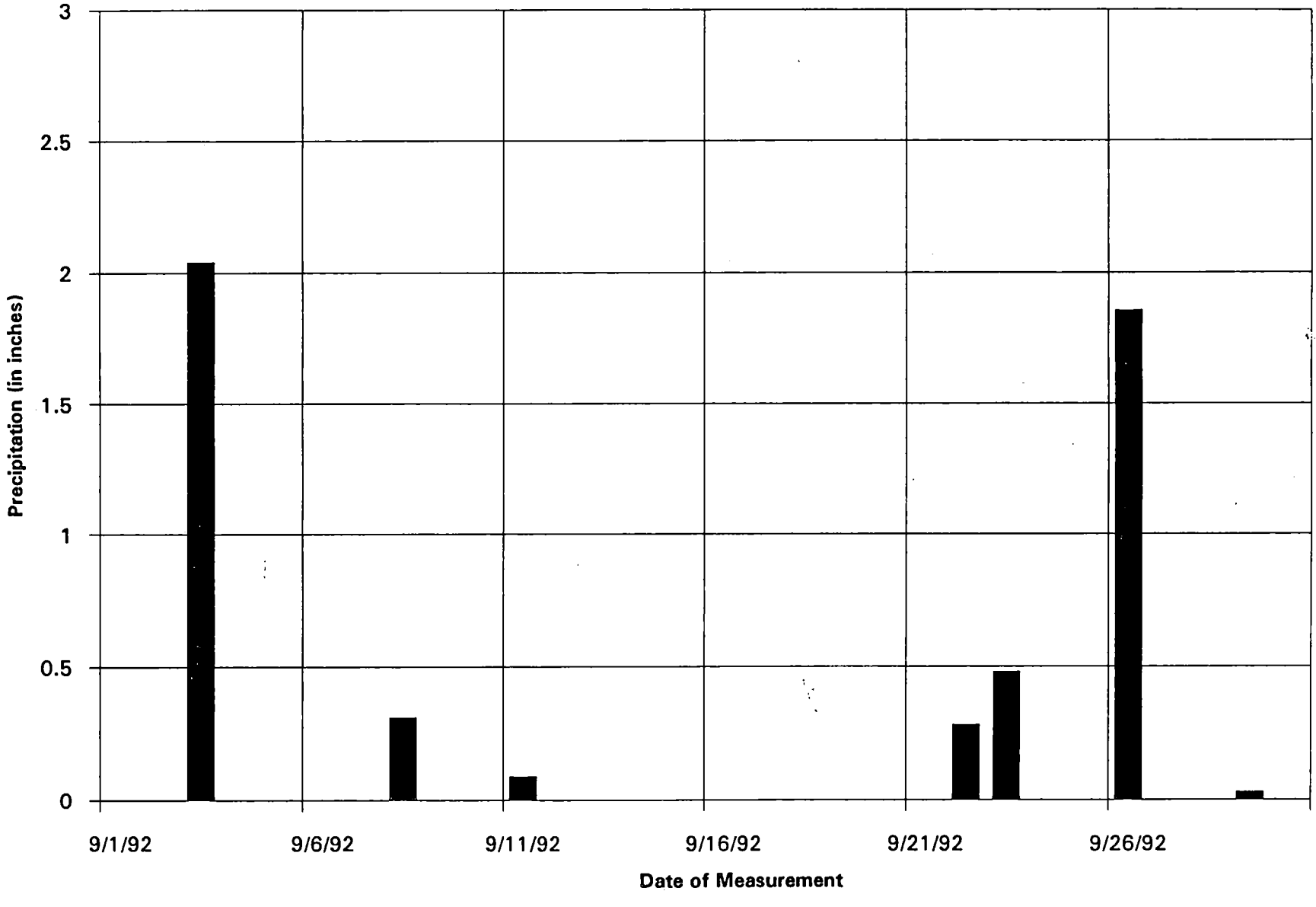

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Figure G-5: Precipitation Data - October 1992

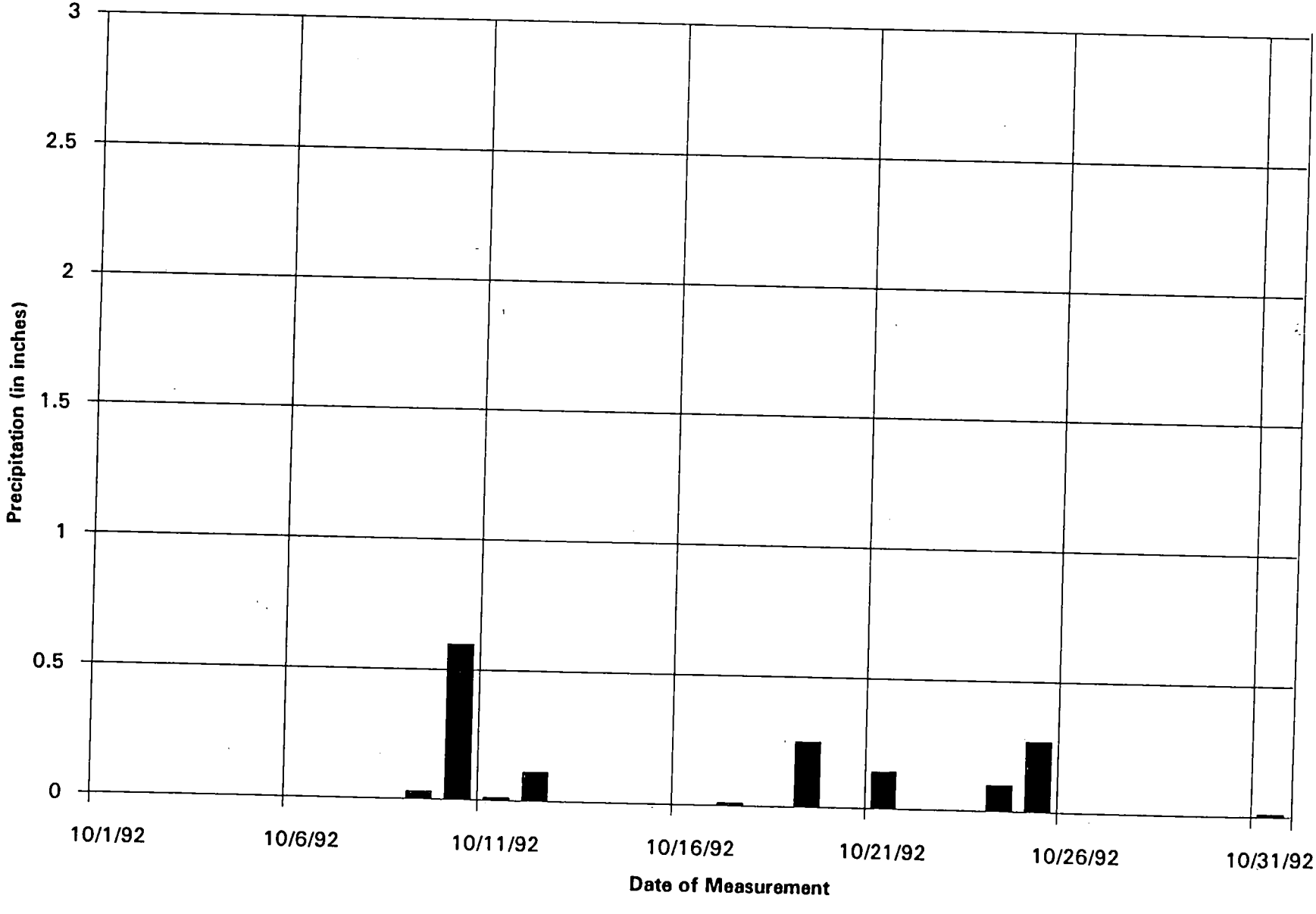

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Figure G-6: Precipitation Data - November 1992

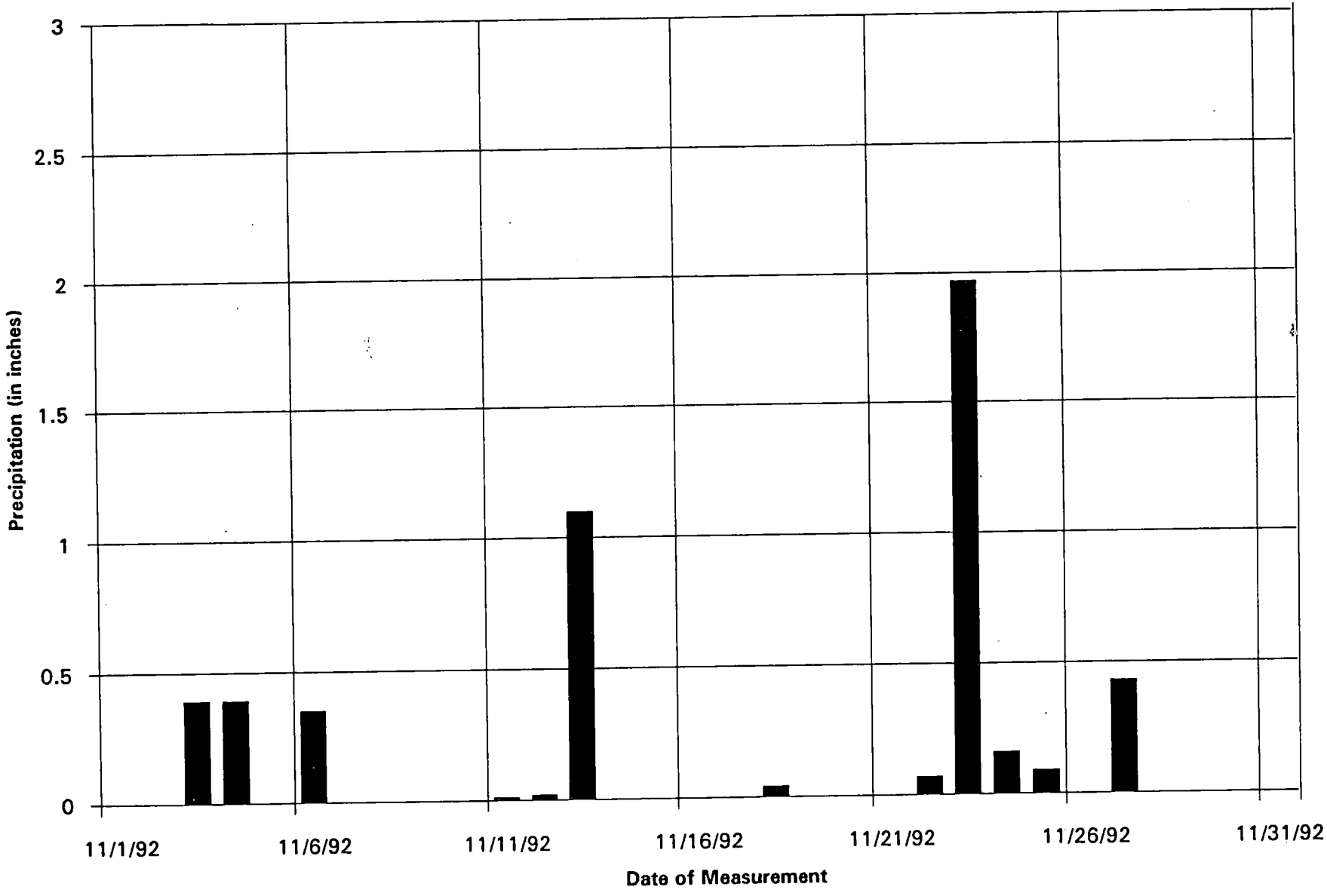

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Figure G-7: Precipitation Data - December 1992

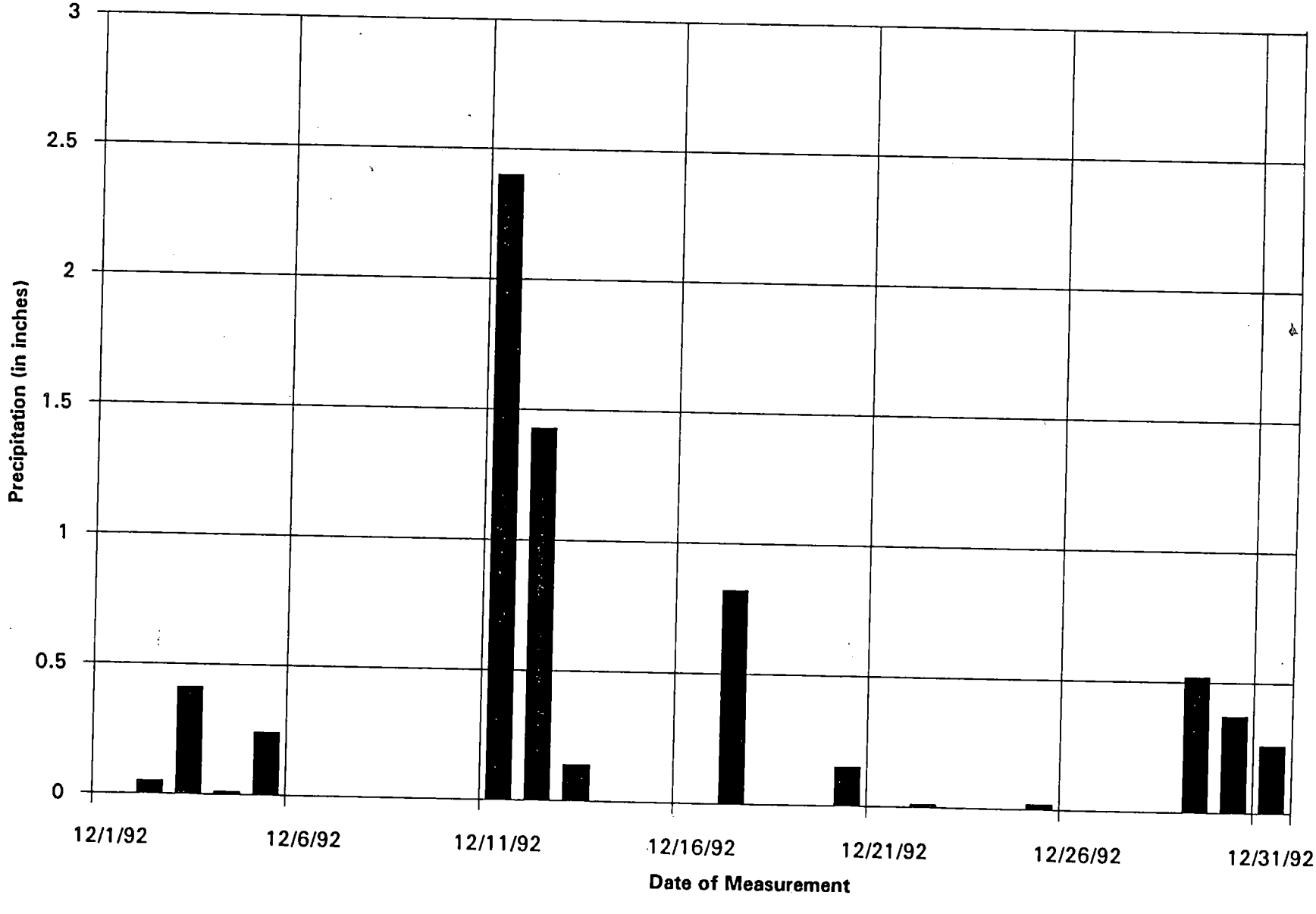

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Figure G-8: Precipitation Data - January 1993

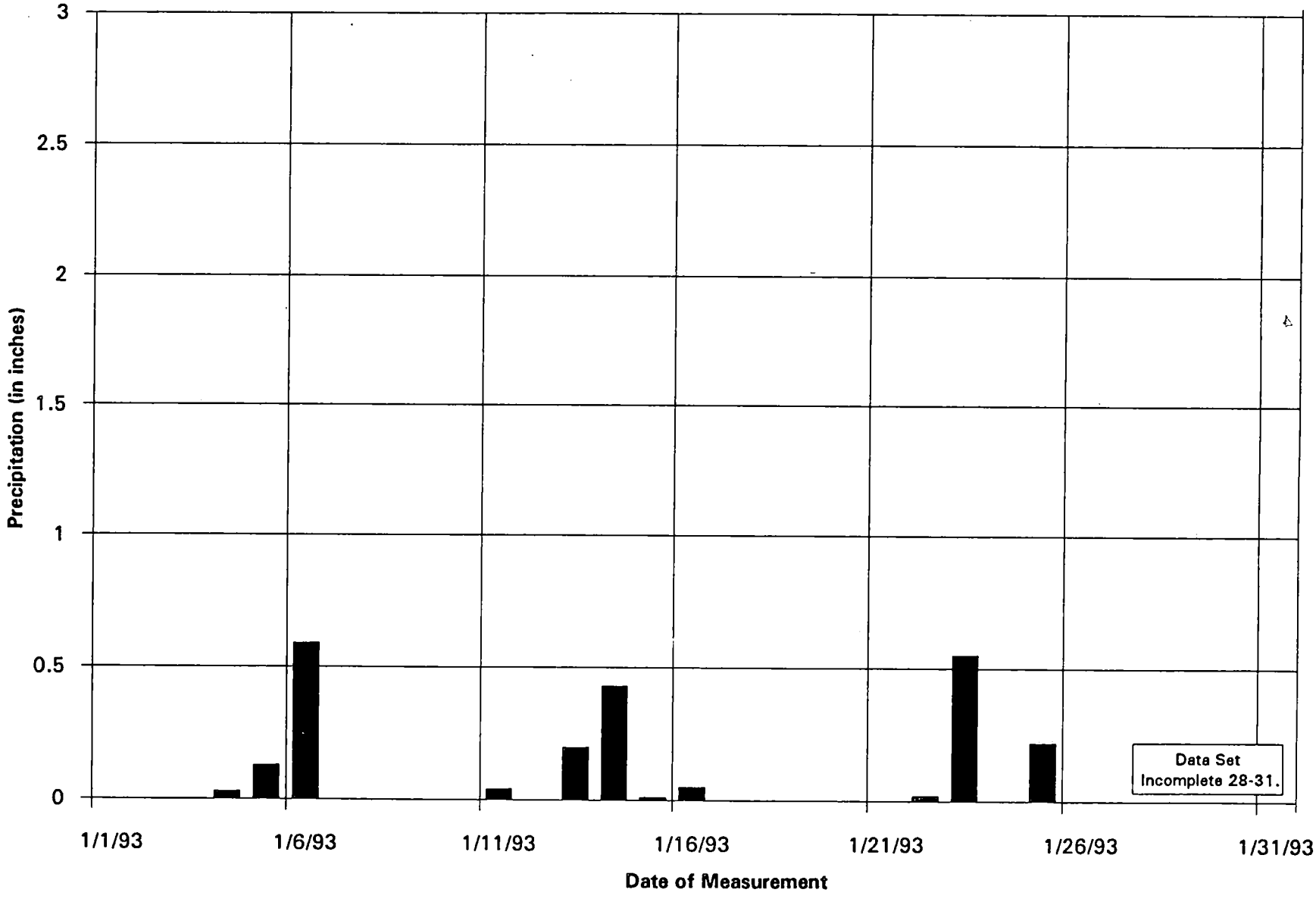

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Figure G-9: MW-1S and MW-1D Hydrographs and Precipitation Data - August 1992

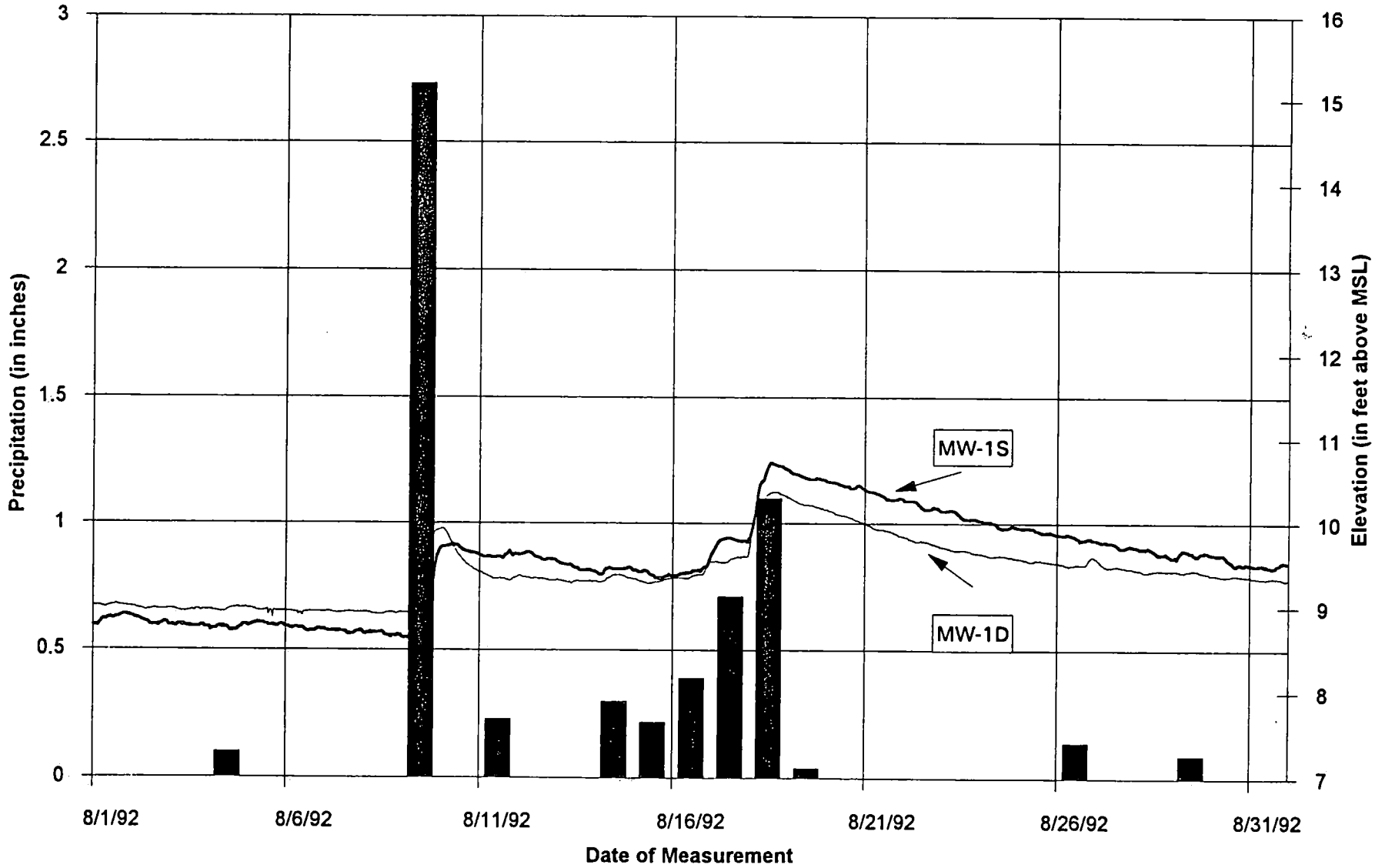

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Figure G-10: MW-10S and MW-10D Hydrographs and Precipitation Data - August 1992

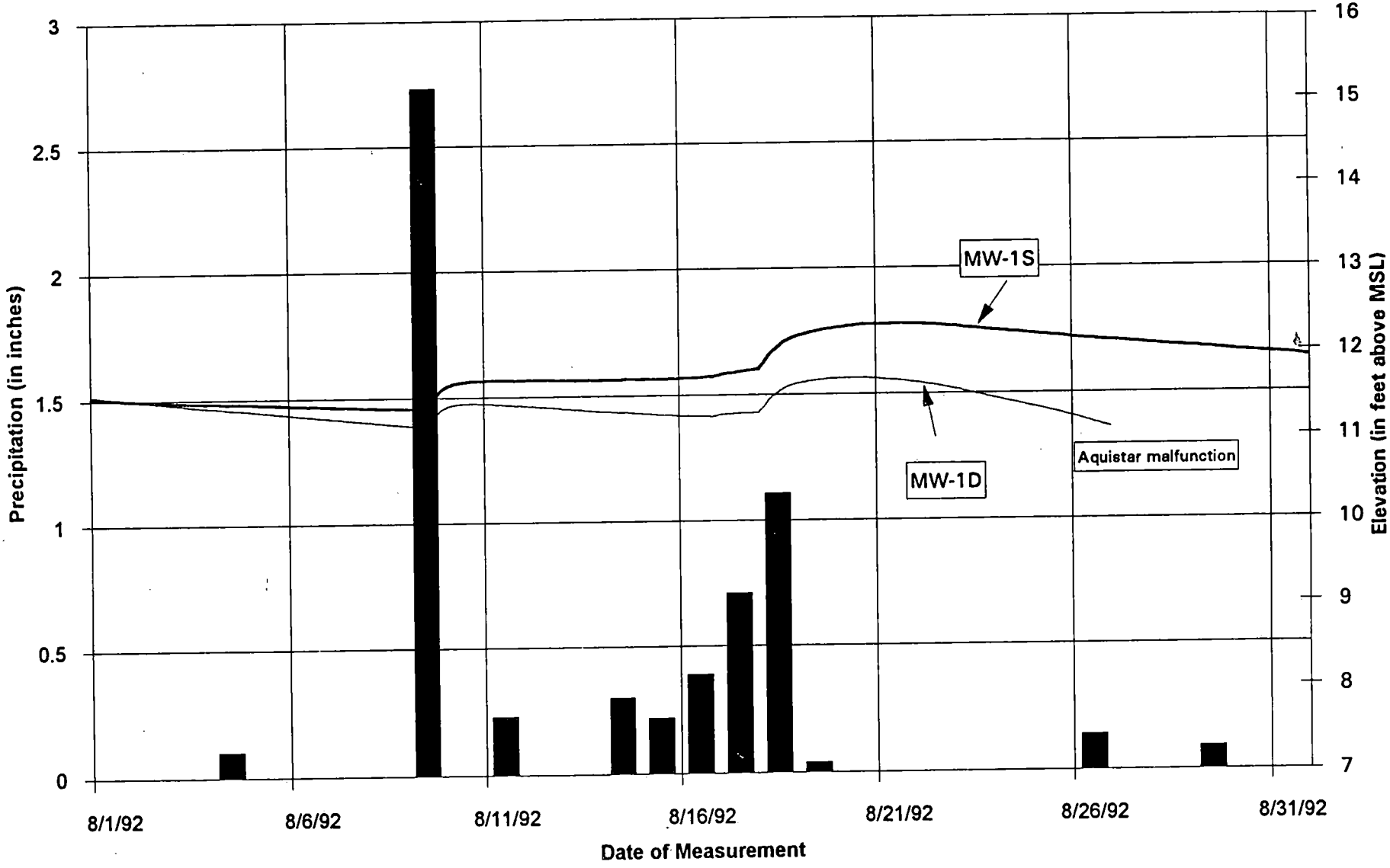

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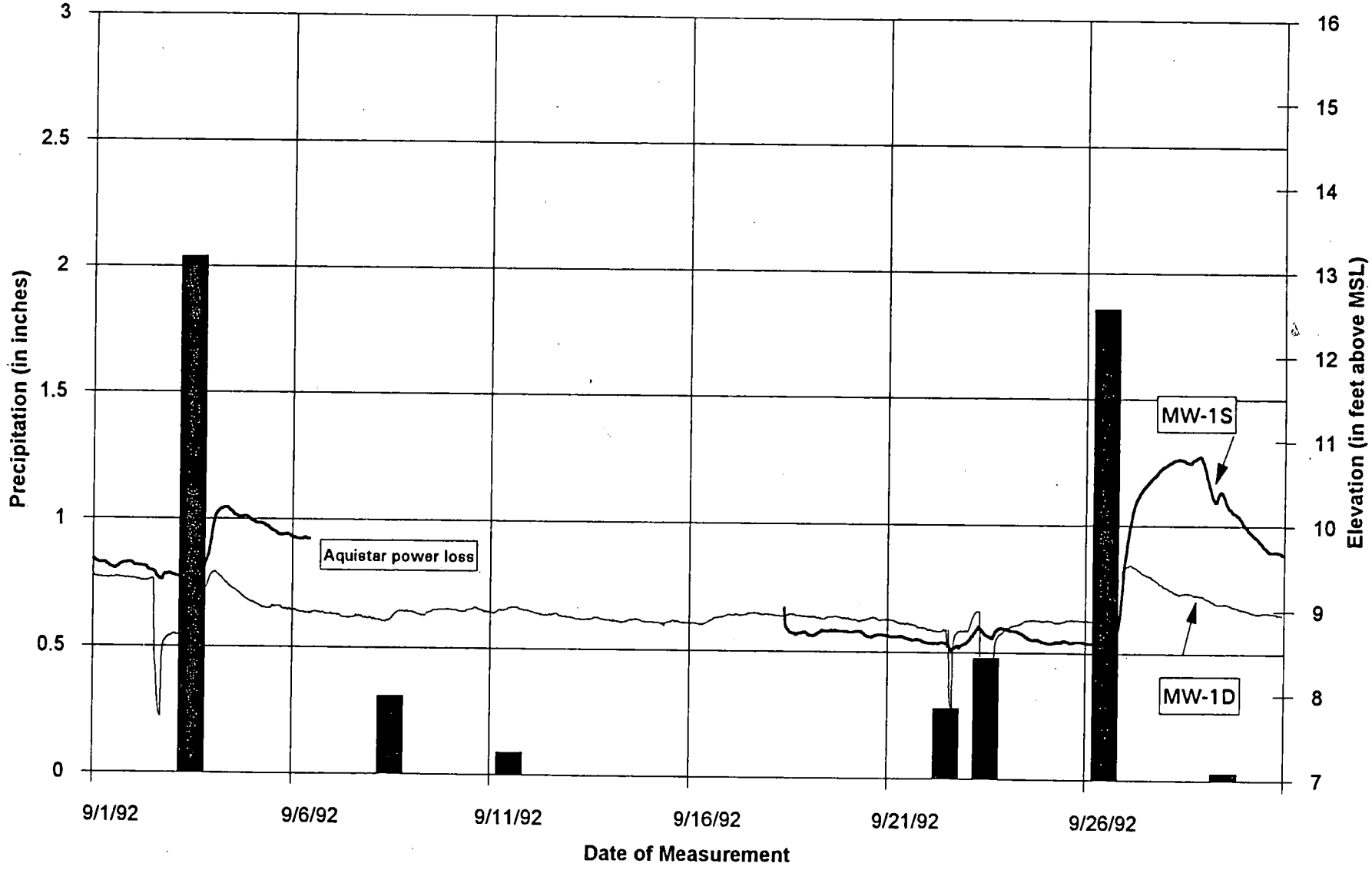
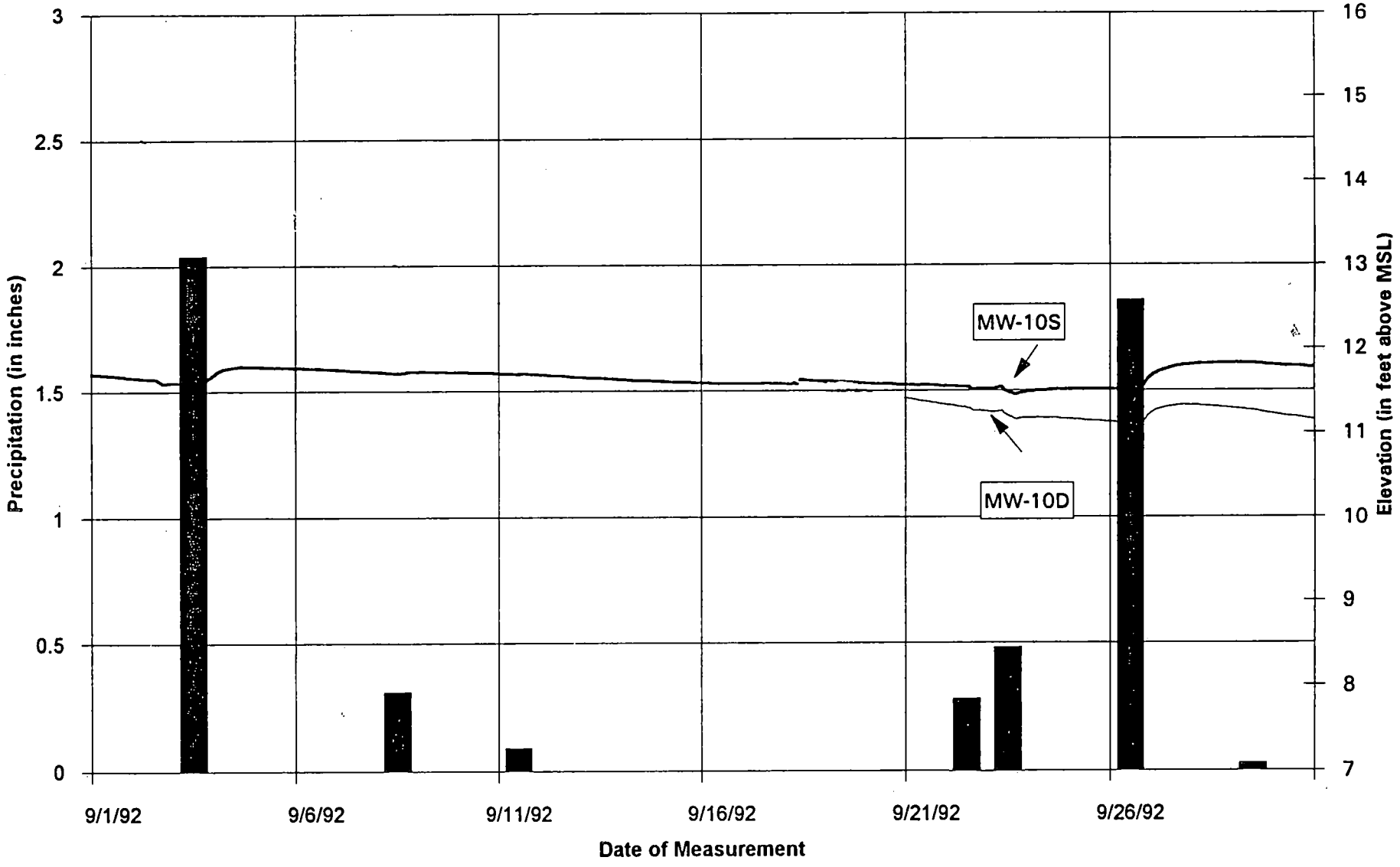
Figure G-11: MW-1S and MW-1D Hydrographs and Precipitation Data - September 1992



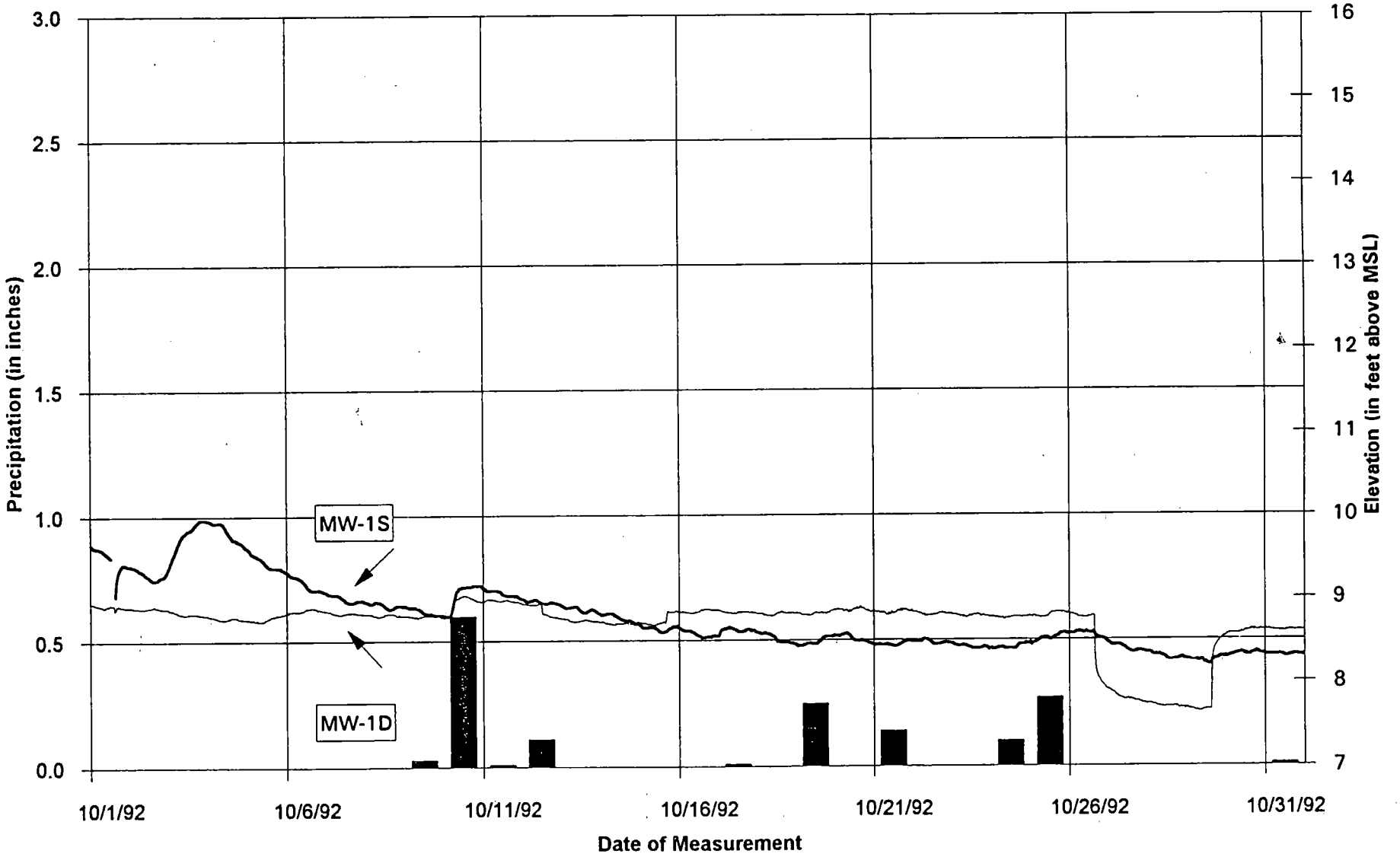
CLH: b:\SEPTPRE.XLS Chart 3

Figure G-12: MW-10S and MW-10D Hydrographs and Precipitation Data - September 1992



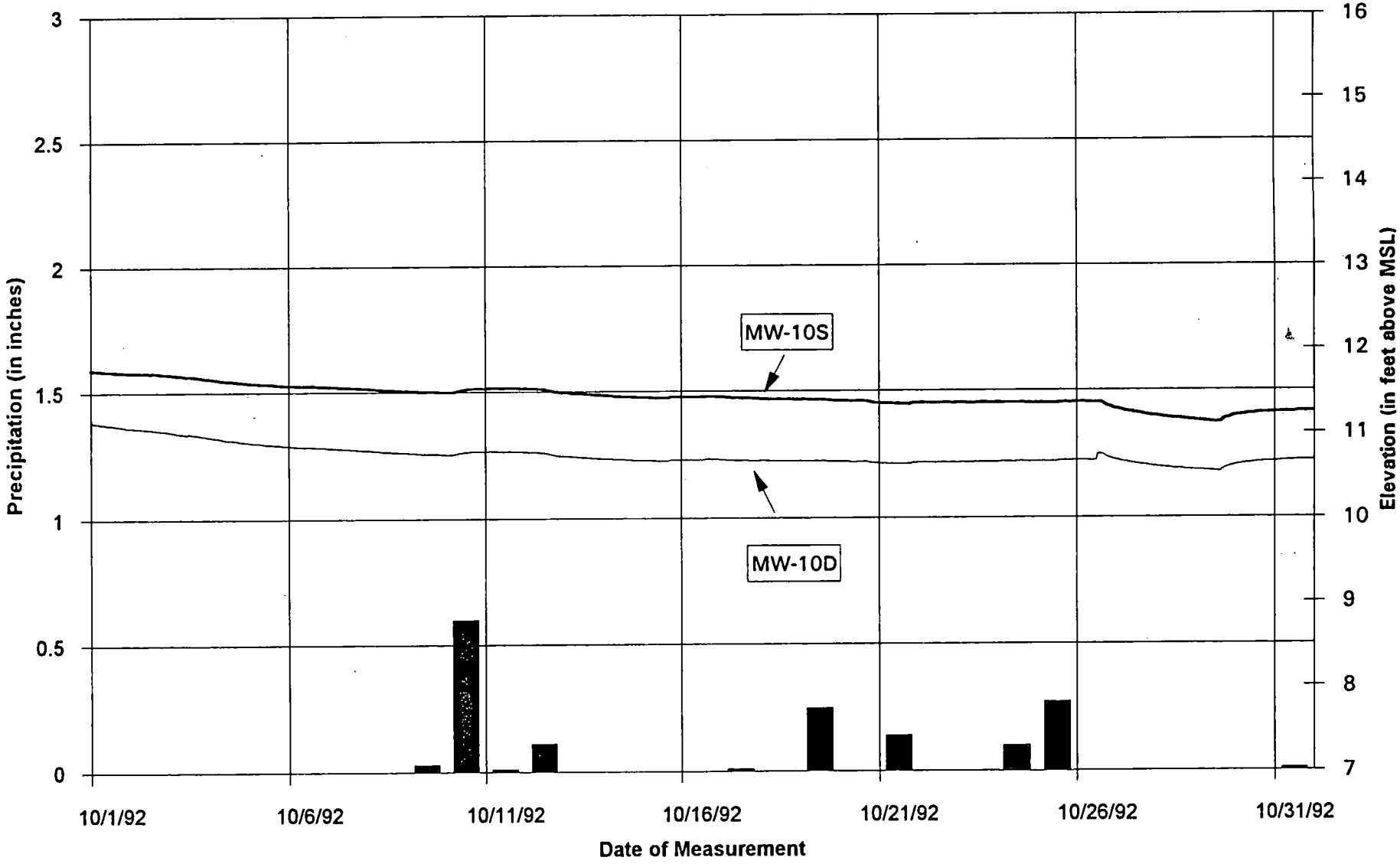
CLH: b:\SEPTPRE.XLS Chart 1

Figure G-13: MW-1S and MW-1D Hydrographs and Precipitation Data - October 1992



CLH: b:\OCTPRE.XLS Chart 2

Figure G-14: MW-10S and MW-10D Hydrographs and Precipitation Data - October 1992



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Appendix H

H

STEP-DRAWDOWN TEST DATA AND ANALYSES

H.1 OVERVIEW

This appendix presents the data and analyses from the step-drawdown tests of recovery wells RC-1 and RC-2 during the stabilization investigation in the Production Area under the RCRA Facility Investigation at the CIBA-GEIGY facility in Cranston, RI.

H.2 STEP-DRAWDOWN TEST DATA

The step-drawdown test data are presented in two sections. The first section presents the well head loss calculations and the specific capacity calculations used for determining the efficiency of RC-1 and RC-2, followed by a head loss graph for each recovery well. The second section presents the drawdown graphs generated from the analysis of the test data using the AQTESOLV™ computer program (Geraghty & Miller, 1989). There is one drawdown graph for each piezometer used as an observation point during the step-drawdown tests. The graphs for P-32S and P-32D (observation points for the RC-1 test) are presented first, followed by the graphs for P-33S and P-33D (observation points for the RC-2 test). These drawdown graphs also present the test parameters (e.g., discharge rate) and estimates of selected aquifer parameters (e.g., transmissivity, storativity).

H.3 STEP-DRAWDOWN TEST ANALYSES

The analyses performed on these step-drawdown data are described here. The efficiency of RC-1 and RC-2 were evaluated based on the step-drawdown test results. Head losses were calculated and used to determine the percent efficiency. Specific capacity was also calculated for each step of each step-drawdown test as a way to evaluate well efficiency.

The step-drawdown data were analyzed using the methods of Hantush (1964) and Bierschenk (1963) to determine linear aquifer head losses and well head losses from laminar and turbulent flow. (The Hantush-Bierschenk method was described in Section 3.5.3 of the Stabilization Work Plan.) The PTEST computer program (Paudyal and Gupta, 1986) was used to solve for aquifer and well losses in accordance with a simplified version of the Hantush-Bierschenk method developed by Rorabaugh (1953). In this simplified version:

$$s_w = BQ + CQ^P \qquad \text{(H-1)}$$

where

s_w = drawdown

B = linear aquifer and well head losses

Q = discharge rate

C = non-linear well head losses

P = a constant between 1.5 and 3.5

Determining the values for B, C, and P requires three independent equations. The method presented by Miller and Weber (1983) solves for B, C, and P independently for each step in a step-drawdown test as follows:

- for Step 1... $sw_1 = B_1Q_1 + C_1Q_1^P$ (H-2)
- for Step 2... $sw_2 = B_2Q_2 + C_2Q_2^P$ (H-3)
- for Step 3... $sw_3 = B_3Q_3 + C_3Q_3^P$ (H-4)

First, the PTEST computer program solves for P using the following equation:

$$P = \frac{\log\left[e + (Q_3/Q_2) - (K_2/K_1)(Q_1/Q_2)\right]}{\log(Q_3/Q_2)} \quad \text{(H-5)}$$

where

$$K_1 = sw_1 - (Q_1/Q_2)\, sw_2 \quad \text{(H-6)}$$

$$K_2 = sw_3 - (Q_3/Q_2)\, sw_2 \quad \text{(H-7)}$$

$$e = (K_2/K_1)(Q_1/Q_2)^P \quad \text{(H-8)}$$

After several iterations, the PTEST program converges on a solution for P. After determining P, the PTEST program calculates values for the coefficients B and C according to equations H-2, H-3, and H-4. The PTEST program determined the following values for B, C, and P for RC-1 and RC-2:

Parameter	RC-1	RC-2
B	0.1067	1.066
C	0.0000121	0.00794
P	2.913	2.635

Figures H-1 and H-2 present graphs of these PTEST results for the data from the step-drawdown tests at RC-1 and RC-2, respectively. These graphs show the drawdown for each discharge rate and the drawdown caused by well head losses.

The efficiency of RC-1 and RC-2 were determined using the following equation:

$$E_w = \frac{BQ}{BQ + CQ^P} \times 100\%$$

The PTEST computer program calculated the following efficiency results:

- For RC-1 (Q = 50 gpm)...
  - — linear aquifer and well head losses = 83% = Well Efficiency
  - — non linear well head losses = 17%

- For RC-2 (Q = 15 gpm)...
  — linear aquifer and well head losses = 62% = Well Efficiency
  — non-linear well head losses = 28%

The relationship between drawdown and discharge — the specific capacity (C_S) — also is a measure of the efficiency of a well. The equation for determining specific capacity is:

$$C_s = Q/s_w$$

After pumping for 60 minutes during each step, the specific capacity results for RC-1 were as follows:

Step	Discharge Rate (gpm)	Drawdown (feet)	Specific Capacity (gpm/ft)
0	20	2.13	9.38
1	38	4.06	9.36
2	56	5.98	9.36

After pumping for 60 minutes during each step, the specific capacity results for RC-2 were as follows:

Step	Discharge Rate (gpm)	Drawdown (feet)	Specific Capacity (gpm/ft)
0	6	8.18	0.733
1	12	23.86	0.503
2	15	35.97	0.417

These results indicate that the specific capacity was relatively constant for RC-1, but varied for RC-2 — a result consistent with the efficiencies calculated for these two recovery wells.

H.4 SUMMARY

This appendix presented the data and analyses from the step-drawdown tests of recovery wells RC-1 and RC-2 during the stabilization investigation.

REFERENCES

Bierschenk, W.H. Determining well efficiency by multiple step-drawdown tests. *International Association of Scientific Hydrology*, 1963, Publication 64, 493 – 509.

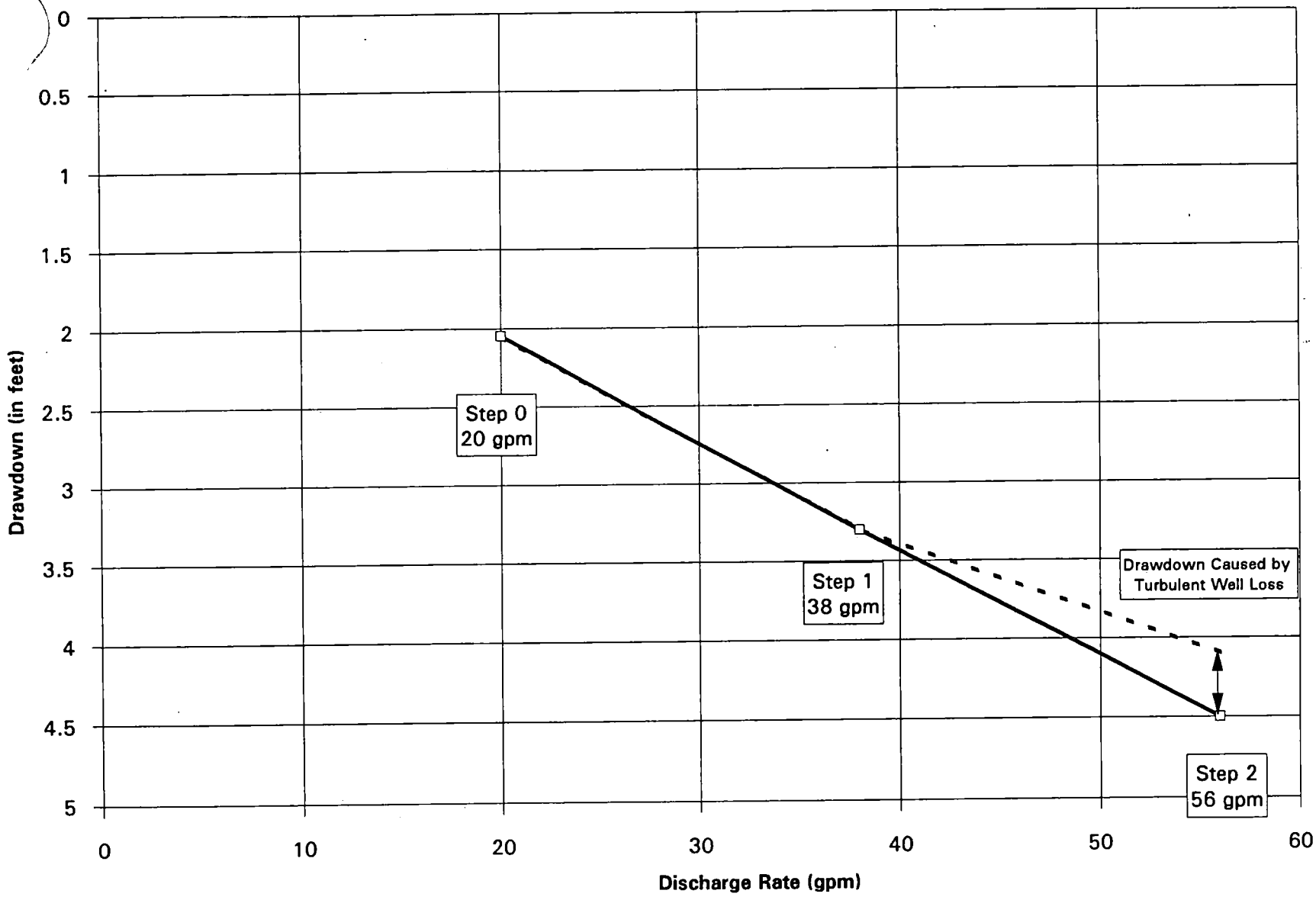
Hantush, M.S. Hydraulics of wells. In V.T. Chow (ed.), *Advances in hydroscience, Volume I*. NY: Academic Press, 1964.

Miller, C.T. and Weber, W.J., Jr. Rapid solution of the nonlinear step-drawdown equation. *Ground Water*, 1983, *21*, no. 5, 584 – 588.

Paudyal, G.N. and Gupta, A.D. *OPTP/PTEST — A microcomputer package for determining optimal well discharge*. International Groundwater Modeling Center, Holcomb Research Institute, Butler University, Indianapolis: IN, October 1986.

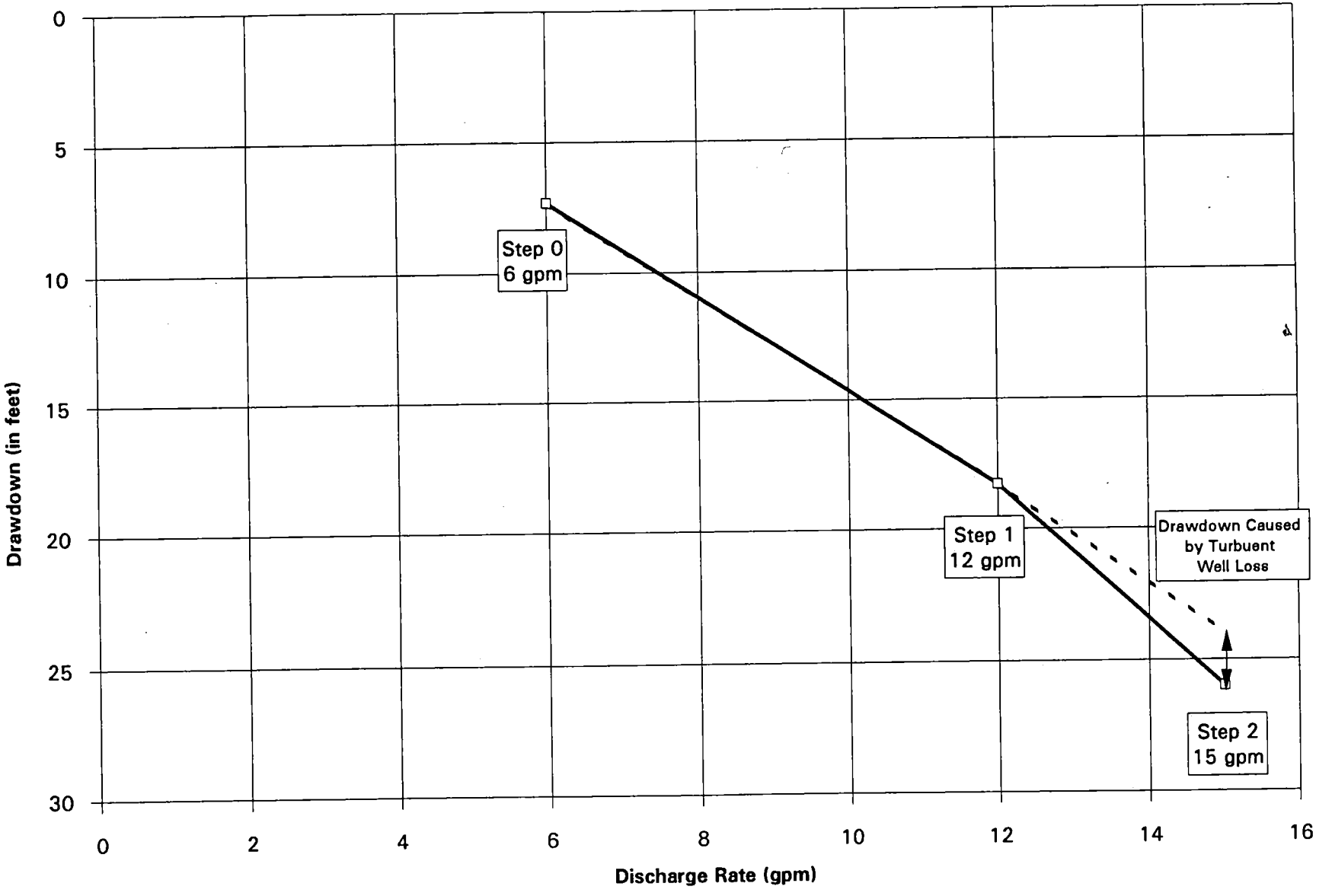
Rorabaugh, M.I. 1953. Graphical and theoretical analysis of step-drawdown test of artesian well. *Proceedings of the ASCE*, 1953, *79*, Separate #362, 362-1 – 362-23.

Figure H-1: RC-1 Head Loss



CLH: b:stptst\graphs\HDLOSS.XLS Chart 4

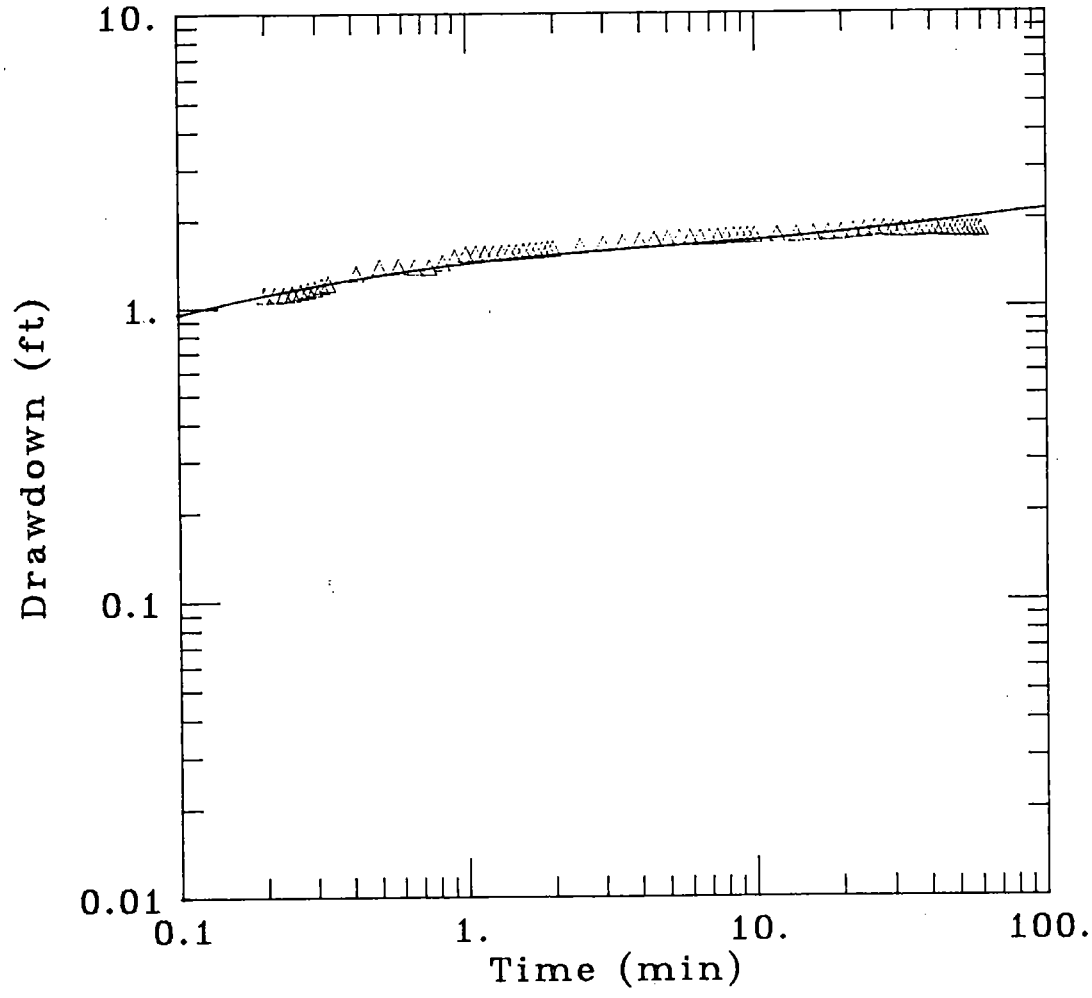
Figure H-2: RC-2 Head Loss



CLH: b:stptst\graphs\HDLOSS.XLS Chart 5

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure H-3: RC-1 Step-Drawdown Test : Drawdown in P-32S



DATA SET:
b:\aqdata\p32s.dat
04/19/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
September 1992

TEST WELL:
RC-1

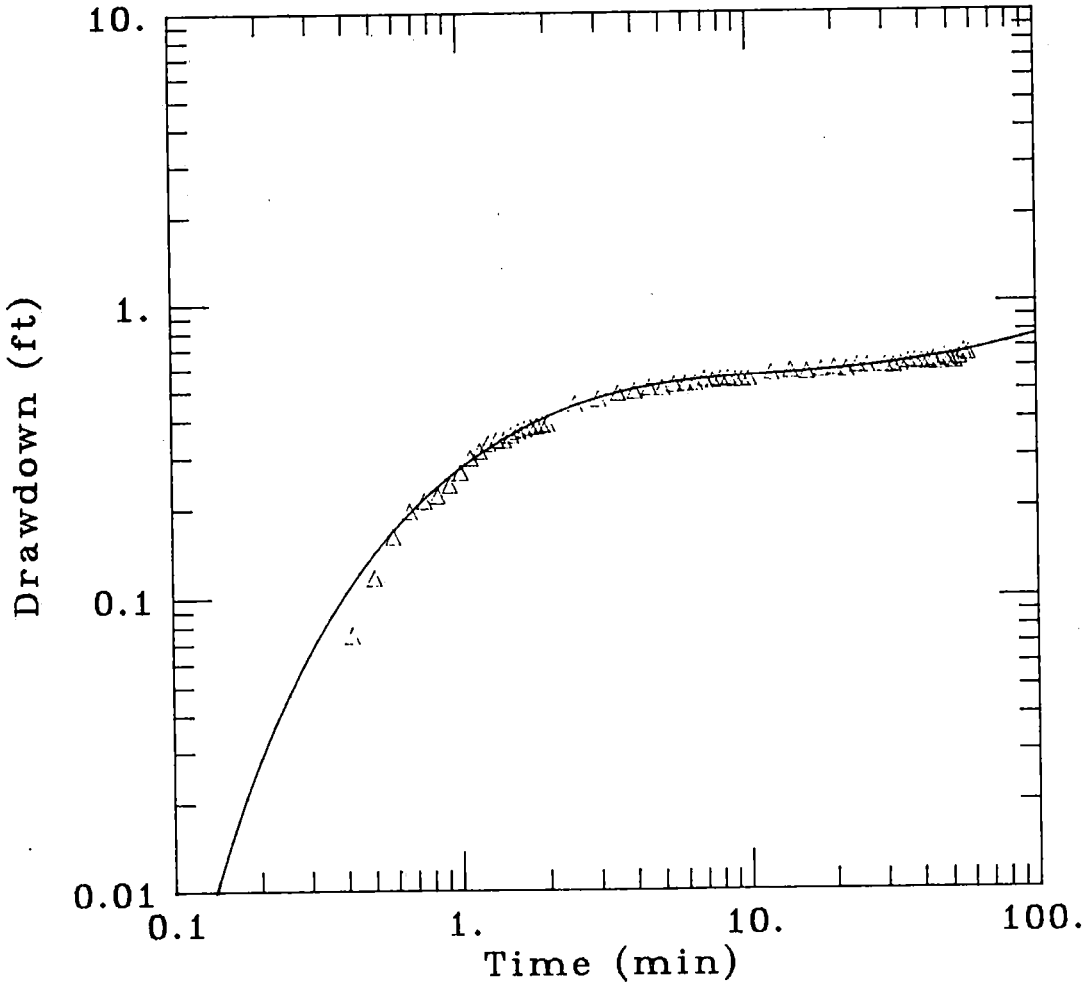
OBS. WELL:
P-32S

ESTIMATED PARAMETERS:
T = 0.7763 ft^2/min
S = 4.3243E-05
Sy = 0.0006105
β = 0.001

TEST DATA:
Q = 2.674 ft^3/min
r = 10. ft
b = 10. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure H-4: RC-1 Step-Drawdown Test : Drawdown in P-32D



DATA SET:
b:\aqdata\p32d.dat
04/19/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
September 1992

TEST WELL:
RC-1

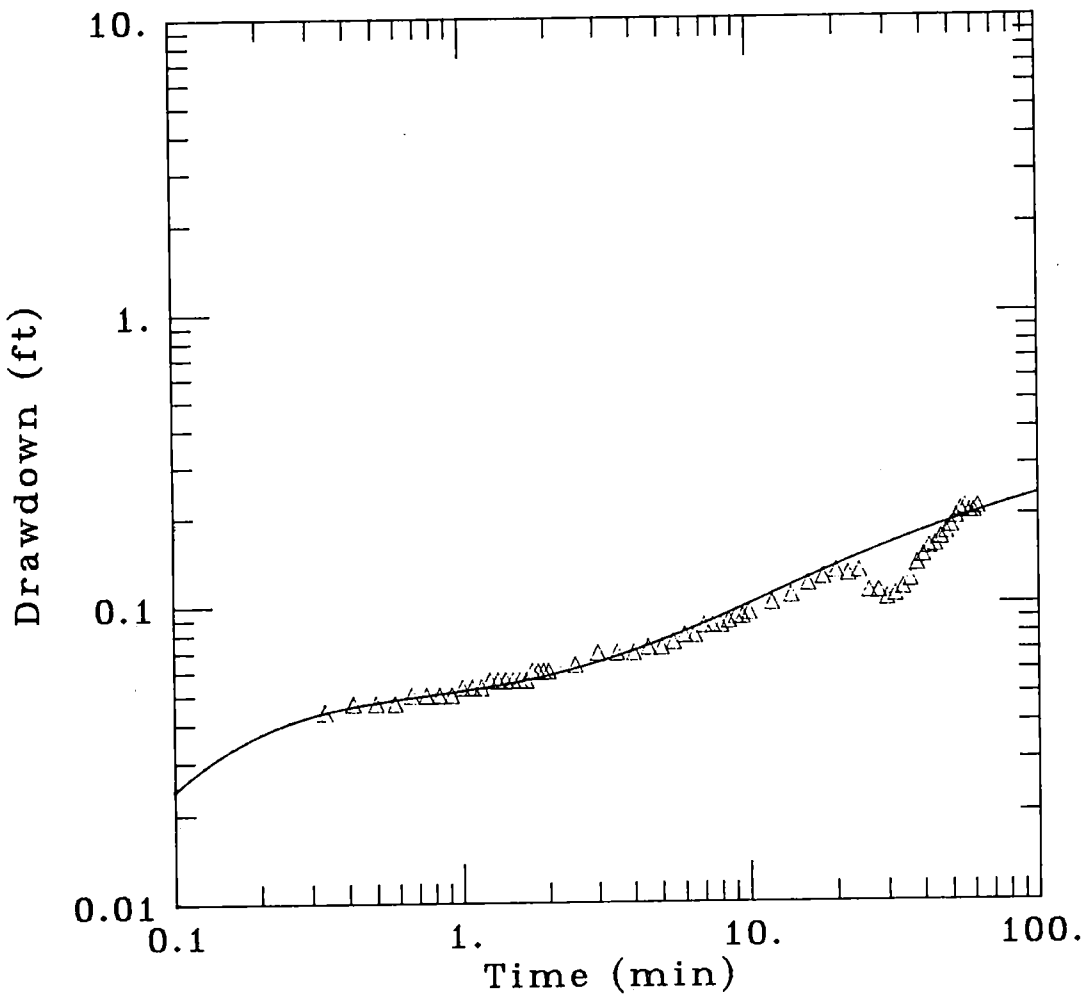
OBS. WELL:
P-32D

ESTIMATED PARAMETERS:
T = 0.4253 ft^2/min
S = 0.02413
Sy = 1.538
β = 0.2

TEST DATA:
Q = 2.674 ft^3/min
r = 5. ft
b = 33. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure H-5: RC-2 Step-Drawdown Test : Drawdown in P-33S



DATA SET:
p33s.dat
04/13/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
September 1992

TEST WELL:
RC-2

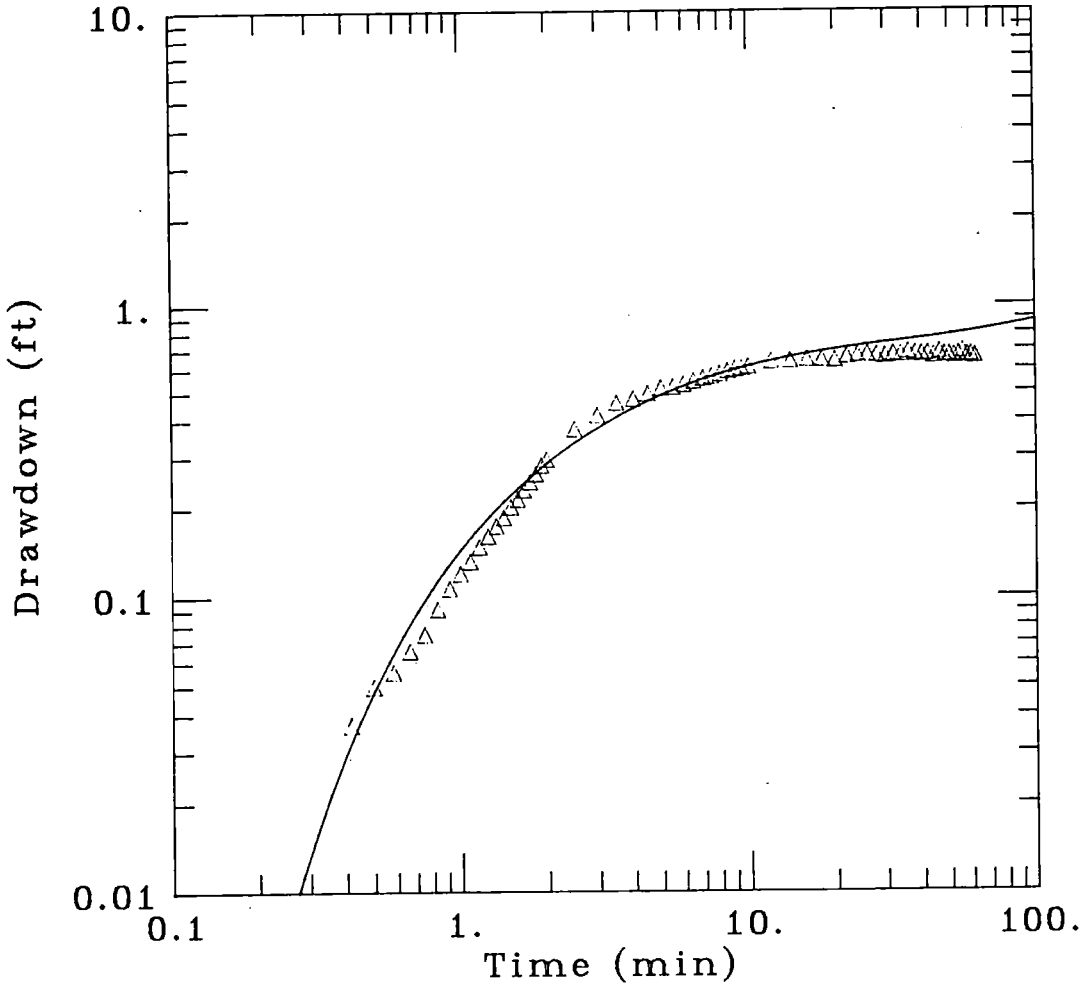
OBS. WELL:
P-33S

ESTIMATED PARAMETERS:
T = 0.9562 ft^2/min
S = 0.001843
Sy = 0.06318
β = 0.4

TEST DATA:
Q = 0.8022 ft^3/min
r = 10. ft
b = 10. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure H-6: RC-2 Step-Drawdown Test : Drawdown in P-33D



DATA SET:
p33d.dat
04/13/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
September 1992

TEST WELL:
RC-2

OBS. WELL:
P-33D

ESTIMATED PARAMETERS:
T = 0.1435 ft^2/min
S = 0.01558
Sy = 0.3376
β = 0.1

TEST DATA:
Q = 0.8022 ft^3/min
r = 5. ft
b = 45. ft

Appendix 1

I

72-HOUR CONSTANT RATE TEST DATA AND ANALYSES

This appendix presents the data and analyses from the 72-hour constant rate tests of recovery wells RC-1 and RC-2 during the stabilization investigation in the Production Area under the RCRA Facility Investigation at the CIBA-GEIGY facility in Cranston, RI. Overall, the 72-hour constant rate test data are organized in two main sections corresponding to the two recovery wells tested — the data and analyses for the test of RC-1 are presented first, followed by the data and analyses for RC-2. Within each main section (i.e., for each recovery well tested), first a table of groundwater levels (measured manually) before and after the test is presented; the table is organized by well/piezometer identifier (e.g., MW-1S, MW-1D, ... P-1S, P-1D,... RW-2, RW-3,... VE-1, VE-2, and so on) for all the wells/piezometers. For each well/piezometer, the table shows the reference elevation, as well as (for both pre-test and post-test measurements) the depth to water and the groundwater elevation calculated. Then a hydrograph is presented, plotting changes in the groundwater elevation against time for the recovery well tested and also for other selected monitoring wells/piezometers that served as observation points for the test. Finally, the drawdown graphs generated during the analysis of the test data using the AQTESOLV computer program (Geraghty and Miller, 1989) are presented. These graphs are presented for selected wells/piezometers used as observation points during the test, and the graphs are organized by well/piezometer identifier. These drawdown graphs also present the test parameters (e.g., discharge rate) and estimates of selected aquifer parameters (e.g., transmissivity, storativity).

Table I-1: Groundwater Level Data - 72-Hour Constant Rate Test on RC-1

Location ID	Reference Elevation(ft)	Pre-Test Data (10/26/92) Depth to Water (ft below Reference Elevation)	Pre-Test Data (10/26/92) Groundwater Elevation (ft MSL)	End of Test Data (10/29/92) Depth to Water (ft below Reference Elevation)	End of Test Data (10/29/92) Groundwater Elevation (ft MSL)
P-1S	16.41	7.35	-7.35	7.91	-7.91
P-1D	16.33	7.83	-7.83	6.81	-6.81
P-2S	13.85	5.38	-5.38	5.83	-5.83
P-2D	16.00	7.20	-7.20	7.35	-7.35
P-3S	15.45	8.07	-8.07	8.07	-8.07
P-4S	19.92	8.61	-8.61	8.66	-8.66
P-5S	21.18	10.37	-10.37	10.64	-10.64
P-6S	23.62	12.74	-12.74	14.28	-14.28
P-6M	21.80	10.72	-10.72	10.52	-10.52
P-7SA	16.26	5.80	-5.80	5.86	-5.86
P-7SB	15.68	5.32	-5.32	5.32	-5.32
P-8S	16.21	9.62	-9.62	9.72	-9.72
P-9S	16.10	8.10	-8.10	8.28	-8.28
P-10S	14.05	7.43	-7.43	8.91	-8.91
P-11S	17.95	6.08	-6.08	6.06	-6.06
P-12SA	15.29	7.40	-7.40	7.42	-7.42
P-12SB	15.32	6.52	-6.52	6.54	-6.54
P-13S	26.99	13.90	-13.90	13.96	-13.96
P-13D	18.85	8.82	-8.82	NA	NA
P-14S	24.18	8.96	-8.96	9.96	-9.96
P-14D	23.95	8.48	-8.48	9.54	-9.54
P-15S	15.69	8.64	-8.64	8.71	-8.71
P-16S	16.29	9.00	-9.00	9.10	-9.10
P-18D	13.27	2.80	-2.80	2.86	-2.86
P-19D	17.21	4.10	-4.10	4.12	-4.12
P-20S	24.02	14.10	-14.10	14.04	-14.04
P-20D	24.30	14.36	-14.36	14.24	-14.24
P-21S	16.96	9.80	-9.80	9.74	-9.74
P-21D	15.75	5.55	-5.55	5.75	-5.75
P-22S	18.75	9.25	-9.25	9.24	-9.24
P-22D	17.57	6.54	-6.54	6.63	-6.63
P-23D	35.42	18.54	-18.54	18.60	-18.60
P-24D	29.43	18.18	-18.18	18.20	-18.20
P-25D	16.93	5.00	-5.00	5.04	-5.04
P-26S	17.29	7.97	-7.97	7.55	-7.55
P-26D	17.59	8.28	-8.28	8.56	-8.56
P-27D	15.76	8.01	-8.01	8.44	-8.44
P-29D	16.51	8.75	-8.75	9.23	-9.23
P-30D	16.43	8.23	-8.23	8.67	-8.67
P-31D	16.45	8.15	-8.15	8.41	-8.41
P-32S	17.02	7.56	-7.56	9.73	-9.73
P-32D	17.10	8.32	-8.32	9.68	-9.68
P-33S	17.74	8.41	-8.41	8.62	-8.62
P-33D	16.99	8.20	-8.20	8.40	-8.40
EP-1	22.90	12.82	-12.82	13.05	-13.05
EP-2	24.52	11.42	-11.42	11.46	-11.46

CLH: b:\RC1GW.XLS

NA - value not available

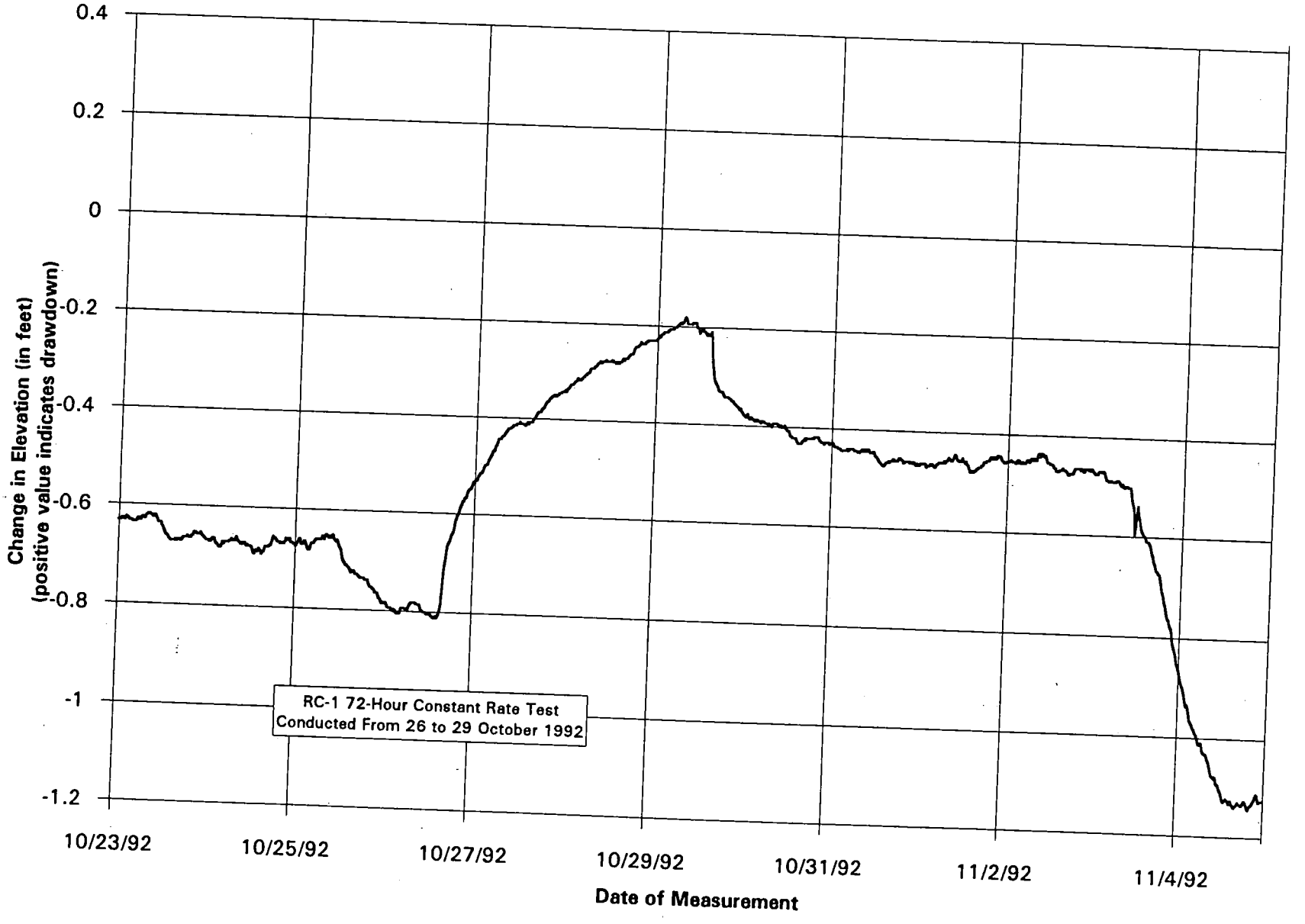
Table I-1: Groundwater Level Data - 72-Hour Constant Rate Test on RC-1

Location ID	Reference Elevation(ft)	Pre-Test Data (10/26/92) Depth to Water (ft below Reference Elevation)	Pre-Test Data (10/26/92) Groundwater Elevation (ft MSL)	End of Test Data (10/29/92) Depth to Water (ft below Reference Elevation)	End of Test Data (10/29/92) Groundwater Elevation (ft MSL)
EP-5	15.84	7.96	-7.96	8.04	-8.04
EP-6	11.04	2.80	-2.80	2.10	-2.10
EP-7	14.37	6.30	-6.30	6.32	-6.32
EP-8	24.41	7.32	-7.32	7.40	-7.40
MW-1S	15.04	6.22	-6.22	6.42	-6.42
MW-1D	16.28	7.55	-7.55	8.62	-8.62
MW-2S	14.46	5.54	-5.54	6.83	-6.83
MW-3S	16.61	8.35	-8.35	8.69	-8.69
MW-4S	21.29	10.33	-10.33	10.51	-10.51
MW-5SA	26.17	12.66	-12.66	12.74	-12.74
MW-6S	14.04	7.12	-7.12	7.18	-7.18
MW-7S	15.25	7.88	-7.88	7.96	-7.96
MW-8S	17.57	11.00	-11.00	11.08	-11.08
MW-10S	22.62	11.45	-11.45	NA	NA
MW-10D	21.61	10.22	-10.22	NA	NA
MW-11S	13.67	5.74	-5.74	6.90	-6.90
MW-12S	22.54	11.57	-11.57	11.80	-11.80
MW-12D	21.23	9.97	-9.97	10.00	-10.00
MW-13S	18.44	8.34	-8.34	NA	NA
MW-14S	21.39	10.05	-10.05	10.37	-10.37
MW-15S	16.65	8.64	-8.64	8.74	-8.74
MW-15D	16.99	4.74	-4.74	4.82	-4.82
MW-16S	26.00	12.44	-12.44	12.50	-12.50
MW-16D	26.44	12.16	-12.16	12.20	-12.20
MW-17S	16.75	8.27	-8.27	8.30	-8.30
MW-17D	17.29	6.41	-6.41	6.58	-6.58
MW-18S	35.28	19.00	-19.00	19.00	-19.00
MW-20S	21.94	11.82	-11.82	10.49	-10.49
MW-21S	15.42	5.22	-5.22	5.25	-5.25
MW-22S	16.87	7.15	-7.15	7.05	-7.05
MW-23S	20.71	10.95	-10.95	11.35	-11.35
MW-24S	21.04	9.90	-9.90	10.10	-10.10
MW-29S	16.66	9.23	-9.23	9.71	-9.71
MW-29D	16.59	9.05	-9.05	9.35	-9.35
MW-30S	16.70	9.15	-9.15	9.52	-9.52
MW-30D	16.67	9.17	-9.17	9.55	-9.55
MW-31S	16.27	8.00	-8.00	8.21	-8.21
MW-31D	16.21	7.80	-7.80	8.02	-8.02
RW-2	18.05	6.88	-6.88	6.92	-6.92
RW-3	13.49	3.24	-3.24	3.18	-3.18
RW-4	23.79	13.70	-13.70	13.76	-13.76
RC-1	16.33	7.00	-7.00	NA	NA
RC-2	16.85	7.95	-7.95	8.29	-8.29
VE-1	21.80	10.55	11.25	NA	NA
VE-2	21.59	10.42	-10.42	10.66	-10.66
VE-3	21.14	10.05	11.09	NA	NA

CLH: b:\RC1GW.XLS

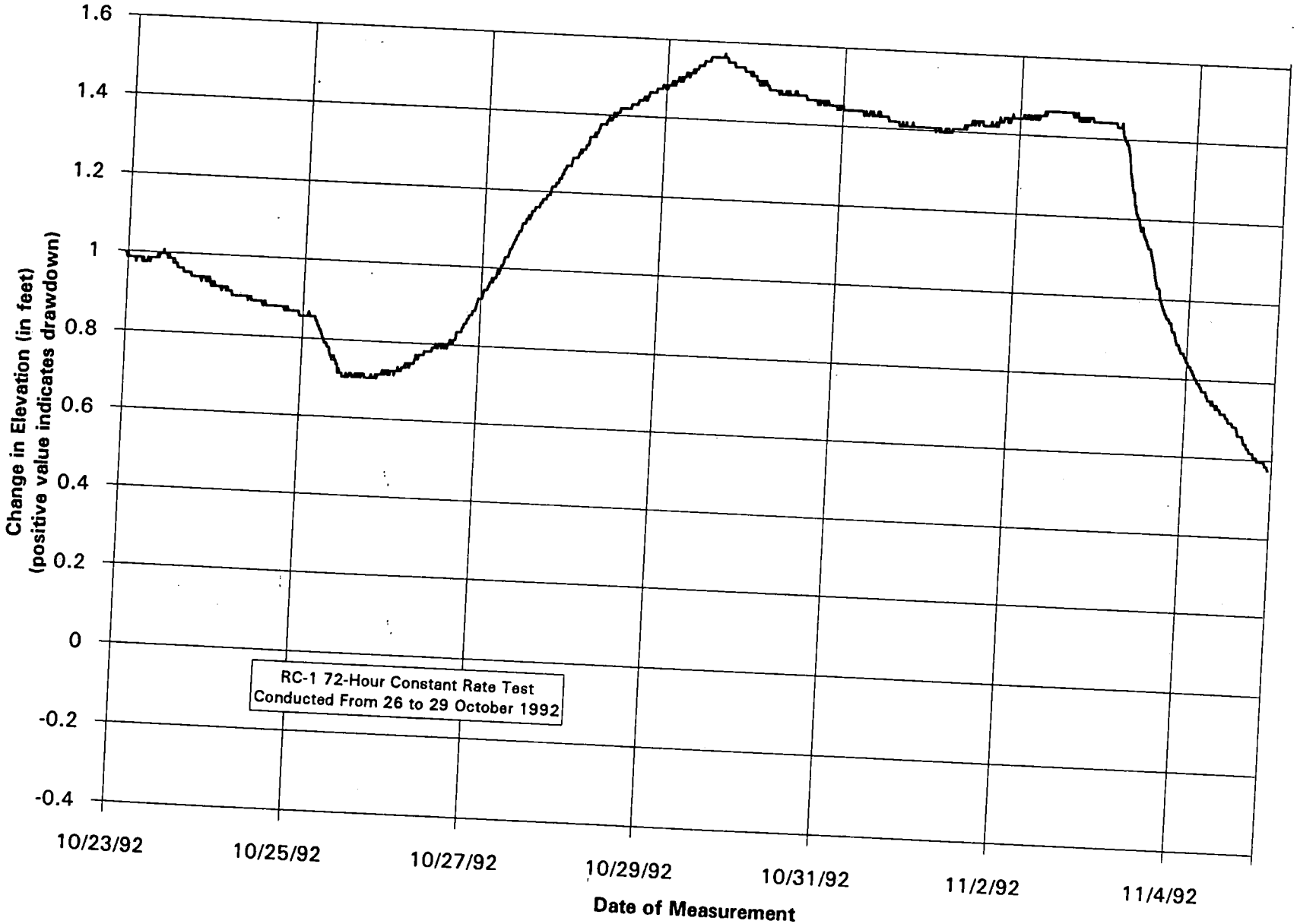
NA - value not available

Figure I-1: P-1S Hydrograph - 23 October to 4 November 1992



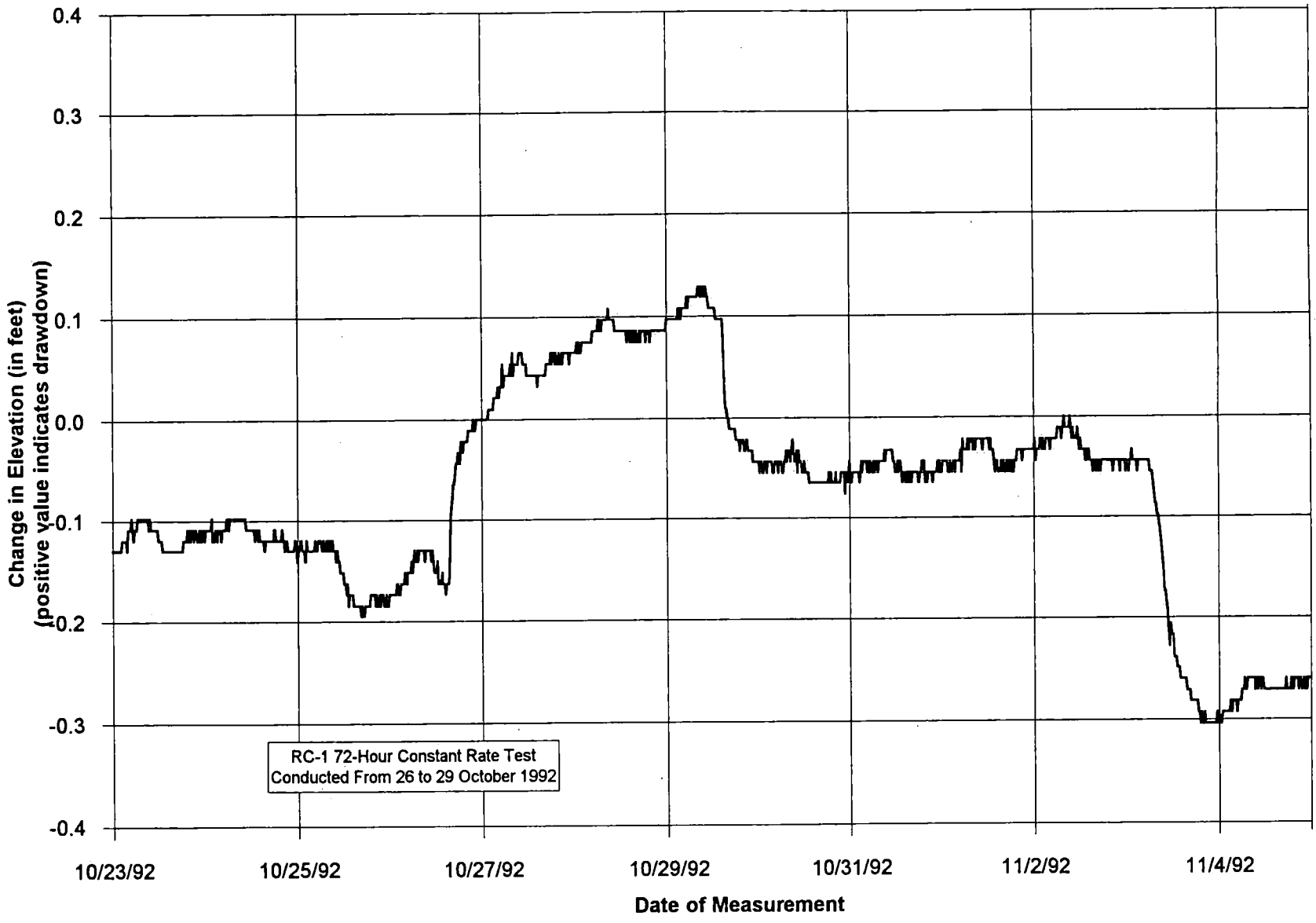
CLH: h:\P1SB.XLC

Figure I-2: P-2S Hydrograph - 23 October to 4 November 1992



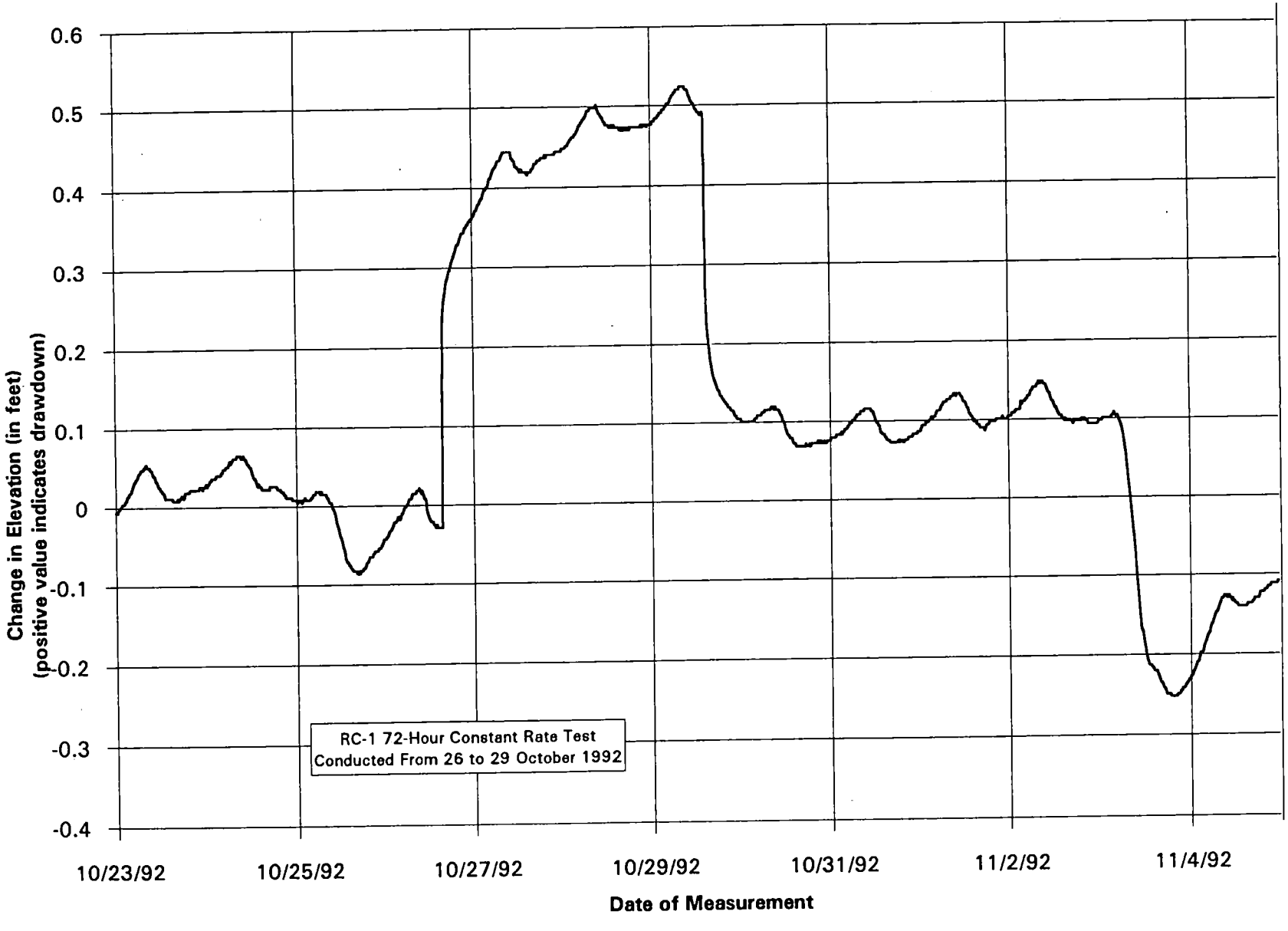
CLH: b:\P2SB.XLC

Figure I-3: P-2D Hydrograph - 23 October to 4 November 1992



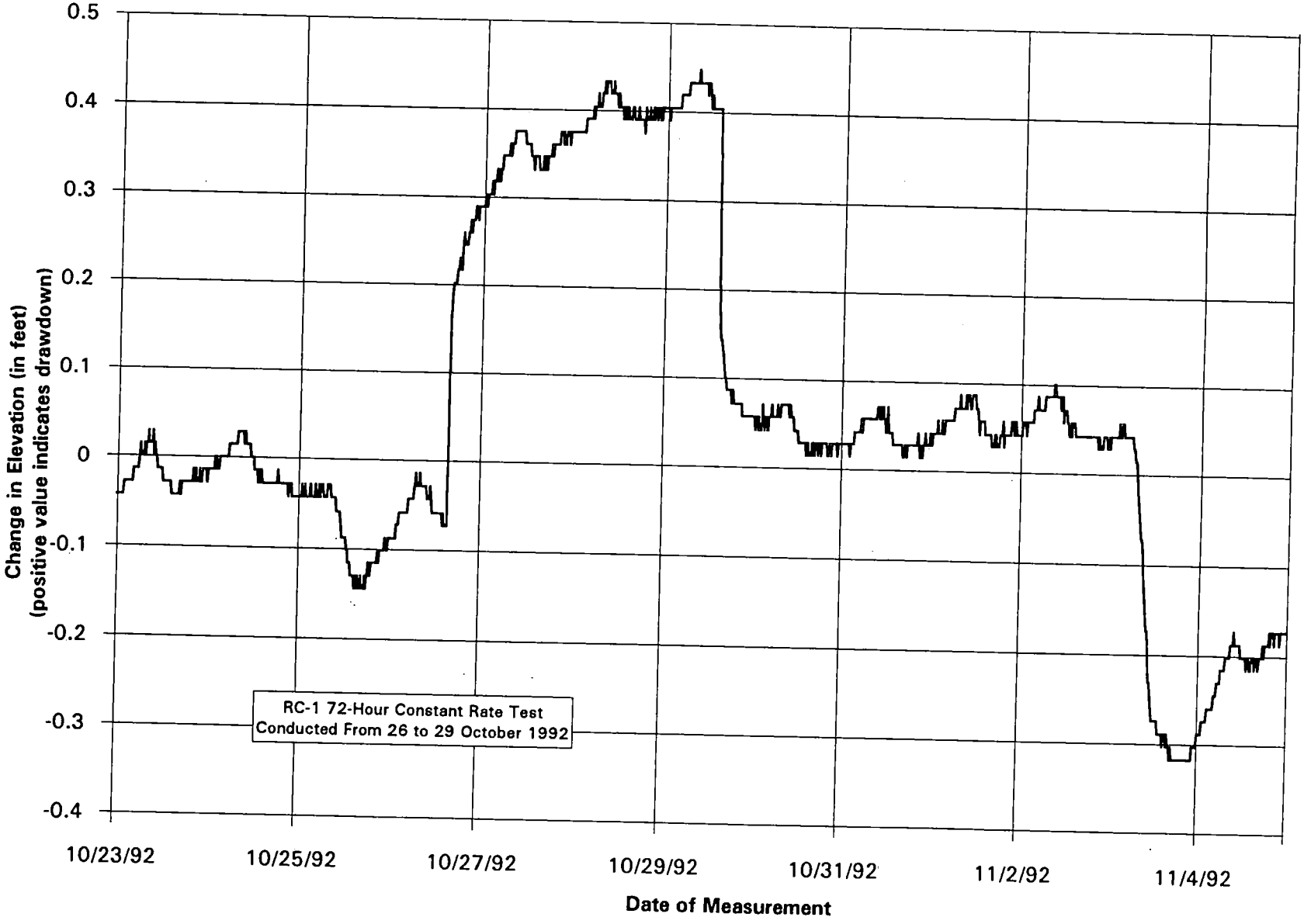
CLH: c:\P2D.XLS Chart 2

Figure I-4: MW-30S Hydrograph - 23 October to 4 November 1992



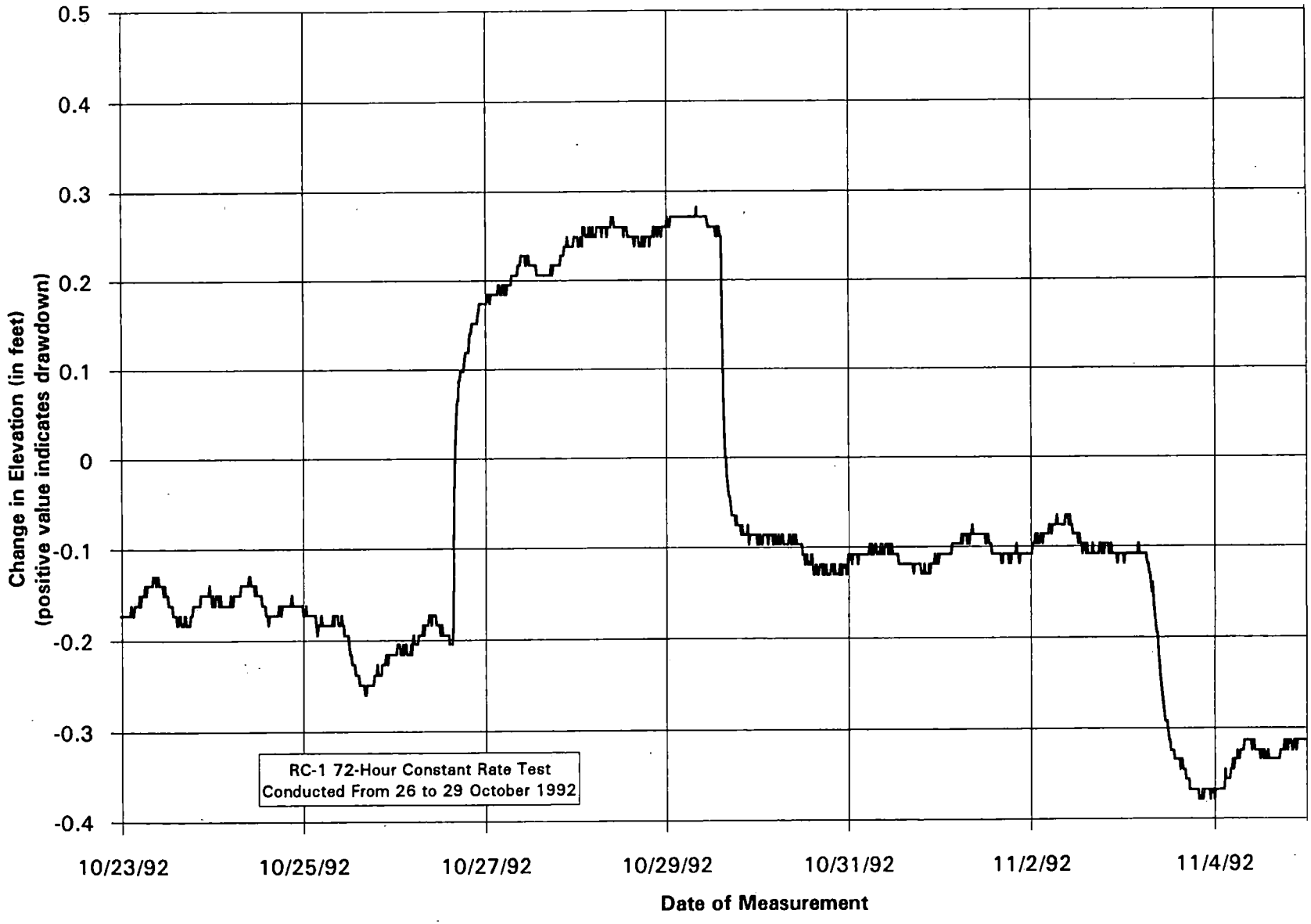
CLH: b:\MW30S.XLS Chart 2

Figure I-5: MW-30D Hydrograph - 23 October to 4 November 1992



CLH: b:\MW30DB.XLC

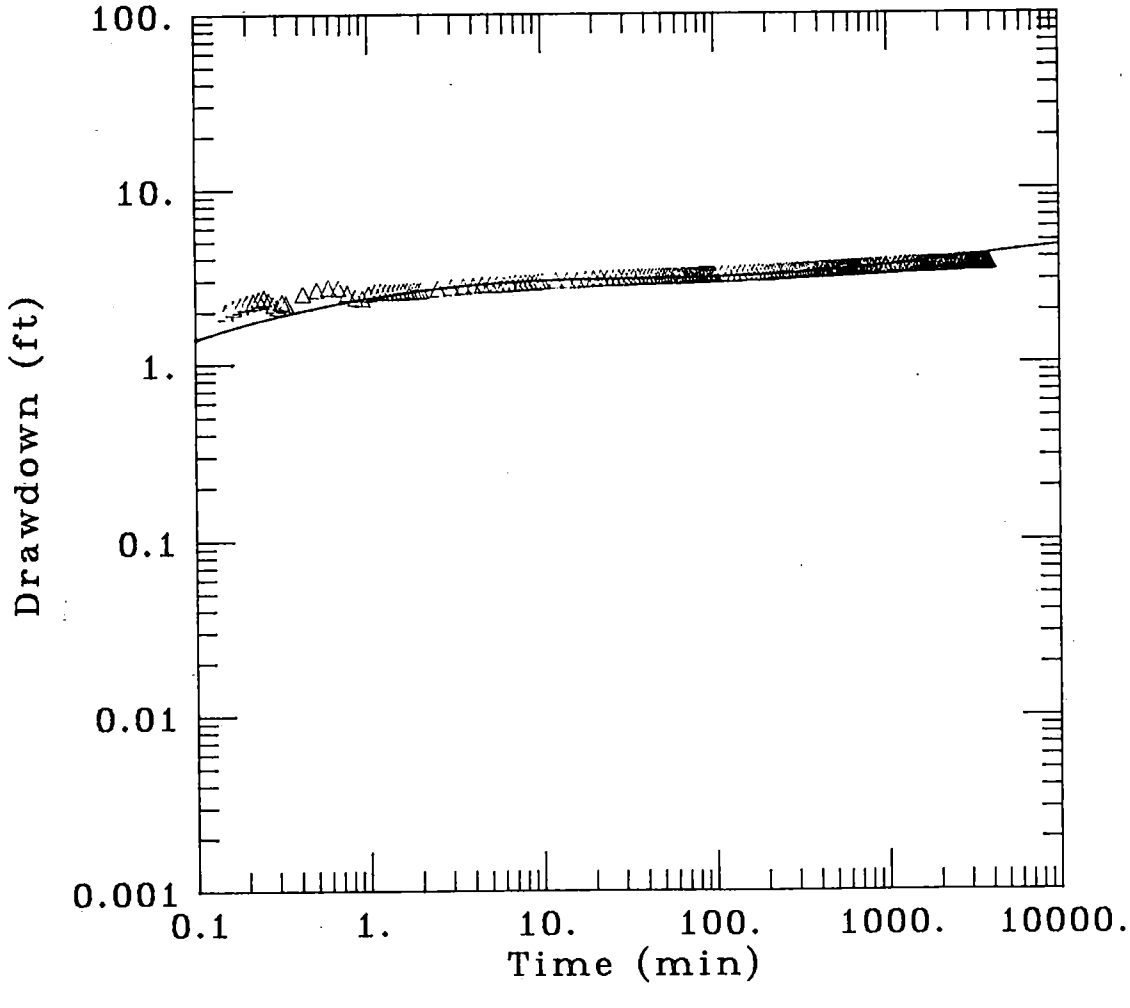
Figure I-6: P-30D Hydrograph - 23 October to 4 November 1992



CLH: b:\P30DB.XLC

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure I-7: RC-1 Constant Rate Test : Drawdown in RC-1



DATA SET:
b:\aqdat\aqrc1.dat
04/19/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
10/26/92-10/29/92

TEST WELL:
RC-1

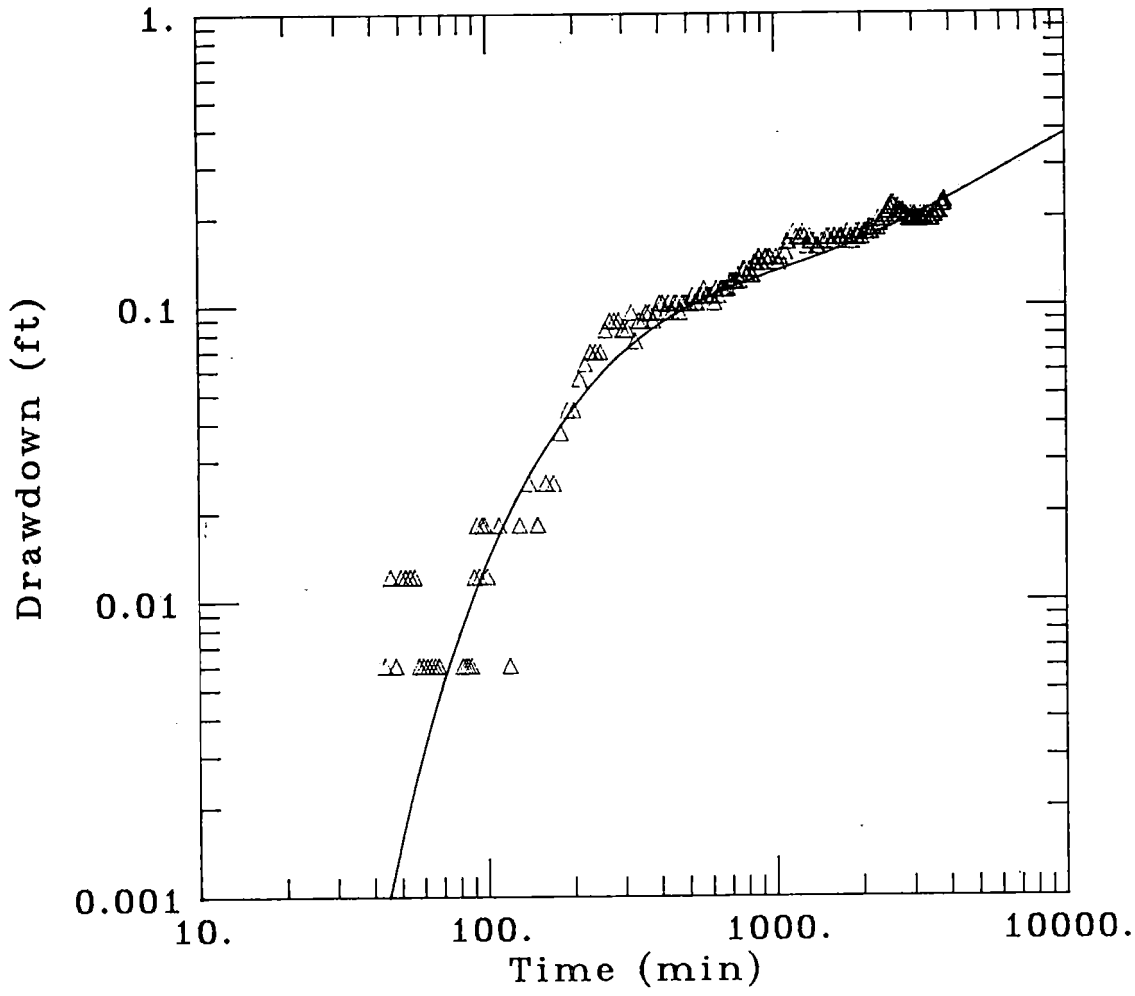
OBS. WELL:
RC-1

ESTIMATED PARAMETERS:
T = 0.5936 ft^2/min
S = 0.009253
Sy = 2.008
β = 0.001

TEST DATA:
Q = 4.01 ft^3/min
r = 1. ft
b = 36. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure I-8: RC-1 Constant Rate Test : Drawdown in P-3S



DATA SET:
aqp-3s.dat
11/04/92

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
10/26/92-10/29/92

TEST WELL:
RC-1

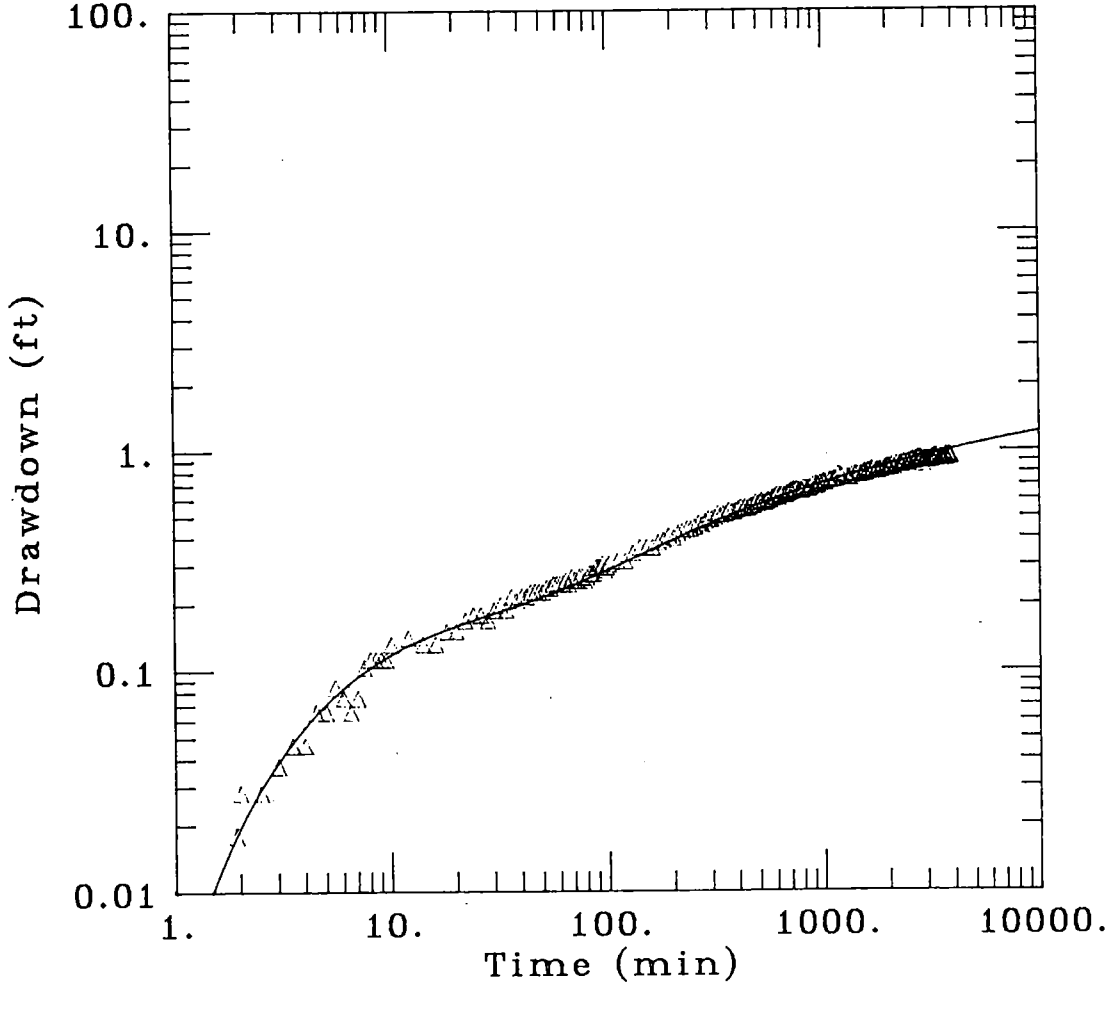
OBS. WELL:
P-3S

ESTIMATED PARAMETERS:
T = 1.109 ft^2/min
S = 0.05257
Sy = 0.5116
β = 0.8

TEST DATA:
Q = 4.01 ft^3/min
r = 121. ft
b = 5. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure I-9: RC-1 Constant Rate Test : Drawdown in MW-13S



DATA SET:
b:\aqdat\aqmw-13s.dat
04/19/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
10/26/92-10/29/92

TEST WELL:
RC-1

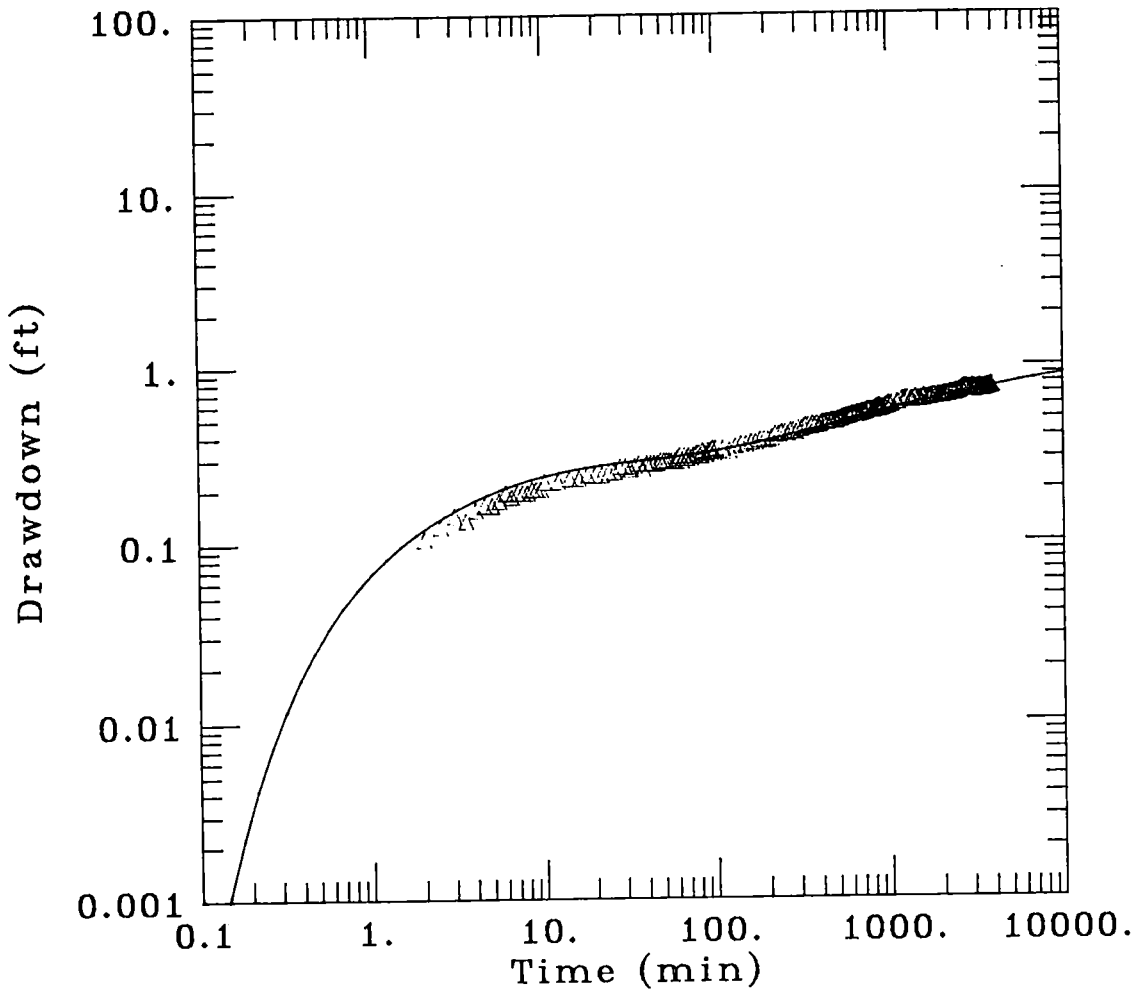
OBS. WELL:
MW-13S

ESTIMATED PARAMETERS:
T = 1.453 ft^2/min
S = 0.003491
Sy = 0.0253
β = 0.4

TEST DATA:
Q = 4.01 ft^3/min
r = 68. ft
b = 8. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure I-10: RC-1 Constant Rate Test : Drawdown in P-13D



DATA SET:
b:\aqdat\aqp-13d.dat
04/19/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
10/26/92-10/29/92

TEST WELL:
RC-1

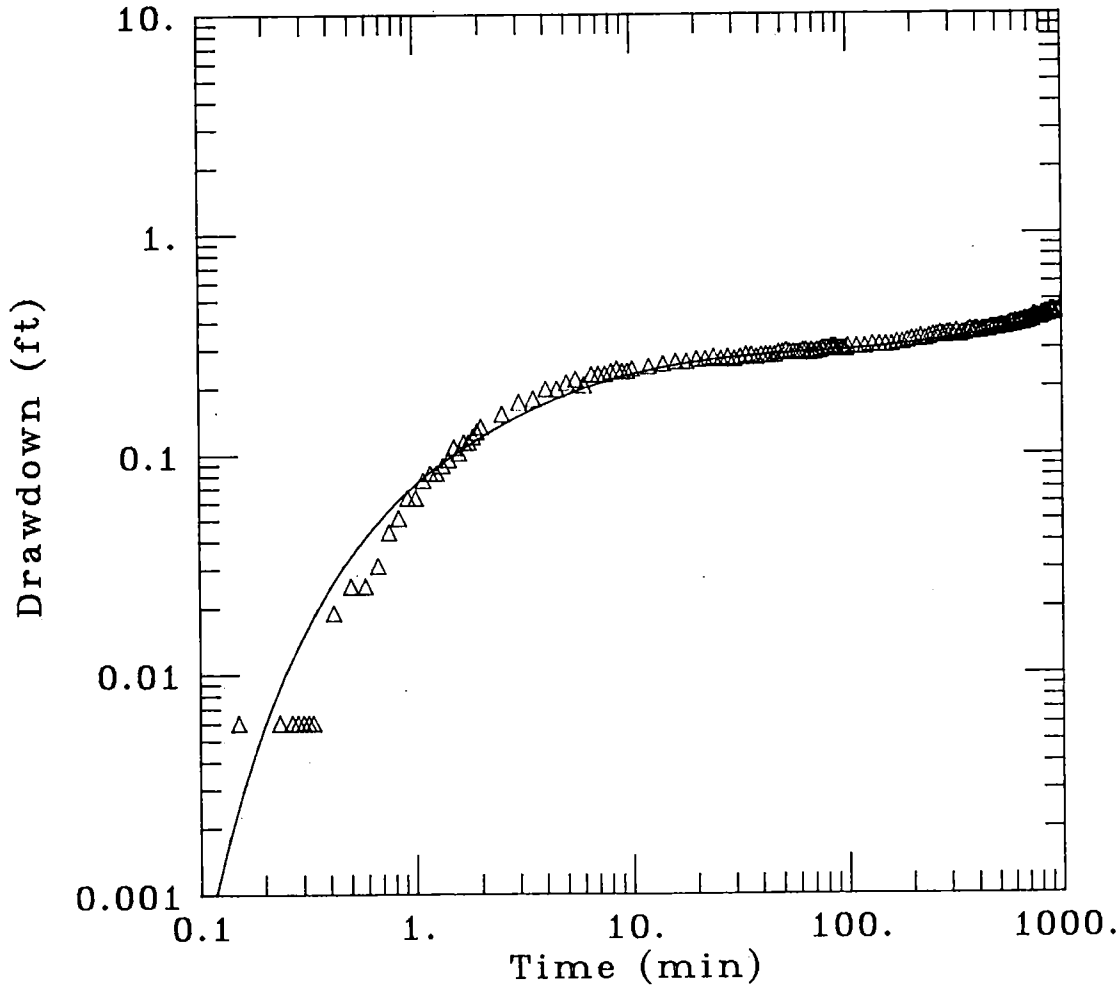
OBS. WELL:
P-13D

ESTIMATED PARAMETERS:
T = 2.251 ft^2/min
S = 0.001058
Sy = 0.02348
β = 0.06

TEST DATA:
Q = 4.01 ft^3/min
r = 65. ft
b = 29. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure I-11: RC-1 Constant Rate Test : Drawdown in MW-29S



DATA SET:
aqmw-29s.dat
04/12/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
10/26/92-10/29/92

TEST WELL:
RC-1

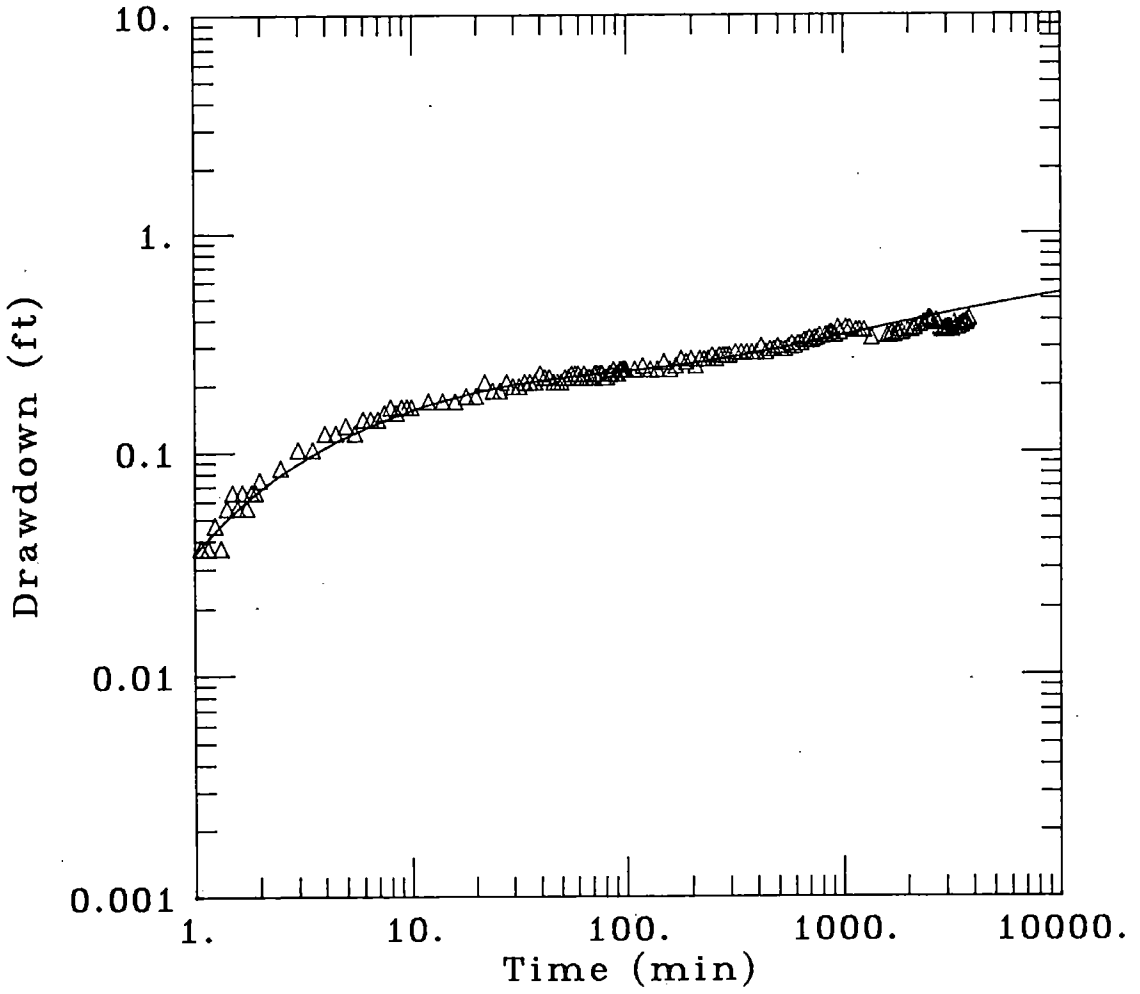
OBS. WELL:
MW-29S

ESTIMATED PARAMETERS:
T = 2.857 ft^2/min
S = 0.001491
Sy = 0.06005
β = 0.03

TEST DATA:
Q = 4.01 ft^3/min
r = 54. ft
b = 26. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure I- 12: RC-1 Constant Rate Test : Drawdown in MW-29D



DATA SET:
aqmw-29d.dat
04/12/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
10/26/92-10/29/92

TEST WELL:
RC-1

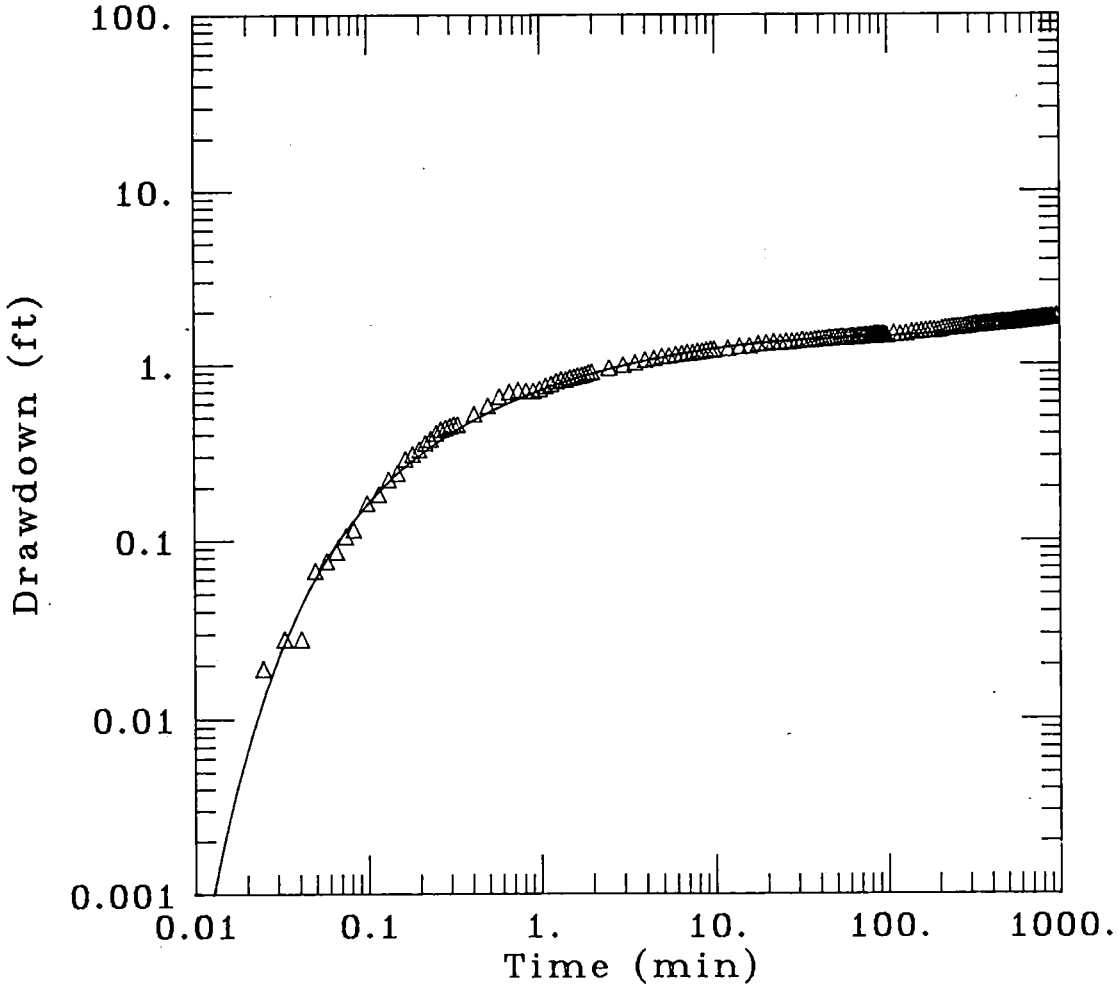
OBS. WELL:
MW-29D

ESTIMATED PARAMETERS:
T = 3.693 ft^2/min
S = 0.002667
Sy = 0.04969
β = 0.03

TEST DATA:
Q = 4.01 ft^3/min
r = 58. ft
b = 37. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure I-13: RC-1 Constant Rate Test : Drawdown in MW-P-32S



DATA SET:
aqp-32s.dat
04/12/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
10/26/92-10/29/92

TEST WELL:
RC-1

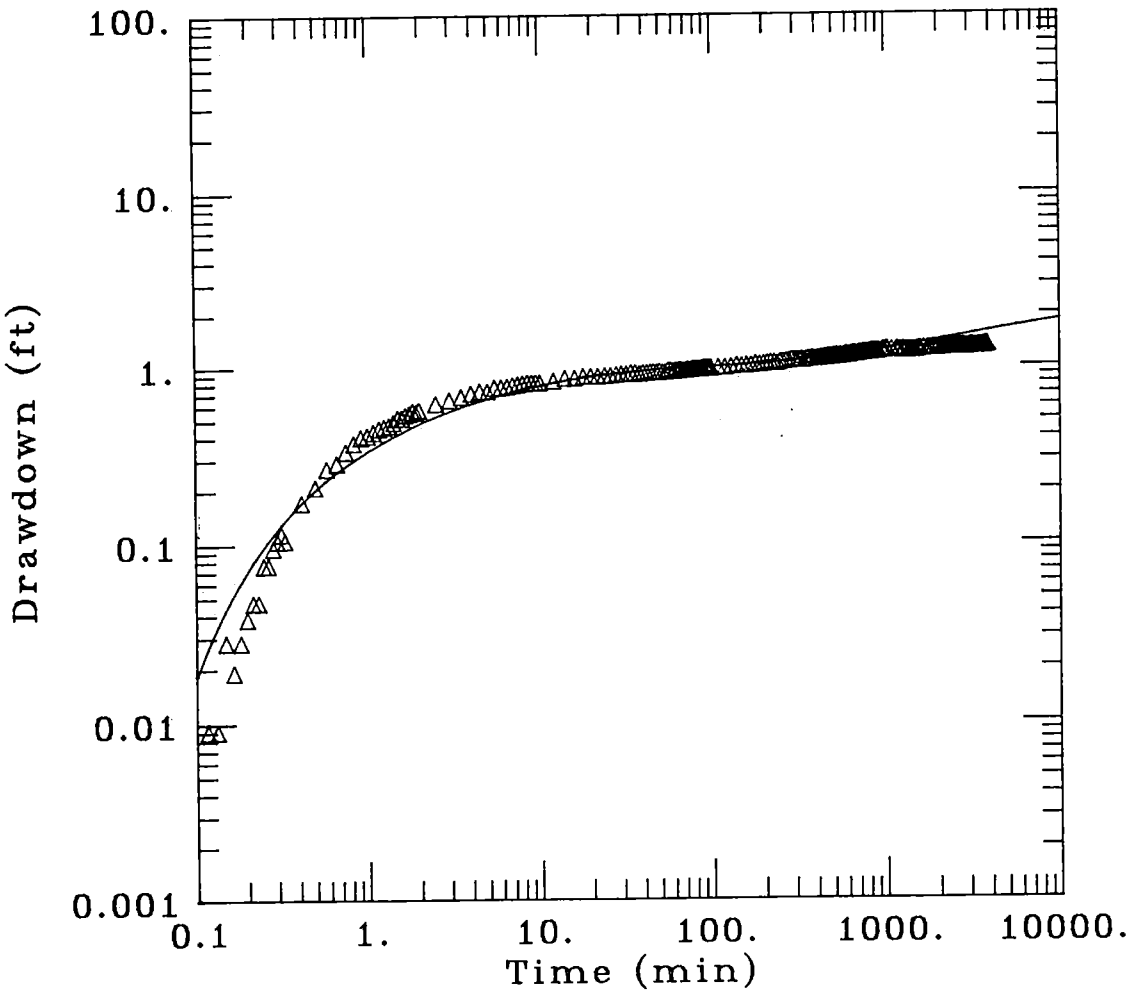
OBS. WELL:
P-32S

ESTIMATED PARAMETERS:
T = 0.9955 ft^2/min
S = 0.0009494
Sy = 0.04428
β = 0.004

TEST DATA:
Q = 4.01 ft^3/min
r = 15. ft
b = 6. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure I-14: RC-1 Constant Rate Test : Drawdown in P-32D



DATA SET:
aqp-32d.dat
04/12/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
10/26/92-10/29/92

TEST WELL:
RC-1

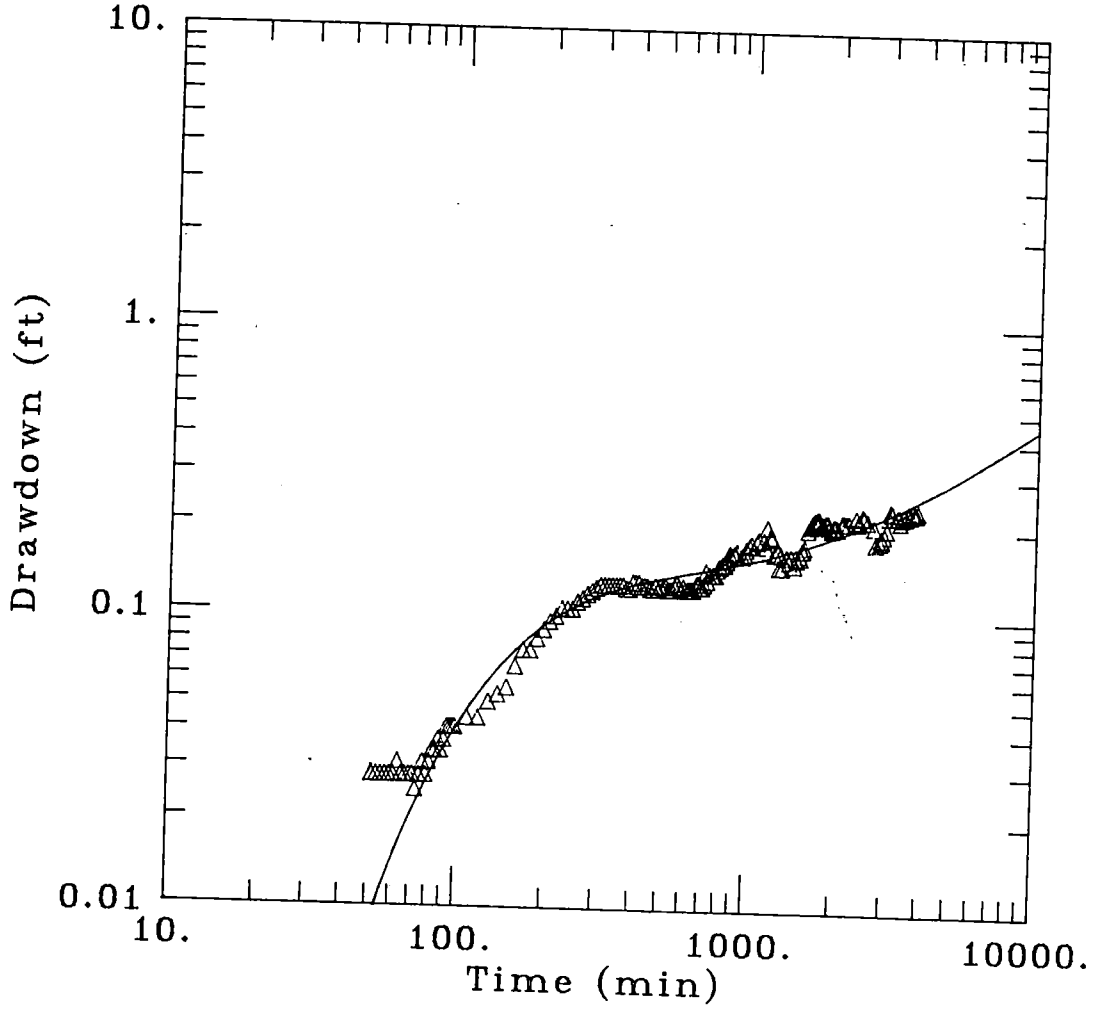
OBS. WELL:
P-32D

ESTIMATED PARAMETERS:
T = 1.147 ft^2/min
S = 0.003577
Sy = 0.1558
β = 0.01

TEST DATA:
Q = 4.01 ft^3/min
r = 15. ft
b = 30. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure I-15: RC-1 Constant Rate Test : Drawdown in P-33S



DATA SET:
aqmw-33s.dat
04/12/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
10/26/92-10/29/92

TEST WELL:
RC-1

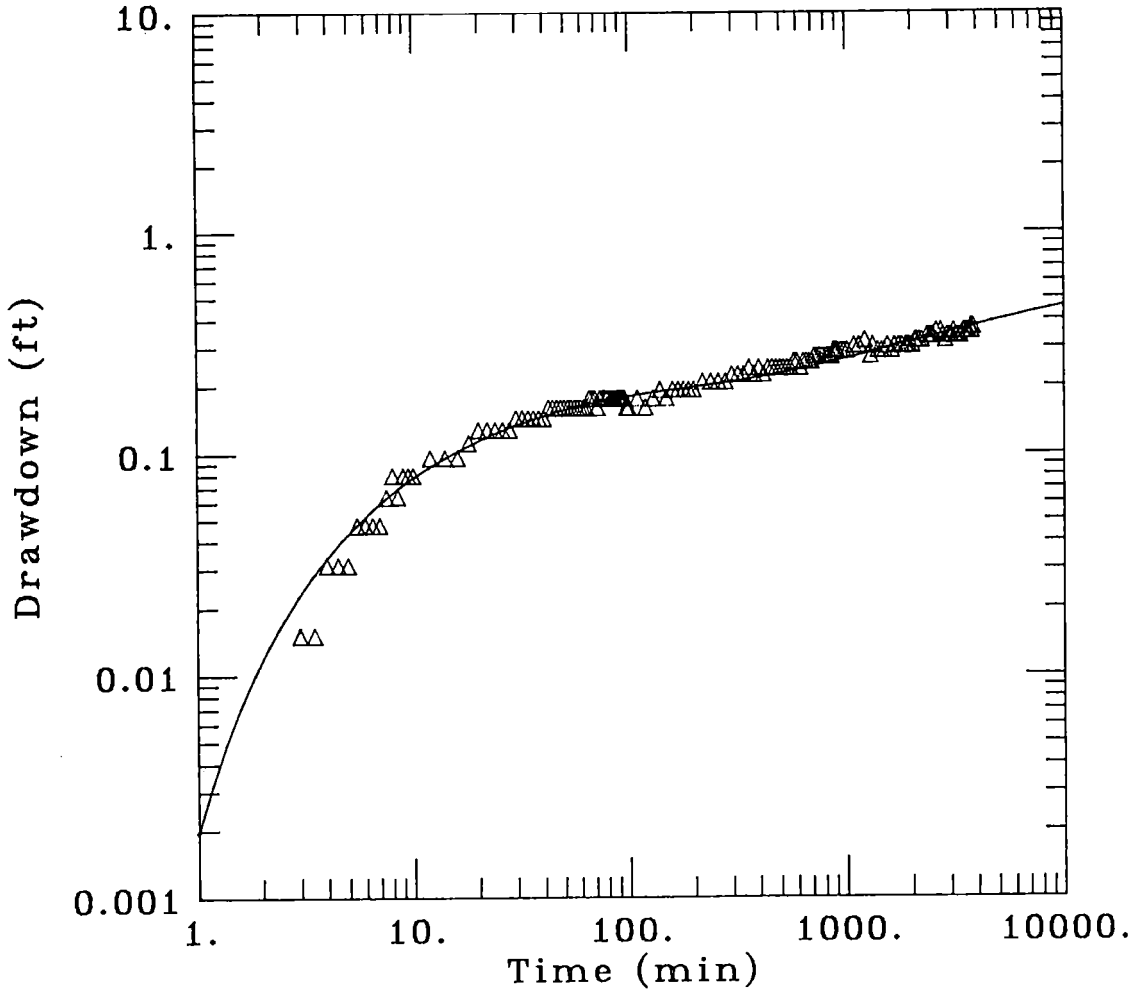
OBS. WELL:
MW-33S

ESTIMATED PARAMETERS:
T = 0.5074 ft^2/min
S = 0.01001
Sy = 0.3434
β = 1.5

TEST DATA:
Q = 4.01 ft^3/min
r = 164. ft
b = 10. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure I-16: RC-1 Constant Rate Test : Drawdown in P-33D



DATA SET:
aqp-33d.dat
04/12/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
10/26/92-10/29/92

TEST WELL:
RC-1

OBS. WELL:
P-33D

ESTIMATED PARAMETERS:
T = 3.407 ft^2/min
S = 0.001367
Sy = 0.02111
β = 0.06

TEST DATA:
Q = 4.01 ft^3/min
r = 160. ft
b = 42. ft

Table I-2: Groundwater Level Data - 72-Hour Constant Rate Test on RC-2

Location ID	Reference Elevation (ft)	Pre-Test Data (10/12/92)		End of Test Data (10/15/92)	
		Depth to Water (ft below Reference Elevation)	Groundwater Elevation (ft MSL)	Depth to Water (ft below Reference Elevation)	Groundwater Elevation (ft MSL)
P-1S	16.41	6.95	9.46	7.32	16.41
P-1D	16.33	6.53	9.80	6.56	16.33
P-2S	13.85	5.10	8.75	5.41	13.85
P-2D	16.00	7.04	8.96	7.64	16.00
P-3S	15.45	7.91	7.54	8.02	15.45
P-4S	19.92	8.30	11.62	8.54	19.92
P-5S	21.18	10.16	11.02	10.30	21.18
P-6S	23.62	12.26	11.36	NA	NA
P-6M	21.80	10.37	11.43	10.67	21.80
P-7SA	16.26	5.68	10.58	NA	NA
P-7SB	15.68	5.12	10.56	NA	NA
P-8S	16.21	9.50	6.71	NA	NA
P-9S	16.10	7.98	8.12	NA	NA
P-10S	14.05	7.31	6.74	NA	NA
P-11S	17.95	6.00	11.95	NA	NA
P-12SA	15.29	7.28	8.01	NA	NA
P-12SB	15.32	6.40	8.92	NA	NA
P-13S	26.99	13.71	13.28	NA	NA
P-13D	18.85	8.67	10.18	8.80	18.85
P-14S	24.18	9.78	14.40	NA	NA
P-14D	23.95	9.30	14.65	NA	NA
P-15S	15.69	8.58	7.11	8.74	15.69
P-16S	16.29	8.91	7.38	NA	NA
P-17S	17.07	7.48	9.59	NA	NA
P-18D	13.27	2.68	10.59	NA	NA
P-19D	17.21	3.92	13.29	NA	NA
P-20S	24.02	13.78	10.24	13.80	24.02
P-20D	24.30	14.20	10.10	14.06	24.30
P-21S	16.96	9.63	7.33	9.77	16.96
P-21D	15.75	5.56	10.19	5.65	15.75
P-22S	18.75	9.18	9.57	NA	NA
P-22D	17.57	6.46	11.11	NA	NA
P-23D	35.42	18.42	17.00	NA	NA
P-24D	29.43	18.20	11.23	NA	NA
P-25D	16.93	4.86	12.07	NA	NA
P-26S	17.29	7.72	9.57	NA	NA
P-26D	17.59	8.36	9.23	NA	NA
P-27D	15.76	8.19	7.57	8.35	15.76
P-29D	16.51	8.57	7.94	8.62	16.51
P-30D	16.43	8.04	8.39	8.21	16.43
P-31D	16.45	7.94	8.51	8.57	16.45
P-32S	17.02	7.53	9.49	7.74	17.02
P-32D	17.10	8.14	8.96	8.32	17.10
P-33S	17.74	8.10	9.64	8.55	17.74
P-33D	16.99	8.03	8.96	9.15	16.99
EP-1	22.90	12.66	10.24	NA	NA
EP-2	24.52	11.30	13.22	NA	NA
EP-5	15.84	7.80	8.04	NA	NA

NA- value not available

CLH:b:\GWLEV.XLS

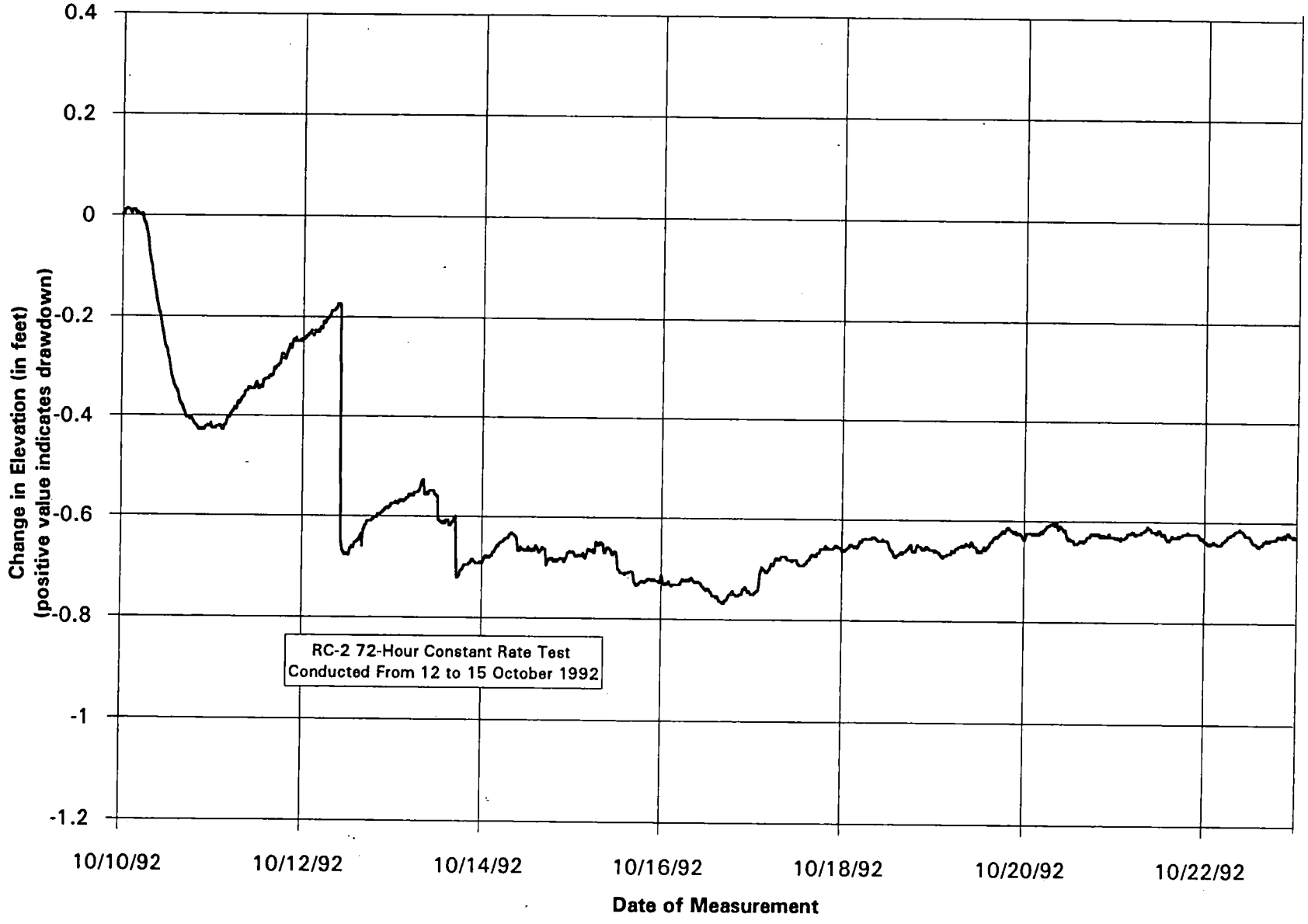
Table I-2: Groundwater Level Data - 72-Hour Constant Rate Test on RC-2

Location ID	Reference Elevation (ft)	Pre-Test Data (10/12/92)		End of Test Data (10/15/92)	
		Depth to Water (ft below Reference Elevation)	Groundwater Elevation (ft MSL)	Depth to Water (ft below Reference Elevation)	Groundwater Elevation (ft MSL)
EP-6	11.04	4.10	6.94	NA	NA
EP-7	14.37	6.05	8.32	NA	NA
EP-8	24.41	7.18	17.23	NA	NA
MW-2S	14.46	4.82	9.64	5.66	14.46
MW-3S	16.61	8.60	8.01	8.32	16.61
MW-4S	21.29	10.17	11.12	10.27	21.29
MW-5SA	26.17	12.56	13.61	NA	NA
MW-6S	14.04	7.00	7.04	NA	NA
MW-7S	15.25	7.74	7.51	NA	NA
MW-8S	17.57	10.84	6.73	NA	NA
MW-11S	13.67	6.62	7.05	NA	NA
MW-12D	21.23	9.80	11.43	9.90	21.23
MW-13S	18.44	8.18	10.26	8.34	18.44
MW-14S	21.39	9.85	11.54	10.10	21.39
MW-15S	16.65	8.52	8.13	8.64	16.65
MW-15D	16.99	4.62	12.37	4.68	16.99
MW-16S	26.00	12.30	13.70	NA	NA
MW-16D	26.44	12.00	14.44	NA	NA
MW-17S	16.75	8.18	8.57	NA	NA
MW-17D	17.29	6.42	10.87	NA	NA
MW-18S	35.28	14.20	21.08	NA	NA
MW-19S	29.17	19.20	9.97	NA	NA
MW-20S	21.94	10.25	11.69	NA	NA
MW-21S	15.42	4.93	10.49	NA	NA
MW-22S	16.87	7.05	9.82	7.35	16.87
MW-23S	20.71	10.97	9.74	NA	NA
MW-24S	21.04	9.58	11.46	NA	NA
MW-29S	16.66	9.05	7.61	9.08	16.66
MW-29D	16.59	8.85	7.74	8.91	16.59
MW-30S	16.70	8.97	7.73	9.17	16.70
MW-30D	16.67	9.00	7.67	9.19	16.67
MW-31S	16.27	7.80	8.47	8.34	16.27
MW-31D	16.21	7.62	8.59	8.20	16.21
RW-1	16.52	7.33	9.19	NA	NA
RW-2	18.05	6.76	11.29	NA	NA
RW-3	13.49	3.40	10.09	NA	NA
RW-4	23.79	13.60	10.19	NA	NA
RC-1	16.33	6.85	9.48	7.04	16.33
RC-2	16.85	7.77	9.08	29.40	16.85
VE-1	21.80	10.40	11.40	10.50	21.80
VE-2	21.59	10.24	11.35	10.36	21.59
VE-3	21.14	9.85	11.29	9.98	21.14
ORTF	10.06	9.7	6.76	NA	NA
Belfont Pond	18.31	1.2	15.51	1.10	15.41
Roger Wm. Par	29.91	1.83	28.08	1.92	27.99
SG-2	11.43	6.8	6.73	6.80	6.73
WWT Pond	16.98	2.4	14.38	2.30	14.28

NA- value not available

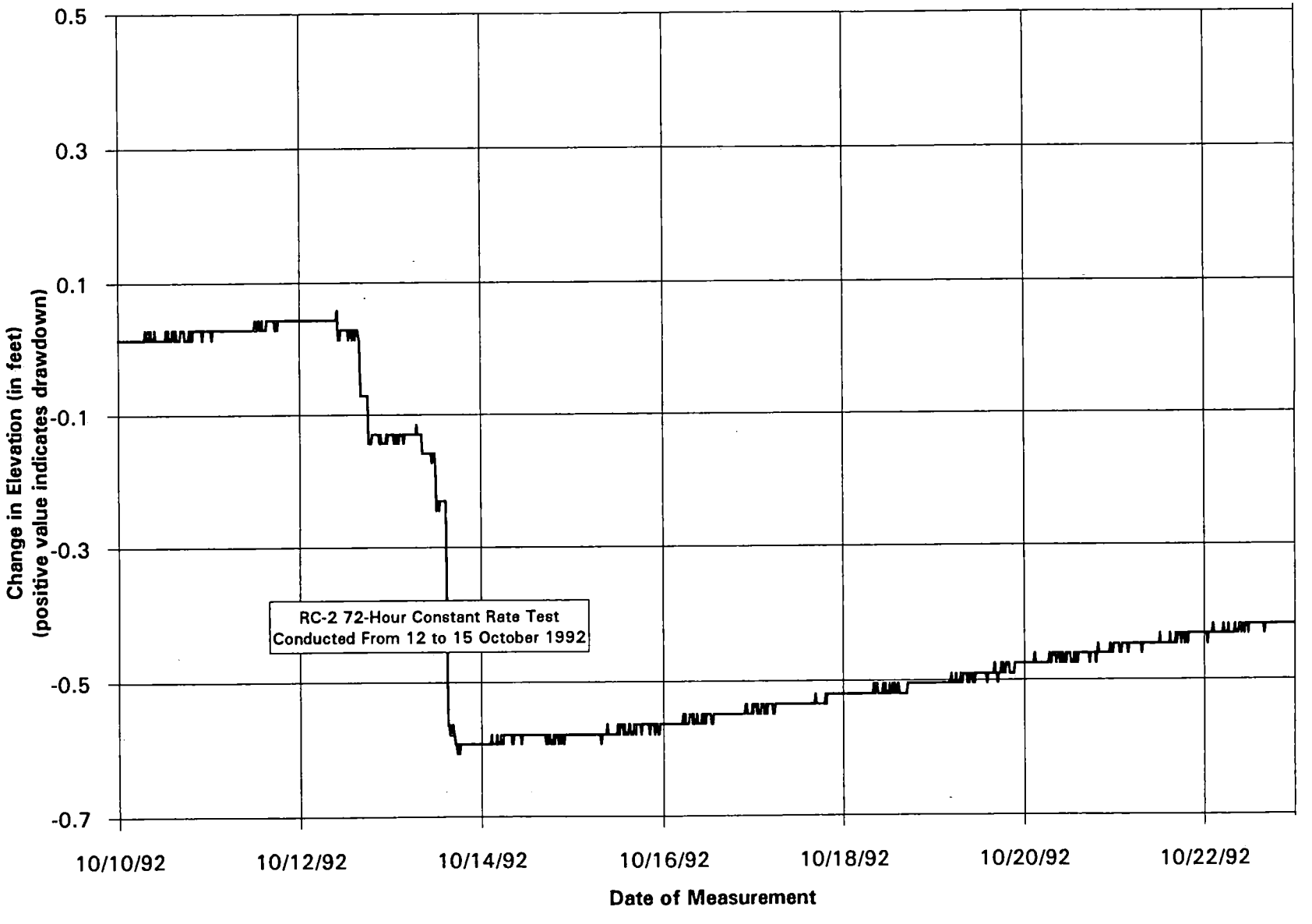
CLH:b:\GWLEV.XLS

Figure I-17: P-1S Hydrograph - 10 to 23 October 1992



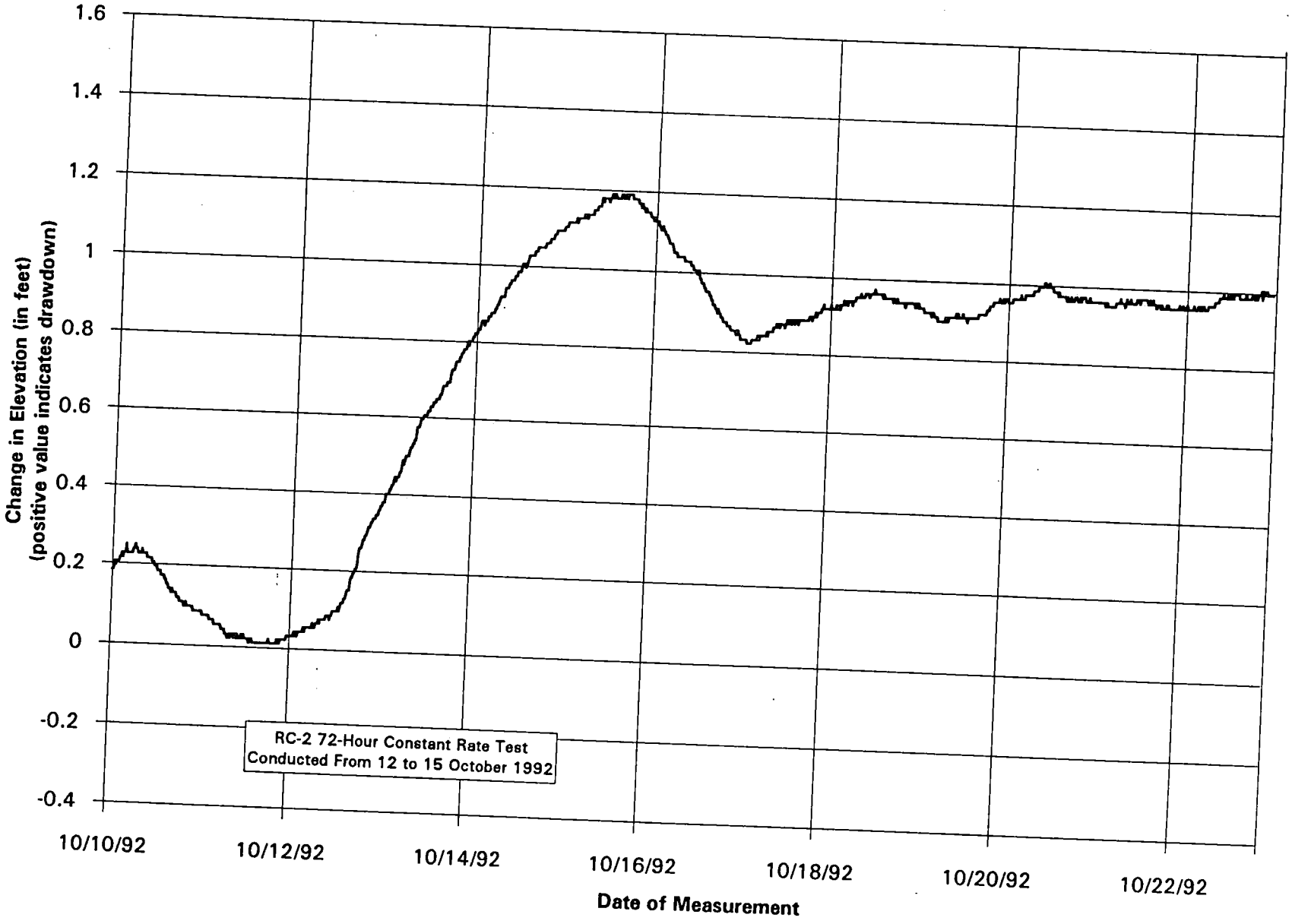
CLH: b:\P1SA.XLC

Figure I-18: P-1D Hydrograph - 10 to 23 October 1992



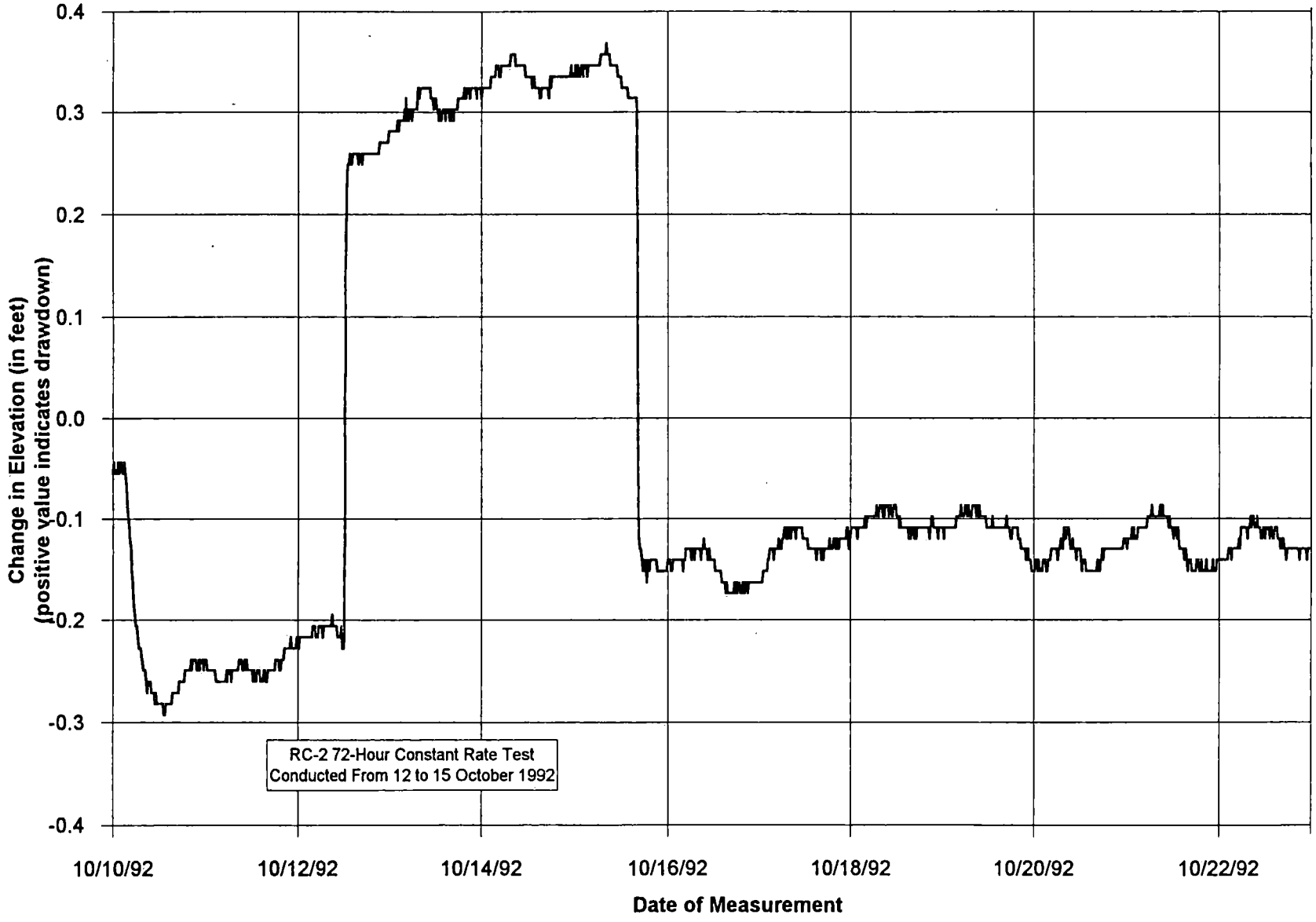
CLH: b:\p1da.xls

Figure I-19: P-2S Hydrograph - 10 to 23 October 1992



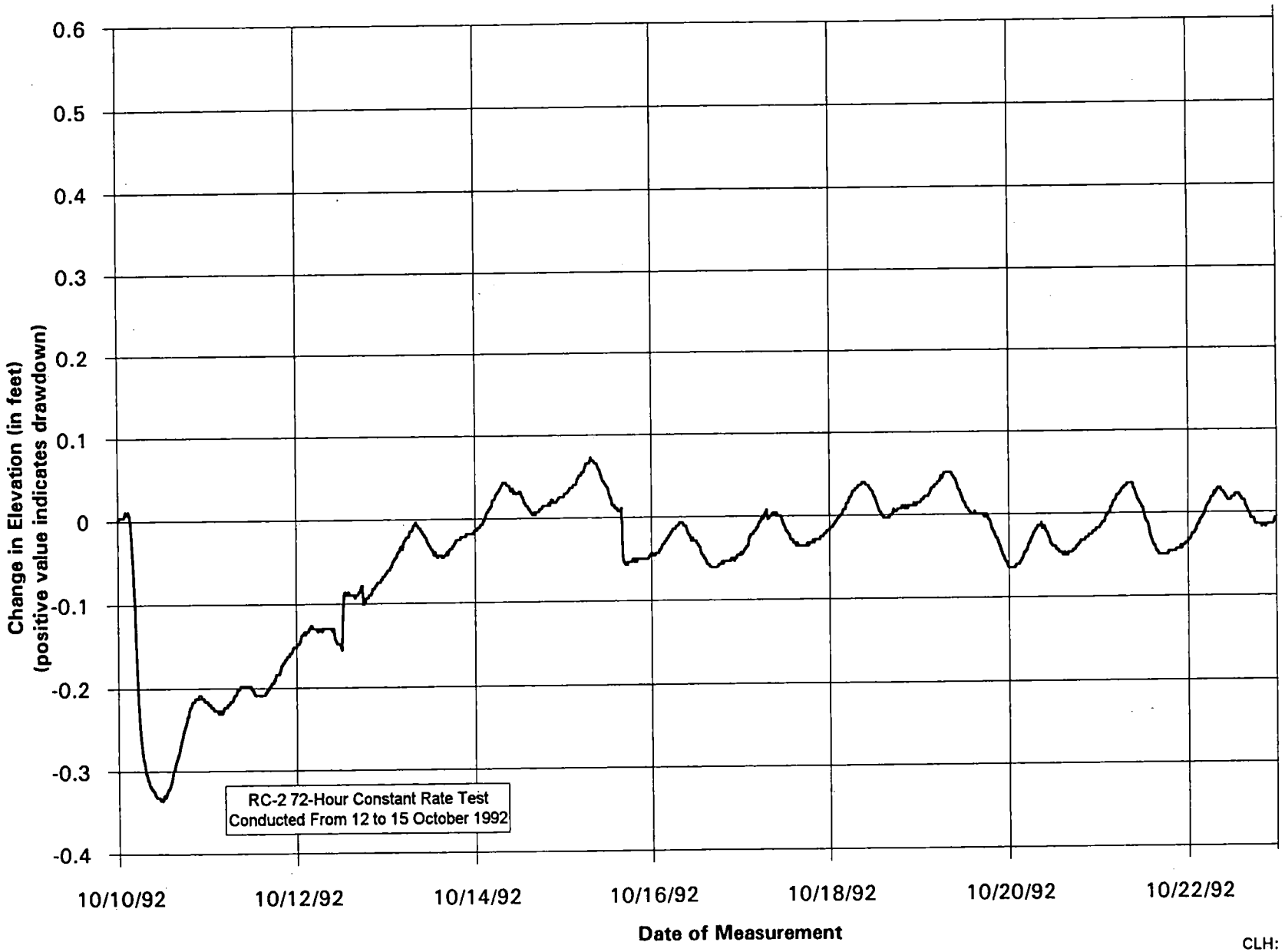
CLH: b:\P2SA.XLC

Figure I-20: P-2D Hydrograph - 10 to 23 October 1992



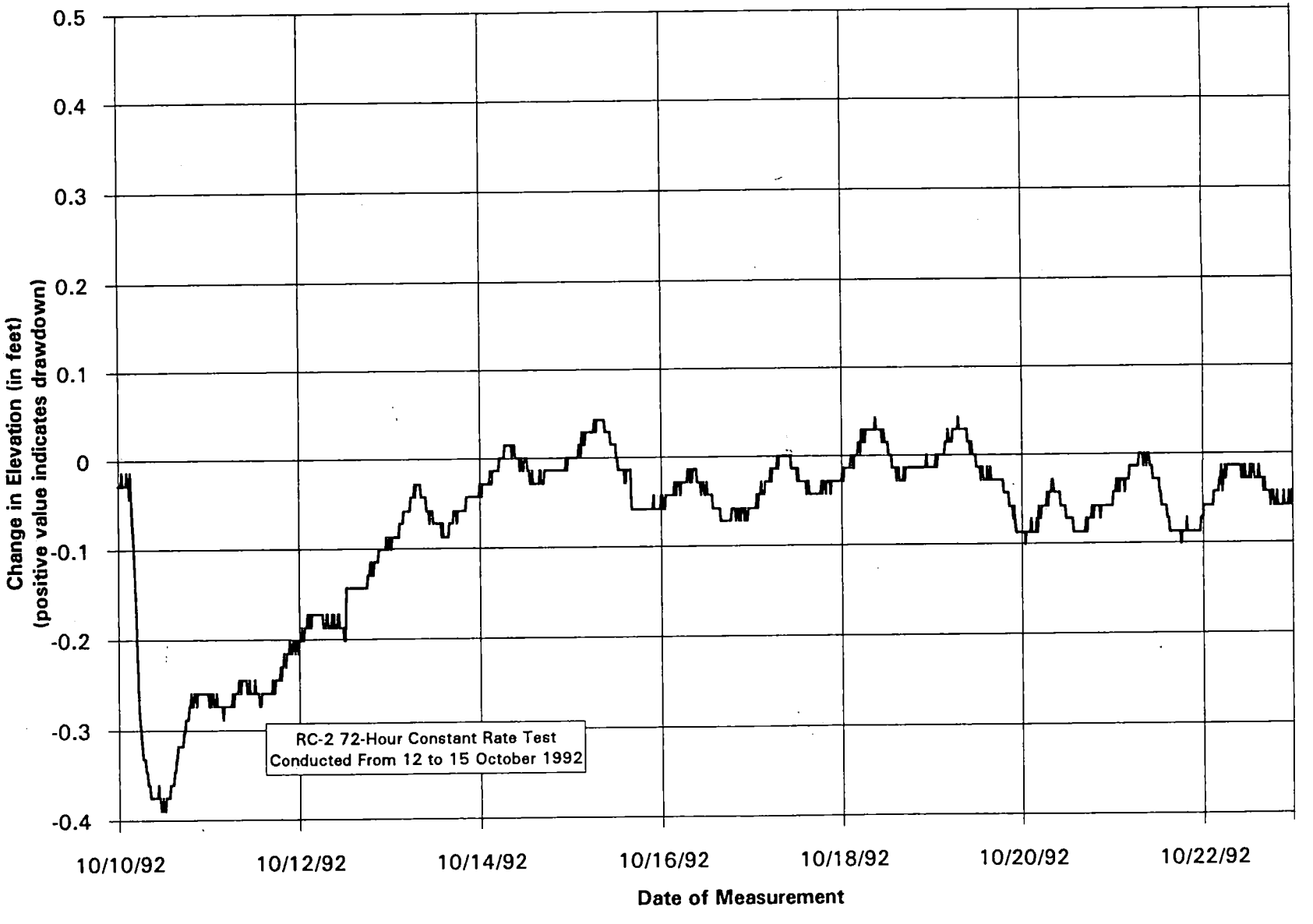
CLH: c:\P2D.XLS Chart 1

Figure I-21: MW-30S Hydrograph - 10 to 23 October 1992



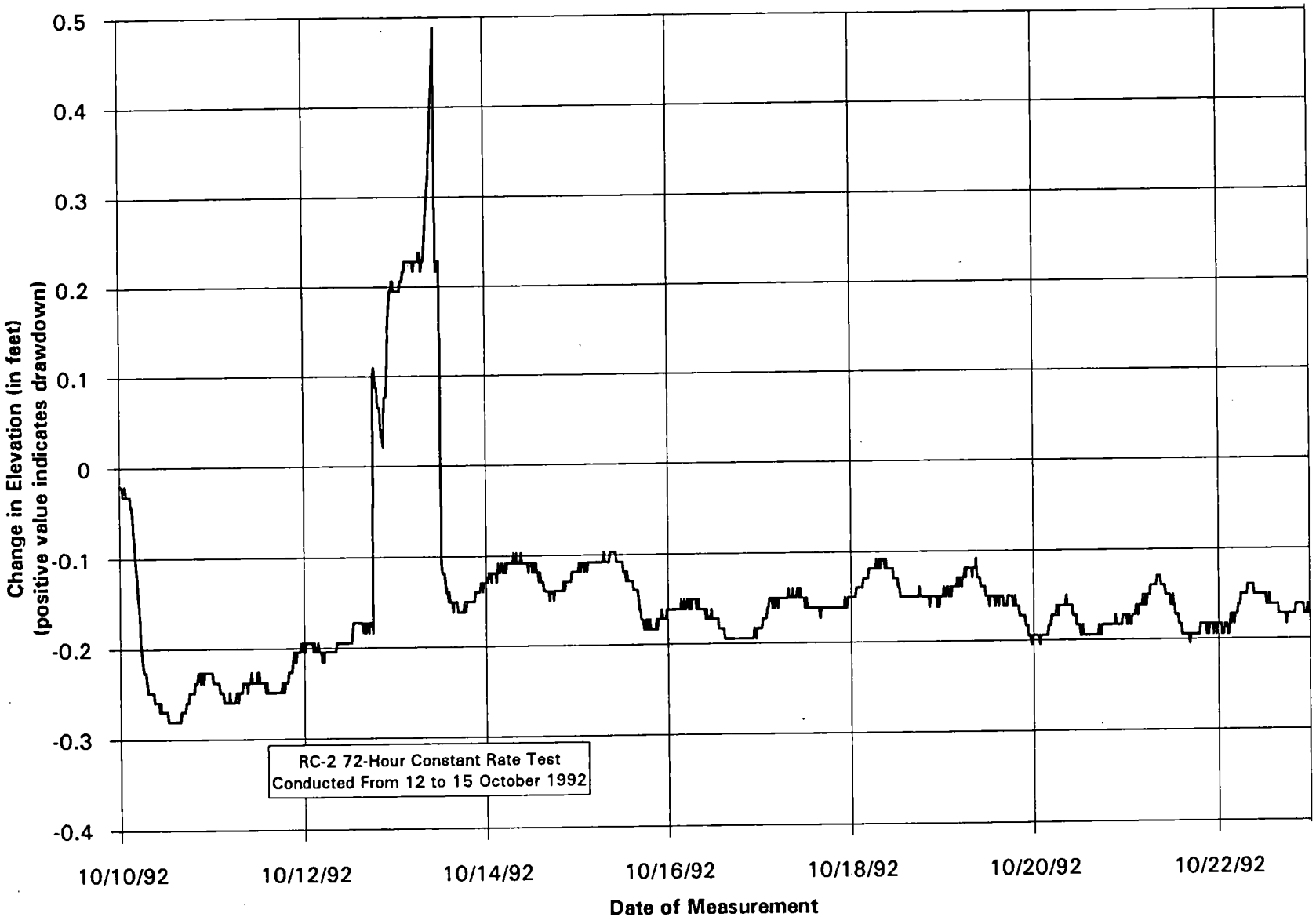
CLH: b:\mw30sa.xls
4/21/93 10:26 AM

Figure I-22: MW-30D Hydrograph - 10 to 23 October 1992



CLH: b:\MW30DA.XLC

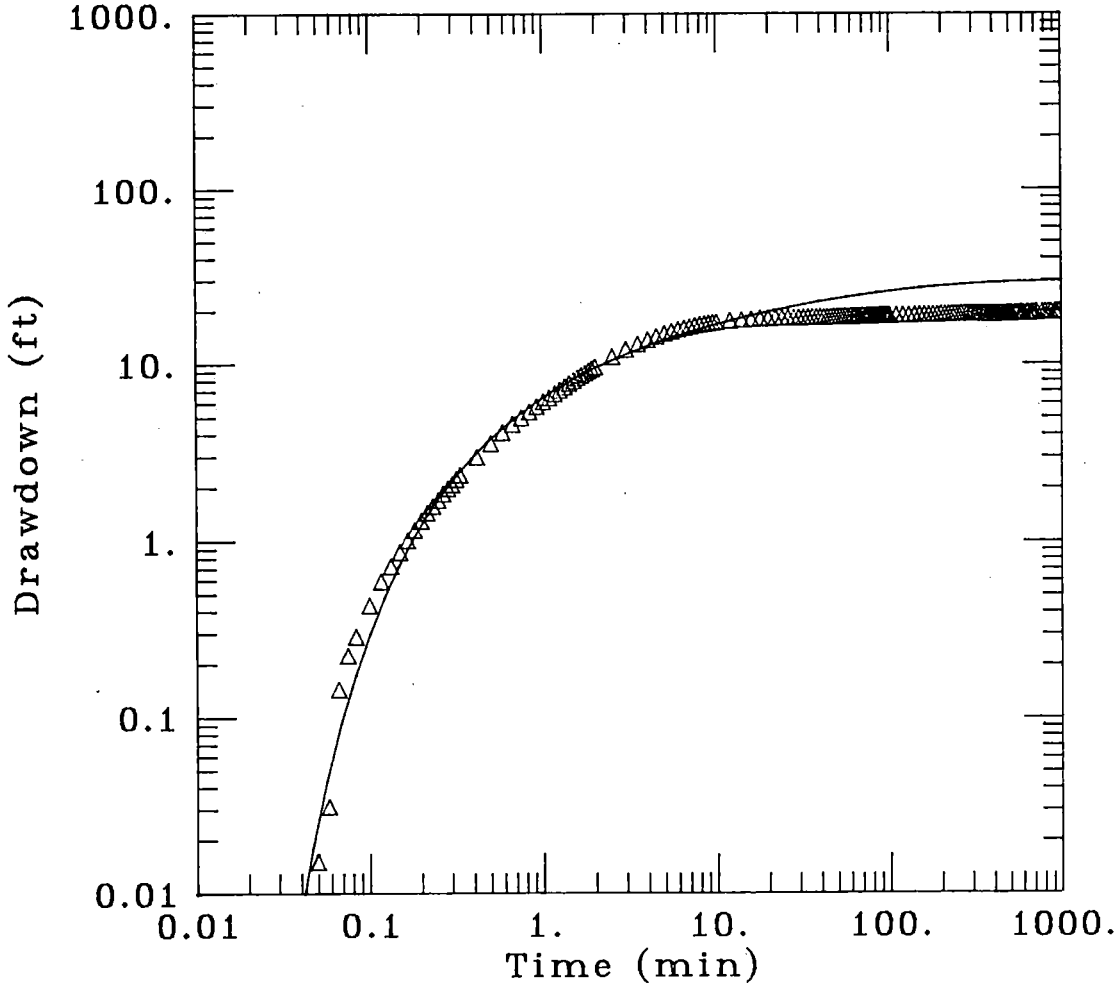
Figure I-23: P-30D Hydrograph - 10 to 23 October 1992



CLH: b:\P30DA.XLC

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure I-24: RC-2 Constant Rate Test : Drawdown in RC-2



DATA SET:
rc2.dat
04/12/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
10/12/92-10/15/92

TEST WELL:
RC-2

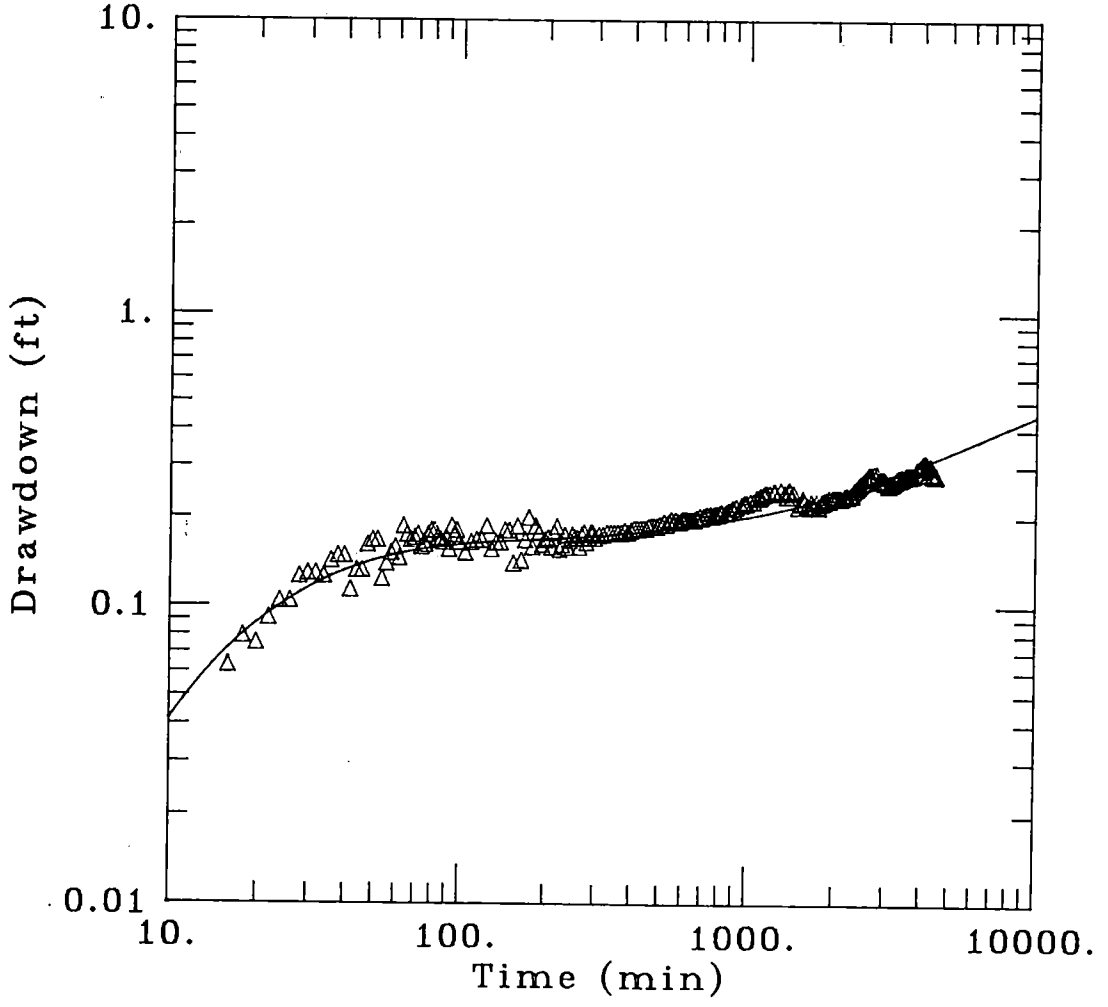
OBS. WELL:
Same

ESTIMATED PARAMETERS:
T = 0.02073 ft^2/min
S = 0.0156
Sy = 2.494
β = 0.001

TEST DATA:
Q = 1.363 ft^3/min
r = 1. ft
b = 45.7 ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure I-25: RC-2 Constant Rate Test : Drawdown in MW-31S



DATA SET:
mw31s.dat
04/12/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
10/12/92-10/15/92

TEST WELL:
RC-2

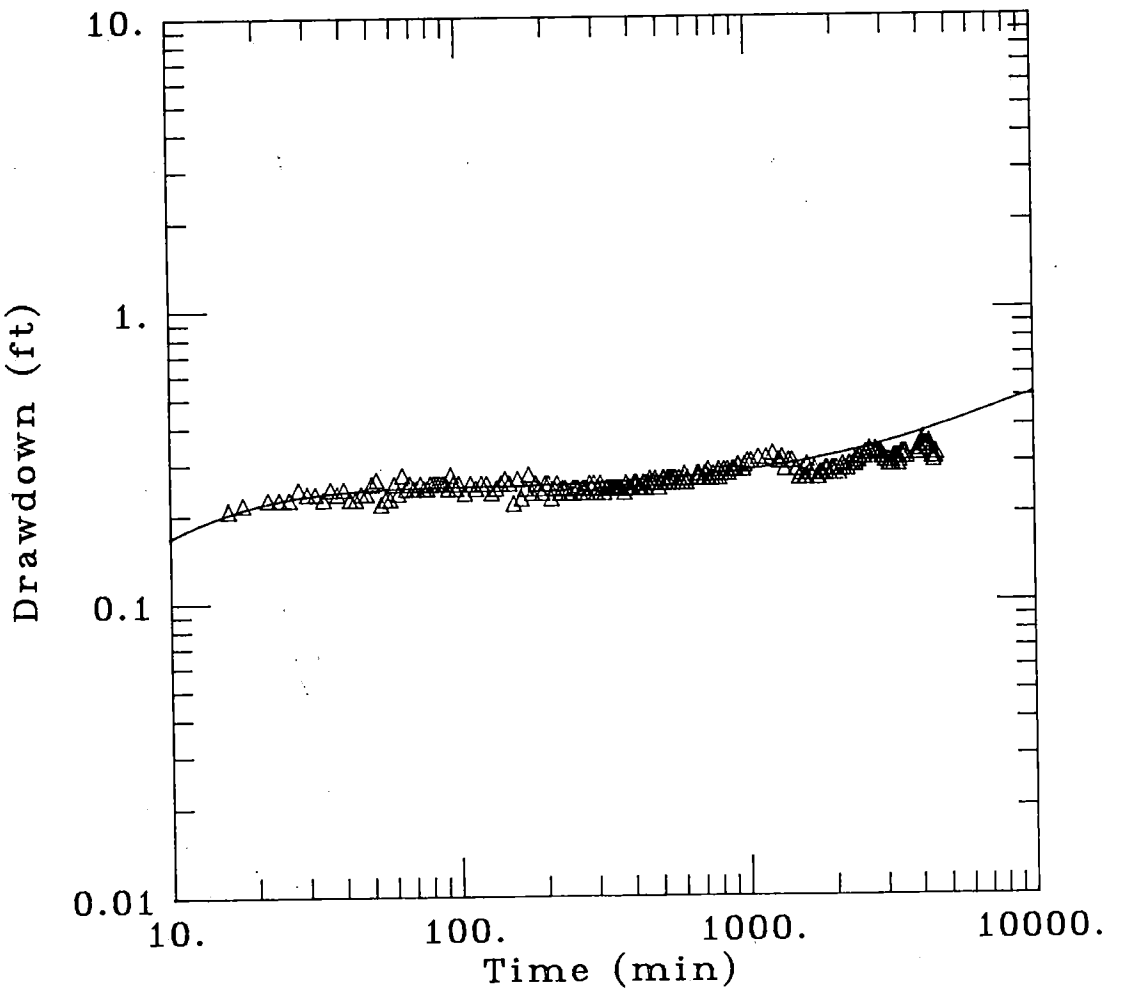
OBS. WELL:
MW-31S

ESTIMATED PARAMETERS:
T = 0.4647 ft^2/min
S = 0.004718
Sy = 0.4838
β = 0.4

TEST DATA:
Q = 1.363 ft^3/min
r = 60. ft
b = 21.2 ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure I-26: RC-2 Constant Rate Test : Drawdown in MW-31D



DATA SET:
mw31d.dat
04/12/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
10/12/92-10/15/92

TEST WELL:
RC-2

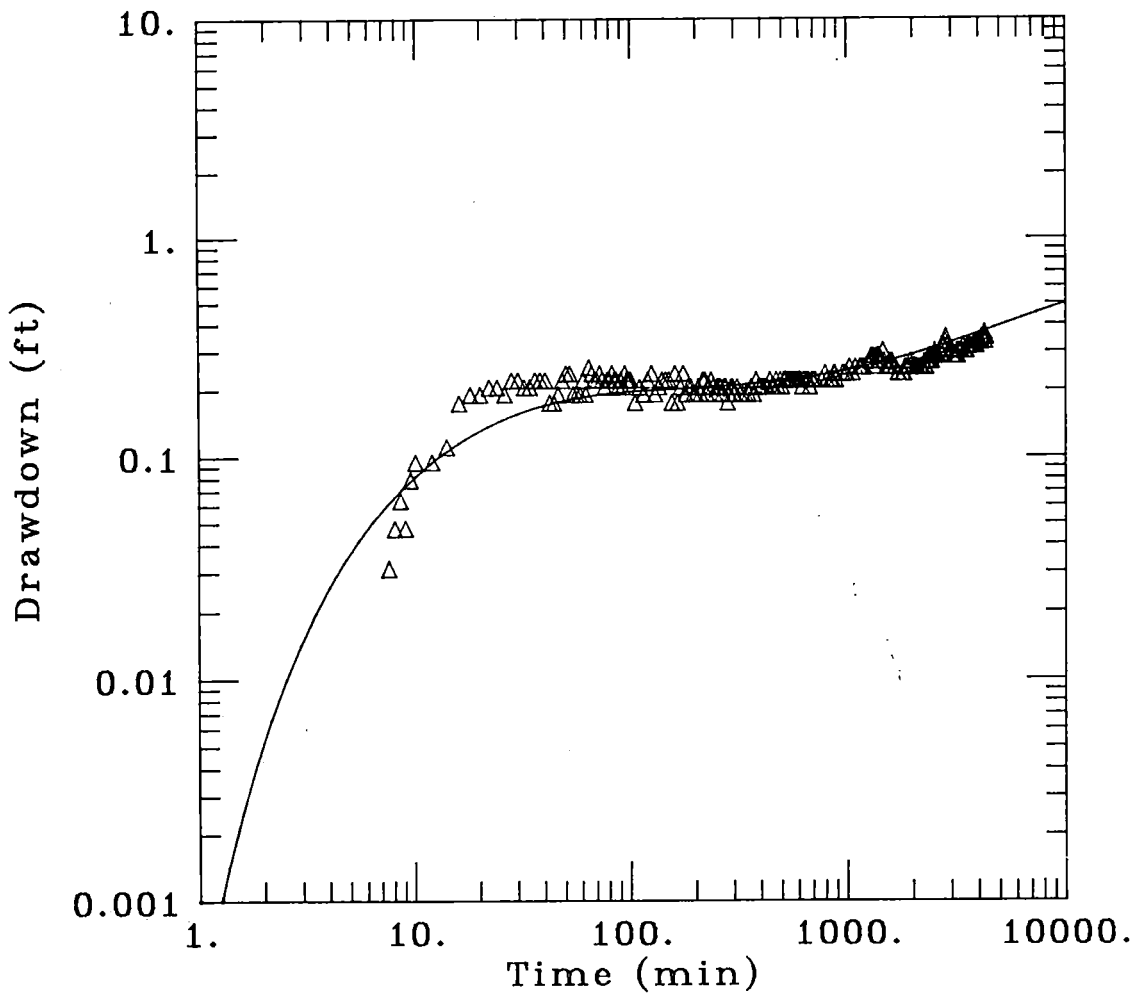
OBS. WELL:
MW-31D

ESTIMATED PARAMETERS:
T = 0.4775 ft^2/min
S = 0.0009919
Sy = 0.3137
β = 0.2

TEST DATA:
Q = 1.363 ft^3/min
r = 65. ft
b = 33.4 ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure I-27: RC-2 Constant Rate Test : Drawdown in P-31D



DATA SET:
p31d.dat
04/12/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
10/12/92-10/15/92

TEST WELL:
RC-2

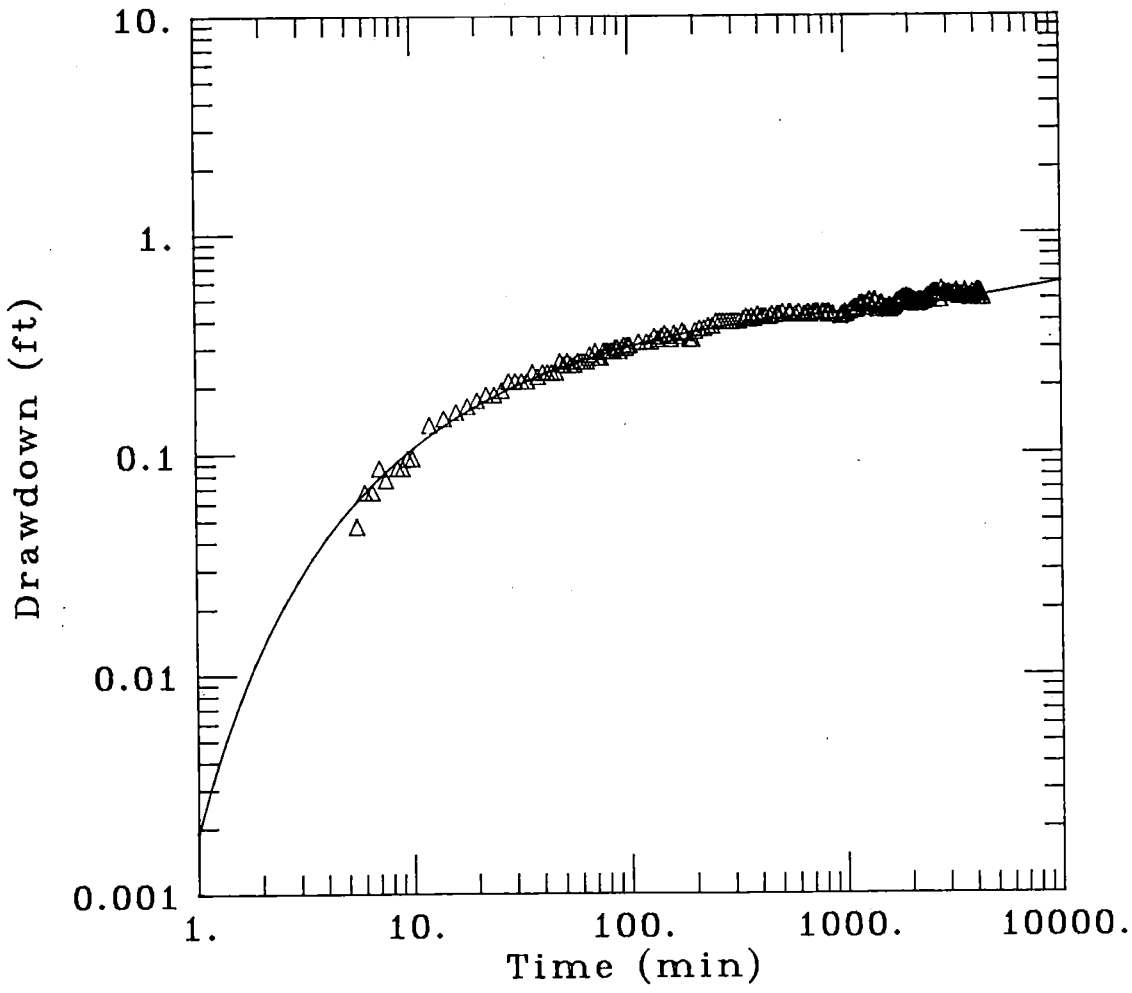
OBS. WELL:
P-31D

ESTIMATED PARAMETERS:
T = 0.6036 ft^2/min
S = 0.003579
Sy = 0.2979
β = 0.2

TEST DATA:
Q = 1.363 ft^3/min
r = 55. ft
b = 42.1 ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure I-28: RC-2 Constant Rate Test : Drawdown in P-33S



DATA SET:
p33s.dat
04/12/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
10/12/92-10/15/92

TEST WELL:
RC-2

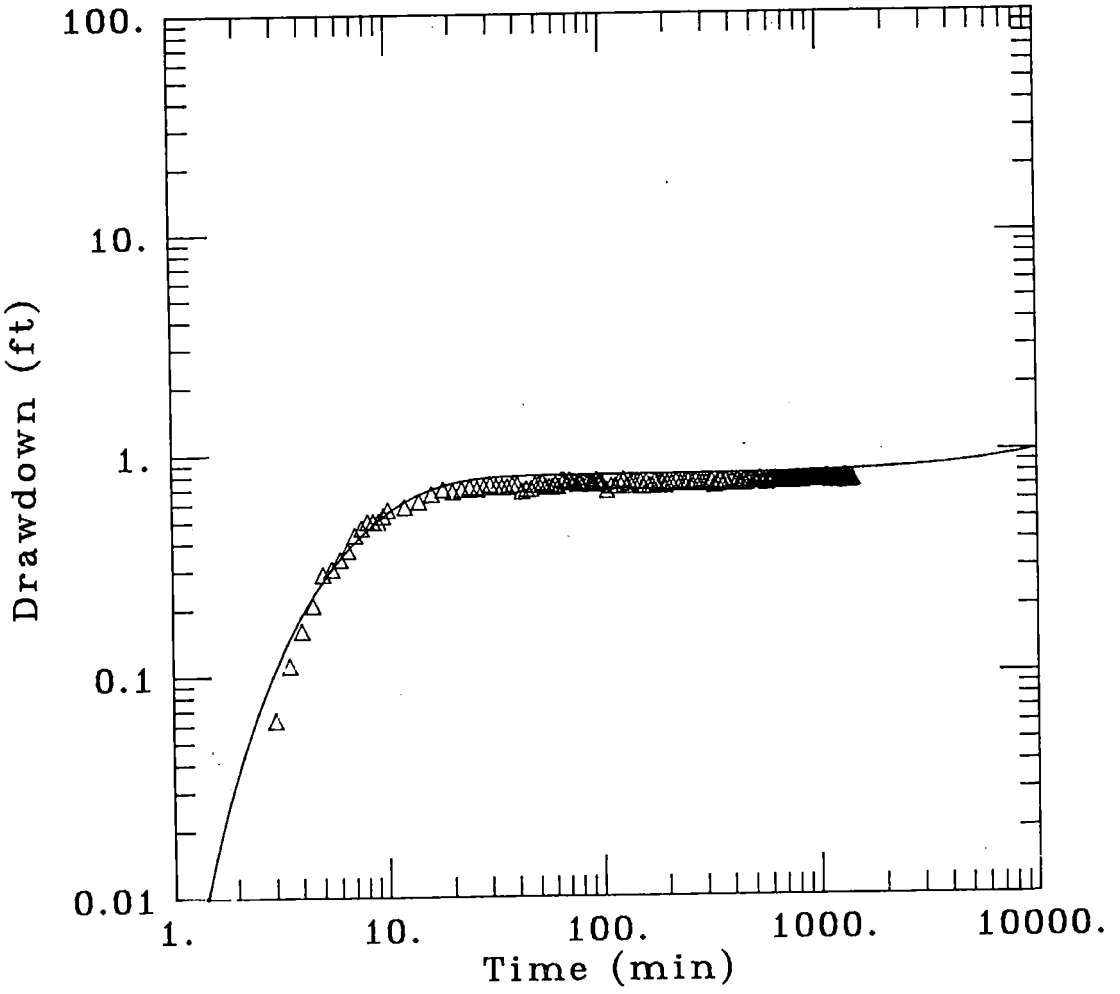
OBS. WELL:
P-33S

ESTIMATED PARAMETERS:
T = 0.9065 ft^2/min
S = 0.1594
Sy = 2.323
β = 0.01

TEST DATA:
Q = 1.363 ft^3/min
r = 8. ft
b = 10. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure I-29: RC-2 Constant Rate Test : Drawdown in P-33D



DATA SET:
p33d.dat
04/12/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
10/12/92-10/15/92

TEST WELL:
RC-2

OBS. WELL:
P-33D

ESTIMATED PARAMETERS:
T = 0.04813 ft^2/min
S = 0.006945
Sy = 34.01
β = 0.9

TEST DATA:
Q = 1.363 ft^3/min
r = 12. ft
b = 37.1 ft

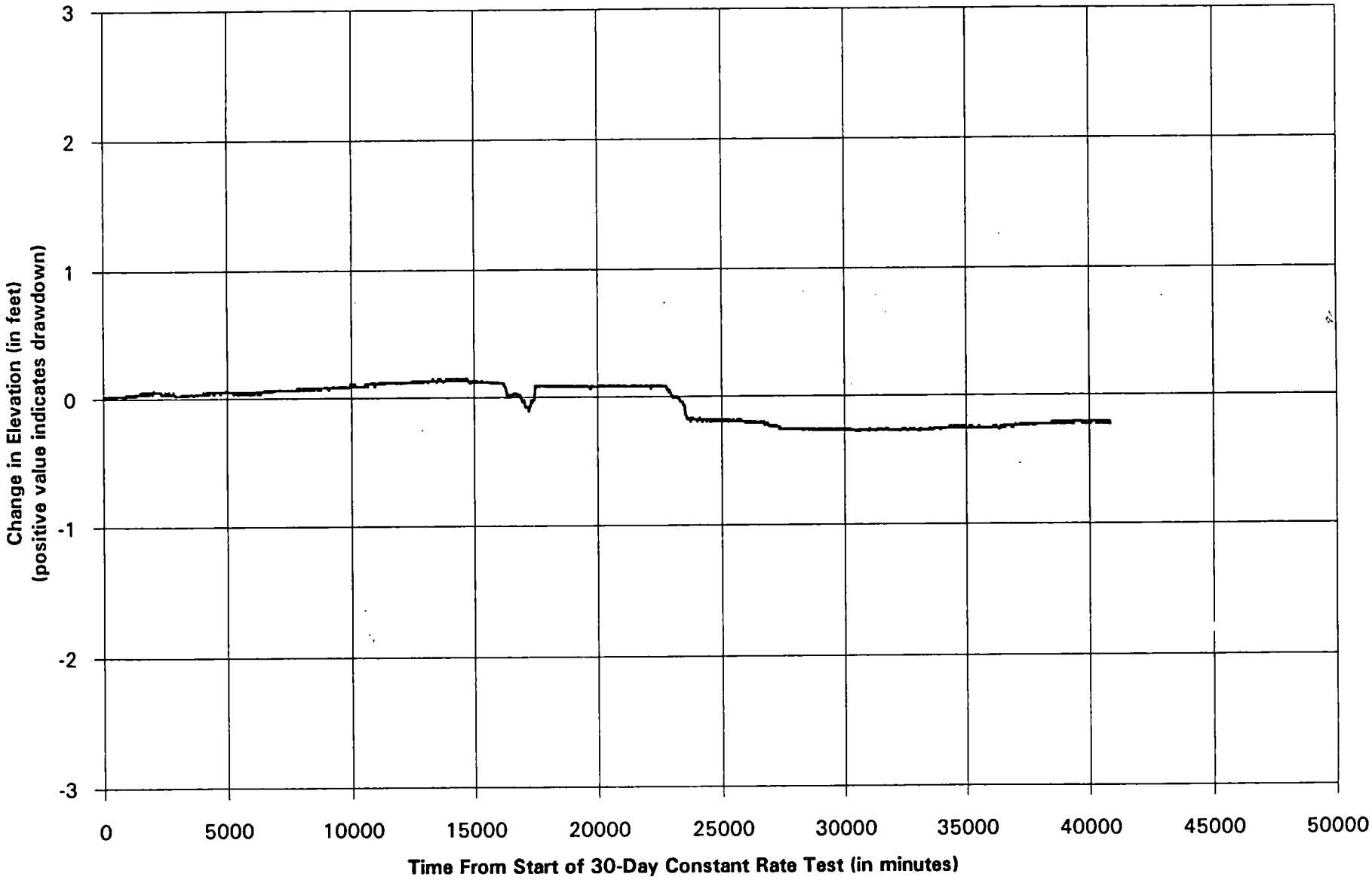
Appendix J

J

30-DAY CONSTANT RATE TEST DATA AND ANALYSES

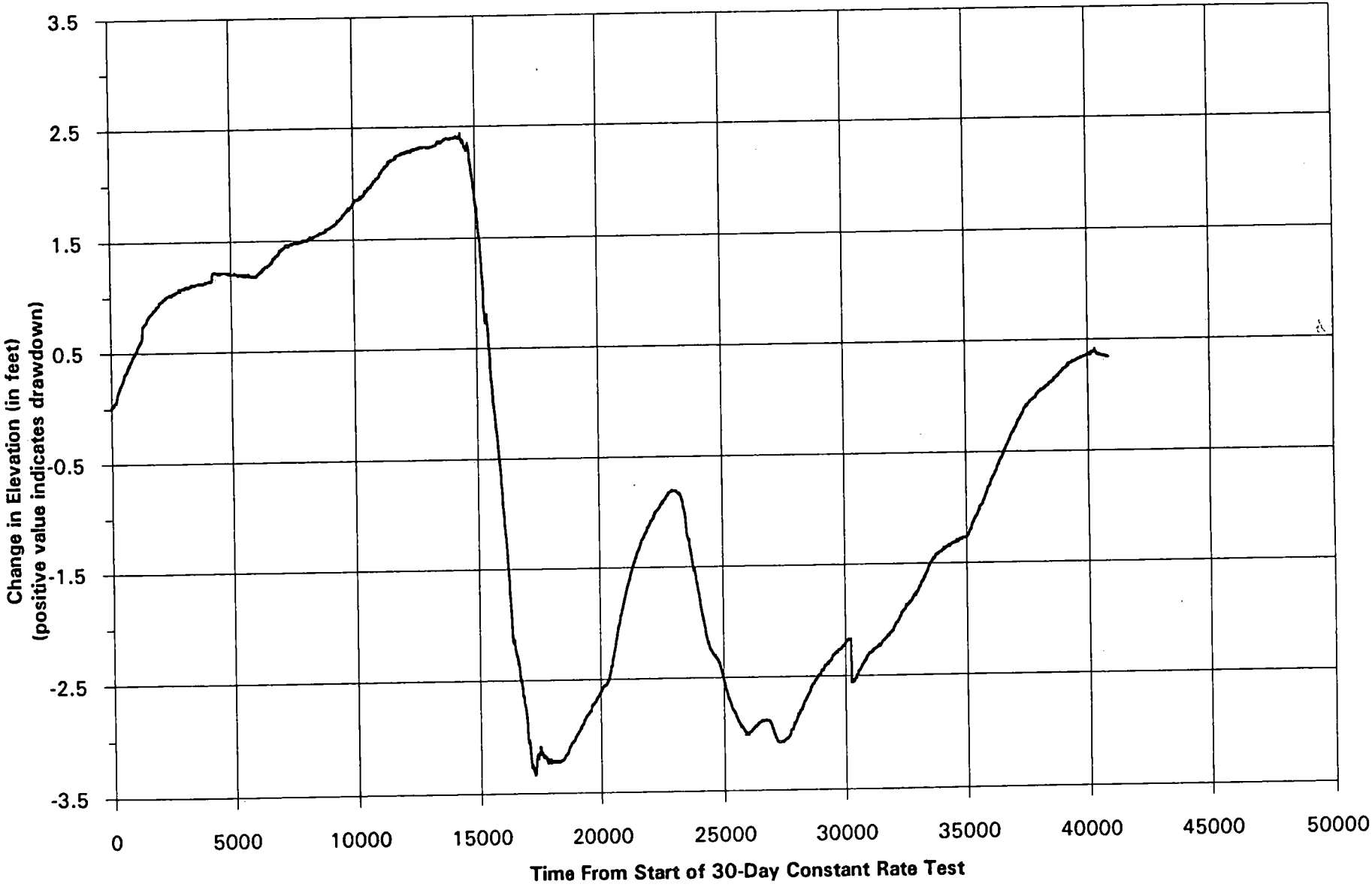
This appendix presents the data and analyses from the 30-day constant rate test conducted simultaneously on recovery wells RC-1 and RC-2 during the stabilization investigation in the Production Area under the RCRA Facility Investigation at the CIBA-GEIGY facility in Cranston, RI. These 30-day constant rate test data are presented in two sections. The first section presents hydrographs that plot changes in groundwater elevation against time for the recovery wells tested and also for other monitoring wells/piezometers that served as observation points for the test. The second section presents the drawdown graphs generated during the analysis of the test data using the AQTESOLV computer program (Geraghty and Miller, 1989). Overall, these graphs are presented for selected wells/piezometers used as observation points during the test, and the graphs are organized by well/piezometer identifier. There are two graphs for each well — one for days 1 through 10 of the test and a second for days 11 through 30. These drawdown graphs also present the test parameters (e.g., discharge rate) and estimates of selected aquifer parameters (e.g., transmissivity, storativity).

Figure J-1: P-1D Hydrograph - 1 to 29 December 1992



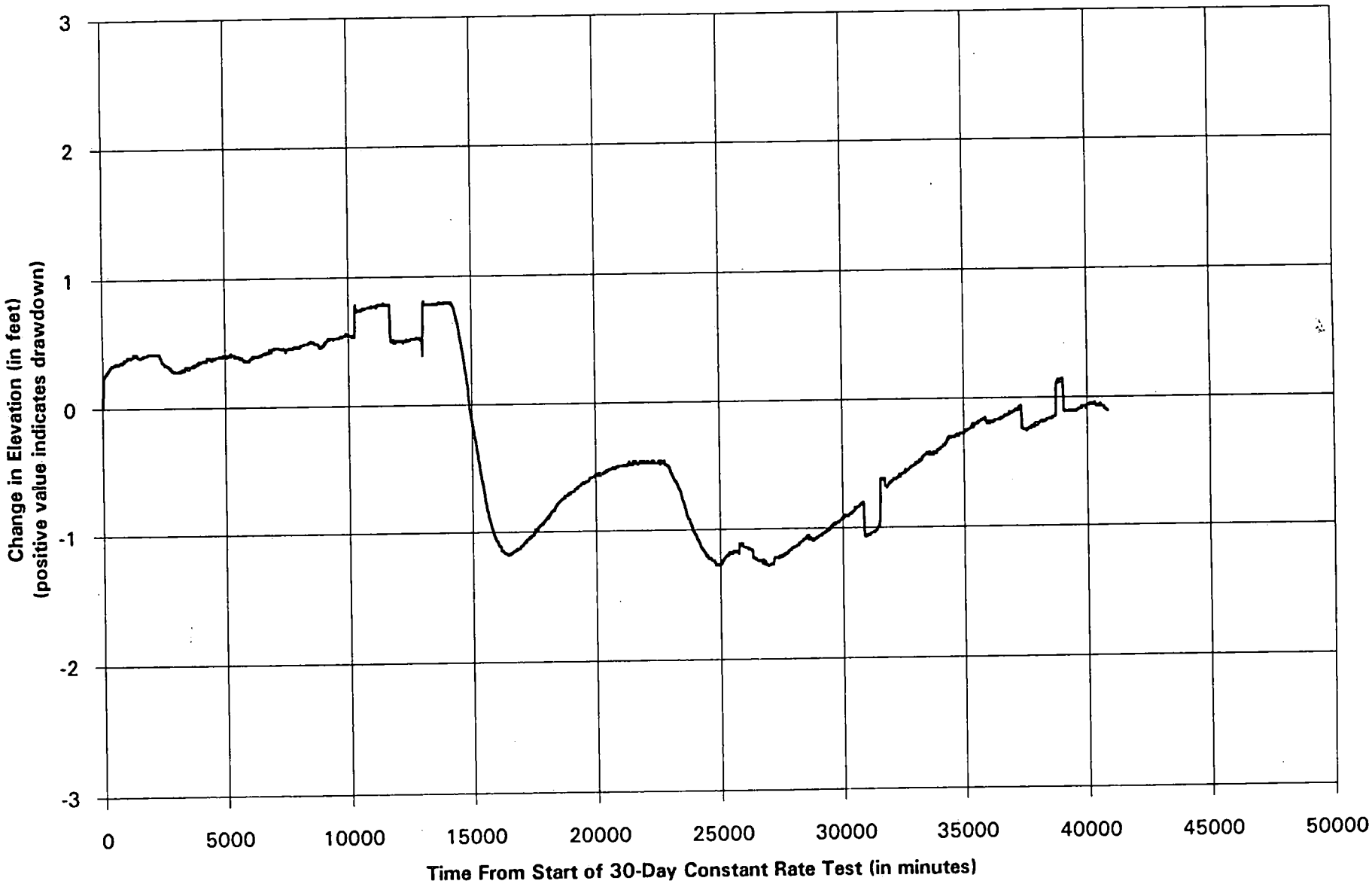
CLH: b:\P1D.XLC

Figure J-2: P-2S Hydrograph - 1 to 29 December 1992



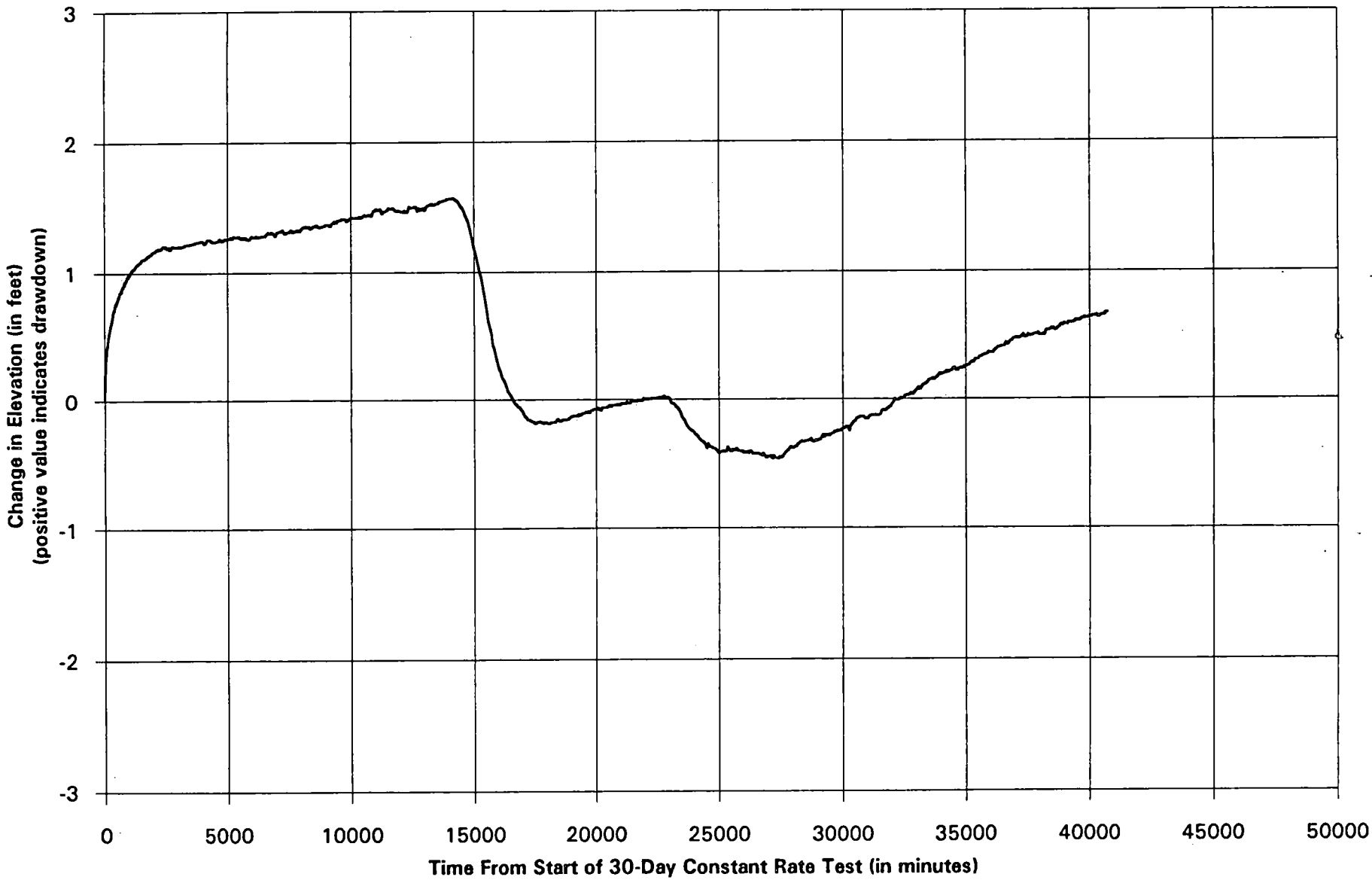
CLH: b:\P2S.XLC

Figure J-3: P-2D Hydrograph - 1 to 29 December 1992



CLH: b:\P2D.XLC

Figure J-4: MW-13S Hydrograph - 1 to 29 December 1992



CLH: b:\MW13S.XLC

Figure J-5: P-13D Hydrograph - 1 to 29 December 1992

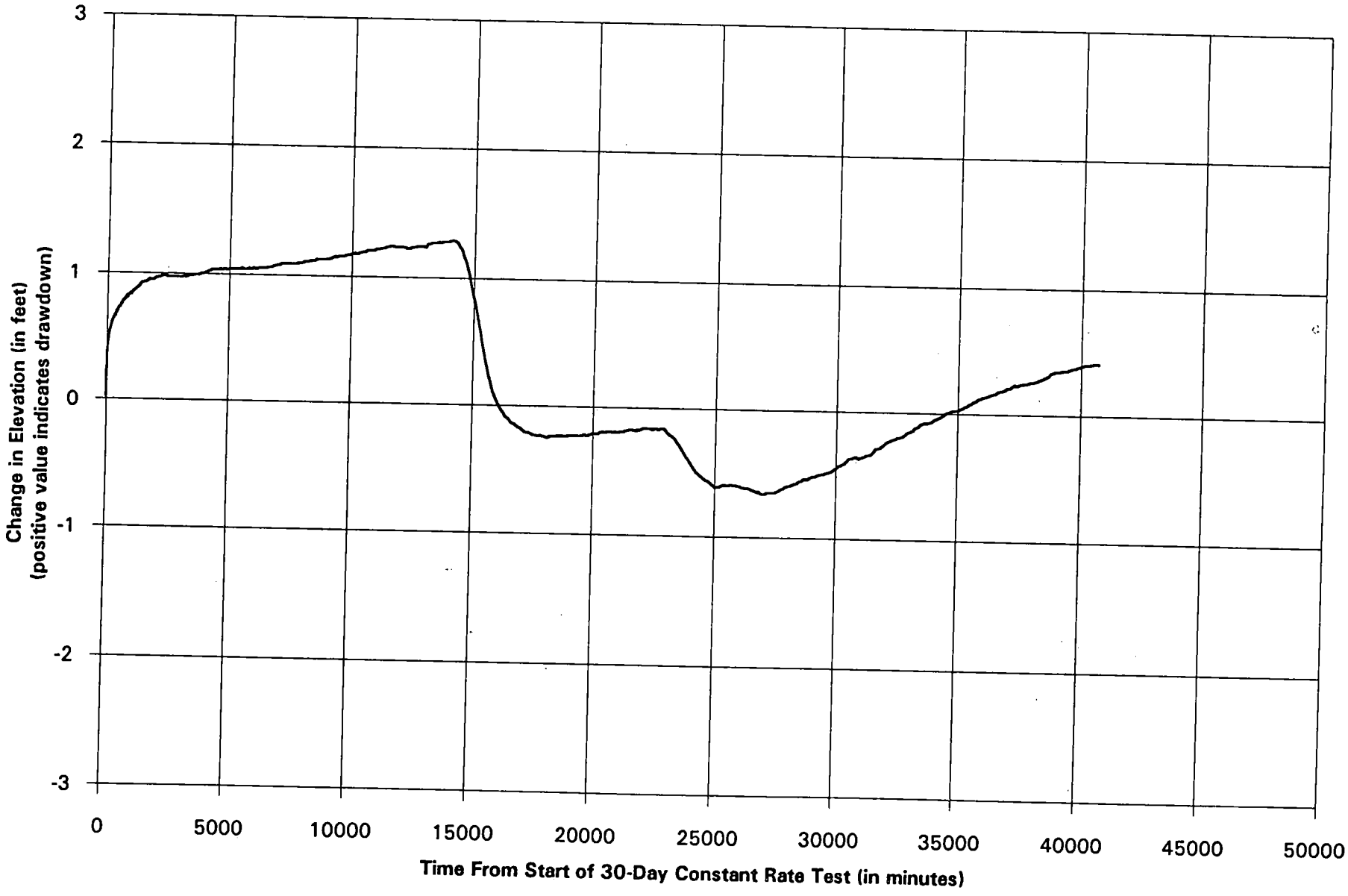
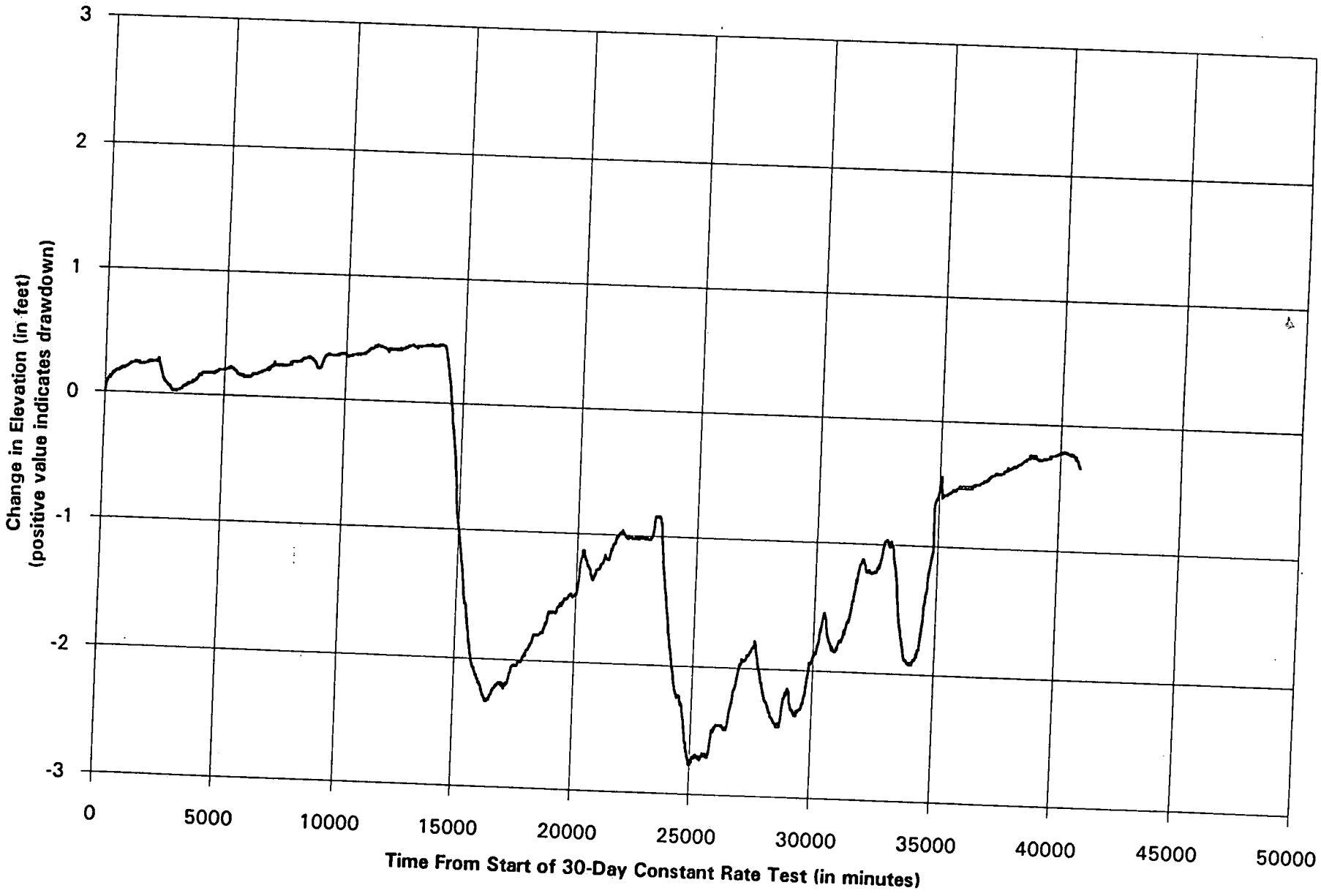
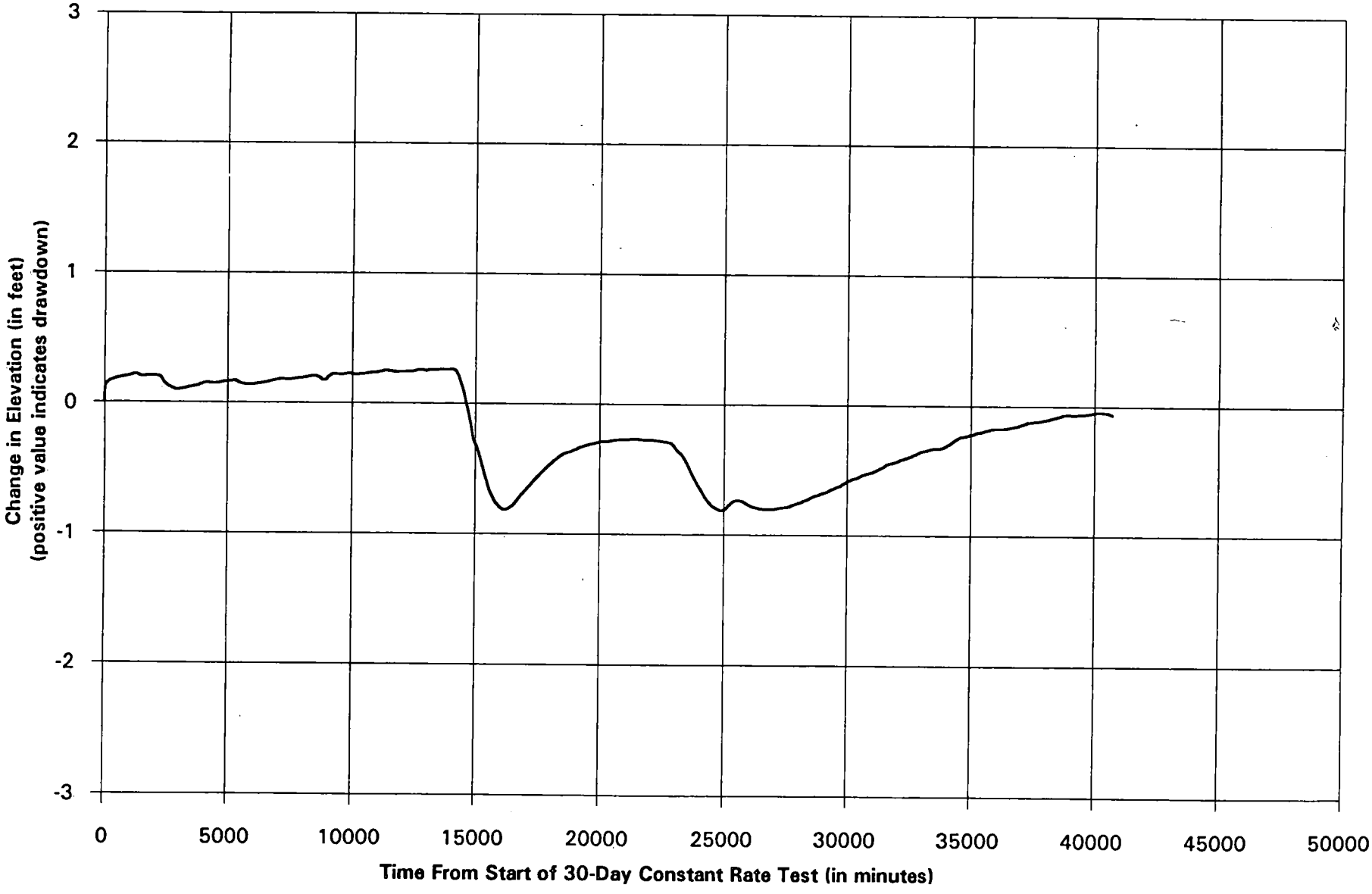


Figure J-6: MW-29S Hydrograph - 1 to 29 December 1992



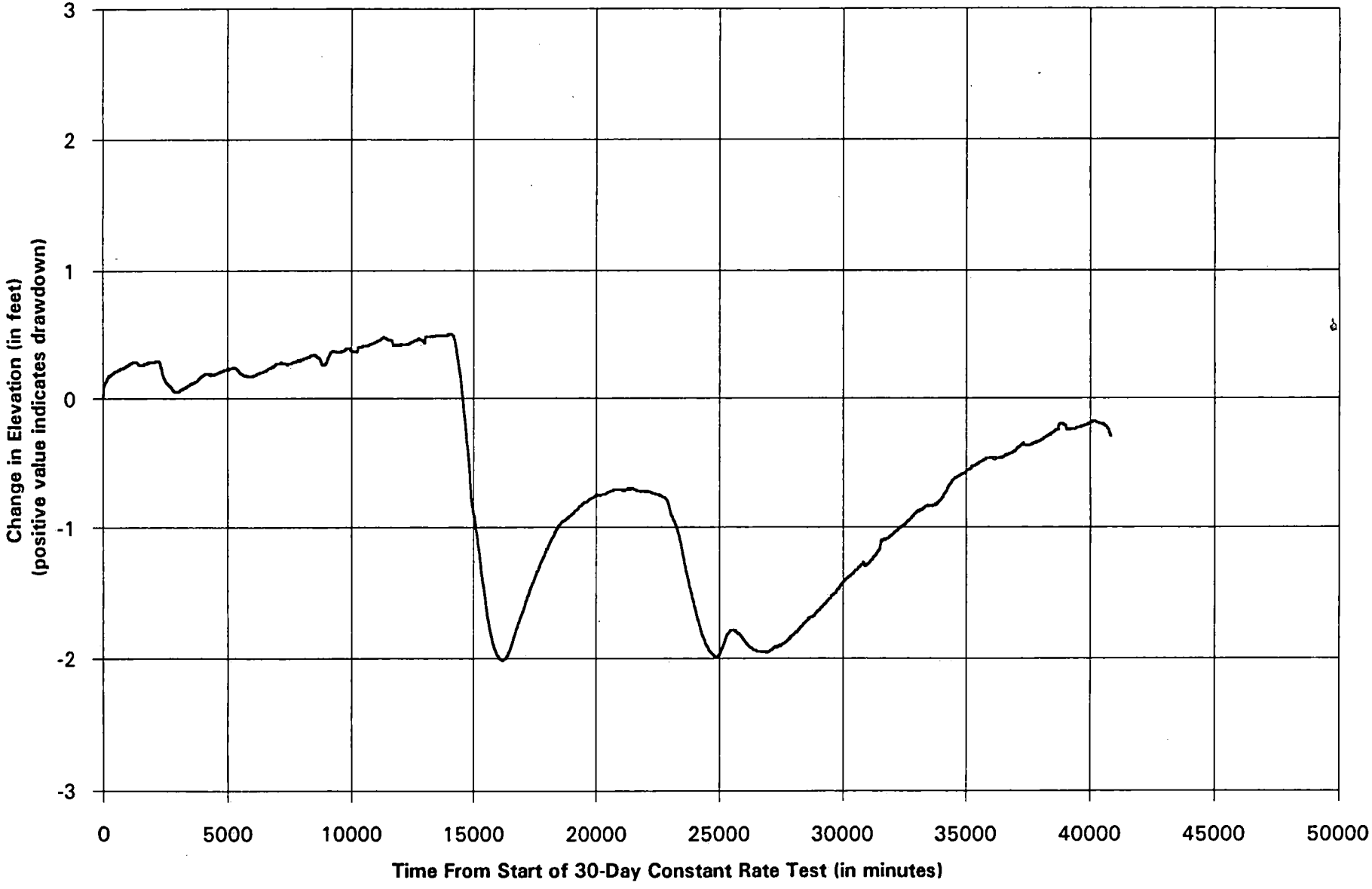
CLH: b:\MW29S.XLC

Figure J-7: MW-29D Hydrograph - 1 to 29 December



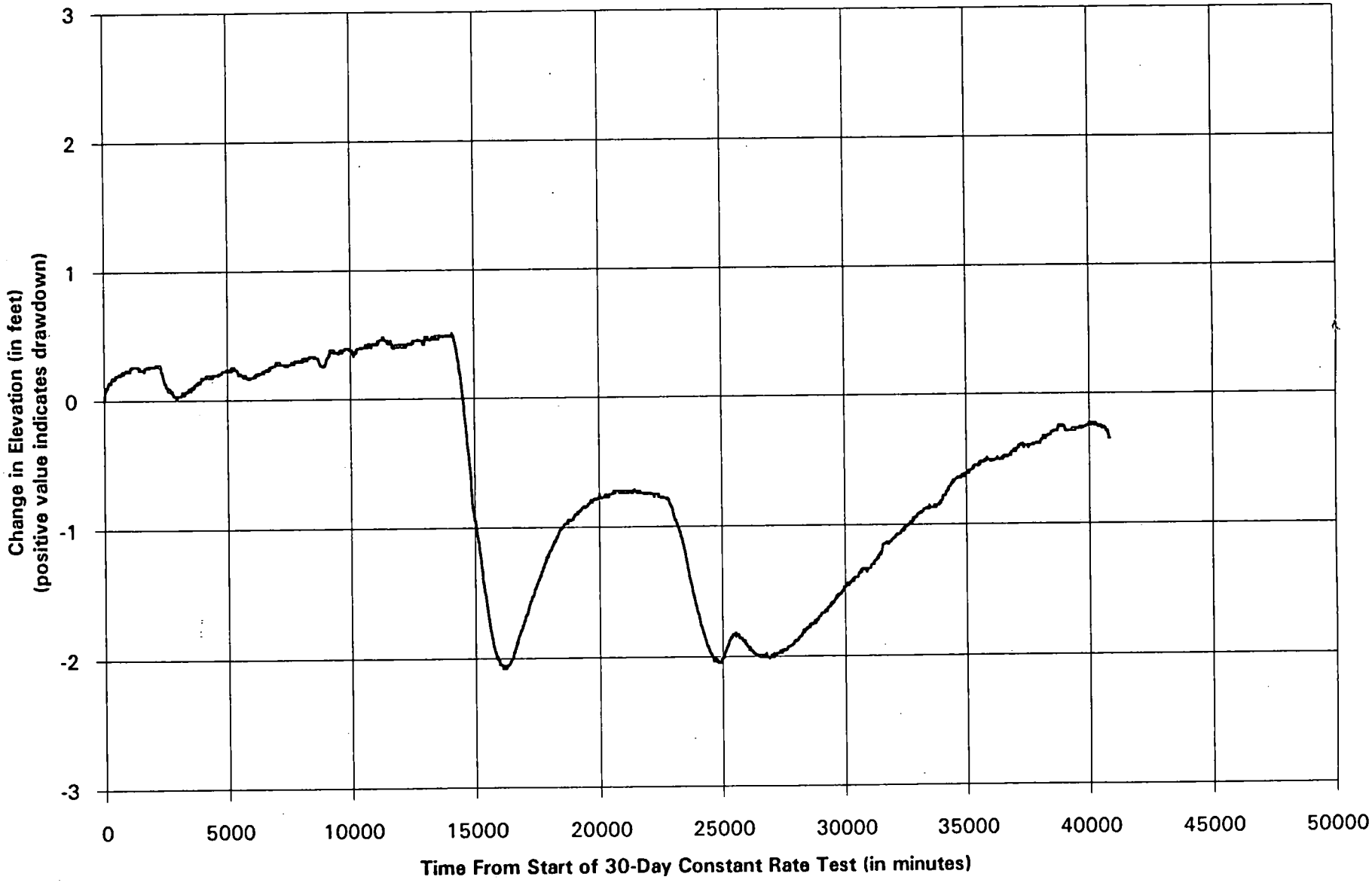
CLH: b:\MW29D.XLS Chart 1

Figure J-8: MW-30S Hydrograph - 1 to 29 December



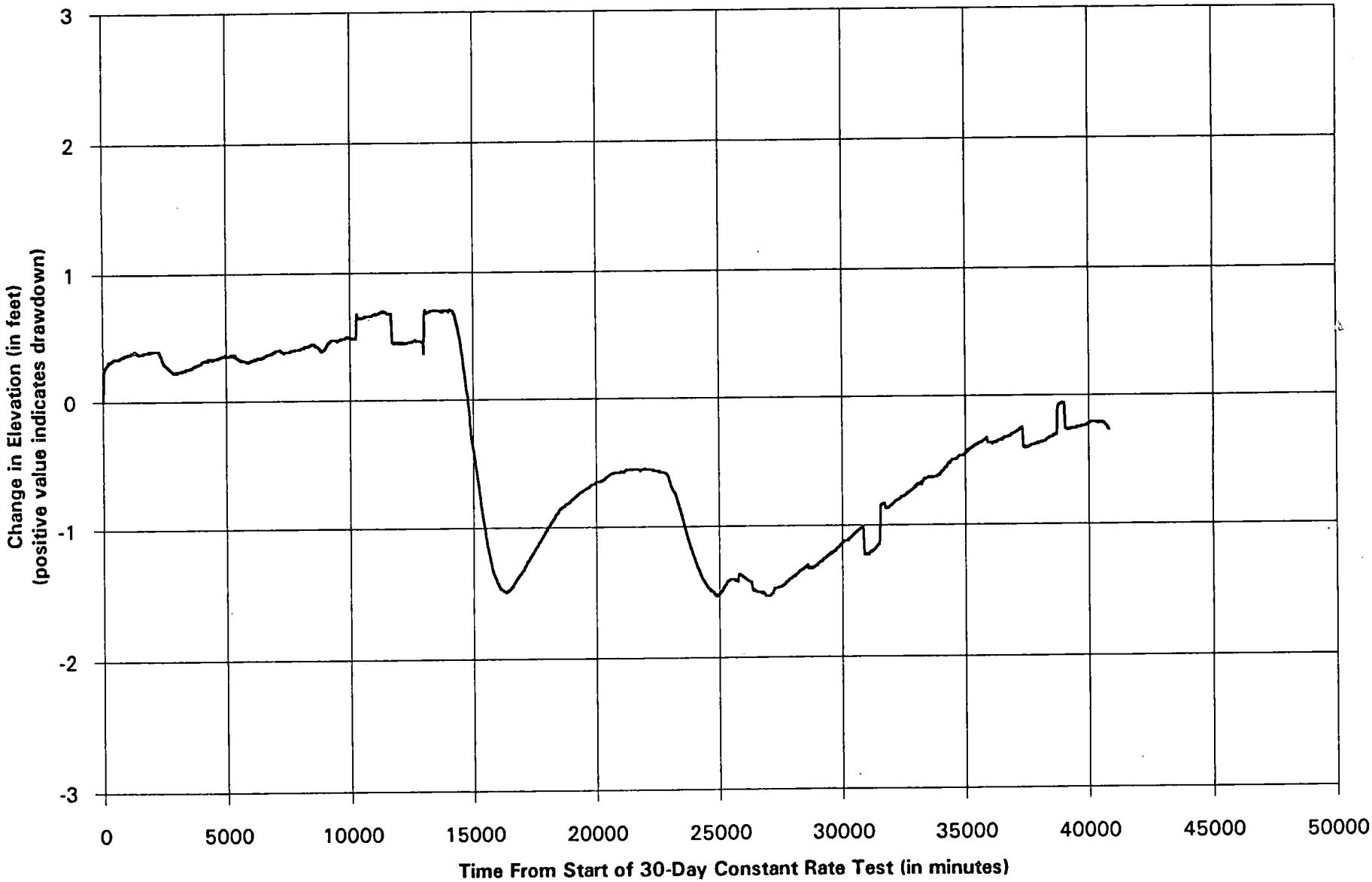
CLH: b:\MW30S.XLC

Figure J-9: MW-30D Hydrograph - 1 to 29 December 1992



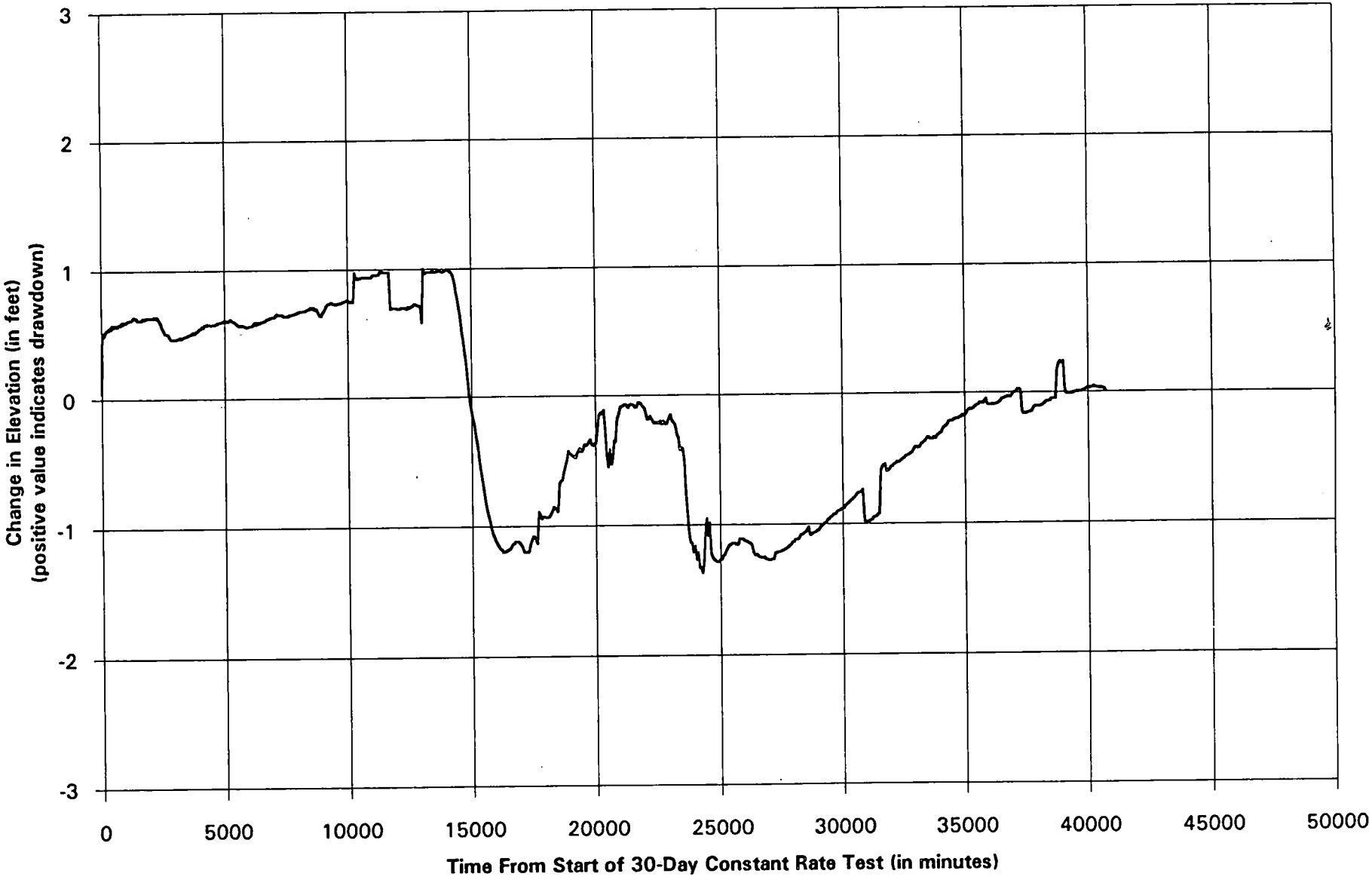
CLH: b:\MW30D.XLC

Figure J-10: MW-31S Hydrograph - 1 to 29 December 1992



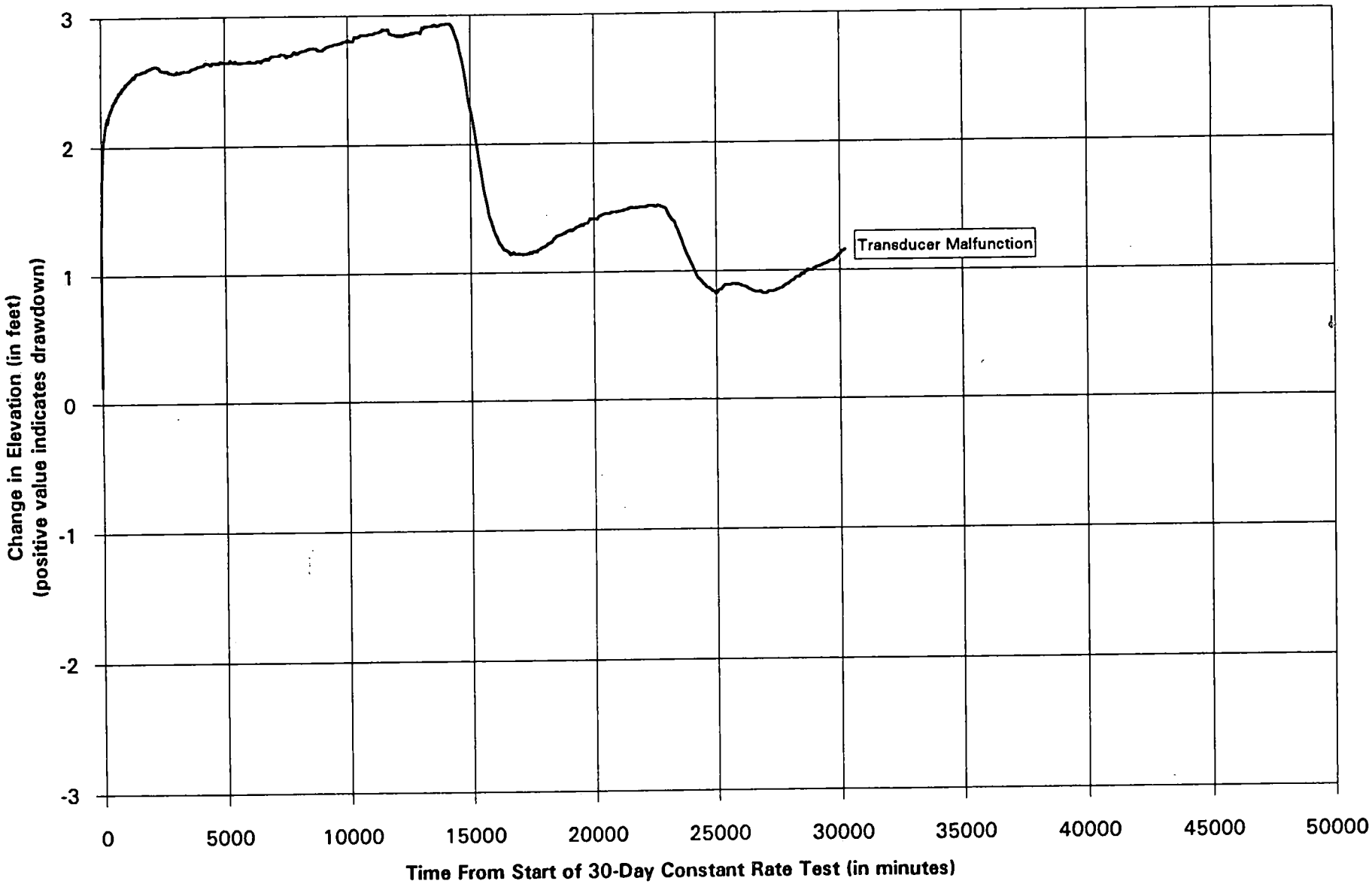
CLH: b:\MW31S.XLC

Figue J-11: MW-31D Hydrograph - 1 to 29 December 1992



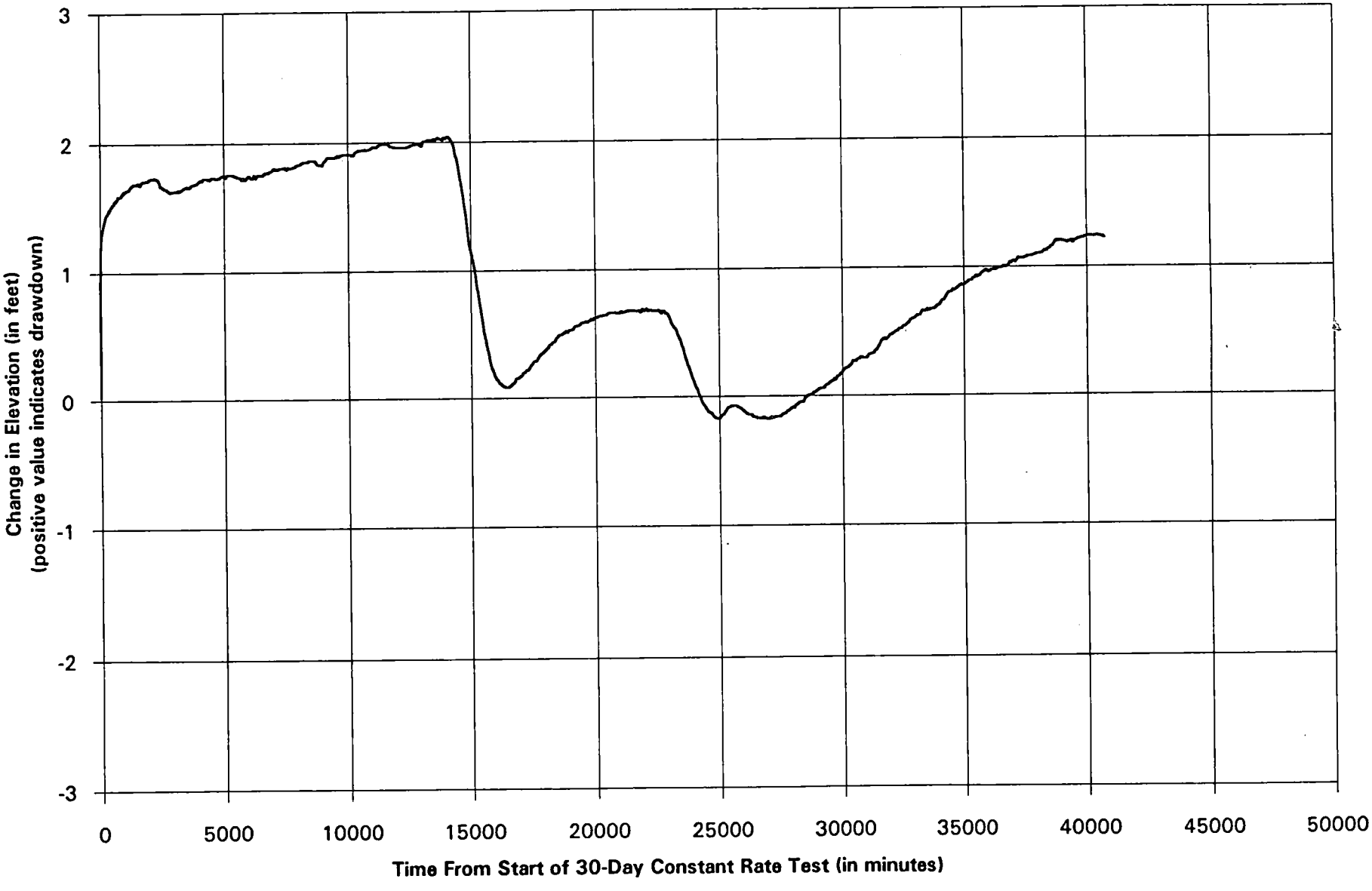
CLH: b:\MW31D.XLS Chart 1

Figure J-12: P-32S Hydrograph - 1 to 29 December 1992



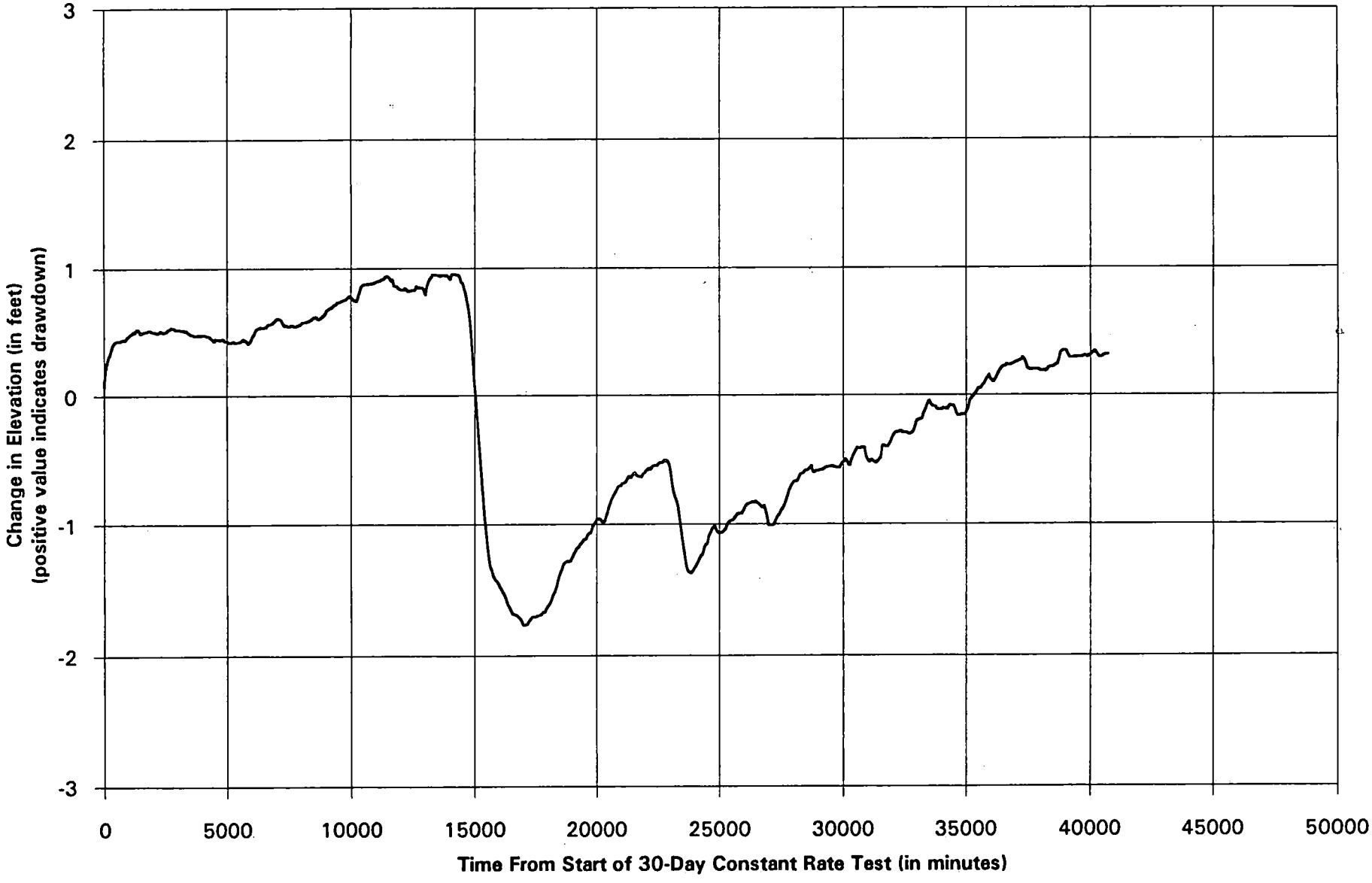
CLH: b:\P32S.XLC

Figure J-13: P-32D Hydrograph - 1 to 29 December 1992



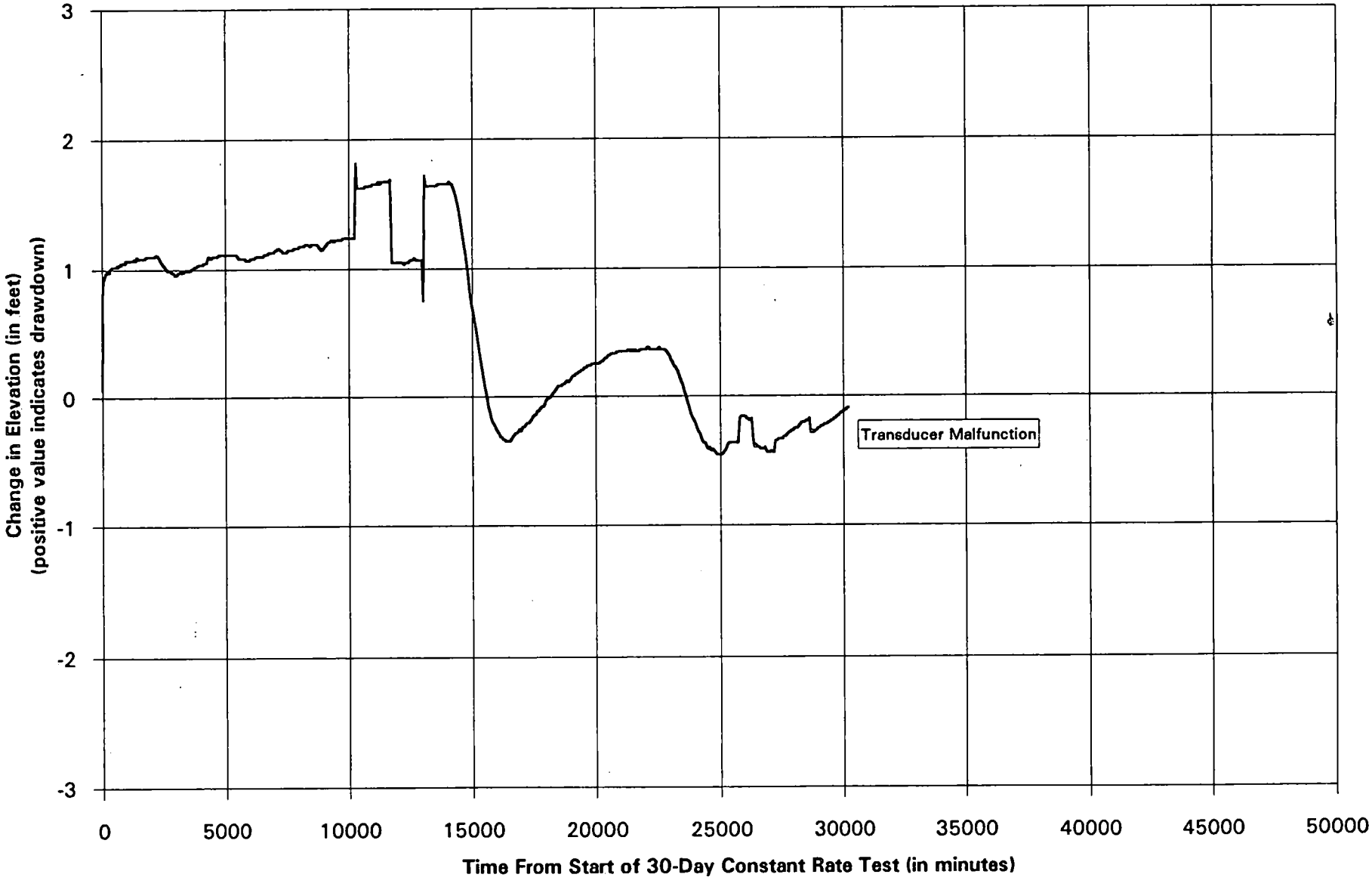
CLH: b:\P32D.XLS Chart 1

Figure J-14: P-33S Hydrograph - 1 to 29 December 1992



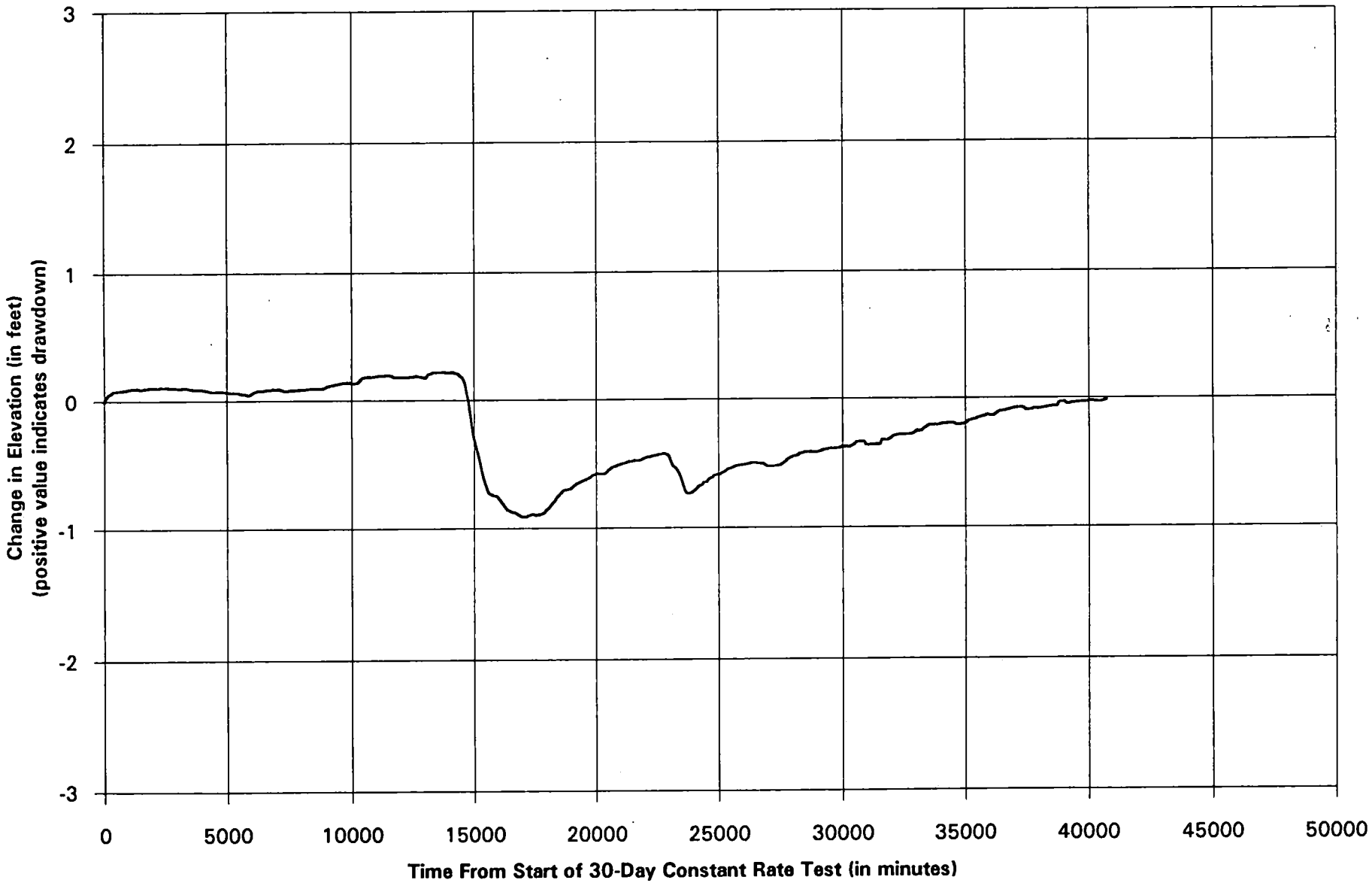
CLH: b:\P33S.XLS Chart 1

Figure J-15: P-33D Hydrograph - 1 to 29 December 1992



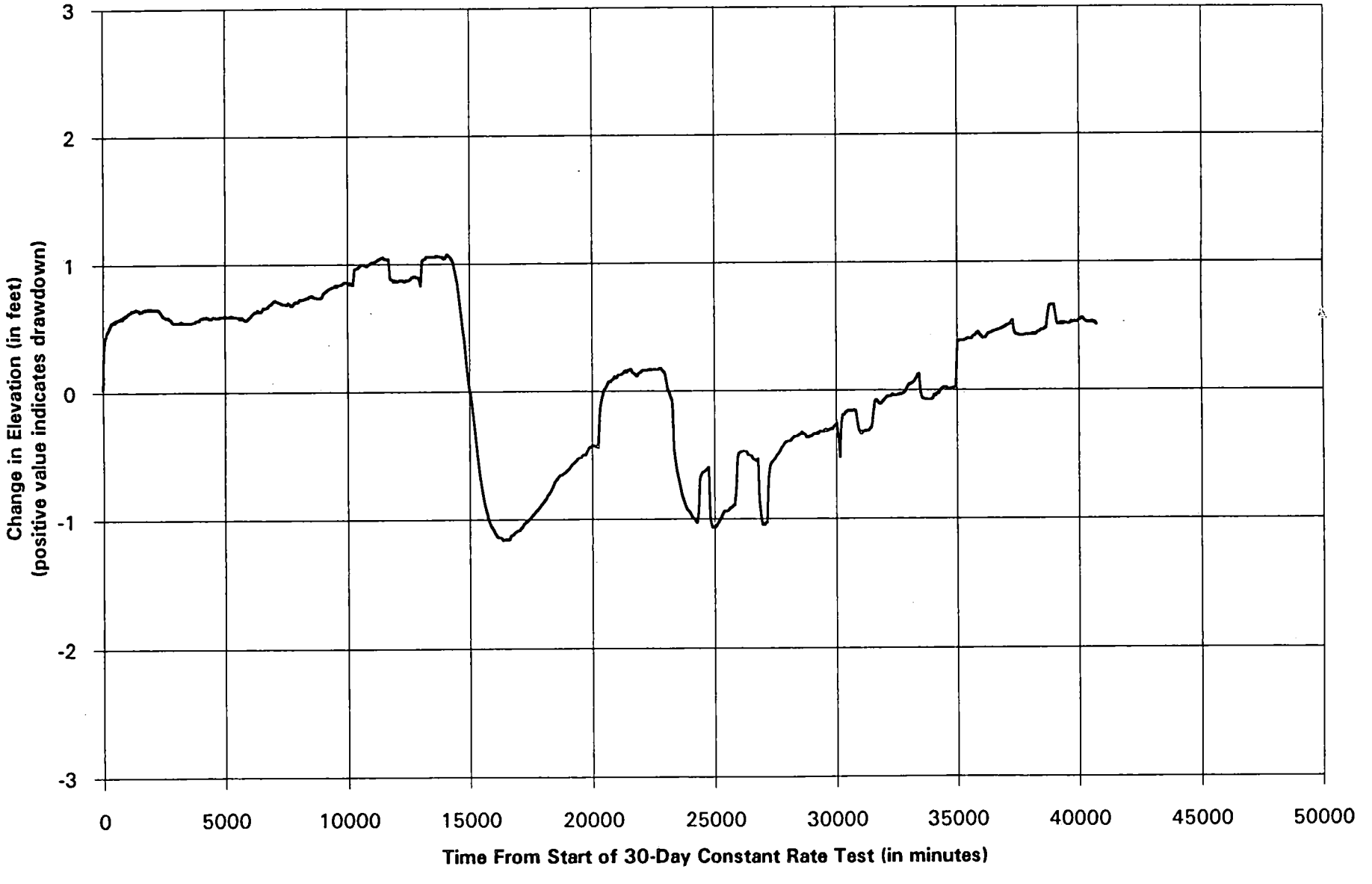
C:H: b:\P33D.XLS Chart 1

Figure J-16: P-34S Hydrograph - 1 to 29 December 1992



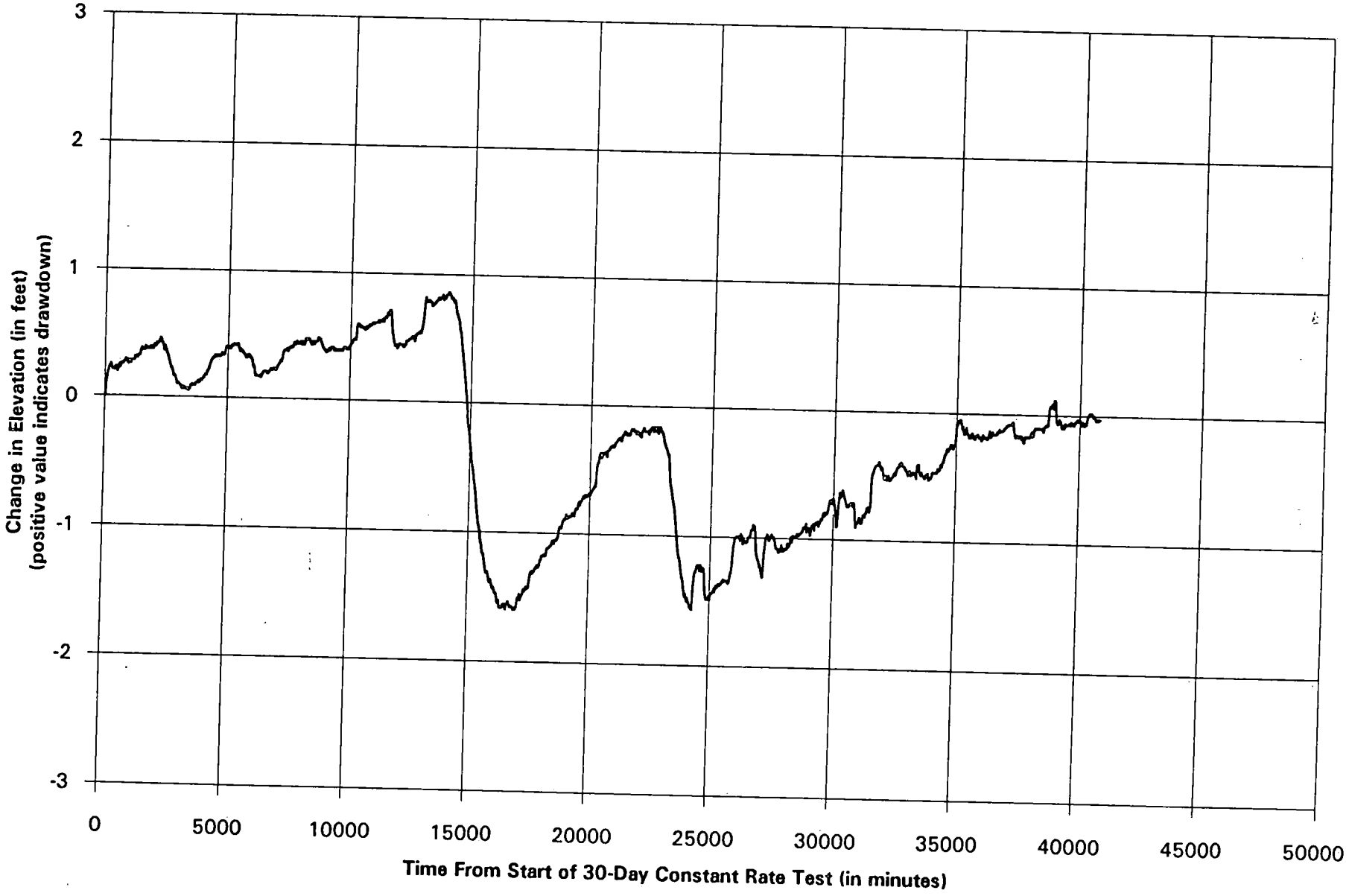
CLH: b:\P-34S.XLS Chart 1

Figure J-17: P-35S Hydrograph - 1 to 29 December 1992



CLH: b:\P35S.XLS Chart 1

Figure J-18: P-36S Hydrograph - 1 to 29 December 1992



CLH: b:\P36.XLC

Figure J-19: P-37S Hydrograph - 1 to 29 December 1992

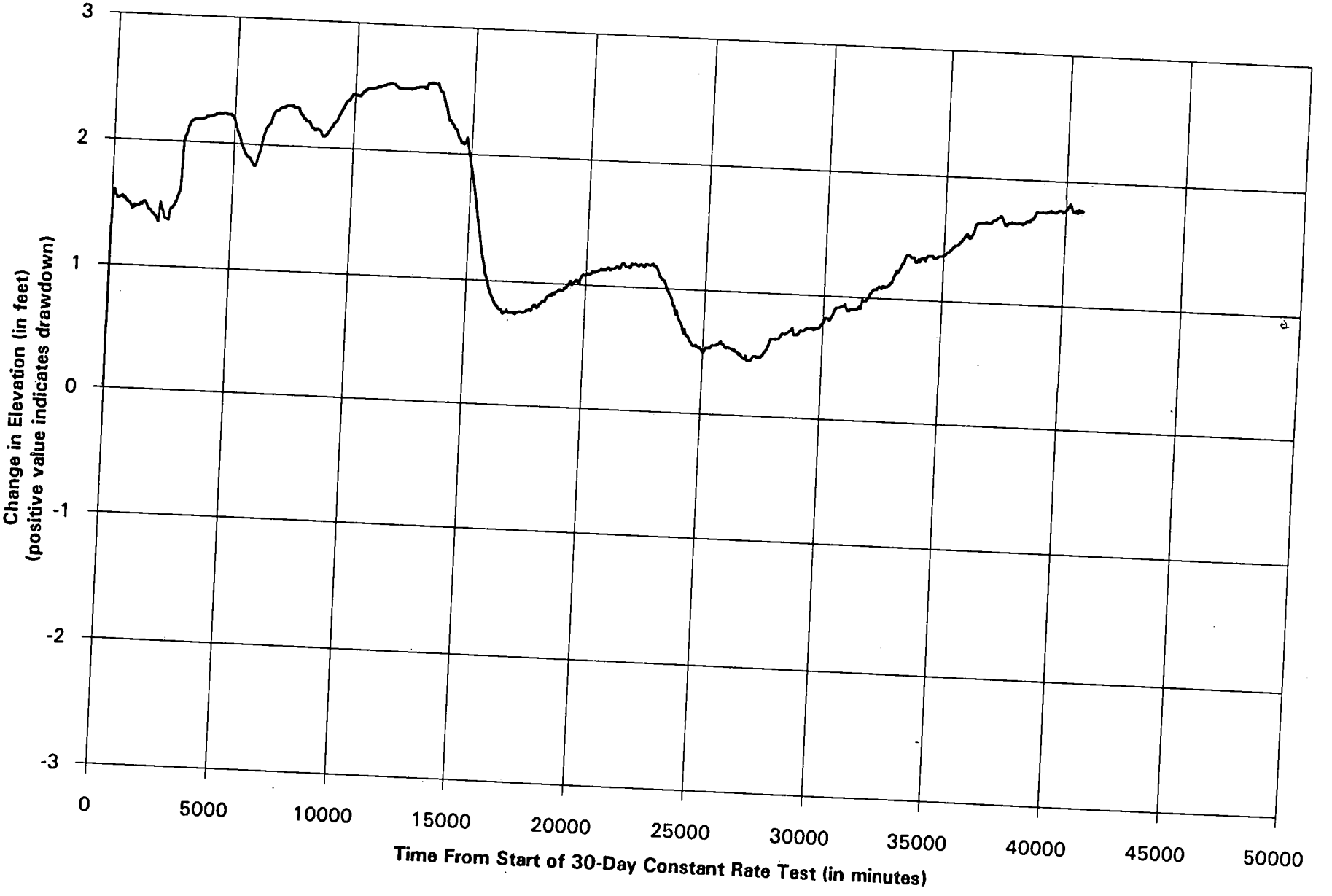
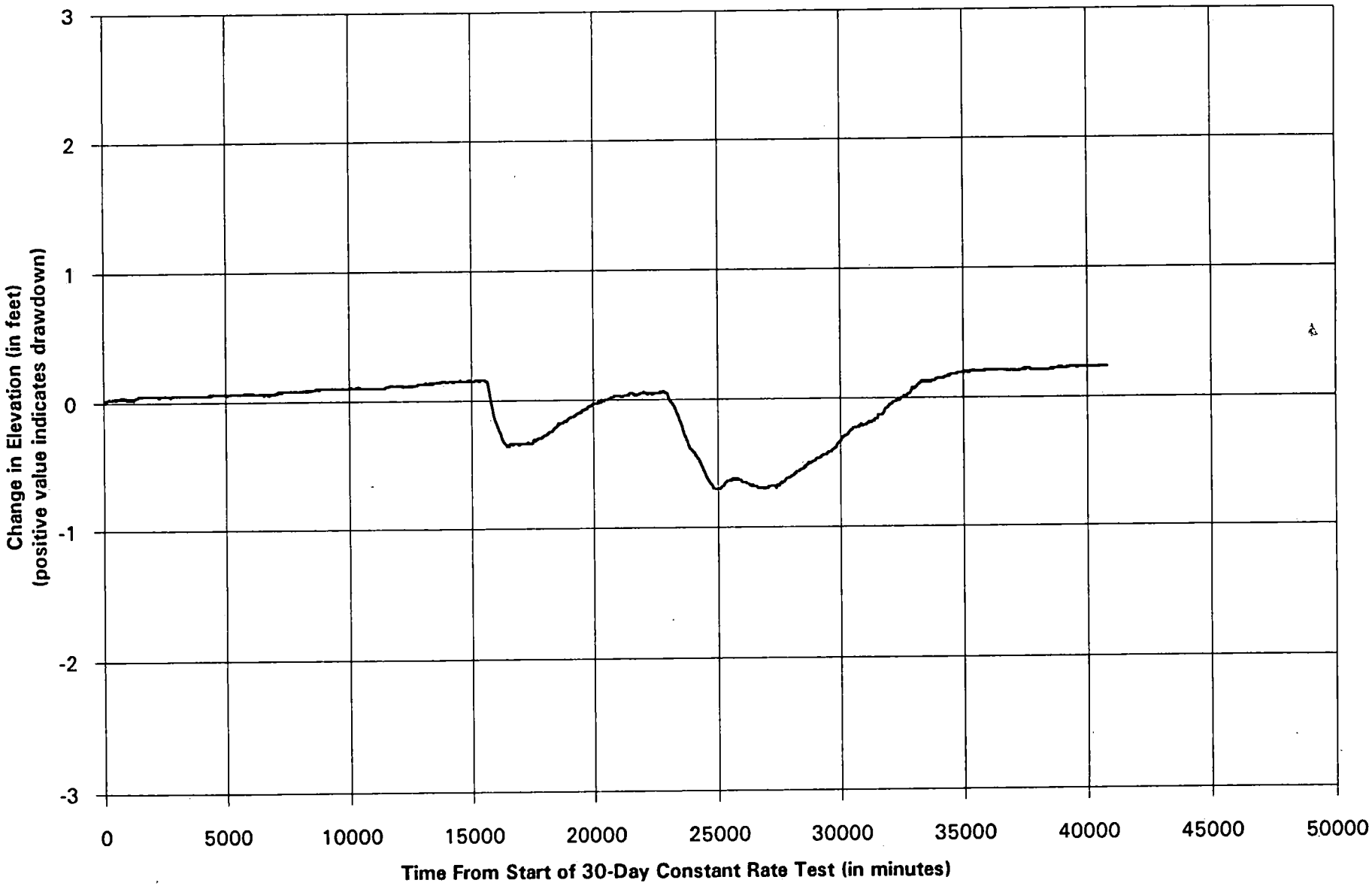


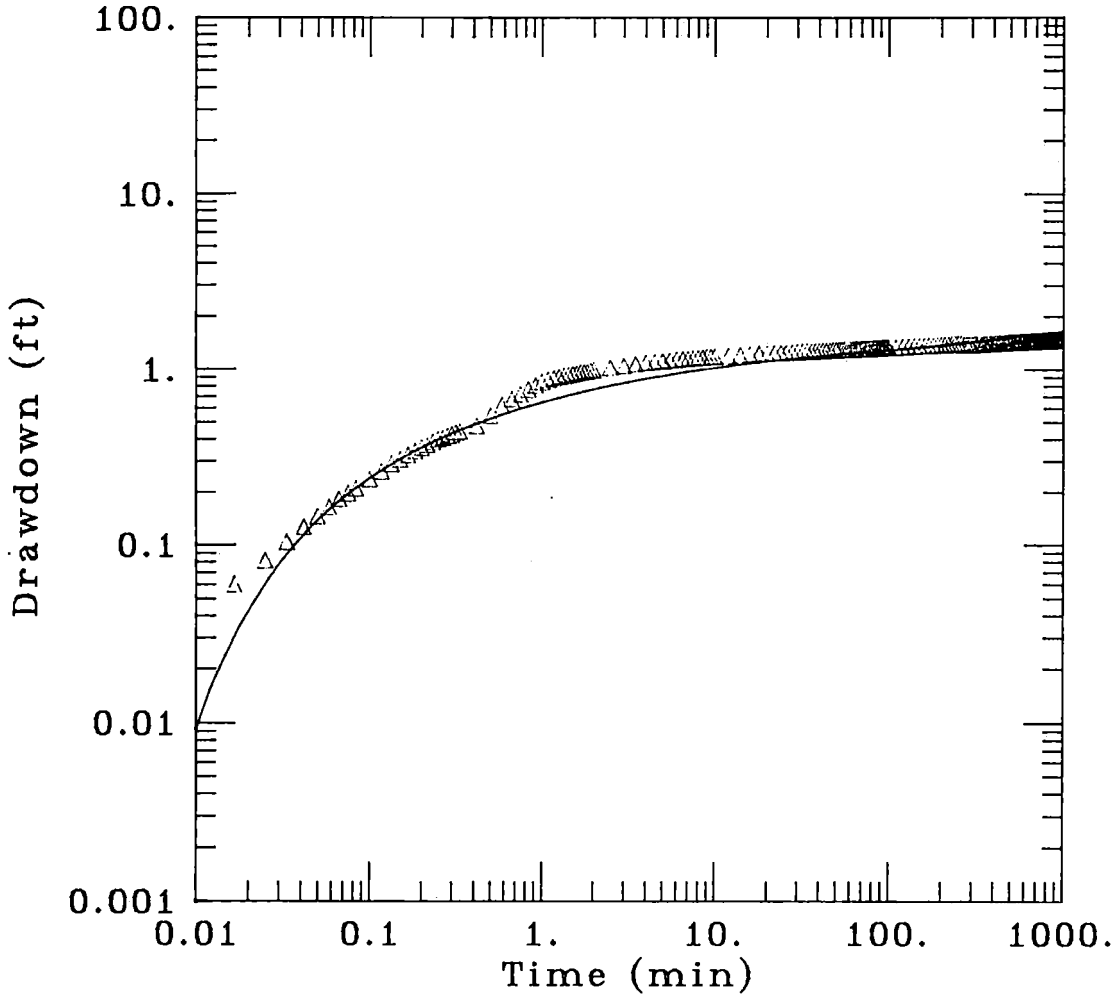
Figure J-20: P-38S Hydrograph - 1 to 29 December 1992



CLH: b:\P38S.XLC

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-21: 30-Day Constant Rate Test : Drawdown in RC-1 (Days 1 - 10)



DATA SET:
rc130d.cs1
04/20/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1

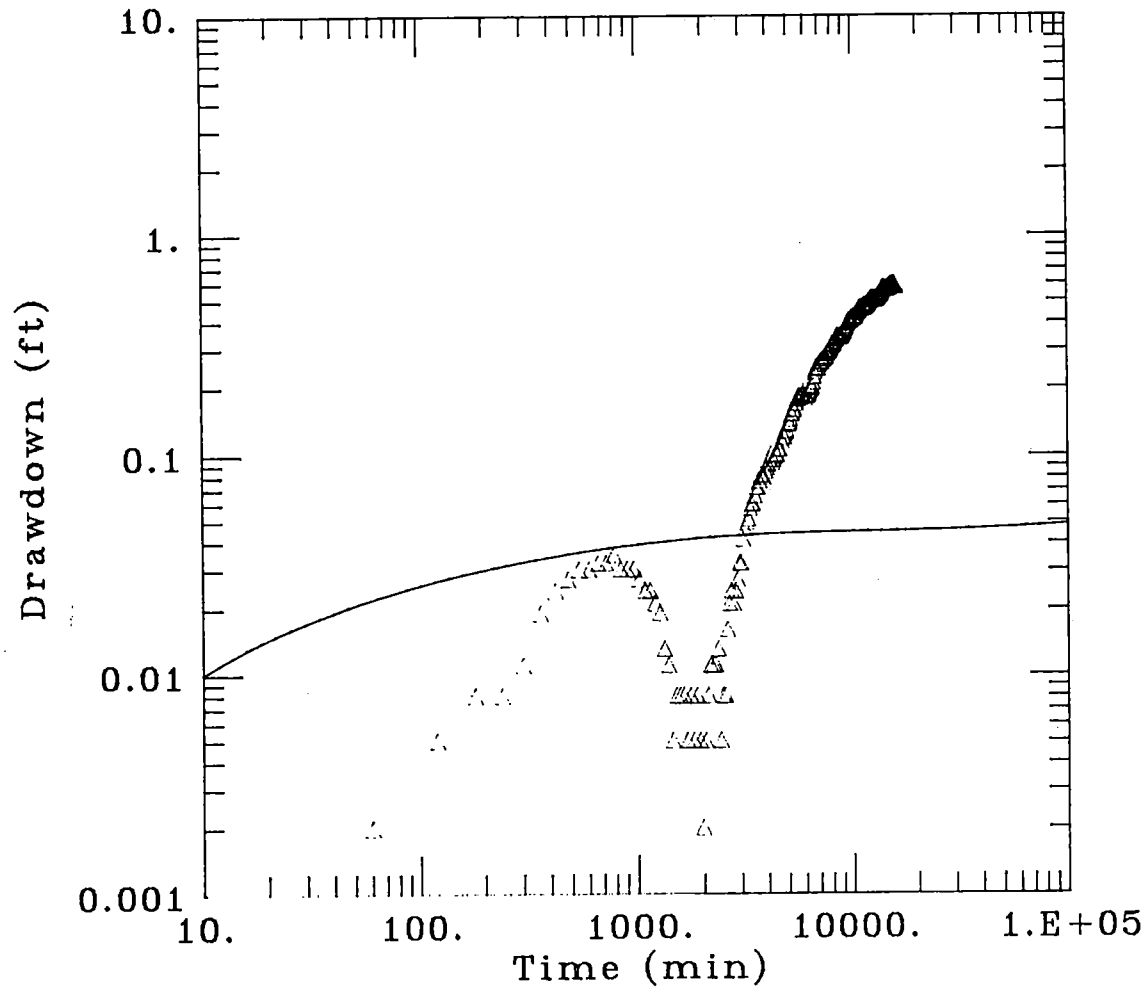
OBS. WELL:
Same

ESTIMATED PARAMETERS:
T = 2.015 ft^2/min
S = 0.6606
Sy = 5.144
β = 0.001

TEST DATA:
Q = 5.214 ft^3/min
r = 0.5 ft
b = 32. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: "Cranston, RI"

Figure J-22: 30-Day Constant Rate Test : Drawdown in RC-1 (Days 11 - 30)



DATA SET:
rc130d.cs2
04/20/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
Dec-92

TEST WELL:
RC-1

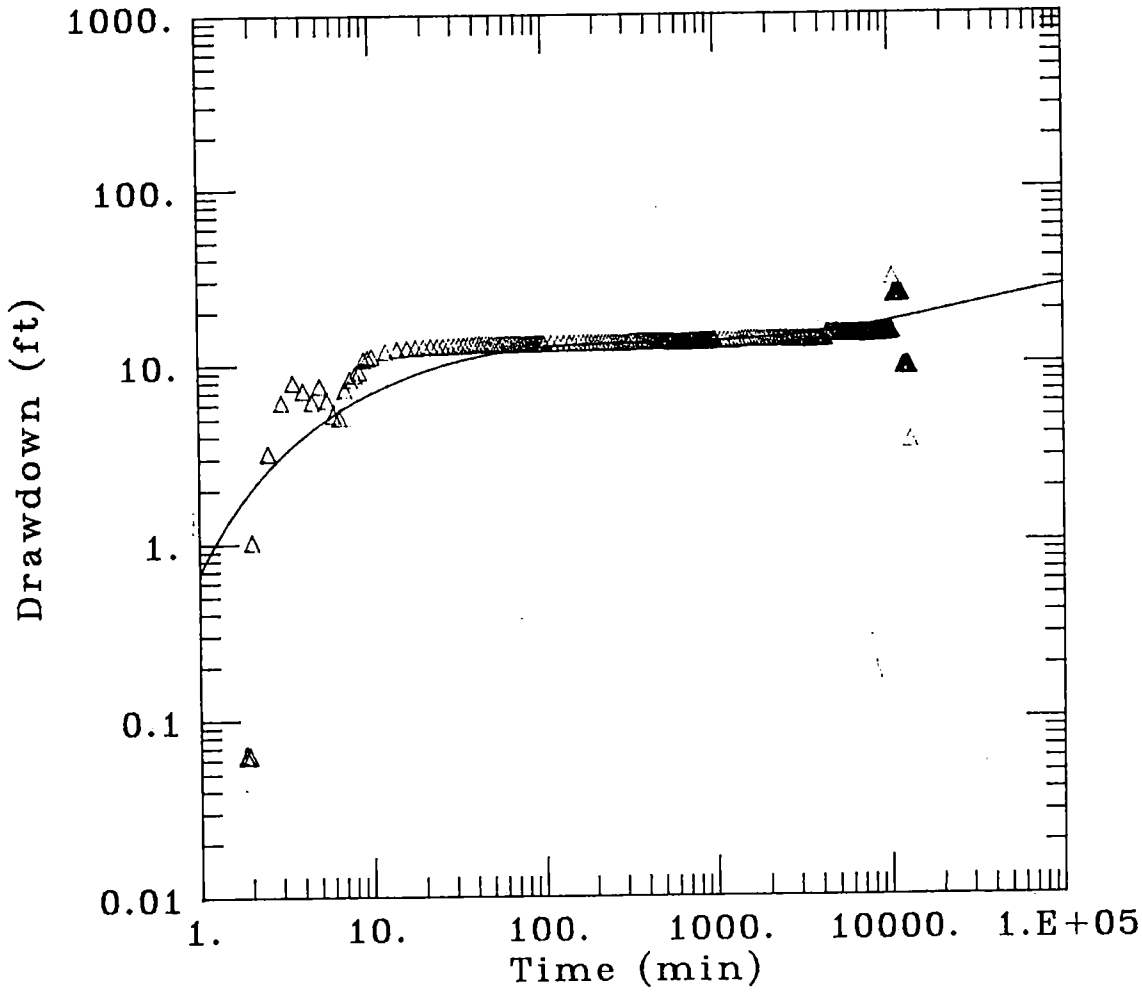
OBS. WELL:
Same

ESTIMATED PARAMETERS:
T = 52.68 ft^2/min
S = 1507.6
Sy = 2.0605E+05
β = 0.001

TEST DATA:
Q = 5.214 ft^3/min
r = 0.5 ft
b = 32. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: "Cranston, RI"

Figure J-23: 30-Day Constant Rate Test : Drawdown in RC-2 (Days 1 - 10)



DATA SET:
rc2.cs1
04/21/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
Dec-92

TEST WELL:
RC-2

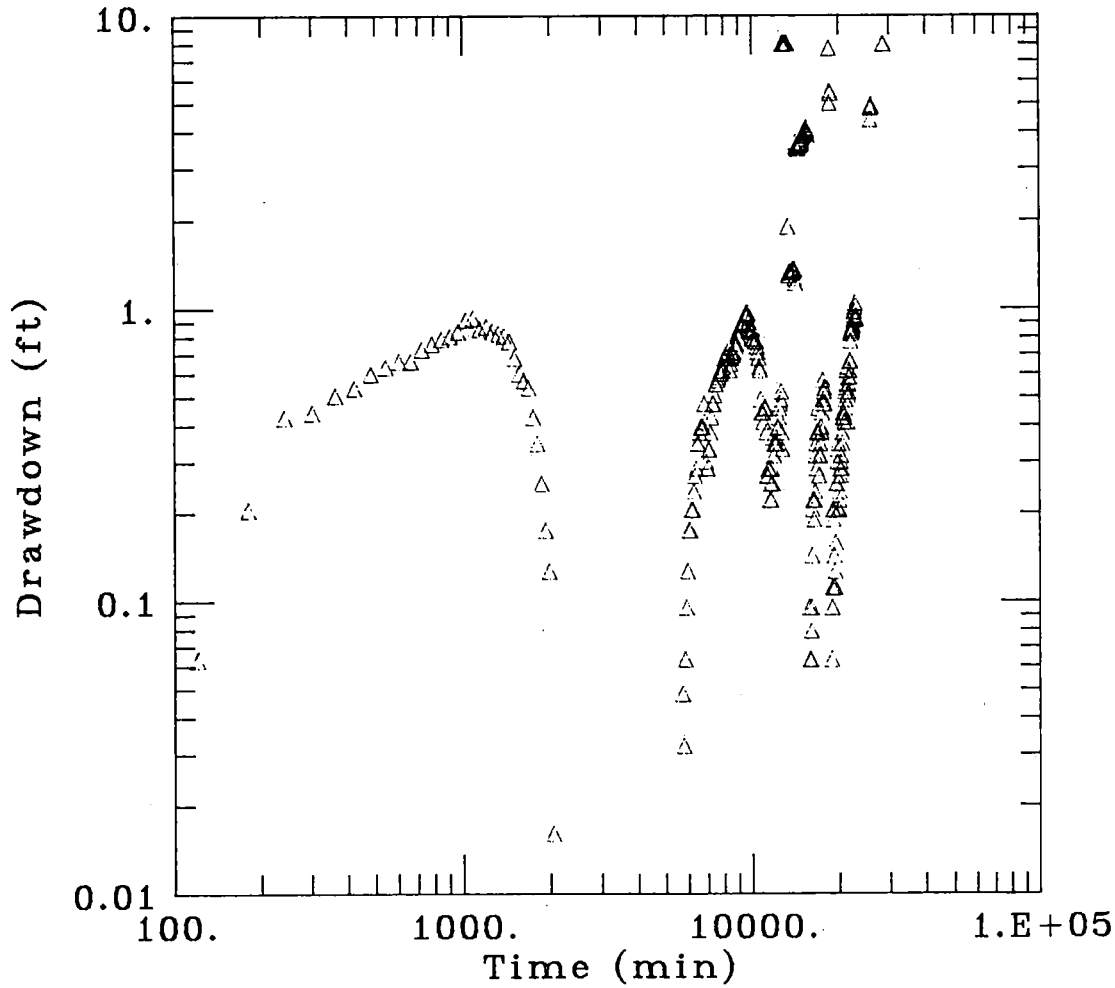
OBS. WELL:
Same

ESTIMATED PARAMETERS:
T = 0.01641 ft^2/min
S = 0.3295
Sy = 71.68
β = 0.03

TEST DATA:
Q = 1.069 ft^3/min
r = 0.5 ft
b = 45.7 ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: "Cranston, RI"

Figure J-24: 30-Day Constant Rate Test : Drawdown in RC-2 (Days 11 - 30)



DATA SET:
rc2.cs2
04/21/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
Dec-92

TEST WELL:
RC-2

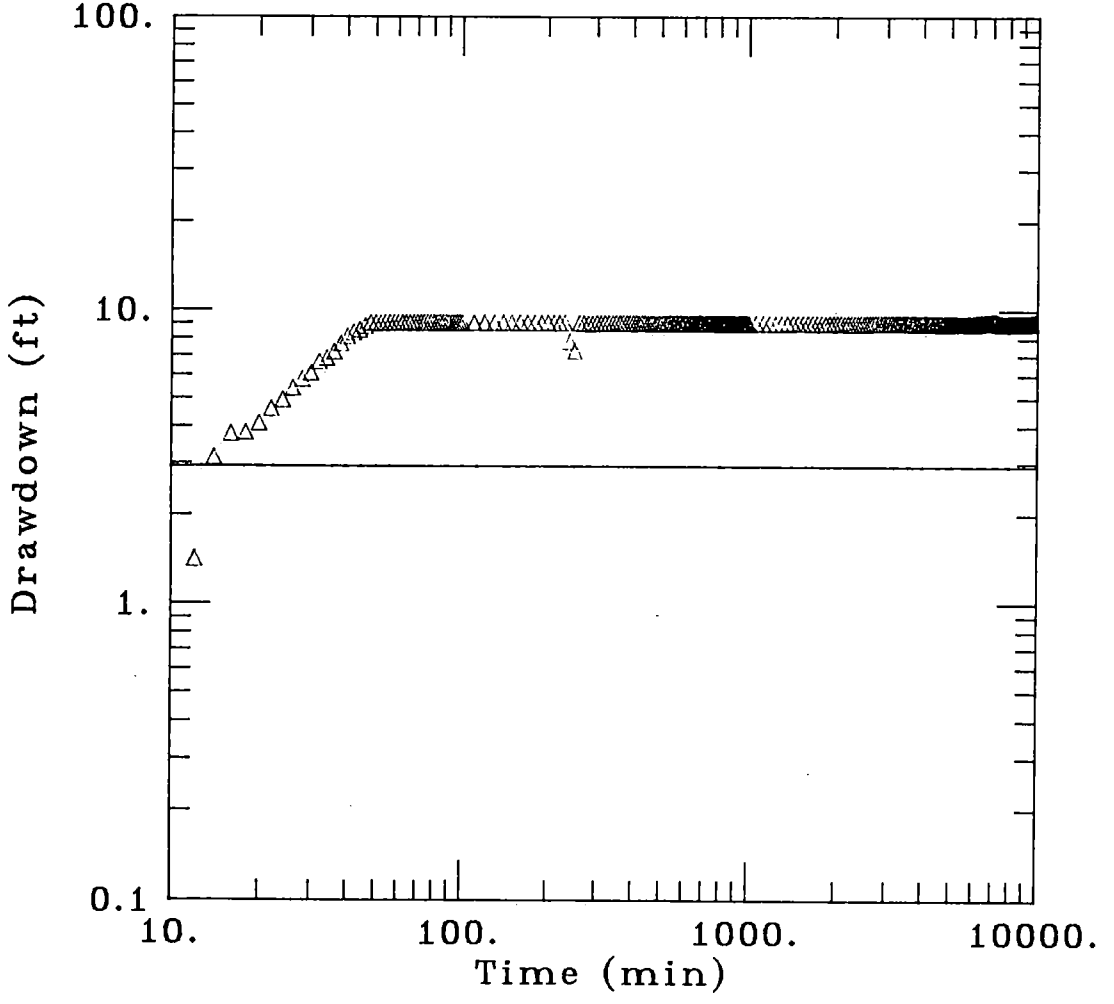
OBS. WELL:
Same

ESTIMATED PARAMETERS:
T = 0.0001031 ft^2/min
S = 0.02903
Sy = 0.6904
β = 0.001

TEST DATA:
Q = 1.069 ft^3/min
r = 0.5 ft
b = 45.7 ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-25: 30-Day Constant Rate Test : Drawdown in MW-1S (Days 1 - 10)



DATA SET:
mw1s30d.cs1
04/11/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
MW-1S

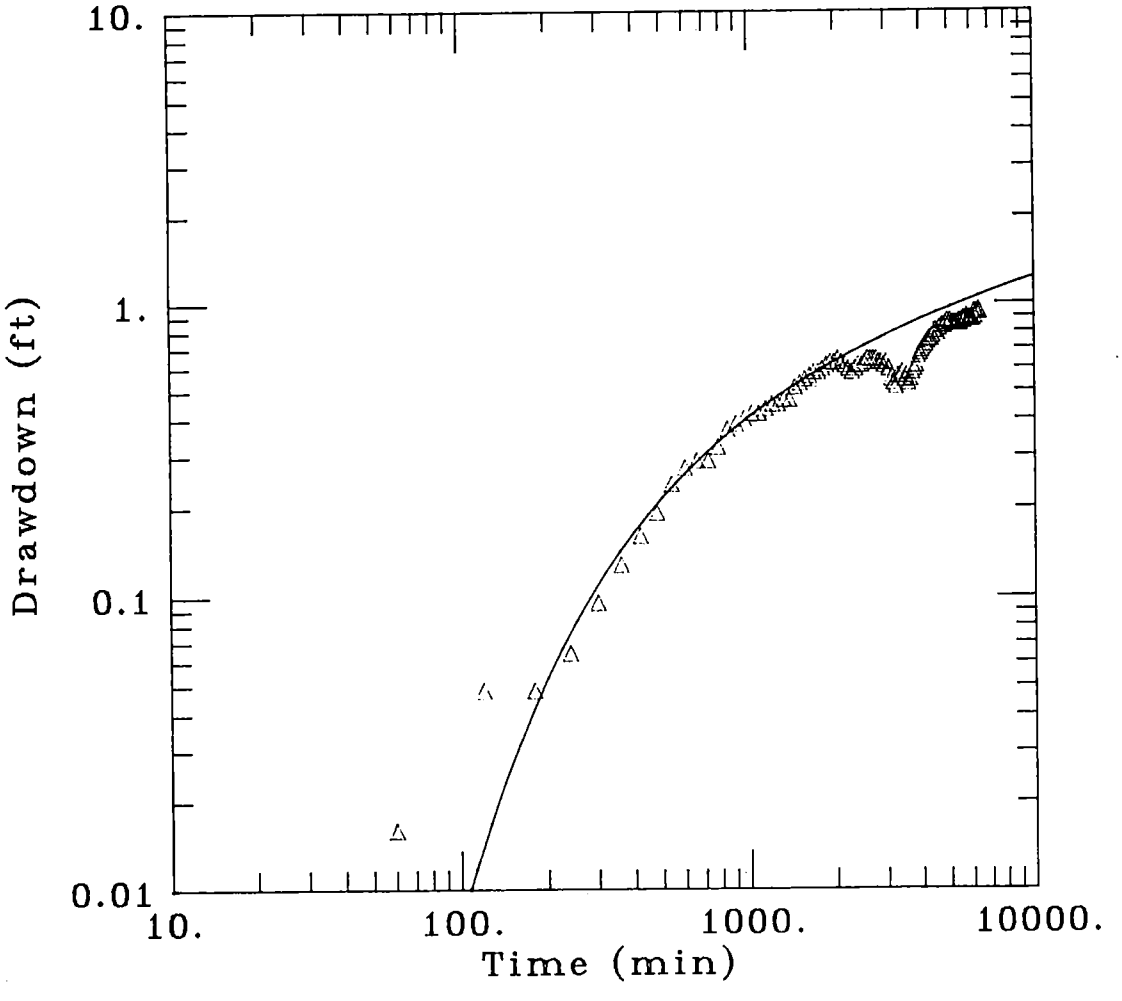
OBS. WELL:
Same

ESTIMATED PARAMETERS:
T = 0.04687 ft^2/min
S = 2.0268E-14
Sy = 2.0268E-14
β = 0.9

TEST DATA:
Q = 0.1337 ft^3/min
r = 0.33 ft
b = 12. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-26: 30-Day Constant Rate Test : Drawdown in MW-1S (Days 11 - 30)



DATA SET:
mw1s30d.cs2
04/11/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

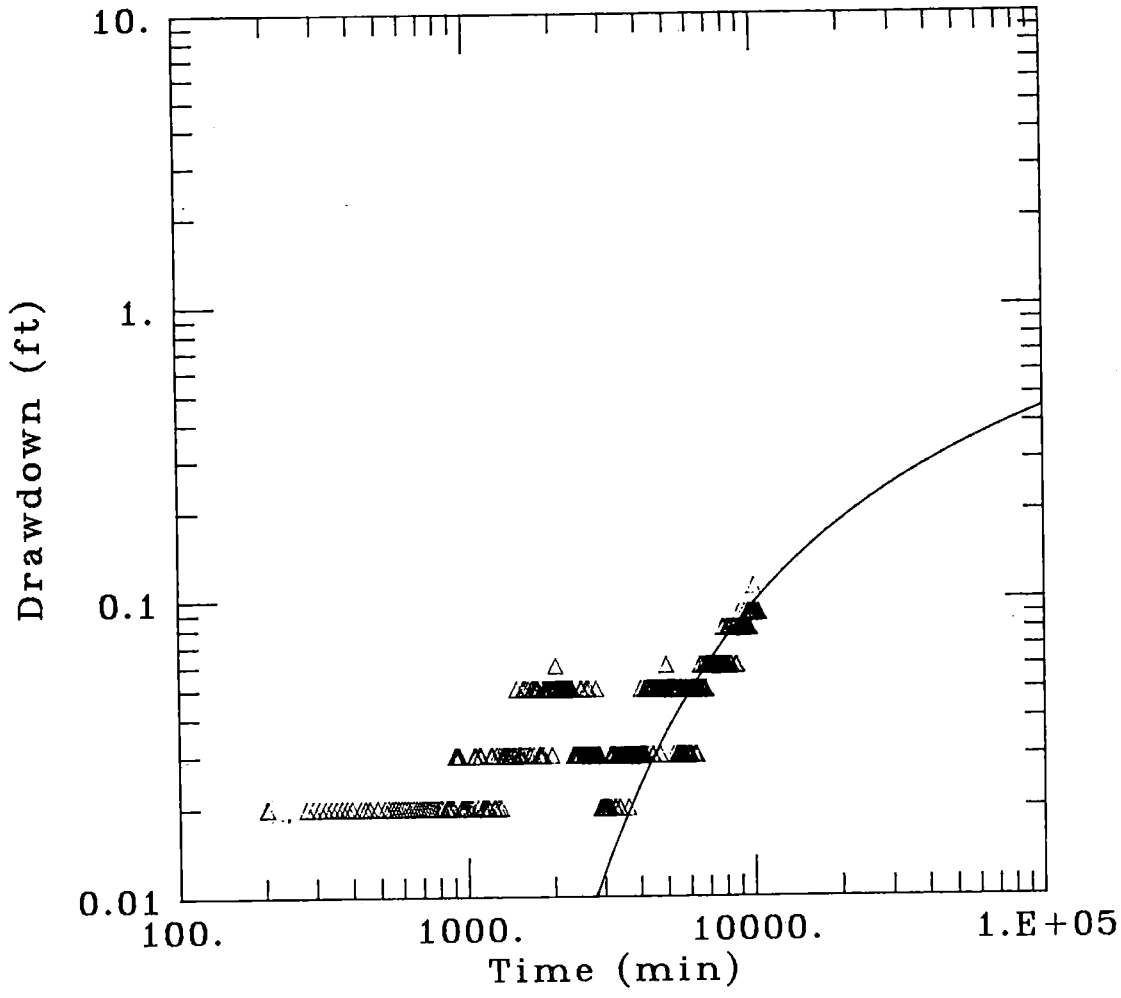
OBS. WELL:
MW-1S

ESTIMATED PARAMETERS:
T = 0.02254 ft^2/min
S = 226.8
Sy = 184.7
β = 0.03

TEST DATA:
Q = 0.1337 ft^3/min
r = 0.33 ft
b = 8. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-27: 30-Day Constant Rate Test : Drawdown in P-1D (Days 1 - 10)



DATA SET:
p1d30d.cs1
04/09/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

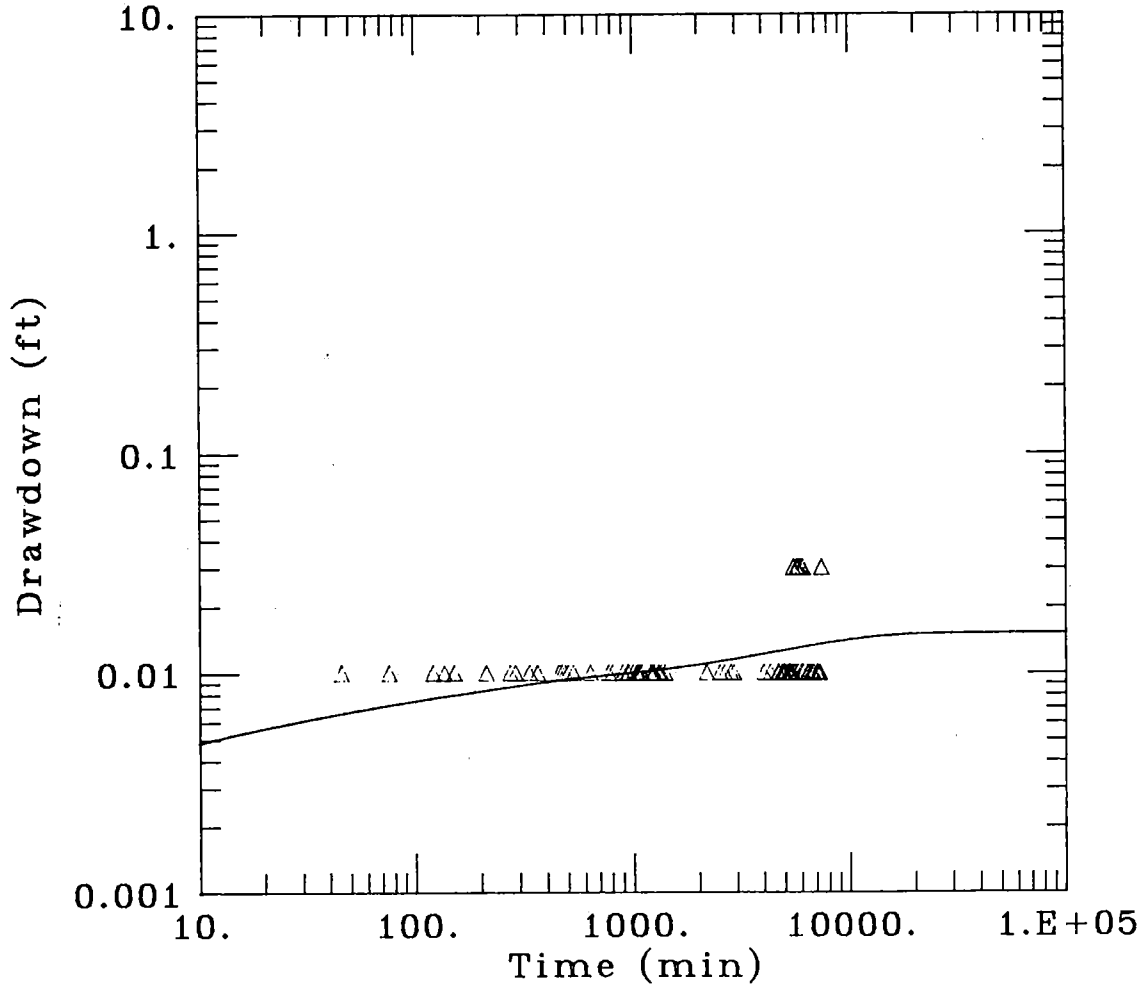
OBS. WELL:
P-1D

ESTIMATED PARAMETERS:
T = 2.142 ft^2/min
S = 21.12
Sy = 9.032
β = 0.001

TEST DATA:
Q = 5.214 ft^3/min
r = 47. ft
b = 25. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-28: 30-Day Constant Rate Test : Drawdown in P-1D (Days 11 - 30)



DATA SET:
p1d30d.cs2
04/13/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

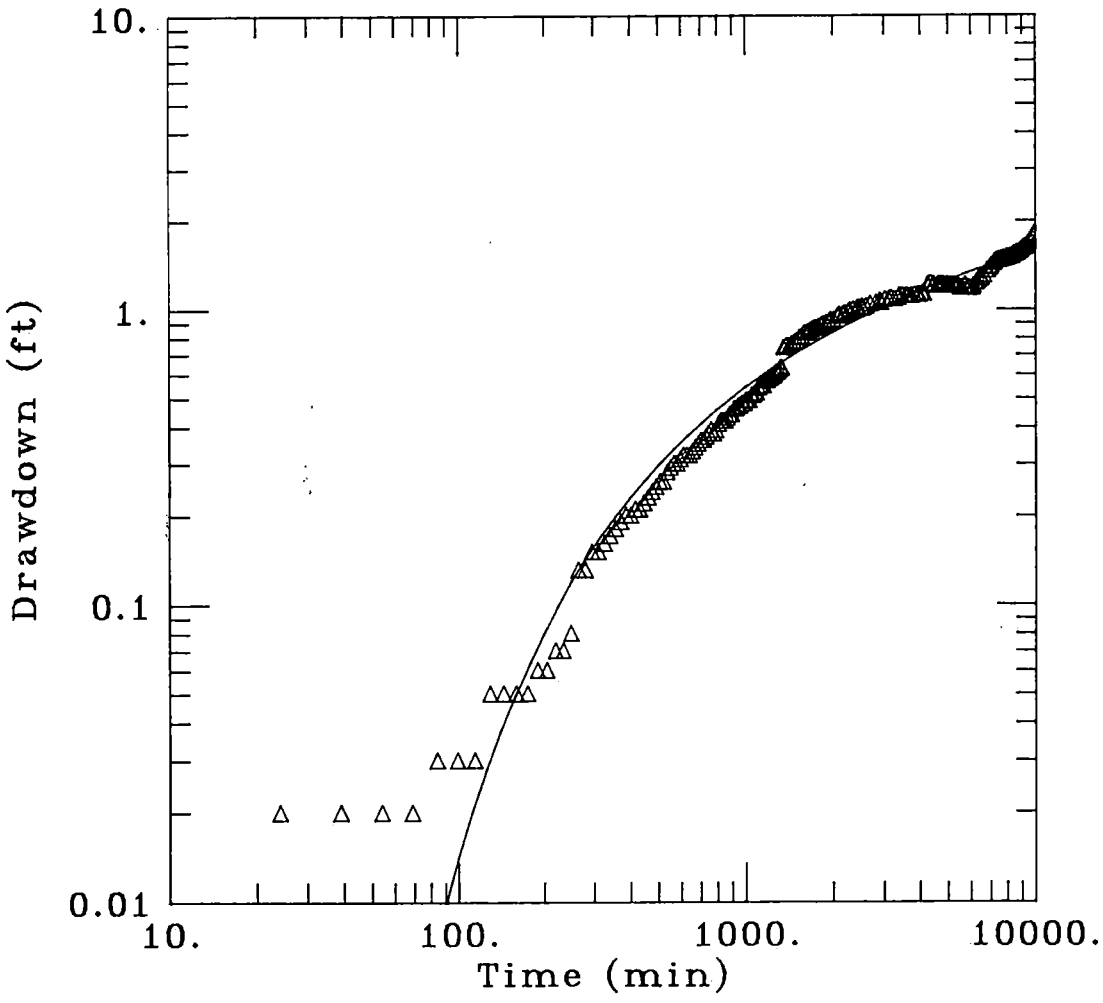
OBS. WELL:
P-1D

ESTIMATED PARAMETERS:
T = 343. ft^2/min
S = 0.02912
Sy = 0.02912
β = 1.

TEST DATA:
Q = 5.08 ft^3/min
r = 47. ft
b = 25. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-29: 30-Day Constant Rate Test : Drawdown in P-2S (Days 1 - 10)



DATA SET:
p2s30d.cs1
04/08/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

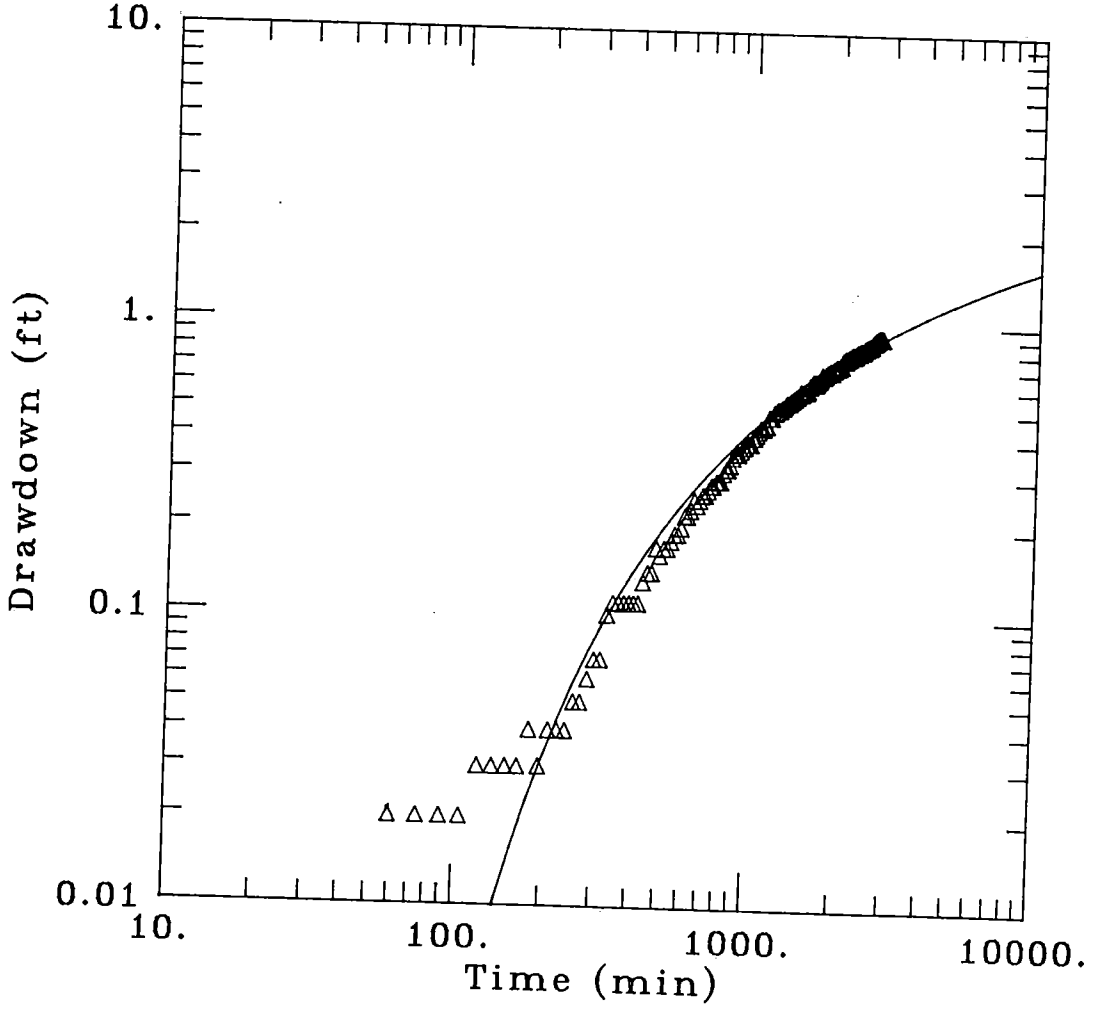
OBS. WELL:
P-2S

ESTIMATED PARAMETERS:
T = 0.1628 ft^2/min
S = 0.01866
Sy = 0.01194
β = 0.001

TEST DATA:
Q = 1.069 ft^3/min
r = 92. ft
b = 11.5 ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-30: 30-Day Constant Rate Test : Drawdown in P-2S (Days 11 - 30)



DATA SET:
p2s30d.cs2
04/08/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

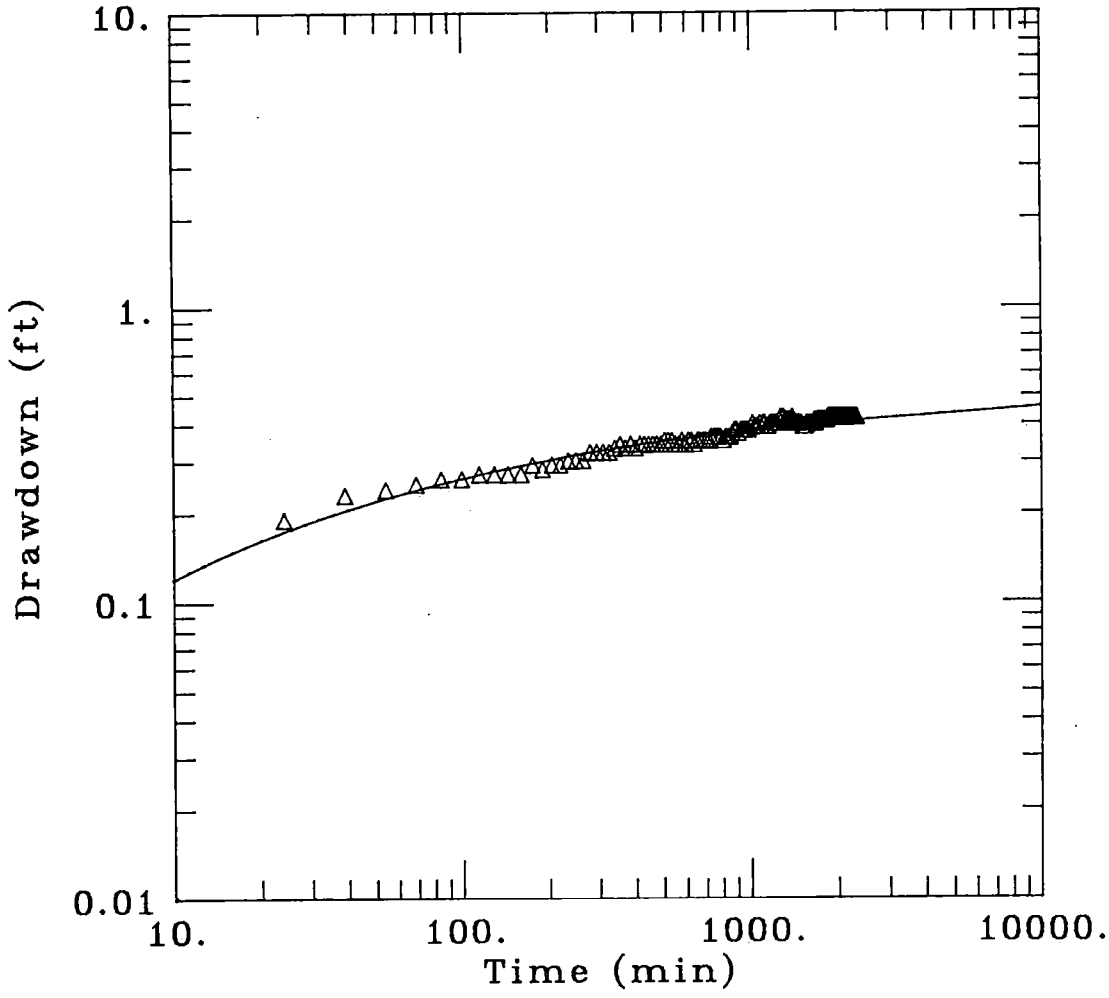
OBS. WELL:
P-2S

ESTIMATED PARAMETERS:
T = 0.1256 ft^2/min
S = 0.02339
Sy = 0.0155
β = 0.03

TEST DATA:
Q = 1.069 ft^3/min
r = 92. ft
b = 11.5 ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-31: 30-Day Constant Rate Test : Drawdown in P-2D (Days 1 - 10)



DATA SET:
p2d30d.cs1
04/08/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

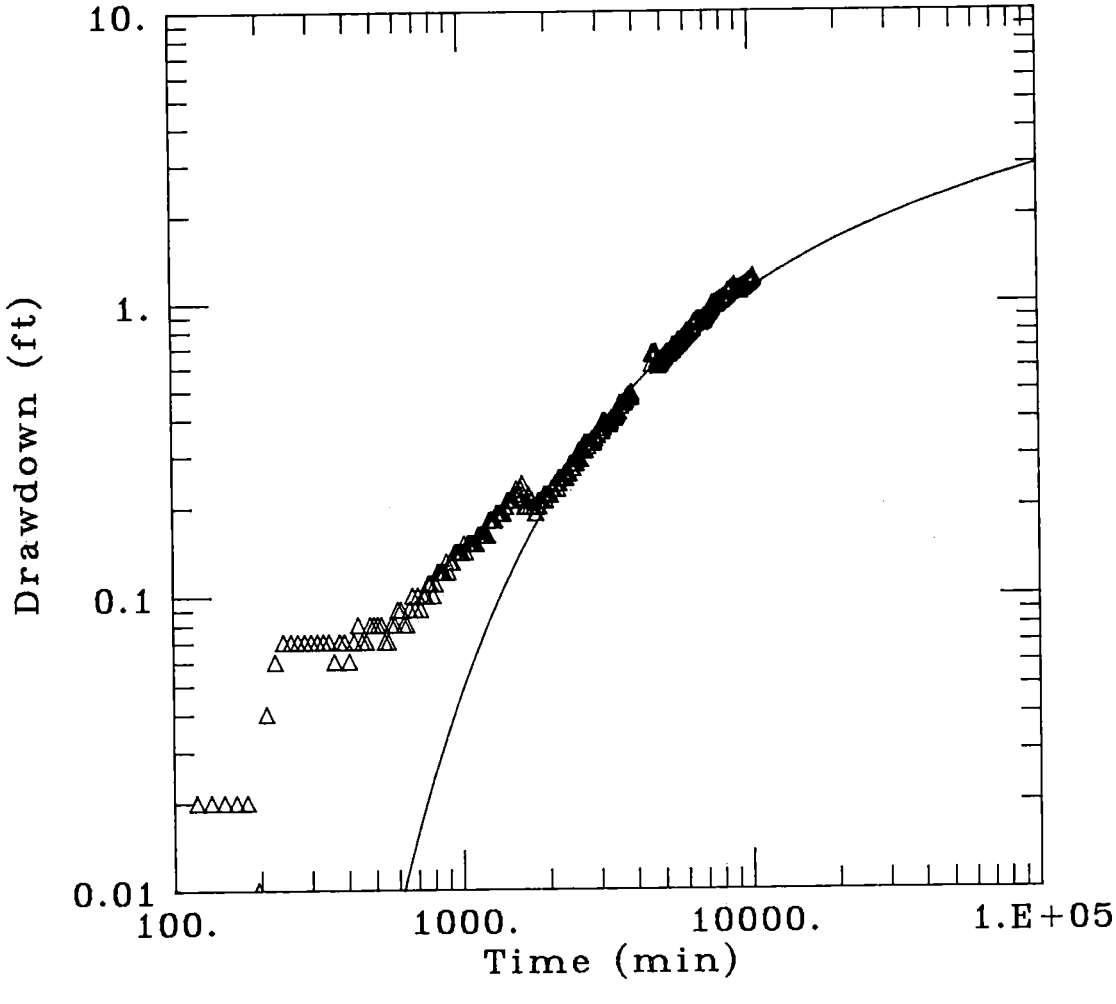
OBS. WELL:
P-2D

ESTIMATED PARAMETERS:
T = 1.184 ft^2/min
S = 0.0009906
Sy = 0.01276
β = 0.001

TEST DATA:
Q = 1.069 ft^3/min
r = 73. ft
b = 14. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-32: 30-Day Constant Rate Test : Drawdown in P-2D (Days 11 - 30)



DATA SET:
p2d30d.cs2
04/08/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

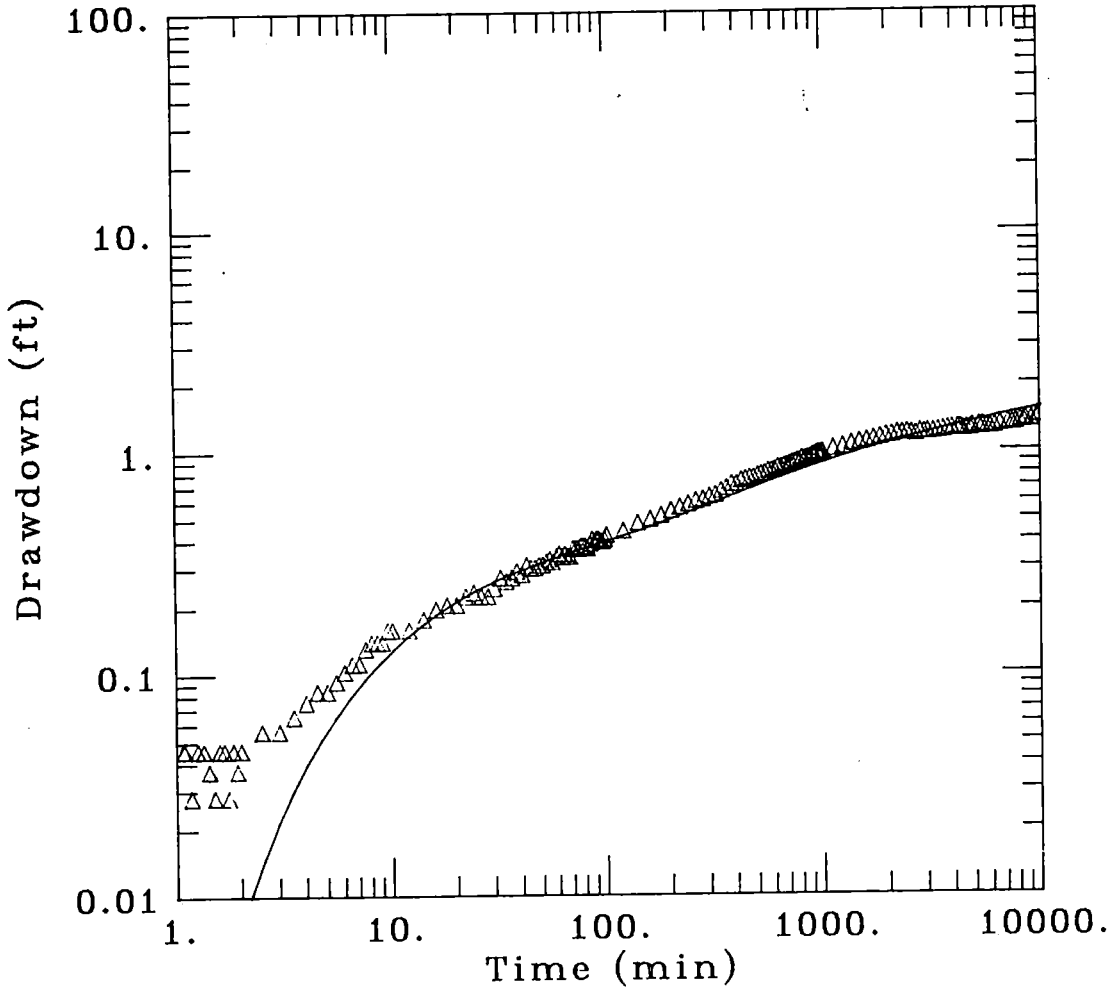
OBS. WELL:
P-2D

ESTIMATED PARAMETERS:
T = 0.1388 ft^2/min
S = 0.2021
Sy = 0.1188
β = 0.001

TEST DATA:
Q = 1.604 ft^3/min
r = 73. ft
b = 14. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-33: 30-Day Constant Rate Test : Drawdown in MW-13S (Days 1 - 10)



DATA SET:
mw13s30d.cs1
04/08/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

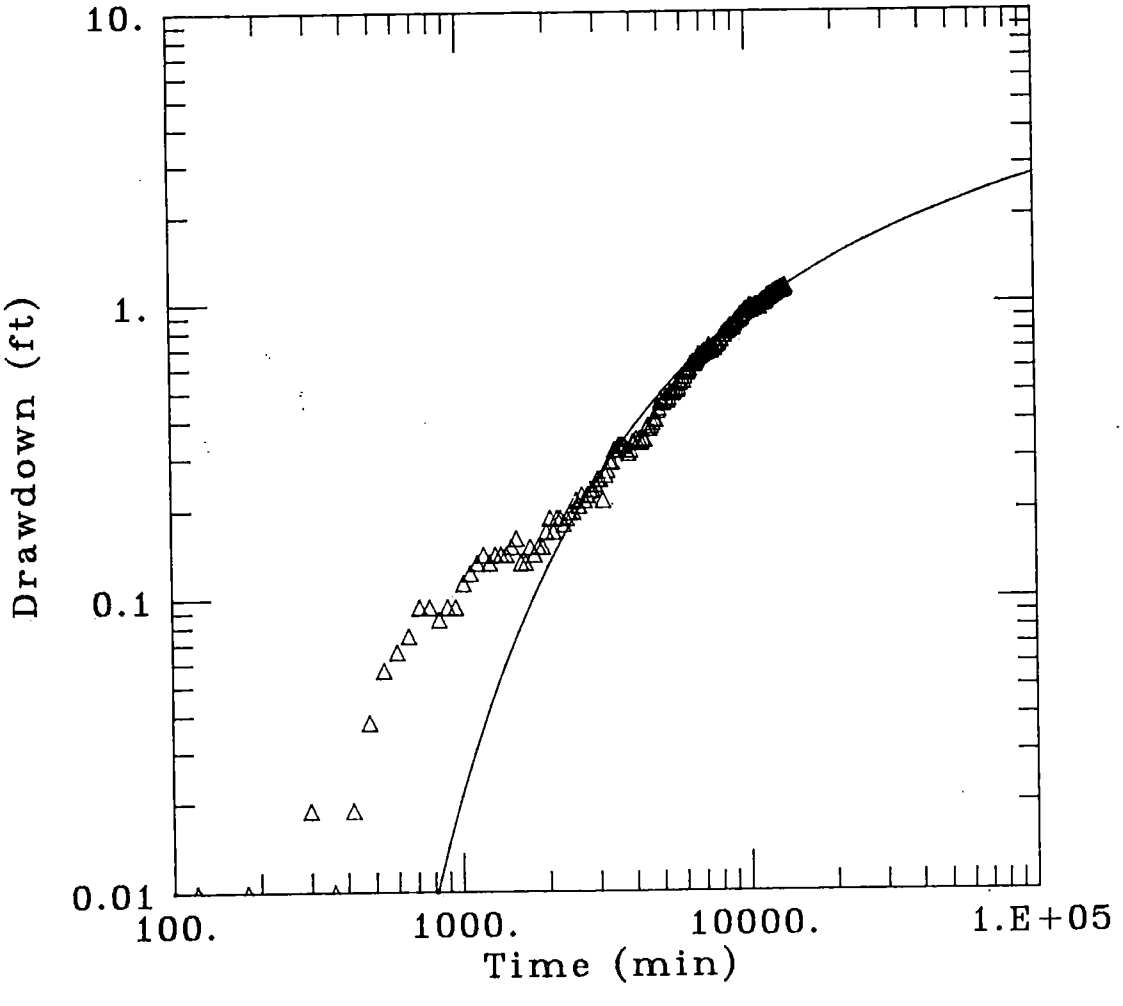
OBS. WELL:
MW-13S

ESTIMATED PARAMETERS:
T = 1.43 ft^2/min
S = 0.0106
Sy = 0.05376
β = 0.2

TEST DATA:
Q = 5.214 ft^3/min
r = 50. ft
b = 14. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-34: 30-Day Constant Rate Test : Drawdown in MW-13S (Days 11 - 30)



DATA SET:
mw13s30d.cs2
04/08/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

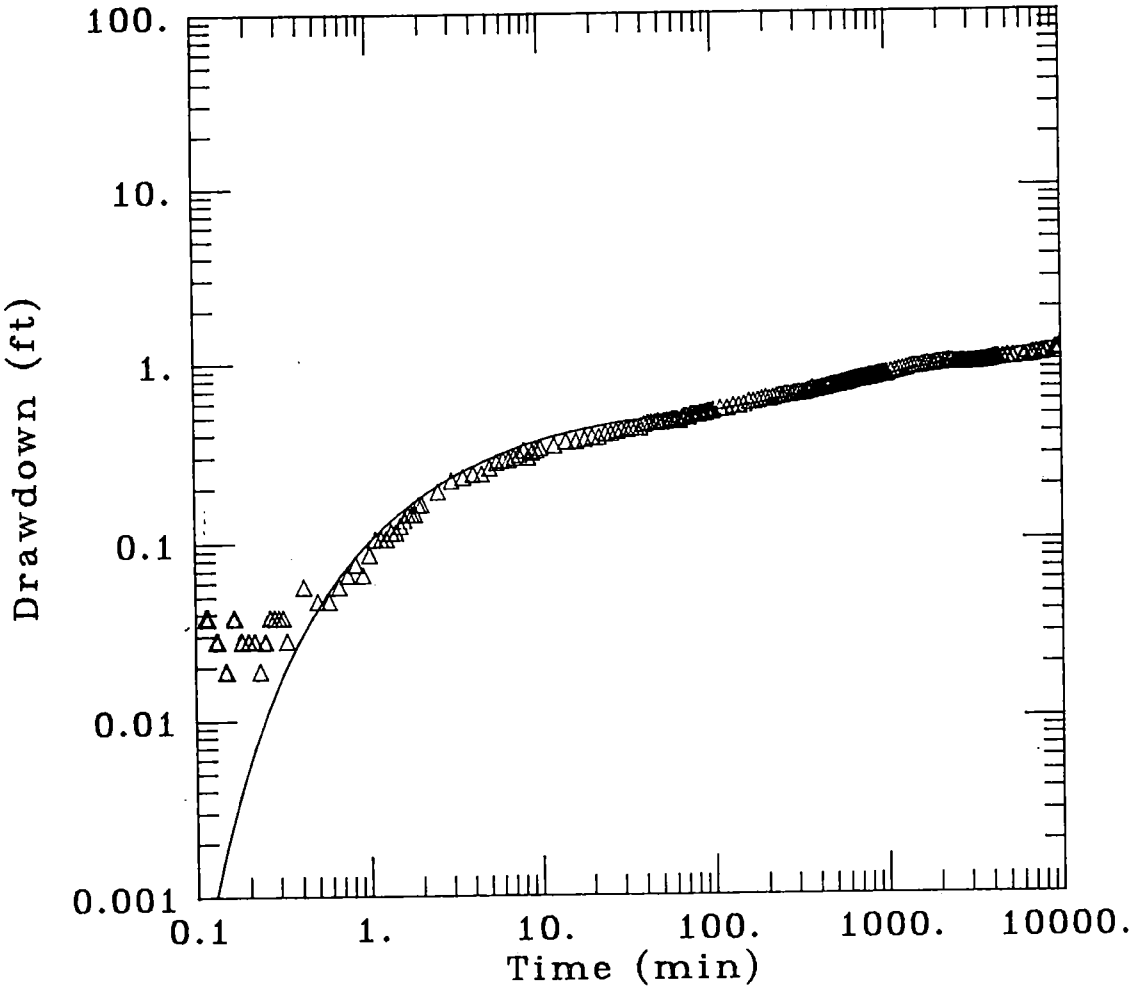
OBS. WELL:
MW-13S

ESTIMATED PARAMETERS:
T = 0.4387 ft^2/min
S = 1.787
Sy = 1.048
β = 0.001

TEST DATA:
Q = 5.08 ft^3/min
r = 50. ft
b = 14. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-35: 30-Day Constant Rate Test : Drawdown in P-13D (Days 1 - 10)



DATA SET:
p13d30d.cs1
04/08/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

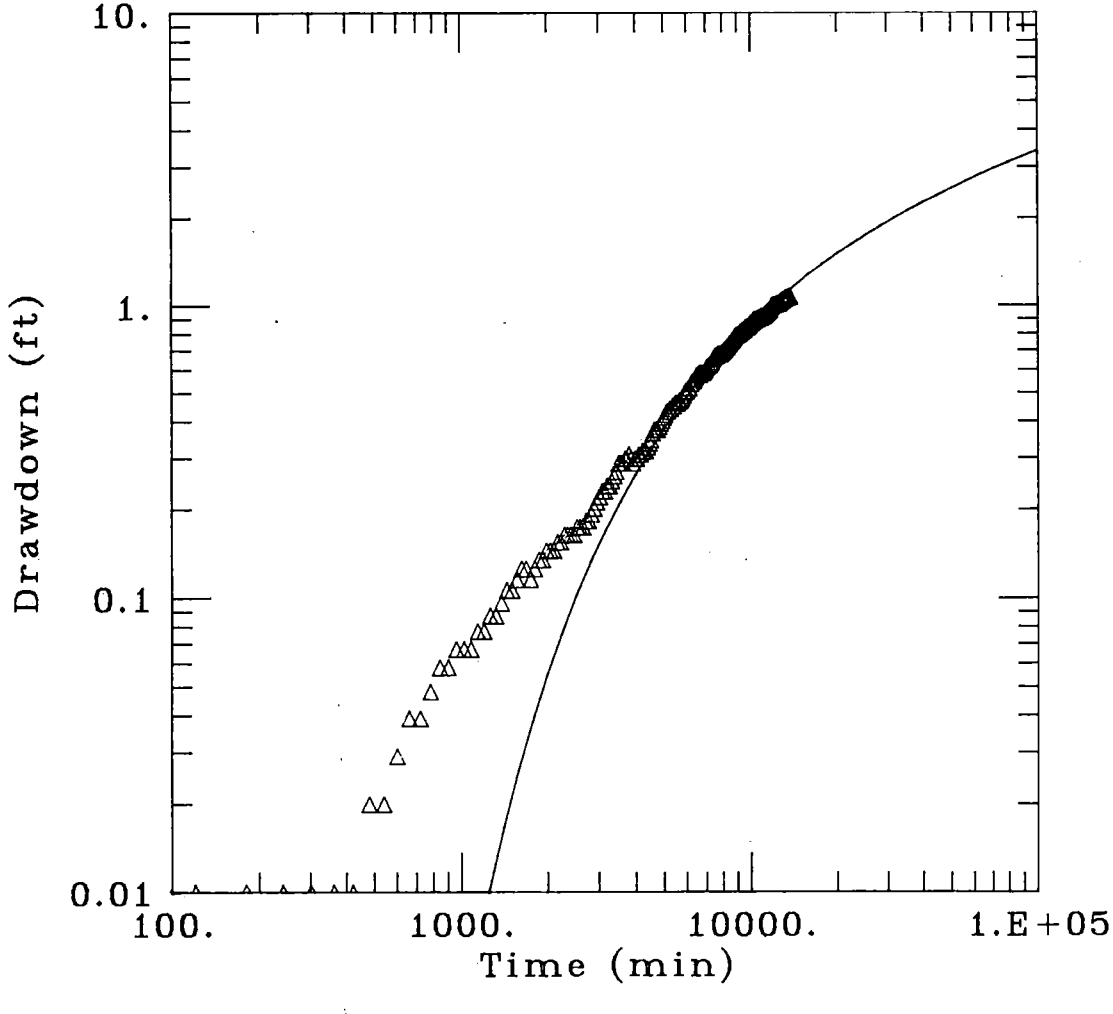
OBS. WELL:
P-13D

ESTIMATED PARAMETERS:
T = 2.186 ft^2/min
S = 0.001854
Sy = 0.02888
β = 0.03

TEST DATA:
Q = 5.214 ft^3/min
r = 47. ft
b = 7. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-36: 30-Day Constant Rate Test : Drawdown in P-13D (Days 11 - 30)



DATA SET:
p13d30d.cs2
04/08/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

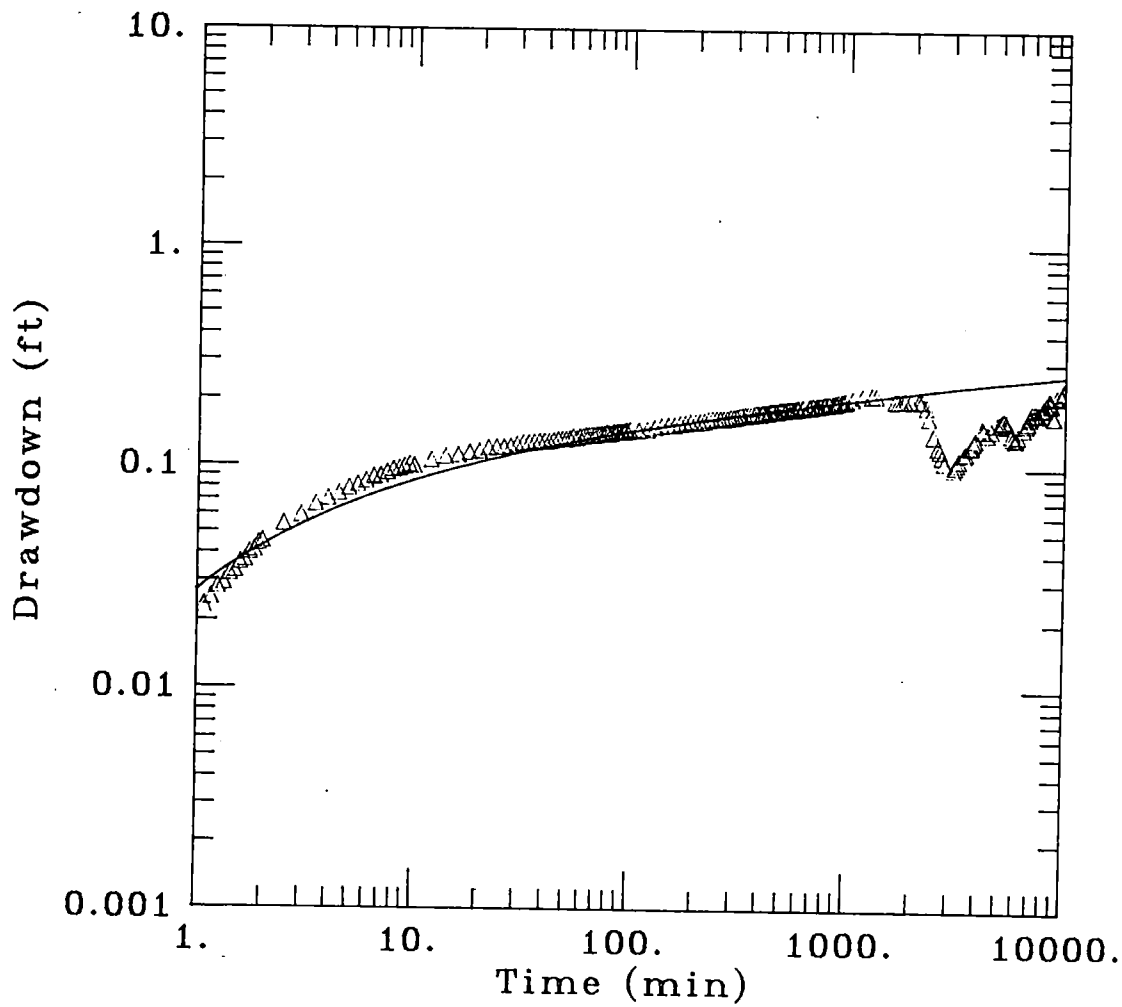
OBS. WELL:
P-13D

ESTIMATED PARAMETERS:
T = 0.2669 ft^2/min
S = 2.069
Sy = 1.086
β = 0.06

TEST DATA:
Q = 5.08 ft^3/min
r = 47. ft
b = 7. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-37: 30-Day Constant Rate Test : Drawdown in MW-29D(Days 1 - 10)



DATA SET:
mw29d30d.cs1
04/11/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

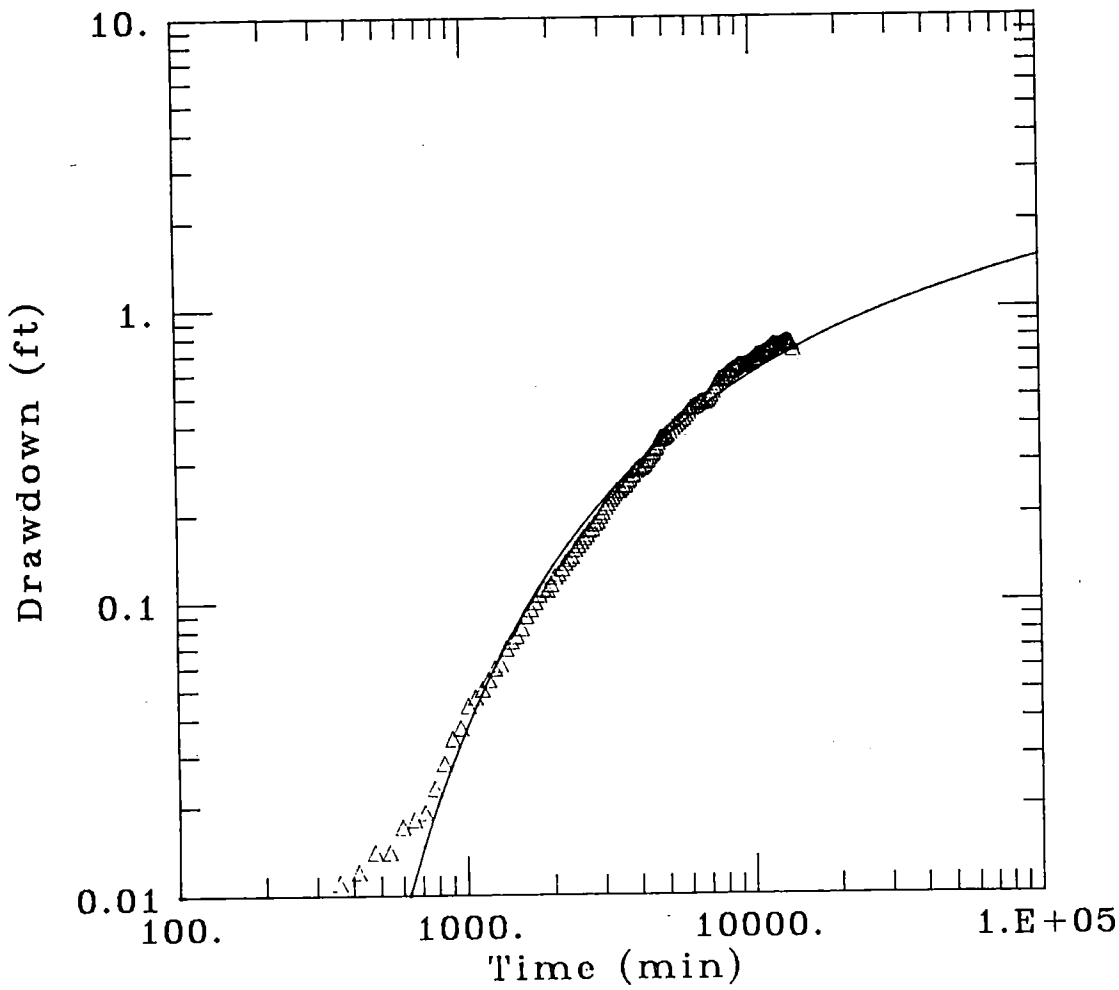
OBS. WELL:
MW-29D

ESTIMATED PARAMETERS:
T = 13.83 ft^2/min
S = 0.00482
Sy = 0.007595
β = 0.001

TEST DATA:
Q = 5.214 ft^3/min
r = 58. ft
b = 37. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-38: 30-Day Constant Rate Test : Drawdown in MW-29D (Days 11 - 30)



DATA SET:
mw29d30d.cs2
04/11/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

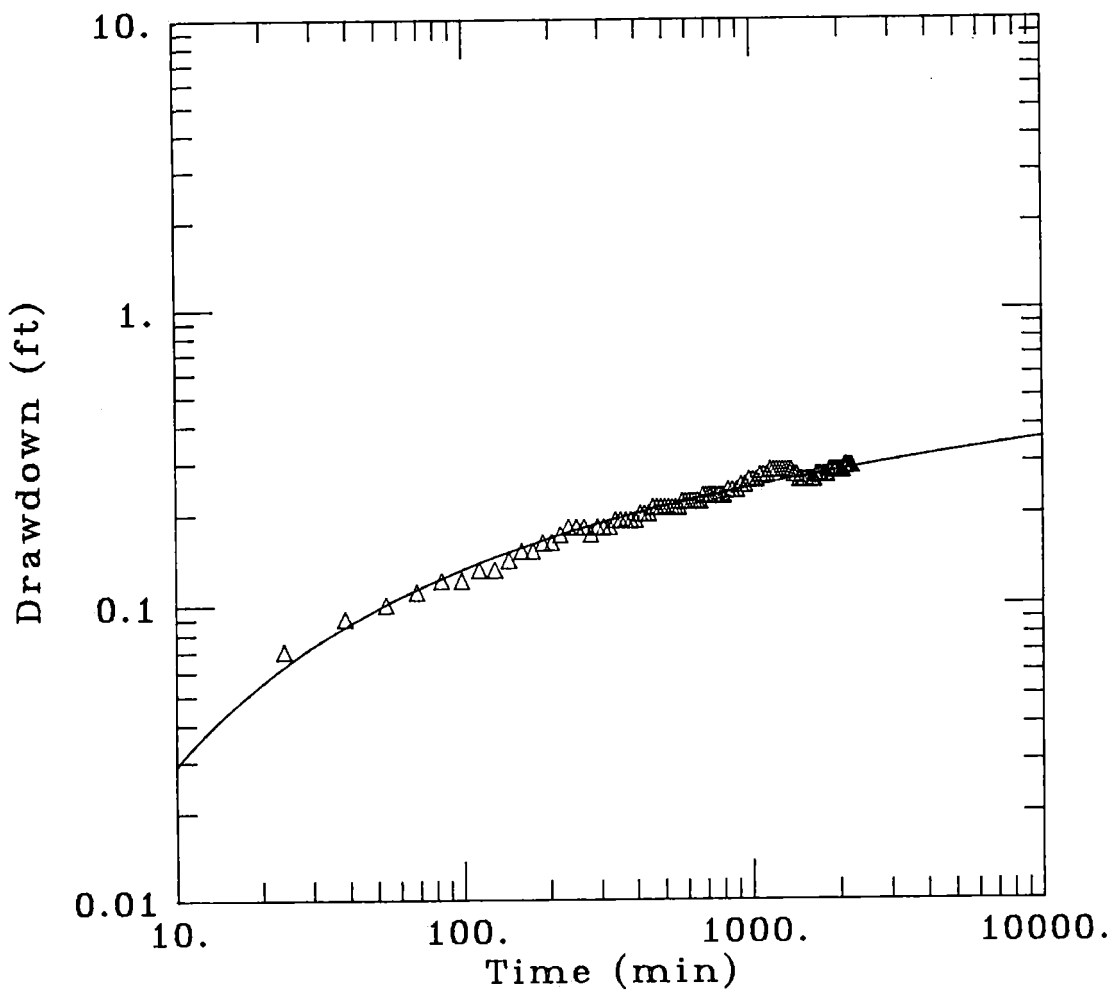
OBS. WELL:
MW-29D

ESTIMATED PARAMETERS:
T = 0.9221 ft^2/min
S = 1.762
Sy = 1.064
β = 0.001

TEST DATA:
Q = 5.08 ft^3/min
r = 58. ft
b = 37. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-39: 30-Day Constant Rate Test : Drawdown in MW-30S (Days 1 - 10)



DATA SET:
mw30s30d.cs1
04/11/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

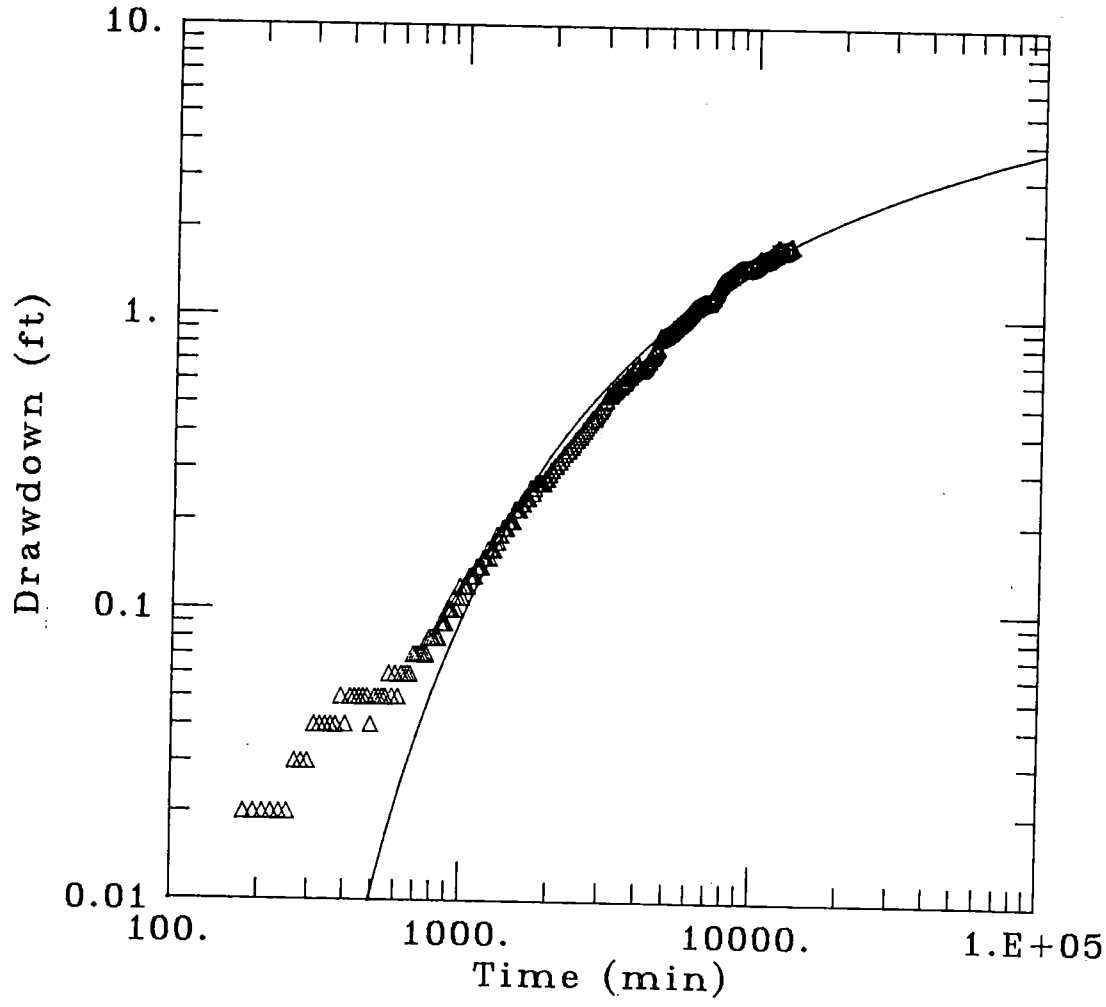
OBS. WELL:
MW-30S

ESTIMATED PARAMETERS:
T = 7.302 ft^2/min
S = 0.05306
Sy = 0.05276
β = 0.001

TEST DATA:
Q = 5.214 ft^3/min
r = 54. ft
b = 20. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-40: 30-Day Constant Rate Test : Drawdown in MW-30S (Days 11-30)



DATA SET:
mw30s30d.cs2
04/11/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

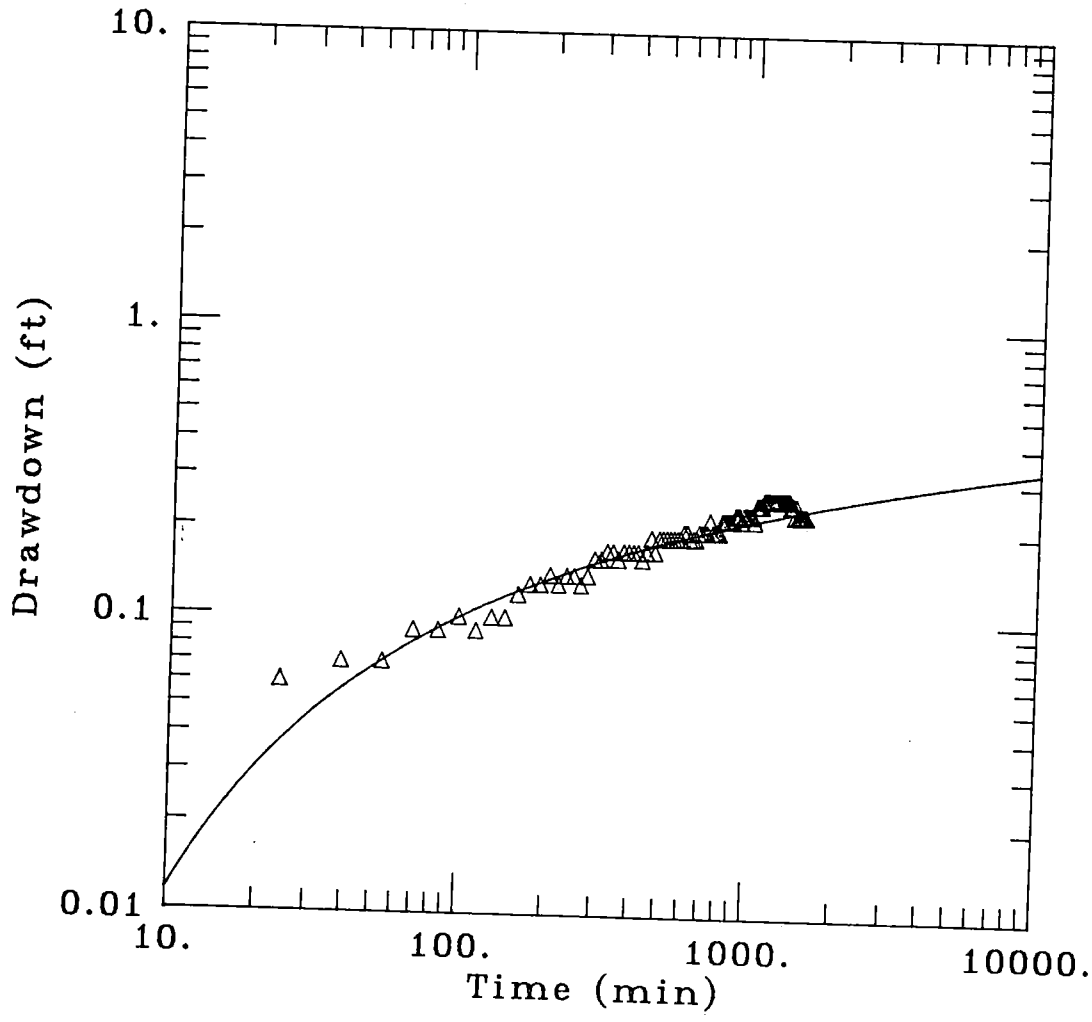
OBS. WELL:
MW-30S

ESTIMATED PARAMETERS:
T = 0.3633 ft^2/min
S = 0.8037
Sy = 0.4087
β = 0.001

TEST DATA:
Q = 5.08 ft^3/min
r = 54. ft
b = 20. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-41: 30-Day Constant Rate Test : Drawdown in MW-30D (Days 1 - 10)



DATA SET:
mw30d30d.cs1
04/09/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

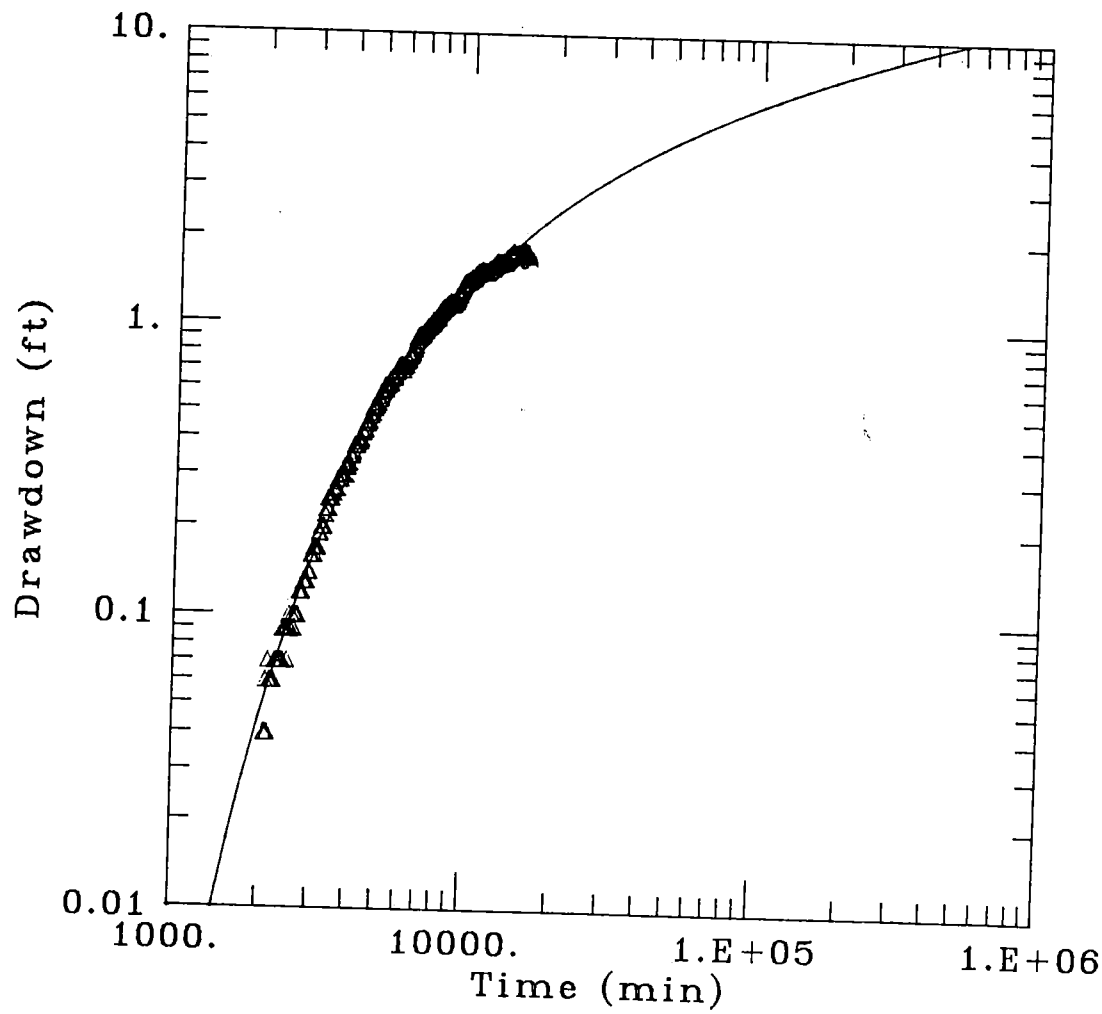
OBS. WELL:
MW-30D

ESTIMATED PARAMETERS:
T = 7.199 ft^2/min
S = 0.09505
Sy = 0.08386
β = 0.001

TEST DATA:
Q = 5.214 ft^3/min
r = 56. ft
b = 19. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-42: 30-Day Constant Rate Test : Drawdown in MW-30D (Days 11 - 30)



DATA SET:
mw30d30d.cs2
04/09/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

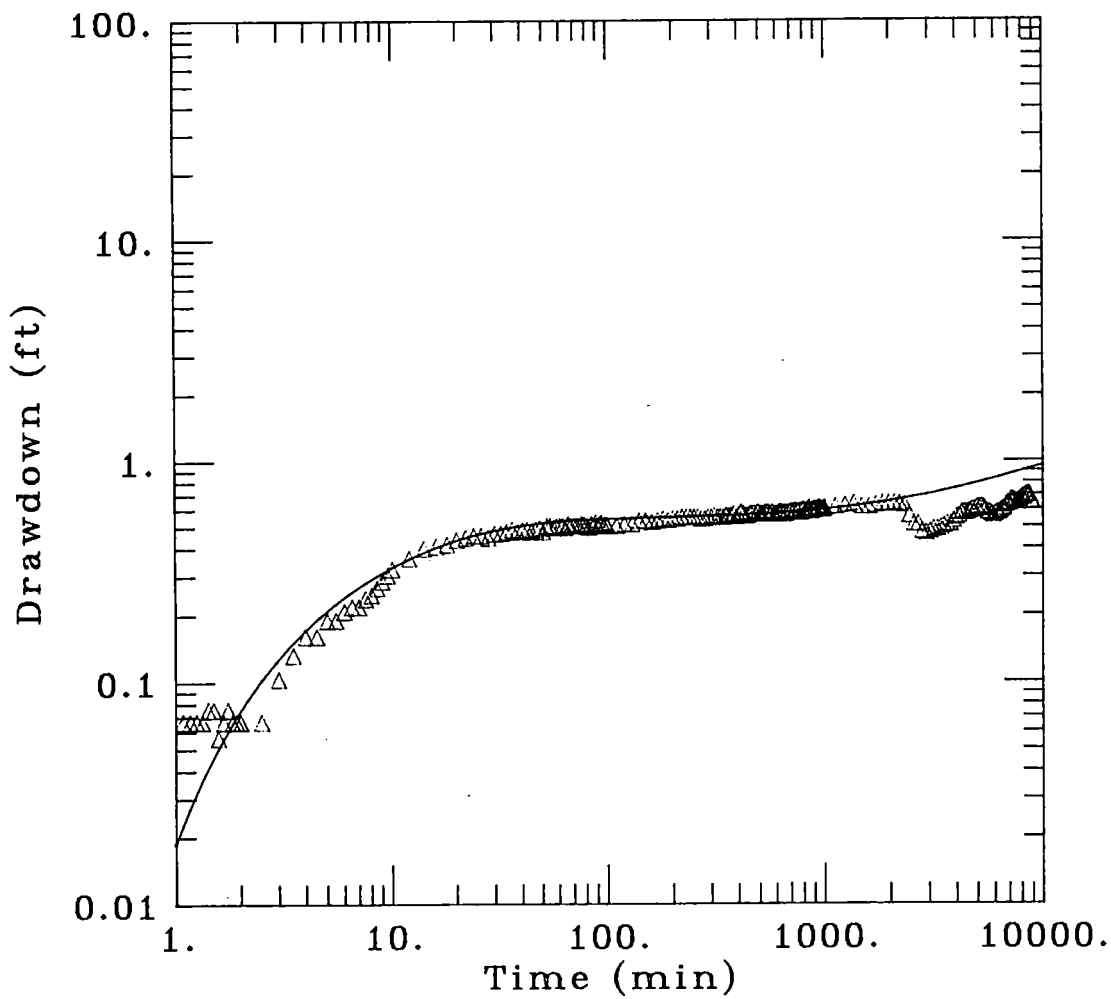
OBS. WELL:
MW-30D

ESTIMATED PARAMETERS:
T = 0.1387 ft^2/min
S = 0.9957
Sy = 0.7467
β = 0.03

TEST DATA:
Q = 5.08 ft^3/min
r = 56. ft
b = 19. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-43: 30-Day Constant Rate Test : Drawdown in MW-31D (Days 1 - 10)



DATA SET:
mw31d30d.cs1
04/09/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

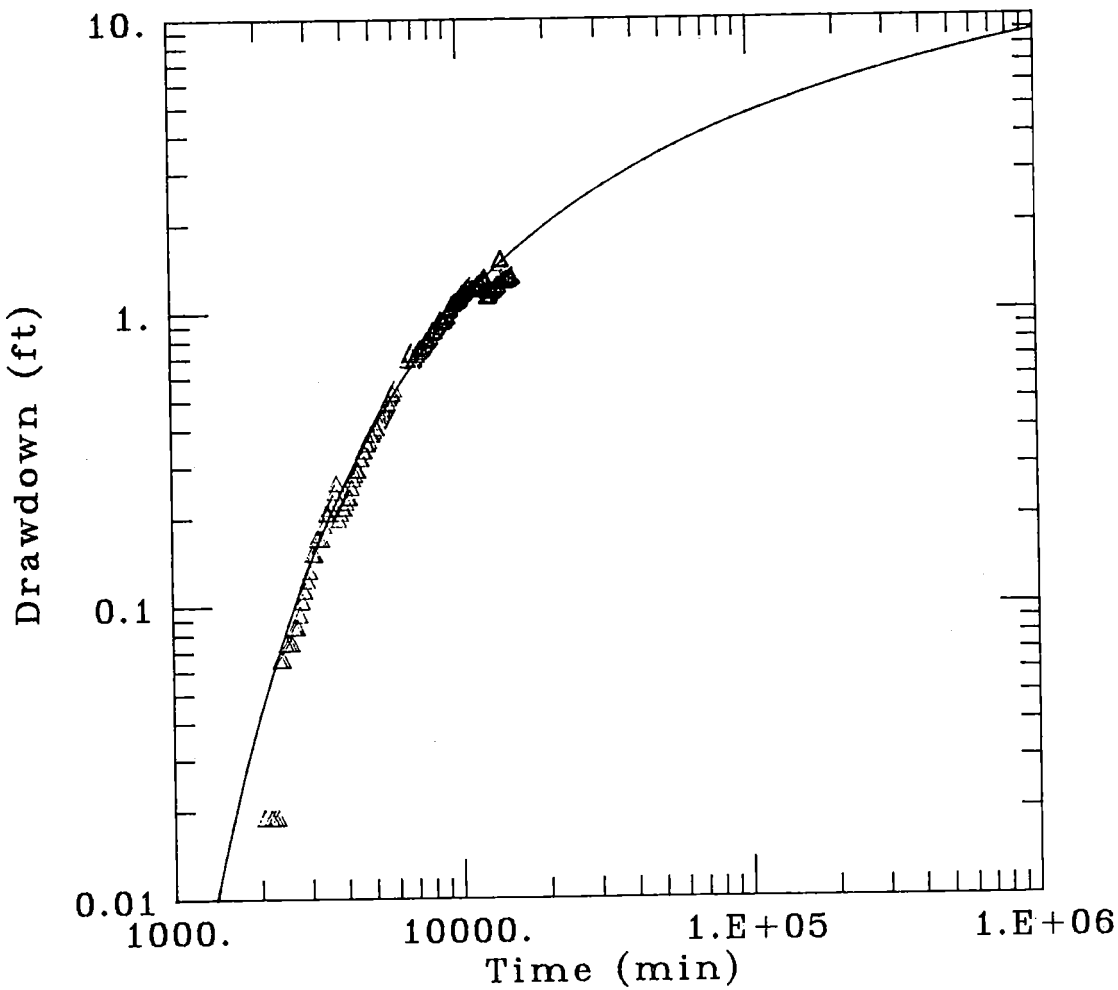
OBS. WELL:
MW-31D

ESTIMATED PARAMETERS:
T = 0.2449 ft^2/min
S = 0.000784
Sy = 0.1819
β = 0.1

TEST DATA:
Q = 1.069 ft^3/min
r = 48. ft
b = 12. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-44: 30-Day Constant Rate Test : Drawdown in MW-31D (Days 11 - 30)



DATA SET:
mw31d30d.cs2
04/09/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

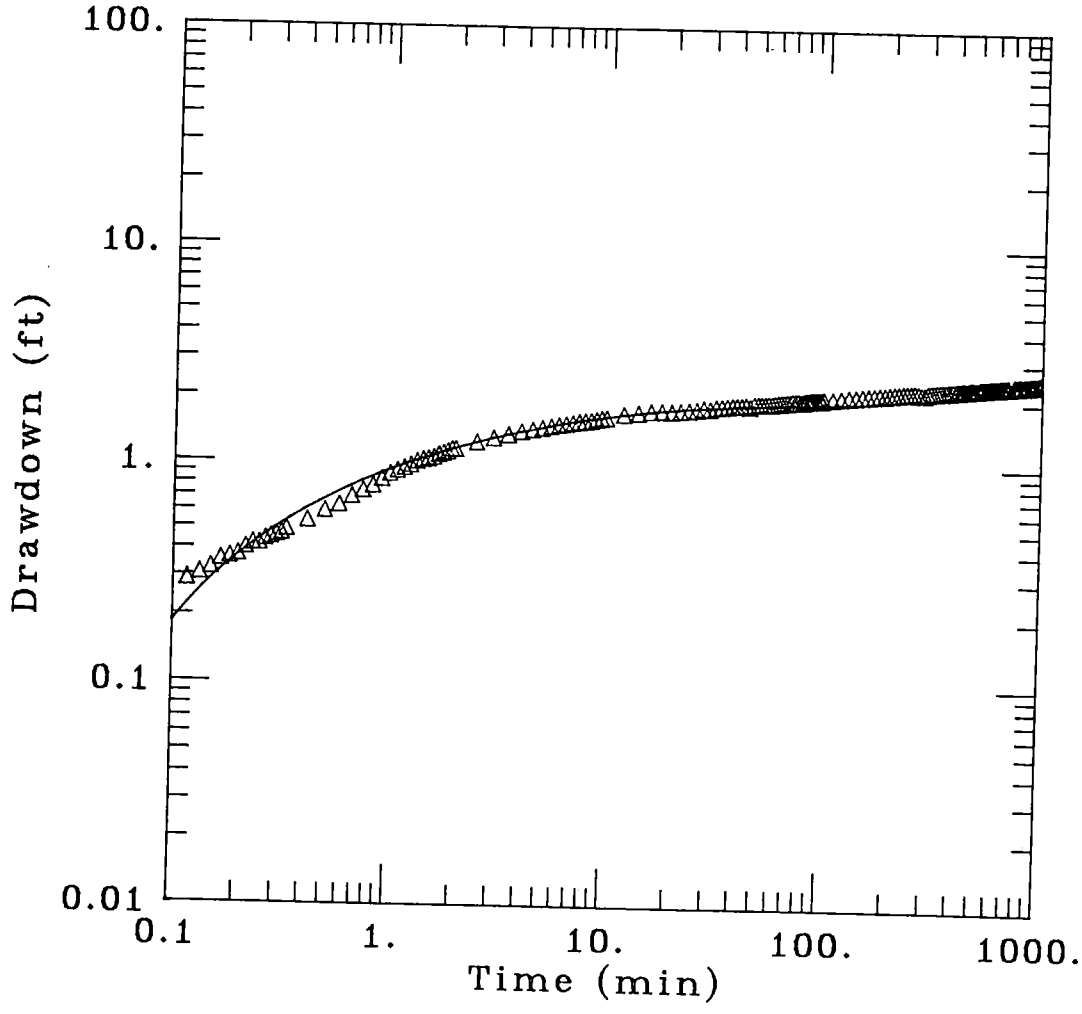
OBS. WELL:
MW-31D

ESTIMATED PARAMETERS:
T = 0.06338 ft^2/min
S = 0.5761
Sy = 0.4345
β = 0.001

TEST DATA:
Q = 1.604 ft^3/min
r = 48. ft
b = 12. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-45: 30-Day Constant Rate Test : Drawdown in P-32S (Days 1 - 10)



DATA SET:
p32s30d.cs1
04/11/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

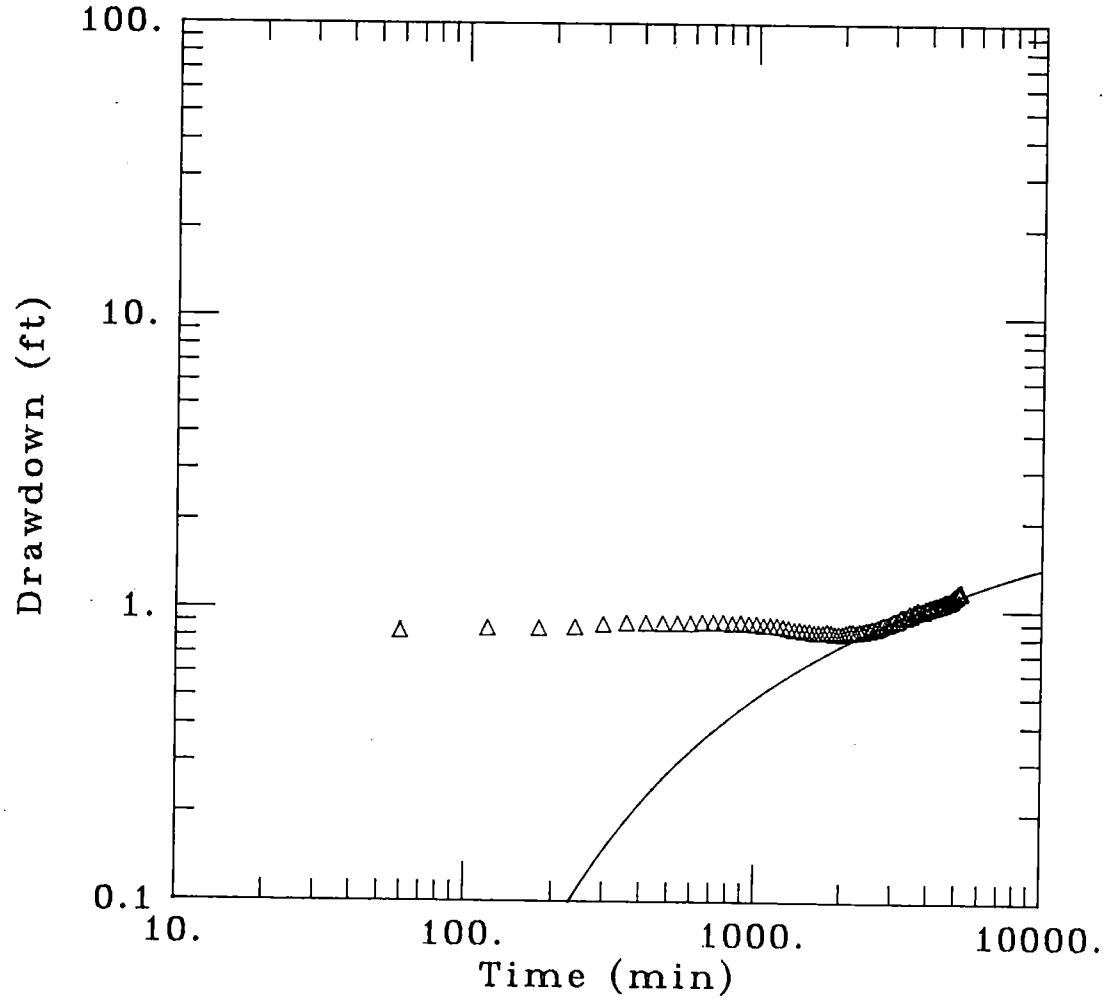
OBS. WELL:
P-32S

ESTIMATED PARAMETERS:
T = 0.9254 ft^2/min
S = 0.001028
Sy = 0.06
β = 0.0045

TEST DATA:
Q = 5.214 ft^3/min
r = 15. ft
b = 6. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-46: 30-Day Constant Rate Test : Drawdown in P-32S (Days 11 - 30)



DATA SET:
p32s30d.cs2
04/11/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

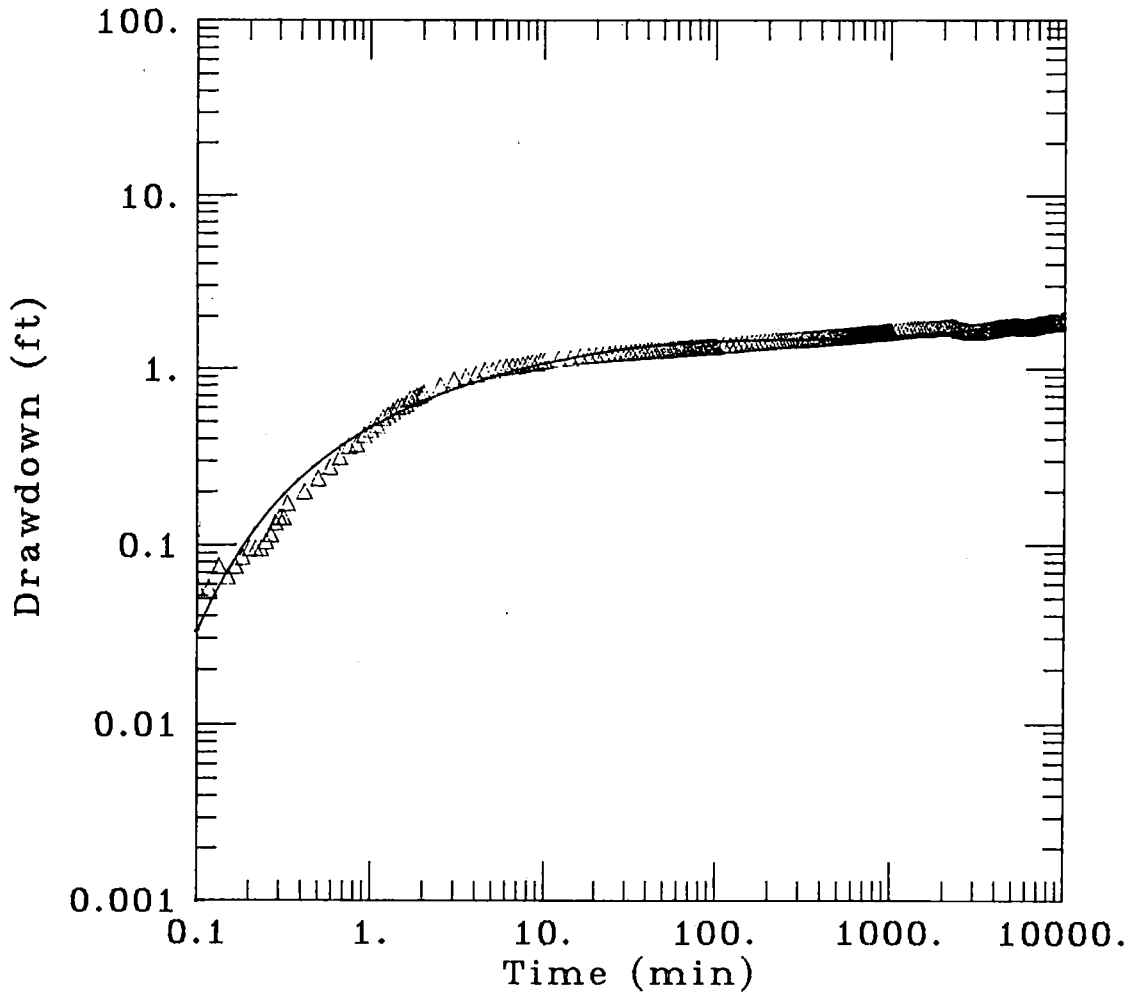
OBS. WELL:
P-32S

ESTIMATED PARAMETERS:
T = 0.893 ft^2/min
S = 3.62
Sy = 2.494
β = 0.001

TEST DATA:
Q = 5.08 ft^3/min
r = 15. ft
b = 6. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-47: 30-Day Constant Rate Test : Drawdown in P-32D (Days 1 - 10)



DATA SET:
p32d30d.cs1
04/09/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

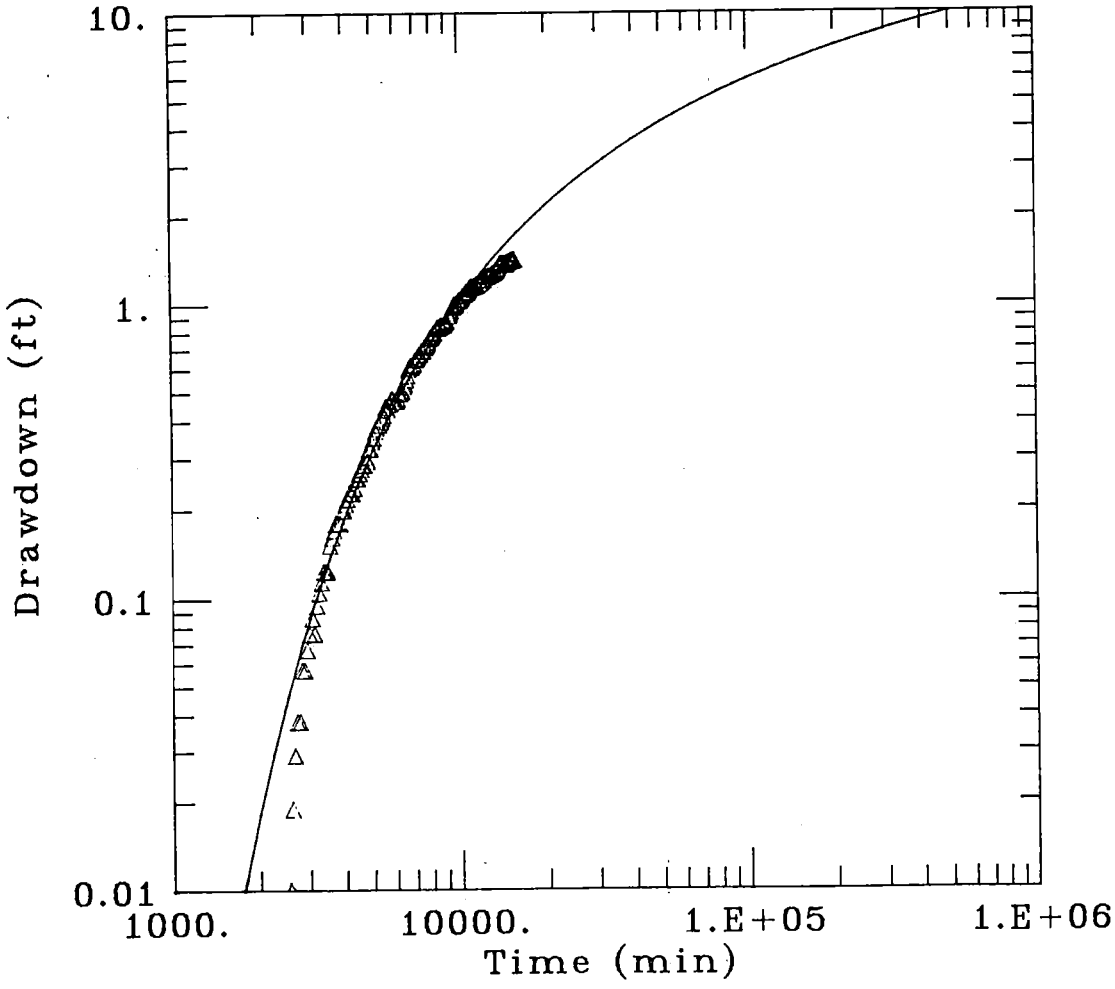
OBS. WELL:
P-32D

ESTIMATED PARAMETERS:
T = 1.234 ft^2/min
S = 0.00328
Sy = 0.4028
β = 0.004

TEST DATA:
Q = 5.214 ft^3/min
r = 15. ft
b = 30. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-48: 30-Day Constant Rate Test : Drawdown in P-32D (Days 11 - 30)



DATA SET:
p32d30d.cs2
04/09/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

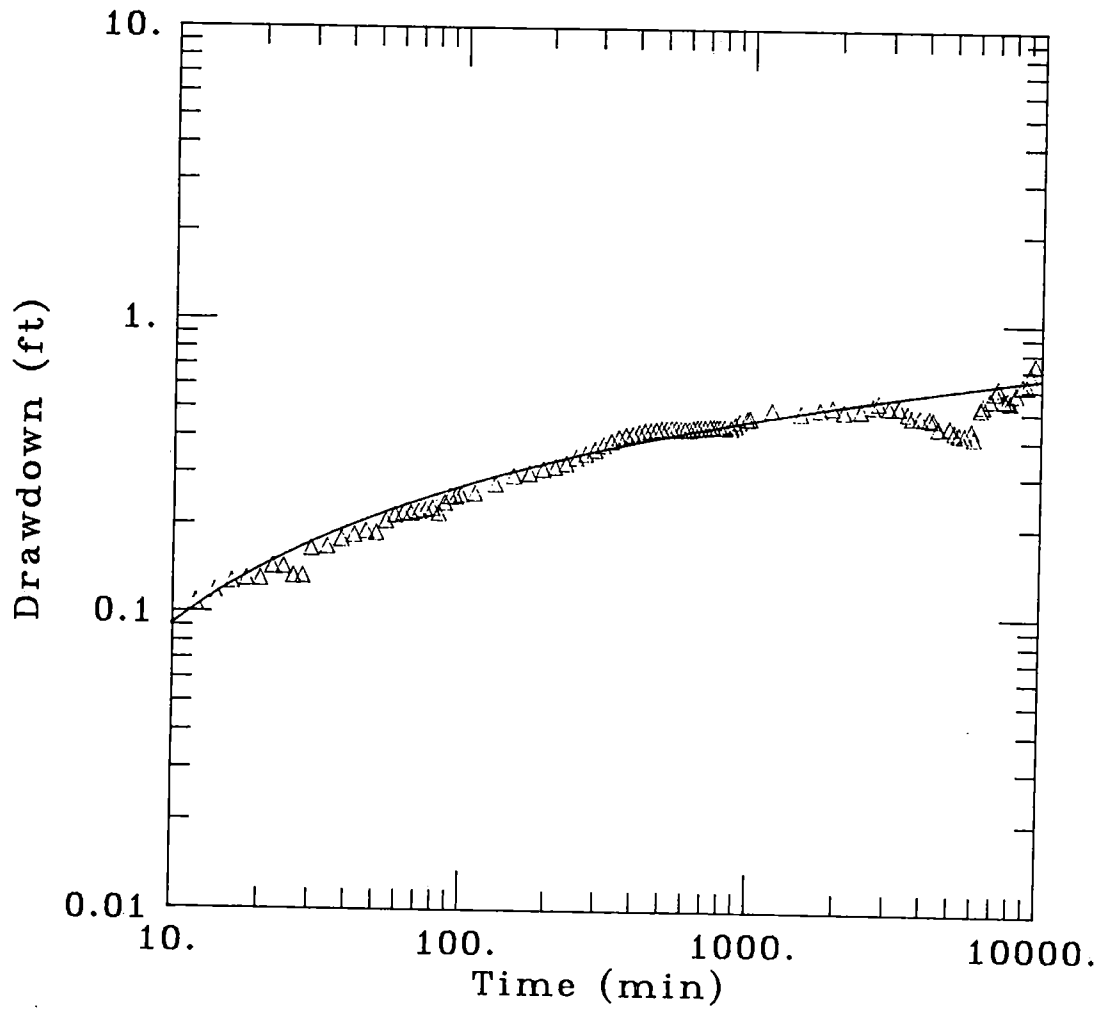
OBS. WELL:
P-32D

ESTIMATED PARAMETERS:
T = 0.1419 ft^2/min
S = 17.89
Sy = 14.55
β = 0.001

TEST DATA:
Q = 5.08 ft^3/min
r = 15. ft
b = 30. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87x4660	Location: Cranston, RI

Figure J-49: 30-Day Constant Rate Test : Drawdown in P-33S (Days 1 - 10)



DATA SET:
p33s30d.cs1
04/13/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

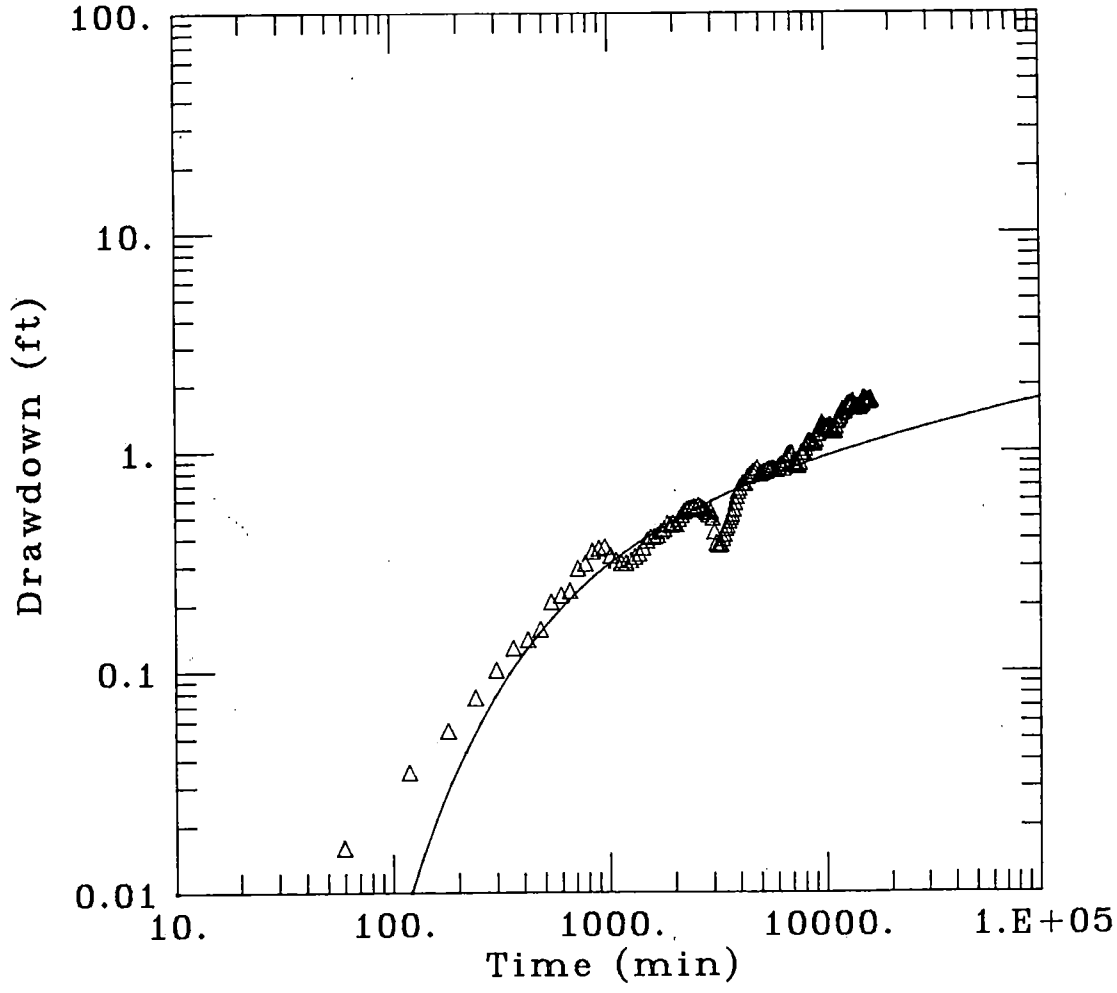
OBS. WELL:
P-33S

ESTIMATED PARAMETERS:
T = 0.9285 ft^2/min
S = 0.1503
Sy = 0.09596
β = 0.001

TEST DATA:
Q = 1.069 ft^3/min
r = 8. ft
b = 10. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87x4660	Location: Cranston, RI

Figure J-50: 30-Day Constant Rate Test : Drawdown in P-33S (Days 11 - 30)



DATA SET:
p33s30d.cs2
04/11/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

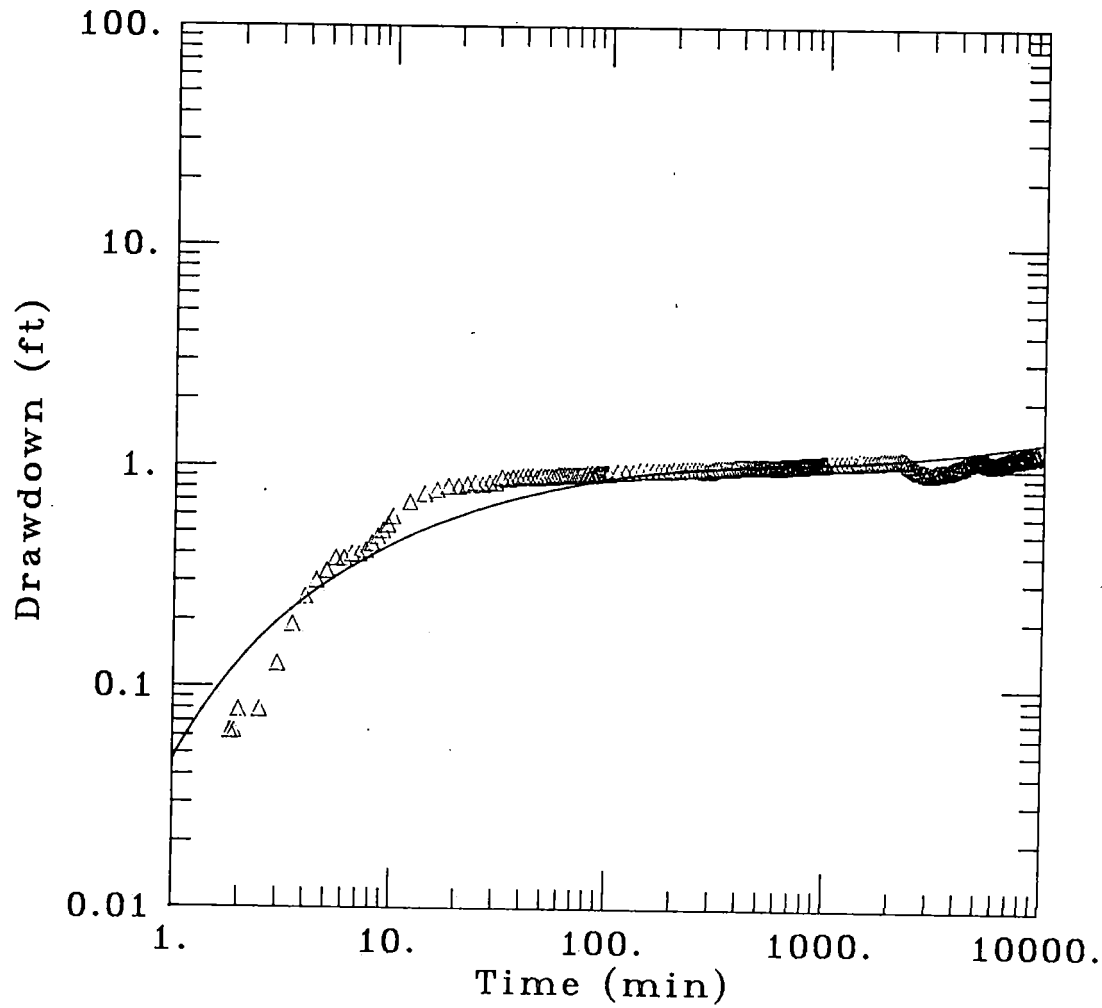
OBS. WELL:
P-33S

ESTIMATED PARAMETERS:
T = 0.341 ft^2/min
S = 6.181
Sy = 5.534
β = 0.03

TEST DATA:
Q = 1.604 ft^3/min
r = 8. ft
b = 10. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-51: 30-Day Constant Rate Test : Drawdown in P-33D (Days 1 - 10)



DATA SET:
p33d30d.cs1
04/09/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

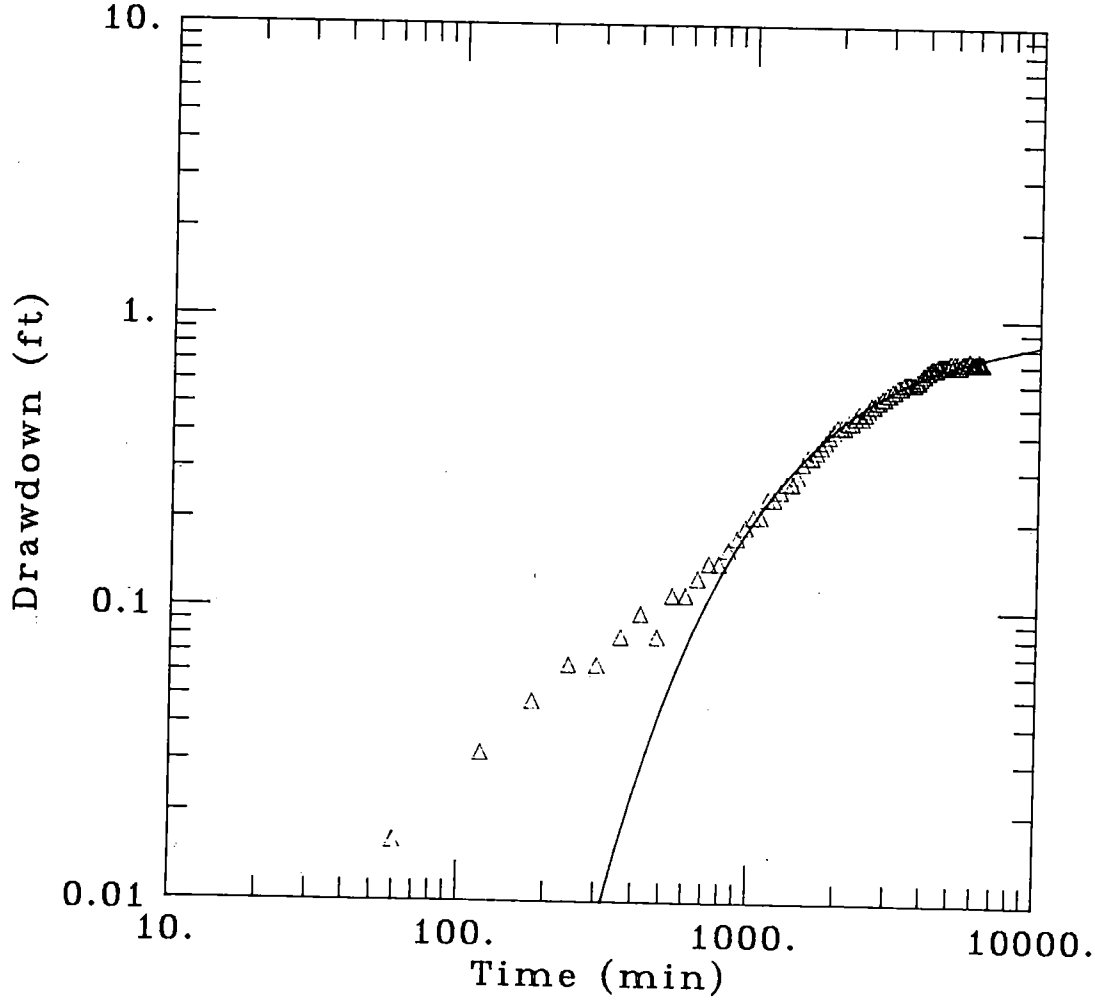
OBS. WELL:
P-33D

ESTIMATED PARAMETERS:
T = 0.2939 ft^2/min
S = 0.009426
Sy = 0.5415
β = 0.0098

TEST DATA:
Q = 1.069 ft^3/min
r = 12. ft
b = 37.1 ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-52: 30-Day Constant Rate Test : Drawdown in P-33D (Days 11 - 30)



DATA SET:
p33d30d.cs2
04/09/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

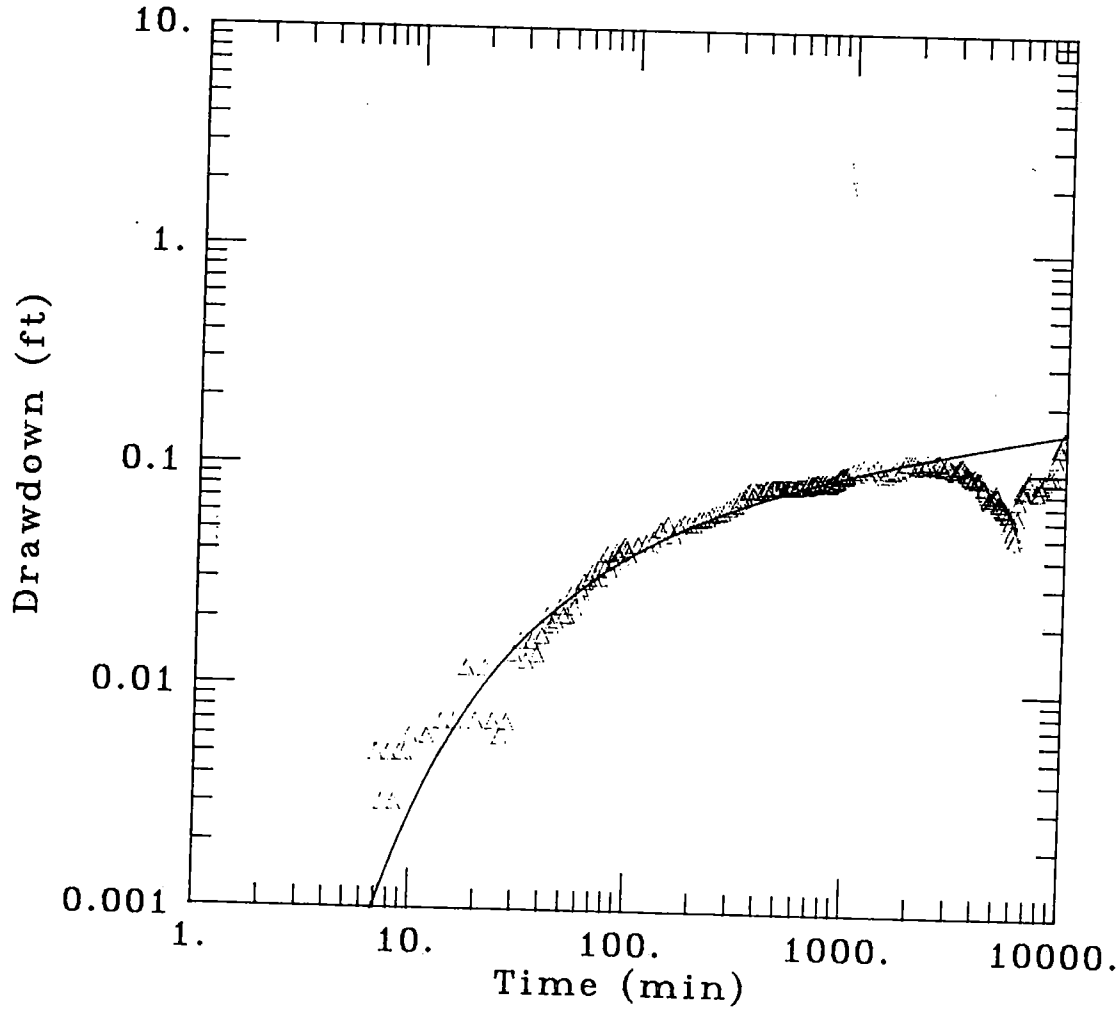
OBS. WELL:
P-33D

ESTIMATED PARAMETERS:
T = 0.05627 ft^2/min
S = 1.663
Sy = 29.4
β = 0.65

TEST DATA:
Q = 1.069 ft^3/min
r = 12. ft
b = 37.1 ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-53: 30-Day Constant Rate Test : Drawdown in P-34S (Days 1 - 10)



DATA SET:
p34s30d.cs1
04/08/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

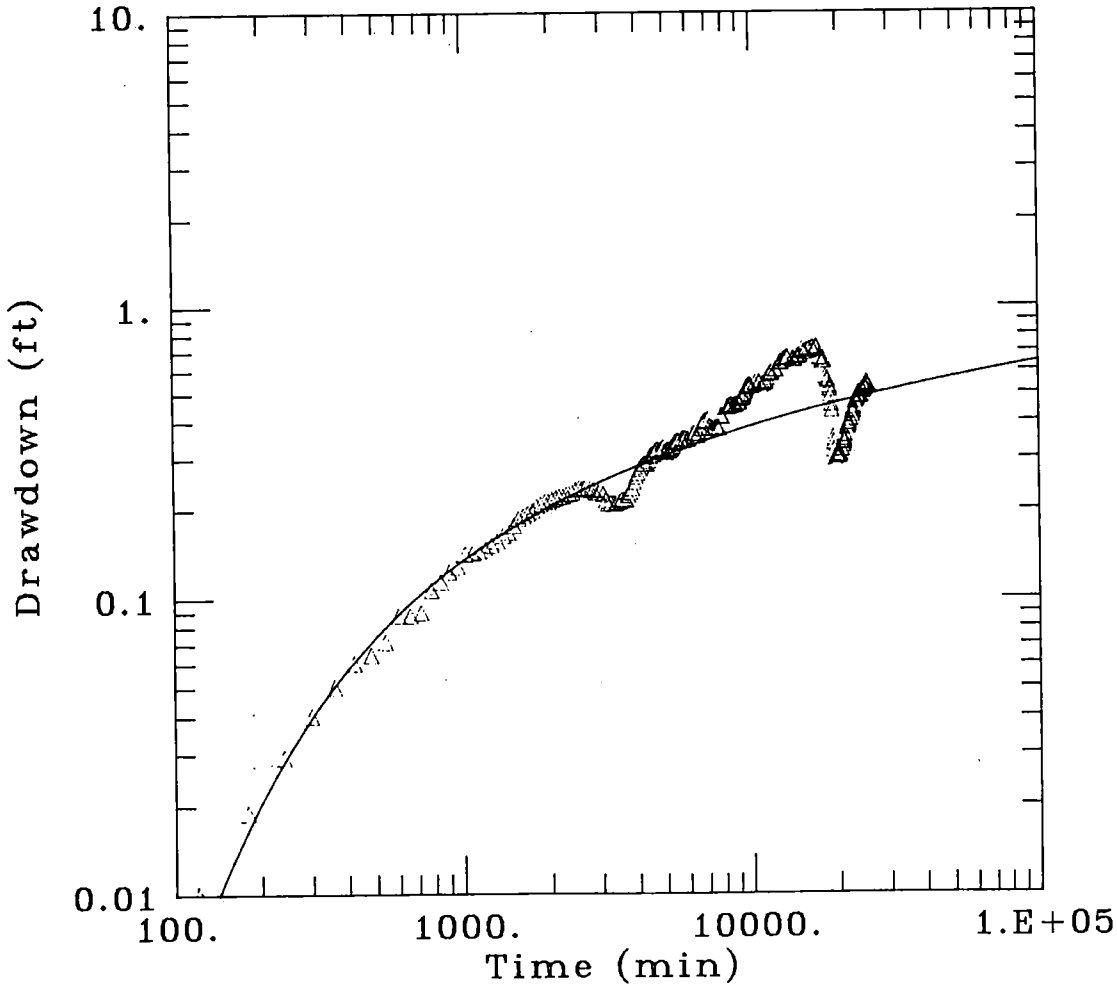
OBS. WELL:
P-34S

ESTIMATED PARAMETERS:
T = 3.017 ft^2/min
S = 0.8167
Sy = 0.4809
β = 0.004

TEST DATA:
Q = 1.069 ft^3/min
r = 15. ft
b = 7.5 ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-54: 30-Day Constant Rate Test : Drawdown in P-34S (Days 11 - 30)



DATA SET:
p34s30d.cs2
04/08/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

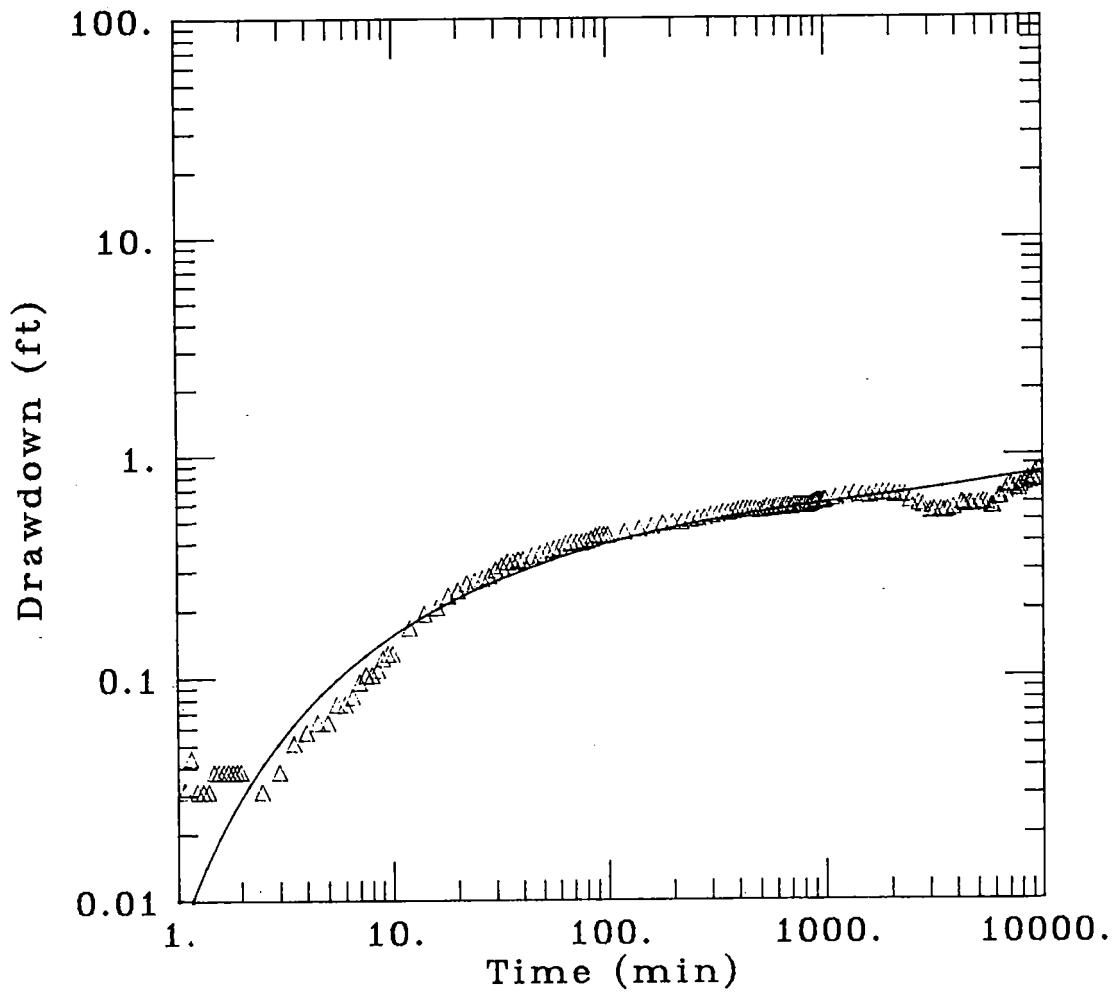
OBS. WELL:
P-34S

ESTIMATED PARAMETERS:
T = 1.014 ft^2/min
S = 4.201
Sy = 3.42
β = 0.001

TEST DATA:
Q = 1.604 ft^3/min
r = 15. ft
b = 7.5 ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-55: 30-Day Constant Rate Test : Drawdown in P-35S (Days 1 - 10)



DATA SET:
p35s30d.cs1
04/11/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

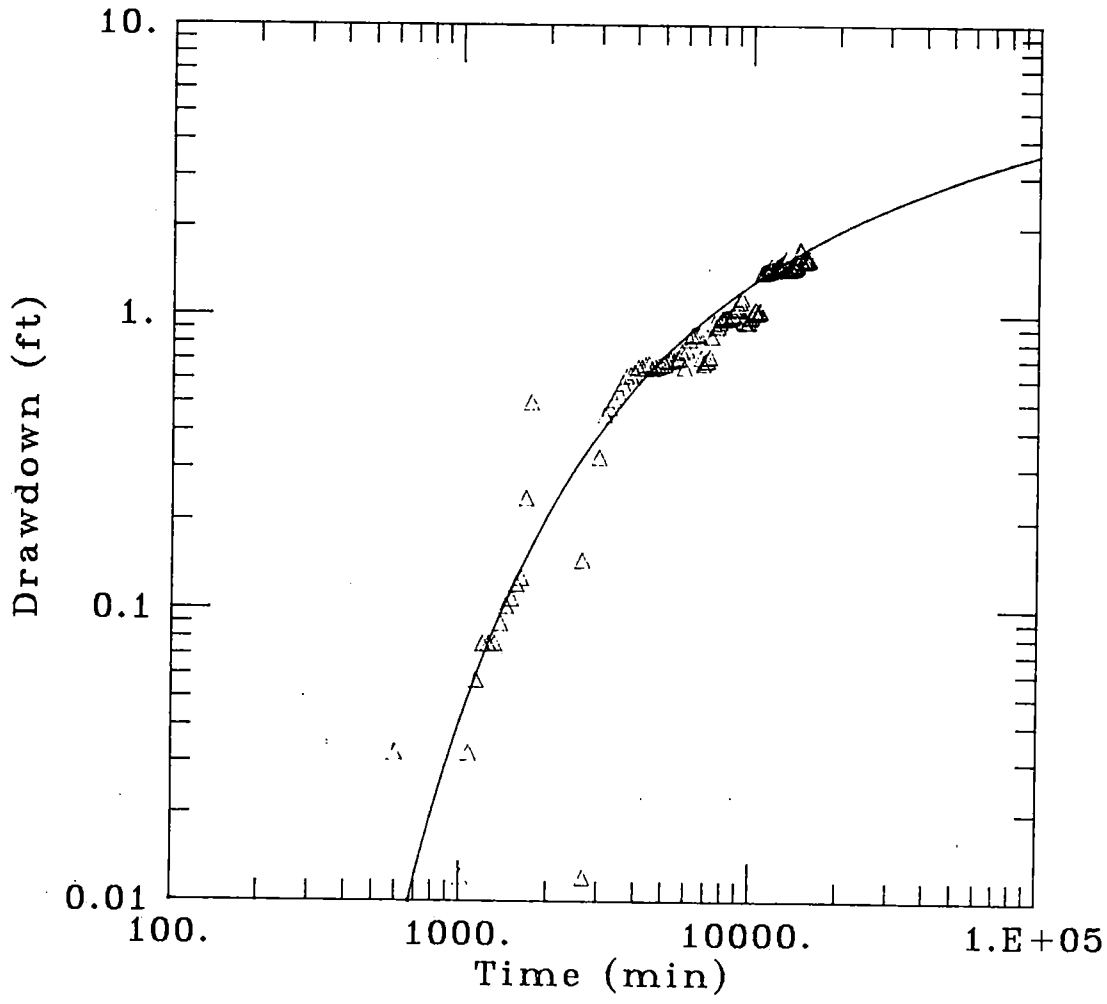
OBS. WELL:
P-35S

ESTIMATED PARAMETERS:
T = 0.6489 ft^2/min
S = 0.002486
Sy = 0.01088
β = 0.004

TEST DATA:
Q = 1.069 ft^3/min
r = 45. ft
b = 5. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-56: 30-Day Constant Rate Test : Drawdown in P-35S (Days 11 - 30)



DATA SET:
p35s30d.cs2
04/11/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

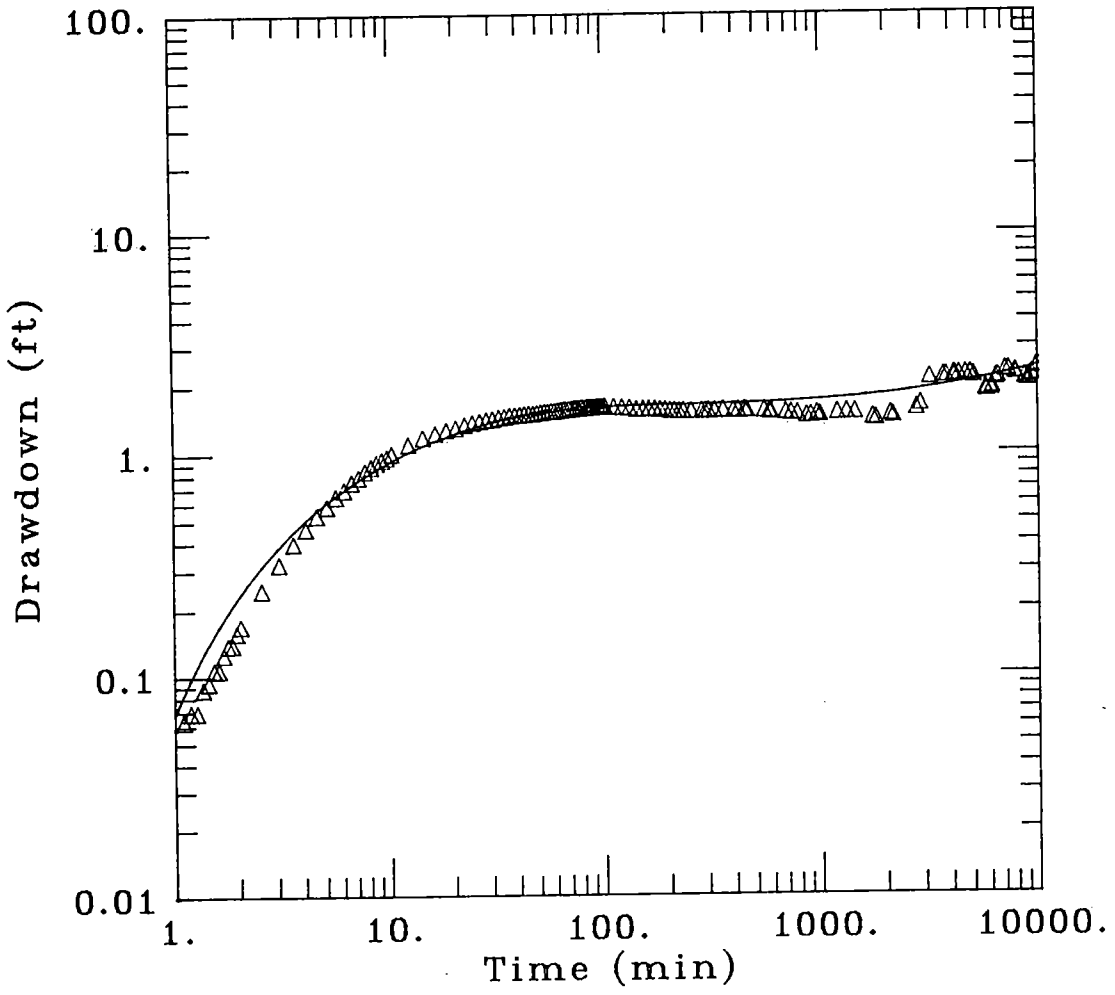
OBS. WELL:
P-35S

ESTIMATED PARAMETERS:
T = 0.1102 ft^2/min
S = 0.4835
Sy = 0.3482
β = 0.001

TEST DATA:
Q = 1.604 ft^3/min
r = 45. ft
b = 5. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-57: 30-Day Constant Rate Test : Drawdown in P-37S (Days 1 - 10)



DATA SET:
p37s30d.cs1
04/11/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

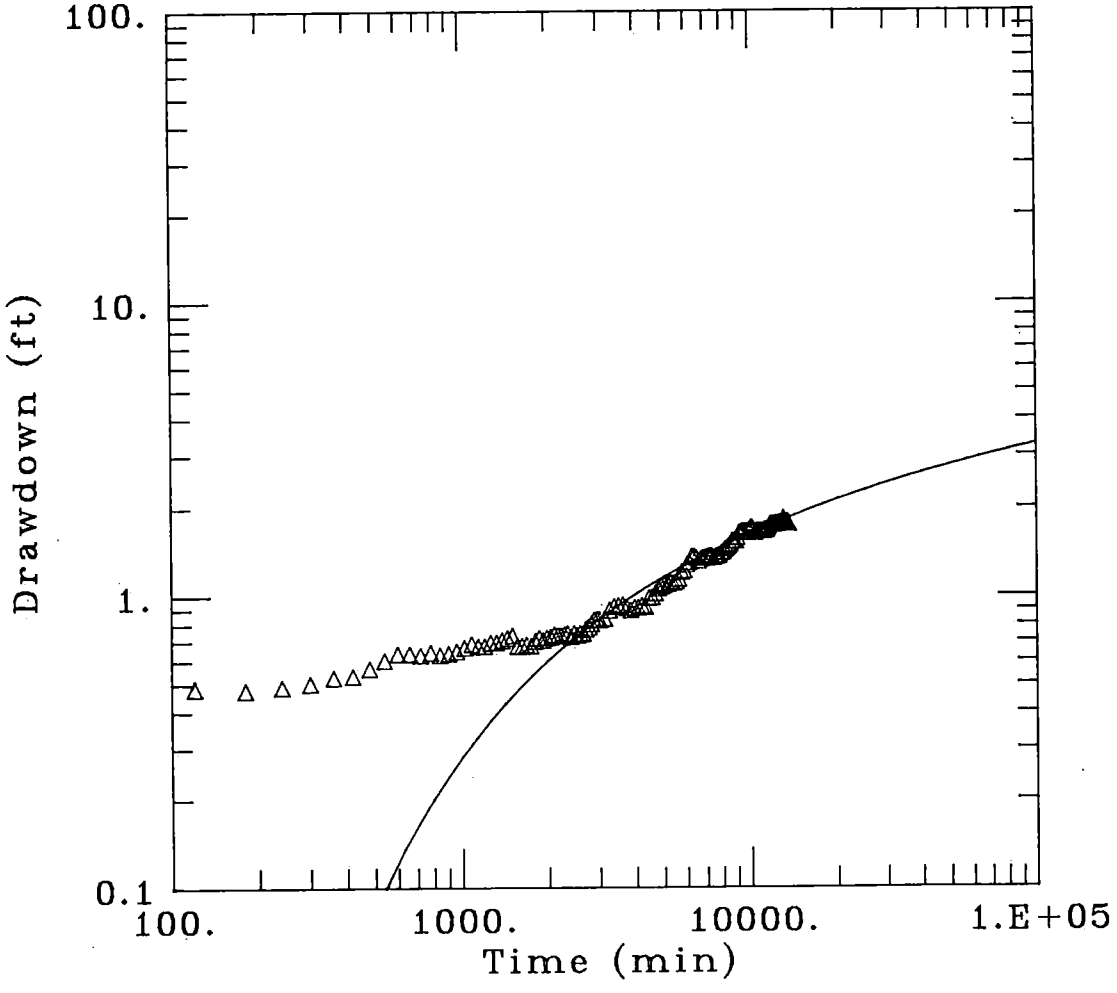
OBS. WELL:
P-37S

ESTIMATED PARAMETERS:
T = 0.4961 ft^2/min
S = 0.002827
Sy = 0.7523
β = 0.06

TEST DATA:
Q = 5.214 ft^3/min
r = 33. ft
b = 6.3 ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure J-58: 30-Day Constant Rate Test : Drawdown in P-37S (Days 11 - 30)



DATA SET:
p37s30d.cs2
04/11/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
December 1992

TEST WELL:
RC-1 and RC-2

OBS. WELL:
P-37S

ESTIMATED PARAMETERS:
T = 0.5074 ft^2/min
S = 1.347
Sy = 1.24
β = 0.001

TEST DATA:
Q = 5.08 ft^3/min
r = 33. ft
b = 6.3 ft

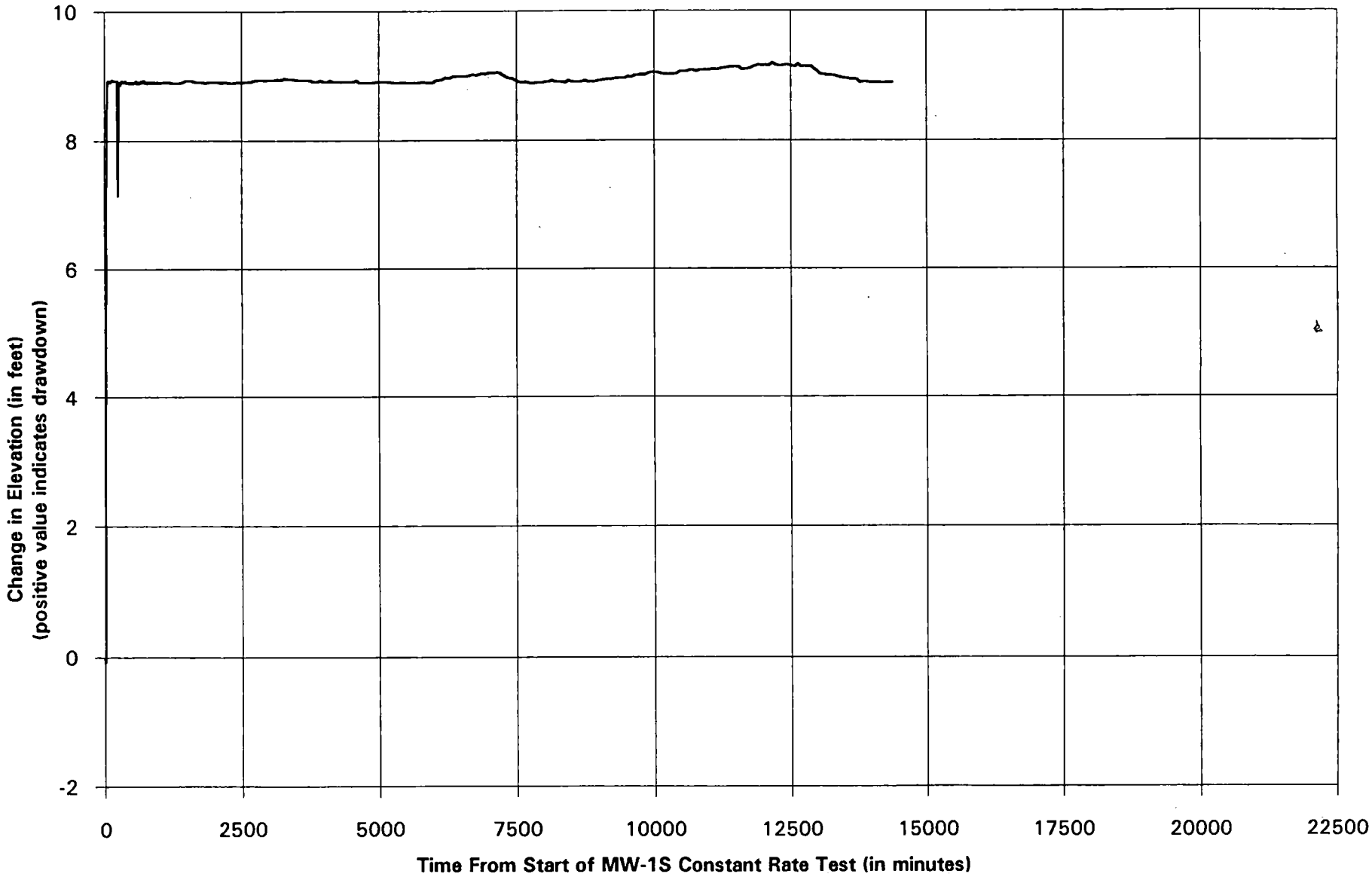
Appendix K

K

ADDITIONAL CONSTANT RATE TEST DATA AND ANALYSES

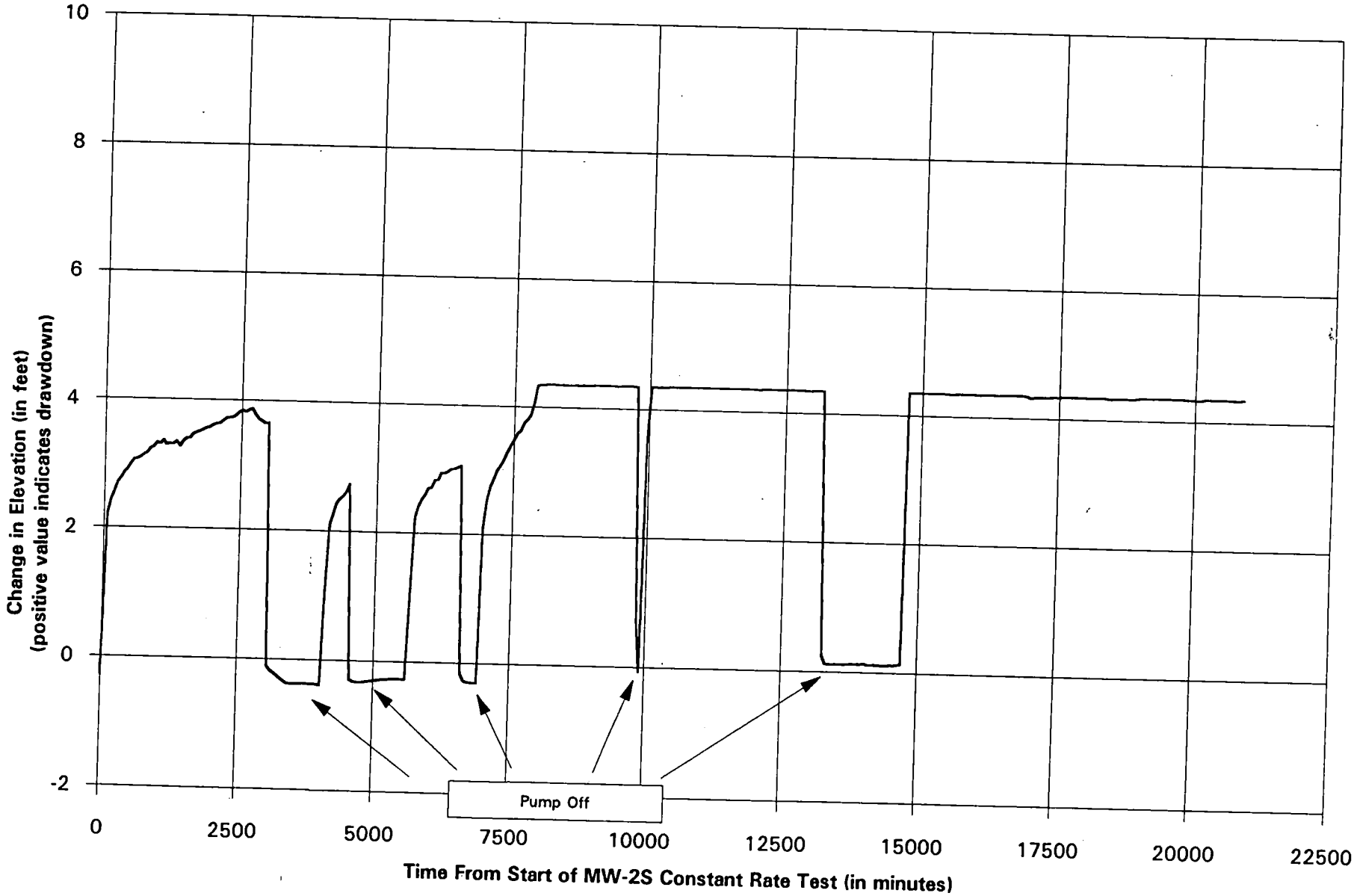
This appendix presents the data and analyses from the additional constant rate tests conducted during the stabilization investigation in the Production Area under the RCRA Facility Investigation at the CIBA-GEIGY facility in Cranston, RI. Additional constant rate tests were conducted for 11 days on MW-1S and for 14 days on MW-2S (during the 30-day constant rate test on RC-1 and RC-2), and for up to 24 hours each on MW-3S, MW-4S, MW-12S, MW-13S, MW-14S, P-35S, and P-37S (after the 30-day constant rate test). These data are presented in two sections; each section is organized by well/piezometer identifier (e.g., MW-1S, MW-2S, MW-3S, and so on). The first section presents hydrographs plotting changes in the groundwater elevation against time for each well/piezometer tested (i.e., pumped). The second section presents the analysis of selected test data using the AQTESOLV computer program (Geraghty & Miller, 1989). (As discussed in Chapter 2, data from the tests on MW-4S, MW-14S, and P-37S were not analyzed because the well/piezometer ran dry.) Some graphs show the drawdown or recovery of water levels in the well/piezometer tested; other graphs show the drawdown in selected observation wells/piezometers monitored during the tests. All of these graphs also present test parameters (e.g., discharge rate) and estimates of selected aquifer parameters (e.g., transmissivity, storativity). Note that the data for the MW-14S test were analyzed in two ways — first using the drawdown of water levels when MW-14S was pumped and then using the recovery of water levels in MW-14S.

Figure K-1: MW-1S Hydrograph - 1 to 11 December 1992



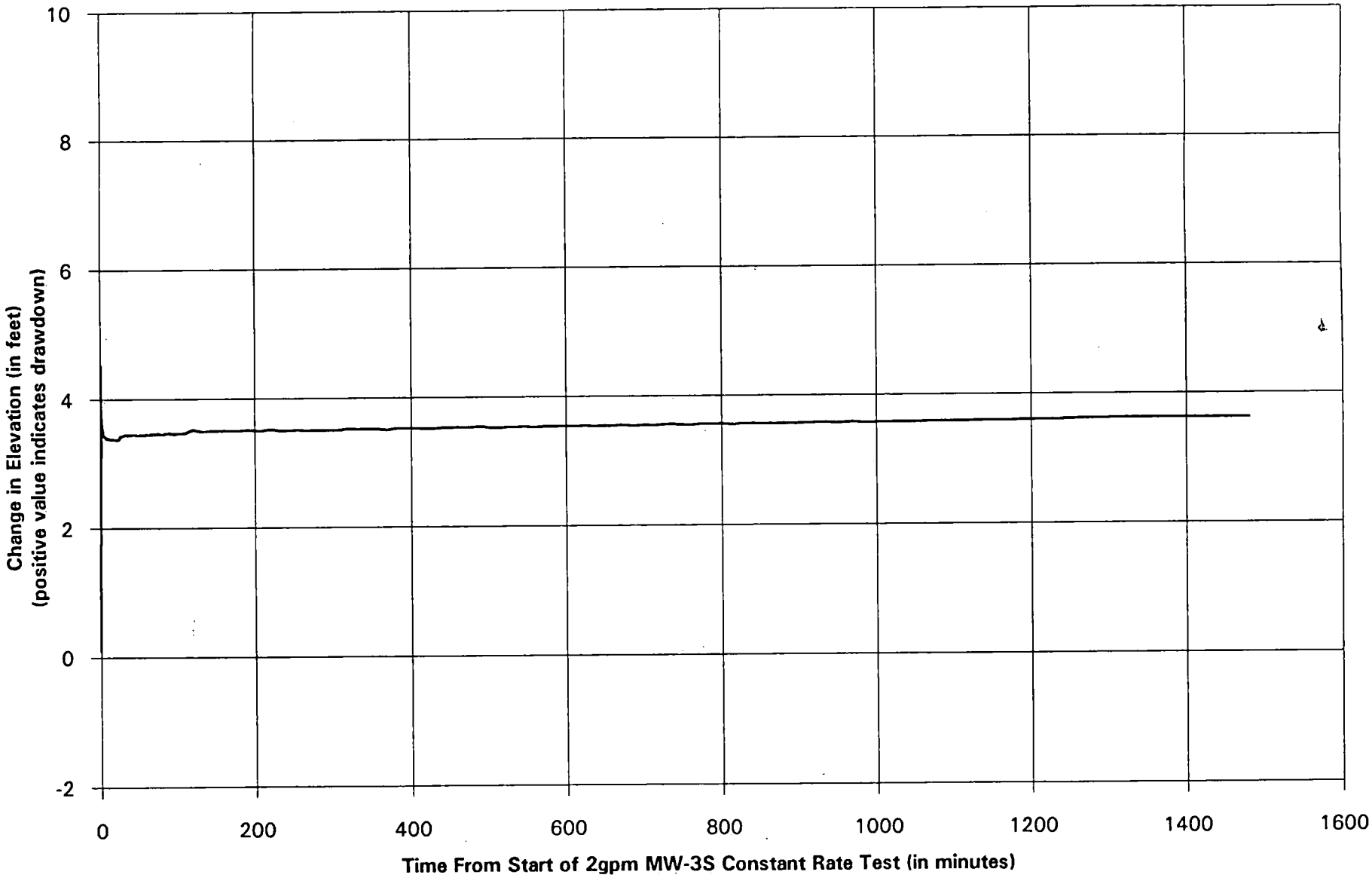
CLH: b: 30 day\MW1S.XLS Chart 1

Figure K-2: MW-2S Hydrograph - 14 to 28 December 1992



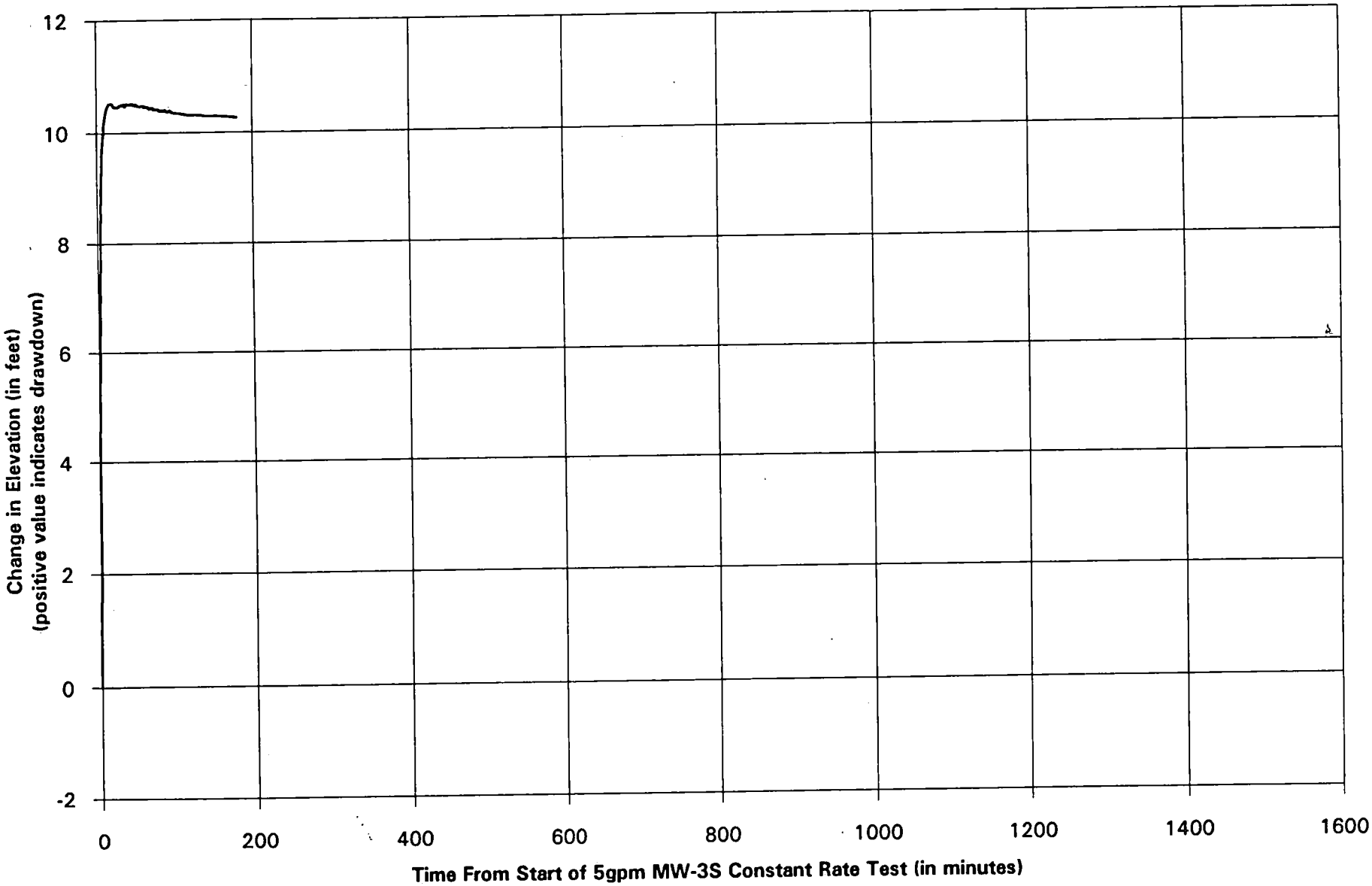
CLH: b: 30 day \MW2S.XLS Chart 1

Figure K-3: MW-3S Hydrograph - 20 January 1993



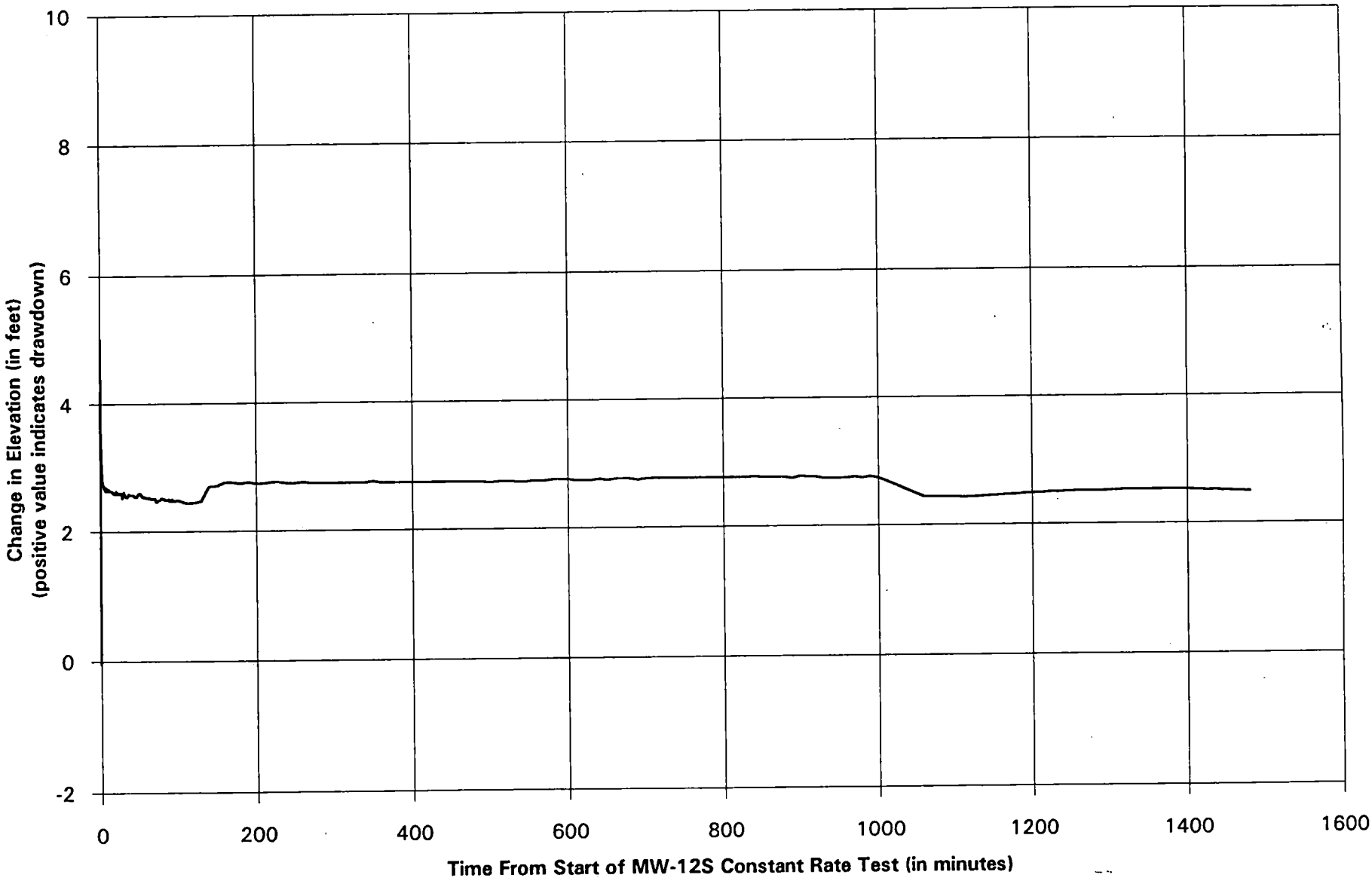
CLH: b:\MW3S.XLC

Figure K-4: MW-3S Hydrograph - 21 January 1993



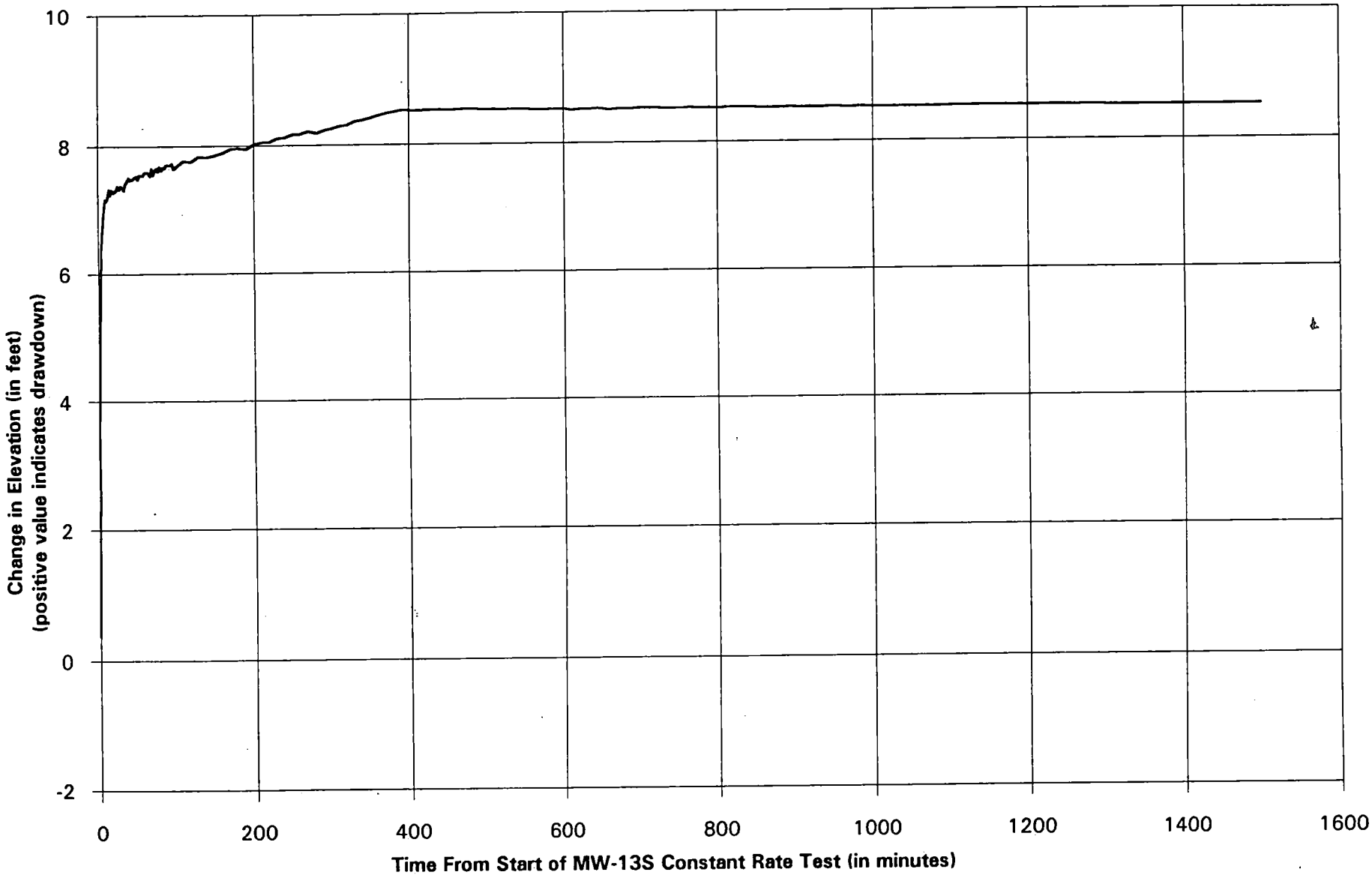
CLH: b:\MW3S2.XLC

Figure K-5: MW-12S Hydrograph - 19 January 1993



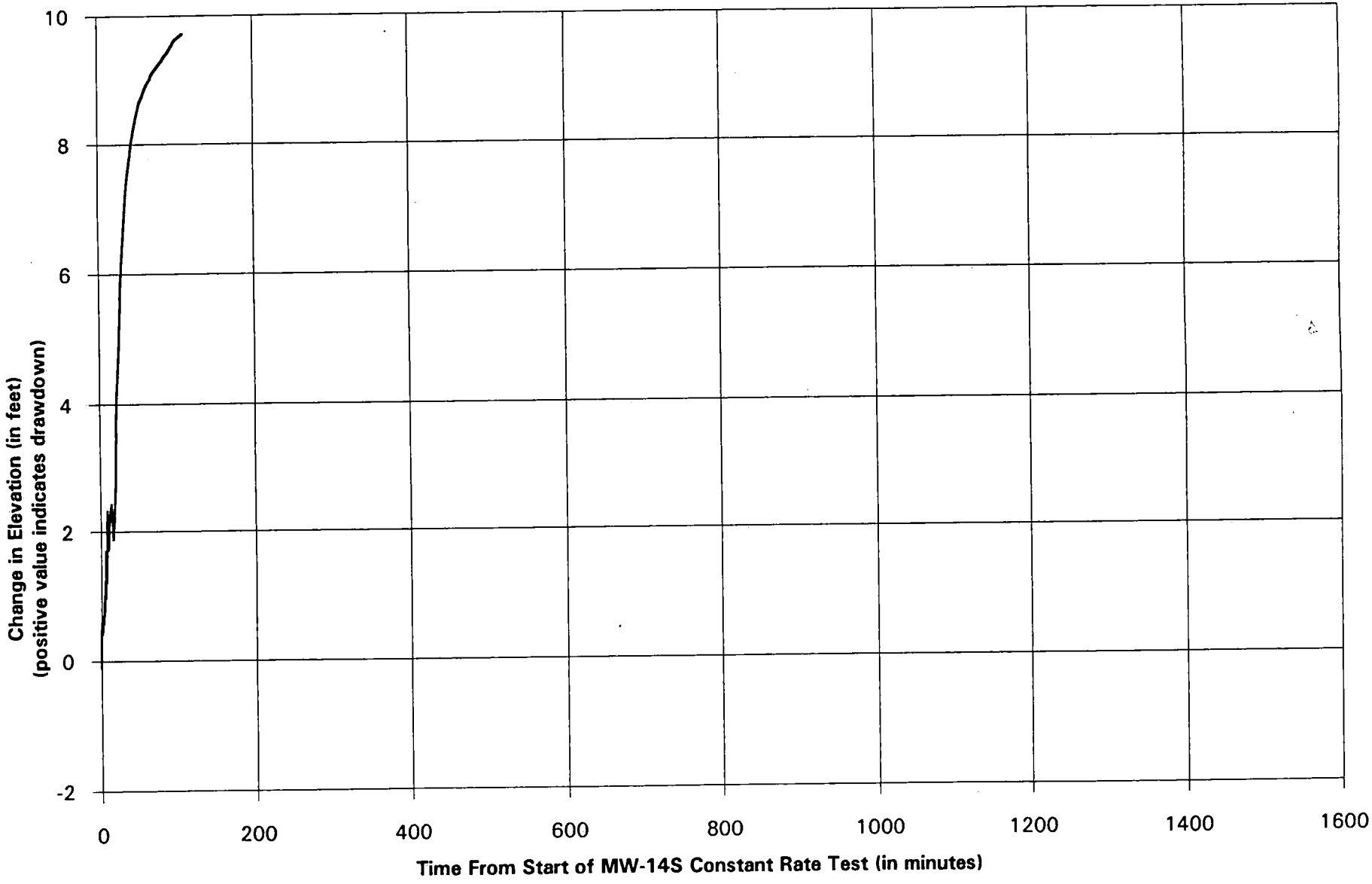
CLH: b:\MW12S.XLC

Figure K-6: MW-13S Hydrograph - 11 January 1993



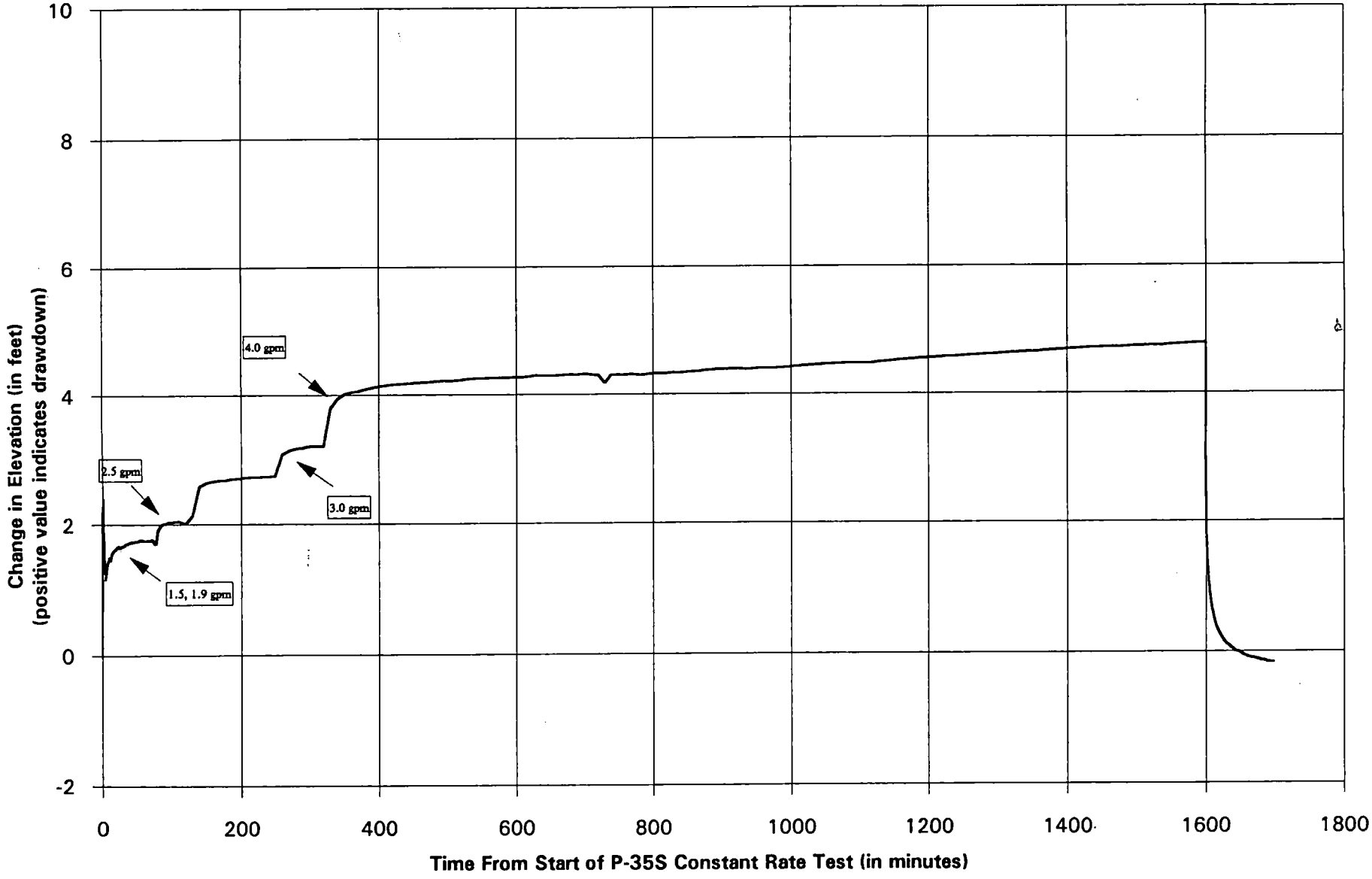
CLH:b:\MW13S.XLC

Figure K-7: MW-14S Hydrograph - 12 January 1993



CLH: b:\MW14S.XLC

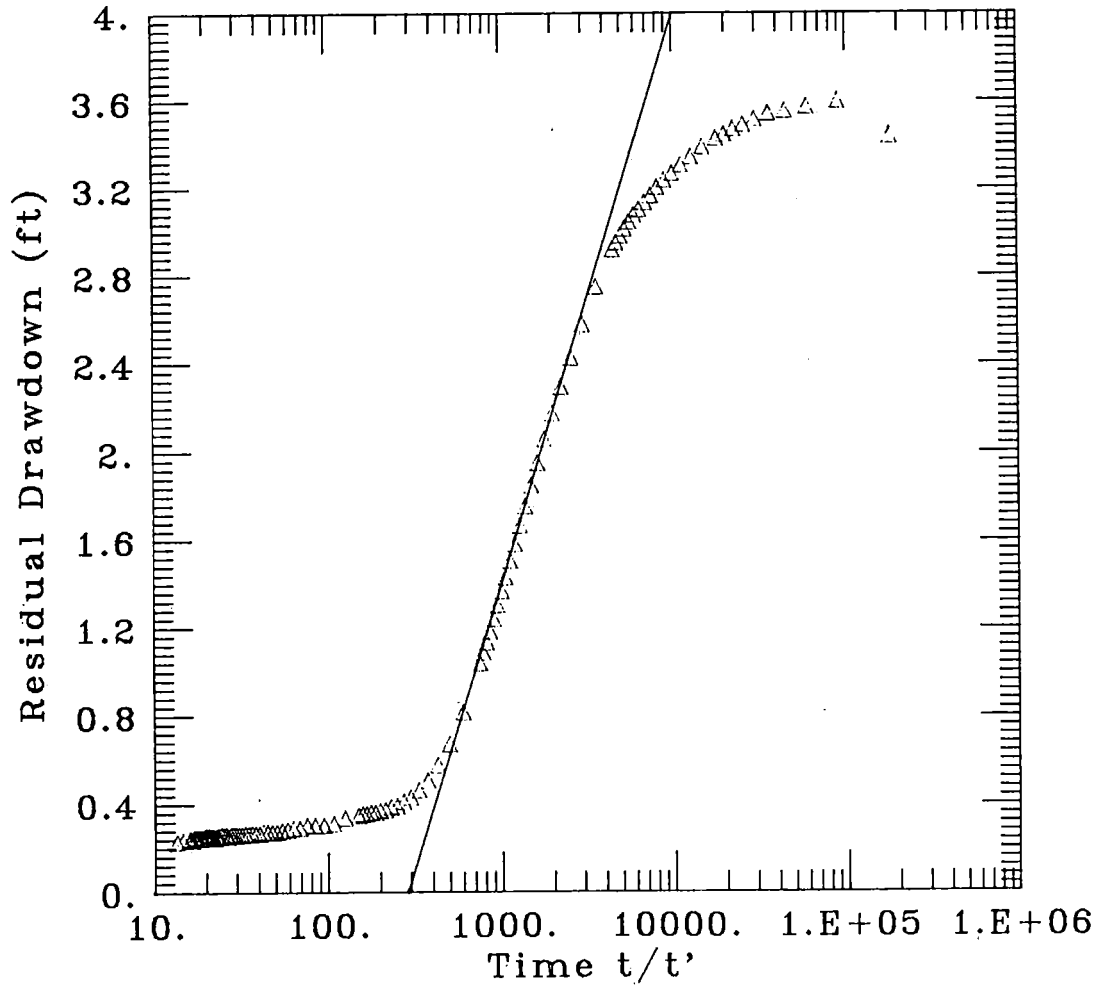
Figure K-8: P-35S Hydrograph - 5 January 1993



CLH: b:\P35ST1.XLC

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure K-9: MW-3S Additional Constant Rate Test - Recovery in MW-3S



DATA SET:
mw3sr.dat
04/13/93

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Theis Recovery

TEST DATE:
1/20/93-1/21/93

TEST WELL:
MW-3S

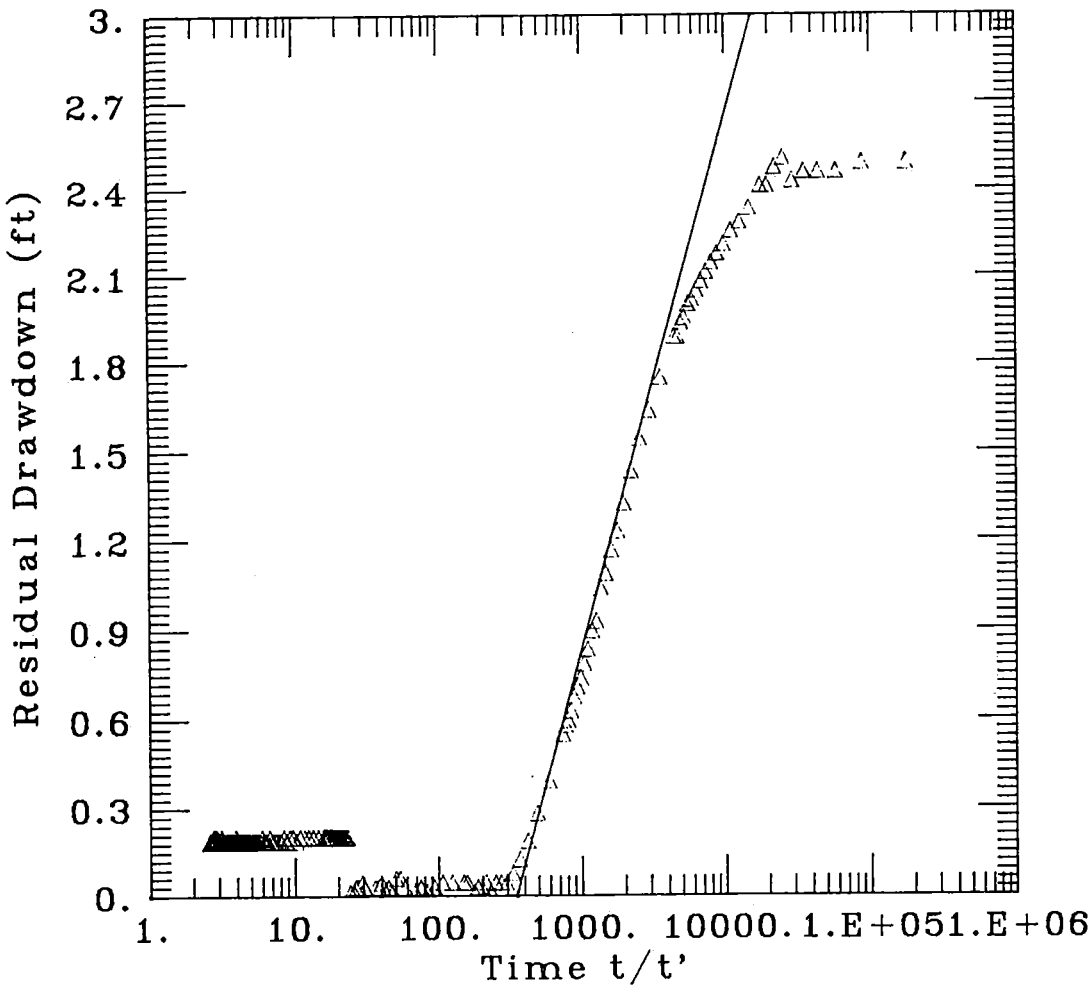
OBS. WELL:
Same

ESTIMATED PARAMETERS:
T = 0.01892 ft^2/min
S' = 286.5

TEST DATA:
Q = 0.267 ft^3/min
t pumping = 1480. min

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure K-10: MW-12S Additional Constant Rate Test - Recovery in MW-12S



DATA SET:
mw12sr.dat
04/13/93

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Theis Recovery

TEST DATE:
1/18/93-1/19/93

TEST WELL:
MW-12S

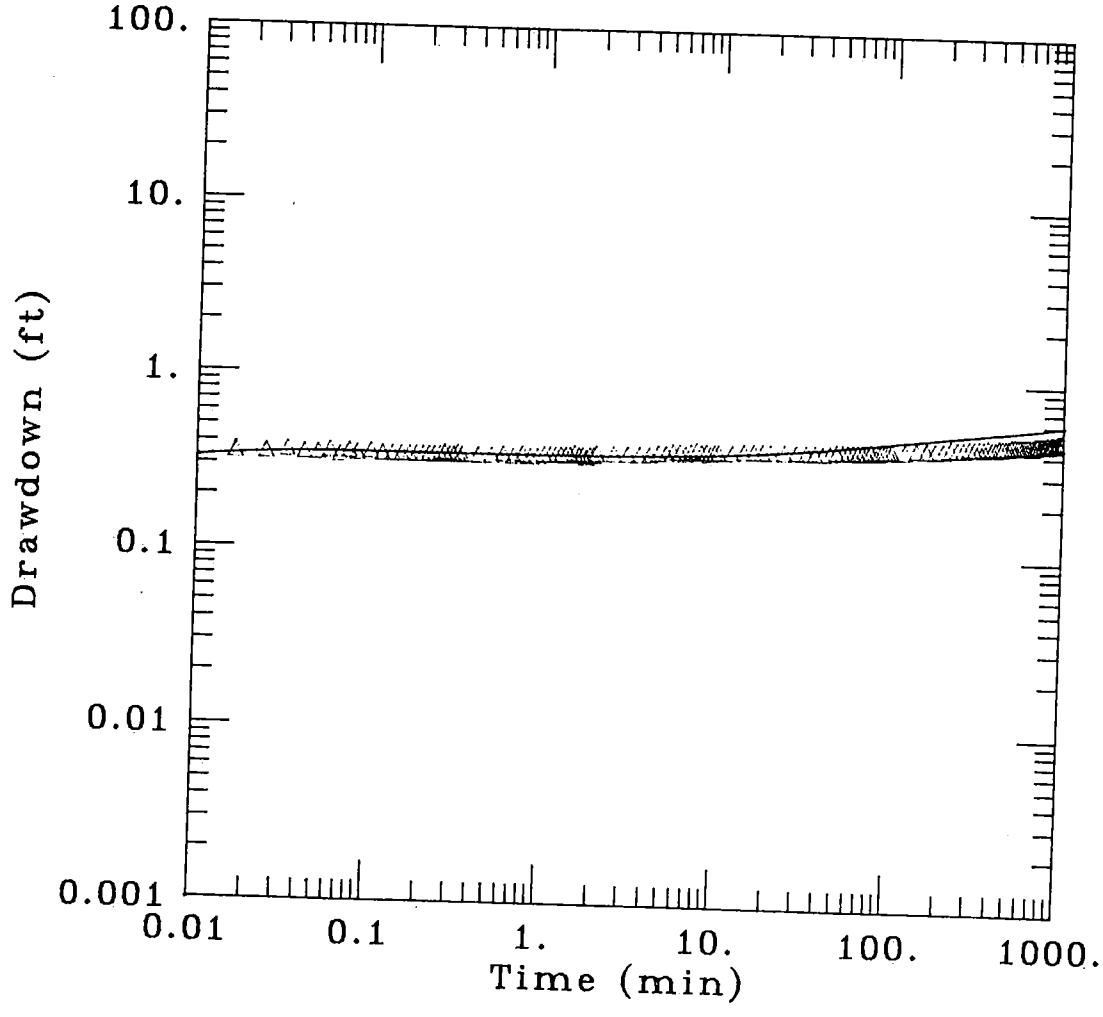
OBS. WELL:
Same

ESTIMATED PARAMETERS:
T = 0.05387 ft^2/min
S' = 354.6

TEST DATA:
Q = 0.535 ft^3/min
t pumping = 1480. min

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure K-11: MW-13S Additional Constant Rate Test - Drawdown in P-13D



DATA SET:
p13dp.dat
04/13/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
1/11/93-1/12/93

TEST WELL:
MW-13S

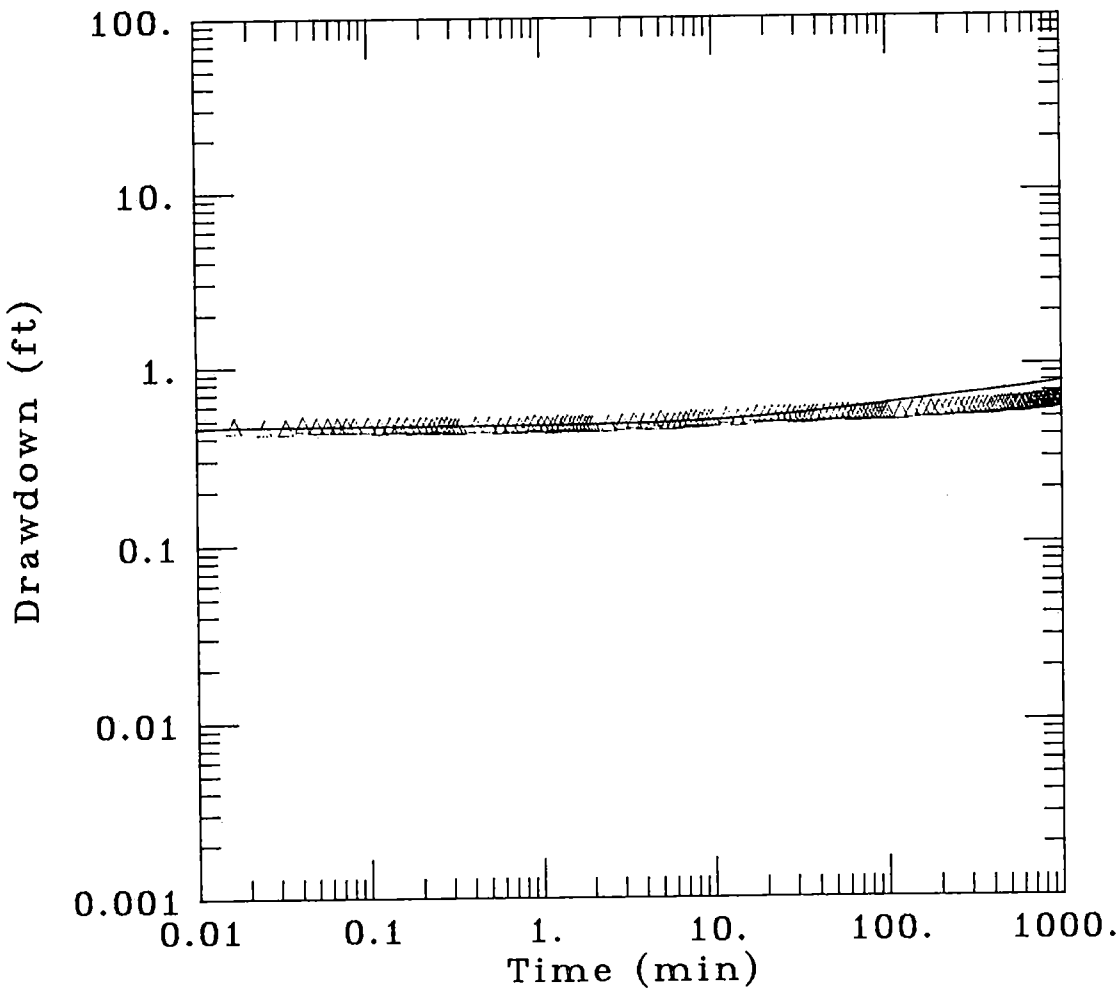
OBS. WELL:
P-13D

ESTIMATED PARAMETERS:
T = 0.6762 ft^2/min
S = 1.5687E-07
Sy = 0.0004434
β = 0.001

TEST DATA:
Q = 0.535 ft^3/min
r = 15. ft
b = 33. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure K-12: MW-13S Additional Constant Rate Test - Drawdown in P-32S



DATA SET:
p32sp.dat
04/13/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
1/11/93-1/12/93

TEST WELL:
MW-13S

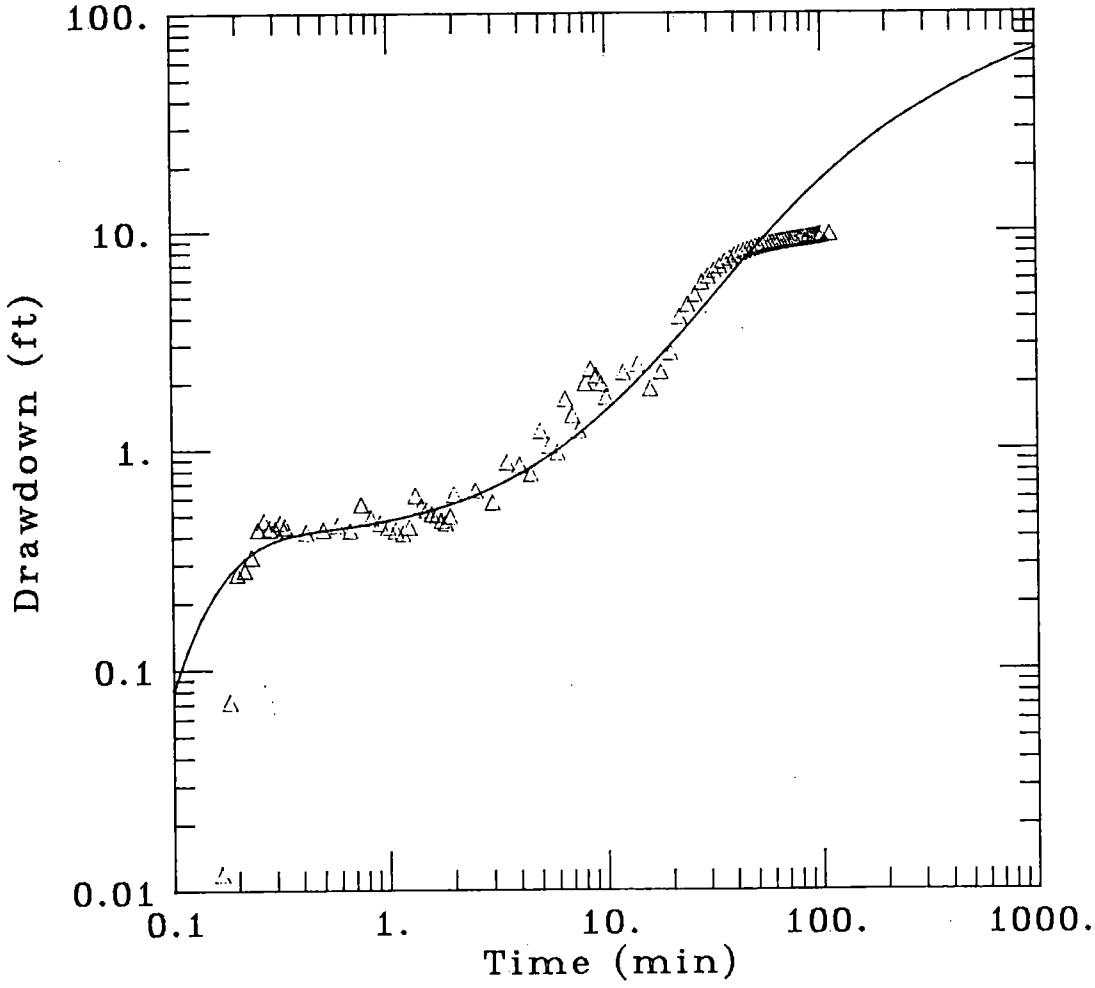
OBS. WELL:
P-32S

ESTIMATED PARAMETERS:
T = 0.5213 ft^2/min
S = 6.7064E-10
Sy = 6.1428E-06
β = 0.001

TEST DATA:
Q = 0.535 ft^3/min
r = 111. ft
b = 10. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure K-13: MW-14S Additional Constant Rate Test - Drawdown in MW-14S



DATA SET:
mw14sp.dat
04/13/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
1/12/93-1/13/93

TEST WELL:
MW-14S

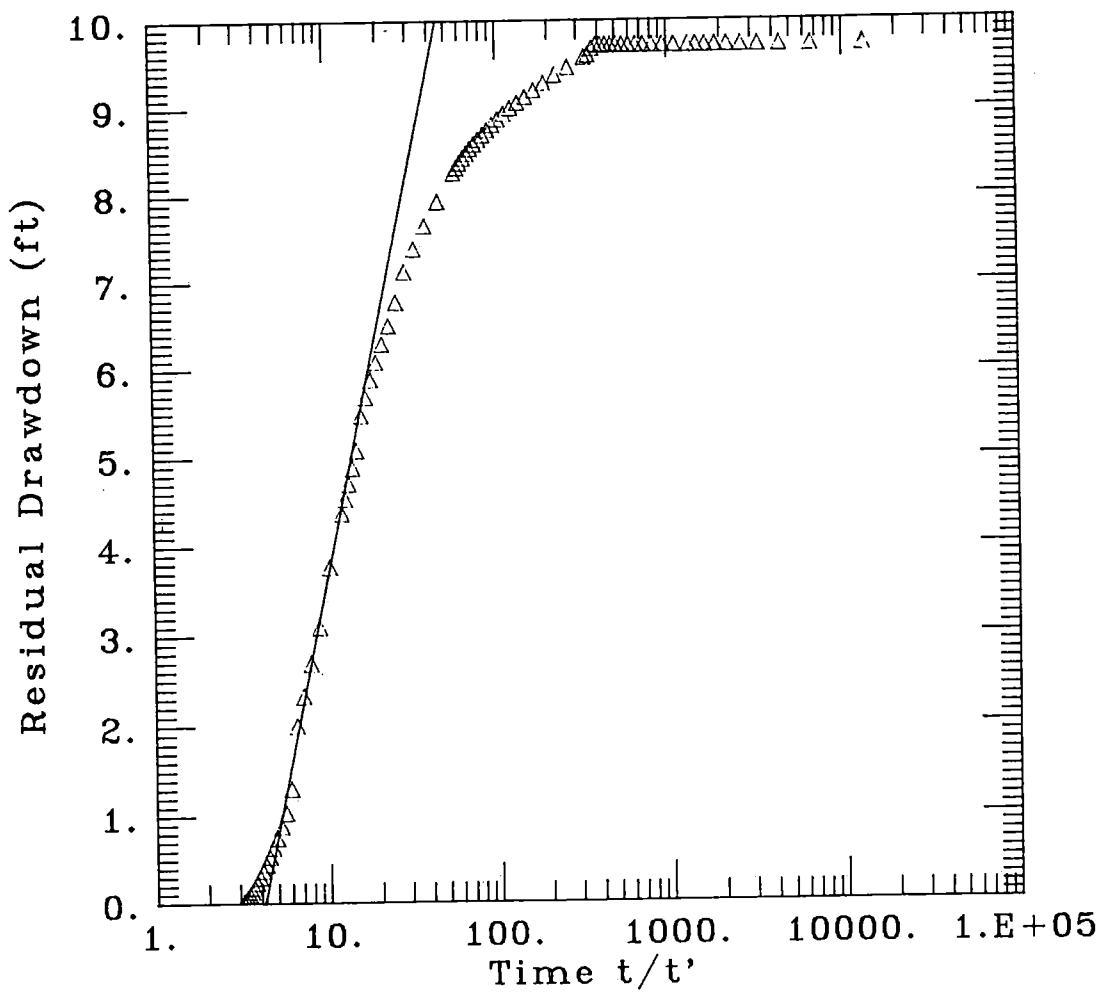
OBS. WELL:
Same

ESTIMATED PARAMETERS:
T = 0.0004025 ft^2/min
S = 0.001997
Sy = 0.287
β = 7.

TEST DATA:
Q = 0.134 ft^3/min
r = 0.5 ft
b = 15. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure K-14: MW-14S Additional Constant Rate Test - Recovery in MW-14S



DATA SET:
mw14sr.dat
04/13/93

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Theis Recovery

TEST DATE:
1/12/93-1/13/93

TEST WELL:
MW-14S

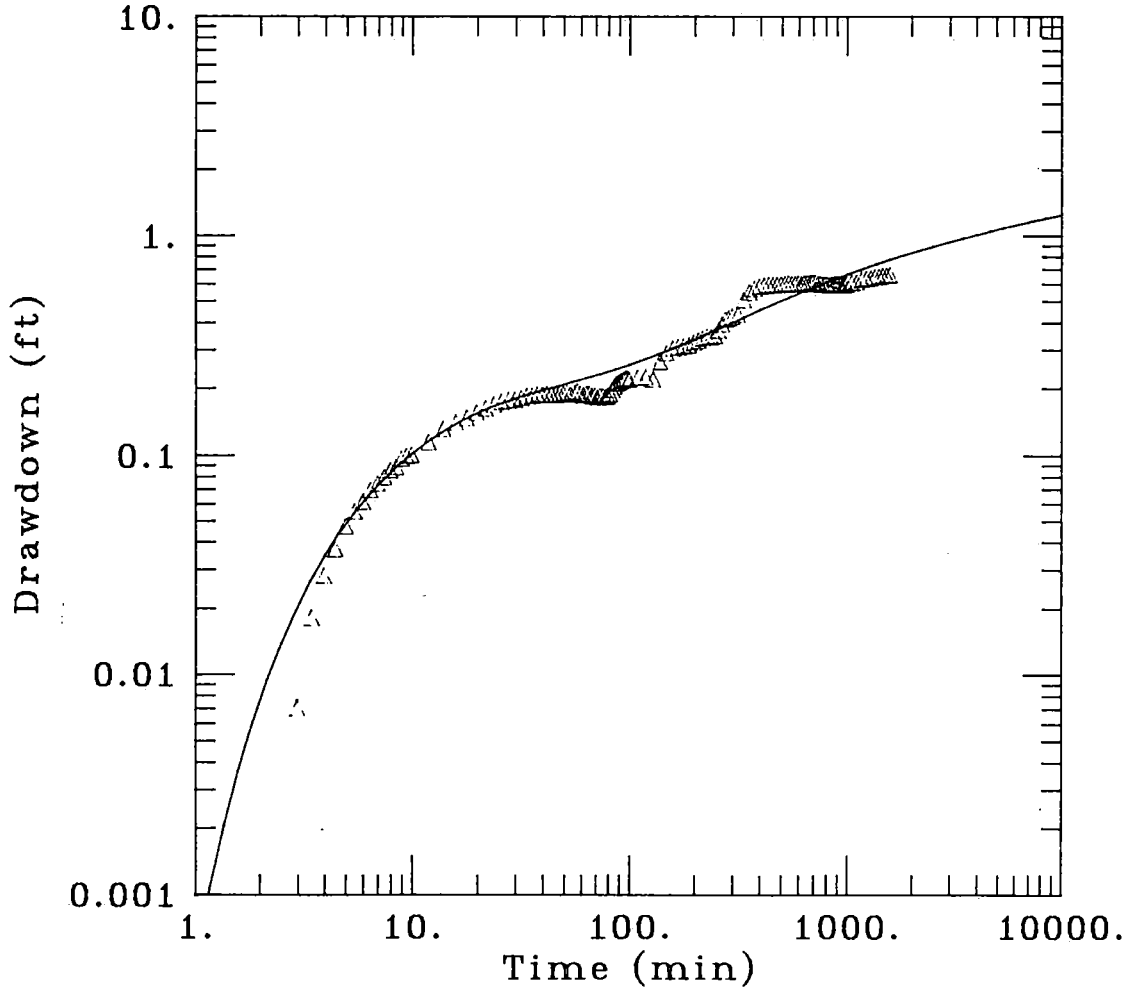
OBS. WELL:
Same

ESTIMATED PARAMETERS:
T = 0.002549 ft^2/min
S' = 4.179

TEST DATA:
Q = 0.134 ft^3/min
t pumping = 110. min

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure K-15: P-35S Additional Constant Rate Test - Drawdown in MW-2S



DATA SET:
mw2sp.dat
04/13/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Neuman

TEST DATE:
1/5/93-1/6/93

TEST WELL:
P-35S

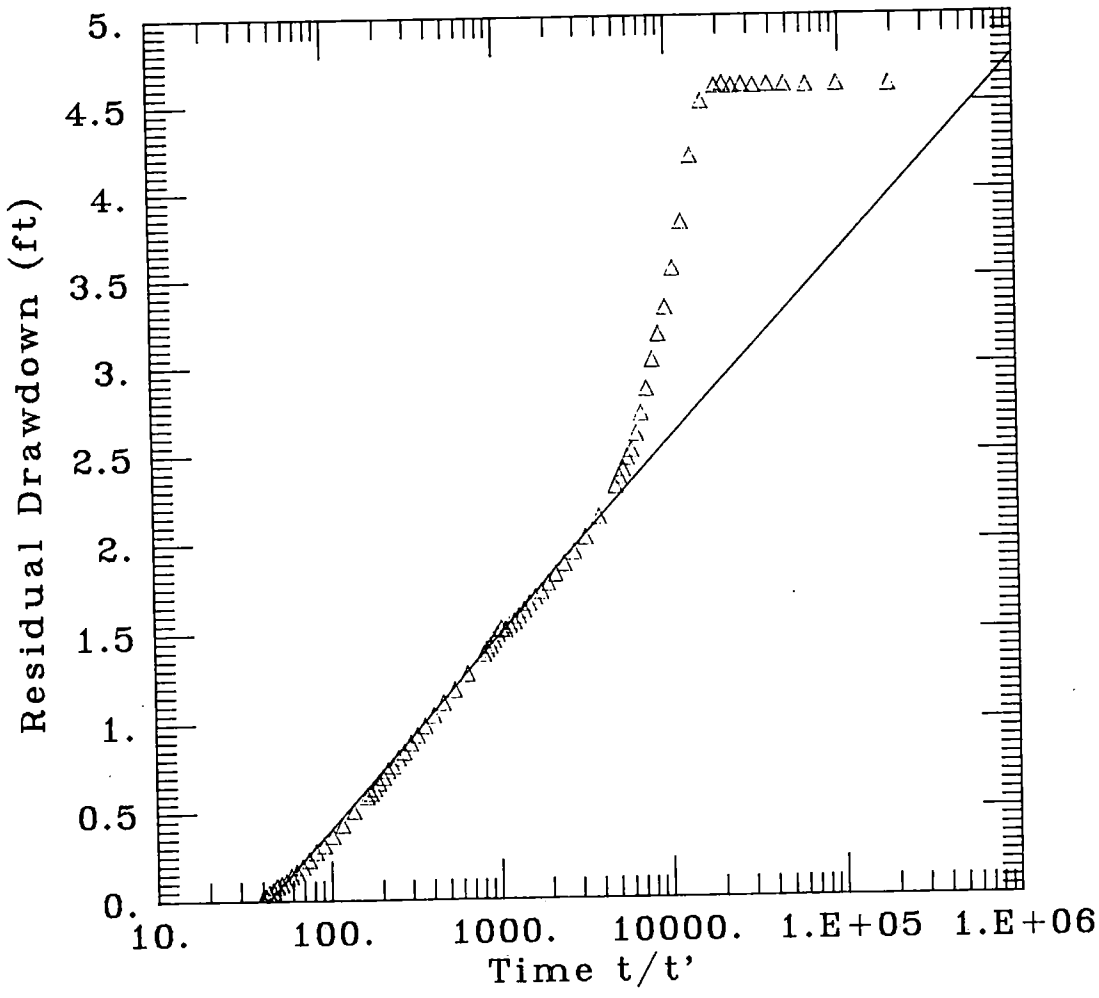
OBS. WELL:
MW-2S

ESTIMATED PARAMETERS:
T = 0.1641 ft^2/min
S = 0.0005575
Sy = 0.005339
β = 0.4

TEST DATA:
Q = 0.535 ft^3/min
r = 72. ft
b = 12. ft

WOODWARD-CLYDE CONSULTANTS	Client: Ciba-Geigy Corp.
Project No.: 87X4660	Location: Cranston, RI

Figure K-16: P-35S Additional Constant Rate Test - Recovery in P-35S



DATA SET:
p35sr.dat
04/13/93

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Theis Recovery

TEST DATE:
1/5/93-1/6/93

TEST WELL:
P-35S

OBS. WELL:
Same

ESTIMATED PARAMETERS:
T = 0.08997 ft^2/min
S' = 42.79

TEST DATA:
Q = 0.535 ft^3/min
t pumping = 1600. min

Appendix L

L

CAPTURE ZONE MODELING

L.1 OVERVIEW

This appendix describes the QUICKFLOW™ model which was used to verify the conceptual design of the full-scale groundwater capture system. The following description was summarized from the QUICKFLOW model manual (Geraghty & Miller, 1991).

The QUICKFLOW model is a two-dimensional analytical model that simulates steady-state and transient groundwater flow. Only the steady-state module was used so that the analysis would be simplified and the simulations would be representative of long-term operations. The steady-state module simulates groundwater flow in a horizontal plane according to the analytical functions developed by Strack (1989). Strack used the principle of superposition to compute the combined effects of several analytic elements, such as two recovery wells acting simultaneously. Superposition involves adding the drawdown from these two wells at a distance *r* from either recovery well.

The steady-state module evaluates the effects of the following analytic elements on two-dimensional flow:

- uniform recharge;
- circular recharge/discharge areas; and
- line sources or sinks (i.e., trenches or impermeable boundaries like the bulkhead).

Any number and/or combination of these analytic elements can be simulated using the QUICKFLOW model. The result of pumping on groundwater flow can be represented by streamlines, particle traces, and/or contours of hydraulic head. Streamlines and contours are computed semi-analytically to illustrate groundwater flow directions. Particle tracing is computed numerically to estimate capture zones and flow directions. The steady-state module of the QUICKFLOW model can simulate both confined and unconfined aquifers.

L.2 GOVERNING EQUATIONS

The equations used in the QUICKFLOW model are defined in terms of discharge potential to simplify the solutions for both confined and unconfined flow. The discharge potential equals the volume of groundwater flowing through a cross-section of the aquifer of unit width and depends upon what changes are occurring in the groundwater flow field (e.g., wells being pumped). Discharge potential is then converted to hydraulic head using the following equations:

For confined to semi-confined flow...

$$\phi = \frac{\Phi + {}^1/_2\, Kb^2}{Kb} \qquad (\Phi \geq {}^1/_2\, Kb^2) \qquad \text{(L-1)}$$

For unconfined flow...

$$\phi = \sqrt{[(2\Phi) / K]} \qquad (\Phi < {}^1/_2\, Kb^2) \qquad \text{(L-2)}$$

where

K = hydraulic conductivity (feet/day)

b = aquifer thickness (feet)

ϕ = hydraulic head (feet/day)

Φ = discharge potential (feet^3/day)

Using these equations, the QUICKFLOW model will account for the transition from confined to unconfined flow. Computing the hydraulic head by equations L-1 and L-2 requires that the discharge potential be solved using the following equations:

For uniform flow...

$$\Phi(x,y) = -Q_o (x \cos \alpha_u + y \sin \alpha_u) + C \qquad \text{(L-3)}$$

For wells...

$$\Phi(x,y) = \sum_{j=1}^{n} \frac{Q_j}{4\pi} \ln [r_j^2 (x,y)] + C \qquad \text{(L-4)}$$

where

x = x-coordinate of calculation point

y = y-coordinate of calculation point

Q_o = uniform flow (feet^2/day)

α_u = angle between uniform flow and x-axis

Q_j = discharge from well j (feet^3/day)

r_j = distance from well j to calculation point (feet)

C = constant (solved in model)

The Q_o term represents the flow per unit width of aquifer and is computed as $Q_o = Kbi$, where K = hydraulic conductivity, b = saturated aquifer thickness, and i = the hydraulic gradient. The QUICKFLOW model determines Q_o at the reference point, eliminating the need to specify this term.

Equations L-3 and L-4 contain an unknown constant — C. This constant is determined by stipulating that the discharge potential is equal to a known value (the reference head) at some point (x_o, y_o) in the system. The model then calculates the constant C using this reference head value.

QUICKFLOW Modeling Assumptions

Several important general assumptions are made in using the QUICKFLOW model and can affect how the model is applied to practical groundwater problems:

- *Groundwater flow is horizontal and occurs in an infinite aquifer.* The QUICKFLOW model is designed to solve two-dimensional flow problems in a horizontal plane only (not two-dimensional cross-sections in a vertical plane). Therefore, the model should not be used in cases where significant vertical gradients exist unless the size of the area being modeled is large enough so that horizontal flow can still be considered to dominate the flow regime. (This assumption does not affect the QUICKFLOW modeling of the full-scale groundwater capture system design because the vertical gradients are small in the Production Area.)

- *The hydraulic conductivity of the aquifer is isotropic and homogeneous.* As such, the top and bottom of the aquifer are horizontal and fixed at a given elevation. (This assumption had a significant impact on how the QUICKFLOW model was used. Because there are major variations in stratigraphy near the bulkhead, the model was run independently for each of the proposed full-scale groundwater capture system recovery wells to account for the differences in aquifer properties at each location.)

- *The reference head in the steady-state module remains constant throughout the simulation.* Therefore, it is important to locate the reference point away from the area being modeled so that the model predictions are not impacted by the constant head requirements at the reference point. (The reference head selected for this capture zone modeling was at the northern end of the Production Area, sufficiently distant from the bulkhead so that the simulations for the full-scale groundwater capture system were not affected.)

- *Wells are always pumped at a constant rate, screened across the entire saturated thickness of the aquifer, and 100% efficient.* These conditions are rarely encountered in the field. Head loss around the well often occurs due to drilling damage and incomplete well development, or due to partial penetration of the aquifer. The implication of these factors is that the pumping rates calculated with the model may not be attainable since more drawdown will occur in the pumping well than is simulated. If so, the recovery well could be dewatered before achieving the desired drawdown in the aquifer. (This possibility is not a factor in this capture zone modeling because the pumping rates simulated were based on the aquifer tests and are easily attainable in each of the proposed full-scale groundwater capture system recovery wells.)

- *Particle traces and streamlines are two-dimensional.* In two-dimensional analyses, the capture zone extends upgradient until encountering a groundwater divide (or extends to infinity). (For the recovery well simulations, this assumption is not a factor because gradient reversal is required only near the bulkhead.)

QUICKFLOW Model Simulations

The QUICKFLOW model was used to confirm the locations, pumping rates, and screened intervals of the proposed recovery wells for the full-scale groundwater capture system and to evaluate the effects of the bulkhead (as a "head linesink" — an impermeable boundary) on the configuration of the capture zones of the recovery wells. The design criteria discussed in Chapter 5 are the basis for modeling the response of the aquifer to pumping recovery wells RC-3, RC-4, and RC-5 using the QUICKFLOW model. The Pawtuxet River was not simulated in the model because (as discussed in Chapter 2) the river has a negligible influence on groundwater flow in the vicinity of the bulkhead.

Because the QUICKFLOW model assumes a homogeneous and isotropic aquifer, separate simulations had to be run to account for the differences in hydraulic conductivity (K) and storativity (S) between:

- the Gravelly Sand and Fine Sand units in the eastern portion of the Production Area (on one hand); and
- the Sand/Fill and Fine Sand units in the western portion of the Production Area (on the other hand).

(These units are shown in Figure 2-3 in Chapter 2.)

Other input required by the model includes the top and bottom elevations of the aquifer, hydraulic gradient (I), uniform recharge rate (R), reference head (H_r), Hantush leakage factor (L), porosity (n), and time required to compute the transient solution (t). Because groundwater flow in the aquifer was assumed to be at steady-state conditions in this capture zone modeling, it was not necessary to specify a time required for the transient solution (t). No recharge was assumed to occur

during these simulations, so R was set at zero; this assumption is justifiable because the portion of the Production Area affected by the full-scale groundwater capture system wells will be capped. In order for the model to calculate drawdown, the reference head (H_r) and the hydraulic gradient (I) also were set at zero. The aquifer in the Production Area is mostly unconfined, so the Hantush leakage factor (L) was set at zero (since this factor applies only to confined conditions). For all simulations, the porosity (n) was assumed to be 30%, consistent with the results reported in Phase I. Table L-1 provides a summary of the input parameters used for the QUICKFLOW capture zone modeling.

L.3 CAPTURE ZONE MODELING RESULTS

The results of capture zone modeling for the three proposed recovery wells — RC-3, RC-4, and RC-5 — are described here.

Proposed Recovery Well RC-3

The proposed location for recovery well RC-3 is in the Gravelly Sand and Fine Sand units about 15 feet landward of the bulkhead near P-37S (shown in Figures 5-1 and 5-2 in Chapter 5). This well will be constructed to a depth of 27 feet and pumped at a rate of 40 to 60 gpm.

The QUICKFLOW model requires only one value each for hydraulic conductivity (K) and storativity (S), so the averages of the transmissivity and storativity values from the 72-hour constant rate test at RC-1 and 30-day constant rate test (from Tables 2-12 and 2-13 in Chapter 2) were used from wells screened in the Gravelly Sand and Fine Sand units; these units also will be screened by RC-3. The average transmissivity value was then divided by the thickness of the saturated portion of the Gravelly Sand and Fine Sand units to obtain K. Other input parameters used in the capture zone modeling of RC-3 are listed in Table L-1.

The predicted drawdown resulting from pumping RC-3 at 50 gpm is shown in Figure L-1. One foot of drawdown was calculated about 50 feet radially from RC-3, and 0.5 feet of drawdown at about 150 feet radially from RC-3. Particle tracing for RC-3 (pumping at 50 gpm) is shown on Figure L-2. The capture zone for RC-3 (the shaded area in Figure L-2) extends throughout much of the area where the Gravelly Sand unit is present (as shown in Figure 2-2 of Chapter 2).

The drawdown predicted for RC-3 is less than the drawdown predicted by the image well analysis for RC-3 (discussed in Chapter 5 and Appendix P). This result was expected since the QUICKFLOW model is conservative (i.e., underestimates drawdown) and, for this capture zone modeling, does not account for the superposition of the drawdown from RC-4 and RC-5. (This consideration is discussed in more detail later.)

Proposed Recovery Well RC-4

The proposed location for recovery well RC-4 is in the Sand/Fill and Fine Sand units about 15 feet from the bulkhead near P-36S (as shown in Figures 5-1 and 5-2). It will be constructed to a depth of about 40 feet and pumped at a rate of 10 to 15 gpm.

The hydraulic conductivity (K) value used for modeling RC-4 was based on the average transmissivity calculated from the drawdown measured in wells in the Fine Sand unit during 72-hour RC-2 and 30-day constant rate tests. The S value also was obtained by averaging the values from the same tests (from Tables 2-12 and 2-13).

The predicted drawdown from pumping RC-4 at 12 gpm is shown in Figure L-3. One foot of drawdown was calculated about 50 feet from RC-4, and 0.5 feet of drawdown at about 155 feet radially from RC-4. Particle tracing for RC-4 (shown in Figure L-4) indicates a more extensive capture zone (about 90 feet in each direction from RC-4) than for RC-3. The capture zone and drawdown for

RC-4 predicted by the QUICKFLOW model are similar to, but less than, the drawdown calculated by image well analysis (Appendix P).

Proposed Recovery Well RC-5

The proposed location for recovery well RC-5 is in the Sand/Fill and Fine Sand units about 25 feet from the bulkhead near P-2D (shown in Figures 5-1 and 5-2). It will be constructed to a depth of about 38 feet and pumped at a rate of 10 to 15 gpm.

The K and S values for modeling RC-5 were the same as used for RC-4. The predicted drawdown from pumping RC-5 at 10 gpm is shown on Figure L-5. One foot of drawdown was calculated at about 95 feet radially from RC-5, and 0.5 feet of drawdown at about 240 feet radially from RC-5. Particle tracing for RC-5 (shown in Figure L-6) indicates a capture zone extending about 80 feet in each direction from RC-5. The RC-5 simulations show similar but smaller drawdown than calculated by image well analysis.

L.4 SUMMARY

The capture zone modeling using the QUICKFLOW model indicated less drawdown than had been calculated by the image well analysis (Appendix P), especially at RC-3. Based on the analysis of the data from the RC-1 72-hour constant rate test and the 30-day constant rate test, the drawdown predicted for RC-3 by the QUICKFLOW model is unrealistically low. Drawdown calculated from the image well analysis (Appendix P) is close to what was measured at selected observation points. For this reason, the capture zone for RC-3 is expected to be larger than predicted by the QUICKFLOW model (shown in Figure L-2).

For wells RC-4 and RC-5, the drawdown predictions from the QUICKFLOW model are more similar to the results from image well analysis. However, drawdown predicted by the QUICKFLOW model was consistently less (generally, by about one foot) than the drawdown predicted from image well analysis.

The QUICKFLOW model results do not show the effect of the bulkhead on drawdown. The cones of depression are circular in the QUICKFLOW simulations instead of being "flattened" at the bulkhead (as shown in Figures 2-17 and 2-19). This is another reason why the drawdowns predicted by the QUICKFLOW model were less than observed.

The QUICKFLOW results confirmed the conceptual design for the full-scale groundwater capture system based on the particle tracing results (Figures L-2, L-4, and L-6). Overlaying the three particle tracings (Figure L-7) shows capture along most of the bulkhead. Areas where the particle tracings show no capture are in the vicinity of RC-3. As discussed previously, the capture zone for RC-3 predicted by the QUICKFLOW model is much smaller than expected based on the constant rate test results. A 20-foot increase in the width of the capture zone for RC-3 would be sufficient to capture groundwater along the entire length of the bulkhead (where required). If such an increase in the RC-3 capture zone is not observed after RC-3 is constructed and pumped at 50 gpm, a higher pumping rate or an additional well (in the vicinity of MW-1S) would be required and can easily be included in the design of the full-scale groundwater capture system.

REFERENCE

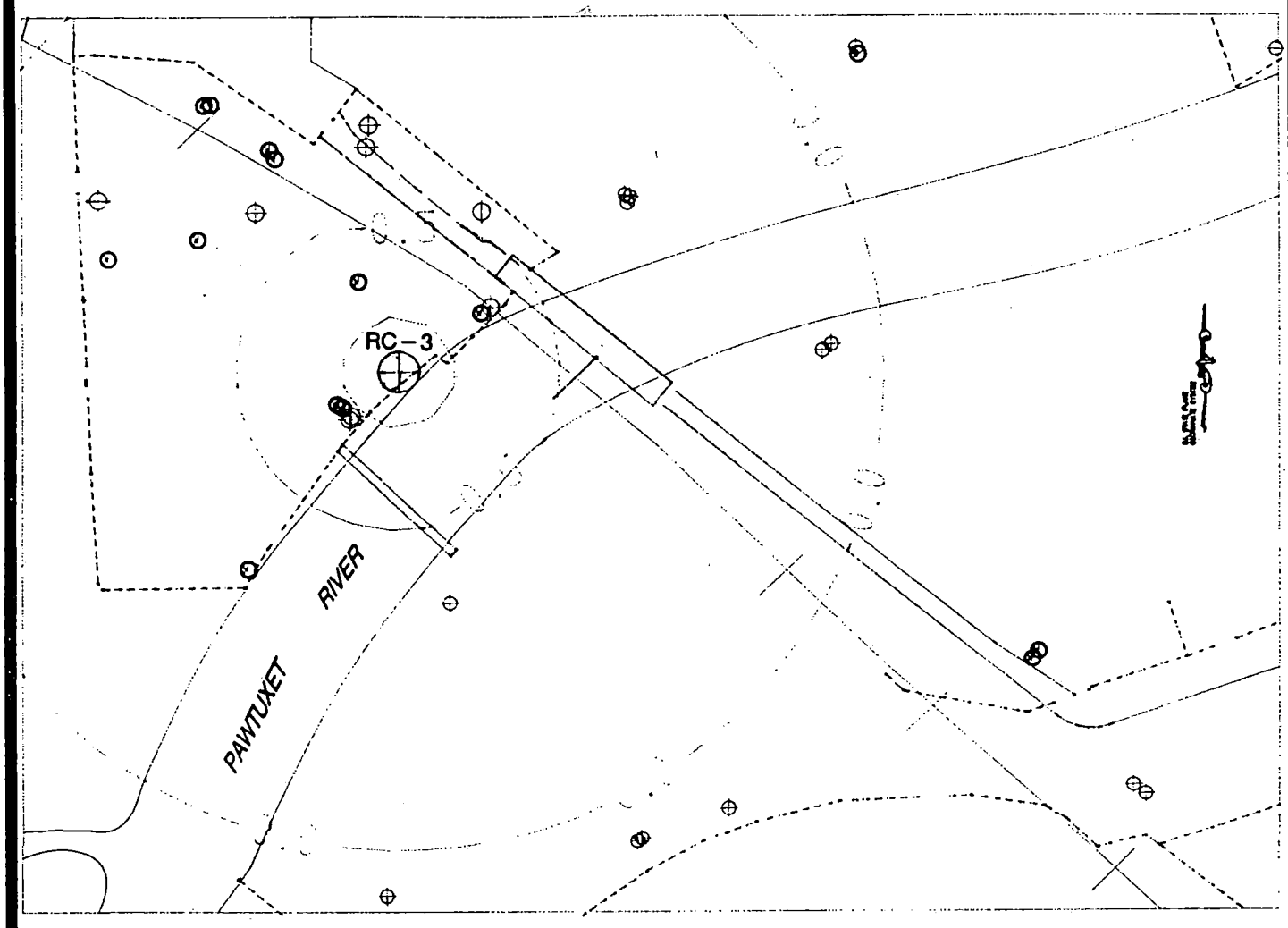
Geraghty & Miller, Inc. *QUICKFLOW — Analytical 2D ground-water flow model, Version 1.10.* Geraghty & Miller Modeling Group, Reston, VA, September 1991.

Strack, O.D.L. *Groundwater mechanics.* Englewood Cliffs, NJ: Prentice Hall, 1989.

Table L-1. Quickflow Modeling Input Parameters

	Proposed Recovery Well Simulations		
	RC-3	RC-4	RC-5
Hydraulic Conductivity (ft/min)	0.16	0.023	0.023
Storativity	0.0025	0.0045	0.0045
Top of Aquifer Elevation (ft MSL)	10	-19.5	10
Bottom of Aquifer Elevation (ft MSL)	-15	-44.5	-15
Porosity	0.30	0.30	0.30
Flow Rate of Recovery Well (gpm)	50	12	10
Hydraulic Gradient	0	0	0
Uniform Recharge Rate	0	0	0
Reference Head	0	0	0
Hantush Leakage Factor	0	0	0
Time to Complete Solution	*	*	*

*Time to complete the solutions is not required for steady-state analyses.



LEGEND:

—0.0— DRAWDOWN (IN FEET)

PROPOSED RECOVERY WELL

EXISTING PIEZOMETERS

EXISTING MONITORING WELLS

0 160 320 FT

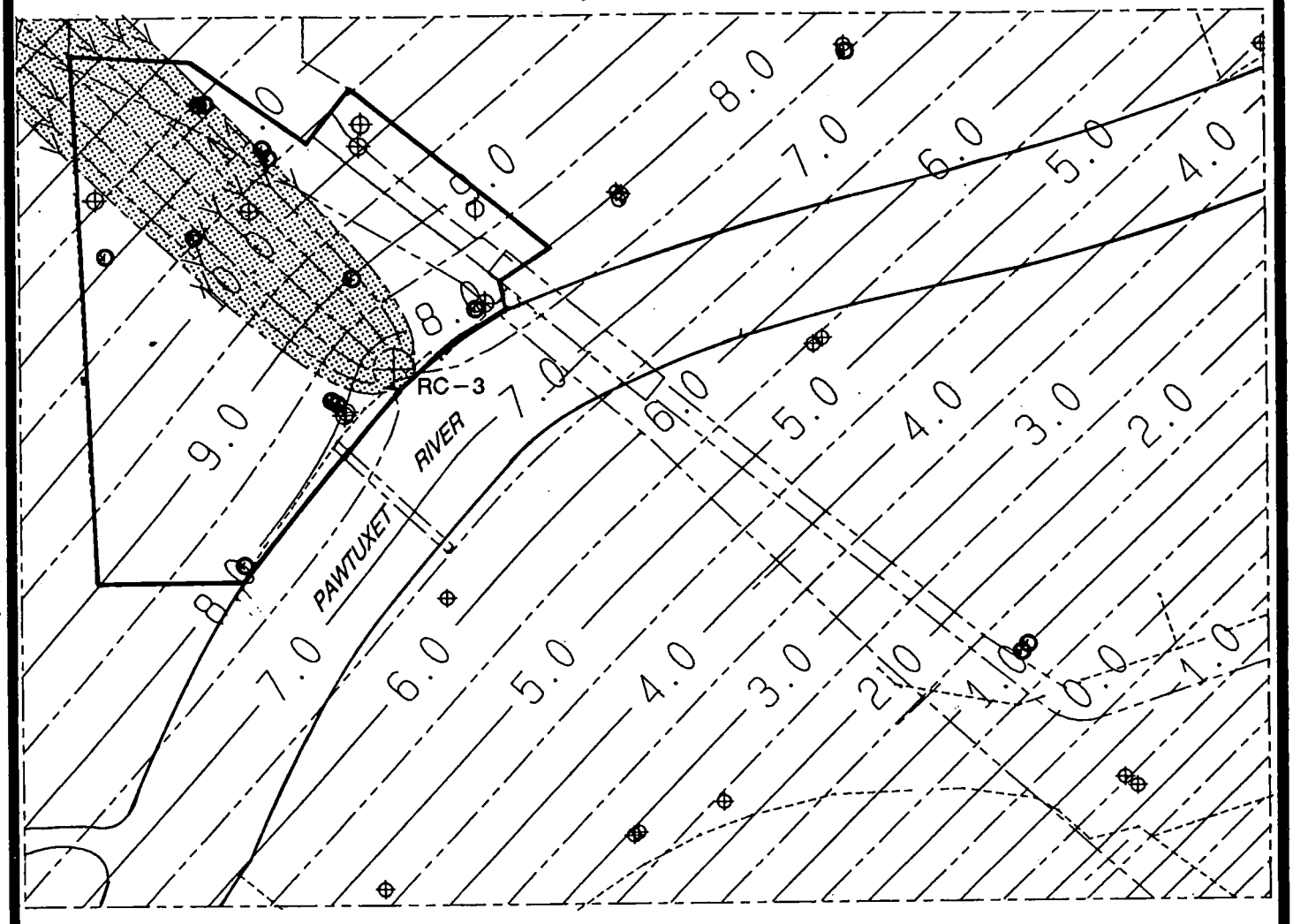
SCALE

DRAWDOWN FROM RC-3
ESTIMATED FROM QUICKFLOW MODELING

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

DR. BY:	KJF	SCALE:	1 : 1920	PROJ. NO.:	87X4660
CK'D BY:	TR	DATE:	MAR. 9, 1993	FIG. NO.:	L-1



0 160 320 FT

SCALE

LEGEND:

—5.0— EQUIPOTENTIAL LINE

PARTICLE TRACE

PROPOSED RECOVERY WELL

EXISTING PIEZOMETERS

EXISTING MONITORING WELLS

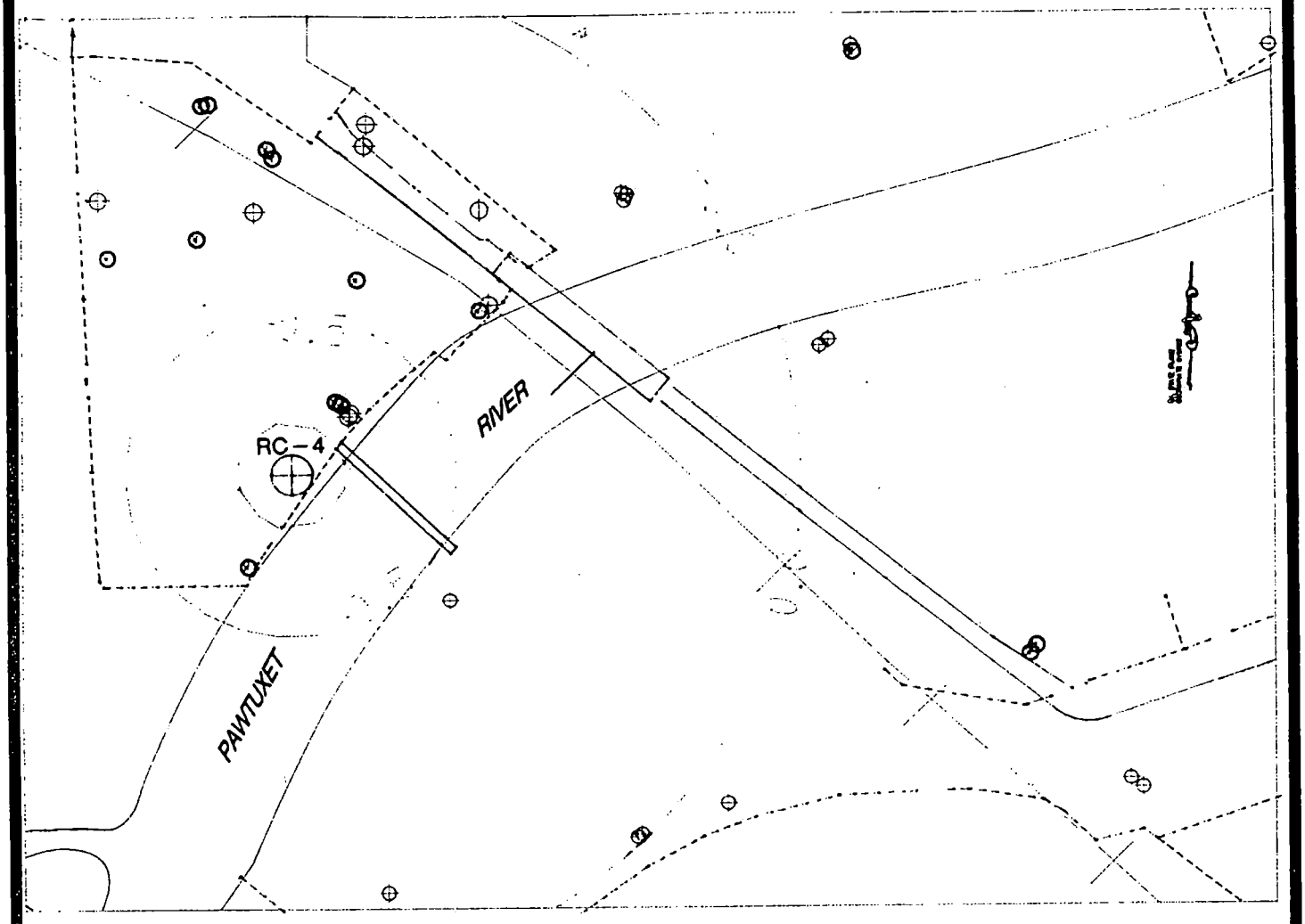
CAPTURE ZONE OF RECOVERY WELL

PARTICLE TRACING FOR RC-3 FROM QUICKFLOW

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

DR. BY:	KJF	SCALE:	1 : 1920	PROJ. NO.:	87X4660
CK'D BY:	TRP	DATE:	APR. 20, 1993	FIG. NO.:	L-2



LEGEND:

—a0— DRAWDOWN (IN FEET)

PROPOSED RECOVERY WELL

EXISTING PIEZOMETERS

EXISTING MONITORING WELLS

0 160 320 FT

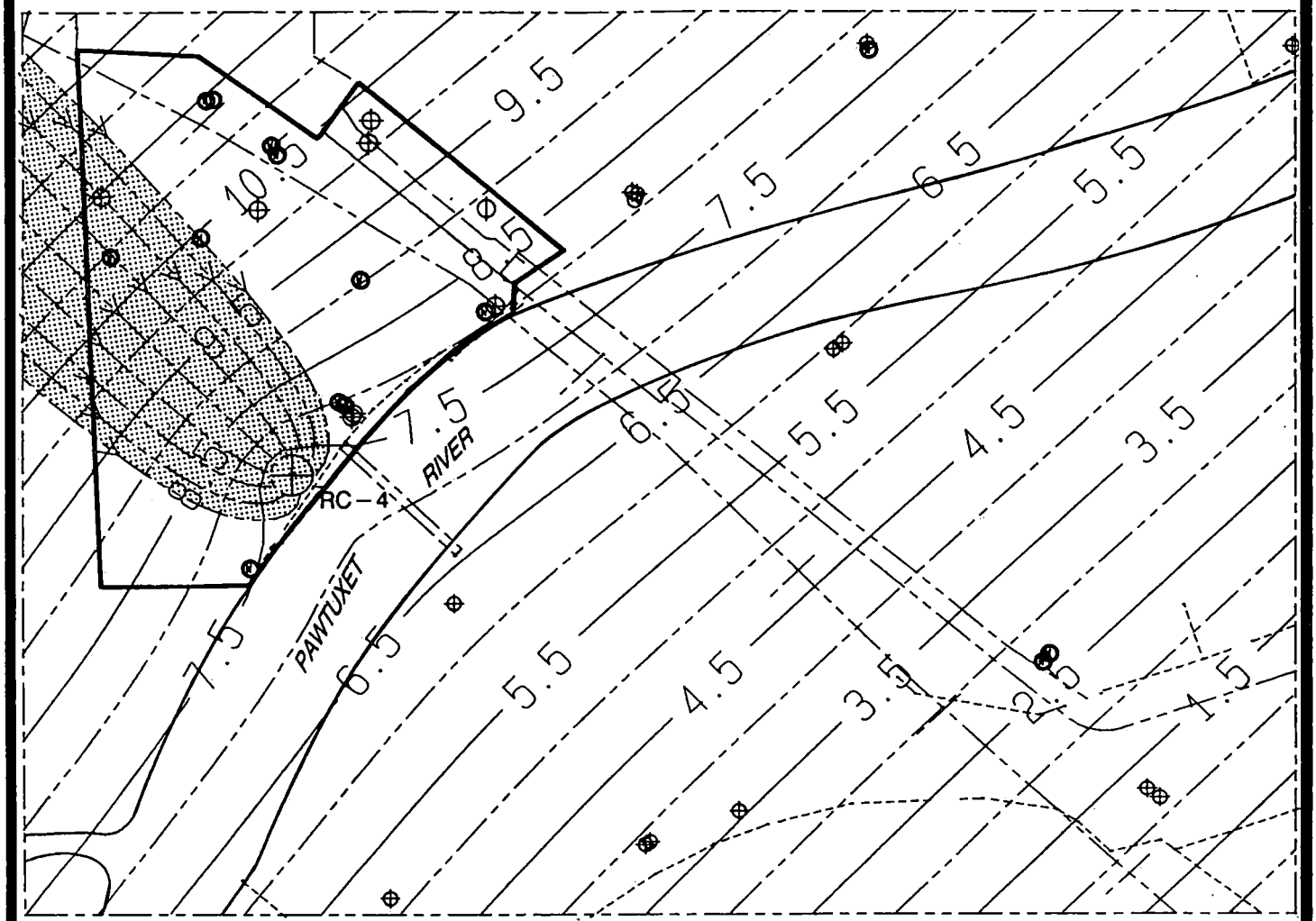
SCALE

DRAWDOWN FROM RC-4
ESTIMATED FROM QUICKFLOW MODELING

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

DR. BY:	KJF	SCALE:	1: 1920	PROJ. NO.:	87X4660
CK'D BY:	TR	DATE:	MAR. 9, 1993	FIG. NO.:	L-3



0 160 320 FT

SCALE

LEGEND:

—5.5— EQUIPOTENTIAL LINE

PARTICLE TRACE

PROPOSED RECOVERY WELL

EXISTING PIEZOMETERS

EXISTING MONITORING WELLS

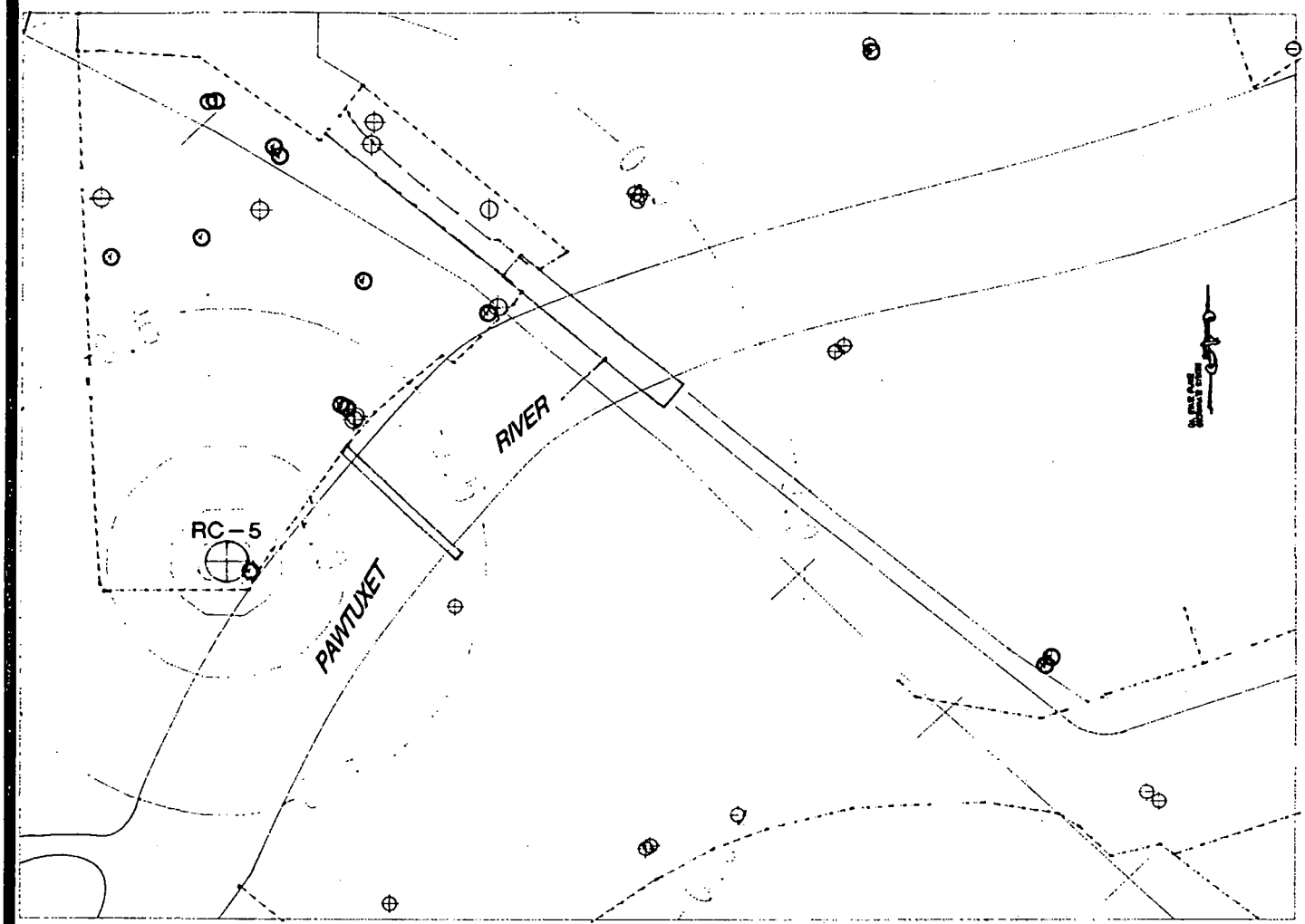
CAPTURE ZONE OF RECOVERY WELL

PARTICLE TRACING FOR RC-4 FROM QUICKFLOW

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

DR. BY:	KJF	SCALE:	1 : 1920	PROJ. NO.:	87X4660
CK'D BY:	TRP	DATE:	APR. 20, 1993	FIG. NO.:	L-4



LEGEND:

— 0.0 — DRAWDOWN (IN FEET)

PROPOSED RECOVERY WELL

EXISTING PIEZOMETERS

EXISTING MONITORING WELLS

0 160 320 FT

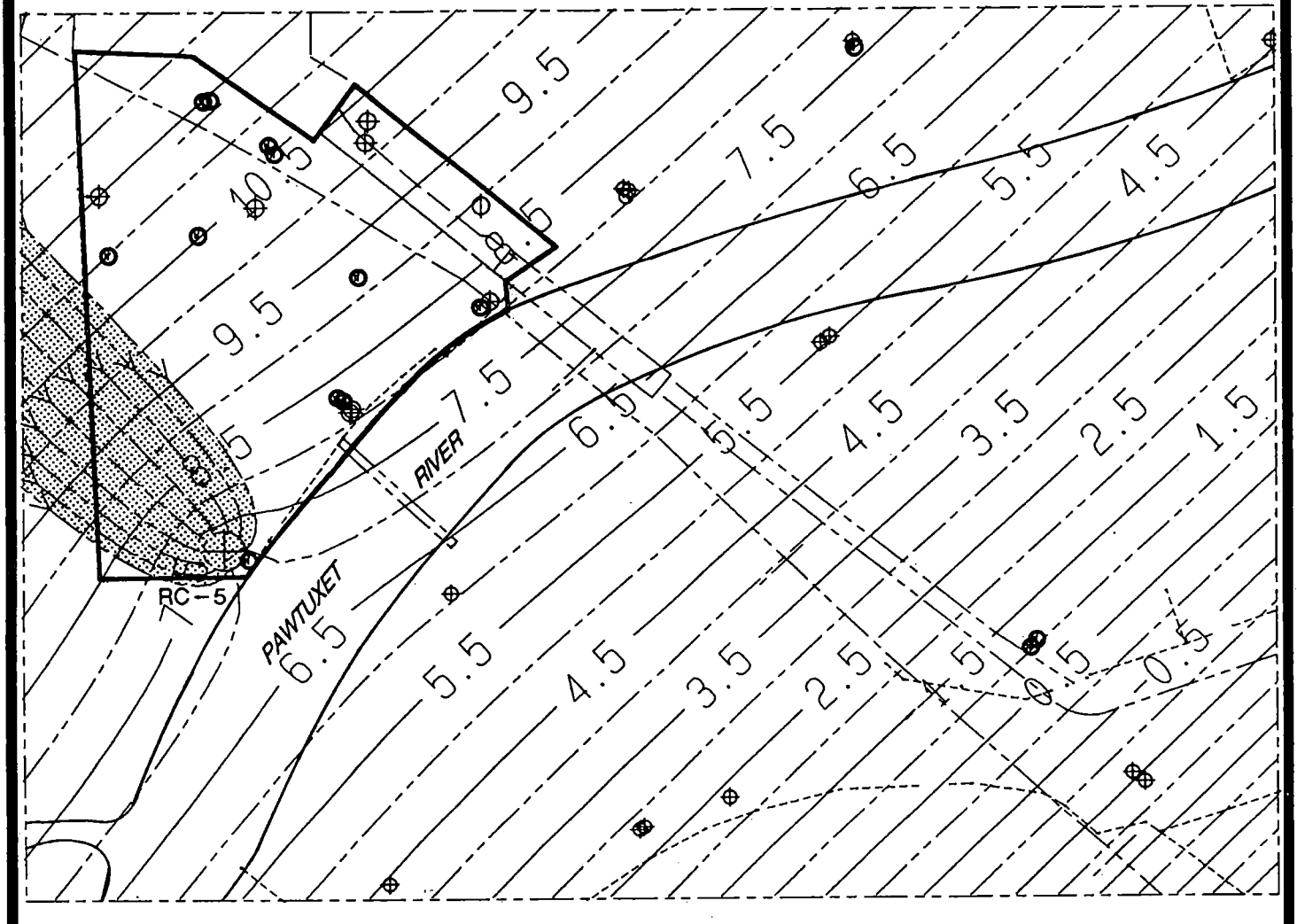
SCALE

DRAWDOWN FROM RC-5 ESTIMATED FROM QUICKFLOW MODELING

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

DR. BY:	KJF	SCALE:	1 : 1920	PROJ. NO.:	87X4660
CK'D BY:	TR	DATE:	MAR. 9, 1993	FIG. NO.:	L-5



0 160 320 FT

SCALE

LEGEND:

—4.5— EQUIPOTENTIAL LINE

—→ PARTICLE TRACE

⊕ PROPOSED RECOVERY WELL

EXISTING PIEZOMETERS

EXISTING MONITORING WELLS

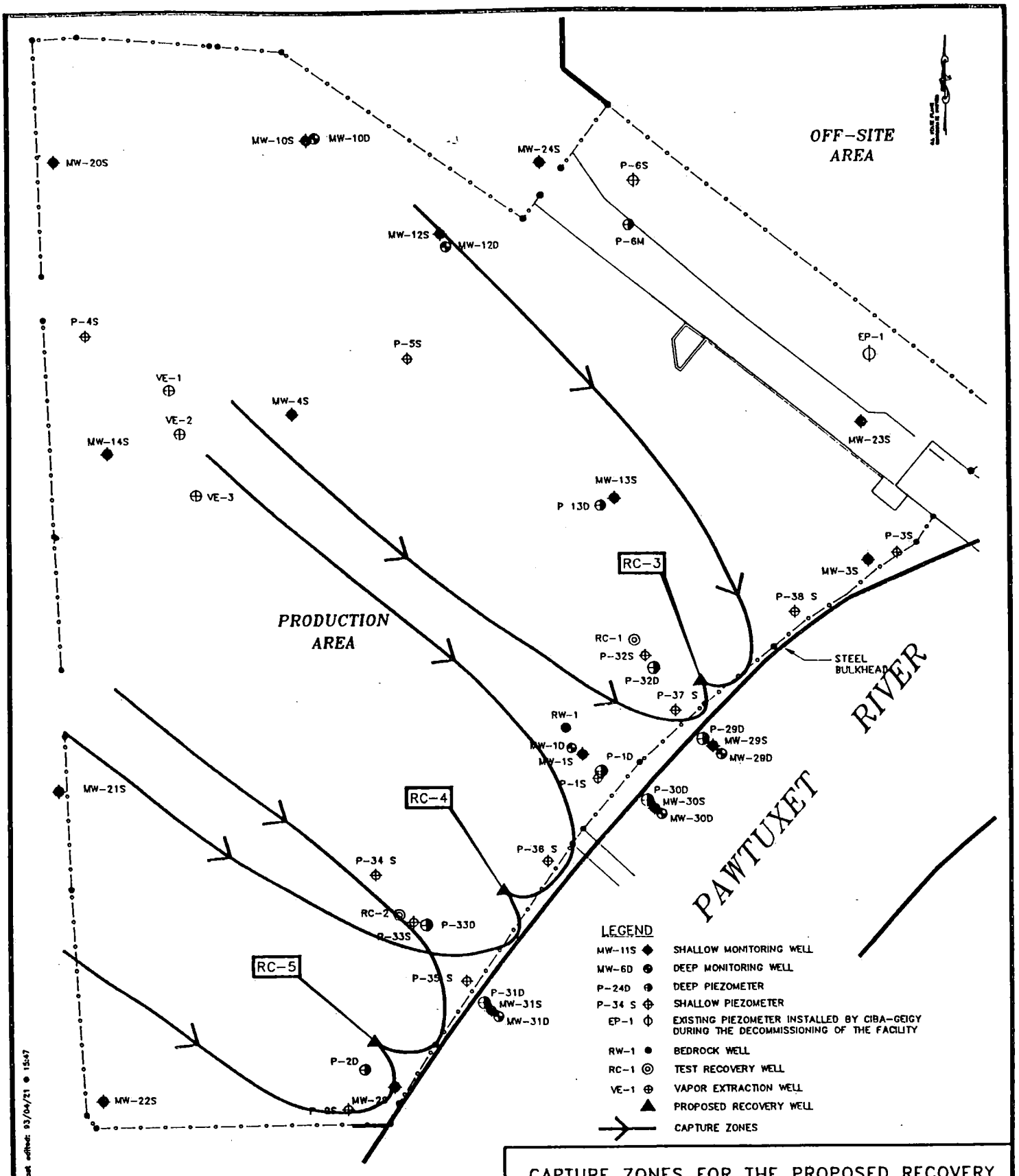
CAPTURE ZONE OF RECOVERY WELL

PARTICLE TRACING FOR RC-5 FROM QUICKFLOW

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

DR. BY:	KJF	SCALE:	1 : 1920	PROJ. NO.:	87X4660
CK'D BY:	TRP	DATE:	APR. 20, 1993	FIG. NO.:	L-6



CAPTURE ZONES FOR THE PROPOSED RECOVERY WELLS ESTIMATED FROM QUICKFLOW MODELING

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

DR.BY	MG	SCALE	1:720	PROJ.	87X4660
CK'D.BY	CLH	DATE	APRIL 19, 1993	FIG.NO.	L-7

File name: G:\DWG\PLOT1.DWG Last edited: 03/04/21 @ 15:47

Appendix M

M

INDUSTRIAL WASTEWATER PERMIT NO. 0321

This appendix presents Industrial Wastewater Discharge Permit Number 0321 issued to CIBA-GEIGY Corporation by the Cranston, Rhode Island POTW.

The Self-Monitoring Report Form is divided into two general parts, the sampling protocol and instruction sheet, and; the report form. The report form further consists of three sections as follows:

Section I - Company Information
Section II - Miscellaneous
Section III - Summary Analysis Sheet

Noncompliance with any terms or conditions of this Permit shall constitute a violation of the Cranston, RI Sewer Use Ordinance and be subject to enforcement actions including but not limited to fines, penalties and/or termination of sewer service.

In accordance with the provisions listed in Section F.9. of this Permit, entitled Permit Appeals, the Permittee may petition to appeal the terms of this Permit within ten (10) days of receipt of this notice. The petition must be in writing; failure to submit a petition for review shall be deemed to be a waiver of the appeal. In its petition, the Permittee must indicate the Permit provisions objected to, the reasons for these objections, and the alternative conditions, if any, it seeks to be placed in this Permit.

This Permit shall become effective on September 30, 1992 and shall expire at midnight on December 30, 1992. If the Permittee wishes to continue to discharge following the expiration date of this Permit, an application must be filed for a renewal permit in accordance with the provisions listed in Section F.10. of this Permit, entitled Duty to Reapply, on or before December 16, 1992.

Very truly yours,

DEPARTMENT OF PUBLIC WORKS

Joseph W. Migneault, P.E.
Acting Director

Encls.

cc: Tutela Engineering Assoc., Inc., w/encls.
Gina Friedman, RIDEM, w/encls.

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SECTION C - Reporting Requirements

Permit No.: 0321

1. Spill Prevention Control Plan: As set forth in Section B.1, entitled Time Schedules, the Permittee must submit to the Director a Spill Prevention Control Plan to provide protection from accidental discharge of prohibited materials and substances to the sewer. The Spill Prevention Control Plan must include the following:

   a) A detailed list and plan showing the location of all stored chemicals, toxic materials, and hazardous substances with a description of each tank's size and contents.

   b) Also, the plan must indicate the location of all trenches, sumps, floor drains, and spill containment berms.

   c) A description as to whether each trench, sump, or floor drain discharges to the sewer, pretreatment system, or other (specify).

   d) The necessary actions to be taken should a spill occur.

   e) Any proposed installation of containment berms and/or other facilities to prevent spill contamination of the sewer system. A description, installation dates, and times of completion of each proposed action should be indicated.

2. Submission of Analysis Results: If the Permittee monitors any pollutant more frequently than required by this Permit, in accordance with the analysis procedures prescribed in the Sampling Protocol on pages SM-3 to SM-5 of the Self-Monitoring Report (SMR) Form, the analysis results of this monitoring shall be submitted to the Director within 30 days following the sample date, including completed pages SM-15 and SM-16 of the SMR Form indicating the date sampled, sampling time, sampling location, etc.

3. Notification of Violation: If, in accordance with the procedures prescribed in item "2." of the Sampling Protocol on pages SM-3 to SM-5 of the Self-Monitoring Report (SMR) Form, monitoring performed by the Permittee, or his representative, indicates a violation, the Permittee shall submit a copy of the analysis results to the Director, including completed pages SM-15 and SM-16 of the SMR Form or pages SM-11 to SM-16 in cases of Demand or Scheduled Monitoring, within 24 hours of becoming aware of the violation. The Permittee shall also repeat the sampling and analysis for those parameters in violation and submit the results of the repeat analysis including completed pages SM-15 and SM-16 of the SMR Form, to the City within thirty (30) days after becoming aware of the violation, except the Permittee is not required to resample if:

   a) The City or the Permittee performs monitoring of their wastewater discharge for the parameters in violation at a frequency of at least once per month; or

   b) The City performs monitoring of the Permittee's wastewater discharge for the parameters in violation between the time when the Permittee performs its initial monitoring and the time when the Permittee receives the results of this monitoring.

SECTION C - Reporting Requirements (Cont'd)

6. Bypass of Treatment Facilities:

a) Bypass is prohibited unless it is unavoidable to prevent loss of life, personal injury, or severe property damage or no feasible alternatives exist.

b) The Permittee may allow bypass to occur which does not cause effluent limitations to be exceeded, but only if it is also for essential maintenance to assure efficient operation.

c) Notification of bypass:

(1) Anticipated bypass. If the Permittee knows in advance of the need for a bypass, it shall submit prior written notice, at least ten days before the date of the bypass, to the Director.

(2) Unanticipated bypass. The Permittee shall immediately notify the Cranston Wastewater Treatment Facility and Tutela Engineering Associates, Inc. and submit a written notice to the Director and the Cranston Wastewater Treatment Facility within 5 days. This report shall specify:

(i) A description of the bypass, and its cause, including its duration;

(ii) Whether the bypass has been corrected; and

(iii) The steps being taken or to be taken to reduce, eliminate and prevent a reoccurrence of the bypass.

7. Planned Changes: The Permittee shall give notice to the Director 90 days prior to any facility expansion, production increase, or process modifications which results in new or substantially increased discharges or a change in the nature of the discharge.

8. Anticipated Noncompliance: The Permittee shall give advance notice to the Director of any planned changes in the Permitted facility or activity which may result in noncompliance with Permit requirements.

9. Duty to Provide Information: The Permittee shall furnish to the Director, within fourteen (14) days unless specified otherwise, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this Permit. The Permittee shall also, upon request, furnish to the Director within fourteen (14) days, unless specified otherwise, copies of any records required to be kept by this Permit.

10. Signatory Requirements: All reports required by this Permit shall be signed in accordance with 40 CFR 403.12 (l) by an authorized company representative being a principal executive officer, ranking elected official or duly authorized employee if such employee is responsible for overall operation of said company.

Permit No.: 0321

SECTION E - Monitoring Conditions

1. Self-Monitoring Reports: The Permittee is required to submit Self-Monitoring Reports to the Director with the sampling performed in accordance with the Sampling Protocol on pages SM-3 to SM-5 of the Self-Monitoring form during the following months of each and every year this Permit is in effect:

* January X February X March X April X May X June X July X
August X September X October X November X December X

Self-Monitoring Reports, pages SM-11 through SM-16, including analytical results (the original Certificate of Analysis), must be completed and submitted within fourteen (14) days of the date of Self-Monitoring corresponding to each and every event required in this Permit.

Attached is the Self-Monitoring Report Form, pages SM-1 to SM-16, all of which is considered as part of this Permit.

The Permittee shall sample their process wastewater discharge from the following location(s):

Location #1: Sampling tap following final pH adjustment tank on treatment system located in building #15.

Location #2: N/A

Location #3: N/A

Location #4: N/A

* During the sampling month(s) of: January, February, March, April, May, June, July, August, September, October, November, December

The following parameter(s) must be analyzed for:

Location #1: Maximum Day: Antimony, Arsenic, Beryllium, Cadmium, Chromium, Copper, Lead, Manganese, Mercury, Nickel, Silver, Zinc, Total Cyanide, TTO (624, 625)

Average 4-day: N/A

Monthly Average: N/A

* Self-Monitoring must be performed during the first and third weeks of each and every month as indicated in Section E.1, Self-Monitoring Reports, above.

SECTION E - Monitoring Conditions (Cont'd)

Location #2: Maximum Day: N/A

Average 4-day: N/A

Monthly Average: N/A

Location #3: Maximum Day: N/A

Average 4-day: N/A

Monthly Average: N/A

Location #4: Maximum Day: N/A

Average 4-day: N/A

Monthly Average: N/A

The Permittee's monitoring schedule is based on a process wastewater flow of about; Location #1: 28,800 (GPD), Location #2: N/A (GPD), Location #3: N/A (GPD), Location #4: N/A (GPD). This schedule is subject to change in accordance with Table I of the Self-Monitoring Report Form should the total process wastewater flow discharged by the Permittee at any time exceed; Location #1: 50,000 (GPD), Location #2: N/A (GPD), Location #3: N/a (GPD), Location #4: N/A (GPD), or fall below; Location #1: 10,000(GPD), Location #2: N/A (GPD), Location #3: N/A (GPD), Location #4: N/A (GPD).

2. Flow Measurements: If flow measurement is required by this Permit, the appropriate flow measurement devices and methods consistent with approved scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated, and maintained to ensure that the accuracy of the measurements are consistent with

SECTION E - Monitoring Conditions (Cont'd)

b) All records that pertain to matters that are subject to special orders or any other enforcement or litigation activities brought by the Director shall be retained and preserved by the Permittee until all enforcement activities have concluded and all periods of limitation with respect to any and all appeals have expired.

SECTION F - Standard Conditions

1. Duty to Comply: The Permittee must comply with all conditions of this Permit. Failure to comply with the requirements of this Permit may be grounds for administrative action, or enforcement proceedings including civil or criminal penalties, injunctive relief, and summary abatements.

2. Duty to Mitigate: The Permittee shall take all reasonable steps to minimize or correct any adverse impact to the public treatment plant or the environment resulting from noncompliance with this Permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

3. General Monitoring and Reporting Requirements: In addition to monitoring and reporting required by this Permit, the Permittee shall comply with, at a minimum, EPA Categorical Pretreatment Standards [Title 40 Code of Federal Regulations Subchapter N], National Prohibited Discharges (general and specific) [Title 40 Code of Federal Regulations Parts 403.5 (a) and (b)], and EPA General Pretreatment Regulations for Existing and New Sources of Pollution [Title 40 Code of Federal Regulations Part 403.12].

4. Annual Publication: A list of all industrial users which were significantly violating applicable Pretreatment Standards or other Pretreatment Requirements during the previous twelve (12) months as set forth in Title 40 Code of Federal Regulations Part 403.8 (f)(2)(vii) of the EPA General Pretreatment Regulations for Existing and New Sources of Pollution shall be published annually by the Director in the largest daily newspaper within its service area. Accordingly, the Permittee is apprised that noncompliance with this Permit may lead to an enforcement action and may result in publication of its name in an appropriate newspaper in accordance with this section.

5. Civil and Criminal Liability: Nothing in this Permit shall be construed to relieve the Permittee from administrative, civil and/or criminal penalties and fines for noncompliance under Sections 26-63 of the Cranston, RI Sewer Use Ordinance or State and/or Federal laws and/or regulations.

6. Revocation of Permit: The Permit issued to the Industrial User by the City may be revoked by the City when, after inspection, monitoring, and/or review of data or analyses it is determined that the discharge of wastewater to the City's sewer system is in violation of Federal, State and/or Local laws, ordinances, and/or regulations. Violations include but are not limited to the following:

   a. Failure to accurately report the wastewater constituents and characteristics of any wastewater discharge;

A City Council's decision not to reconsider a final Permit shall be considered final administrative action for purposes of judicial review. The Permittee seeking judicial review of the Council's final action must do so by filing a complaint with the Superior Court for Providence County within thirty (30) days of the City Council's decision.

10. Duty to Reapply: Within fourteen (14) days prior to the expiration date of this Permit, the Permittee shall submit a written request for reapplication to the Director of Public Works for a new Industrial Wastewater Discharge Permit. The Permittee must reapply to the Director on or before December 16, 1992 .

11. Continuation of Expired Permits: An expired Permit will continue to be effective and enforceable until the Permit is reissued if:

    a. The Permittee has submitted a complete Permit application at least ninety (90) days prior to the expiration date of the user's existing Permit.

    b. The failure to reissue the Permit, prior to expiration of the previous Permit, is not due to any act or failure to act on the part of the Permittee.

12. Compliance with Applicable Pretreatment Standards and Requirements: Compliance with this Permit does not relieve the Permittee from its obligations regarding compliance with any and all applicable Local, State and Federal pretreatment standards and requirements including any such standards or requirements that may become effective during the term of this Permit.

13. Proper Operation and Maintenance: In addition to the requirements set forth in Section 26-52, entitled Monitoring Facility Requirements of the Cranston, RI Sewer Use Ordinance, the Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this Permit. Proper operation and maintenance includes but is not limited to: effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this Permit.

14. Duty to Halt or Reduce Activity: Upon reduction of efficiency of operation, or loss or failure of all or part of the treatment facility, the Permittee shall, to the extent necessary to maintain compliance with its Permit, control its production or discharges (or both) until operation of the treatment facility is restored or an alternative method of treatment is provided. This requirement applies, for example, when the primary source of power of the treatment facility fails or is reduced. It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Permit.

15. Proper Disposal of Pretreatment Sludges and Spent Chemicals: Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in accordance with Section 405 of the Clean Water Act and Subtitles C and D of the Resource Conservation and Recovery Act.

Permit No.: 0321

Section G - Special Conditions

1. Compliance Schedule: In accordance with the following schedule, the Permittee is required to install wastewater pretreatment devices as needed to maintain full and continued compliance with all Federal, State and Local discharge limitations, including the Wastewater Discharge Limitations set forth in Section D.1 of this Permit. The Scheduled Tasks must be completed by each Compliance Date as follows:

Scheduled Task	Compliance Date
a. Evaluate current compliance status and develop compliance strategy.	N/A
b. Design wastewater pretreatment system.	N/A
c. Order wastewater pretreatment equipment.	N/A
d. Install wastewater pretreatment equipment.	N/A
e. Start-up and debug wastewater pretreatment system.	N/A

Within seven (7) days following each compliance date, the Permittee must submit to the Director a progress report on the scheduled task. The progress report must include plans, specifications and documents generated for completion of the scheduled task. Should the compliance date not be met, the Permittee must submit a Compliance Schedule Report to the Director within seven (7) days following each compliance date. The Compliance Schedule Report form is on page DP-17 of this Permit.

2. Flow Measurement: In accordance with the following schedule, the Permittee must install a flow metering device(s) just downstream of Sampling Locations N/A _____ as described in Section E, entitled Monitoring Conditions, of this Permit and before dilution with other wastestreams. Each metering device must account for all process discharge passing the sampling location and be installed at a location free from flow conditions which may interfere with accurate readings. As an alternative to monitoring the process discharge(s) to the sewer, the Permittee may install water meters on each incoming water line which supplies water to the process(es) corresponding to each sampling location. An incoming water meter will not be subject to corrections to discharge flow based on evaporation, product make-up, correspondence to other unregulated uses, or other losses. Any metering device selected must be capable of measuring the range of discharge flows in gallons with an accuracy of ± 1% of full scale and have the following capabilities, as checked [X]: 1. [X] Instantaneous readout; 2. [X] Non-resettable totalizer; and 3. [ ] Continuous chart recorder. The Scheduled Tasks must be completed by each Compliance Date as follows:

Scheduled Task	Compliance Date
a. Determine location and flow monitoring device proposed for installation.	N/A
b. Order flow metering device and associated equipment.	N/A
c. Install flow metering device.	N/A
d. Start-up and calibrate flow metering device.	N/A

Permit No.: 0321

SECTION G - Special Conditions (Cont'd)

Scheduled Task	Compliance Date
a. Determine sampling location proposed for installation.	N/A
b. Order sampling location equipment.	N/A
c. Install sampling location.	N/A

Within seven (7) days following each compliance date, the Permittee must submit to the Industrial Pretreatment Program Manager, a progress report on the scheduled task. The progress report must include plans, specifications and documents generated for completion of the scheduled task. Should the compliance date not be met, the Permittee must submit a Compliance Schedule Report to the Director within seven (7) days following each compliance date. The Compliance Schedule Report form is on page DP-17 of this Permit.

Section H - Signatory

Effective Date of Permit: September 30, 1992 Expiration Date of Permit: December 30, 1992

September 30, 1992
Date

Approved by:

Joseph W. Migneault, P.E
Acting Director of Public Works

TUTELA ENGINEERING ASSOCIATES
P.O. Box 28066
Providence, R.I. 02908

INDUSTRIAL WASTEWATER PRETREATMENT PROGRAM
CRANSTON, R.I.

SELF-MONITORING REPORT FORM

The effective management of an industrial wastewater pretreatment program requires a constant flow of reliable information on the quality and quantity of industrial contributions to the publicly-owned system.

Self-Monitoring is one of the most important parts of a pretreatment program. Self-Monitoring will be conducted by the industries and the information obtained may then be applied to specific areas of interest. These areas may include compliance with EPA, Discharge Permit and/or Sewer Use Ordinance requirements, ascertaining usercharge fees, and completion of reports required by the R.I. Department of Environmental Management (RIDEM) and the U.S. Environmental Protection Agency (EPA). The frequency of self-monitoring has been determined by using TABLE I, which is based on discharge volume and whether or not a given pollutant in the discharge is above Federal, State and/or Local limits (out of compliance) or below Federal, State and/or Local limits (in compliance).

Along with the Self-Monitoring Report (SMR) Form, an instruction sheet has been prepared to familiarize the User with the information contained in the form.

Self-monitoring is required of all parameters as indicated in Section E, entitled Monitoring Conditions, of the Permittee's Industrial Wastewater Discharge Permit.

When "Director" is referred to in this form, it shall mean the Cranston, RI Director of Public Works or his designee, Tutela Engineering Associates, Inc. (Program Manager).

All reports are to be sent to:

Tutela Engineering Associates, Inc.
P.O. Box 28066
Providence, R.I. 02908

Note: Please keep blank copies of this form on hand for future submittals. A computer generated reproduction of this form will not be accepted.

SAMPLING PROTOCOL

1. Self-monitoring sampling shall be performed over a full operational day(s) during the months specified in Section E, entitled Monitoring Conditions, of the Permittee's Industrial Wastewater Discharge Permit.

2. All measurements, tests, and analyses of the characteristics of water and wastes to which reference is made in this Self-Monitoring Report Form shall be performed by an independent, non-affiliated, State certified laboratory and shall be determined in accordance with EPA acceptable methods as published in the latest version or edition of EPA "Guidelines Establishing Test Procedures for the Analysis of Pollutants", Title 40 Code of Federal Regulations Part 136 (and amendments thereto) and shall be determined at the monitoring facility provided, or upon suitable samples taken at said monitoring facility. Phenols shall be as analyzed by wet chemistry methods given in EPA Guidelines and not acid-extractable, semi-volatile phenols.

3. Samples must be collected from the monitoring location(s) indicated in Section E, entitled Monitoring Conditions, of the Permittee's Industrial Wastewater Discharge Permit. This location(s) should be easily accessible and provide a well-mixed wastestream. Repetitive samples should always be taken in the same location. Samples should be taken immediately downstream from the regulated process, including any pretreatment equipment, and prior to dilution with any other wastestream(s). If it is not possible to take a sample of the regulated process wastewater before dilution with other wastestreams, then the flows from these additional streams must be reported.

4. Samples should be flow-proportional composited, if possible, over a full operational day, except as otherwise required herein. If it is not possible to take flow-proportional composite samples, then continuous composite or composite samples consisting of at least twelve (12) equal volume grab samples drawn at equal time intervals during the monitoring period, not to exceed one (1) hour, shall be taken over a full operational day, except as otherwise required herein.

   A full operational day shall mean the total accumulated time during a twenty-four (24) hour period that the Permittee discharges, to the sewer system, any wastewaters at a sampling location for which monitoring is being conducted.

5. A composite shall be taken whenever the wastestream is a continuous discharge. A continuous discharge is defined as an effluent flow which is discharged into the collection system for 100% of the time for which a firm's manufacturing processes are in operation.

6. Grab and grab-composite samples shall be taken during intermittent discharge(s). An intermittent discharge is defined as an effluent flow collected from a firm's manufacturing processes which is discharged into the collection system sporadically or periodically. Intermittent flows exclude those flows that are continuous. Batch discharges would fall under intermittent. Samples must be taken during batch discharging if any process wastewaters are batch treated.

7. All samples must be properly preserved from the time they are collected until they are analyzed. Required preservation techniques and sample holding times must be maintained at all times in accordance with 40 CFR Part 136 "Guidelines Establishing Test Procedures for the Analysis of Pollutants".

Sulfuric Acid to maintain a pH < 2 and packed in ice to maintain a temperature of 4 deg C (39.2 deg F). A minimum of four (4) grab samples shall be taken at even time intervals throughout the monitoring period. Batch dischargers are required to take only one (1) grab sample for Oil & Grease analysis.

17. Sampling for Total Phenols and Sulfide shall consist of a minimum of four (4) grab samples taken at even time intervals throughout the monitoring period. Batch dischargers are required to take only one (1) grab sample for Total Phenols and Sulfide analysis.

18. All samples must be packed in ice at all times, especially during sampling, storage and transport to the laboratory for analysis, to maintain a temperature of 4 deg C (39.2 deg F).

19. All industrial Self-Monitoring shall be performed in accordance with the above conditions, applicable City, EPA, and RIDEM Pretreatment Standards and Requirements, permits issued by the City of Cranston under the provisions of the Sewer Use Ordinance and contractual agreements with the City. In cases of conflicting monitoring requirements, the more stringent thereof shall apply.

All Industrial Users required to monitor their discharge shall maintain records as required by Federal, State and/or Local regulations and report the results of such monitoring to the Director, as required. Such records shall be made available upon request by the Director, to other agencies having jurisdiction over discharges to the receiving waters, or as public record as provided for in Federal, State and/or Local regulations.

When filling out the Self-Monitoring Report Form, if a particular section or part of a section does not apply to your operation, please indicate so with N/A (Not Applicable) in the appropriate space.

INSTRUCTION SHEET

Line 1.6 Give the number of Full and Part-time Employees at your company.

Line 1.7 Circle one of the four names which best describes the Nature of the Business of your company.

Line 1.7a If "Other" is circled on line 1.7, specify the nature of the business on this line.

Line 1.8 Give the Standard Industrial Classification (SIC) code number(s) of the Company listed on line 1.0. Note: Applicable SIC codes appear on page DP-1, second paragraph, of your company's Industrial Wastewater Discharge Permit.

Line 1.9 Give the current total water usage in gallons per day. This figure is to be based on a 30-day average and may be taken from a water meter(s), if available.

Line 1.10 Give the measured or accurately estimated average daily and maximum daily effluent wastewater flows (total flow) in gallons per day to the sewer system for each of the sampling locations indicated in Section E, entitled Monitoring Conditions, of your company's Industrial Wastewater Discharge Permit.

Line 1.10a If applicable, give the measured or accurately estimated average daily and maximum daily dilution wastewater flows (non-contact cooling water, sanitary wastewater, etc.) in gallons per day for each of the sampling locations indicated in Section E, entitled Monitoring Conditions, of your company's Industrial Wastewater Discharge Permit.

Line 1.10b Check the appropriate box(es) and indicate the frequency of discharge from each of your company's process and/or dilution flows at each monitoring location.

Line 1.11 Check the appropriate box indicating whether or not your wastewater discharge is intermittent or continuous at each monitoring location.

Note: Continuous is defined as an effluent flow which is discharged into the collection system for 100% of the time for which your manufacturing processes are in operation.

Note: Intermittent is defined as an effluent flow which is discharged into the collection system sporadically or periodically during the time for which your manufacturing processes are in operation. Intermittent flows exclude those flows that are continuous. Batch discharges would fall under intermittent.

Line 1.11a If intermittent was checked on line 1.11, give the time(s) and day(s) of the intermittent discharges at each monitoring location.

INSTRUCTION SHEET

Line 2.5a If you answered "yes" on line 2.5, describe your pretreatment method here. If you answered "no" on line 2.5, write N/A on this line.

Line 2.6 Indicate here whether or not any sludge (solids accumulated in treatment processes such as metal hydroxide sludge), grit, etc. is produced within your facility.

Line 2.6a If you answered "no" on line 2.6, write N/A on this line. If you answered "yes" on line 2.6, indicate here how you dispose of it and by whom.

Section III - The heart of Section III is the results of the analysis conducted on your wastewater discharge(s) by an independent, non-affiliated, State certified laboratory. This Section must be filled out completely with every submittal.

Line 3.1 On this line, list the number of separate wastewater discharge pipes (outfalls) which are connected directly to the sewer system.

Line 3.1a Indicate here the sewer line (street name) to which your wastewater discharge pipe is connected for each of your outfalls.

Line 3.1b Indicate the wastewater treatment plant (WWTP) to which your company's wastewater discharges.

Line 3.1c Indicate here the number of individual aliquots comprising the sample which is to be analyzed from each of your company's monitoring locations as defined in Section E, entitled Monitoring Conditions, of your company's Industrial Wastewater Discharge Permit. Example: A composite sample could be made up of 12, 18, 24, etc., individual aliquots. Continuous composite samples should be noted as such.

Line 3.1d List the type of sample (Grab, Grab-Composite, Composite, Continuous Composite, etc.) taken from each of your company's monitoring locations.

Line 3.1e Indicate whether the sample was taken manually or automatically (by sampling pump) from each of your company's monitoring locations.

Line 3.1f List the locations where the samples were taken.

Line 3.1g For each sample(s) taken, list the hours that the sampling time encompassed at each of the monitoring locations.

Example: A composite sample could be from 8:00 AM to 8:00 PM, or it could be over a twenty-four hour period, corresponding to a full operational day. For a grab or grab-composite sample, list the time the sample(s) were taken.

Permit No.: 0321

Due: _____ _____ _____
Month Day Year

Demand Monitoring: _____ Scheduled Monitoring: _____

SELF-MONITORING REPORT FORM

Section I
(Please Print or Type)

COMPANY INFORMATION

1.0 Company Name _____

1.1 Telephone Number _____

1.2 Premises Address:

1.2a Number and Street _____

1.2b City or Town _____

1.2c County _____

1.2d State _____

1.2e Zip Code _____

1.3 Mailing Address:
(If different)

1.3a Number and Street _____

1.3b City or Town _____

1.3c County _____

1.3d State _____

1.3e Zip Code _____

1.4 Facility Representative: _____

1.4a Signature/Date* _____ / _____

1.4b Title _____

*I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possiblity of fine and imprisonment for knowing violations.

Section I (Cont'd)

1.12 What was the date of the last monitoring report sent:

To the Director _____ To the EPA _____

1.13 Status of Permit Discharge:

Discharge Permit Limits: IN COMPLIANCE _____ OUT OF COMPLIANCE _____
EPA Categorical Standards: IN COMPLIANCE _____ OUT OF COMPLIANCE _____

Note: If the status of permit discharge is out of compliance, please refer to Section C, Part 3, entitled Notification of Violation, of your company's Industrial Wastewater Discharge Permit and complete line 1.13c below.

1.13a If out, list parameters not in compliance with:

Discharge Permit Limits: _____
EPA Categorical Standards: _____

1.13b Indicate reason(s) for non-compliance and corrective actions that have or will be taken including milestone dates:

_____

_____

_____

1.13c Indicate the date on which the Program Manager was notified of this violation:

_____

1.14 Manufacturing process(es) which generate wastewaters discharged into the sewer system:

No.	Process Name	Description
1		
2		
3		
4		
5		
6		

1.14a List process and/or pretreatment changes:

_____

_____

Permit No.: 0321

Section III

SUMMARY ANALYSIS SHEET

3.1 Number of Outfall Sewers: _____

Outfall No. 1 2 3

3.1a Location _____ / _____ / _____

3.1b WWTP Discharged to: _____

(***)	Location #1	Location #2	Location #3	Location #4
3.1c Number of Samples:				
3.1d Type of Sample:				
3.1e Method of Sampling:				
3.1f Location of Sampling:				
3.1g Hours of Sampling:				
3.1h Date(s) Sampled:				

3.2 Parameters Ciba-Geigy Corporation

Analysis Results (*) are to be recorded for the following Parameters:	Permit Limits (mg/l)	EPA Categorical Standards (mg/l) (**)			(All Analysis Results Must Be Reported In mg/l)											
					Location #1			Location #2			Location #3			Location #4		
	MAX. DAY	MAX. DAY	AVG. 4-DAY	MO. AVG.	MAX. DAY	AVG. 4-DAY	MO. AVG.	MAX. DAY	AVG. 4-DAY	MO. AVG.	MAX. DAY	AVG. 4-DAY	MO. AVG.	MAX. DAY	AVG. 4-DAY	MO. AVG.
Antimony	0.05	N/A	N/A	N/A												
Arsenic	0.10	N/A	N/A	N/A												
Beryllium	0.005	N/A	N/A	N/A												
Cadmium	0.04	N/A	N/A	N/A												
Chromium	0.40	N/A	N/A	N/A												
Copper	1.00	N/A	N/A	N/A												
Lead	0.30	N/A	N/A	N/A												
Manganese	2.0	N/A	N/A	N/A												
Mercury	0.005	N/A	N/A	N/A												
Nickel	0.70	N/A	N/A	N/A												
Silver	0.10	N/A	N/A	N/A												
Zinc	1.00	N/A	N/A	N/A												
Total Cyanide	0.30	N/A	N/A	N/A												
Total Toxic Organics	2.13	N/A	N/A	N/A												

(*) Analysis results, in mg/l, must be reported in above appropriate spaces with averages calculated where necessary.

(**) Production data, if required, must be submitted for each sampling day.

(***) Monitoring locations are indicated in Section E, entitled Monitoring Conditions, of your company's Industrial Wastewater Discharge Permit.

Appendix N

N

BENCH-SCALE TREATABILITY TESTING: LABORATORY REPORT

This appendix presents the report ("Ground Water Treatability Study Laboratory-Scale for the Ciba Site, Cranston, RI") describing the scope, methods, and results of bench-scale treatability testing conducted by CIBA-GEIGY's Corporate Environmental Technology Group in Greensboro, North Carolina.

LIST OF TABLES

No.	Title	Page
2-1	Monitor Well Ground Water Characterization Results	4
2-2	Comparison of On-Site and Laboratory Composites	5
3-1	Metals Pretreatment Results	8
4-1	Results of the Air Stripping Tests	12
5-1	Pulverized GAC Contact Study Results at a pH of 8.0	13

LIST OF FIGURES

6-1	Flow Diagram of Pilot-Scale Treatment System - Cranston, R.I	15

- GAC polishing of the air stripped water to reduce all chemical constituents to near or below their respective detection limits,
- development of a conceptual design for the pilot-scale pretreatment system based on the laboratory-scale treatability study results,
- estimation of anticipated operating costs for the pretreatment system proposed in the conceptual design, and
- recommendations for other treatment processes which may be effective for meeting both present and future pretreatment standards.

1.2 Summary of Laboratory-Scale Treatability Study Results

The results of this treatability study support the following:

- iron and manganese removal using pH adjustment to 10.0,
- anionic polymer enhanced settling with American Cyanamid's 1820A during clarification,
- filtration of clarifier effluent prior to air stripping,
- pH adjustment of air stripper influent from 10.0 to 7.0 with either sulfuric acid or carbon dioxide, and
- air stripping for volatile organics removal using an air to water ratio of 60:1
- GAC polishing of air stripper effluent appeared not to be required.

The results also indicated that removal of total iron and manganese will occur during exposure to the oxidizing outdoor environment in the equalization tank following extraction from below-ground. The total manganese concentration was not less than the 200 ppb (μg/L) limit, therefore additional treatment is required. Additional treatment for manganese will not be required in the event that the discharge-to-POTW limit is increased to 2,000 ppb. It appears that iron and manganese will precipitate in the equalization tank. The equalization tank must be equipped for sludge removal. Toxicity Leachate Characteristics Procedure (TCLP) was not performed on the settled sludge.

Although both cationic and anionic polymers system were used throughout this study, solely anionic polymer will be effective in the 10 ppm (mg/L) feedrate range. American Cyanamid's 1820A was the most effective anionic polymer for this application, while American Cyanamid's 1594C cationic polymer proved most effective.

At least three ground water monitor well volumes were extracted from each well prior to sample collection on June 30, 1992. On-site analyses were performed by Woodward-Clyde to determine temperature, pH, conductivity and turbidity of the ground water from each well. These results are presented in Table 2-1. Analytical results from ETL (denoted on-site composite), in concert with the results from the CETC Analytical Chemistry (denoted laboratory composite) are shown in Table 2-2.

2.2 Discussion of Characterization Results

The results in Table 2-1 indicate that ground water temperatures varied from 14.8°C in MW-3S to a maximum value of 16.2°C in MW-2S. The ground water pH ranged from 4.32 in MW-1D to 8.30 in MW-1S. The pH of 4.32 appears low for a ground water, given that the pH values from the other four monitor wells were much higher.

Table 2-1. Monitor Well Ground Water Characterization Results

Parameters	MW-1S	MW-1D	MW-2S	MW-3S	MW-13S
Temperature, °C	16.1	15.0	16.2	14.8	15.9
pH, std. units	8.3	4.3	6.9	6.6	7.3
Cond., umhos/cm	580	300	630	249	790
Turbidity, NTU	19.2	3.2	20.6	7.3	7.0

Conductivity was highest in MW-13S with a value of 790 μmhos/cm and turbidity was highest in MWs 1S and 2S. The relatively high conductivity values in MWs 13S and 2S may be interpreted as wells with the highest concentration of dissolved solids which can be comprised of anions such as chlorides, hydroxides and bicarbonates, as well as cations such as calcium, magnesium and most likely other metals such as iron and manganese.[1]

The on-site/field composite of ground water sampling results compared favorably with the laboratory composite, with the exception of vinyl chloride, chlorobenzene, and di-n-butylphthalate as presented in Table 2-2. The vinyl chloride and chlorobenzene concentrations were reduced most likely by either volatilization or adsorption to the sample containers during sample handling and storage at the CETC Water & Wastewater Treatment Group Laboratory. These results indicate that the sum of TTOs, iron and manganese are greater than the current pretreatment standards of 2,130 ppb, 2,000 ppb and 200 ppb, respectively. The laboratory composite sample was utilized for the treatability study.

[1]Adopted from Sawyer and McCarty, Editors, "Chemistry For Environmental Engineering"; McGraw-Hill, New York, 1978.

3.0 Pretreatment - Iron and Manganese Removal

The laboratory-scale treatability study was directed at achieving the lowest total iron and manganese concentrations in the ground water pretreatment system effluent. The temporary pretreatment permit allows less than 2,000 ppb of iron to be discharged to the POTW. It is also anticipated that the 200 ppb manganese discharge limit may be increased to 2,000 ppb.

Candidate technologies for removal of total iron include oxidation/precipitation in the pH range of 7 to 10 with or without filtration, two-stage hydroxide precipitation and sulfide precipitation.[2] Total manganese removal is generally enhanced with pH adjustment to greater than 9.5.

Air oxidation of the ground water to enhance the reduction of iron and manganese was not considered since there is the potential for the premature stripping of the detected target volatile organics.

3.1 Metals Precipitation

Ground water from the site composite sample was adjusted from a pH value of 6.9 to pH values of 8 and 10 with sodium hydroxide (NaOH) to enhance the precipitation of ferrous iron and the reduced form of manganese. Iron precipitation generally occurs at a ground water pH of 7 to 8, while a pH of greater than 9.5 is favorable for manganese precipitation. Adjustment of the clarifier effluent pH will be required in the event that the more favorable conditions for both iron and manganese precipitation reaches 10. The anticipated pretreatment limitations for pH range from 5.5 to 9.5.

The jar tests were conducted with 400 ml volumes of the composited ground water in 600 ml reactors equipped with magnetic stirrers. Each ground water sample was subjected to rapid mixing for 5 minutes in the reactor at 200 rpm after pH adjustment and polymer addition. Slow mixing was performed during flocculation for 10 minutes followed by quiescent settling overnight. The supernatant was collected and submitted to the CETC Analytical Chemistry for total iron, total organic carbon (TOC), and total manganese analyses.

The results in Table 3-1 indicate that the total iron decreased from 9,000 ppb to below the detection limit of 100 ppb using pH adjustment to both 8 and 10 with NaOH followed by polymer addition and settling. Filtration was not employed in these tests. Results from separate jar tests indicate higher total iron concentrations at both pH values. The polymers used were a combination of American Cyanamid's liquid polymers, 1594C (cationic polymer) followed by American Cyanamid's 1820A (anionic polymer). Polymers from Stockhausen, Inc. were screened during jar testing but the results were not as promising as with the American Cyanamid polymers. Effective settling of suspended precipitate also occurred solely with the use of

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[2]Adopted from Lankford and Eckenfelder, Editors, "Toxicity Reduction in Industrial Effluents", Van Nostrand Reinhold, New York, 1990.

3.3 Potassium Permanganate Treatment

Potassium permanganate is used to reduce iron concentrations in water and wastewater. It has been used effectively in reducing iron as 1.0 ppm of $KMnO_4$ will oxidize 1.0 ppm of iron.[3] In addition, $KMnO_4$ produces a manganese dioxide (MnO_2) sludge which forms surfaces for the attachment of the difficult to settle iron precipitate, "sweep floc", and enhances the settling of this precipitate.

Table 3-1. **Metals Pretreatment Results**
(All values in ppb, except as noted)

Oxidant	Oxidant Conc., ppm	pH, S.U.	Total Iron	Total Manganese
Raw GW	-	6.5	8660	1858
Raw GW	-	8	<100/509	732/1390
		10	<100/216	306/135
H_2O_2	250	8	352	933
		10	910	727
	2500	8	800	876
		10	254	477
$KMnO_4$	40	8	<100	713
		10	329	576
	80	8	141	1,390
		10	239	15,900

$KMnO_4$ oxidized ferrous iron rapidly, within two to three minutes, and produced a sludge which settled rapidly with the aide of 1594C and 1820A polymers. This reaction occurred more rapidly than the H_2O_2 enhanced oxidation of ferrous iron.

Results presented in Table 3-1 indicate that iron concentrations are significantly reduced at the ground water pH values of 8.0 and 10.0, and that the anticipated pretreatment standards will be met.

[3]Adopted from Clark, Viessman, and Hammer, Editors, "Water Supply and Pollution Control", Donnelley, New York, 1977.

3.6 Summary

Adjustment of pH to both 8 and 10 followed by polymer addition with American Cyanamid's 1594C and 1820A was effective for reducing the total iron concentration to below anticipated pretreatment standards without the use of a chemical oxidant. The total manganese concentration was not consistently reduced to below pretreatment standards. A ground water pH of 10 is recommended to achieve the lowest total manganese concentration.

It is recommended that a gravity sand filter be installed following clarification to remove a portion of the suspended iron and manganese from the supernatant and to achieve results similar to those realized under laboratory-scale conditions. It appears that the filter media should consist of 0.45 to 0.55 mm mesh size sand.

Hydrogen peroxide oxidation appeared to be more effective in reducing total iron concentrations to below anticipated pretreatment standards within shorter reaction times when added to the reactor in high concentrations (2,500 ppm).

4.0 Evaluation of Air Stripping for Volatile Organics Removal

4.1 Objective

The objective of this study was to determine the most effective air to water ratio for reduction of the detected volatile organic compounds to near or below their respective detection limits.

The determination of the need for a vapor phase GAC adsorber for the stripped volatiles is outside of the scope of this work.

4.2 Experimental Protocol

Twenty (20) liters of ground water was pretreated with H_2O_2 (2,500 ppm) followed by pH adjustment to 10.2 to reduce total iron and manganese concentrations in accordance with the scope of work. The air stripper influent remained at a pH of 10 for laboratory-scale testing of a worse case scenario. This pH 10 air stripper influent will not be recommended in the pilot-scale study. It appears that a pH in the range of 7.0 to 8.0 will be effective in the pilot-scale unit.

A 20-liter sample of pretreated ground water was submitted to the CETC Air Technology Group for determination of the most effective air to water ratio for volatile organic compounds reduction to near or below their respective detection limits.

Batch air stripping experiments were conducted on pretreated ground water. Approximately 5 liters of ground water was stripped with air that was diffused into a triple port, 5-liter spherical reactor at 5 liters per minute for two different time periods. The air effluent or off-gas from the reactor was continuously monitored using a total hydrocarbon (THC) analyzer equipped with

Table 4-1. **Results of the Air Stripping Tests**
(All values in ppb, except as noted.)

Parameters	Influent	Effluent 10 minutes	Effluent 60 minutes	Permit Limits
Volatile Organics				
1,2-Dichlorobenzene*	1	<1	<1	--
Benzene*	4	<1	<1	--
Chlorobenzene*	100	25	5	--
M & p-Xylene	2	<1	<1	--
Trans, 1,2-DCE*	630	190	5	--
Toluene*	9	1	<1	--
Vinyl Chloride*	54	<1	<1	--
Sum of Volatile Toxic Organics	800	216	10	2,130
Semi-Volatile Organics				
Di-n-butylphthalate*	16	28	39	--
Bis(2-ethylhexyl)phthalate*	<10	58	70	--
Sum of Toxic Organics	816	302	119	2,130
Conventional Parameters				
pH, std. units	10.2	10.1	10.1	5.5-9.5
TOC	50,000	80,000	70,000	

Notes: * - denotes a TTO compound

The initial objective of this study is to determine the GAC concentration which would reduce the aqueous residual organics from the air stripper effluent to near or below their respective detection limits.

5.1 GAC Experimental Protocol

Calgon F-400 pulverized granular activated carbon was utilized for testing since it is widely used on a full-scale. Air stripper effluent/GAC 18-hour contact studies were performed in one-liter reactors to determine the most effective GAC concentration for the reduction of DCE, chlorobenzene, and 2-chlorophenol to near or below their respective detection limits. GAC influent pH was decreased to the 7.0 to 8.0 range with sulfuric acid. Carbon dioxide (CO_2) may also be utilized on a pilot-scale for lowering the pH of the air stripper effluent to meet permit requirements.

6.0 Conceptual Design

The purpose of this section is to provide a conceptual design and a process description. The conceptual design is presented in Figure 6-1.

Ground water will be pumped from the individual wells to an equalization tank for mixing and retention prior to pH adjustment. Sludge removal equipment is required to enhance removal of precipitated iron and manganese.

Equalization tank effluent shall be pumped to the rapid mix tank. Sodium hydroxide and cationic polymer (if required) will be injected in-line into the ground water prior to it entering the rapid mix tank. The pH shall be adjusted to 10.0 and controlled to precipitate iron and manganese.

The rapid mix tank shall be designed with a 5-minute maximum retention time. This tank shall contain an impeller type mixer with 0 to 200 rpm blade speed. Effluent from the rapid mix tank will gravity flow to the coagulation and flocculation chamber, equipped with a 0 to 50 rpm impeller and a detention time of 20 minutes. Anionic polymer shall be pumped directly into this tank.

Polymers will be prepared using both continuous and batch operations. The cationic polymer may be fed directly from a drum (neat) into a Polyblend unit, while to anionic polymer require at least 45 minutes of curing-in-water prior to use.

Effluent from the coagulation/flocculation chamber shall flow by gravity to the clarifier to enhance settling. Sludge withdrawal equipment shall be provided to remove settled solids from the clarifier for off-site disposal.

Clarifier effluent pH shall be adjusted to the 5.5 to 9.5 range using either sulfuric acid or carbon dioxide at the wet well. The wet well lift pumps shall pump treated ground water to the gravity filter for suspended iron and manganese removal.

Gravity filter effluent shall be pumped to the air stripper for volatile organics removal. The air stripper shall be operated at a 60:1 air to water ratio. Air compressors shall supply the stripper with sufficient air to remove the volatile toxic organic compounds to near or below their respective detection limits. The air stripper off gas shall be scrubbed, if required to meet local air standards.

Air stripper effluent shall be pumped to a surge tank and discharged to the POTW. Surge tank water can be utilized for periodic backflushing of the gravity filter. Backflush water shall be collected in a 55-gallon drum for disposal in either the rapid mix tank or off-site.

It appears that GAC treatment is not required. GAC treatment may be useful in maintaining pretreatment permit compliance in the event that the air stripper malfunctions, resulting in decreased removal efficiencies of the volatile organics, in concert with 2-chlorophenol.

ATTACHMENT

Request for a Temporary Permit to Discharge Treated Ground Water From the Former Ciba Cranston Facility

The discharge water will be analyzed for parameters of concern. It is envisioned that the water will be analyzed frequently in the beginning of the pump test, and less often once it is documented that flow rates and concentrations have stabilized.

Thank you for your consideration of this discharge permit request. After allowing some time for review, I will contact you to see if additional information is required.

Sincerely,

Diane M. Leber

Diane M. Leber
Project Coordinator

CC: Mr. J. Mignault - City of Cranston
Department of Public Works

dml/08
enc.

bcc: M. Hawkday
P. Collins

concentration of 78 ppb, mostly from phenols and mostly restricted to MW-1S and MW-2S. Across all fractions, very few analytes were detected in shallow well MW-3S.

AOC-13 (Bedrock Aquifer). Across both sampling rounds, the groundwater samples from the bedrock aquifer in AOC-13 (RW-1) contained only one VOC, two semi-volatile organics, and ten pesticides. None of these compounds were detected in the overlying portion of the deep overburden aquifer (MW-1D).

AAOI-15. Three VOCs (mean total concentration of 1.5 ppb) were detected in both the shallow and deep portions of the overburden aquifer at AAOI-15. No semi-volatile organic compounds were detected in any of the samples. PCBs were detected in the Round 2 sample from ME-5S at a concentration of 1.7 ppb. No dioxin/furans were detected in the samples. Twelve pesticides (but no herbicides) were detected at a mean total concentration of 0.12 ppb.

Groundwater Results: Inorganics

SWMU-2. Across the 4 samples, both the total and dissolved concentrations of iron (4 and 1, respectively) and manganese (4,3) exceeded secondary drinking water standards (in the number of samples indicated). The total concentration of chromium exceeded the MCL in 3 samples.

SWMUs -3 and -7. In all four samples, the total and dissolved concentrations of both iron and manganese exceeded secondary drinking water standards in the groundwater beneath SWMU-3 and -7.

SWMU-8. Both the total and dissolved concentrations of both iron and manganese exceeded secondary drinking water standards in the 2 groundwater samples. The total concentrations of chromium(2), lead (1), and mercury (1) exceeded the MCL in the number of samples indicated.

SWMU-11. Both the total and dissolved concentrations of both iron and manganese exceeded secondary drinking water standards in all 6 groundwater samples.

AOC-13 (Overburden Aquifer). Both the total and dissolved concentrations of both iron and manganese exceeded secondary drinking water standards in all (or nearly all) 10 of the samples from the overburden aquifer beneath AOC-13. The concentrations of total arsenic exceeded the MCL in one sample.

AOC-13 (Bedrock Aquifer). Across both samples, the total concentrations of iron (1) as well as the dissolved concentration of manganese (1), exceeded secondary drinking water standards in the samples from the bedrock aquifer beneath AOC-13. The concentrations of dissolved lead exceeded the MCL in one sample.

AAOI-15. Across the 6 samples, both the total and dissolved concentrations of iron (5,2) and manganese (4,2) exceeded secondary drinking water standards.

SECTION A - GENERAL INFORMATION (continued)

4. Executive Officer

A. Name JOHN SIMAS B. Title V.P. Environmental Affairs

C. Mailing Address 444 SAW MILL RIVER ROAD D. City ARDSLEY State NY Zip 10502

5. Person to be contacted about this Application

A. Name DIANE M. LERER B. Title MANAGER C. Phone (914) 479-2159

6. Person to be contacted in case of emergency

* A. Name DIANE M. LERER B. Title MANAGER

C. Day phone 914-479-2159 D. Night phone 203-791-0234

SECTION B - BUSINESS DESCRIPTION

1. Business Activity

ACTIVITY Groundwater studies SIC(s) 9999

Substances Proposed to be Discharged - Give common and technical names of any materials or product proposed to be discharged to the sewer. Briefly describe the physical and chemical properties of each substance and product.

NAME	DESCRIPTION
TRACE VOLATILE & SEMI-VOLATILE ORGANICS REMAINING AFTER TREATMENT	TOLUENE, XYLENE, CHLOROBENZENE, ETHYLBENZENE, PHENOLS

2. Discharge Period 24 hours/day

(a) Discharge occurs daily: from _____ to _____

(b) Circle the days of the week that the discharge occurs: (S M T W T F S)

3. Variation of Operation. Indicate whether the business activity is: Continuous throughout the year, or Seasonal - Circle the months of the year during which discharge occurs: J F M A M J (J A S) O N D The pump test will last 5-6 weeks. The estimated start date is July.

Comments: _____

* LOCAL CONTACT:

SECTION D - WASTEWATER STRENGTH ESTIMATES

1. Elements of Wastewater Strength	Unit	Code	Est. Avg.	Est. Max.
Suspended Solids	Mg/l	TSS	200	1000
Total Chemical Oxygen Demand	"	CODT	100	<300
Filtered Chem. Oxygen Demand	"	CODF	100	<300
Oil and Grease	"	O&GT		<100
Chlorine Demand	"	CL2D		—
Biochemical Oxygen Demand	"	BOD	<50	<200
Total Kjeldahl Nitrogen	"	TKN	15	<30
Other				

If data from a commercial laboratory was used to determine the values, please give the name and address of the laboratory.

* ESTIMATES WERE MADE FROM MONITORING WELL WATER DATA. ANALYSES WERE PERFORMED BY:

Name RADIAN CORP. Address AUSTIN, TEXAS

2. Wastewater Flow Rate

Peak Hourly (gpm)	Max. Daily (gpd)	Ann. Daily Avg. (gpd)	Seasonal Avg. Daily(gpd)	Seasonal Min. Seasonal Max.
A. 60	B. 60,000	C. 50,000	D.	E.

3. If Batch Discharge, Indicate:

a. Number of batch discharges: _____ per month

b. Time of batch discharges: _____, at _____, _____, _____.

c. Average quantity per batch: _____ gallons

d. Flow Rate: _____ gallons/minute.

SECTION E - WASTEWATER TREATMENT

1. Pollution Abatement Practices

a. Wastewater Pretreatment - Check the type of treatment, if any, given wastewater from this building sewer before it is discharged to the public sewer:

__none, ✓holding tank, __grease trap, __oil and water separator, __grinding, __sedimentation, __pH adjustment, __biological treatment, __screening, __chlorination, or ✓*other.

Description.

Describe the loading rates, design capacity, physical size, etc. of each pretreatment facility checked above.

* Groundwater will be treated to meet discharge requirements, most likely by air stripping and/or granular activated carbon.

SECTION F - SUPPLEMENTAL DATA

1. A plan of the property showing accurately all sewers and drains now existing is attached hereunto as Exhibit "A".

2. Plans and specifications covering any work proposed to be performed under this permit is attached hereunto as Exhibit "B".

3. The name and address of the person or firm who will perform the work covered by this permit is Woodward-Clyde Consultants Inc are the environmental consultants contracted by Ciba-Geigy to perform the pump test. Their mailing address is:

201 Willowbrook Blvd.
P.O. Box 290
Wayne, NJ 07470

Phone: 201-785-0023
Project Mgr: Mark Haulday

4. Additional pertinent data:

Isophorone
Lead and compounds
Mercury and compounds
Naphthalene and compounds
Nickel and compounds
Nitrobenzene
Nitrophenols (including 2, 4-dinitrophenol dinitrocresol)
Nitrosamines
Pentachlorophenol
Phenol
Phthalate esters
Polychlorinated biphenyls (PCBs)
Polynuclear aromatic hydrocarbons (including benzanthracenes, benzopyrenes, benzofluoranthene, chrysenes, dibenzathracenes, and indenopyrenes)
Selenium and compounds
Silver and compounds
2, 3, 7, 8-tetrachlorodibenzo-p-dioxin (TCDD)
Tetrachloroethylene
Thallium and compounds
Toluene
Toxaphene
Trichloroethylene
Vinyl chloride
Zinc and compounds

Appendix O

O

ANALYTICAL DATA

This appendix presents analytical (chemical) data from laboratory analyses of samples collected during the stabilization investigation under the RCRA Facility Investigation at the CIBA-GEIGY facility in Cranston, RI. This appendix is divided into three main sections:

1. analytical data associated with the *aquifer testing program* (discussed in Chapter 2 of this report);
2. analytical data associated with the *pretreatment testing program* (discussed in Chapter 3); and
3. analytical data associated with the *HIVAC pilot testing program* (discussed in Chapter 4).

Aquifer Testing Program Data

This section includes the analytical data for:

- HydroPunch sampling;
- monitoring well and recovery well sampling;
- TCLP analysis of groundwater extracted during the step-drawdown tests;
- additional out-of-scope piezometer sampling;
- 30-day constant rate test sampling; and
- additional single well constant rate test sampling.

Pretreatment Testing Program Data

This section includes the analytical data for:

- effluent sampling as required by Industrial Wastewater Permit Number 0321;
- internal pretreatment system sampling; and
- TCLP analysis of the sludge generated during the pretreatment pilot test.

HIVAC Pilot Testing Program Data

This section includes the analytical data for:

- groundwater sampling at VE-2 before starting the HIVAC pilot test;
- soil gas sampling during the test; and
- groundwater sampling during the test.

General aspects about the treatment of analytical data were discussed in the Phase I Interim Report and Phase II Proposal; the procedures used were described in the Quality Assurance Documents and Quality Assurance Documents: Supplement.

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.
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Received: 13 JUN 92

Ms. Diana Baldi
Ciba-Geigy, Corporate Environmental Technology
410 Swing Road, P.O.Box 18300
Greensboro, NC 27419-8300

Project: Cranston
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
42871-1	HP-P33D(1)*II-1	06-10-92
42871-2	HP-P33D(2)*II-1	06-10-92
42871-3	HP-P33D(3)*II-1	06-10-92
42871-4	HP-P30D(1)*II-1	06-10-92
42871-5	HP-P30D(2)*II-1	06-11-92

PARAMETER	42871-1	42871-2	42871-3	42871-4	42871-5
Volatile Organic Compounds (8240)					
Acetone, ug/l	<50	<50	<50	<50	<50
Acetonitrile, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Acrolein, ug/l	<100	<100	<100	<100	<100
Acrylonitrile, ug/l	<100	<100	<100	<100	<100
Benzene, ug/l	54	5.2	<5.0	<5.0	<5.0
Bromodichloromethane, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Bromoform, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Bromomethane, ug/l	<10	<10	<10	<10	<10
2-butanone, ug/l	<50	<50	<50	<50	<50
Carbon Disulfide, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon Tetrachloride, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene, ug/l	740	170	110	180	8.0
Chloroethane, ug/l	<10	<10	<10	<10	<10
Chloroform, ug/l	<5.0	11	8.9	<5.0	<5.0
Chloromethane, ug/l	<10	<10	<10	<10	<10
2-chloro-1,3-butadiene, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
3-Chloropropene, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Dibromochloromethane, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dibromo-3-chloropropane, ug/l	<10	<10	<10	<10	<10

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42871-3	HP-P33D(3)*II-1	06-10-92
42871-4	HP-P30D(1)*II-1	06-10-92
42871-5	HP-P30D(2)*II-1	06-11-92

PARAMETER	42871-1	42871-2	42871-3	42871-4	42871-5
1,2-Dibromoethane , ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Dibromomethane, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Trans-1,4-Dichloro-2-butene, ug/l	<10	<10	<10	<10	<10
Dichlorodifluoromethane, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Trans-1,2-Dichloroethene, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Cis-1,3-Dichloropropene, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Trans-1,3-Dichloropropene, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Ethyl methacrylate, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
2-Hexanone, ug/l	<50	<50	<50	<50	<50
Iodomethane, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Isobutanol, ug/l	<1000	<1000	<1000	<1000	<1000
Methacrylonitrile, ug/l	<100	<100	<100	<100	<100
Methylene Chloride, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Methyl methacrylate, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
4-methyl-2-pentanone, ug/l	<50	<50	<50	<50	<50

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42871-3	HP-P33D(3)*II-1	06-10-92
42871-4	HP-P30D(1)*II-1	06-10-92
42871-5	HP-P30D(2)*II-1	06-11-92

PARAMETER	42871-1	42871-2	42871-3	42871-4	42871-5
N-Octane, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Pentachloroethane, ug/l	<25	<25	<25	<25	<25
Propanenitrile, ug/l	<100	<100	<100	<100	<100
Styrene, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,1,2-Tetrachloroethane, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Toluene, ug/l	<5.0	<5.0	<5.0	12	150
1,1,1-Trichloroethane, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Trichloroethene, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Trichlorofluoromethane, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,3-Trichloropropane, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl Acetate, ug/l	<10	<10	<10	<10	<10
Vinyl chloride, ug/l	<10	<10	<10	<10	<10
o-Xylene, ug/l	34	21	16	<5.0	<5.0
m&p-Xylene, ug/l	84	47	37	<5.0	<5.0
Date Analyzed	06.23.92	06.23.92	06.23.92	06.23.92	06.23.92

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42871-7	HP-P32D(1)*II-1	06-12-92
42871-8	HP-P32D(2)*II-1	06-12-92

PARAMETER	42871-6	42871-7	42871-8
Volatile Organic Compounds (8240)			
Acetone, ug/l	<50	<250	<250
Acetonitrile, ug/l	<5.0	<25	<25
Acrolein, ug/l	<100	<500	<500
Acrylonitrile, ug/l	<100	<500	<500
Benzene, ug/l	<5.0	<25	<25
Bromodichloromethane, ug/l	<5.0	<25	<25
Bromoform, ug/l	<5.0	<25	<25
Bromomethane, ug/l	<10	<50	<50
2-butanone, ug/l	<50	<250	<250
Carbon Disulfide, ug/l	<5.0	<25	<25
Carbon Tetrachloride, ug/l	<5.0	<25	<25
Chlorobenzene, ug/l	79	64	96
Chloroethane, ug/l	<10	<50	<50
Chloroform, ug/l	10	<25	<25
Chloromethane, ug/l	<10	<50	<50
2-chloro-1,3-butadiene, ug/l	<5.0	<25	<25
3-Chloropropene, ug/l	<5.0	<25	<25
Dibromochloromethane, ug/l	<5.0	<25	<25
1,2-Dibromo-3-chloropropane, ug/l	<10	<50	<50
1,2-Dibromoethane , ug/l	<5.0	<25	<25
Dibromomethane, ug/l	<5.0	<25	<25

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42871-7	HP-P32D(1)*II-1	06-12-92
42871-8	HP-P32D(2)*II-1	06-12-92

PARAMETER	42871-6	42871-7	42871-8
Trans-1,4-Dichloro-2-butene, ug/l	<10	<50	<50
Dichlorodifluoromethane, ug/l	<5.0	<25	<25
1,1-Dichloroethane, ug/l	<5.0	<25	<25
1,2-Dichloroethane, ug/l	<5.0	<25	<25
1,1-Dichloroethene, ug/l	<5.0	<25	<25
Trans-1,2-Dichloroethene, ug/l	<5.0	<25	<25
1,2-Dichloropropane, ug/l	<5.0	<25	<25
Cis-1,3-Dichloropropene, ug/l	<5.0	<25	<25
Trans-1,3-Dichloropropene, ug/l	<5.0	<25	<25
Ethylbenzene, ug/l	<5.0	87	160
Ethyl methacrylate, ug/l	<5.0	<25	<25
2-Hexanone, ug/l	<50	<250	<250
Iodomethane, ug/l	<5.0	<25	<25
Isobutanol, ug/l	<1000	<5000	<5000
Methacrylonitrile, ug/l	<100	<500	<500
Methylene Chloride, ug/l	<5.0	<25	<25
Methyl methacrylate, ug/l	<5.0	<25	<25
4-methyl-2-pentanone, ug/l	<50	<250	<250
N-Octane, ug/l	<5.0	<25	<25
Pentachloroethane, ug/l	<25	<125	<125
Propanenitrile, ug/l	<100	<500	<500
Styrene, ug/l	<5.0	<25	<25

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S2-42871

Received: 13 JUN 92

Ms. Diana Baldi
Ciba-Geigy, Corporate Environmental Technology
410 Swing Road, P.O.Box 18300
Greensboro, NC 27419-8300

Project: Cranston
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
42871-6	HP-P33D(4)*II-1	06-11-92
42871-7	HP-P32D(1)*II-1	06-12-92
42871-8	HP-P32D(2)*II-1	06-12-92

PARAMETER	42871-6	42871-7	42871-8
1,1,1,2-Tetrachloroethane, ug/l	<5.0	<25	<25
1,1,2,2-Tetrachloroethane, ug/l	<5.0	<25	<25
Tetrachloroethene, ug/l	<5.0	<25	<25
Toluene, ug/l	150	<25	<25
1,1,1-Trichloroethane, ug/l	<5.0	<25	<25
1,1,2-Trichloroethane, ug/l	<5.0	<25	<25
Trichloroethene, ug/l	<5.0	<25	<25
Trichlorofluoromethane, ug/l	<5.0	<25	<25
1,2,3-Trichloropropane, ug/l	<5.0	<25	<25
Vinyl Acetate, ug/l	<10	<50	<50
Vinyl chloride, ug/l	<10	<50	<50
o-Xylene, ug/l	5.7	190	270
m&p-Xylene, ug/l	12	490	750
Date Analyzed	06.23.92	06.23.92	06.23.92

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Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
42871-9	Method Blank - Liquid

PARAMETER	42871-9
Volatile Organic Compounds (8240)	
Acetone, ug/l	<50
Acetonitrile, ug/l	<5.0
Acrolein, ug/l	<100
Acrylonitrile, ug/l	<100
Benzene, ug/l	<5.0
Bromodichloromethane, ug/l	<5.0
Bromoform, ug/l	<5.0
Bromomethane, ug/l	<10
2-butanone, ug/l	<50
Carbon Disulfide, ug/l	<5.0
Carbon Tetrachloride, ug/l	<5.0
Chlorobenzene, ug/l	<5.0
Chloroethane, ug/l	<10
Chloroform, ug/l	<5.0
Chloromethane, ug/l	<10
2-chloro-1,3-butadiene, ug/l	<5.0
3-Chloropropene, ug/l	<5.0
Dibromochloromethane, ug/l	<5.0
1,2-Dibromo-3-chloropropane, ug/l	<10
1,2-Dibromoethane , ug/l	<5.0
Dibromomethane, ug/l	<5.0
Trans-1,4-Dichloro-2-butene, ug/l	<10
Dichlorodifluoromethane, ug/l	<5.0

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Project: Cranston
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
42871-9	Method Blank - Liquid

PARAMETER	42871-9
1,1-Dichloroethane, ug/l	<5.0
1,2-Dichloroethane, ug/l	<5.0
1,1-Dichloroethene, ug/l	<5.0
Trans-1,2-Dichloroethene, ug/l	<5.0
1,2-Dichloropropane, ug/l	<5.0
Cis-1,3-Dichloropropene, ug/l	<5.0
Trans-1,3-Dichloropropene, ug/l	<5.0
Ethylbenzene, ug/l	<5.0
Ethyl methacrylate, ug/l	<5.0
2-Hexanone, ug/l	<50
Iodomethane, ug/l	<5.0
Isobutanol, ug/l	<1000
Methacrylonitrile, ug/l	<100
Methylene Chloride, ug/l	<5.0
Methyl methacrylate, ug/l	<5.0
4-methyl-2-pentanone, ug/l	<50
N-Octane, ug/l	<5.0
Pentachloroethane, ug/l	<25
Propanenitrile, ug/l	<100
Styrene, ug/l	<5.0
1,1,1,2-Tetrachloroethane, ug/l	<5.0
1,1,2,2-Tetrachloroethane, ug/l	<5.0
Tetrachloroethene, ug/l	<5.0
Toluene, ug/l	<5.0

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
42871-9	Method Blank - Liquid

PARAMETER	42871-9
1,1,1-Trichloroethane, ug/l	<5.0
1,1,2-Trichloroethane, ug/l	<5.0
Trichloroethene, ug/l	<5.0
Trichlorofluoromethane, ug/l	<5.0
1,2,3-Trichloropropane, ug/l	<5.0
Vinyl Acetate, ug/l	<10
Vinyl chloride, ug/l	<10
o-Xylene, ug/l	<5.0
m&p-Xylene, ug/l	<5.0
Date Analyzed	06.23.92

Methods: EPA SW-846.

Linda A. Wolfe

Linda A. Wolfe

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S2-42899

Received: 16 JUN 92

Ms. Diana Baldi
Ciba-Geigy, Corporate Environmental Technology
410 Swing Road, P.O.Box 18300
Greensboro, NC 27419-8300

Project: Cranston
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
42899-1	HP-MW30D(1)*II-1	06-14-92
42899-2	HP-MW30D(2)*II-1	06-14-92
42899-3	HP-P13D(1)*II-1	06-13-92
42899-4	HP-P13D(2)*II-1	06-13-92
42899-5	HP-P2D(1)*II-1	06-14-92

PARAMETER	42899-1	42899-2	42899-3	42899-4	42899-5
Volatile Organic Compounds (8240)					
Acetone, ug/l	<500	<500	<100	<50	<25000
Acetonitrile, ug/l	<50	<50	<10	<5.0	<2500
Acrolein, ug/l	<1000	<1000	<200	<100	<50000
Acrylonitrile, ug/l	<1000	<1000	<200	<100	<50000
Benzene, ug/l	<50	<50	<10	<5.0	<2500
Bromodichloromethane, ug/l	<50	<50	<10	<5.0	<2500
Bromoform, ug/l	<50	<50	<10	<5.0	<2500
Bromomethane, ug/l	<100	<100	<20	<10	<5000
2-butanone, ug/l	<500	<500	<100	<50	<25000
Carbon Disulfide, ug/l	<50	<50	<10	<5.0	<2500
Carbon Tetrachloride, ug/l	<50	<50	<10	<5.0	<2500
Chlorobenzene, ug/l	1500	1500	<10	<5.0	38000
Chloroethane, ug/l	<100	<100	<20	<10	<5000
Chloroform, ug/l	<50	<50	<10	<5.0	<2500
Chloromethane, ug/l	<100	<100	<20	<10	<5000
2-chloro-1,3-butadiene, ug/l	<50	<50	<10	<5.0	<2500
3-Chloropropene, ug/l	<50	<50	<10	<5.0	<2500
Dibromochloromethane, ug/l	<50	<50	<10	<5.0	<2500
1,2-Dibromo-3-chloropropane, ug/l	<100	<100	<20	<10	<5000

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
42899-1	HP-MW30D(1)*II-1	06-14-92
42899-2	HP-MW30D(2)*II-1	06-14-92
42899-3	HP-P13D(1)*II-1	06-13-92
42899-4	HP-P13D(2)*II-1	06-13-92
42899-5	HP-P2D(1)*II-1	06-14-92

PARAMETER	42899-1	42899-2	42899-3	42899-4	42899-5
1,2-Dibromoethane , ug/l	<50	<50	<10	<5.0	<2500
Dibromomethane, ug/l	<50	<50	<10	<5.0	<2500
Trans-1,4-Dichloro-2-butene, ug/l	<100	<100	<10	<5.0	<2500
Dichlorodifluoromethane, ug/l	<50	<50	<10	<5.0	<2500
1,1-Dichloroethane, ug/l	<50	<50	<10	<5.0	<2500
1,2-Dichloroethane, ug/l	<50	<50	<10	<5.0	<2500
1,1-Dichloroethene, ug/l	<50	<50	<10	<5.0	<2500
Trans-1,2-Dichloroethene, ug/l	<50	<50	<10	<5.0	<2500
1,2-Dichloropropane, ug/l	<50	<50	<10	<5.0	<2500
Cis-1,3-Dichloropropene, ug/l	<50	<50	<10	<5.0	<2500
Trans-1,3-Dichloropropene, ug/l	<50	<50	<10	<5.0	<2500
Ethylbenzene, ug/l	<50	<50	220	20	<2500
Ethyl methacrylate, ug/l	<50	<50	<10	<5.0	<2500
2-Hexanone, ug/l	<500	<500	<100	<50	<25000
Iodomethane, ug/l	<50	<50	<10	<5.0	<2500
Isobutanol, ug/l	<10000	<10000	<2000	<1000	<500000
Methacrylonitrile, ug/l	<1000	<1000	<200	<100	<50000
Methylene Chloride, ug/l	<50	<50	<10	<5.0	<2500
Methyl methacrylate, ug/l	<50	<50	<10	<5.0	<2500
4-methyl-2-pentanone, ug/l	<500	<500	<100	<50	<25000

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
42899-1	HP-MW30D(1)*II-1	06-14-92
42899-2	HP-MW30D(2)*II-1	06-14-92
42899-3	HP-P13D(1)*II-1	06-13-92
42899-4	HP-P13D(2)*II-1	06-13-92
42899-5	HP-P2D(1)*II-1	06-14-92

PARAMETER	42899-1	42899-2	42899-3	42899-4	42899-5
N-Octane, ug/l	<50	<50	<10	<5.0	<2500
Pentachloroethane, ug/l	<250	<250	<50	<25	<12500
Propanenitrile, ug/l	<1000	<1000	<200	<100	<50000
Styrene, ug/l	<50	<50	<10	<5.0	<2500
1,1,1,2-Tetrachloroethane, ug/l	<50	<50	<10	<5.0	<2500
1,1,2,2-Tetrachloroethane, ug/l	<50	<50	<10	<5.0	<2500
Tetrachloroethene, ug/l	<50	<50	<10	<5.0	29000
Toluene, ug/l	290	250	<10	<5.0	7700
1,1,1-Trichloroethane, ug/l	<50	<50	<10	<5.0	<2500
1,1,2-Trichloroethane, ug/l	<50	<50	<10	<5.0	<2500
Trichloroethene, ug/l	<50	<50	<10	<5.0	<2500
Trichlorofluoromethane, ug/l	<50	<50	<10	<5.0	<2500
1,2,3-Trichloropropane, ug/l	<50	<50	<10	<5.0	<2500
Vinyl Acetate, ug/l	<100	<100	<20	<10	<5000
Vinyl chloride, ug/l	<100	<100	<20	<10	<5000
o-Xylene, ug/l	<50	<50	14	<5.0	<2500
m&p-Xylene, ug/l	<50	<50	180	22	<2500
Date Analyzed	06.24.92	06.25.92	06.24.92	06.23.92	06.26.92

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Greensboro, NC 27419-8300

Project: Cranston
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
42899-6	HP-P2D(2)*II-1	06-14-92
42899-7	HP-P2D(3)*II-1	06-14-92
42899-8	HP-P2D(4)*II-1	06-14-92

PARAMETER	42899-6	42899-7	42899-8
Volatile Organic Compounds (8240)			
Acetone, ug/l	<10000	<500	<2500
Acetonitrile, ug/l	<1000	<50	<250
Acrolein, ug/l	<20000	<1000	<5000
Acrylonitrile, ug/l	<20000	<1000	<5000
Benzene, ug/l	<1000	<50	<250
Bromodichloromethane, ug/l	<1000	<50	<250
Bromoform, ug/l	<1000	<50	<250
Bromomethane, ug/l	<2000	<100	<500
2-butanone, ug/l	<10000	<500	<2500
Carbon Disulfide, ug/l	<1000	<50	<250
Carbon Tetrachloride, ug/l	<1000	<50	<250
Chlorobenzene, ug/l	23000	790	5700
Chloroethane, ug/l	<2000	<100	<500
Chloroform, ug/l	<1000	<50	<250
Chloromethane, ug/l	<2000	<100	<500
2-chloro-1,3-butadiene, ug/l	<1000	<50	<250
3-Chloropropene, ug/l	<1000	<50	<250
Dibromochloromethane, ug/l	<1000	<50	<250
1,2-Dibromo-3-chloropropane, ug/l	<2000	<100	<500
1,2-Dibromoethane , ug/l	<1000	<50	<250
Dibromomethane, ug/l	<1000	<50	<250

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Project: Cranston
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
42899-6	HP-P2D(2)*II-1	06-14-92
42899-7	HP-P2D(3)*II-1	06-14-92
42899-8	HP-P2D(4)*II-1	06-14-92

PARAMETER	42899-6	42899-7	42899-8
Trans-1,4-Dichloro-2-butene, ug/l	<1000	<50	<250
Dichlorodifluoromethane, ug/l	<1000	<50	<250
1,1-Dichloroethane, ug/l	<1000	<50	<250
1,2-Dichloroethane, ug/l	<1000	<50	<250
1,1-Dichloroethene, ug/l	<1000	<50	<250
Trans-1,2-Dichloroethene, ug/l	<1000	<50	<250
1,2-Dichloropropane, ug/l	<1000	<50	<250
Cis-1,3-Dichloropropene, ug/l	<1000	<50	<250
Trans-1,3-Dichloropropene, ug/l	<1000	<50	<250
Ethylbenzene, ug/l	<1000	<50	<250
Ethyl methacrylate, ug/l	<1000	<50	<250
2-Hexanone, ug/l	<10000	<500	<2500
Iodomethane, ug/l	<1000	<50	<250
Isobutanol, ug/l	<200000	<10000	<50000
Methacrylonitrile, ug/l	<20000	<1000	<5000
Methylene Chloride, ug/l	<1000	<50	<250
Methyl methacrylate, ug/l	<1000	<50	<250
4-methyl-2-pentanone, ug/l	<10000	<500	<2500
N-Octane, ug/l	<1000	<50	<250
Pentachloroethane, ug/l	<5000	<250	<1250
Propanenitrile, ug/l	<20000	<1000	<5000
Styrene, ug/l	<1000	<50	<250

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
42899-6	HP-P2D(2)*II-1	06-14-92
42899-7	HP-P2D(3)*II-1	06-14-92
42899-8	HP-P2D(4)*II-1	06-14-92

PARAMETER	42899-6	42899-7	42899-8
1,1,1,2-Tetrachloroethane, ug/l	<1000	<50	<250
1,1,2,2-Tetrachloroethane, ug/l	<1000	<50	<250
Tetrachloroethene, ug/l	20000	1100	7500
Toluene, ug/l	2700	91	760
1,1,1-Trichloroethane, ug/l	<1000	<50	<250
1,1,2-Trichloroethane, ug/l	<1000	<50	<250
Trichloroethene, ug/l	1000	<50	300
Trichlorofluoromethane, ug/l	<1000	<50	<250
1,2,3-Trichloropropane, ug/l	<1000	<50	<250
Vinyl Acetate, ug/l	<2000	<100	<500
Vinyl chloride, ug/l	<2000	<100	<500
o-Xylene, ug/l	<1000	<50	<250
m&p-Xylene, ug/l	<1000	<50	450
Date Analyzed	06.24.92	06.24.92	06.24.92

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Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
42899-9	Method Blank - Liquid

PARAMETER	42899-9
Volatile Organic Compounds (8240)	
Acetone, ug/l	<50
Acetonitrile, ug/l	<5.0
Acrolein, ug/l	<100
Acrylonitrile, ug/l	<100
Benzene, ug/l	<5.0
Bromodichloromethane, ug/l	<5.0
Bromoform, ug/l	<5.0
Bromomethane, ug/l	<10
2-butanone, ug/l	<50
Carbon Disulfide, ug/l	<5.0
Carbon Tetrachloride, ug/l	<5.0
Chlorobenzene, ug/l	<5.0
Chloroethane, ug/l	<10
Chloroform, ug/l	<5.0
Chloromethane, ug/l	<10
2-chloro-1,3-butadiene, ug/l	<5.0
3-Chloropropene, ug/l	<5.0
Dibromochloromethane, ug/l	<5.0
1,2-Dibromo-3-chloropropane, ug/l	<10
1,2-Dibromoethane , ug/l	<5.0
Dibromomethane, ug/l	<5.0
Trans-1,4-Dichloro-2-butene, ug/l	<5.0
Dichlorodifluoromethane, ug/l	<5.0

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
42899-9	Method Blank - Liquid

PARAMETER	42899-9
1,1-Dichloroethane, ug/l	<5.0
1,2-Dichloroethane, ug/l	<5.0
1,1-Dichloroethene, ug/l	<5.0
Trans-1,2-Dichloroethene, ug/l	<5.0
1,2-Dichloropropane, ug/l	<5.0
Cis-1,3-Dichloropropene, ug/l	<5.0
Trans-1,3-Dichloropropene, ug/l	<5.0
Ethylbenzene, ug/l	<5.0
Ethyl methacrylate, ug/l	<5.0
2-Hexanone, ug/l	<50
Iodomethane, ug/l	<5.0
Isobutanol, ug/l	<1000
Methacrylonitrile, ug/l	<100
Methylene Chloride, ug/l	<5.0
Methyl methacrylate, ug/l	<5.0
4-methyl-2-pentanone, ug/l	<50
N-Octane, ug/l	<5.0
Pentachloroethane, ug/l	<25
Propanenitrile, ug/l	<100
Styrene, ug/l	<5.0
1,1,1,2-Tetrachloroethane, ug/l	<5.0
1,1,2,2-Tetrachloroethane, ug/l	<5.0
Tetrachloroethene, ug/l	<5.0
Toluene, ug/l	<5.0

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
42899-9	Method Blank - Liquid

PARAMETER	42899-9
1,1,1-Trichloroethane, ug/l	<5.0
1,1,2-Trichloroethane, ug/l	<5.0
Trichloroethene, ug/l	<5.0
Trichlorofluoromethane, ug/l	<5.0
1,2,3-Trichloropropane, ug/l	<5.0
Vinyl Acetate, ug/l	<10
Vinyl chloride, ug/l	<10
o-Xylene, ug/l	<5.0
m&p-Xylene, ug/l	<5.0
Date Analyzed	06.24.92

Methods: EPA SW-846.

Linda A. Wolfe

Linda A. Wolfe

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LOG NO: S2-42983

Received: 19 JUN 92

Ms. Diana Baldi
Ciba-Geigy, Corporate Environmental Technology
410 Swing Road, P.O.Box 18300
Greensboro, NC 27419-8300

Project: Cranston
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
42983-1	HP-P29D(1)*II-1	06-16-92
42983-2	HP-P29D(2)*II-1	06-16-92

PARAMETER	42983-1	42983-2
Volatile Organic Compounds (8240)		
Acetone, ug/l	<250	<50
Acetonitrile, ug/l	<5000	<1000
Acrolein, ug/l	<500	<100
Acrylonitrile, ug/l	<500	<100
Benzene, ug/l	<25	<5.0
Bromodichloromethane, ug/l	<25	<5.0
Bromoform, ug/l	<25	<5.0
Bromomethane, ug/l	<50	<10
2-butanone, ug/l	<250	<50
Carbon Disulfide, ug/l	<25	<5.0
Carbon Tetrachloride, ug/l	<25	<5.0
Chlorobenzene, ug/l	270	130
Chloroethane, ug/l	<50	<10
Chloroform, ug/l	<25	<5.0
Chloromethane, ug/l	<50	<10
2-chloro-1,3-butadiene, ug/l	<25	<5.0
3-Chloropropene, ug/l	<25	<5.0
Dibromochloromethane, ug/l	<25	<5.0
1,2-Dibromo-3-chloropropane, ug/l	<25	<5.0
1,2-Dibromoethane , ug/l	<25	<5.0
Dibromomethane, ug/l	<25	<5.0
Trans-1,4-Dichloro-2-butene, ug/l	<25	<5.0

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Project: Cranston
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
42983-1	HP-P29D(1)*II-1	06-16-92
42983-2	HP-P29D(2)*II-1	06-16-92

PARAMETER	42983-1	42983-2
Dichlorodifluoromethane, ug/l	<25	<5.0
1,1-Dichloroethane, ug/l	<25	<5.0
1,2-Dichloroethane, ug/l	<25	<5.0
1,1-Dichloroethene, ug/l	<25	<5.0
Trans-1,2-Dichloroethene, ug/l	<25	<5.0
1,2-Dichloropropane, ug/l	<25	<5.0
Cis-1,3-Dichloropropene, ug/l	<25	<5.0
Trans-1,3-Dichloropropene, ug/l	<25	<5.0
Ethylbenzene, ug/l	<25	<5.0
Ethyl methacrylate, ug/l	<25	<5.0
2-Hexanone, ug/l	<250	<50
Iodomethane, ug/l	<25	<5.0
Isobutanol, ug/l	<5000	<1000
Methacrylonitrile, ug/l	<500	<100
Methylene Chloride, ug/l	<25	<5.0
Methyl methacrylate, ug/l	<25	<5.0
4-methyl-2-pentanone, ug/l	<250	<50
N-Octane, ug/l	<25	<5.0
Oxy-bis(ethanol), ug/l	<5000	<1000
Pentachloroethane, ug/l	<130	<25
Propanenitrile, ug/l	<500	<100
Styrene, ug/l	<25	<5.0
1,1,1,2-Tetrachloroethane, ug/l	<25	<5.0

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LOG NO: S2-42983

Received: 19 JUN 92

Ms. Diana Baldi
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410 Swing Road, P.O.Box 18300
Greensboro, NC 27419-8300

Project: Cranston
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
42983-1	HP-P29D(1)*II-1	06-16-92
42983-2	HP-P29D(2)*II-1	06-16-92

PARAMETER	42983-1	42983-2
1,1,2,2-Tetrachloroethane, ug/l	<25	<5.0
Tetrachloroethene, ug/l	39	<5.0
Toluene, ug/l	<25	10
1,1,1-Trichloroethane, ug/l	<25	<5.0
1,1,2-Trichloroethane, ug/l	<25	<5.0
Trichloroethene, ug/l	<25	<5.0
Trichlorofluoromethane, ug/l	<25	<5.0
1,2,3-Trichloropropane, ug/l	<25	<5.0
Vinyl Acetate, ug/l	<50	<10
Vinyl chloride, ug/l	<50	<10
o-Xylene, ug/l	<25	<5.0
m&p-Xylene, ug/l	<25	<5.0
Date Analyzed	06.25.92	06.24.92

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LOG NO: S2-42983

Received: 19 JUN 92

Ms. Diana Baldi
Ciba-Geigy, Corporate Environmental Technology
410 Swing Road, P.O.Box 18300
Greensboro, NC 27419-8300

Project: Cranston
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
42983-3	Method Blank - Liquid

PARAMETER	42983-3
Volatile Organic Compounds (8240)	
Acetone, ug/l	<50
Acetonitrile, ug/l	<1000
Acrolein, ug/l	<100
Acrylonitrile, ug/l	<100
Benzene, ug/l	<5.0
Bromodichloromethane, ug/l	<5.0
Bromoform, ug/l	<5.0
Bromomethane, ug/l	<10
2-butanone, ug/l	<50
Carbon Disulfide, ug/l	<5.0
Carbon Tetrachloride, ug/l	<5.0
Chlorobenzene, ug/l	<5.0
Chloroethane, ug/l	<10
Chloroform, ug/l	<5.0
Chloromethane, ug/l	<10
2-chloro-1,3-butadiene, ug/l	<5.0
3-Chloropropene, ug/l	<5.0
Dibromochloromethane, ug/l	<5.0
1,2-Dibromo-3-chloropropane, ug/l	<5.0
1,2-Dibromoethane , ug/l	<5.0
Dibromomethane, ug/l	<5.0
Trans-1,4-Dichloro-2-butene, ug/l	<5.0
Dichlorodifluoromethane, ug/l	<5.0

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Greensboro, NC 27419-8300

Project: Cranston
Sampled By: Client

REPORT OF RESULTS

LOG NO SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES

42983-3 Method Blank - Liquid

PARAMETER	42983-3
1,1-Dichloroethane, ug/l	<5.0
1,2-Dichloroethane, ug/l	<5.0
1,1-Dichloroethene, ug/l	<5.0
Trans-1,2-Dichloroethene, ug/l	<5.0
1,2-Dichloropropane, ug/l	<5.0
Cis-i,3-Dichloropropene, ug/l	<5.0
Trans-1,3-Dichloropropene, ug/l	<5.0
Ethylbenzene, ug/l	<5.0
Ethyl methacrylate, ug/l	<5.0
2-Hexanone, ug/l	<50
Iodomethane, ug/l	<5.0
Isobutanol, ug/l	<1000
Methacrylonitrile, ug/l	<100
Methylene Chloride, ug/l	<5.0
Methyl methacrylate, ug/l	<5.0
4-methyl-2-pentanone, ug/l	<50
N-Octane, ug/l	<5.0
Oxy-bis(ethanol), ug/l	<1000
Pentachloroethane, ug/l	<25
Propanenitrile, ug/l	<100
Styrene, ug/l	<5.0
1,1,1,2-Tetrachloroethane, ug/l	<5.0
1,1,2,2-Tetrachloroethane, ug/l	<5.0
Tetrachloroethene, ug/l	<5.0

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Greensboro, NC 27419-8300

Project: Cranston
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
42983-3	Method Blank - Liquid

PARAMETER	42983-3
Toluene, ug/l	<5.0
1,1,1-Trichloroethane, ug/l	<5.0
1,1,2-Trichloroethane, ug/l	<5.0
Trichloroethene, ug/l	<5.0
Trichlorofluoromethane, ug/l	<5.0
1,2,3-Trichloropropane, ug/l	<5.0
Vinyl Acetate, ug/l	<5.0
Vinyl chloride, ug/l	<10
o-Xylene, ug/l	<10
m&p-Xylene, ug/l	<5.0
Date Analyzed	06.25.92

Methods: EPA SW-846.

Linda A. Wolfe

Linda A. Wolfe

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JUL 16 1992

LOG NO: S2-43047
Received: 24 JUN 92

Ms. Diana Baldi
Ciba-Geigy, Corporate Environmental Technology
410 Swing Road, P.O.Box 18300
Greensboro, NC 27419-8300

CC: Peter Reynolds-WWC

Project: Cranston
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
43047-1	HP-MW29S(1)*II-1	06-23-92

PARAMETER	43047-1
Volatile Organic Compounds (8240)	
Acetone, ug/l	<50
Acetonitrile, ug/l	<1000
Acrolein, ug/l	<100
Acrylonitrile, ug/l	<100
Benzene, ug/l	<5.0
Bromodichloromethane, ug/l	<5.0
Bromoform, ug/l	<5.0
Bromomethane, ug/l	<10
2-butanone, ug/l	<50
Carbon Disulfide, ug/l	<5.0
Carbon Tetrachloride, ug/l	<5.0
Chlorobenzene, ug/l	<5.0
Chloroethane, ug/l	<10
Chloroform, ug/l	<5.0
Chloromethane, ug/l	<10
2-chloro-1,3-butadiene, ug/l	<5.0
3-Chloropropene, ug/l	<5.0
Dibromochloromethane, ug/l	<5.0
1,2-Dibromo-3-chloropropane, ug/l	<10
1,2-Dibromoethane , ug/l	<5.0
Dibromomethane, ug/l	<5.0
Trans-1,4-Dichloro-2-butene, ug/l	<10
Dichlorodifluoromethane, ug/l	<5.0

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LOG NO: S2-43047

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Greensboro, NC 27419-8300

CC: Peter Reynolds-WWC

Project: Cranston
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
43047-1	HP-MW29S(1)*II-1	06-23-92

PARAMETER	43047-1
1,1-Dichloroethane, ug/l	<5.0
1,2-Dichloroethane, ug/l	<5.0
1,1-Dichloroethene, ug/l	<5.0
Trans-1,2-Dichloroethene, ug/l	<5.0
1,2-Dichloropropane, ug/l	<5.0
Cis-1,3-Dichloropropene, ug/l	<5.0
Trans-1,3-Dichloropropene, ug/l	<5.0
Ethylbenzene, ug/l	<5.0
Ethyl methacrylate, ug/l	<5.0
2-Hexanone, ug/l	<50
Iodomethane, ug/l	<5.0
Isobutanol, ug/l	<1000
Methacrylonitrile, ug/l	<100
Methylene Chloride, ug/l	<5.0
Methyl methacrylate, ug/l	<5.0
4-methyl-2-pentanone, ug/l	<50
N-Octane, ug/l	<5.0
Pentachloroethane, ug/l	<25
Propanenitrile, ug/l	<100
Styrene, ug/l	<5.0
1,1,1,2-Tetrachloroethane, ug/l	<5.0
1,1,2,2-Tetrachloroethane, ug/l	<5.0
Tetrachloroethene, ug/l	<5.0
Toluene, ug/l	<5.0

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Greensboro, NC 27419-8300

CC: Peter Reynolds-WWC

Project: Cranston
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
43047-1	HP-MW29S(1)*II-1	06-23-92

PARAMETER	43047-1
1,1,1-Trichloroethane, ug/l	<5.0
1,1,2-Trichloroethane, ug/l	<5.0
Trichloroethene, ug/l	<5.0
Trichlorofluoromethane, ug/l	<5.0
1,2,3-Trichloropropane, ug/l	<5.0
Vinyl Acetate, ug/l	<10
Vinyl chloride, ug/l	<10
o-Xylene, ug/l	<5.0
m&p-Xylene, ug/l	<5.0
Date Analyzed	07.06.92

SL SAVANNAH LABORATORIES
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LOG NO: S2-43047

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Greensboro, NC 27419-8300

CC: Peter Reynolds-WWC

Project: Cranston
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
43047-2	Method Blank - Liquid

PARAMETER	43047-2
Volatile Organic Compounds (8240)	
Acetone, ug/l	<50
Acetonitrile, ug/l	<1000
Acrolein, ug/l	<100
Acrylonitrile, ug/l	<100
Benzene, ug/l	<5.0
Bromodichloromethane, ug/l	<5.0
Bromoform, ug/l	<5.0
Bromomethane, ug/l	<10
2-butanone, ug/l	<50
Carbon Disulfide, ug/l	<5.0
Carbon Tetrachloride, ug/l	<5.0
Chlorobenzene, ug/l	<5.0
Chloroethane, ug/l	<10
Chloroform, ug/l	<5.0
Chloromethane, ug/l	<10
2-chloro-1,3-butadiene, ug/l	<5.0
3-Chloropropene, ug/l	<5.0
Dibromochloromethane, ug/l	<5.0
1,2-Dibromo-3-chloropropane, ug/l	<10
1,2-Dibromoethane , ug/l	<5.0
Dibromomethane, ug/l	<5.0
Trans-1,4-Dichloro-2-butene, ug/l	<10
Dichlorodifluoromethane, ug/l	<5.0

SL SAVANNAH LABORATORIES
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Greensboro, NC 27419-8300

CC: Peter Reynolds-WWC

Project: Cranston
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
43047-2	Method Blank - Liquid

PARAMETER	43047-2
1,1-Dichloroethane, ug/l	<5.0
1,2-Dichloroethane, ug/l	<5.0
1,1-Dichloroethene, ug/l	<5.0
Trans-1,2-Dichloroethene, ug/l	<5.0
1,2-Dichloropropane, ug/l	<5.0
Cis-1,3-Dichloropropene, ug/l	<5.0
Trans-1,3-Dichloropropene, ug/l	<5.0
Ethylbenzene, ug/l	<5.0
Ethyl methacrylate, ug/l	<5.0
2-Hexanone, ug/l	<50
Iodomethane, ug/l	<5.0
Isobutanol, ug/l	<1000
Methacrylonitrile, ug/l	<100
Methylene Chloride, ug/l	<5.0
Methyl methacrylate, ug/l	<5.0
4-methyl-2-pentanone, ug/l	<50
N-Octane, ug/l	<5.0
Pentachloroethane, ug/l	<25
Propanenitrile, ug/l	<100
Styrene, ug/l	<5.0
1,1,1,2-Tetrachloroethane, ug/l	<5.0
1,1,2,2-Tetrachloroethane, ug/l	<5.0
Tetrachloroethene, ug/l	<5.0
Toluene, ug/l	<5.0

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410 Swing Road, P.O.Box 18300
Greensboro, NC 27419-8300

CC: Peter Reynolds-WWC

Project: Cranston
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
43047-2	Method Blank - Liquid

PARAMETER	43047-2
1,1,1-Trichloroethane, ug/l	<5.0
1,1,2-Trichloroethane, ug/l	<5.0
Trichloroethene, ug/l	<5.0
Trichlorofluoromethane, ug/l	<5.0
1,2,3-Trichloropropane, ug/l	<5.0
Vinyl Acetate, ug/l	<10
Vinyl chloride, ug/l	<10
o-Xylene, ug/l	<5.0
m&p-Xylene, ug/l	<5.0
Date Analyzed	07.06.92

Methods: EPA SW-846.

Linda A. Wolfe

Linda A. Wolfe

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO. 92-43427

Received: 16 JUL 92

Ms. Diana Baldi,
Ciba-Geigy, Corporate Environmental Technology
410 Swing Road, P.O.Box 18300
Greensboro, NC 27419-8300

Project: Cranston
Sampled By: Client

REPORT OF RESULTS

Page 1

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
43427-1	HP-P310(1)-II-1	07-13-92
43427-2	HP-P310(2)-II-1	07-14-92
43427-3	HP-P310(3)-II-1	07-14-92

PARAMETER	43427-1	43427-2	43427-3
Volatile Organic Compounds (8240)			
Acetone, ug/l	<100	<100	<50
Acetonitrile, ug/l	<2000	<2000	<1000
Acrolein, ug/l	<200	<200	<100
Acrylonitrile, ug/l	<200	<200	<100
Benzene, ug/l	<10	<10	<5.0
Bromodichloromethane, ug/l	<10	<10	<5.0
Bromoform, ug/l	<10	<10	<5.0
Bromomethane, ug/l	<10	<10	<5.0
2-butanone, ug/l	<100	<100	<50
Carbon Disulfide, ug/l	<10	<10	<5.0
Carbon Tetrachloride, ug/l	<10	<10	<5.0
Chlorobenzene, ug/l	250	200	33
Chloroethane, ug/l	<20	<20	<10
Chloroform, ug/l	<10	<10	<5.0
Chloromethane, ug/l	<20	<20	<10
2-chloro-1,3-butadiene, ug/l	<10	<10	<5.0
3-Chloropropene, ug/l	<10	<10	<5.0
Dibromochloromethane, ug/l	<10	<10	<5.0
1,2-Dibromo-3-chloropropane, ug/l	<10	<10	<5.0
1,2-Dibromoethane , ug/l	<10	<10	<5.0
Dibromomethane, ug/l	<10	<10	<5.0

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOS NO: 92-43427

Received: 16 JUL 92

Ms. Diana Baldi
Ciba-Geigy, Corporate Environmental Technology
410 Swing Road, P.O.Box 18300
Greensboro, NC 27419-8300

Project: Cramaron
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
43427-1	HP-P310(1)-II-1	07-15-92
43427-2	HP-P310(2)-II-1	07-15-92
43427-3	HP-P310(3)-II-1	07-15-92

PARAMETER	43427-1	43427-2	43427-3
Trans-1,4-Dichloro-2-butene, ug/l	<10	<10	<5.0
Dichlorodifluoromethane, ug/l	<10	<10	<5.0
1,1-Dichloroethane, ug/l	<10	<10	<5.0
1,2-Dichloroethane, ug/l	<10	<10	<5.0
1,1-Dichloroethene, ug/l	<10	<10	<5.0
Trans-1,2-Dichloroethene, ug/l	<10	<10	<5.0
1,2-Dichloropropane, ug/l	<10	<10	<5.0
Cis-1,3-Dichloropropene, ug/l	<10	<10	<5.0
Trans-1,3-Dichloropropene, ug/l	<10	<10	<5.0
Ethylbenzene, ug/l	<10	<10	<5.0
Ethyl methacrylate, ug/l	<10	<10	<5.0
2-Hexanone, ug/l	<100	<100	<50
Iodomethane, ug/l	<10	<10	<5.0
Isobutanol, ug/l	<2000	<2000	<1000
Methacrylonitrile, ug/l	<200	<200	<100
Methylene Chloride, ug/l	<10	<10	<5.0
Methyl methacrylate, ug/l	<10	<10	<5.0
4-methyl-2-pentanone, ug/l	<100	<100	<50
N-Octane, ug/l	<10	<10	<5.0
Pentachloroethane, ug/l	<50	<50	<25
Propanenitrile, ug/l	<200	<200	<100
Styrene, ug/l	<10	<10	<5.0

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: 92-43427

Received: 16 JUL 92

Ms. Diana Baldi
Ciba-Geigy, Corporate Environmental Technology
410 Swing Road, P.O.Box 18300
Greensboro, NC 27419-8300

Project: Cranston
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
43427-1	HP-P310(1)*II-1	07-13-92
43427-2	HP-P310(2)*II-1	07-14-92
43427-3	HP-P310(3)*II-1	07-14-92

PARAMETER	43427-1	43427-2	43427-3
1,1,1,2-Tetrachloroethane, ug/l	<10	<10	<5.0
1,1,2,2-Tetrachloroethane, ug/l	<10	<10	<5.0
Tetrachloroethene, ug/l	<10	<10	<5.0
Toluene, ug/l	<10	15	5.6
1,1,1-Trichloroethane, ug/l	<10	<10	<5.0
1,1,2-Trichloroethane, ug/l	<10	<10	<5.0
Trichloroethene, ug/l	<10	<10	<5.0
Trichlorofluoromethane, ug/l	<10	<10	<5.0
1,2,3-Trichloropropane, ug/l	<10	<10	<5.0
Vinyl Acetate, ug/l	<20	<20	<10
Vinyl chloride, ug/l	<20	<20	<10
o-Xylene, ug/l	<10	14	<5.0
m&p-Xylene, ug/l	<10	<10	<5.0
Date Analyzed	07.23.92	07.24.92	07.23.92

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S2-43427

Received: 16 JUL 92

Ms. Diana Baldi
Ciba-Geigy, Corporate Environmental Technology
410 Swing Road, P.O.Box 18300
Greensboro, NC 27419-8300

Project: Cranston
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
43427-4	Method Blank - Liquid

PARAMETER	43427-4
Volatile Organic Compounds (8240)	
Acetone, ug/l	<50
Acetonitrile, ug/l	<1000
Acrolein, ug/l	<100
Acrylonitrile, ug/l	<100
Benzene, ug/l	<5.0
Bromodichloromethane, ug/l	<5.0
Bromoform, ug/l	<5.0
Bromomethane, ug/l	<5.0
2-butanone, ug/l	<50
Carbon Disulfide, ug/l	<5.0
Carbon Tetrachloride, ug/l	<5.0
Chlorobenzene, ug/l	<5.0
Chloroethane, ug/l	<10
Chloroform, ug/l	<5.0
Chloromethane, ug/l	<10
2-chloro-1,3-butadiene, ug/l	<5.0
3-Chloropropene, ug/l	<5.0
Dibromochloromethane, ug/l	<5.0
1,2-Dibromo-3-chloropropane, ug/l	<5.0
1,2-Dibromoethane , ug/l	<5.0
Dibromomethane, ug/l	<5.0
Trans-1,4-Dichloro-2-butene, ug/l	<5.0
Dichlorodifluoromethane, ug/l	<5.0

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LOG NO: 92-43427

Received: 16 JUL 92

Ms. Diana Baldi
Ciba-Geigy, Corporate Environmental Technology
410 Swing Road, P.O.Box 18300
Greensboro, NC 27419-8300

Project: Cranston
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
43427-4	Method Blank - Liquid

PARAMETER	43427-4
1,1-Dichloroethane, ug/l	<5.0
1,2-Dichloroethane, ug/l	<5.0
1,1-Dichloroethene, ug/l	<5.0
Trans-1,2-Dichloroethene, ug/l	<5.0
1,2-Dichloropropane, ug/l	<5.0
Cis-1,3-Dichloropropene, ug/l	<5.0
Trans-1,3-Dichloropropene, ug/l	<5.0
Ethylbenzene, ug/l	<5.0
Ethyl methacrylate, ug/l	<5.0
2-Hexanone, ug/l	<50
Iodomethane, ug/l	<5.0
Isobutanol, ug/l	<1000
Methacrylonitrile, ug/l	<100
Methylene Chloride, ug/l	<5.0
Methyl methacrylate, ug/l	<5.0
4-methyl-2-pentanone, ug/l	<50
N-Octane, ug/l	<5.0
Pentachloroethane, ug/l	<25
Propanenitrile, ug/l	<100
Styrene, ug/l	<5.0
1,1,1,2-Tetrachloroethane, ug/l	<5.0
1,1,2,2-Tetrachloroethane, ug/l	<5.0
Tetrachloroethene, ug/l	<5.0
Toluene, ug/l	<5.0

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: 52-43427

Received: 16 JUL 92

Ms. Diana Baldi
Ciba-Geigy, Corporate Environmental Technology
410 Swing Road, P.O.Box 18300
Greensboro, NC 27419-8300

Project: Cranston
Sampled By: Client

Page 6

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
43427-4	Method Blank - Liquid

PARAMETER	43427-4
1,1,1-Trichloroethane, ug/l	<5.0
1,1,2-Trichloroethane, ug/l	<5.0
Trichloroethene, ug/l	<5.0
Trichlorofluoromethane, ug/l	<5.0
1,2,3-Trichloropropane, ug/l	<5.0
Vinyl Acetate, ug/l	<10
Vinyl chloride, ug/l	<10
o-Xylene, ug/l	<5.0
m&p-Xylene, ug/l	<5.0
Date Analyzed	07.23.92

Methods: EPA SW-846

Linda A. Wolfe

Linda A. Wolfe

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
MW-20S*II-S	BARIUM	D	27.1	UG/L	J	6010W
	BARIUM	T	44.9	UG/L	J	
	CHROMIUM	T	16.4	UG/L		
	IRON	T	14000	UG/L		
	MAGNESIUM	T	5300	UG/L		
	CALCIUM	T	35000	UG/L		
	MANGANESE	T	275	UG/L		
	CALCIUM	D	35000	UG/L		
	IRON	D	21	UG/L		
	MANGANESE	D	110	UG/L		
	MAGNESIUM	D	2800	UG/L		
	POTASSIUM	D	2.9	MG/L		
	SODIUM	D	15000	UG/L		
	POTASSIUM	T	3.8	MG/L		
	SODIUM	T	15000	UG/L		
	LEAD	T	14	UG/L		7421W
	SELENIUM	T	10	UG/L	R	7740W
	ISOBUTANOL		1000	UG/L	R	8240W
	N-OCTANE		5	UG/L	R	
	ACROLEIN		100	UG/L	R	
	ACETONITRILE		1000	UG/L	R	
	2-BUTANONE		50	UG/L	R	
	TRANS-1,4-DICHLORO-2-BUTENE		10	UG/L	R	
	PYRENE		.16	UG/L	J	8270W
	FLUORANTHENE		.15	UG/L	J	
	ARAMITE		10	UG/L	R	
	4-NITROQUINOLINE-N-OXIDE		100	UG/L	R	
	2-CYCLOHEXENE-1-OL		.7	UG/L	J	
	2-CYCLOHEXENE-1-ONE		.79	UG/L	J	
	TOTAL ALKALINITY		82	MG/L		ALKZW
	BICARBONATE ALKALINITY	T	82	MG/L		
	BIOLOGICAL OXYGEN DEMAND - 5	T	.45	MG/L		BOD5W
	CHLORIDE	T	20	MG/L		CHLOW

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
MW-20S*II-S	CHEMICAL OXYGEN DEMAND	T	7	MG/L		CODZW
	LANGLIER INDEX		-1.88	X		CORRW
	TOTAL HARDNESS, AS CACO3		100	MG/L		HARDW
	AMMONIA AS N	T	.034	MG/L		NH3NW
	NITRATE-NITRITE AS N	T	1.4	MG/L		NO32W
	OIL AND GREASE	T	.48	MG/L		ONGRW
	ORTHOPHOSPHATE	T	3	MG/L		OPO4W
	PH	T	6.1	PH UNITS		PHZZW
	SILICA,TOTAL		41000	UG/L		SIO2W
	SULFATE	T	12	MG/L		SO4ZW
	TOTAL DISSOLVED SOLIDS	T	200	MG/L		TDSZW
	TKN	T	.82	MG/L		TKNZW
	TOTAL ORGANIC CARBON	T	3.3	MG/L		TOCZW
	TOTAL ORGANIC HALIDES	T	.012	MG/L		TOXZW
	HYDROCARBONS	T	.66	MG/KG		TPHCW
	TOTAL SUSPENDED SOLIDS	T	260	MG/L		TSSZW
MW-21S*II-S	POTASSIUM	T	7.2	MG/L		6010W
	MANGANESE	D	760	UG/L		
	MAGNESIUM	D	3100	UG/L		
	IRON	D	2000	UG/L		
	CALCIUM	D	25000	UG/L		
	CALCIUM	T	27000	UG/L		
	SODIUM	D	160000	UG/L		

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
MW-21S*II-S	IRON	T	40000	UG/L		6010W
	MAGNESIUM	T	8900	UG/L		
	POTASSIUM	D	3.4	MG/L		
	MANGANESE	T	1200	UG/L		
	SODIUM	T	160000	UG/L		
	BARIUM	D	56.3	UG/L	J	
	NICKEL	T	77.5	UG/L		
	ZINC	T	212	UG/L		
	VANADIUM	T	65.4	UG/L		
	CHROMIUM	T	82.9	UG/L		
	COPPER	T	50.9	UG/L		
	BARIUM	T	197	UG/L	J	
	COBALT	T	25.3	UG/L	J	
	ARSENIC	D	10.2	UG/L		7060W
	ARSENIC	T	20.6	UG/L		
	LEAD	T	24.5	UG/L		7421W
	SELENIUM	T	50	UG/L	R	7740W
	TRANS-1,4-DICHLORO-2-BUTENE		5000	UG/L	R	8240W
	TOLUENE		37000	UG/L		
	PHENOL		190	UG/L		8270W
	ARAMITE		50	UG/L	R	
	4-NITROQUINOLINE-N-OXIDE		500	UG/L	R	
	3&4-METHYLPHENOL		110	UG/L		
	2,4-DICHLOROPHENOL		310	UG/L		
	1,2-DICHLOROBENZENE		21	UG/L	J	
	2,4-DIMETHYLPHENOL		32	UG/L	J	
	1,1-BIPHENYL		1.8	UG/L	J	
	2-METHYLPHENOL		450	UG/L		
	4-CHLORO-3-METHYLPHENOL		43	UG/L	J	
	BENZYL ALCOHOL		21	UG/L	J	
	IRGASAN DP-300		1200	UG/L		
	NAPHTHALENE		210	UG/L		
	1,4-DICHLOROBENZENE		2.3	UG/L	J	
	TOTAL ALKALINITY		225	MG/L		ALKZW
	BICARBONATE ALKALINITY	T	225	MG/L		

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
MW-21S*II-S	BIOLOGICAL OXYGEN DEMAND - 5	T	84	MG/L		BOD5W
	CHLORIDE	T	90	MG/L		CHLOW
	CHEMICAL OXYGEN DEMAND	T	170	MG/L		CODZW
	LANGLIER INDEX		-.99	X		CORRW
	TOTAL HARDNESS, AS CACO3		96	MG/L		HARDW
	AMMONIA AS N	T	1.71	MG/L		NH3NW
	NITRATE-NITRITE AS N	T	.018	MG/L		NO32W
	OIL AND GREASE	T	5.5	MG/L		ONGRW
	ORTHOPHOSPHATE	T	11	MG/L		OPO4W
	PH	T	6.7	PH UNITS		PHZZW
	SILICA,TOTAL		90000	UG/L		SIO2W
	SULFATE	T	28	MG/L		SO4ZW
	TOTAL DISSOLVED SOLIDS	T	530	MG/L		TDSZW
	TKN	T	3.91	MG/L		TKNZW
	TOTAL ORGANIC CARBON	T	27.1	MG/L		TOCZW
	TOTAL ORGANIC HALIDES	T	2.3	MG/L		TOXZW
	HYDROCARBONS	T	4.4	MG/KG		TPHCW
	TOTAL SUSPENDED SOLIDS	T	2800	MG/L		TSSZW
MW-22S*II-S	SODIUM	T	23000	UG/L		6010W
	MAGNESIUM	D	10000	UG/L		

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
MW-22S*II-S	IRON	D	57	UG/L		6010W
	CALCIUM	D	58000	UG/L		
	CALCIUM	T	60000	UG/L		
	IRON	T	11000	UG/L		
	MAGNESIUM	T	13000	UG/L		
	MANGANESE	T	380	UG/L		
	SODIUM	D	22000	UG/L		
	POTASSIUM	D	21	MG/L		
	MANGANESE	D	250	UG/L		
	POTASSIUM	T	22	MG/L		
	BARIUM	D	132	UG/L	J	
	BARIUM	T	144	UG/L	J	
	CHROMIUM	T	18.3	UG/L		
	SELENIUM	T	50	UG/L	R	7740W
	TRANS-1,4-DICHLORO-2-BUTENE		50	UG/L	R	8240W
	ACROLEIN		500	UG/L	R	
	2-BUTANONE		250	UG/L	R	
	N-OCTANE		25	UG/L	R	
	CHLOROBENZENE		640	UG/L		
	ISOBUTANOL		5000	UG/L	R	
	ACETONITRILE		5000	UG/L	R	
	PYRENE		.21	UG/L	J	8270W
	1,1-BIPHENYL		.076	UG/L	J	
	2-CYCLOHEXENE-1-ONE		.87	UG/L	J	
	FLUORANTHENE		.19	UG/L	J	
	ARAMITE		10	UG/L	R	
	BIS(2-ETHYLHEXYL)PHTHALATE		.62	UG/L	J	
	4-NITROQUINOLINE-N-OXIDE		100	UG/L	R	
	TOTAL ALKALINITY		197	MG/L		ALKZW
	BICARBONATE ALKALINITY	T	197	MG/L		
	BIOLOGICAL OXYGEN DEMAND - 5	T	2	MG/L		BOD5W
	CHLORIDE	T	6.8	MG/L		CHLOW
	CHEMICAL OXYGEN DEMAND	T	19	MG/L		CODZW

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHO
MW-22S*II-S	LANGLIER INDEX		-.59	X		CORRW
	TOTAL HARDNESS, AS CACO3		190	MG/L		HARDW
	AMMONIA AS N	T	2.8	MG/L		NH3NW
	NITRATE-NITRITE AS N	T	.11	MG/L		NO32W
	OIL AND GREASE	T	.77	MG/L		ONGRW
	ORTHOPHOSPHATE	T	1.3	MG/L		OPO4W
	PH	T	6.8	PH UNITS		PHZZW
	SILICA,TOTAL		34000	UG/L		SIO2W
	SULFATE	T	44	MG/L		SO4ZW
	TOTAL DISSOLVED SOLIDS	T	350	MG/L		TDSZW
	TKN	T	3	MG/L		TKNZW
	TOTAL ORGANIC CARBON	T	6.2	MG/L		TOCZW
	TOTAL ORGANIC HALIDES	T	.17	MG/L		TOXZW
	HYDROCARBONS	T	.48	MG/KG		TPHCW
	TOTAL SUSPENDED SOLIDS	T	230	MG/L		TSSZW
MW-23S*II-S	POTASSIUM	T	3	MG/L		6010W
	SODIUM	T	25000	UG/L		
	IRON	T	9400	UG/L		
	MANGANESE	T	516	UG/L		
	IRON	D	60	UG/L		
	MANGANESE	D	290	UG/L		
	SODIUM	D	24000	UG/L		
	POTASSIUM	D	2.7	MG/L		
	MAGNESIUM	D	4500	UG/L		

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
MW-23S*II-S	CALCIUM	D	28000	UG/L		6010W
	MAGNESIUM	T	61000	UG/L		
	CALCIUM	T	29000	UG/L		
	BARIUM	D	17.5	UG/L	J	
	BARIUM	T	31.3	UG/L	J	
	CHROMIUM	T	129	UG/L		
	COPPER	T	29.6	UG/L		
	LEAD	T	8.6	UG/L		7421W
	SELENIUM	T	10	UG/L	R	7740W
	TRANS-1,4-DICHLORO-2-BUTENE		10	UG/L	R	8240W
	2-BUTANONE		50	UG/L	R	
	ACROLEIN		100	UG/L	R	
	ACETONITRILE		1000	UG/L	R	
	CHLOROBENZENE		7.1	UG/L		
	ISOBUTANOL		1000	UG/L	R	
	PYRENE		.095	UG/L	J	8270W
	ARAMITE		10	UG/L	R	
	4-NITROQUINOLINE-N-OXIDE		100	UG/L	R	
	2-CYCLOHEXENE-1-ONE		.65	UG/L	J	
	FLUORANTHENE		.31	UG/L	J	
	TINUVIN 327		.22	UG/L	J	
	TOTAL ALKALINITY		60	MG/L		ALKZW
	BICARBONATE ALKALINITY	T	60	MG/L		
	BIOLOGICAL OXYGEN DEMAND - 5	T	.57	MG/L		BOD5W
	CHLORIDE	T	44	MG/L		CHLOW
	CHEMICAL OXYGEN DEMAND	T	6.6	MG/L		CODZW
	LANGLIER INDEX		-2.41	X		CORRW
	TOTAL HARDNESS, AS CACO3		94	MG/L		HARDW
	AMMONIA AS N	T	.01	MG/L		NH3NW

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
MW-23S*II-S	NITRATE-NITRITE AS N	T	.83	MG/L		NO32W
	OIL AND GREASE	T	.48	MG/L		ONGRW
	ORTHOPHOSPHATE	T	2.2	MG/L		OPO4W
	PH	T	5.8	PH UNITS		PHZZW
	SILICA,TOTAL		24000	UG/L		SIO2W
	SULFATE	T	15	MG/L		SO4ZW
	TOTAL DISSOLVED SOLIDS	T	210	MG/L		TDSZW
	TKN	T	.82	MG/L		TKNZW
	TOTAL ORGANIC CARBON	T	1.2	MG/L		TOCZW
	TOTAL ORGANIC HALIDES	T	.012	MG/L		TOXZW
	HYDROCARBONS	T	.53	MG/KG		TPHCW
	TOTAL SUSPENDED SOLIDS	T	240	MG/L		TSSZW
MW-24S*II-S	CALCIUM	D	23000	UG/L		6010W
	MANGANESE	D	5600	UG/L		
	MAGNESIUM	D	2400	UG/L		
	IRON	D	770	UG/L		
	CALCIUM	T	26000	UG/L		
	MANGANESE	T	17000	UG/L		
	MAGNESIUM	T	11000	UG/L		
	IRON	T	110000	UG/L		
	SODIUM	T	20000	UG/L		
	POTASSIUM	T	6.5	MG/L		
	SILICA,TOTAL		66000	UG/L		
	POTASSIUM	D	3.6	MG/L		
	SODIUM	D	19000	UG/L		
	TIN	D	57.1	UG/L		
	VANADIUM	T	24.1	UG/L	J	

March 3, 1993

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
MW-24S*II-S	CHROMIUM	T	40.3	UG/L		6010W
	COPPER	T	87.6	UG/L		
	COBALT	T	36.4	UG/L	J	
	BARIUM	T	178	UG/L	J	
	ZINC	T	117	UG/L		
	TIN	T	83.4	UG/L		
	BARIUM	D	43.8	UG/L	J	
	NICKEL	T	55.1	UG/L		
	ARSENIC	T	68.1	UG/L		7060W
	LEAD	T	49.5	UG/L		7421W
	SELENIUM	T	50	UG/L	R	7740W
	TRANS-1,4-DICHLORO-2-BUTENE		10	UG/L	R	8240W
	2-BUTANONE		50	UG/L	R	
	ACROLEIN		100	UG/L	R	
	ISOBUTANOL		1000	UG/L	R	
	ACETONITRILE		1000	UG/L	R	
	ARAMITE		10	UG/L	R	8270W
	2-CYCLOHEXENE-1-OL		.74	UG/L	J	
	2-CYCLOHEXENE-1-ONE		.41	UG/L	J	
	4-NITROQUINOLINE-N-OXIDE		100	UG/L	R	
	TOTAL ALKALINITY		50	MG/L		ALKZW
	BICARBONATE ALKALINITY	T	50	MG/L		
	BIOLOGICAL OXYGEN DEMAND - 5	T	.6	MG/L		BOD5W
	CHLORIDE	T	27	MG/L		CHLOW
	CHEMICAL OXYGEN DEMAND	T	6.6	MG/L		CODZW
	LANGLIER INDEX		-2.52	X		CORRW
	TOTAL HARDNESS, AS CACO3		110	MG/L		HARDW
	AMMONIA AS N	T	.01	MG/L		NH3NW

March 3, 1993

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
MW-24S*II-S	NITRATE-NITRITE AS N	T	1	MG/L		NO32W
	OIL AND GREASE	T	.48	MG/L		ONGRW
	ORTHOPHOSPHATE	T	5.9	MG/L		OPO4W
	PH	T	5.8	PH UNITS		PHZZW
	SULFATE	T	27	MG/L		SO4ZW
	TOTAL DISSOLVED SOLIDS	T	180	MG/L		TDSZW
	TKN	T	1.4	MG/L		TKNZW
	TOTAL ORGANIC CARBON	T	2.3	MG/L		TOCZW
	TOTAL ORGANIC HALIDES	T	.018	MG/L		TOXZW
	HYDROCARBONS	T	.38	MG/KG		TPHCW
	TOTAL SUSPENDED SOLIDS	T	1900	MG/L		TSSZW
MW-29D*II-S	MANGANESE	T	3000	UG/L		6010W
	MAGNESIUM	D	19000	UG/L		
	IRON	D	13000	UG/L		
	SODIUM	D	100000	UG/L		
	POTASSIUM	D	2.9	MG/L		
	MANGANESE	D	2500	UG/L		
	SODIUM	T	100000	UG/L		
	IRON	T	43000	UG/L		
	MAGNESIUM	T	25000	UG/L		
	CALCIUM	D	76000	UG/L		
	CALCIUM	T	80000	UG/L		
	POTASSIUM	T	6.1	MG/L		
	BARIUM	D	15.2	UG/L	J	
	VANADIUM	T	17.2	UG/L	J	
	COPPER	T	42.7	UG/L		
	COBALT	T	12.3	UG/L	J	
	NICKEL	T	73.4	UG/L		

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
MW-29D*II-S	BARIUM	T	51.1	UG/L	J	6010W
	CHROMIUM	T	112	UG/L		
	ARSENIC	D	25.9	UG/L		7060W
	ARSENIC	T	54.9	UG/L		
	LEAD	T	13.3	UG/L		7421W
	SELENIUM	T	50	UG/L	R	7740W
	TRANS-1,4-DICHLORO-2-BUTENE		10	UG/L	R	8240W
	N-OCTANE		5	UG/L	R	
	ANILINE		.3	UG/L	J	8270W
	2-CYCLOHEXENE-1-OL		.59	UG/L	J	
	ARAMITE		10	UG/L	R	
	4-NITROQUINOLINE-N-OXIDE		100	UG/L	R	
	TOTAL ALKALINITY		84	MG/L		ALKZW
	BICARBONATE ALKALINITY	T	84	MG/L		
	BIOLOGICAL OXYGEN DEMAND - 5	T	1.3	MG/L		BOD5W
	CHLORIDE	T	30	MG/L		CHLOW
	CHEMICAL OXYGEN DEMAND	T	6.6	MG/L		CODZW
	LANGLIER INDEX		-1.16	X		CORRW
	TOTAL HARDNESS, AS CACO3		290	MG/L		HARDW
	AMMONIA AS N	T	.72	MG/L		NH3NW
	NITRATE-NITRITE AS N	T	.04	MG/L		NO32W
	ORTHOPHOSPHATE	T	4.5	MG/L		OPO4W
	PH	T	6.5	PH UNITS		PHZZW
	SILICA,TOTAL		39000	MG/L		SIO2W

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
MW-29D*II-S	SULFATE	T	390	MG/L		SO4ZW
	TOTAL DISSOLVED SOLIDS	T	650	MG/L		TDSZW
	TKN	T	.82	MG/L		TKNZW
	TOTAL ORGANIC CARBON	T	2.53	MG/L		TOCZW
	TOTAL SUSPENDED SOLIDS	T	590	MG/L		TSSZW
MW-29S*II-S	NICKEL	D	44.1	UG/L		6010W
	BARIUM	T	51.5	UG/L	J	
	CHROMIUM	T	144	UG/L		
	NICKEL	T	102	UG/L		
	VANADIUM	T	10.8	UG/L	J	
	COPPER	T	53.8	UG/L		
	BARIUM	D	11.2	UG/L	J	
	MANGANESE	T	450	UG/L		
	SODIUM	D	23000	UG/L		
	POTASSIUM	D	2.2	MG/L		
	CALCIUM	T	14000	UG/L		
	CALCIUM	D	13000	UG/L		
	MAGNESIUM	D	3400	UG/L		
	MANGANESE	D	240	UG/L		
	IRON	D	25000	UG/L		
	MAGNESIUM	T	6700	UG/L		
	IRON	T	57000	UG/L		
	POTASSIUM	T	2.9	MG/L		
	SODIUM	T	22000	UG/L		
	ARSENIC	D	41.6	UG/L		7060W
	ARSENIC	T	56.3	UG/L		
	LEAD	T	28.1	UG/L		7421W
	SELENIUM	T	50	UG/L	R	7740W
	TRANS-1,4-DICHLORO-2-BUTENE		10	UG/L	R	8240W
	CHLOROBENZENE		5.7	UG/L		

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
MW-29S*II-S	ARAMITE		10	UG/L	R	8270W
	2-CYCLOHEXENE-1-ONE		.8	UG/L	J	
	1,1-BIPHENYL		.11	UG/L	J	
	4-NITROQUINOLINE-N-OXIDE		100	UG/L	R	
	TOTAL ALKALINITY		32	MG/L		ALKZW
	BICARBONATE ALKALINITY	T	32	UG/L		
	BIOLOGICAL OXYGEN DEMAND - 5	T	1.3	MG/L		BOD5W
	CHLORIDE	T	34	MG/L		CHLOW
	CHEMICAL OXYGEN DEMAND	T	10	MG/L		CODZW
	LANGLIER INDEX		-2.67	X		CORRW
	TOTAL HARDNESS, AS CACO3		67	MG/L		HARDW
	AMMONIA AS N	T	.087	MG/L		NH3NW
	NITRATE-NITRITE AS N	T	.02	MG/L		NO32W
	ORTHOPHOSPHATE	T	6.2	MG/L		OPO4W
	PH	T	6.1	PH UNITS		PHZZW
	SILICA,TOTAL		45000	UG/L		SIO2W
	SULFATE	T	21	MG/L		SO4ZW
	TOTAL DISSOLVED SOLIDS	T	160	MG/L		TDSZW
	TKN	T	.82	MG/L		TKNZW
	TOTAL ORGANIC CARBON	T	1.45	MG/L		TOCZW
	TOTAL ORGANIC HALIDES	T	.014	MG/L		TOXZW
	TOTAL SUSPENDED SOLIDS	T	520	MG/L		TSSZW

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
MW-30D*II-S	MAGNESIUM	T	22000	UG/L		6010W
	POTASSIUM	D	3.8	MG/L		
	MANGANESE	D	2100	UG/L		
	MAGNESIUM	D	3600	UG/L		
	IRON	D	23000	UG/L		
	CALCIUM	D	12000	UG/L		
	IRON	T	135000	UG/L		
	POTASSIUM	T	10	MG/L		
	SODIUM	T	27000	UG/L		
	SODIUM	D	26000	UG/L		
	MANGANESE	T	3500	UG/L		
	CALCIUM	T	22000	UG/L		
	NICKEL	D	45.2	UG/L		
	VANADIUM	T	80.2	UG/L		
	ZINC	T	435	UG/L		
	BARIUM	D	23.8	UG/L	J	
	CHROMIUM	T	115	UG/L		
	COPPER	T	212	UG/L		
	NICKEL	T	184	UG/L		
	BARIUM	T	173	UG/L	J	
	COBALT	T	55.5	UG/L		
	ARSENIC	D	61.7	UG/L		7060W
	ARSENIC	T	120	UG/L		
	LEAD	T	45.1	UG/L		7421W
	SELENIUM	T	50	UG/L	R	7740W
	TRANS-1,4-DICHLORO-2-BUTENE		10	UG/L	R	8240W
	N-OCTANE		5	UG/L	R	
	ARAMITE		10	UG/L	R	8270W
	ANILINE		.26	UG/L	J	
	4-NITROQUINOLINE-N-OXIDE		100	UG/L	R	
	TOTAL ALKALINITY		36	MG/L		ALKZW
	BICARBONATE ALKALINITY	T	36	MG/L		

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
MW-30D*II-S	BIOLOGICAL OXYGEN DEMAND - 5	T	.68	MG/L		BOD5W
	CHLORIDE	T	40	MG/L		CHLOW
	CHEMICAL OXYGEN DEMAND	T	9	MG/L		CODZW
	LANGLIER INDEX		-2.64	X		CORRW
	TOTAL HARDNESS, AS CACO3		95	MG/L		HARDW
	AMMONIA AS N	T	.18	MG/L		NH3NW
	NITRATE-NITRITE AS N	T	.04	MG/L		NO32W
	ORTHOPHOSPHATE	T	17	MG/L		OPO4W
	PH	T	5.9	PH UNITS		PHZZW
	SILICA,TOTAL		130000	UG/L		SIO2W
	SULFATE	T	34	MG/L		SO4ZW
	TOTAL DISSOLVED SOLIDS	T	200	MG/L		TDSZW
	TKN	T	1.8	MG/L		TKNZW
	TOTAL ORGANIC CARBON	T	1.57	MG/L		TOCZW
	TOTAL SUSPENDED SOLIDS	T	4800	MG/L		TSSZW
MW-30S*II-S	MANGANESE	T	770	UG/L		6010W
	COPPER	T	67.8	UG/L		
	CHROMIUM	T	32.6	UG/L		
	BARIUM	T	32.1	UG/L	J	
	ZINC	T	382	UG/L		
	SODIUM	D	21000	UG/L		
	POTASSIUM	D	3.2	MG/L		
	MANGANESE	D	700	UG/L		
	MAGNESIUM	D	3300	UG/L		

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
MW-30S*II-S	IRON	D	8800	UG/L		6010W
	CALCIUM	D	21000	UG/L		
	MAGNESIUM	T	4400	UG/L		
	IRON	T	17000	UG/L		
	BARIUM	D	14.6	UG/L	J	
	CALCIUM	T	22000	UG/L		
	SODIUM	T	21000	UG/L		
	POTASSIUM	T	4.1	MG/L		
	LEAD	T	18	UG/L		7421W
	SELENIUM	T	50	UG/L	R	7740W
	TOLUENE		530	UG/L	J	8240W
	O-XYLENE		39	UG/L	J	
	M&P-XYLENE		130	UG/L	J	
	ETHYLBENZENE		40	UG/L	J	
	TRANS-1,4-DICHLORO-2-BUTENE		50	UG/L	R	
	NAPHTHALENE		.65	UG/L	J	8270W
	ANILINE		.32	UG/L	J	
	4-NITROQUINOLINE-N-OXIDE		100	UG/L	R	
	3&4-METHYLPHENOL		7.9	UG/L	J	
	2,4-DIMETHYLPHENOL		.47	UG/L	J	
	ARAMITE		10	UG/L	R	
	BENZYL ALCOHOL		.29	UG/L	J	
	BICARBONATE ALKALINITY	T	50	MG/L		ALKZW
	TOTAL ALKALINITY		50	MG/L		
	BIOLOGICAL OXYGEN DEMAND - 5	T	1.2	MG/L		BOD5W
	CHLORIDE	T	35	MG/L		CHLOW
	CHEMICAL OXYGEN DEMAND	T	6.6	MG/L		CODZW
	LANGLIER INDEX		-2.28	X		CORRW
	TOTAL HARDNESS, AS CACO3		70	MG/L		HARDW
	AMMONIA AS N	T	.05	MG/L		NH3NW

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
MW-30S*II-S	NITRATE-NITRITE AS N	T	.03	MG/L		NO32W
	ORTHOPHOSPHATE	T	2.4	MG/L		OPO4W
	PH	T	6.1	PH UNITS		PHZZW
	SILICA,TOTAL		16000	UG/L		SIO2W
	SULFATE	T	16	MG/L		SO4ZW
	TOTAL DISSOLVED SOLIDS	T	170	MG/L		TDSZW
	TKN	T	.82	MG/L		TKNZW
	TOTAL ORGANIC CARBON	T	.94	MG/L		TOCZW
	TOTAL ORGANIC HALIDES	T	.016	MG/L		TOXZW
	TOTAL SUSPENDED SOLIDS	T	320	MG/L		TSSZW
MW-31D*II-S	SODIUM	T	30000	UG/L		6010W
	NICKEL	T	46	UG/L		
	COPPER	T	90	UG/L		
	COBALT	T	18.5	UG/L	J	
	ZINC	T	242	UG/L		
	VANADIUM	T	35.4	UG/L	J	
	POTASSIUM	D	2.2	MG/L		
	MANGANESE	D	1500	MG/L		
	MAGNESIUM	D	6200	UG/L		
	IRON	D	9100	UG/L		
	CALCIUM	D	25000	UG/L		
	CALCIUM	T	30000	UG/L		
	SODIUM	D	30000	UG/L		
	POTASSIUM	T	4.2	MG/L		
	MANGANESE	T	2100	UG/L		
	CHROMIUM	T	53.9	UG/L		
	BARIUM	T	96.6	UG/L	J	
	BARIUM	D	20.3	UG/L	J	

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
MW-31D*II-S	IRON	T	47000	UG/L		6010W
	MAGNESIUM	T	14000	UG/L		
	ARSENIC	D	25.3	UG/L		7060W
	ARSENIC	T	42.8	UG/L		
	LEAD	T	28.3	UG/L		7421W
	SELENIUM	T	50	UG/L	R	7740W
	TRANS-1,4-DICHLORO-2-BUTENE		20	UG/L	R	8240W
	CHLOROBENZENE		230	UG/L	J	
	M&P-XYLENE		15	UG/L	J	
	NAPHTHALENE		4.5	UG/L	J	8270W
	ARAMITE		10	UG/L	R	
	4-NITROQUINOLINE-N-OXIDE		100	UG/L	R	
	4-CHLORO-3-METHYLPHENOL		2	UG/L	J	
	BUTAZOLIDIN		3.1	UG/L	J	
	ANILINE		.23	UG/L	J	
	BICARBONATE ALKALINITY	T	87	MG/L		ALKZW
	TOTAL ALKALINITY		87	MG/L		
	BIOLOGICAL OXYGEN DEMAND - 5	T	3	MG/L		BOD5W
	CHLORIDE	T	40	MG/L		CHLOW
	CHEMICAL OXYGEN DEMAND	T	8	MG/L		CODZW
	LANGLIER INDEX		-1.83	X		CORRW
	TOTAL HARDNESS, AS CACO3		110	MG/L		HARDW
	AMMONIA AS N	T	.25	MG/L		NH3NW
	NITRATE-NITRITE AS N	T	.07	MG/L		NO32W
	ORTHOPHOSPHATE	T	6.6	MG/L		OPO4W
	PH	T	6.2	PH UNITS		PHZZW

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
MW-31D*II-S	SILICA,TOTAL		58000	UG/L		SIO2W
	SULFATE	T	6.1	MG/L		SO4ZW
	OCDD		3	NG/L		SOWZW
	TOTAL DISSOLVED SOLIDS	T	200	MG/L		TDSZW
	TKN	T	.82	MG/L		TKNZW
	TOTAL ORGANIC CARBON	T	10	MG/L		TOCZW
	TOTAL ORGANIC HALIDES	T	.038	MG/L		TOXZW
	TOTAL SUSPENDED SOLIDS	T	830	MG/L		TSSZW
MW-31S*II-S	POTASSIUM	T	16	MG/L		6010W
	VANADIUM	T	757	UG/L		
	BARIUM	D	39.8	UG/L	J	
	POTASSIUM	D	2.3	MG/L		
	MANGANESE	D	1500	UG/L		
	MAGNESIUM	D	6600	UG/L		
	IRON	D	6700	UG/L		
	CALCIUM	D	27000	UG/L		
	CALCIUM	T	92000	UG/L		
	ANTIMONY	T	86.1	UG/L		
	NICKEL	T	549	UG/L		
	COPPER	T	551	UG/L		
	COBALT	T	338	UG/L		
	CHROMIUM	T	618	UG/L		
	BERYLLIUM	T	20.4	UG/L		
	ZINC	T	1510	UG/L		
	SODIUM	D	29000	UG/L		
	BARIUM	T	1140	UG/L		
	MANGANESE	T	5000	UG/L		
	MAGNESIUM	T	35000	UG/L		
	IRON	T	68000	UG/L		
	SODIUM	T	30000	UG/L		

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
MW-31S*II-S	ARSENIC	D	20.5	UG/L		7060W
	ARSENIC	T	109	UG/L		
	LEAD	T	263	UG/L		7421W
	SELENIUM	T	50	UG/L	R	7740W
	TRANS-1,4-DICHLORO-2-BUTENE		10	UG/L	R	8240W
	N-OCTANE		5	UG/L	R	
	CHLOROBENZENE		34	UG/L	J	
	BUTAZOLIDIN		8.9	UG/L	J	8270W
	ARAMITE		10	UG/L	R	
	4-NITROQUINOLINE-N-OXIDE		100	UG/L	R	
	TOTAL ALKALINITY		84	MG/L		ALKZW
	BICARBONATE ALKALINITY	T	84	MG/L		
	BIOLOGICAL OXYGEN DEMAND - 5	T	1.7	MG/L		BOD5W
	CHLORIDE	T	42	MG/L		CHLOW
	CHEMICAL OXYGEN DEMAND	T	18	MG/L		CODZW
	LANGLIER INDEX		-1.15	X		CORRW
	TOTAL HARDNESS, AS CACO3		360	MG/L		HARDW
	AMMONIA AS N	T	.29	MG/L		NH3NW
	NITRATE-NITRITE AS N	T	.05	MG/L		NO32W
	ORTHOPHOSPHATE	T	61	MG/L		OPO4W
	PH	T	6.4	PH UNITS		PHZZW
	SILICA,TOTAL		160000	UG/L		SIO2W
	SULFATE	T	5.6	MG/L		SO4ZW

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
MW-31S*II-S	TOTAL DISSOLVED SOLIDS	T	200	MG/L		TDSZW
	TKN	T	2.1	MG/L		TKNZW
	TOTAL ORGANIC CARBON	T	2.83	MG/L		TOCZW
	TOTAL ORGANIC HALIDES	T	.015	MG/L		TOXZW
	TOTAL SUSPENDED SOLIDS	T	6400	MG/L		TSSZW
MW-DUP	POTASSIUM	D	3.4	MG/L		6010W
	SODIUM	D	170000	UG/L		
	CALCIUM	D	23000	UG/L		
	MAGNESIUM	D	3000	UG/L		
	MANGANESE	D	720	UG/L		
	IRON	D	1900	UG/L		
	MANGANESE	T	1100	UG/L		
	MAGNESIUM	T	9500	UG/L		
	IRON	T	38000	UG/L		
	CALCIUM	T	27000	UG/L		
	SODIUM	T	170000	UG/L		
	POTASSIUM	T	6.53	MG/L		
	TOTAL ALKALINITY		231	MG/L		ALKZW
	BICARBONATE ALKALINITY	T	231	MG/L		
	BIOLOGICAL OXYGEN DEMAND - 5	T	97	MG/L		BOD5W
	CHLORIDE	T	95	MG/L		CHLOW
	CHEMICAL OXYGEN DEMAND	T	290	MG/L		CODZW
	LANGLIER INDEX		-1.08	X		CORRW
	TOTAL HARDNESS, AS CACO3		83	MG/L		HARDW
	AMMONIA AS N	T	1.7	MG/L		NH3NW
	NITRATE-NITRITE AS N	T	.03	MG/L		NO32W

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHO
MW-DUP	OIL AND GREASE	T	6.1	MG/L		ONGRW
	ORTHOPHOSPHATE	T	4.9	MG/L		OPO4W
	PH	T	6.6	PH UNITS		PHZZW
	SILICA,TOTAL		47000	UG/L		SIO2W
	SULFATE	T	29	MG/L		SO4ZW
	TOTAL DISSOLVED SOLIDS	T	520	MG/L		TDSZW
	TKN	T	3.9	MG/L		TKNZW
	TOTAL ORGANIC CARBON	T	23.1	MG/L		TOCZW
	HYDROCARBONS	T	4.9	MG/KG		TPHCW
	TOTAL SUSPENDED SOLIDS	T	760	MG/L		TSSZW
MW-DUP*II-S	BARIUM	D	56.8	UG/L	J	6010W
	VANADIUM	T	60	UG/L		
	ZINC	T	190	UG/L		
	COPPER	T	56.4	UG/L		
	NICKEL	T	64.9	UG/L		
	COBALT	T	23.4	UG/L	J	
	CHROMIUM	T	67.8	UG/L		
	BARIUM	T	177	UG/L	J	
	ARSENIC	T	23.1	UG/L		7060W
	LEAD	T	22.9	UG/L		7421W
	SELENIUM	T	50	UG/L	R	7740W
	TOLUENE		33000	UG/L		8240W
	TRANS-1,4-DICHLORO-2-BUTENE		5000	UG/L	R	

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
MW-DUP*II-S	PHENOL		210	UG/L		8270W
	IRGASAN DP-300		760	UG/L	J	
	ARAMITE		50	UG/L	R	
	4-NITROQUINOLINE-N-OXIDE		500	UG/L	R	
	3&4-METHYLPHENOL		130	UG/L		
	2-METHYLPHENOL		450	UG/L		
	1,2-DICHLOROBENZENE		25	UG/L	J	
	1,1-BIPHENYL		2.1	UG/L	J	
	1,4-DIOXANE		10	UG/L	J	
	1,4-DICHLOROBENZENE		2.8	UG/L	J	
	2,4-DIMETHYLPHENOL		36	UG/L	J	
	2,4-DICHLOROPHENOL		350	UG/L		
	4-CHLORO-3-METHYLPHENOL		23	UG/L	J	
	BENZYL ALCOHOL		24	UG/L	J	
	NAPHTHALENE		240	UG/L		
	TOTAL ORGANIC HALIDES	T	2.7	MG/L		TOXZW
MW-TB8-5*II-S	TRANS-1,4-DICHLORO-2-BUTENE		10	UG/L	R	8240W
MW-TB8-6*II-S	TRANS-1,4-DICHLORO-2-BUTENE		10	UG/L	R	8240W
	N-OCTANE		5	UG/L	R	
MWFB8-5*II-S	SELENIUM	T	10	UG/L	R	7740W
	TRANS-1,4-DICHLORO-2-BUTENE		10	UG/L	R	8240W
	BUTYLBENZYLPHTHALATE		.19	UG/L	J	8270W
	2-METHYLNAPHTHALENE		.11	UG/L	J	
	2-METHYLPHENOL		.44	UG/L	J	
	ACETOPHENONE		1.4	UG/L	J	
	DI-N-BUTYLPHTHALATE		.27	UG/L	J	
	ARAMITE		10	UG/L	R	
	4-NITROQUINOLINE-N-OXIDE		100	UG/L	R	

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
MWFB8-5*II-S	TOTAL ORGANIC HALIDES	T	.054	MG/L		TOXZW
MWTB8*II-S	TRANS-1,4-DICHLORO-2-BUTENE		10	UG/L	R	8240W
	ISOBUTANOL		1000	UG/L	R	
	ACETONITRILE		1000	UG/L	R	
	ACROLEIN		100	UG/L	R	
	2-BUTANONE		50	UG/L	R	
RC-1*II-S	BARIUM	D	28.4	UG/L	J	6010W
	BARIUM	T	45.6	UG/L	J	
	POTASSIUM	T	6.6	MG/L		
	IRON	T	30000	UG/L		
	SODIUM	T	28000	UG/L		
	CALCIUM	T	33000	UG/L		
	MAGNESIUM	T	6900	UG/L		
	MANGANESE	T	1000	UG/L		
	MAGNESIUM	D	4600	UG/L		
	IRON	D	13000	UG/L		
	CALCIUM	D	29000	UG/L		
	SODIUM	D	27000	UG/L		
	POTASSIUM	D	5.6	MG/L		
	MANGANESE	D	750	UG/L		
	ARSENIC	T	13.7	UG/L		7060W
	LEAD	T	5.5	UG/L		7421W
	SELENIUM	T	10	UG/L	R	7740W
	TRANS-1,4-DICHLORO-2-BUTENE		10	UG/L	R	8240W
	M&P-XYLENE		7.7	UG/L		
	CHLOROBENZENE		65	UG/L	J	
	IRGASAN DP-300		2.6	UG/L	J	8270W
	ARAMITE		10	UG/L	R	
	4-NITROQUINOLINE-N-OXIDE		100	UG/L	R	
	1,1-BIPHENYL		.27	UG/L	J	

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
RC-1*II-S	CYANIDE	T	64.5	UG/L		9010W
	BICARBONATE ALKALINITY	T	85	MG/L		ALKZW
	TOTAL ALKALINITY		85	MG/L		
	BIOLOGICAL OXYGEN DEMAND - 5	T	1.5	MG/L		BOD5W
	CHLORIDE	T	32	MG/L		CHLOW
	CHEMICAL OXYGEN DEMAND	T	11	MG/L		CODZW
	LANGLIER INDEX		-1.79	X		CORRW
	TOTAL HARDNESS, AS CACO3		100	MG/L		HARDW
	AMMONIA AS N	T	.65	MG/L		NH3NW
	NITRATE-NITRITE AS N	T	.06	MG/L		NO32W
	OIL AND GREASE	T	.48	MG/L		ONGRW
	ORTHOPHOSPHATE	T	2.6	MG/L		OPO4W
	PH	T	6.2	PH UNITS		PHZZW
	SILICA,TOTAL		32000	UG/L		SIO2W
	SULFATE	T	27	MG/L		SO4ZW
	TOTAL DISSOLVED SOLIDS	T	190	MG/L		TDSZW
	TKN	T	1	MG/L		TKNZW
	TOTAL ORGANIC CARBON	T	5.57	MG/L		TOCZW
	TOTAL ORGANIC HALIDES	T	.076	MG/L		TOXZW
	HYDROCARBONS	T	.56	MG/KG		TPHCW
	TOTAL SUSPENDED SOLIDS	T	620	MG/L		TSSZW

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
RC-2*II-S	BARIUM	T	44.7	UG/L	J	6010W
	MAGNESIUM	D	7400	UG/L		
	IRON	D	6500	UG/L		
	CALCIUM	D	30000	UG/L		
	SODIUM	D	40000	UG/L		
	POTASSIUM	D	3.2	MG/L		
	MANGANESE	D	820	UG/L		
	SODIUM	T	41000	UG/L		
	IRON	T	6800	UG/L		
	MAGNESIUM	T	7700	UG/L		
	MANGANESE	T	830	UG/L		
	CALCIUM	T	31000	UG/L		
	POTASSIUM	T	3.3	MG/L		
	BARIUM	D	44.3	UG/L	J	
	CHROMIUM	T	26.7	UG/L		
	SELENIUM	T	10	UG/L	R	7740W
	TOLUENE		28	UG/L	J	8240W
	CHLOROBENZENE		36	UG/L	J	
	N-OCTANE		5	UG/L	R	
	TRANS-1,4-DICHLORO-2-BUTENE		10	UG/L	R	
	PROPAZINE		20	UG/L	R	8270W
	ARAMITE		10	UG/L	R	
	2-CHLOROPHENOL		.38	UG/L	J	
	4-NITROQUINOLINE-N-OXIDE		100	UG/L	R	
	BUTAZOLIDIN		3.7	UG/L	J	
	CYANIDE	T	13.2	UG/L		9010W
	TOTAL ALKALINITY		101	MG/L		ALKZW
	BICARBONATE ALKALINITY	T	101	MG/L		
	BIOLOGICAL OXYGEN DEMAND - 5	T	2.7	MG/L		BOD5W
	CHLORIDE	T	50	MG/L		CHLOW

CIBA-GEIGY/Cranston Site

Validated Round II-S Analytic Laboratory Data

Medium: GROUNDWATER

SAMPLE NUMBER	ANALYTE	T/D	VALID DATA	UOM	QUAL QC2	METHOD
RC-2*II-S	CHEMICAL OXYGEN DEMAND	T	6.6	MG/L		CODZW
	LANGLIER INDEX		-1.46	X		CORRW
	TOTAL HARDNESS, AS CACO3		110	MG/L		HARDW
	AMMONIA AS N	T	.012	MG/L		NH3NW
	NITRATE-NITRITE AS N	T	.03	MG/L		NO32W
	ORTHOPHOSPHATE	T	.69	MG/L		OPO4W
	PH	T	6.5	PH UNITS		PHZZW
	SILICA,TOTAL		12000	UG/L		SIO2W
	SULFATE	T	19	MG/L		SO4ZW
	TOTAL DISSOLVED SOLIDS	T	250	MG/L		TDSZW
	TKN	T	.82	MG/L		TKNZW
	TOTAL ORGANIC CARBON	T	1.88	MG/L		TOCZW
	TOTAL ORGANIC HALIDES	T	.27	MG/L		TOXZW
	HYDROCARBONS	T	.96	MG/KG		TPHCW
	TOTAL SUSPENDED SOLIDS	T	17	MG/L		TSSZW

22 rows selected.

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

TOMS RIVER, NEW JERSEY

CLIENT NAME:	CIBA-GEIGY Corporation Cranston, Rhode Island
PROJECT NAME:	EQTNK-1
PROJECT CODE:	RI-TCLP
CHARGE NUMBER:	CLA-61
REPORT NUMBER:	92E-0611
REPORT DATE:	23-Sep-92

John Rissel
Laboratory Director

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Definitions

ND Not detected at or above method detection limit.

J Detected but below method detection limit.

B Analyte detected in blank but not corrected for amount in blank.

Method Detection Limit Lowest concentration (amount) that must be present before a reliable and recognizable response is observed for that method of analysis.

When a sample has been diluted, the Method Detection Limit has been multiplied by the dilution factor.

Methodology

TCLP extracts were prepared in accordance with Toxicity Characteristics Revisions; Final Rule, 40 CFR 261, March 29, 1990.

Volatile organic analyses were performed in accordance with Method 8240, SW-846, EPA Test Methods for Evaluating Solid Wastes, 3rd edition.

Semivolatile organic analyses were performed in accordance with Method 8270, SW-846, EPA Test Methods for Evaluating Solid Wastes, 3rd edition.

Pesticides analyses were performed in accordance with Method 8080, SW-846, EPA Test Methods for Evaluating Solid Wastes, 3rd edition.

Herbicide analyses were performed in accordance with Method 509B, Standard Methods for the Examination of Water and Wastewater, 15th edition.

ICP metals analyses were performed in accordance with Method 200.7, 40 CFR 136.

Furnace metals and inorganics analyses were performed in accordance with EPA Test Methods for the Chemical Analysis of Water and Wastes.

REPORT NUMBER: 92E-0611

23-Sep-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Date Sampled	Date Received
92090288	EQTNK-1	9/11/1992	9/12/1992

Sample #	Sample Description	Parameter	Date Extracted
92090288	EQTNK-1	TCLP-ALL	9/15/1992
		Semivolatiles-TCLP	9/15/1992
		Pesticides-TCLP	9/15/1992
		Herbicides-TCLP	9/16/1992

Sample #	Sample Description	Parameter	Date Analyzed
92090288	EQTNK-1	Volatiles	9/17/1992
		Semivolatiles	9/21/1992
		Pesticides	9/17/1992
		Herbicides	9/17/1992
		Total Mercury TCLP	9/15/1992
		Total Barium TCLP	9/16/1992
		Total Cadmium TCLP	9/16/1992
		Total Chromium TCLP	9/16/1992
		Total Silver TCLP	9/17/1992
		Total Arsenic TCLP	9/15/1992
		Total Lead TCLP	9/15/1992
		Total Selenium TCLP	9/15/1992

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

TCLP REGULATORY LEVELS

PARAMETER	MAXIMUM CONC. LIMITS
Vinyl chloride	200
1,1-Dichloroethene	700
2-Butanone	200000
Chloroform	6000
Carbon tetrachloride	500
1,2 Dichloroethane	500
Trichloroethene	500
Benzene	500
Tetrachloroethene	700
Chlorobenzene	100000
1,4-Dichlorobenzene	7500
Total Cresols	200000
Hexachloroethane	3000
Nitrobenzene	2000
Hexachlorobutadiene	500
2,4,6-Trichlorophenol	2000
2,4,5-Trichlorophenol	400000
2,4-Dinitrotoluene	130
Hexachlorobenzene	130
Pentachlorophenol	100000
Pyridine	5000
Gamma BHC (Lindane)	400
Chlordane	30
Endrin	20
Heptachlor	8.0
Heptachlor Epoxide	8.0
Toxaphene	500
Methoxychlor	10000
2,4-D	10000
2,4,5-TP(Silvex)	1000
Barium	100000
Cadmium	1000
Chromium	5000
Arsenic	5000
Lead	5000
Selenium	1000
Silver	5000
Mercury	200
	(ug/L)

REPORT NUMBER: 92E-0611
23-Sep-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

TCLP Matrix Spike Corrected Results

Volatiles

EQTNK-1 Parameter	92090288	Method Detection Limit	Units
Vinyl chloride	ND	91	ug/L
1,1-Dichloroethene	ND	45	ug/L
2-Butanone	ND	900	ug/L
Chloroform	ND	45	ug/L
Carbon tetrachloride	ND	45	ug/L
1,2-Dichloroethane	ND	45	ug/L
Trichloroethene	ND	45	ug/L
Benzene	ND	45	ug/L
Tetrachloroethene	ND	45	ug/L
Chlorobenzene	ND	45	ug/L

Semivolatiles

EQTNK-1 Parameter	92090288	Method Detection Limit	Units
1,4-Dichlorobenzene	ND	150	ug/L
Total Cresol	ND	85	ug/L
Hexachloroethane	ND	150	ug/L
Nitrobenzene	ND	150	ug/L
Hexachlorobutadiene	ND	150	ug/L
2,4,6-Trichlorophenol	ND	85	ug/L
2,4,5-Trichlorophenol	ND	85	ug/L
2,4-Dinitrotoluene	ND	150	ug/L
Hexachlorobenzene	ND	150	ug/L
Pentachlorophenol	ND	260	ug/L
Pyridine	ND	310	ug/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

TCLP Matrix Spike Corrected Results

Pesticides

EQTNK-1 Parameter	92090288	Method Detection Limit	Units
Gamma BHC(Lindane)	ND	0.065	ug/L
Heptachlor	ND	0.072	ug/L
Heptachlor epoxide	ND	0.11	ug/L
Endrin	ND	0.092	ug/L
Methoxychlor	ND	0.79	ug/L
Chlordane	ND	1.9	ug/L
Toxaphene	ND	4.1	ug/L

Herbicides

EQTNK-1 Parameter	92090288	Method Detection Limit	Units
2,4-D	ND	1.3	ug/L
2,4,5-TP(Silvex)	ND	0.76	ug/L

REPORT NUMBER: 92E-0611
23-Sep-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

TCLP Matrix Spike Corrected Results

Metals

EQTNK-1 Parameter	92090288	Method Detection Limit	Units
Total Mercury	ND	42	ug/L
Total Barium	93	56	ug/L
Total Cadmium	ND	82	ug/L
Total Chromium	200 J	1100	ug/L
Total Silver	ND	9.1	ug/L
Total Arsenic	ND	120	ug/L
Total Lead	ND	50	ug/L
Total Selenium	ND	79	ug/L

REPORT NUMBER: 92E-0838

14-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Date Sampled	Date Received
92110575	TRIP BLANK	11/17/1992	11/18/1992
92110576	P-34S	11/17/1992	11/18/1992
92110578	P-35S	11/17/1992	11/18/1992
92110579	P-36S	11/17/1992	11/18/1992
92110580	P-37S	11/17/1992	11/18/1992
92110581	P-38S	11/17/1992	11/18/1992

REPORT NUMBER: 92E-0838

14-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Parameter	Date Analyzed
92110575	TRIP BLANK	Volatiles	12/01/1992
92110576	P-34S	Volatiles	11/19/1992
		Total Potassium	12/02/1992
		Total Mercury	12/04/1992
		Total Aluminum	12/10/1992
		Total Barium	12/09/1992
		Total Beryllium	12/10/1992
		Total Calcium	12/10/1992
		Total Cadmium	12/03/1992
		Total Cobalt	12/03/1992
		Total Chromium	12/03/1992
		Total Copper	12/03/1992
		Total Iron	12/10/1992
		Total Magnesium	12/10/1992
		Total Manganese	12/03/1992
		Total Sodium	12/10/1992
		Total Nickel	12/03/1992
		Total Vanadium	12/03/1992
		Total Zinc	12/09/1992
		Total Silver	12/01/1992
		Total Arsenic	11/24/1992
		Total Lead	11/24/1992
		Total Antimony	12/08/1992
		Total Selenium	11/24/1992
		Total Tin	11/30/1992
		Total Thallium	11/24/1992

REPORT NUMBER: 92E-0838

14-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

92110578	P-35S	Volatiles	12/01/1992
		Total Potassium	12/02/1992
		Total Mercury	12/04/1992
		Total Aluminum	12/10/1992
		Total Barium	12/09/1992
		Total Beryllium	12/10/1992
		Total Calcium	12/10/1992
		Total Cadmium	12/03/1992
		Total Cobalt	12/03/1992
		Total Chromium	12/03/1992
		Total Copper	12/03/1992
		Total Iron	12/10/1992
		Total Magnesium	12/10/1992
		Total Manganese	12/03/1992
		Total Sodium	12/10/1992
		Total Nickel	12/03/1992
		Total Vanadium	12/03/1992
		Total Zinc	12/09/1992
		Total Silver	12/01/1992
		Total Arsenic	11/24/1992
		Total Lead	11/24/1992
		Total Antimony	12/08/1992
		Total Selenium	11/24/1992
		Total Tin	11/30/1992
		Total Thallium	11/24/1992

REPORT NUMBER: 92E-0838

14-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

92110579	P-36S	Volatiles	11/19/1992
		Total Potassium	12/02/1992
		Total Mercury	12/04/1992
		Total Aluminum	12/10/1992
		Total Barium	12/09/1992
		Total Beryllium	12/10/1992
		Total Calcium	12/10/1992
		Total Cadmium	12/03/1992
		Total Cobalt	12/03/1992
		Total Chromium	12/03/1992
		Total Copper	12/03/1992
		Total Iron	12/10/1992
		Total Magnesium	12/10/1992
		Total Manganese	12/03/1992
		Total Sodium	12/10/1992
		Total Nickel	12/03/1992
		Total Vanadium	12/03/1992
		Total Zinc	12/09/1992
		Total Silver	12/01/1992
		Total Arsenic	11/24/1992
		Total Lead	11/24/1992
		Total Antimony	12/08/1992
		Total Selenium	11/24/1992
		Total Tin	11/30/1992
		Total Thallium	11/24/1992

REPORT NUMBER: 92E-0838

14-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

92110580	P-37S	Volatiles	11/19/1992
		Total Potassium	12/02/1992
		Total Mercury	12/04/1992
		Total Aluminum	12/10/1992
		Total Barium	12/09/1992
		Total Beryllium	12/10/1992
		Total Calcium	12/10/1992
		Total Cadmium	12/03/1992
		Total Cobalt	12/03/1992
		Total Chromium	12/03/1992
		Total Copper	12/03/1992
		Total Iron	12/10/1992
		Total Magnesium	12/10/1992
		Total Manganese	12/03/1992
		Total Sodium	12/10/1992
		Total Nickel	12/03/1992
		Total Vanadium	12/03/1992
		Total Zinc	12/09/1992
		Total Silver	12/01/1992
		Total Arsenic	11/24/1992
		Total Lead	11/24/1992
		Total Antimony	12/08/1992
		Total Selenium	11/24/1992
		Total Tin	11/30/1992
		Total Thallium	11/24/1992

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

92110581	P-38S	Volatiles	11/19/1992
		Total Potassium	12/02/1992
		Total Mercury	12/04/1992
		Total Aluminum	12/10/1992
		Total Barium	12/09/1992
		Total Beryllium	12/10/1992
		Total Calcium	12/10/1992
		Total Cadmium	12/03/1992
		Total Cobalt	12/03/1992
		Total Chromium	12/03/1992
		Total Copper	12/03/1992
		Total Iron	12/10/1992
		Total Magnesium	12/10/1992
		Total Manganese	12/03/1992
		Total Sodium	12/10/1992
		Total Nickel	12/03/1992
		Total Vanadium	12/03/1992
		Total Zinc	12/09/1992
		Total Silver	12/01/1992
		Total Arsenic	11/24/1992
		Total Lead	11/24/1992
		Total Antimony	12/08/1992
		Total Selenium	11/24/1992
		Total Tin	11/30/1992
		Total Thallium	11/24/1992

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Definitions

N/A	Not applicable
ND	Not detected at or above method detection limit.
J	Detected but below method detection limit.
B	Analyte detected in blank but not corrected for amount in blank.
Method Detection Limit	Lowest concentration (amount) that must be present before a reliable and recognizable response is observed for that method of analysis. When a sample has been diluted, the Method Detection Limit has been multiplied by the dilution factor.

Methodology

Volatile organic analyses were performed in accordance with Method 8240, SW-846, EPA Test Methods for Evaluating Solid Waste, 3rd edition.

ICP metals analyses were performed in accordance with Method 200.7, 40 CFR 136.

Furnace metals and inorganics analyses were performed in accordance with EPA Test Methods for the Chemical Analysis of Water and Waste.

REPORT NUMBER: 92E-0838

14-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Volatiles

TRIP BLANK Parameter	92110575	Method Detection Limit	Units
Chloromethane	ND	10	ug/L
Bromomethane	ND	10	ug/L
Vinyl chloride	ND	10	ug/L
Chloroethane	ND	10	ug/L
Methylene chloride	2.3 J	5.0	ug/L
Acetone	ND	100	ug/L
Carbon disulfide	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
2-Butanone	ND	100	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
Carbon tetrachloride	ND	5.0	ug/L
Vinyl acetate	ND	50	ug/L
Bromodichloromethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
Trichloroethene	ND	5.0	ug/L
Benzene	ND	5.0	ug/L
Chlorodibromomethane	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
2-Chloroethylvinyl ether	ND	10	ug/L
Bromoform	ND	5.0	ug/L
4-Methyl-2-pentanone	ND	50	ug/L
2-Hexanone	ND	50	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
Tetrachloroethene	ND	5.0	ug/L
Toluene	ND	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
Styrene	ND	5.0	ug/L
Total Xylene	ND	5.0	ug/L

REPORT NUMBER: 92E-0838

14-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Volatiles

P-34S Parameter	92110576	Method Detection Limit	Units
Chloromethane	ND	100	ug/L
Bromomethane	ND	100	ug/L
Vinyl chloride	ND	100	ug/L
Chloroethane	ND	100	ug/L
Methylene chloride	ND	50	ug/L
Acetone	ND	1000	ug/L
Carbon disulfide	ND	50	ug/L
Trichlorofluoromethane	ND	50	ug/L
1,1-Dichloroethene	ND	50	ug/L
1,1-Dichloroethane	ND	50	ug/L
trans-1,2-Dichloroethene	ND	50	ug/L
Chloroform	ND	50	ug/L
1,2-Dichloroethane	ND	50	ug/L
2-Butanone	ND	1000	ug/L
1,1,1-Trichloroethane	ND	50	ug/L
Carbon tetrachloride	ND	50	ug/L
Vinyl acetate	ND	500	ug/L
Bromodichloromethane	ND	50	ug/L
1,2-Dichloropropane	ND	50	ug/L
trans-1,3-Dichloropropene	ND	50	ug/L
Trichloroethene	ND	50	ug/L
Benzene	ND	50	ug/L
Chlorodibromomethane	ND	50	ug/L
cis-1,3-Dichloropropene	ND	50	ug/L
1,1,2-Trichloroethane	ND	50	ug/L
2-Chloroethylvinyl ether	ND	100	ug/L
Bromoform	ND	50	ug/L
4-Methyl-2-pentanone	ND	500	ug/L
2-Hexanone	ND	500	ug/L
1,1,2,2-Tetrachloroethane	ND	50	ug/L
Tetrachloroethene	ND	50	ug/L
Toluene	250	50	ug/L
Chlorobenzene	1700	50	ug/L
Ethylbenzene	17 J	50	ug/L
Styrene	ND	50	ug/L
Total Xylene	15 J	50	ug/L

REPORT NUMBER: 92E-0838

14-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

P-34S Parameter	92110576	Method Detection Limit	Units
Total Potassium	14	1.0	mg/L
Total Mercury	ND	0.47	ug/L
Total Aluminum	630	41	ug/L
Total Barium	51	5.0	ug/L
Total Beryllium	ND	1.8	ug/L
Total Calcium	40000	6.1	ug/L
Total Cadmium	ND	7.5	ug/L
Total Cobalt	ND	15	ug/L
Total Chromium	ND	100	ug/L
Total Copper	ND	4.4	ug/L
Total Iron	3200	7.2	ug/L
Total Magnesium	2900	74	ug/L
Total Manganese	570	0.60	ug/L
Total Sodium	170000	840	ug/L
Total Nickel	ND	26	ug/L
Total Vanadium	19	1.7	ug/L
Total Zinc	15	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	9.2	1.1	ug/L
Total Lead	13	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Selenium	0.75	0.72	ug/L
Total Tin	ND	1.0	ug/L
Total Thallium	ND	1.0	ug/L

REPORT NUMBER: 92E-0838
14-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Volatiles

P-35S Parameter	92110578	Method Detection Limit	Units
Chloromethane	ND	1000	ug/L
Bromomethane	ND	1000	ug/L
Vinyl chloride	ND	1000	ug/L
Chloroethane	ND	1000	ug/L
Methylene chloride	ND	500	ug/L
Acetone	ND	10000	ug/L
Carbon disulfide	ND	500	ug/L
Trichlorofluoromethane	ND	500	ug/L
1,1-Dichloroethene	ND	500	ug/L
1,1-Dichloroethane	ND	500	ug/L
trans-1,2-Dichloroethene	ND	500	ug/L
Chloroform	ND	500	ug/L
1,2-Dichloroethane	ND	500	ug/L
2-Butanone	ND	10000	ug/L
1,1,1-Trichloroethane	ND	500	ug/L
Carbon tetrachloride	ND	500	ug/L
Vinyl acetate	ND	5000	ug/L
Bromodichloromethane	ND	500	ug/L
1,2-Dichloropropane	ND	500	ug/L
trans-1,3-Dichloropropene	ND	500	ug/L
Trichloroethene	ND	500	ug/L
Benzene	ND	500	ug/L
Chlorodibromomethane	ND	500	ug/L
cis-1,3-Dichloropropene	ND	500	ug/L
1,1,2-Trichloroethane	ND	500	ug/L
2-Chloroethylvinyl ether	ND	1000	ug/L
Bromoform	ND	500	ug/L
4-Methyl-2-pentanone	ND	5000	ug/L
2-Hexanone	ND	5000	ug/L
1,1,2,2-Tetrachloroethane	ND	500	ug/L
Tetrachloroethene	ND	500	ug/L
Toluene	120 J	500	ug/L
Chlorobenzene	7700	500	ug/L
Ethylbenzene	ND	500	ug/L
Styrene	ND	500	ug/L
Total Xylene	ND	500	ug/L

REPORT NUMBER: 92E-0838

14-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

P-35S Parameter	92110578	Method Detection Limit	Units
Total Potassium	12	0.50	mg/L
Total Mercury	ND	0.47	ug/L
Total Aluminum	3600	410	ug/L
Total Barium	560	50	ug/L
Total Beryllium	2.7	1.8	ug/L
Total Calcium	99000	610	ug/L
Total Cadmium	ND	7.5	ug/L
Total Cobalt	24	15	ug/L
Total Chromium	ND	100	ug/L
Total Copper	21	4.4	ug/L
Total Iron	24000	72	ug/L
Total Magnesium	10000	740	ug/L
Total Manganese	1200	0.60	ug/L
Total Sodium	230000	84000	ug/L
Total Nickel	ND	26	ug/L
Total Vanadium	30	1.7	ug/L
Total Zinc	167	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	7.9	1.1	ug/L
Total Lead	320	23	ug/L
Total Antimony	ND	2.2	ug/L
Total Selenium	1.2	0.72	ug/L
Total Tin	3.2	1.0	ug/L
Total Thallium	ND	1.0	ug/L

REPORT NUMBER: 92E-0838

14-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Volatiles

P-36S Parameter	92110579	Method Detection Limit	Units
Chloromethane	ND	50	ug/L
Bromomethane	ND	50	ug/L
Vinyl chloride	ND	50	ug/L
Chloroethane	ND	50	ug/L
Methylene chloride	ND	25	ug/L
Acetone	ND	500	ug/L
Carbon disulfide	ND	25	ug/L
Trichlorofluoromethane	ND	25	ug/L
1,1-Dichloroethene	ND	25	ug/L
1,1-Dichloroethane	ND	25	ug/L
trans-1,2-Dichloroethene	6.0 J	25	ug/L
Chloroform	ND	25	ug/L
1,2-Dichloroethane	ND	25	ug/L
2-Butanone	ND	500	ug/L
1,1,1-Trichloroethane	ND	25	ug/L
Carbon tetrachloride	ND	25	ug/L
Vinyl acetate	ND	250	ug/L
Bromodichloromethane	ND	25	ug/L
1,2-Dichloropropane	ND	25	ug/L
trans-1,3-Dichloropropene	ND	25	ug/L
Trichloroethene	ND	25	ug/L
Benzene	18 J	25	ug/L
Chlorodibromomethane	ND	25	ug/L
cis-1,3-Dichloropropene	ND	25	ug/L
1,1,2-Trichloroethane	ND	25	ug/L
2-Chloroethylvinyl ether	ND	50	ug/L
Bromoform	ND	25	ug/L
4-Methyl-2-pentanone	ND	250	ug/L
2-Hexanone	ND	250	ug/L
1,1,2,2-Tetrachloroethane	ND	25	ug/L
Tetrachloroethene	ND	25	ug/L
Toluene	11 J	25	ug/L
Chlorobenzene	1000	25	ug/L
Ethylbenzene	10 J	25	ug/L
Styrene	ND	25	ug/L
Total Xylene	18 J	25	ug/L

REPORT NUMBER: 92E-0838

14-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

P-36S Parameter	92110579	Method Detection Limit	Units
Total Potassium	9.0	0.10	mg/L
Total Mercury	ND	0.47	ug/L
Total Aluminum	8900	41	ug/L
Total Barium	270	5.0	ug/L
Total Beryllium	3.3	1.8	ug/L
Total Calcium	90000	61	ug/L
Total Cadmium	9.5	7.5	ug/L
Total Cobalt	18	15	ug/L
Total Chromium	260	100	ug/L
Total Copper	8.0	4.4	ug/L
Total Iron	12000	72	ug/L
Total Magnesium	3800	74	ug/L
Total Manganese	450	0.60	ug/L
Total Sodium	140000	840	ug/L
Total Nickel	ND	26	ug/L
Total Vanadium	40	1.7	ug/L
Total Zinc	190	2.2	ug/L
Total Silver	0.20	0.12	ug/L
Total Arsenic	47	1.1	ug/L
Total Lead	650	46	ug/L
Total Antimony	3.1	2.2	ug/L
Total Selenium	1.2	0.72	ug/L
Total Tin	3.2	1.0	ug/L
Total Thallium	ND	1.0	ug/L

REPORT NUMBER: 92E-0838

14-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Volatiles

P-37S Parameter	92110580	Method Detection Limit	Units
Chloromethane	ND	50	ug/L
Bromomethane	ND	50	ug/L
Vinyl chloride	ND	50	ug/L
Chloroethane	ND	50	ug/L
Methylene chloride	ND	25	ug/L
Acetone	ND	500	ug/L
Carbon disulfide	ND	25	ug/L
Trichlorofluoromethane	ND	25	ug/L
1,1-Dichloroethene	ND	25	ug/L
1,1-Dichloroethane	ND	25	ug/L
trans-1,2-Dichloroethene	ND	25	ug/L
Chloroform	ND	25	ug/L
1,2-Dichloroethane	ND	25	ug/L
2-Butanone	ND	500	ug/L
1,1,1-Trichloroethane	ND	25	ug/L
Carbon tetrachloride	ND	25	ug/L
Vinyl acetate	ND	250	ug/L
Bromodichloromethane	ND	25	ug/L
1,2-Dichloropropane	ND	25	ug/L
trans-1,3-Dichloropropene	ND	25	ug/L
Trichloroethene	ND	25	ug/L
Benzene	ND	25	ug/L
Chlorodibromomethane	ND	25	ug/L
cis-1,3-Dichloropropene	ND	25	ug/L
1,1,2-Trichloroethane	ND	25	ug/L
2-Chloroethylvinyl ether	ND	50	ug/L
Bromoform	ND	25	ug/L
4-Methyl-2-pentanone	ND	250	ug/L
2-Hexanone	ND	250	ug/L
1,1,2,2-Tetrachloroethane	ND	25	ug/L
Tetrachloroethene	ND	25	ug/L
Toluene	8.0 J	25	ug/L
Chlorobenzene	920	25	ug/L
Ethylbenzene	ND	25	ug/L
Styrene	ND	25	ug/L
Total Xylene	180	25	ug/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Metals

P-37S Parameter	92110580	Method Detection Limit	Units
Total Potassium	8.6	0.10	mg/L
Total Mercury	ND	0.47	ug/L
Total Aluminum	1700	41	ug/L
Total Barium	75	5.0	ug/L
Total Beryllium	1.8	1.8	ug/L
Total Calcium	64000	61	ug/L
Total Cadmium	7.8	7.5	ug/L
Total Cobalt	24	15	ug/L
Total Chromium	ND	100	ug/L
Total Copper	14	4.4	ug/L
Total Iron	12000	72	ug/L
Total Magnesium	6600	74	ug/L
Total Manganese	1300	0.6	ug/L
Total Sodium	47000	84	ug/L
Total Nickel	ND	26	ug/L
Total Vanadium	61	1.7	ug/L
Total Zinc	94	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	11	1.1	ug/L
Total Lead	81	9.2	ug/L
Total Antimony	ND	2.2	ug/L
Total Selenium	ND	14.4	ug/L
Total Tin	ND	1.0	ug/L
Total Thallium	ND	1.0	ug/L

REPORT NUMBER: 92E-0838
14-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Volatiles

P-38S Parameter	92110581	Method Detection Limit	Units
Chloromethane	ND	50	ug/L
Bromomethane	ND	50	ug/L
Vinyl chloride	ND	50	ug/L
Chloroethane	ND	50	ug/L
Methylene chloride	ND	25	ug/L
Acetone	ND	500	ug/L
Carbon disulfide	ND	25	ug/L
Trichlorofluoromethane	ND	25	ug/L
1,1-Dichloroethene	ND	25	ug/L
1,1-Dichloroethane	ND	25	ug/L
trans-1,2-Dichloroethene	ND	25	ug/L
Chloroform	ND	25	ug/L
1,2-Dichloroethane	ND	25	ug/L
2-Butanone	ND	500	ug/L
1,1,1-Trichloroethane	ND	25	ug/L
Carbon tetrachloride	ND	25	ug/L
Vinyl acetate	ND	250	ug/L
Bromodichloromethane	ND	25	ug/L
1,2-Dichloropropane	ND	25	ug/L
trans-1,3-Dichloropropene	ND	25	ug/L
Trichloroethene	ND	25	ug/L
Benzene	ND	25	ug/L
Chlorodibromomethane	ND	25	ug/L
cis-1,3-Dichloropropene	ND	25	ug/L
1,1,2-Trichloroethane	ND	25	ug/L
2-Chloroethylvinyl ether	ND	50	ug/L
Bromoform	ND	25	ug/L
4-Methyl-2-pentanone	ND	250	ug/L
2-Hexanone	ND	250	ug/L
1,1,2,2-Tetrachloroethane	ND	25	ug/L
Tetrachloroethene	ND	25	ug/L
Toluene	370	25	ug/L
Chlorobenzene	110	25	ug/L
Ethylbenzene	210	25	ug/L
Styrene	ND	25	ug/L
Total Xylene	180	25	ug/L

REPORT NUMBER: 92E-0838
14-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Metals

P-38S Parameter	92110581	Method Detection Limit	Units
Total Potassium	13	0.5	mg/L
Total Mercury	ND	0.47	ug/L
Total Aluminum	4200	41	ug/L
Total Barium	95	5.0	ug/L
Total Beryllium	1.8	1.8	ug/L
Total Calcium	68000	61	ug/L
Total Cadmium	8.3	7.5	ug/L
Total Cobalt	23	15	ug/L
Total Chromium	ND	100	ug/L
Total Copper	40	4.4	ug/L
Total Iron	9700	7.2	ug/L
Total Magnesium	6500	74	ug/L
Total Manganese	1000	0.60	ug/L
Total Sodium	76000	840	ug/L
Total Nickel	29	26	ug/L
Total Vanadium	35	1.7	ug/L
Total Zinc	84	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	27	1.1	ug/L
Total Lead	140	15.3	ug/L
Total Antimony	ND	2.2	ug/L
Total Selenium	ND	0.72	ug/L
Total Tin	1.0	1.0	ug/L
Total Thallium	ND	1.0	ug/L

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THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

Ciba-Geigy Corporation
P.O. Box 18300
Greensboro, NC 27419-8800

January 04, 1993
PACE Project Number: 1212035

Attn: Ms. Diana Baldi

Client Reference: Cranston Site

PACE Sample Number:			97 0104470		
Date Collected:			12/01/92		
Date Received:			12/03/92		
			RC-1		
Parameter	Units	MDL	PT1	METHOD	DATE ANALYZE
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	ND	EPA 200.7	12/18/92
Antimony	mg/L	0.005	ND	EPA 204.2	12/31/92
Arsenic	mg/L	0.01	0.02	EPA 206.2	12/18/92
Barium	mg/L	0.2	ND	EPA 200.7	12/18/92
Beryllium	mg/L	0.005	ND	EPA 200.7	12/18/92
Cadmium	mg/L	0.005	ND	EPA 200.7	12/18/92
Calcium	mg/L	5	19	EPA 200.7	12/18/92
Chromium	mg/L	0.01	ND	EPA 200.7	12/18/92
Cobalt	mg/L	0.05	ND	EPA 200.7	12/18/92
Copper	mg/L	0.02	ND	EPA 200.7	12/18/92
Iron	mg/L	0.1	18	EPA 200.7	12/18/92
Lead	mg/L	0.003	ND	EPA 239.2	12/14/92
Magnesium	mg/L	5	ND	EPA 200.7	12/18/92
Manganese	mg/L	0.01	0.55	EPA 200.7	12/18/92
Mercury	mg/L	0.0002	ND	EPA 245.1	12/09/92
Nickel	mg/L	0.04	ND	EPA 200.7	12/18/92
Potassium	mg/L	5	ND	EPA 200.7	12/18/92
Selenium	mg/L	0.005	ND	EPA 270.2	12/15/92
Silver	mg/L	0.01	ND	EPA 200.7	12/18/92
Sodium	mg/L	5	24	EPA 200.7	12/18/92
Thallium	mg/L	0.01	ND	EPA 279.2	12/19/92
Tin	mg/L	1	ND	EPA 200.7	12/09/92
Vanadium	mg/L	0.05	ND	EPA 200.7	12/18/92
Zinc	mg/L	0.02	ND	EPA 200.7	12/18/92
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acetone	ug/L	10	ND		12/15/92
Benzene	ug/L	5.0	ND		12/15/92

100 Marshall Drive
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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 2

January 04, 1993
PACE Project Number: 12120[redacted]

Client Reference: Cranston Site

PACE Sample Number:			97 0104470		
Date Collected:			12/01/92		
Date Received:			12/03/92		
Client Sample ID:			RC-1		
Parameter	Units	MDL	PT1	METHOD	DATE ANALY[redacted]
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Bromodichloromethane	ug/L	5.0	ND		12/15/92
Bromoform	ug/L	5.0	ND		12/15/[redacted]
Bromomethane	ug/L	10	ND		12/15/[redacted]
2-Butanone (MEK)	ug/L	10	ND		12/15/92
Carbon disulfide	ug/L	5.0	ND		12/15/[redacted]
Carbon tetrachloride	ug/L	5.0	ND		12/15/[redacted]
Chlorobenzene	ug/L	5.0	12		12/15/92
Chloroethane	ug/L	10	ND		12/15/[redacted]
Chloroform	ug/L	5.0	ND		12/15/92
Chloromethane	ug/L	10	ND		12/15/92
Dibromochloromethane	ug/L	5.0	ND		12/15/[redacted]
1,1-Dichloroethane	ug/L	5.0	ND		12/15/[redacted]
1,2-Dichloroethane	ug/L	5.0	ND		12/15/[redacted]
1,1-Dichloroethylene	ug/L	5.0	ND		12/15/[redacted]
1,2-Dichloroethylene (Total)	ug/L	5.0	ND		12/15/92
1,2-Dichloropropane	ug/L	5.0	ND		12/15/92
cis-1,3-Dichloropropylene	ug/L	5.0	ND		12/15/[redacted]
Trans-1,3-dichloropropylene	ug/L	5.0	ND		12/15/92
Ethylbenzene	ug/L	5.0	ND		12/15/[redacted]
2-Hexanone	ug/L	10	ND		12/15/[redacted]
4-Methyl-2-pentanone (MIBK)	ug/L	10	ND		12/15/92
Methylene chloride	ug/L	5.0	ND		12/15/92
Styrene	ug/L	5.0	ND		12/15/[redacted]
1,1,2,2-Tetrachloroethane	ug/L	5.0	ND		12/15/92
Tetrachloroethylene	ug/L	5.0	ND		12/15/[redacted]
Toluene	ug/L	5.0	ND		12/15/[redacted]
1,1,1-Trichloroethane	ug/L	5.0	ND		12/15/92
1,1,2-Trichloroethane	ug/L	5.0	ND		12/15/[redacted]
Trichloroethylene	ug/L	5.0	ND		12/15/[redacted]
Vinyl acetate	ug/L	10	ND		12/15/92
Vinyl chloride	ug/L	10	ND		12/15/[redacted]

pace INCORPORATED
THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 3

January 04, 1993
PACE Project Number: 12120350

Client Reference: Cranston Site

PACE Sample Number:			97 0104470		
Date Collected:			12/01/92		
Date Received:			12/03/92		
Client Sample ID:			RC-1		
Parameter	Units	MDL	PT1	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Xylenes (Total)	ug/L	5.0	ND		12/15/92
Acetonitrile	ug/L	50	ND		12/15/92
Acrolein	ug/L	50	ND		12/15/92
Acrylonitrile	ug/L	50	ND		12/15/92
Allyl chloride	ug/L	5.0	ND		12/15/92
2-Chloroethylvinylether	ug/L	5.0	ND		12/15/92
Chloroprene	ug/L	5.0	ND		12/15/92
1,2-Dibromoethane	ug/L	5.0	ND		12/15/92
Dibromomethane	ug/L	5.0	ND		12/15/92
trans-1,4-Dichloro-2-butene	ug/L	5.0	ND		12/15/92
Dichlorodifluoromethane	ug/L	5.0	ND		12/15/92
1,4-Dioxane	ug/L	500	ND		12/15/92
Iodomethane	ug/L	5.0	ND		12/15/92
Isobutanol	ug/L	500	ND		12/15/92
Methacrylonitrile	ug/L	10	ND		12/15/92
Methyl Methacrylate	ug/L	10	ND		12/15/92
Propionitrile	ug/L	50	ND		12/15/92
1,1,1,2-Tetrachloroethane	ug/L	5.0	ND		12/15/92
Trichloromonofluoromethane	ug/L	5.0	ND		12/15/92
1,2,3-Trichloropropane	ug/L	5.0	ND		12/15/92
DCE (Surrogate Recovery)	%		108		12/15/92
TOL (Surrogate Recovery)	%		96		12/15/92
BFB (Surrogate Recovery)	%		98		12/15/92

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THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 4

January 04, 1993
PACE Project Number: 1212[redacted]

Client Reference: Cranston Site

PACE Sample Number:			97 0104488		
Date Collected:			12/01/92		
Date Received:			12/03/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT1	METHOD	DATE ANALYZE
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	ND	EPA 200.7	12/18/[redacted]
Antimony	mg/L	0.005	ND	EPA 204.2	12/31/[redacted]
Arsenic	mg/L	0.01	ND	EPA 206.2	12/18/92
Barium	mg/L	0.2	ND	EPA 200.7	12/18/[redacted]
Beryllium	mg/L	0.005	ND	EPA 200.7	12/18/[redacted]
Cadmium	mg/L	0.005	ND	EPA 200.7	12/18/92
Calcium	mg/L	5	27	EPA 200.7	12/18/[redacted]
Chromium	mg/L	0.01	ND	EPA 200.7	12/18/92
Cobalt	mg/L	0.05	ND	EPA 200.7	12/18/92
Copper	mg/L	0.02	ND	EPA 200.7	12/18/[redacted]
Iron	mg/L	0.1	6.6	EPA 200.7	12/18/[redacted]
Lead	mg/L	0.003	ND	EPA 239.2	12/14/92
Magnesium	mg/L	5	7.2	EPA 200.7	12/18/[redacted]
Manganese	mg/L	0.01	0.81	EPA 200.7	12/18/92
Mercury	mg/L	0.0002	ND	EPA 245.1	12/09/92
Nickel	mg/L	0.04	ND	EPA 200.7	12/18/[redacted]
Potassium	mg/L	5	ND	EPA 200.7	12/18/[redacted]
Selenium	mg/L	0.005	ND	EPA 270.2	12/15/92
Silver	mg/L	0.01	ND	EPA 200.7	12/18/[redacted]
Sodium	mg/L	5	46	EPA 200.7	12/18/92
Thallium	mg/L	0.01	ND	EPA 279.2	12/19/92
Tin	mg/L	1	ND	EPA 200.7	12/09/[redacted]
Vanadium	mg/L	0.05	ND	EPA 200.7	12/18/92
Zinc	mg/L	0.02	ND	EPA 200.7	12/18/92
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acetone	ug/L	10	ND		12/15/[redacted]
Benzene	ug/L	5.0	ND		12/15/92
Bromodichloromethane	ug/L	5.0	ND		12/15/92
Bromoform	ug/L	5.0	ND		12/15/[redacted]
Bromomethane	ug/L	10	ND		12/15/[redacted]

REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 5

January 04, 1993
PACE Project Number: 121203509

Client Reference: Cranston Site

PACE Sample Number:			97 0104488		
Date Collected:			12/01/92		
Date Received:			12/03/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT1	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
2-Butanone (MEK)	ug/L	10	ND		12/15/92
Carbon disulfide	ug/L	5.0	ND		12/15/92
Carbon tetrachloride	ug/L	5.0	ND		12/15/92
Chlorobenzene	ug/L	5.0	100		12/15/92
Chloroethane	ug/L	10	ND		12/15/92
Chloroform	ug/L	5.0	ND		12/15/92
Chloromethane	ug/L	10	ND		12/15/92
Dibromochloromethane	ug/L	5.0	ND		12/15/92
1,1-Dichloroethane	ug/L	5.0	ND		12/15/92
1,2-Dichloroethane	ug/L	5.0	ND		12/15/92
1,1-Dichloroethylene	ug/L	5.0	ND		12/15/92
1,2-Dichloroethylene (Total)	ug/L	5.0	ND		12/15/92
1,2-Dichloropropane	ug/L	5.0	ND		12/15/92
cis-1,3-Dichloropropylene	ug/L	5.0	ND		12/15/92
Trans-1,3-dichloropropylene	ug/L	5.0	ND		12/15/92
Ethylbenzene	ug/L	5.0	ND		12/15/92
2-Hexanone	ug/L	10	ND		12/15/92
4-Methyl-2-pentanone (MIBK)	ug/L	10	ND		12/15/92
Methylene chloride	ug/L	5.0	ND		12/15/92
Styrene	ug/L	5.0	ND		12/15/92
1,1,2,2-Tetrachloroethane	ug/L	5.0	ND		12/15/92
Tetrachloroethylene	ug/L	5.0	ND		12/15/92
Toluene	ug/L	5.0	14		12/15/92
1,1,1-Trichloroethane	ug/L	5.0	ND		12/15/92
1,1,2-Trichloroethane	ug/L	5.0	ND		12/15/92
Trichloroethylene	ug/L	5.0	ND		12/15/92
Vinyl acetate	ug/L	10	ND		12/15/92
Vinyl chloride	ug/L	10	ND		12/15/92
Xylenes (Total)	ug/L	5.0	ND		12/15/92
Acetonitrile	ug/L	50	ND		12/15/92
Acrolein	ug/L	50	ND		12/15/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 6

January 04, 1993
PACE Project Number: 12120[illegible]C

Client Reference: Cranston Site

PACE Sample Number:			97 0104488		
Date Collected:			12/01/92		
Date Received:			12/03/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT1	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acrylonitrile	ug/L	50	ND		12/15/9[illegible]
Allyl chloride	ug/L	5.0	ND		12/15/9[illegible]
2-Chloroethylvinylether	ug/L	5.0	ND		12/15/92
Chloroprene	ug/L	5.0	ND		12/15/92
1,2-Dibromoethane	ug/L	5.0	ND		12/15/9[illegible]
Dibromomethane	ug/L	5.0	ND		12/15/9[illegible]
trans-1,4-Dichloro-2-butene	ug/L	5.0	ND		12/15/9[illegible]
Dichlorodifluoromethane	ug/L	5.0	ND		12/15/9[illegible]
1,4-Dioxane	ug/L	500	ND		12/15/92
Iodomethane	ug/L	5.0	ND		12/15/92
Isobutanol	ug/L	500	ND		12/15/9[illegible]
Methacrylonitrile	ug/L	10	ND		12/15/92
Methyl Methacrylate	ug/L	10	ND		12/15/9[illegible]
Propionitrile	ug/L	50	ND		12/15/9[illegible]
1,1,1,2-Tetrachloroethane	ug/L	5.0	ND		12/15/92
Trichloromonofluoromethane	ug/L	5.0	ND		12/15/9[illegible]
1,2,3-Trichloropropane	ug/L	5.0	ND		12/15/9[illegible]
DCE (Surrogate Recovery)	%		109		12/15/92
TOL (Surrogate Recovery)	%		95		12/15/9[illegible]
BFB (Surrogate Recovery)	%		104		12/15/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 7

January 04, 1993
PACE Project Number: 121203

Client Reference: Cranston Site

PACE Sample Number:			97 0104496		
Date Collected:			12/01/92		
Date Received:			12/03/92		
Client Sample ID:			MW-1S		
Parameter	Units	MDL	PT1	METHOD	DATE ANALYZE
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	2.3	EPA 200.7	12/18/92
Antimony	mg/L	0.005	ND	EPA 204.2	12/31/92
Arsenic	mg/L	0.01	ND	EPA 206.2	12/18/92
Barium	mg/L	0.2	ND	EPA 200.7	12/18/92
Beryllium	mg/L	0.005	ND	EPA 200.7	12/18/92
Cadmium	mg/L	0.005	ND	EPA 200.7	12/18/92
Calcium	mg/L	5	54	EPA 200.7	12/18/92
Chromium	mg/L	0.01	0.012	EPA 200.7	12/18/92
Cobalt	mg/L	0.05	ND	EPA 200.7	12/18/92
Copper	mg/L	0.02	ND	EPA 200.7	12/18/92
Iron	mg/L	0.1	0.9	EPA 200.7	12/18/92
Lead	mg/L	0.003	ND	EPA 239.2	12/14/92
Magnesium	mg/L	5	ND	EPA 200.7	12/18/92
Manganese	mg/L	0.01	1.4	EPA 200.7	12/18/92
Mercury	mg/L	0.0002	ND	EPA 245.1	12/09/92
Nickel	mg/L	0.04	ND	EPA 200.7	12/18/92
Potassium	mg/L	5	10	EPA 200.7	12/18/92
Selenium	mg/L	0.005	ND	EPA 270.2	12/15/92
Silver	mg/L	0.01	ND	EPA 200.7	12/18/92
Sodium	mg/L	5	90	EPA 200.7	12/18/92
Thallium	mg/L	0.01	ND	EPA 279.2	12/19/92
Tin	mg/L	1	ND	EPA 200.7	12/09/92
Vanadium	mg/L	0.05	ND	EPA 200.7	12/18/92
Zinc	mg/L	0.02	ND	EPA 200.7	12/18/92
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST					
Acetone	ug/L	500	ND	SW846-8240	12/15/92
Benzene	ug/L	250	ND		12/15/92
Bromodichloromethane	ug/L	250	ND		12/15/92
Bromoform	ug/L	250	ND		12/15/92
Bromomethane	ug/L	500	ND		12/15/92

REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 8

January 04, 1993
PACE Project Number: 121203[illegible]0

Client Reference: Cranston Site

PACE Sample Number:			97 0104496		
Date Collected:			12/01/92		
Date Received:			12/03/92		
Client Sample ID:			MW-1S		
Parameter	Units	MDL	PT1	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
2-Butanone (MEK)	ug/L	500	ND		12/15/9[illegible]
Carbon disulfide	ug/L	250	ND		12/15/9[illegible]
Carbon tetrachloride	ug/L	250	ND		12/15/92
Chlorobenzene	ug/L	250	12000		12/15/92
Chloroethane	ug/L	500	ND		12/15/9[illegible]
Chloroform	ug/L	250	ND		12/15/9[illegible]
Chloromethane	ug/L	500	ND		12/15/9[illegible]
Dibromochloromethane	ug/L	250	ND		12/15/9[illegible]
1,1-Dichloroethane	ug/L	250	ND		12/15/92
1,2-Dichloroethane	ug/L	250	ND		12/15/92
1,1-Dichloroethylene	ug/L	250	ND		12/15/9[illegible]
1,2-Dichloroethylene (Total)	ug/L	250	ND		12/15/92
1,2-Dichloropropane	ug/L	250	ND		12/15/9[illegible]
cis-1,3-Dichloropropylene	ug/L	250	ND		12/15/9[illegible]
Trans-1,3-dichloropropylene	ug/L	250	ND		12/15/92
Ethylbenzene	ug/L	250	ND		12/15/9[illegible]
2-Hexanone	ug/L	500	ND		12/15/9[illegible]
4-Methyl-2-pentanone (MIBK)	ug/L	500	ND		12/15/92
Methylene chloride	ug/L	250	ND		12/15/9[illegible]
Styrene	ug/L	250	ND		12/15/92
1,1,2,2-Tetrachloroethane	ug/L	250	ND		12/15/92
Tetrachloroethylene	ug/L	250	ND		12/15/9[illegible]
Toluene	ug/L	250	ND		12/15/9[illegible]
1,1,1-Trichloroethane	ug/L	250	ND		12/15/92
1,1,2-Trichloroethane	ug/L	250	ND		12/15/9[illegible]
Trichloroethylene	ug/L	250	ND		12/15/92
Vinyl acetate	ug/L	500	ND		12/15/92
Vinyl chloride	ug/L	500	ND		12/15/9[illegible]
Xylenes (Total)	ug/L	250	ND		12/15/9[illegible]
Acetonitrile	ug/L	2500	ND		12/15/92
Acrolein	ug/L	2500	ND		12/15/9[illegible]

REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 9

January 04, 1993
PACE Project Number: 12120350

Client Reference: Cranston Site

PACE Sample Number:			97 0104496		
Date Collected:			12/01/92		
Date Received:			12/03/92		
Client Sample ID:			MW-1S		
Parameter	Units	MDL	PT1	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acrylonitrile	ug/L	2500	ND		12/15/92
Allyl chloride	ug/L	250	ND		12/15/92
2-Chloroethylvinylether	ug/L	250	ND		12/15/92
Chloroprene	ug/L	250	ND		12/15/92
1,2-Dibromoethane	ug/L	250	ND		12/15/92
Dibromomethane	ug/L	250	ND		12/15/92
trans-1,4-Dichloro-2-butene	ug/L	250	ND		12/15/92
Dichlorodifluoromethane	ug/L	250	ND		12/15/92
1,4-Dioxane	ug/L	25000	ND		12/15/92
Iodomethane	ug/L	250	ND		12/15/92
Isobutanol	ug/L	25000	ND		12/15/92
Methacrylonitrile	ug/L	500	ND		12/15/92
Methyl Methacrylate	ug/L	500	ND		12/15/92
Propionitrile	ug/L	2500	ND		12/15/92
1,1,1,2-Tetrachloroethane	ug/L	250	ND		12/15/92
Trichloromonofluoromethane	ug/L	250	ND		12/15/92
1,2,3-Trichloropropane	ug/L	250	ND		12/15/92
DCE (Surrogate Recovery)	%		103		12/15/92
TOL (Surrogate Recovery)	%		97		12/15/92
BFB (Surrogate Recovery)	%		102		12/15/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 10

January 04, 1993
PACE Project Number: 12[illegible]

Client Reference: Cranston Site

PACE Sample Number:			97 0104500		
Date Collected:			12/01/92		
Date Received:			12/03/92		
Client Sample ID:			RC-1		
Parameter	Units	MDL	PT2	METHOD	DATE ANALY[illegible]
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	ND	EPA 200.7	12/18/9[illegible]
Antimony	mg/L	0.005	ND	EPA 204.2	01/04/9[illegible]
Arsenic	mg/L	0.01	0.02	EPA 206.2	12/18/9[illegible]
Barium	mg/L	0.2	ND	EPA 200.7	12/18/9[illegible]
Beryllium	mg/L	0.005	ND	EPA 200.7	12/18/9[illegible]
Cadmium	mg/L	0.005	ND	EPA 200.7	12/18/9
Calcium	mg/L	5	21	EPA 200.7	12/18/9[illegible]
Chromium	mg/L	0.01	ND	EPA 200.7	12/18/9[illegible]
Cobalt	mg/L	0.05	ND	EPA 200.7	12/18/92
Copper	mg/L	0.02	ND	EPA 200.7	12/18/9[illegible]
Iron	mg/L	0.1	20	EPA 200.7	12/18/[illegible]
Lead	mg/L	0.003	ND	EPA 239.2	12/14/92
Magnesium	mg/L	5	ND	EPA 200.7	12/18/[illegible]2
Manganese	mg/L	0.01	0.67	EPA 200.7	12/18/92
Mercury	mg/L	0.0002	ND	EPA 245.1	12/09/92
Nickel	mg/L	0.04	ND	EPA 200.7	12/18/[illegible]
Potassium	mg/L	5	ND	EPA 200.7	12/18/[illegible]
Selenium	mg/L	0.005	ND	EPA 270.2	12/15/92
Silver	mg/L	0.01	ND	EPA 200.7	12/18/[illegible]
Sodium	mg/L	5	24	EPA 200.7	12/18/92
Thallium	mg/L	0.01	ND	EPA 279.2	12/19/92
Tin	mg/L	1	ND	EPA 200.7	12/09/9[illegible]
Vanadium	mg/L	0.05	ND	EPA 200.7	12/18/92
Zinc	mg/L	0.02	ND	EPA 200.7	12/18/92
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST					
Acetone	ug/L	10	ND	SW846-8240	12/15/9[illegible]
Benzene	ug/L	5.0	ND		12/15/92
Bromodichloromethane	ug/L	5.0	ND		12/15/92
Bromoform	ug/L	5.0	ND		12/15/92
Bromomethane	ug/L	10	ND		12/15/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 11

January 04, 1993
PACE Project Number: 12120

Client Reference: Cranston Site

Parameter	Units	MDL		METHOD	DATE ANALYZ
PACE Sample Number:			97 0104500		
Date Collected:			12/01/92		
Date Received:			12/03/92		
Client Sample ID:			RC-1		
			PT2		
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST					
2-Butanone (MEK)	ug/L	10	ND	SW846-8240	12/15/9
Carbon disulfide	ug/L	5.0	ND		12/15/9
Carbon tetrachloride	ug/L	5.0	ND		12/15/9
Chlorobenzene	ug/L	5.0	14		12/15/9
Chloroethane	ug/L	10	ND		12/15/9
Chloroform	ug/L	5.0	ND		12/15/9
Chloromethane	ug/L	10	ND		12/15/92
Dibromochloromethane	ug/L	5.0	ND		12/15/92
1,1-Dichloroethane	ug/L	5.0	ND		12/15/92
1,2-Dichloroethane	ug/L	5.0	ND		12/15/92
1,1-Dichloroethylene	ug/L	5.0	ND		12/15/92
1,2-Dichloroethylene (Total)	ug/L	5.0	ND		12/15/92
1,2-Dichloropropane	ug/L	5.0	ND		12/15/92
cis-1,3-Dichloropropylene	ug/L	5.0	ND		12/15/92
Trans-1,3-dichloropropylene	ug/L	5.0	ND		12/15/92
Ethylbenzene	ug/L	5.0	ND		12/15/92
2-Hexanone	ug/L	10	ND		12/15/92
4-Methyl-2-pentanone (MIBK)	ug/L	10	ND		12/15/92
Methylene chloride	ug/L	5.0	ND		12/15/92
Styrene	ug/L	5.0	ND		12/15/92
1,1,2,2-Tetrachloroethane	ug/L	5.0	ND		12/15/92
Tetrachloroethylene	ug/L	5.0	ND		12/15/92
Toluene	ug/L	5.0	ND		12/15/92
1,1,1-Trichloroethane	ug/L	5.0	ND		12/15/92
1,1,2-Trichloroethane	ug/L	5.0	ND		12/15/92
Trichloroethylene	ug/L	5.0	ND		12/15/92
Vinyl acetate	ug/L	10	ND		12/15/92
Vinyl chloride	ug/L	10	ND		12/15/92
Xylenes (Total)	ug/L	5.0	ND		12/15/92
Acetonitrile	ug/L	50	ND		12/15/92
Acrolein	ug/L	50	ND		12/15/92

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THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 12

January 04, 1993
PACE Project Number: 12[illegible]

Client Reference: Cranston Site

PACE Sample Number:			97 0104500		
Date Collected:			12/01/92		
Date Received:			12/03/92		
Client Sample ID:			RC-1		
Parameter	Units	MDL	PT2	METHOD	DATE ANALYZ
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST					
Acrylonitrile	ug/L	50	ND	SW846-8240	12/15/9
Allyl chloride	ug/L	5.0	ND		12/15/9
2-Chloroethylvinylether	ug/L	5.0	ND		12/15/9
Chloroprene	ug/L	5.0	ND		12/15/9
1,2-Dibromoethane	ug/L	5.0	ND		12/15/9
Dibromomethane	ug/L	5.0	ND		12/15/9
trans-1,4-Dichloro-2-butene	ug/L	5.0	ND		12/15/92
Dichlorodifluoromethane	ug/L	5.0	ND		12/15/92
1,4-Dioxane	ug/L	500	ND		12/15/92
Iodomethane	ug/L	5.0	ND		12/15/92
Isobutanol	ug/L	500	ND		12/15/92
Methacrylonitrile	ug/L	10	ND		12/15/92
Methyl Methacrylate	ug/L	10	ND		12/15/92
Propionitrile	ug/L	50	ND		12/15/92
1,1,1,2-Tetrachloroethane	ug/L	5.0	ND		12/15/92
Trichloromonofluoromethane	ug/L	5.0	ND		12/15/92
1,2,3-Trichloropropane	ug/L	5.0	ND		12/15/92
DCE (Surrogate Recovery)	%		109		12/15/92
TOL (Surrogate Recovery)	%		95		12/15/92
BFB (Surrogate Recovery)	%		101		12/15/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 13

January 04, 1993
PACE Project Number: 12120350

Client Reference: Cranston Site

PACE Sample Number:			97 0104518		
Date Collected:			12/01/92		
Date Received:			12/03/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT2	METHOD	DATE ANALYZED
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	ND	EPA 200.7	12/18/92
Antimony	mg/L	0.005	ND	EPA 204.2	12/15/92
Arsenic	mg/L	0.01	0.016	EPA 206.2	12/14/92
Barium	mg/L	0.2	ND	EPA 200.7	12/18/92
Beryllium	mg/L	0.005	ND	EPA 200.7	12/18/92
Cadmium	mg/L	0.005	ND	EPA 200.7	12/18/92
Calcium	mg/L	5	25	EPA 200.7	12/18/92
Chromium	mg/L	0.01	ND	EPA 200.7	12/18/92
Cobalt	mg/L	0.05	ND	EPA 200.7	12/18/92
Copper	mg/L	0.02	ND	EPA 200.7	12/18/92
Iron	mg/L	0.1	7.1	EPA 200.7	12/18/92
Lead	mg/L	0.003	ND	EPA 239.2	12/15/92
Magnesium	mg/L	5	7.3	EPA 200.7	12/18/92
Manganese	mg/L	0.01	0.72	EPA 200.7	12/18/92
Mercury	mg/L	0.0002	ND	EPA 245.1	12/09/92
Nickel	mg/L	0.04	ND	EPA 200.7	12/18/92
Potassium	mg/L	5	ND	EPA 200.7	12/18/92
Selenium	mg/L	0.005	ND	EPA 270.2	12/14/92
Silver	mg/L	0.01	ND	EPA 200.7	12/18/92
Sodium	mg/L	5	38	EPA 200.7	12/18/92
Thallium	mg/L	0.01	ND	EPA 279.2	12/14/92
Tin	mg/L	1	ND	EPA 200.7	12/09/92
Vanadium	mg/L	0.05	ND	EPA 200.7	12/18/92
Zinc	mg/L	0.02	ND	EPA 200.7	12/18/92
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acetone	ug/L	20	ND		12/15/92
Benzene	ug/L	10	ND		12/15/92
Bromodichloromethane	ug/L	10	ND		12/15/92
Bromoform	ug/L	10	ND		12/15/92
Bromomethane	ug/L	20	ND		12/15/92

Ms. Diana Baldi
Page 14

January 04, 1993
PACE Project Number: 12120350

Client Reference: Cranston Site

PACE Sample Number:			97 0104518		
Date Collected:			12/01/92		
Date Received:			12/03/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT2	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
2-Butanone (MEK)	ug/L	20	ND		12/15/92
Carbon disulfide	ug/L	10	ND		12/15/92
Carbon tetrachloride	ug/L	10	ND		12/15/92
Chlorobenzene	ug/L	10	240		12/15/92
Chloroethane	ug/L	20	ND		12/15/92
Chloroform	ug/L	10	ND		12/15/92
Chloromethane	ug/L	20	ND		12/15/92
Dibromochloromethane	ug/L	10	ND		12/15/92
1,1-Dichloroethane	ug/L	10	ND		12/15/92
1,2-Dichloroethane	ug/L	10	ND		12/15/92
1,1-Dichloroethylene	ug/L	10	ND		12/15/92
1,2-Dichloroethylene (Total)	ug/L	10	ND		12/15/92
1,2-Dichloropropane	ug/L	10	ND		12/15/92
cis-1,3-Dichloropropylene	ug/L	10	ND		12/15/92
Trans-1,3-dichloropropylene	ug/L	10	ND		12/15/92
Ethylbenzene	ug/L	10	ND		12/15/92
2-Hexanone	ug/L	20	ND		12/15/92
4-Methyl-2-pentanone (MIBK)	ug/L	20	ND		12/15/92
Methylene chloride	ug/L	10	ND		12/15/92
Styrene	ug/L	10	ND		12/15/92
1,1,2,2-Tetrachloroethane	ug/L	10	ND		12/15/92
Tetrachloroethylene	ug/L	10	ND		12/15/92
Toluene	ug/L	10	220		12/15/92
1,1,1-Trichloroethane	ug/L	10	ND		12/15/92
1,1,2-Trichloroethane	ug/L	10	ND		12/15/92
Trichloroethylene	ug/L	10	ND		12/15/92
Vinyl acetate	ug/L	20	ND		12/15/92
Vinyl chloride	ug/L	20	ND		12/15/92
Xylenes (Total)	ug/L	10	32		12/15/92
Acetonitrile	ug/L	100	ND		12/15/92
Acrolein	ug/L	100	ND		12/15/92

REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 15

January 04, 1993
PACE Project Number: 12120350

Client Reference: Cranston Site

PACE Sample Number:			97 0104518		
Date Collected:			12/01/92		
Date Received:			12/03/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT2	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acrylonitrile	ug/L	100	ND		12/15/92
Allyl chloride	ug/L	10	ND		12/15/92
2-Chloroethylvinylether	ug/L	10	ND		12/15/92
Chloroprene	ug/L	10	ND		12/15/92
1,2-Dibromoethane	ug/L	10	ND		12/15/92
Dibromomethane	ug/L	10	ND		12/15/92
trans-1,4-Dichloro-2-butene	ug/L	10	ND		12/15/92
Dichlorodifluoromethane	ug/L	10	ND		12/15/92
1,4-Dioxane	ug/L	1000	ND		12/15/92
Iodomethane	ug/L	10	ND		12/15/92
Isobutanol	ug/L	1000	ND		12/15/92
Methacrylonitrile	ug/L	20	ND		12/15/92
Methyl Methacrylate	ug/L	20	ND		12/15/92
Propionitrile	ug/L	100	ND		12/15/92
1,1,1,2-Tetrachloroethane	ug/L	10	ND		12/15/92
Trichloromonofluoromethane	ug/L	10	ND		12/15/92
1,2,3-Trichloropropane	ug/L	10	ND		12/15/92
DCE (Surrogate Recovery)	%		113		12/15/92
TOL (Surrogate Recovery)	%		96		12/15/92
BFB (Surrogate Recovery)	%		95		12/15/92

REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 16

January 04, 1993
PACE Project Number: 121[illegible]

Client Reference: Cranston Site

PACE Sample Number:			97 0104526		
Date Collected:			12/02/92		
Date Received:			12/03/92		
Client Sample ID:			RC-1		
Parameter	Units	MDL	PT3	METHOD	DATE ANALYZ
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	ND	EPA 200.7	12/18/[illegible]
Antimony	mg/L	0.005	ND	EPA 204.2	12/15/[illegible]
Arsenic	mg/L	0.01	0.020	EPA 206.2	12/14/[illegible]
Barium	mg/L	0.2	ND	EPA 200.7	12/18/[illegible]
Beryllium	mg/L	0.005	ND	EPA 200.7	12/18/[illegible]
Cadmium	mg/L	0.005	ND	EPA 200.7	12/18/92
Calcium	mg/L	5	20	EPA 200.7	12/18/[illegible]
Chromium	mg/L	0.01	ND	EPA 200.7	12/18/92
Cobalt	mg/L	0.05	ND	EPA 200.7	12/18/92
Copper	mg/L	0.02	ND	EPA 200.7	12/18/[illegible]
Iron	mg/L	0.1	19	EPA 200.7	12/18/[illegible]
Lead	mg/L	0.003	ND	EPA 239.2	12/15/92
Magnesium	mg/L	5	ND	EPA 200.7	12/18/[illegible]
Manganese	mg/L	0.01	0.64	EPA 200.7	12/18/92
Mercury	mg/L	0.0002	ND	EPA 245.1	12/09/[illegible]
Nickel	mg/L	0.04	ND	EPA 200.7	12/18/[illegible]
Potassium	mg/L	5	ND	EPA 200.7	12/18/92
Selenium	mg/L	0.005	ND	EPA 270.2	12/14/92
Silver	mg/L	0.01	ND	EPA 200.7	12/18/[illegible]
Sodium	mg/L	5	23	EPA 200.7	12/18/92
Thallium	mg/L	0.01	ND	EPA 279.2	12/14/[illegible]
Tin	mg/L	1	ND	EPA 200.7	12/09/[illegible]
Vanadium	mg/L	0.05	ND	EPA 200.7	12/18/92
Zinc	mg/L	0.02	ND	EPA 200.7	12/18/92
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST					
Acetone	ug/L	50	ND	SW846-8240	12/16/92
Benzene	ug/L	25	ND		12/16/92
Bromodichloromethane	ug/L	25	ND		12/16/92
Bromoform	ug/L	25	ND		12/16/92
Bromomethane	ug/L	50	ND		12/16/92

REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 17

January 04, 1993
PACE Project Number: 121203509

Client Reference: Cranston Site

PACE Sample Number:			97 0104526		
Date Collected:			12/02/92		
Date Received:			12/03/92		
Client Sample ID:			RC-1		
Parameter	Units	MDL	PT3	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
2-Butanone (MEK)	ug/L	50	ND		12/16/92
Carbon disulfide	ug/L	25	ND		12/16/92
Carbon tetrachloride	ug/L	25	ND		12/16/92
Chlorobenzene	ug/L	25	ND		12/16/92
Chloroethane	ug/L	50	ND		12/16/92
Chloroform	ug/L	25	ND		12/16/92
Chloromethane	ug/L	50	ND		12/16/92
Dibromochloromethane	ug/L	25	ND		12/16/92
1,1-Dichloroethane	ug/L	25	ND		12/16/92
1,2-Dichloroethane	ug/L	25	ND		12/16/92
1,1-Dichloroethylene	ug/L	25	ND		12/16/92
1,2-Dichloroethylene (Total)	ug/L	25	ND		12/16/92
1,2-Dichloropropane	ug/L	25	ND		12/16/92
cis-1,3-Dichloropropylene	ug/L	25	ND		12/16/92
Trans-1,3-dichloropropylene	ug/L	25	ND		12/16/92
Ethylbenzene	ug/L	25	ND		12/16/92
2-Hexanone	ug/L	50	ND		12/16/92
4-Methyl-2-pentanone (MIBK)	ug/L	50	ND		12/16/92
Methylene chloride	ug/L	25	ND		12/16/92
Styrene	ug/L	25	ND		12/16/92
1,1,2,2-Tetrachloroethane	ug/L	25	ND		12/16/92
Tetrachloroethylene	ug/L	25	ND		12/16/92
Toluene	ug/L	25	420		12/16/92
1,1,1-Trichloroethane	ug/L	25	ND		12/16/92
1,1,2-Trichloroethane	ug/L	25	ND		12/16/92
Trichloroethylene	ug/L	25	ND		12/16/92
Vinyl acetate	ug/L	50	ND		12/16/92
Vinyl chloride	ug/L	50	ND		12/16/92
Xylenes (Total)	ug/L	25	91		12/16/92
Acetonitrile	ug/L	250	ND		12/16/92
Acrolein	ug/L	250	ND		12/16/92

REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 18

January 04, 1993
PACE Project Number: 12120350

Client Reference: Cranston Site

PACE Sample Number:			97 0104526		
Date Collected:			12/02/92		
Date Received:			12/03/92		
Client Sample ID:			RC-1		
Parameter	Units	MDL	PT3	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acrylonitrile	ug/L	250	ND		12/16/92
Allyl chloride	ug/L	25	ND		12/16/92
2-Chloroethylvinylether	ug/L	25	ND		12/16/92
Chloroprene	ug/L	25	ND		12/16/92
1,2-Dibromoethane	ug/L	25	ND		12/16/92
Dibromomethane	ug/L	25	ND		12/16/92
trans-1,4-Dichloro-2-butene	ug/L	25	ND		12/16/92
Dichlorodifluoromethane	ug/L	25	ND		12/16/92
1,4-Dioxane	ug/L	2500	ND		12/16/92
Iodomethane	ug/L	25	ND		12/16/92
Isobutanol	ug/L	2500	ND		12/16/92
Methacrylonitrile	ug/L	50	ND		12/16/92
Methyl Methacrylate	ug/L	50	ND		12/16/92
Propionitrile	ug/L	250	ND		12/16/92
1,1,1,2-Tetrachloroethane	ug/L	25	ND		12/16/92
Trichloromonofluoromethane	ug/L	25	ND		12/16/92
1,2,3-Trichloropropane	ug/L	25	ND		12/16/92
DCE (Surrogate Recovery)	%		108		12/16/92
TOL (Surrogate Recovery)	%		95		12/16/92
BFB (Surrogate Recovery)	%		100		12/16/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 19

January 04, 1993
PACE Project Number: 121203509

Client Reference: Cranston Site

PACE Sample Number:			97 0104534		
Date Collected:			12/02/92		
Date Received:			12/03/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT3	METHOD	DATE ANALYZED
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	0.2	EPA 200.7	12/18/92
Antimony	mg/L	0.005	ND	EPA 204.2	12/15/92
Arsenic	mg/L	0.01	0.020	EPA 206.2	12/14/92
Barium	mg/L	0.2	ND	EPA 200.7	12/18/92
Beryllium	mg/L	0.005	ND	EPA 200.7	12/18/92
Cadmium	mg/L	0.005	ND	EPA 200.7	12/18/92
Calcium	mg/L	5	24	EPA 200.7	12/18/92
Chromium	mg/L	0.01	ND	EPA 200.7	12/18/92
Cobalt	mg/L	0.05	ND	EPA 200.7	12/18/92
Copper	mg/L	0.02	ND	EPA 200.7	12/18/92
Iron	mg/L	0.1	7.8	EPA 200.7	12/18/92
Lead	mg/L	0.003	ND	EPA 239.2	12/15/92
Magnesium	mg/L	5	7	EPA 200.7	12/18/92
Manganese	mg/L	0.01	0.84	EPA 200.7	12/18/92
Mercury	mg/L	0.0002	ND	EPA 245.1	12/09/92
Nickel	mg/L	0.04	ND	EPA 200.7	12/18/92
Potassium	mg/L	5	ND	EPA 200.7	12/18/92
Selenium	mg/L	0.005	ND	EPA 270.2	12/14/92
Silver	mg/L	0.01	ND	EPA 200.7	12/18/92
Sodium	mg/L	5	37	EPA 200.7	12/18/92
Thallium	mg/L	0.01	ND	EPA 279.2	12/14/92
Tin	mg/L	1	ND	EPA 200.7	12/09/92
Vanadium	mg/L	0.05	ND	EPA 200.7	12/18/92
Zinc	mg/L	0.02	ND	EPA 200.7	12/18/92
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acetone	ug/L	20	ND		12/16/92
Benzene	ug/L	10	ND		12/16/92
Bromodichloromethane	ug/L	10	ND		12/16/92
Bromoform	ug/L	10	ND		12/16/92
Bromomethane	ug/L	20	ND		12/16/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 20

January 04, 1993
PACE Project Number: 121203[illegible]

Client Reference: Cranston Site

PACE Sample Number:			97 0104534		
Date Collected:			12/02/92		
Date Received:			12/03/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT3	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
2-Butanone (MEK)	ug/L	20	ND		12/16/9[illegible]
Carbon disulfide	ug/L	10	ND		12/16/9[illegible]
Carbon tetrachloride	ug/L	10	ND		12/16/92
Chlorobenzene	ug/L	10	250		12/16/92
Chloroethane	ug/L	20	ND		12/16/9[illegible]
Chloroform	ug/L	10	ND		12/16/9[illegible]
Chloromethane	ug/L	20	ND		12/16/9[illegible]
Dibromochloromethane	ug/L	10	ND		12/16/9[illegible]
1,1-Dichloroethane	ug/L	10	ND		12/16/92
1,2-Dichloroethane	ug/L	10	ND		12/16/92
1,1-Dichloroethylene	ug/L	10	ND		12/16/9[illegible]
1,2-Dichloroethylene (Total)	ug/L	10	ND		12/16/92
1,2-Dichloropropane	ug/L	10	ND		12/16/9[illegible]
cis-1,3-Dichloropropylene	ug/L	10	ND		12/16/9[illegible]
Trans-1,3-dichloropropylene	ug/L	10	ND		12/16/92
Ethylbenzene	ug/L	10	ND		12/16/9[illegible]
2-Hexanone	ug/L	20	ND		12/16/9[illegible]
4-Methyl-2-pentanone (MIBK)	ug/L	20	ND		12/16/92
Methylene chloride	ug/L	10	ND		12/16/9[illegible]
Styrene	ug/L	10	ND		12/16/9[illegible]
1,1,2,2-Tetrachloroethane	ug/L	10	ND		12/16/92
Tetrachloroethylene	ug/L	10	ND		12/16/9[illegible]
Toluene	ug/L	10	140		12/16/9[illegible]
1,1,1-Trichloroethane	ug/L	10	ND		12/16/92
1,1,2-Trichloroethane	ug/L	10	ND		12/16/9[illegible]
Trichloroethylene	ug/L	10	ND		12/16/92
Vinyl acetate	ug/L	20	ND		12/16/92
Vinyl chloride	ug/L	20	ND		12/16/9[illegible]
Xylenes (Total)	ug/L	10	25		12/16/9[illegible]
Acetonitrile	ug/L	100	ND		12/16/92
Acrolein	ug/L	100	ND		12/16/9[illegible]

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 21

January 04, 1993
PACE Project Number: 12120350

Client Reference: Cranston Site

PACE Sample Number:			97 0104534		
Date Collected:			12/02/92		
Date Received:			12/03/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT3	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acrylonitrile	ug/L	100	ND		12/16/92
Allyl chloride	ug/L	10	ND		12/16/92
2-Chloroethylvinylether	ug/L	10	ND		12/16/92
Chloroprene	ug/L	10	ND		12/16/92
1,2-Dibromoethane	ug/L	10	ND		12/16/92
Dibromomethane	ug/L	10	ND		12/16/92
trans-1,4-Dichloro-2-butene	ug/L	10	ND		12/16/92
Dichlorodifluoromethane	ug/L	10	ND		12/16/92
1,4-Dioxane	ug/L	1000	ND		12/16/92
Iodomethane	ug/L	10	ND		12/16/92
Isobutanol	ug/L	1000	ND		12/16/92
Methacrylonitrile	ug/L	20	ND		12/16/92
Methyl Methacrylate	ug/L	20	ND		12/16/92
Propionitrile	ug/L	100	ND		12/16/92
1,1,1,2-Tetrachloroethane	ug/L	10	ND		12/16/92
Trichloromonofluoromethane	ug/L	10	ND		12/16/92
1,2,3-Trichloropropane	ug/L	10	ND		12/16/92
DCE (Surrogate Recovery)	%		114		12/16/92
TOL (Surrogate Recovery)	%		94		12/16/92
BFB (Surrogate Recovery)	%		102		12/16/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 22

January 04, 1993
PACE Project Number: 12120[redacted]

Client Reference: Cranston Site

PACE Sample Number:			97 0104542		
Date Collected:			12/03/92		
Date Received:			12/03/92		
Client Sample ID:			Trip Blank		
Parameter	Units	MDL		METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acetone	ug/L	10	ND		12/16/92
Benzene	ug/L	5.0	ND		12/16/[redacted]
Bromodichloromethane	ug/L	5.0	ND		12/16/[redacted]
Bromoform	ug/L	5.0	ND		12/16/92
Bromomethane	ug/L	10	ND		12/16/[redacted]
2-Butanone (MEK)	ug/L	10	ND		12/16/[redacted]
Carbon disulfide	ug/L	5.0	ND		12/16/92
Carbon tetrachloride	ug/L	5.0	ND		12/16/[redacted]
Chlorobenzene	ug/L	5.0	ND		12/16/92
Chloroethane	ug/L	10	ND		12/16/92
Chloroform	ug/L	5.0	ND		12/16/[redacted]
Chloromethane	ug/L	10	ND		12/16/[redacted]
Dibromochloromethane	ug/L	5.0	ND		12/16/[redacted]
1,1-Dichloroethane	ug/L	5.0	ND		12/16/[redacted]
1,2-Dichloroethane	ug/L	5.0	ND		12/16/92
1,1-Dichloroethylene	ug/L	5.0	ND		12/16/92
1,2-Dichloroethylene (Total)	ug/L	5.0	ND		12/16/[redacted]
1,2-Dichloropropane	ug/L	5.0	ND		12/16/92
cis-1,3-Dichloropropylene	ug/L	5.0	ND		12/16/[redacted]
Trans-1,3-dichloropropylene	ug/L	5.0	ND		12/16/[redacted]
Ethylbenzene	ug/L	5.0	ND		12/16/92
2-Hexanone	ug/L	10	ND		12/16/92
4-Methyl-2-pentanone (MIBK)	ug/L	10	ND		12/16/[redacted]
Methylene chloride	ug/L	5.0	ND		12/16/92
Styrene	ug/L	5.0	ND		12/16/[redacted]
1,1,2,2-Tetrachloroethane	ug/L	5.0	ND		12/16/[redacted]
Tetrachloroethylene	ug/L	5.0	ND		12/16/92
Toluene	ug/L	5.0	ND		12/16/[redacted]
1,1,1-Trichloroethane	ug/L	5.0	ND		12/16/[redacted]
1,1,2-Trichloroethane	ug/L	5.0	ND		12/16/92
Trichloroethylene	ug/L	5.0	ND		12/16/92

REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 23

January 04, 1993
PACE Project Number: 12120350

Client Reference: Cranston Site

PACE Sample Number:			97 0104542		
Date Collected:			12/03/92		
Date Received:			12/03/92		
Client Sample ID:			Trip Blank		
Parameter	Units	MDL		METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Vinyl acetate	ug/L	10	ND		12/16/92
Vinyl chloride	ug/L	10	ND		12/16/92
Xylenes (Total)	ug/L	5.0	ND		12/16/92
Acetonitrile	ug/L	50	ND		12/16/92
Acrolein	ug/L	50	ND		12/16/92
Acrylonitrile	ug/L	50	ND		12/16/92
Allyl chloride	ug/L	5.0	ND		12/16/92
2-Chloroethylvinylether	ug/L	5.0	ND		12/16/92
Chloroprene	ug/L	5.0	ND		12/16/92
1,2-Dibromoethane	ug/L	5.0	ND		12/16/92
Dibromomethane	ug/L	5.0	ND		12/16/92
trans-1,4-Dichloro-2-butene	ug/L	5.0	ND		12/16/92
Dichlorodifluoromethane	ug/L	5.0	ND		12/16/92
1,4-Dioxane	ug/L	500	ND		12/16/92
Iodomethane	ug/L	5.0	ND		12/16/92
Isobutanol	ug/L	500	ND		12/16/92
Methacrylonitrile	ug/L	10	ND		12/16/92
Methyl Methacrylate	ug/L	10	ND		12/16/92
Propionitrile	ug/L	50	ND		12/16/92
1,1,1,2-Tetrachloroethane	ug/L	5.0	ND		12/16/92
Trichloromonofluoromethane	ug/L	5.0	ND		12/16/92
1,2,3-Trichloropropane	ug/L	5.0	ND		12/16/92
DCE (Surrogate Recovery)	%		108		12/16/92
TOL (Surrogate Recovery)	%		95		12/16/92
BFB (Surrogate Recovery)	%		96		12/16/92

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REPORT OF LABORATORY ANALYSIS

Ciba-Geigy Corporation
P.O. Box 18300
Greensboro, NC 27419-8800

January 05, 1993
PACE Project Number: 121204
WPPLAB3207

Attn: Ms. Diana Baldi

Client Reference: Cranston Site

PACE Sample Number:			97 0104941		
Date Collected:			12/03/92		
Date Received:			12/04/92		
			RC-1		
Parameter	Units	MDL	PT4	METHOD	DATE ANALYZED
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	ND	SW846 6010	12/18/92
Antimony	mg/L	0.010	ND	SW846 7041	01/05/93
Arsenic	mg/L	0.01	0.02	SW846 7060	12/29/92
Barium	mg/L	0.2	ND	SW846 6010	12/18/92
Beryllium	mg/L	0.005	ND	SW846 6010	12/18/92
Cadmium	mg/L	0.005	ND	SW846 6010	12/18/92
Calcium	mg/L	5	22	SW846 6010	12/18/92
Chromium	mg/L	0.01	ND	SW846 6010	12/18/92
Cobalt	mg/L	0.05	ND	SW846 6010	12/18/92
Copper	mg/L	0.02	ND	SW846 6010	12/18/92
Iron	mg/L	0.1	21	SW846 6010	12/18/92
Lead	mg/L	0.003	ND	SW846 7421	12/29/92
Magnesium	mg/L	5	ND	SW846 6010	12/18/92
Manganese	mg/L	0.01	0.68	SW846 6010	12/18/92
Mercury	mg/L	0.0002	ND	SW846 7470	12/22/92
Nickel	mg/L	0.04	ND	SW846 6010	12/18/92
Potassium	mg/L	5	ND	SW846 6010	12/18/92
Selenium	mg/L	0.005	ND	SW846 7740	12/30/92
Silver	mg/L	0.01	ND	SW846 6010	12/18/92
Sodium	mg/L	5	25	SW846 6010	12/18/92
Thallium	mg/L	0.01	ND	SW846 7841	12/31/92
Tin	mg/L	1	ND	SW846 6010	12/24/92
Vanadium	mg/L	0.05	ND	SW846 6010	12/18/92
Zinc	mg/L	0.02	ND	SW846 6010	12/18/92
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acetone	ug/L	50	140		12/17/92
Benzene	ug/L	25	ND		12/17/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 2

January 05, 1993
PACE Project Number: 12120451

Client Reference: Cranston Site

PACE Sample Number:			97 0104941		
Date Collected:			12/03/92		
Date Received:			12/04/92		
Client Sample ID:			RC-1		
Parameter	Units	MDL	PT4	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Bromodichloromethane	ug/L	25	ND		12/17/92
Bromoform	ug/L	25	ND		12/17/92
Bromomethane	ug/L	50	ND		12/17/92
2-Butanone (MEK)	ug/L	50	ND		12/17/92
Carbon disulfide	ug/L	25	ND		12/17/92
Carbon tetrachloride	ug/L	25	ND		12/17/92
Chlorobenzene	ug/L	25	27		12/17/92
Chloroethane	ug/L	50	ND		12/17/92
Chloroform	ug/L	25	ND		12/17/92
Chloromethane	ug/L	50	ND		12/17/92
Dibromochloromethane	ug/L	25	ND		12/17/92
1,1-Dichloroethane	ug/L	25	ND		12/17/92
1,2-Dichloroethane	ug/L	25	ND		12/17/92
1,1-Dichloroethylene	ug/L	25	ND		12/17/92
1,2-Dichloroethylene (Total)	ug/L	25	ND		12/17/92
1,2-Dichloropropane	ug/L	25	ND		12/17/92
cis-1,3-Dichloropropylene	ug/L	25	ND		12/17/92
Trans-1,3-dichloropropylene	ug/L	25	ND		12/17/92
Ethylbenzene	ug/L	25	31		12/17/92
2-Hexanone	ug/L	50	ND		12/17/92
4-Methyl-2-pentanone (MIBK)	ug/L	50	ND		12/17/92
Methylene chloride	ug/L	25	ND		12/17/92
Styrene	ug/L	25	ND		12/17/92
1,1,2,2-Tetrachloroethane	ug/L	25	ND		12/17/92
Tetrachloroethylene	ug/L	25	ND		12/17/92
Toluene	ug/L	25	900		12/17/92
1,1,1-Trichloroethane	ug/L	25	ND		12/17/92
1,1,2-Trichloroethane	ug/L	25	ND		12/17/92
Trichloroethylene	ug/L	25	ND		12/17/92
Vinyl acetate	ug/L	50	ND		12/17/92
Vinyl chloride	ug/L	50	ND		12/17/92

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THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 3

January 05, 1993
PACE Project Number: 1212045[illegible]3

Client Reference: Cranston Site

PACE Sample Number:			97 0104941		
Date Collected:			12/03/92		
Date Received:			12/04/92		
Client Sample ID:			RC-1		
Parameter	Units	MDL	PT4	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Xylenes (Total)	ug/L	25	170		12/17/92
Acetonitrile	ug/L	250	ND		12/17/92
Acrolein	ug/L	250	ND		12/17/92
Acrylonitrile	ug/L	250	ND		12/17/92
Allyl chloride	ug/L	25	ND		12/17/92
2-Chloroethylvinylether	ug/L	25	ND		12/17/92
Chloroprene	ug/L	25	ND		12/17/92
1,2-Dibromoethane	ug/L	25	ND		12/17/92
Dibromomethane	ug/L	25	ND		12/17/92
trans-1,4-Dichloro-2-butene	ug/L	25	ND		12/17/92
Dichlorodifluoromethane	ug/L	25	ND		12/17/92
1,4-Dioxane	ug/L	2500	ND		12/17/92
Iodomethane	ug/L	25	ND		12/17/92
Isobutanol	ug/L	2500	ND		12/17/92
Methacrylonitrile	ug/L	50	ND		12/17/92
Methyl Methacrylate	ug/L	50	ND		12/17/92
Propionitrile	ug/L	250	ND		12/17/92
1,1,1,2-Tetrachloroethane	ug/L	25	ND		12/17/92
Trichloromonofluoromethane	ug/L	25	ND		12/17/92
1,2,3-Trichloropropane	ug/L	25	ND		12/17/92
DCE (Surrogate Recovery)	%		109		12/17/92
TOL (Surrogate Recovery)	%		96		12/17/92
BFB (Surrogate Recovery)	%		104		12/17/92

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THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 4

January 05, 1993
PACE Project Number: 121204513

Client Reference: Cranston Site

PACE Sample Number:			97 0104950		
Date Collected:			12/03/92		
Date Received:			12/04/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT4	METHOD	DATE ANALYZED
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	ND	SW846 6010	12/18/92
Antimony	mg/L	0.010	ND	SW846 7041	01/05/93
Arsenic	mg/L	0.01	0.020	SW846 7060	12/29/92
Barium	mg/L	0.2	ND	SW846 6010	12/18/92
Beryllium	mg/L	0.005	ND	SW846 6010	12/18/92
Cadmium	mg/L	0.005	ND	SW846 6010	12/18/92
Calcium	mg/L	5	25	SW846 6010	12/18/92
Chromium	mg/L	0.01	ND	SW846 6010	12/18/92
Cobalt	mg/L	0.05	ND	SW846 6010	12/18/92
Copper	mg/L	0.02	ND	SW846 6010	12/18/92
Iron	mg/L	0.1	9.1	SW846 6010	12/18/92
Lead	mg/L	0.003	ND	SW846 7421	12/29/92
Magnesium	mg/L	5	7	SW846 6010	12/18/92
Manganese	mg/L	0.01	1.0	SW846 6010	12/18/92
Mercury	mg/L	0.0002	ND	SW846 7470	12/22/92
Nickel	mg/L	0.04	ND	SW846 6010	12/18/92
Potassium	mg/L	5	ND	SW846 6010	12/18/92
Selenium	mg/L	0.005	ND	SW846 7740	12/30/92
Silver	mg/L	0.01	ND	SW846 6010	12/18/92
Sodium	mg/L	5	38	SW846 6010	12/18/92
Thallium	mg/L	0.01	ND	SW846 7841	12/31/92
Tin	mg/L	1	ND	SW846 6010	12/24/92
Vanadium	mg/L	0.05	ND	SW846 6010	12/18/92
Zinc	mg/L	0.02	ND	SW846 6010	12/18/92
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acetone	ug/L	20	ND		12/17/92
Benzene	ug/L	10	ND		12/17/92
Bromodichloromethane	ug/L	10	ND		12/17/92
Bromoform	ug/L	10	ND		12/17/92
Bromomethane	ug/L	20	ND		12/17/92

REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 5

January 05, 1993
PACE Project Number: 121204

Client Reference: Cranston Site

PACE Sample Number:			97 0104950		
Date Collected:			12/03/92		
Date Received:			12/04/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT4	METHOD	DATE ANALYZ
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
2-Butanone (MEK)	ug/L	20	ND		12/17/92
Carbon disulfide	ug/L	10	ND		12/17/9
Carbon tetrachloride	ug/L	10	ND		12/17/9
Chlorobenzene	ug/L	10	290		12/17/92
Chloroethane	ug/L	20	ND		12/17/9
Chloroform	ug/L	10	ND		12/17/9
Chloromethane	ug/L	20	ND		12/17/92
Dibromochloromethane	ug/L	10	ND		12/17/9
1,1-Dichloroethane	ug/L	10	ND		12/17/9
1,2-Dichloroethane	ug/L	10	ND		12/17/92
1,1-Dichloroethylene	ug/L	10	ND		12/17/9
1,2-Dichloroethylene (Total)	ug/L	10	ND		12/17/9
1,2-Dichloropropane	ug/L	10	ND		12/17/92
cis-1,3-Dichloropropylene	ug/L	10	ND		12/17/9
Trans-1,3-dichloropropylene	ug/L	10	ND		12/17/92
Ethylbenzene	ug/L	10	ND		12/17/92
2-Hexanone	ug/L	20	ND		12/17/9
4-Methyl-2-pentanone (MIBK)	ug/L	20	ND		12/17/9
Methylene chloride	ug/L	10	ND		12/17/9
Styrene	ug/L	10	ND		12/17/9
1,1,2,2-Tetrachloroethane	ug/L	10	ND		12/17/92
Tetrachloroethylene	ug/L	10	ND		12/17/92
Toluene	ug/L	10	200		12/17/9
1,1,1-Trichloroethane	ug/L	10	ND		12/17/9
1,1,2-Trichloroethane	ug/L	10	ND		12/17/9
Trichloroethylene	ug/L	10	ND		12/17/9
Vinyl acetate	ug/L	20	ND		12/17/92
Vinyl chloride	ug/L	20	ND		12/17/9
Xylenes (Total)	ug/L	10	25		12/17/9
Acetonitrile	ug/L	100	ND		12/17/92
Acrolein	ug/L	100	ND		12/17/9

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 6

January 05, 1993
PACE Project Number: 12120451

Client Reference: Cranston Site

PACE Sample Number:			97 0104950		
Date Collected:			12/03/92		
Date Received:			12/04/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT4	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acrylonitrile	ug/L	100	ND		12/17/92
Allyl chloride	ug/L	10	ND		12/17/92
2-Chloroethylvinylether	ug/L	10	ND		12/17/92
Chloroprene	ug/L	10	ND		12/17/92
1,2-Dibromoethane	ug/L	10	ND		12/17/92
Dibromomethane	ug/L	10	ND		12/17/92
trans-1,4-Dichloro-2-butene	ug/L	10	ND		12/17/92
Dichlorodifluoromethane	ug/L	10	ND		12/17/92
1,4-Dioxane	ug/L	1000	ND		12/17/92
Iodomethane	ug/L	10	ND		12/17/92
Isobutanol	ug/L	1000	ND		12/17/92
Methacrylonitrile	ug/L	20	ND		12/17/92
Methyl Methacrylate	ug/L	20	ND		12/17/92
Propionitrile	ug/L	100	ND		12/17/92
1,1,1,2-Tetrachloroethane	ug/L	10	ND		12/17/92
Trichloromonofluoromethane	ug/L	10	ND		12/17/92
1,2,3-Trichloropropane	ug/L	10	ND		12/17/92
DCE (Surrogate Recovery)	%		114		12/17/92
TOL (Surrogate Recovery)	%		96		12/17/92
BFB (Surrogate Recovery)	%		104		12/17/92

These data have been reviewed and are approved for release.

Frank J. Resnick
Project Manager

100 Marshall Drive
Warrendale, PA 15086-7554
TEL: 412-772-0610
FAX: 412-772-4020

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REPORT OF LABORATORY ANALYSIS

Ciba-Geigy Corporation
P.O. Box 18300
Greensboro, NC 27419-8800

January 07, 1993
PACE Project Number: 121207501

Attn: Ms. Diana Baldi

Client Reference: Cranston Site

PACE Sample Number:			97 0105115		
Date Collected:			12/04/92		
Date Received:			12/05/92		
			RC-1		
Parameter	Units	MDL	PT5	METHOD	DATE ANALYZED
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	ND	SW846 6010	12/28/92
Antimony	mg/L	0.010	ND	SW846 7040	01/05/93
Arsenic	mg/L	0.01	0.020	SW846 7060	12/29/92
Barium	mg/L	0.2	ND	SW846 6010	12/23/92
Beryllium	mg/L	0.005	ND	SW846 6010	12/23/92
Cadmium	mg/L	0.005	ND	SW846 6010	12/28/92
Calcium	mg/L	5	21	SW846 6010	12/28/92
Chromium	mg/L	0.01	ND	SW846 6010	12/23/92
Cobalt	mg/L	0.05	ND	SW846 6010	12/23/92
Copper	mg/L	0.02	ND	SW846 6010	12/23/92
Iron	mg/L	0.1	20	SW846 6010	12/28/92
Lead	mg/L	0.003	ND	SW846 7421	12/29/92
Magnesium	mg/L	5	ND	SW846 6010	12/28/92
Manganese	mg/L	0.01	0.64	SW846 6010	12/28/92
Mercury	mg/L	0.0002	ND	SW846 7470	12/22/92
Nickel	mg/L	0.04	ND	SW846 6010	12/23/92
Potassium	mg/L	5	ND	SW846 6010	12/28/92
Selenium	mg/L	0.005	ND	SW846 7740	12/30/92
Silver	mg/L	0.01	ND	SW846 6010	12/23/92
Sodium	mg/L	5	24	SW846 6010	12/28/92
Thallium	mg/L	0.01	ND	SW846 7841	12/31/92
Tin	mg/L	1	ND	SW846 6010	12/24/92
Vanadium	mg/L	0.05	ND	SW846 6010	12/23/92
Zinc	mg/L	0.02	ND	SW846 6010	12/28/92
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acetone	ug/L	100	ND		12/18/92
Benzene	ug/L	50	ND		12/18/92

REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 2

January 07, 1993
PACE Project Number: 1212075C

Client Reference: Cranston Site

PACE Sample Number:			97 0105115		
Date Collected:			12/04/92		
Date Received:			12/05/92		
Client Sample ID:			RC-1		
Parameter	Units	MDL	PT5	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Bromodichloromethane	ug/L	50	ND		12/18/92
Bromoform	ug/L	50	ND		12/18/92
Bromomethane	ug/L	100	ND		12/18/92
2-Butanone (MEK)	ug/L	100	ND		12/18/92
Carbon disulfide	ug/L	50	ND		12/18/92
Carbon tetrachloride	ug/L	50	ND		12/18/92
Chlorobenzene	ug/L	50	ND		12/18/92
Chloroethane	ug/L	100	ND		12/18/92
Chloroform	ug/L	50	ND		12/18/92
Chloromethane	ug/L	100	ND		12/18/92
Dibromochloromethane	ug/L	50	ND		12/18/92
1,1-Dichloroethane	ug/L	50	ND		12/18/92
1,2-Dichloroethane	ug/L	50	ND		12/18/92
1,1-Dichloroethylene	ug/L	50	ND		12/18/92
1,2-Dichloroethylene (Total)	ug/L	50	ND		12/18/92
1,2-Dichloropropane	ug/L	50	ND		12/18/92
cis-1,3-Dichloropropylene	ug/L	50	ND		12/18/92
Trans-1,3-dichloropropylene	ug/L	50	ND		12/18/92
Ethylbenzene	ug/L	50	ND		12/18/92
2-Hexanone	ug/L	100	ND		12/18/92
4-Methyl-2-pentanone (MIBK)	ug/L	100	ND		12/18/92
Methylene chloride	ug/L	50	ND		12/18/92
Styrene	ug/L	50	ND		12/18/92
1,1,2,2-Tetrachloroethane	ug/L	50	ND		12/18/92
Tetrachloroethylene	ug/L	50	ND		12/18/92
Toluene	ug/L	50	690		12/18/92
1,1,1-Trichloroethane	ug/L	50	ND		12/18/92
1,1,2-Trichloroethane	ug/L	50	ND		12/18/92
Trichloroethylene	ug/L	50	ND		12/18/92
Vinyl acetate	ug/L	100	ND		12/18/92
Vinyl chloride	ug/L	100	ND		12/18/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 3

January 07, 1993
PACE Project Number: 12120750

Client Reference: Cranston Site

PACE Sample Number:			97 0105115		
Date Collected:			12/04/92		
Date Received:			12/05/92		
Client Sample ID:			RC-1		
Parameter	Units	MDL	PT5	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Xylenes (Total)	ug/L	50	150		12/18/92
Acetonitrile	ug/L	500	ND		12/18/92
Acrolein	ug/L	500	ND		12/18/92
Acrylonitrile	ug/L	500	ND		12/18/92
Allyl chloride	ug/L	50	ND		12/18/92
2-Chloroethylvinylether	ug/L	50	ND		12/18/92
Chloroprene	ug/L	50	ND		12/18/92
1,2-Dibromoethane	ug/L	50	ND		12/18/92
Dibromomethane	ug/L	50	ND		12/18/92
trans-1,4-Dichloro-2-butene	ug/L	50	ND		12/18/92
Dichlorodifluoromethane	ug/L	50	ND		12/18/92
1,4-Dioxane	ug/L	5000	ND		12/18/92
Iodomethane	ug/L	50	ND		12/18/92
Isobutanol	ug/L	5000	ND		12/18/92
Methacrylonitrile	ug/L	100	ND		12/18/92
Methyl Methacrylate	ug/L	100	ND		12/18/92
Propionitrile	ug/L	500	ND		12/18/92
1,1,1,2-Tetrachloroethane	ug/L	50	ND		12/18/92
Trichloromonofluoromethane	ug/L	50	ND		12/18/92
1,2,3-Trichloropropane	ug/L	50	ND		12/18/92
DCE (Surrogate Recovery)	%		107		12/18/92
TOL (Surrogate Recovery)	%		98		12/18/92
BFB (Surrogate Recovery)	%		103		12/18/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 4

January 07, 1993
PACE Project Number: 12120750

Client Reference: Cranston Site

PACE Sample Number:			97 0105123		
Date Collected:			12/04/92		
Date Received:			12/05/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT5	METHOD	DATE ANALYZED
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	ND	SW846 6010	12/28/92
Antimony	mg/L	0.010	ND	SW846 7040	01/05/93
Arsenic	mg/L	0.01	0.06	SW846 7060	12/30/92
Barium	mg/L	0.2	ND	SW846 6010	12/23/92
Beryllium	mg/L	0.005	ND	SW846 6010	12/23/92
Cadmium	mg/L	0.005	ND	SW846 6010	12/28/92
Calcium	mg/L	5	24	SW846 6010	12/28/92
Chromium	mg/L	0.01	ND	SW846 6010	12/23/92
Cobalt	mg/L	0.05	ND	SW846 6010	12/23/92
Copper	mg/L	0.02	ND	SW846 6010	12/23/92
Iron	mg/L	0.1	9.3	SW846 6010	12/28/92
Lead	mg/L	0.003	ND	SW846 7421	12/18/92
Magnesium	mg/L	5	7	SW846 6010	12/28/92
Manganese	mg/L	0.01	1.1	SW846 6010	12/28/92
Mercury	mg/L	0.0002	ND	SW846 7470	12/22/92
Nickel	mg/L	0.04	ND	SW846 6010	12/23/92
Potassium	mg/L	5	ND	SW846 6010	12/28/92
Selenium	mg/L	0.005	ND	SW846 7740	12/30/92
Silver	mg/L	0.01	ND	SW846 6010	12/23/92
Sodium	mg/L	5	36	SW846 6010	12/28/92
Thallium	mg/L	0.01	ND	SW846 7841	12/31/92
Tin	mg/L	1	ND	SW846 6010	12/24/92
Vanadium	mg/L	0.05	ND	SW846 6010	12/23/92
Zinc	mg/L	0.02	ND	SW846 6010	12/28/92
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acetone	ug/L	100	ND		12/18/92
Benzene	ug/L	50	ND		12/18/92
Bromodichloromethane	ug/L	50	ND		12/18/92
Bromoform	ug/L	50	ND		12/18/92
Bromomethane	ug/L	100	ND		12/18/92

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THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 5

January 07, 1993
PACE Project Number: 1212075[illegible]

Client Reference: Cranston Site

PACE Sample Number:			97 0105123		
Date Collected:			12/04/92		
Date Received:			12/05/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT5	METHOD	DATE ANALYZ[illegible]
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
2-Butanone (MEK)	ug/L	100	ND		12/18/92
Carbon disulfide	ug/L	50	ND		12/18/9[illegible]
Carbon tetrachloride	ug/L	50	ND		12/18/9[illegible]
Chlorobenzene	ug/L	50	310		12/18/92
Chloroethane	ug/L	100	ND		12/18/9[illegible]
Chloroform	ug/L	50	ND		12/18/9[illegible]
Chloromethane	ug/L	100	ND		12/18/92
Dibromochloromethane	ug/L	50	ND		12/18/9[illegible]
1,1-Dichloroethane	ug/L	50	ND		12/18/9[illegible]
1,2-Dichloroethane	ug/L	50	ND		12/18/92
1,1-Dichloroethylene	ug/L	50	ND		12/18/9[illegible]
1,2-Dichloroethylene (Total)	ug/L	50	ND		12/18/9[illegible]
1,2-Dichloropropane	ug/L	50	ND		12/18/92
cis-1,3-Dichloropropylene	ug/L	50	ND		12/18/9[illegible]
Trans-1,3-dichloropropylene	ug/L	50	ND		12/18/92
Ethylbenzene	ug/L	50	ND		12/18/92
2-Hexanone	ug/L	100	ND		12/18/9[illegible]
4-Methyl-2-pentanone (MIBK)	ug/L	100	ND		12/18/9[illegible]
Methylene chloride	ug/L	50	ND		12/18/9[illegible]
Styrene	ug/L	50	ND		12/18/9[illegible]
1,1,2,2-Tetrachloroethane	ug/L	50	ND		12/18/92
Tetrachloroethylene	ug/L	50	ND		12/18/92
Toluene	ug/L	50	280		12/18/9[illegible]
1,1,1-Trichloroethane	ug/L	50	ND		12/18/9[illegible]
1,1,2-Trichloroethane	ug/L	50	ND		12/18/9[illegible]
Trichloroethylene	ug/L	50	ND		12/18/9[illegible]
Vinyl acetate	ug/L	100	ND		12/18/92
Vinyl chloride	ug/L	100	ND		12/18/92
Xylenes (Total)	ug/L	50	ND		12/18/9[illegible]
Acetonitrile	ug/L	500	ND		12/18/9[illegible]
Acrolein	ug/L	500	ND		12/18/9[illegible]

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 6

January 07, 1993
PACE Project Number: 12120750

Client Reference: Cranston Site

PACE Sample Number:			97 0105123		
Date Collected:			12/04/92		
Date Received:			12/05/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT5	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acrylonitrile	ug/L	500	ND		12/18/92
Allyl chloride	ug/L	50	ND		12/18/92
2-Chloroethylvinylether	ug/L	50	ND		12/18/92
Chloroprene	ug/L	50	ND		12/18/92
1,2-Dibromoethane	ug/L	50	ND		12/18/92
Dibromomethane	ug/L	50	ND		12/18/92
trans-1,4-Dichloro-2-butene	ug/L	50	ND		12/18/92
Dichlorodifluoromethane	ug/L	50	ND		12/18/92
1,4-Dioxane	ug/L	5000	ND		12/18/92
Iodomethane	ug/L	50	ND		12/18/92
Isobutanol	ug/L	5000	ND		12/18/92
Methacrylonitrile	ug/L	100	ND		12/18/92
Methyl Methacrylate	ug/L	100	ND		12/18/92
Propionitrile	ug/L	500	ND		12/18/92
1,1,1,2-Tetrachloroethane	ug/L	50	ND		12/18/92
Trichloromonofluoromethane	ug/L	50	ND		12/18/92
1,2,3-Trichloropropane	ug/L	50	ND		12/18/92
DCE (Surrogate Recovery)	%		108		12/18/92
TOL (Surrogate Recovery)	%		100		12/18/92
BFB (Surrogate Recovery)	%		105		12/18/92

These data have been reviewed and are approved for release.

Frank J. Resnick

Frank J. Resnick
Project Manager

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Warrendale, PA 15086-7554
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REPORT OF LABORATORY ANALYSIS

Ciba-Geigy Corporation
P.O. Box 18300
Greensboro, NC 27419-8800

January 08, 1993
PACE Project Number: 12120951
WPPLAB3256

Attn: Ms. Diana Baldi

Client Reference: Cranston Site

PACE Sample Number:			97 0106294		
Date Collected:			12/08/92		
Date Received:			12/09/92		
			RC-1		
Parameter	Units	MDL	PT6	METHOD	DATE ANALYZED
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	ND	SW846 6010	01/04/93
Antimony	mg/L	0.005	ND	SW846 7041	01/07/93
Arsenic	mg/L	0.01	0.02	SW846 7060	01/05/93
Barium	mg/L	0.2	ND	SW846 6010	12/23/92
Beryllium	mg/L	0.005	ND	SW846 6010	12/23/92
Cadmium	mg/L	0.005	ND	SW846 6010	01/04/93
Calcium	mg/L	5	20	SW846 6010	01/04/93
Chromium	mg/L	0.01	ND	SW846 6010	12/23/92
Cobalt	mg/L	0.05	ND	SW846 6010	12/23/92
Copper	mg/L	0.02	ND	SW846 6010	12/23/92
Iron	mg/L	0.1	18	SW846 6010	01/04/93
Lead	mg/L	0.003	ND	SW846 7421	01/06/93
Magnesium	mg/L	5	ND	SW846 6010	01/04/93
Manganese	mg/L	0.01	0.62	SW846 6010	01/04/93
Mercury	mg/L	0.0002	ND	SW846 7470	12/23/92
Nickel	mg/L	0.04	ND	SW846 6010	12/23/92
Potassium	mg/L	5	ND	SW846 6010	01/04/93
Selenium	mg/L	0.005	ND	SW846 7740	01/06/93
Silver	mg/L	0.01	ND	SW846 6010	12/23/92
Sodium	mg/L	5	26	SW846 6010	01/04/93
Thallium	mg/L	0.01	ND	SW846 7841	12/31/92
Tin	mg/L	1	ND	SW846 6010	12/24/92
Vanadium	mg/L	0.05	ND	SW846 6010	12/23/92
Zinc	mg/L	0.02	ND	SW846 6010	01/04/93
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acetone	ug/L	50	ND		12/23/92
Benzene	ug/L	25	ND		12/23/92

REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 2

January 08, 1993
PACE Project Number: 121209516

Client Reference: Cranston Site

PACE Sample Number:			97 0106294		
Date Collected:			12/08/92		
Date Received:			12/09/92		
Client Sample ID:			RC-1		
Parameter	Units	MDL	PT6	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Bromodichloromethane	ug/L	25	ND		12/23/92
Bromoform	ug/L	25	ND		12/23/92
Bromomethane	ug/L	50	ND		12/23/92
2-Butanone (MEK)	ug/L	50	ND		12/23/92
Carbon disulfide	ug/L	25	ND		12/23/92
Carbon tetrachloride	ug/L	25	ND		12/23/92
Chlorobenzene	ug/L	25	32		12/23/92
Chloroethane	ug/L	50	ND		12/23/92
Chloroform	ug/L	25	ND		12/23/92
Chloromethane	ug/L	50	ND		12/23/92
Dibromochloromethane	ug/L	25	ND		12/23/92
1,1-Dichloroethane	ug/L	25	ND		12/23/92
1,2-Dichloroethane	ug/L	25	ND		12/23/92
1,1-Dichloroethylene	ug/L	25	ND		12/23/92
1,2-Dichloroethylene (Total)	ug/L	25	ND		12/23/92
1,2-Dichloropropane	ug/L	25	ND		12/23/92
cis-1,3-Dichloropropylene	ug/L	25	ND		12/23/92
Trans-1,3-dichloropropylene	ug/L	25	ND		12/23/92
Ethylbenzene	ug/L	25	ND		12/23/92
2-Hexanone	ug/L	50	ND		12/23/92
4-Methyl-2-pentanone (MIBK)	ug/L	50	ND		12/23/92
Methylene chloride	ug/L	25	ND		12/23/92
Styrene	ug/L	25	ND		12/23/92
1,1,2,2-Tetrachloroethane	ug/L	25	ND		12/23/92
Tetrachloroethylene	ug/L	25	ND		12/23/92
Toluene	ug/L	25	560		12/23/92
1,1,1-Trichloroethane	ug/L	25	ND		12/23/92
1,1,2-Trichloroethane	ug/L	25	ND		12/23/92
Trichloroethylene	ug/L	25	ND		12/23/92
Vinyl acetate	ug/L	50	ND		12/23/92
Vinyl chloride	ug/L	50	ND		12/23/92

REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 3

January 08, 1993
PACE Project Number: 12120951

Client Reference: Cranston Site

PACE Sample Number:			97 0106294		
Date Collected:			12/08/92		
Date Received:			12/09/92		
Client Sample ID:			RC-1		
Parameter	Units	MDL	PT6	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Xylenes (Total)	ug/L	25	140		12/23/92
Acetonitrile	ug/L	250	ND		12/23/92
Acrolein	ug/L	250	ND		12/23/92
Acrylonitrile	ug/L	250	ND		12/23/92
Allyl chloride	ug/L	25	ND		12/23/92
2-Chloroethylvinylether	ug/L	25	ND		12/23/92
Chloroprene	ug/L	25	ND		12/23/92
1,2-Dibromoethane	ug/L	25	ND		12/23/92
Dibromomethane	ug/L	25	ND		12/23/92
trans-1,4-Dichloro-2-butene	ug/L	25	ND		12/23/92
Dichlorodifluoromethane	ug/L	25	ND		12/23/92
1,4-Dioxane	ug/L	2500	ND		12/23/92
Iodomethane	ug/L	25	ND		12/23/92
Isobutanol	ug/L	2500	ND		12/23/92
Methacrylonitrile	ug/L	50	ND		12/23/92
Methyl Methacrylate	ug/L	50	ND		12/23/92
Propionitrile	ug/L	250	ND		12/23/92
1,1,1,2-Tetrachloroethane	ug/L	25	ND		12/23/92
Trichloromonofluoromethane	ug/L	25	ND		12/23/92
1,2,3-Trichloropropane	ug/L	25	ND		12/23/92
DCE (Surrogate Recovery)	%		90		12/23/92
TOL (Surrogate Recovery)	%		96		12/23/92
BFB (Surrogate Recovery)	%		92		12/23/92

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THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 4

January 08, 1993
PACE Project Number: 12120

Client Reference: Cranston Site

PACE Sample Number:			97 0106308		
Date Collected:			12/08/92		
Date Received:			12/09/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT6	METHOD	DATE ANALYZ
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	ND	SW846 6010	01/04/9
Antimony	mg/L	0.005	ND	SW846 7041	01/07/9
Arsenic	mg/L	0.01	0.02	SW846 7060	01/05/9
Barium	mg/L	0.2	ND	SW846 6010	12/23/9
Beryllium	mg/L	0.005	ND	SW846 6010	12/23/9
Cadmium	mg/L	0.005	ND	SW846 6010	01/04/9
Calcium	mg/L	5	23	SW846 6010	01/04/93
Chromium	mg/L	0.01	ND	SW846 6010	12/23/92
Cobalt	mg/L	0.05	ND	SW846 6010	12/23/92
Copper	mg/L	0.02	ND	SW846 6010	12/23/92
Iron	mg/L	0.1	9.4	SW846 6010	01/04/93
Lead	mg/L	0.003	ND	SW846 7421	01/06/93
Magnesium	mg/L	5	6	SW846 6010	01/04/93
Manganese	mg/L	0.01	1.1	SW846 6010	01/04/93
Mercury	mg/L	0.0002	ND	SW846 7470	12/23/92
Nickel	mg/L	0.04	ND	SW846 6010	12/23/92
Potassium	mg/L	5	ND	SW846 6010	01/04/93
Selenium	mg/L	0.005	ND	SW846 7740	01/06/93
Silver	mg/L	0.01	ND	SW846 6010	12/23/92
Sodium	mg/L	5	34	SW846 6010	01/04/93
Thallium	mg/L	0.01	ND	SW846 7841	12/31/92
Tin	mg/L	1	ND	SW846 6010	12/24/92
Vanadium	mg/L	0.05	ND	SW846 6010	12/23/92
Zinc	mg/L	0.02	ND	SW846 6010	01/04/93
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST					
Acetone	ug/L	20	ND	SW846-8240	12/23/92
Benzene	ug/L	10	ND		12/23/92
Bromodichloromethane	ug/L	10	ND		12/23/92
Bromoform	ug/L	10	ND		12/23/92
Bromomethane	ug/L	20	ND		12/23/92

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THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 5

January 08, 1993
PACE Project Number: 1212095

Client Reference: Cranston Site

PACE Sample Number:			97 0106308		
Date Collected:			12/08/92		
Date Received:			12/09/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT6	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
2-Butanone (MEK)	ug/L	20	ND		12/23/92
Carbon disulfide	ug/L	10	ND		12/23/92
Carbon tetrachloride	ug/L	10	ND		12/23/92
Chlorobenzene	ug/L	10	300		12/23/92
Chloroethane	ug/L	20	ND		12/23/92
Chloroform	ug/L	10	ND		12/23/92
Chloromethane	ug/L	20	ND		12/23/92
Dibromochloromethane	ug/L	10	ND		12/23/92
1,1-Dichloroethane	ug/L	10	ND		12/23/92
1,2-Dichloroethane	ug/L	10	ND		12/23/92
1,1-Dichloroethylene	ug/L	10	ND		12/23/92
1,2-Dichloroethylene (Total)	ug/L	10	ND		12/23/92
1,2-Dichloropropane	ug/L	10	ND		12/23/92
cis-1,3-Dichloropropylene	ug/L	10	ND		12/23/92
Trans-1,3-dichloropropylene	ug/L	10	ND		12/23/92
Ethylbenzene	ug/L	10	ND		12/23/92
2-Hexanone	ug/L	20	ND		12/23/92
4-Methyl-2-pentanone (MIBK)	ug/L	20	ND		12/23/92
Methylene chloride	ug/L	10	ND		12/23/92
Styrene	ug/L	10	ND		12/23/92
1,1,2,2-Tetrachloroethane	ug/L	10	ND		12/23/92
Tetrachloroethylene	ug/L	10	ND		12/23/92
Toluene	ug/L	10	170		12/23/92
1,1,1-Trichloroethane	ug/L	10	ND		12/23/92
1,1,2-Trichloroethane	ug/L	10	ND		12/23/92
Trichloroethylene	ug/L	10	ND		12/23/92
Vinyl acetate	ug/L	20	ND		12/23/92
Vinyl chloride	ug/L	20	ND		12/23/92
Xylenes (Total)	ug/L	10	21		12/23/92
Acetonitrile	ug/L	100	ND		12/23/92
Acrolein	ug/L	100	ND		12/23/92

REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 6

January 08, 1993
PACE Project Number: 121209

Client Reference: Cranston Site

PACE Sample Number:			97 0106308		
Date Collected:			12/08/92		
Date Received:			12/09/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT6	METHOD	DATE ANALYZE
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST					
Acrylonitrile	ug/L	100	ND	SW846-8240	12/23/92
Allyl chloride	ug/L	10	ND		12/23/92
2-Chloroethylvinylether	ug/L	10	ND		12/23/92
Chloroprene	ug/L	10	ND		12/23/92
1,2-Dibromoethane	ug/L	10	ND		12/23/92
Dibromomethane	ug/L	10	ND		12/23/92
trans-1,4-Dichloro-2-butene	ug/L	10	ND		12/23/92
Dichlorodifluoromethane	ug/L	10	ND		12/23/92
1,4-Dioxane	ug/L	1000	ND		12/23/92
Iodomethane	ug/L	10	ND		12/23/92
Isobutanol	ug/L	1000	ND		12/23/92
Methacrylonitrile	ug/L	20	ND		12/23/92
Methyl Methacrylate	ug/L	20	ND		12/23/92
Propionitrile	ug/L	100	ND		12/23/92
1,1,1,2-Tetrachloroethane	ug/L	10	ND		12/23/92
Trichloromonofluoromethane	ug/L	10	ND		12/23/92
1,2,3-Trichloropropane	ug/L	10	ND		12/23/92
DCE (Surrogate Recovery)	%		104		12/23/92
TOL (Surrogate Recovery)	%		96		12/23/92
BFB (Surrogate Recovery)	%		100		12/23/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 7

January 08, 1993
PACE Project Number: 121209[illegible]6

Client Reference: Cranston Site

PACE Sample Number:			97 0106316		
Date Collected:			12/08/92		
Date Received:			12/09/92		
Client Sample ID:			MW-1S		
Parameter	Units	MDL	PT6	METHOD	DATE ANALYZ[illegible]
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	0.7	SW846 6010	01/04/93
Antimony	mg/L	0.005	ND	SW846 7041	01/07/9[illegible]
Arsenic	mg/L	0.01	0.02	SW846 7060	01/05/9[illegible]
Barium	mg/L	0.2	ND	SW846 6010	12/23/92
Beryllium	mg/L	0.005	ND	SW846 6010	12/23/9[illegible]
Cadmium	mg/L	0.005	ND	SW846 6010	01/04/9[illegible]
Calcium	mg/L	5	45	SW846 6010	01/04/93
Chromium	mg/L	0.01	ND	SW846 6010	12/23/9[illegible]
Cobalt	mg/L	0.05	ND	SW846 6010	12/23/92
Copper	mg/L	0.02	ND	SW846 6010	12/23/92
Iron	mg/L	0.1	0.5	SW846 6010	01/04/9[illegible]
Lead	mg/L	0.003	0.004	SW846 7421	01/06/9[illegible]
Magnesium	mg/L	5	ND	SW846 6010	01/04/9[illegible]
Manganese	mg/L	0.01	0.89	SW846 6010	01/04/9[illegible]
Mercury	mg/L	0.0002	ND	SW846 7470	12/23/92
Nickel	mg/L	0.04	ND	SW846 6010	12/23/92
Potassium	mg/L	5	6	SW846 6010	01/04/9[illegible]
Selenium	mg/L	0.005	ND	SW846 7740	01/06/9[illegible]
Silver	mg/L	0.01	ND	SW846 6010	12/23/9[illegible]
Sodium	mg/L	5	98	SW846 6010	01/04/9[illegible]
Thallium	mg/L	0.01	ND	SW846 7841	12/31/92
Tin	mg/L	1	ND	SW846 6010	12/24/92
Vanadium	mg/L	0.05	ND	SW846 6010	12/23/9[illegible]
Zinc	mg/L	0.02	ND	SW846 6010	01/04/93
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acetone	ug/L	100	ND		12/24/9[illegible]
Benzene	ug/L	50	ND		12/24/9[illegible]
Bromodichloromethane	ug/L	50	ND		12/24/92
Bromoform	ug/L	50	ND		12/24/92
Bromomethane	ug/L	100	ND		12/24/9[illegible]

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 8

January 08, 1993
PACE Project Number: 12120

Client Reference: Cranston Site

Parameter	Units	MDL		METHOD	DATE ANALYZ
PACE Sample Number:			97 0106316		
Date Collected:			12/08/92		
Date Received:			12/09/92		
Client Sample ID:			MW-1S		
			PT6		
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST					
2-Butanone (MEK)	ug/L	100	ND	SW846-8240	12/24/9
Carbon disulfide	ug/L	50	ND		12/24/9
Carbon tetrachloride	ug/L	50	ND		12/24/9
Chlorobenzene	ug/L	50	1700		12/24/9
Chloroethane	ug/L	100	ND		12/24/9
Chloroform	ug/L	50	ND		12/24/9
Chloromethane	ug/L	100	ND		12/24/92
Dibromochloromethane	ug/L	50	ND		12/24/92
1,1-Dichloroethane	ug/L	50	ND		12/24/92
1,2-Dichloroethane	ug/L	50	ND		12/24/92
1,1-Dichloroethylene	ug/L	50	ND		12/24/92
1,2-Dichloroethylene (Total)	ug/L	50	ND		12/24/92
1,2-Dichloropropane	ug/L	50	ND		12/24/92
cis-1,3-Dichloropropylene	ug/L	50	ND		12/24/92
Trans-1,3-dichloropropylene	ug/L	50	ND		12/24/92
Ethylbenzene	ug/L	50	ND		12/24/92
2-Hexanone	ug/L	100	ND		12/24/92
4-Methyl-2-pentanone (MIBK)	ug/L	100	ND		12/24/92
Methylene chloride	ug/L	50	ND		12/24/92
Styrene	ug/L	50	ND		12/24/92
1,1,2,2-Tetrachloroethane	ug/L	50	ND		12/24/92
Tetrachloroethylene	ug/L	50	ND		12/24/92
Toluene	ug/L	50	ND		12/24/92
1,1,1-Trichloroethane	ug/L	50	ND		12/24/92
1,1,2-Trichloroethane	ug/L	50	ND		12/24/92
Trichloroethylene	ug/L	50	ND		12/24/92
Vinyl acetate	ug/L	100	ND		12/24/92
Vinyl chloride	ug/L	100	ND		12/24/92
Xylenes (Total)	ug/L	50	62		12/24/92
Acetonitrile	ug/L	500	ND		12/24/92
Acrolein	ug/L	500	ND		12/24/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 9

January 08, 1993
PACE Project Number: 121[illegible]

Client Reference: Cranston Site

Parameter	Units	MDL		METHOD	DATE ANALYZ
PACE Sample Number:			97 0106316		
Date Collected:			12/08/92		
Date Received:			12/09/92		
Client Sample ID:			MW-1S		
			PT6		
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST					
Acrylonitrile	ug/L	500	ND	SW846-8240	12/24/[illegible]
Allyl chloride	ug/L	50	ND		12/24/[illegible]
2-Chloroethylvinylether	ug/L	50	ND		12/24/[illegible]
Chloroprene	ug/L	50	ND		12/24/[illegible]
1,2-Dibromoethane	ug/L	50	ND		12/24/[illegible]
Dibromomethane	ug/L	50	ND		12/24/[illegible]
trans-1,4-Dichloro-2-butene	ug/L	50	ND		12/24/[illegible]
Dichlorodifluoromethane	ug/L	50	ND		12/24/[illegible]
1,4-Dioxane	ug/L	5000	ND		12/24/[illegible]
Iodomethane	ug/L	50	ND		12/24/92
Isobutanol	ug/L	5000	ND		12/24/[illegible]
Methacrylonitrile	ug/L	100	ND		12/24/[illegible]
Methyl Methacrylate	ug/L	100	ND		12/24/[illegible]
Propionitrile	ug/L	500	ND		12/24/[illegible]
1,1,1,2-Tetrachloroethane	ug/L	50	ND		12/24/92
Trichloromonofluoromethane	ug/L	50	ND		12/24/[illegible]
1,2,3-Trichloropropane	ug/L	50	ND		12/24/[illegible]
DCE (Surrogate Recovery)	%		81		12/24/92
TOL (Surrogate Recovery)	%		87		12/24/[illegible]
BFB (Surrogate Recovery)	%		89		12/24/[illegible]

These data have been reviewed and are approved for release.

Frank Resnick
Project Manager

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REPORT OF LABORATORY ANALYSIS

Ciba-Geigy Corporation
P.O. Box 18300
Greensboro, NC 27419-8800

January 15, 1993
PACE Project Number: 12121650
WPPLAB3288

Attn: Ms. Diana Baldi

Client Reference: Cranston Site

PACE Sample Number:			97 0109234		
Date Collected:			12/15/92		
Date Received:			12/16/92		
			RC-1		
Parameter	Units	MDL	PT 7	METHOD	DATE ANALYZED
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	ND	SW846 6010	01/07/93
Antimony	mg/L	0.005	ND	SW846 7041	01/11/93
Arsenic	mg/L	0.01	0.02	SW846 7060	01/09/93
Barium	mg/L	0.2	ND	SW846 6010	01/07/93
Beryllium	mg/L	0.005	ND	SW846 6010	01/07/93
Cadmium	mg/L	0.005	ND	SW846 6010	01/07/93
Calcium	mg/L	5	21	SW846 6010	01/07/93
Chromium	mg/L	0.01	ND	SW846 6010	01/07/93
Cobalt	mg/L	0.05	ND	SW846 6010	01/07/93
Copper	mg/L	0.02	ND	SW846 6010	01/07/93
Iron	mg/L	0.1	19	SW846 6010	01/07/93
Lead	mg/L	0.003	ND	SW846 7421	01/07/93
Magnesium	mg/L	5	ND	SW846 6010	01/07/93
Manganese	mg/L	0.01	0.70	SW846 6010	01/07/93
Mercury	mg/L	0.0002	ND	SW846 7470	01/07/93
Nickel	mg/L	0.04	ND	SW846 6010	01/07/93
Potassium	mg/L	5	ND	SW846 6010	01/07/93
Selenium	mg/L	0.005	ND	SW846 7740	01/06/93
Silver	mg/L	0.01	ND	SW846 6010	01/07/93
Sodium	mg/L	5	32	SW846 6010	01/07/93
Thallium	mg/L	0.01	ND	SW846 7841	01/10/93
Tin	mg/L	1	ND	SW846 6010	01/05/93
Vanadium	mg/L	0.05	ND	SW846 6010	01/07/93
Zinc	mg/L	0.02	ND	SW846 6010	01/07/93
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acetone	ug/L	25	ND		12/29/92
Benzene	ug/L	12	ND		12/29/92

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Ms. Diana Baldi
Page 2

January 15, 1993
PACE Project Number: 1212165

Client Reference: Cranston Site

PACE Sample Number:			97 0109234		
Date Collected:			12/15/92		
Date Received:			12/16/92		
Client Sample ID:			RC-1		
Parameter	Units	MDL	PT 7	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Bromodichloromethane	ug/L	12	ND		12/29/92
Bromoform	ug/L	12	ND		12/29/92
Bromomethane	ug/L	25	ND		12/29/92
2-Butanone (MEK)	ug/L	25	ND		12/29/92
Carbon disulfide	ug/L	12	ND		12/29/92
Carbon tetrachloride	ug/L	12	ND		12/29/92
Chlorobenzene	ug/L	12	54		12/29/92
Chloroethane	ug/L	25	ND		12/29/92
Chloroform	ug/L	12	ND		12/29/92
Chloromethane	ug/L	25	ND		12/29/92
Dibromochloromethane	ug/L	12	ND		12/29/92
1,1-Dichloroethane	ug/L	12	ND		12/29/92
1,2-Dichloroethane	ug/L	12	ND		12/29/92
1,1-Dichloroethylene	ug/L	12	ND		12/29/92
1,2-Dichloroethylene (Total)	ug/L	12	ND		12/29/92
1,2-Dichloropropane	ug/L	12	ND		12/29/92
cis-1,3-Dichloropropylene	ug/L	12	ND		12/29/92
Trans-1,3-dichloropropylene	ug/L	12	ND		12/29/92
Ethylbenzene	ug/L	12	55		12/29/92
2-Hexanone	ug/L	25	ND		12/29/92
4-Methyl-2-pentanone (MIBK)	ug/L	25	ND		12/29/92
Methylene chloride	ug/L	12	ND		12/29/92
Styrene	ug/L	12	ND		12/29/92
1,1,2,2-Tetrachloroethane	ug/L	12	ND		12/29/92
Tetrachloroethylene	ug/L	12	ND		12/29/92
Toluene	ug/L	12	430		12/29/92
1,1,1-Trichloroethane	ug/L	12	ND		12/29/92
1,1,2-Trichloroethane	ug/L	12	ND		12/29/92
Trichloroethylene	ug/L	12	ND		12/29/92
Vinyl acetate	ug/L	25	ND		12/29/92
Vinyl chloride	ug/L	25	ND		12/29/92

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Ms. Diana Baldi
Page 3

January 15, 1993
PACE Project Number: 121216506

Client Reference: Cranston Site

PACE Sample Number:			97 0109234		
Date Collected:			12/15/92		
Date Received:			12/16/92		
Client Sample ID:			RC-1		
Parameter	Units	MDL	PT 7	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Xylenes (Total)	ug/L	12	150		12/29/92
Acetonitrile	ug/L	120	ND		12/29/92
Acrolein	ug/L	120	ND		12/29/92
Acrylonitrile	ug/L	120	ND		12/29/92
Allyl chloride	ug/L	12	ND		12/29/92
2-Chloroethylvinylether	ug/L	12	ND		12/29/92
Chloroprene	ug/L	12	ND		12/29/92
1,2-Dibromoethane	ug/L	12	ND		12/29/92
Dibromomethane	ug/L	12	ND		12/29/92
trans-1,4-Dichloro-2-butene	ug/L	12	ND		12/29/92
Dichlorodifluoromethane	ug/L	12	ND		12/29/92
1,4-Dioxane	ug/L	1200	ND		12/29/92
Iodomethane	ug/L	12	ND		12/29/92
Isobutanol	ug/L	1200	ND		12/29/92
Methacrylonitrile	ug/L	25	ND		12/29/92
Methyl Methacrylate	ug/L	25	ND		12/29/92
Propionitrile	ug/L	120	ND		12/29/92
1,1,1,2-Tetrachloroethane	ug/L	12	ND		12/29/92
Trichloromonofluoromethane	ug/L	12	ND		12/29/92
1,2,3-Trichloropropane	ug/L	12	ND		12/29/92
DCE (Surrogate Recovery)	%		96		12/29/92
TOL (Surrogate Recovery)	%		110		12/29/92
BFB (Surrogate Recovery)	%		104		12/29/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 4

January 15, 1993
PACE Project Number: 12121650

Client Reference: Cranston Site

PACE Sample Number:			97 0109242		
Date Collected:			12/15/92		
Date Received:			12/16/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT 7	METHOD	DATE ANALYZED
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	ND	SW846 6010	01/07/93
Antimony	mg/L	0.005	ND	SW846 7041	01/11/93
Arsenic	mg/L	0.01	0.02	SW846 7060	01/09/93
Barium	mg/L	0.2	ND	SW846 6010	01/07/93
Beryllium	mg/L	0.005	ND	SW846 6010	01/07/93
Cadmium	mg/L	0.005	ND	SW846 6010	01/07/93
Calcium	mg/L	5	23	SW846 6010	01/07/93
Chromium	mg/L	0.01	ND	SW846 6010	01/07/93
Cobalt	mg/L	0.05	ND	SW846 6010	01/07/93
Copper	mg/L	0.02	ND	SW846 6010	01/07/93
Iron	mg/L	0.1	9.0	SW846 6010	01/07/93
Lead	mg/L	0.003	ND	SW846 7421	01/07/93
Magnesium	mg/L	5	6.2	SW846 6010	01/07/93
Manganese	mg/L	0.01	1.2	SW846 6010	01/07/93
Mercury	mg/L	0.0002	ND	SW846 7470	01/07/93
Nickel	mg/L	0.04	ND	SW846 6010	01/07/93
Potassium	mg/L	5	ND	SW846 6010	01/07/93
Selenium	mg/L	0.005	ND	SW846 7740	01/06/93
Silver	mg/L	0.01	ND	SW846 6010	01/07/93
Sodium	mg/L	5	34	SW846 6010	01/07/93
Thallium	mg/L	0.01	ND	SW846 7841	01/10/93
Tin	mg/L	1	ND	SW846 6010	01/05/93
Vanadium	mg/L	0.05	ND	SW846 6010	01/07/93
Zinc	mg/L	0.02	ND	SW846 6010	01/07/93
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acetone	ug/L	20	ND		12/29/92
Benzene	ug/L	10	13		12/29/92
Bromodichloromethane	ug/L	10	ND		12/29/92
Bromoform	ug/L	10	ND		12/29/92
Bromomethane	ug/L	20	ND		12/29/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 5

January 15, 1993
PACE Project Number: 12121650

Client Reference: Cranston Site

PACE Sample Number:			97 0109242		
Date Collected:			12/15/92		
Date Received:			12/16/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT 7	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
2-Butanone (MEK)	ug/L	20	ND		12/29/92
Carbon disulfide	ug/L	10	ND		12/29/92
Carbon tetrachloride	ug/L	10	ND		12/29/92
Chlorobenzene	ug/L	10	240		12/29/92
Chloroethane	ug/L	20	ND		12/29/92
Chloroform	ug/L	10	ND		12/29/92
Chloromethane	ug/L	20	ND		12/29/92
Dibromochloromethane	ug/L	10	ND		12/29/92
1,1-Dichloroethane	ug/L	10	ND		12/29/92
1,2-Dichloroethane	ug/L	10	ND		12/29/92
1,1-Dichloroethylene	ug/L	10	ND		12/29/92
1,2-Dichloroethylene (Total)	ug/L	10	ND		12/29/92
1,2-Dichloropropane	ug/L	10	ND		12/29/92
cis-1,3-Dichloropropylene	ug/L	10	ND		12/29/92
Trans-1,3-dichloropropylene	ug/L	10	ND		12/29/92
Ethylbenzene	ug/L	10	ND		12/29/92
2-Hexanone	ug/L	20	ND		12/29/92
4-Methyl-2-pentanone (MIBK)	ug/L	20	ND		12/29/92
Methylene chloride	ug/L	10	ND		12/29/92
Styrene	ug/L	10	ND		12/29/92
1,1,2,2-Tetrachloroethane	ug/L	10	ND		12/29/92
Tetrachloroethylene	ug/L	10	ND		12/29/92
Toluene	ug/L	10	96		12/29/92
1,1,1-Trichloroethane	ug/L	10	ND		12/29/92
1,1,2-Trichloroethane	ug/L	10	ND		12/29/92
Trichloroethylene	ug/L	10	ND		12/29/92
Vinyl acetate	ug/L	20	ND		12/29/92
Vinyl chloride	ug/L	20	ND		12/29/92
Xylenes (Total)	ug/L	10	21		12/29/92
Acetonitrile	ug/L	100	ND		12/29/92
Acrolein	ug/L	100	ND		12/29/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 6

January 15, 1993
PACE Project Number: 12121650

Client Reference: Cranston Site

PACE Sample Number:			97 0109242		
Date Collected:			12/15/92		
Date Received:			12/16/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT 7	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acrylonitrile	ug/L	100	ND		12/29/92
Allyl chloride	ug/L	10	ND		12/29/92
2-Chloroethylvinylether	ug/L	10	ND		12/29/92
Chloroprene	ug/L	10	ND		12/29/92
1,2-Dibromoethane	ug/L	10	ND		12/29/92
Dibromomethane	ug/L	10	ND		12/29/92
trans-1,4-Dichloro-2-butene	ug/L	10	ND		12/29/92
Dichlorodifluoromethane	ug/L	10	ND		12/29/92
1,4-Dioxane	ug/L	1000	ND		12/29/92
Iodomethane	ug/L	10	ND		12/29/92
Isobutanol	ug/L	1000	ND		12/29/92
Methacrylonitrile	ug/L	20	ND		12/29/92
Methyl Methacrylate	ug/L	20	ND		12/29/92
Propionitrile	ug/L	100	ND		12/29/92
1,1,1,2-Tetrachloroethane	ug/L	10	ND		12/29/92
Trichloromonofluoromethane	ug/L	10	ND		12/29/92
1,2,3-Trichloropropane	ug/L	10	ND		12/29/92
DCE (Surrogate Recovery)	%		96		12/29/92
TOL (Surrogate Recovery)	%		107		12/29/92
BFB (Surrogate Recovery)	%		104		12/29/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 7

January 15, 1993
PACE Project Number: 1212165(

Client Reference: Cranston Site

PACE Sample Number:			97 0109250		
Date Collected:			12/15/92		
Date Received:			12/16/92		
Client Sample ID:			MW-1S		
Parameter	Units	MDL	PT 7	METHOD	DATE ANALYZED
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	ND	SW846 6010	01/07/93
Antimony	mg/L	0.005	ND	SW846 7041	01/11/93
Arsenic	mg/L	0.01	ND	SW846 7060	01/09/93
Barium	mg/L	0.2	ND	SW846 6010	01/07/93
Beryllium	mg/L	0.005	ND	SW846 6010	01/07/93
Cadmium	mg/L	0.005	ND	SW846 6010	01/07/93
Calcium	mg/L	5	53	SW846 6010	01/07/93
Chromium	mg/L	0.01	ND	SW846 6010	01/07/93
Cobalt	mg/L	0.05	ND	SW846 6010	01/07/93
Copper	mg/L	0.02	ND	SW846 6010	01/07/93
Iron	mg/L	0.1	6.6	SW846 6010	01/07/93
Lead	mg/L	0.003	ND	SW846 7421	01/07/93
Magnesium	mg/L	5	ND	SW846 6010	01/07/93
Manganese	mg/L	0.01	1.6	SW846 6010	01/07/93
Mercury	mg/L	0.0002	ND	SW846 7470	01/07/93
Nickel	mg/L	0.04	ND	SW846 6010	01/07/93
Potassium	mg/L	5	8.2	SW846 6010	01/07/93
Selenium	mg/L	0.005	ND	SW846 7740	01/06/93
Silver	mg/L	0.01	ND	SW846 6010	01/07/93
Sodium	mg/L	5	44	SW846 6010	01/07/93
Thallium	mg/L	0.01	ND	SW846 7841	01/10/93
Tin	mg/L	1	ND	SW846 6010	01/05/93
Vanadium	mg/L	0.05	ND	SW846 6010	01/07/93
Zinc	mg/L	0.02	ND	SW846 6010	01/07/93
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acetone	ug/L	1000	ND		12/30/92
Benzene	ug/L	500	ND		12/30/92
Bromodichloromethane	ug/L	500	ND		12/30/92
Bromoform	ug/L	500	ND		12/30/92
Bromomethane	ug/L	1000	ND		12/30/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 8

January 15, 1993
PACE Project Number: 1212[illegible]

Client Reference: Cranston Site

Parameter	Units	MDL		METHOD	DATE ANALYZED
PACE Sample Number:			97 0109250		
Date Collected:			12/15/92		
Date Received:			12/16/92		
Client Sample ID:			MW-1S		
			PT 7		
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
2-Butanone (MEK)	ug/L	1000	ND		12/30/[illegible]
Carbon disulfide	ug/L	500	ND		12/30/[illegible]
Carbon tetrachloride	ug/L	500	ND		12/30/92
Chlorobenzene	ug/L	500	13000		12/30/[illegible]
Chloroethane	ug/L	1000	ND		12/30/[illegible]
Chloroform	ug/L	500	ND		12/30/92
Chloromethane	ug/L	1000	ND		12/30/9[illegible]
Dibromochloromethane	ug/L	500	ND		12/30/9[illegible]
1,1-Dichloroethane	ug/L	500	ND		12/30/92
1,2-Dichloroethane	ug/L	500	ND		12/30/9[illegible]
1,1-Dichloroethylene	ug/L	500	ND		12/30/9[illegible]
1,2-Dichloroethylene (Total)	ug/L	500	ND		12/30/92
1,2-Dichloropropane	ug/L	500	ND		12/30/9[illegible]
cis-1,3-Dichloropropylene	ug/L	500	ND		12/30/92
Trans-1,3-dichloropropylene	ug/L	500	ND		12/30/92
Ethylbenzene	ug/L	500	ND		12/30/9[illegible]
2-Hexanone	ug/L	1000	ND		12/30/92
4-Methyl-2-pentanone (MIBK)	ug/L	1000	ND		12/30/92
Methylene chloride	ug/L	500	ND		12/30/92
Styrene	ug/L	500	ND		12/30/92
1,1,2,2-Tetrachloroethane	ug/L	500	ND		12/30/92
Tetrachloroethylene	ug/L	500	ND		12/30/92
Toluene	ug/L	500	ND		12/30/92
1,1,1-Trichloroethane	ug/L	500	ND		12/30/92
1,1,2-Trichloroethane	ug/L	500	ND		12/30/92
Trichloroethylene	ug/L	500	ND		12/30/92
Vinyl acetate	ug/L	1000	ND		12/30/92
Vinyl chloride	ug/L	1000	ND		12/30/92
Xylenes (Total)	ug/L	500	ND		12/30/92
Acetonitrile	ug/L	5000	ND		12/30/92
Acrolein	ug/L	5000	ND		12/30/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 9

January 15, 1993
PACE Project Number: 121216506

Client Reference: Cranston Site

PACE Sample Number:			97 0109250		
Date Collected:			12/15/92		
Date Received:			12/16/92		
Client Sample ID:			MW-1S		
Parameter	Units	MDL	PT 7	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acrylonitrile	ug/L	5000	ND		12/30/92
Allyl chloride	ug/L	500	ND		12/30/92
2-Chloroethylvinylether	ug/L	500	ND		12/30/92
Chloroprene	ug/L	500	ND		12/30/92
1,2-Dibromoethane	ug/L	500	ND		12/30/92
Dibromomethane	ug/L	500	ND		12/30/92
trans-1,4-Dichloro-2-butene	ug/L	500	ND		12/30/92
Dichlorodifluoromethane	ug/L	500	ND		12/30/92
1,4-Dioxane	ug/L	50000	ND		12/30/92
Iodomethane	ug/L	500	ND		12/30/92
Isobutanol	ug/L	50000	ND		12/30/92
Methacrylonitrile	ug/L	1000	ND		12/30/92
Methyl Methacrylate	ug/L	1000	ND		12/30/92
Propionitrile	ug/L	5000	ND		12/30/92
1,1,1,2-Tetrachloroethane	ug/L	500	ND		12/30/92
Trichloromonofluoromethane	ug/L	500	ND		12/30/92
1,2,3-Trichloropropane	ug/L	500	ND		12/30/92
DCE (Surrogate Recovery)	%		104		12/30/92
TOL (Surrogate Recovery)	%		108		12/30/92
BFB (Surrogate Recovery)	%		110		12/30/92

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Ms. Diana Baldi
Page 10

January 15, 1993
PACE Project Number: 1212165

Client Reference: Cranston Site

PACE Sample Number:			97 0109269		
Date Collected:			12/15/92		
Date Received:			12/16/92		
Client Sample ID:			MW-2S		
Parameter	Units	MDL	PT 7	METHOD	DATE ANALYZED
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	0.3	SW846 6010	01/07/93
Antimony	mg/L	0.01	ND	SW846 7041	01/12/93
Arsenic	mg/L	0.01	ND	SW846 7060	01/09/93
Barium	mg/L	0.2	ND	SW846 6010	01/07/93
Beryllium	mg/L	0.005	ND	SW846 6010	01/07/93
Cadmium	mg/L	0.005	ND	SW846 6010	01/07/93
Calcium	mg/L	5	69	SW846 6010	01/07/93
Chromium	mg/L	0.01	ND	SW846 6010	01/07/93
Cobalt	mg/L	0.05	ND	SW846 6010	01/07/93
Copper	mg/L	0.02	ND	SW846 6010	01/07/93
Iron	mg/L	0.1	2.5	SW846 6010	01/07/93
Lead	mg/L	0.003	0.006	SW846 7421	01/07/93
Magnesium	mg/L	5	ND	SW846 6010	01/07/93
Manganese	mg/L	0.01	0.23	SW846 6010	01/07/93
Mercury	mg/L	0.0002	ND	SW846 7470	01/07/93
Nickel	mg/L	0.04	ND	SW846 6010	01/07/93
Potassium	mg/L	5	14	SW846 6010	01/07/93
Selenium	mg/L	0.005	ND	SW846 7740	01/06/93
Silver	mg/L	0.01	ND	SW846 6010	01/07/93
Sodium	mg/L	5	20	SW846 6010	01/07/93
Thallium	mg/L	0.01	ND	SW846 7841	01/10/93
Tin	mg/L	1	ND	SW846 6010	01/05/93
Vanadium	mg/L	0.05	ND	SW846 6010	01/07/93
Zinc	mg/L	0.02	0.20	SW846 6010	01/07/93
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acetone	ug/L	100	ND		12/29/92
Benzene	ug/L	50	ND		12/29/92
Bromodichloromethane	ug/L	50	ND		12/29/92
Bromoform	ug/L	50	ND		12/29/92
Bromomethane	ug/L	100	ND		12/29/92

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Ms. Diana Baldi
Page 11

January 15, 1993
PACE Project Number: 121216506

Client Reference: Cranston Site

PACE Sample Number:			97 0109269		
Date Collected:			12/15/92		
Date Received:			12/16/92		
Client Sample ID:			MW-2S		
Parameter	Units	MDL	PT 7	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
2-Butanone (MEK)	ug/L	100	ND		12/29/92
Carbon disulfide	ug/L	50	ND		12/29/92
Carbon tetrachloride	ug/L	50	ND		12/29/92
Chlorobenzene	ug/L	50	1400		12/29/92
Chloroethane	ug/L	100	ND		12/29/92
Chloroform	ug/L	50	ND		12/29/92
Chloromethane	ug/L	100	ND		12/29/92
Dibromochloromethane	ug/L	50	ND		12/29/92
1,1-Dichloroethane	ug/L	50	ND		12/29/92
1,2-Dichloroethane	ug/L	50	ND		12/29/92
1,1-Dichloroethylene	ug/L	50	ND		12/29/92
1,2-Dichloroethylene (Total)	ug/L	50	290		12/29/92
1,2-Dichloropropane	ug/L	50	ND		12/29/92
cis-1,3-Dichloropropylene	ug/L	50	ND		12/29/92
Trans-1,3-dichloropropylene	ug/L	50	ND		12/29/92
Ethylbenzene	ug/L	50	ND		12/29/92
2-Hexanone	ug/L	100	ND		12/29/92
4-Methyl-2-pentanone (MIBK)	ug/L	100	ND		12/29/92
Methylene chloride	ug/L	50	ND		12/29/92
Styrene	ug/L	50	ND		12/29/92
1,1,2,2-Tetrachloroethane	ug/L	50	ND		12/29/92
Tetrachloroethylene	ug/L	50	ND		12/29/92
Toluene	ug/L	50	ND		12/29/92
1,1,1-Trichloroethane	ug/L	50	ND		12/29/92
1,1,2-Trichloroethane	ug/L	50	ND		12/29/92
Trichloroethylene	ug/L	50	ND		12/29/92
Vinyl acetate	ug/L	100	ND		12/29/92
Vinyl chloride	ug/L	100	ND		12/29/92
Xylenes (Total)	ug/L	50	ND		12/29/92
Acetonitrile	ug/L	500	ND		12/29/92
Acrolein	ug/L	500	ND		12/29/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 12

January 15, 1993
PACE Project Number: 1212[redacted]

Client Reference: Cranston Site

Parameter	Units	MDL		METHOD	DATE ANALYZE[redacted]
PACE Sample Number:			97 0109269		
Date Collected:			12/15/92		
Date Received:			12/16/92		
Client Sample ID:			MW-2S		
			PT 7		
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acrylonitrile	ug/L	500	ND		12/29/[redacted]
Allyl chloride	ug/L	50	ND		12/29/[redacted]
2-Chloroethylvinylether	ug/L	50	ND		12/29/92
Chloroprene	ug/L	50	ND		12/29/92
1,2-Dibromoethane	ug/L	50	ND		12/29/[redacted]
Dibromomethane	ug/L	50	ND		12/29/92
trans-1,4-Dichloro-2-butene	ug/L	50	ND		12/29/[redacted]
Dichlorodifluoromethane	ug/L	50	ND		12/29/[redacted]
1,4-Dioxane	ug/L	5000	ND		12/29/92
Iodomethane	ug/L	50	ND		12/29/[redacted]
Isobutanol	ug/L	5000	ND		12/29/[redacted]
Methacrylonitrile	ug/L	100	ND		12/29/92
Methyl Methacrylate	ug/L	100	ND		12/29/92
Propionitrile	ug/L	500	ND		12/29/92
1,1,1,2-Tetrachloroethane	ug/L	50	ND		12/29/92
Trichloromonofluoromethane	ug/L	50	ND		12/29/92
1,2,3-Trichloropropane	ug/L	50	ND		12/29/92
DCE (Surrogate Recovery)	%		101		12/29/92
TOL (Surrogate Recovery)	%		108		12/29/92
BFB (Surrogate Recovery)	%		106		12/29/92

These data have been reviewed and are approved for release.

Frank Resnick
Project Manager

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REPORT OF LABORATORY ANALYSIS

Ciba-Geigy Corporation
P.O. Box 18300
Greensboro, NC 27419-8800

January 15, 1993
PACE Project Number: 121224504
WPPLAB3289

Attn: Ms. Diana Baldi

Client Reference: Cranston Site

PACE Sample Number:			97 0111549		
Date Collected:			12/22/92		
Date Received:			12/24/92		
			RC-1		
Parameter	Units	MDL	PT8	METHOD	DATE ANALYZED
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	ND	SW846 6010	01/07/93
Antimony	mg/L	0.01	ND	SW846 7041	01/13/93
Arsenic	mg/L	0.01	0.02	SW846 7060	01/11/93
Barium	mg/L	0.2	ND	SW846 6010	01/07/93
Beryllium	mg/L	0.005	ND	SW846 6010	01/07/93
Cadmium	mg/L	0.005	ND	SW846 6010	01/07/93
Calcium	mg/L	5	22	SW846 6010	01/07/93
Chromium	mg/L	0.01	ND	SW846 6010	01/07/93
Cobalt	mg/L	0.05	ND	SW846 6010	01/07/93
Copper	mg/L	0.02	ND	SW846 6010	01/07/93
Iron	mg/L	0.1	19	SW846 6010	01/07/93
Lead	mg/L	0.003	ND	SW846 7421	01/11/93
Magnesium	mg/L	5	ND	SW846 6010	01/07/93
Manganese	mg/L	0.01	0.75	SW846 6010	01/07/93
Mercury	mg/L	0.0002	ND	SW846 7470	01/07/93
Nickel	mg/L	0.04	ND	SW846 6010	01/07/93
Potassium	mg/L	5	ND	SW846 6010	01/07/93
Selenium	mg/L	0.005	ND	SW846 7740	01/12/93
Silver	mg/L	0.01	ND	SW846 6010	01/07/93
Sodium	mg/L	5	35	SW846 6010	01/07/93
Thallium	mg/L	0.01	ND	SW846 7841	01/10/93
Tin	mg/L	1	ND	SW846 6010	01/05/93
Vanadium	mg/L	0.05	ND	SW846 6010	01/07/93
Zinc	mg/L	0.02	ND	SW846 6010	01/07/93
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acetone	ug/L	25	ND		12/30/92
Benzene	ug/L	12	ND		12/30/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 2

January 15, 1993
PACE Project Number: 1212245

Client Reference: Cranston Site

PACE Sample Number:			97 0111549		
Date Collected:			12/22/92		
Date Received:			12/24/92		
Client Sample ID:			RC-1		
Parameter	Units	MDL	PT8	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Bromodichloromethane	ug/L	12	ND		12/30/92
Bromoform	ug/L	12	ND		12/30/92
Bromomethane	ug/L	25	ND		12/30/92
2-Butanone (MEK)	ug/L	25	ND		12/30/92
Carbon disulfide	ug/L	12	ND		12/30/92
Carbon tetrachloride	ug/L	12	ND		12/30/92
Chlorobenzene	ug/L	12	67		12/30/92
Chloroethane	ug/L	25	ND		12/30/92
Chloroform	ug/L	12	ND		12/30/92
Chloromethane	ug/L	25	ND		12/30/92
Dibromochloromethane	ug/L	12	ND		12/30/92
1,1-Dichloroethane	ug/L	12	ND		12/30/92
1,2-Dichloroethane	ug/L	12	ND		12/30/92
1,1-Dichloroethylene	ug/L	12	ND		12/30/92
1,2-Dichloroethylene (Total)	ug/L	12	ND		12/30/92
1,2-Dichloropropane	ug/L	12	ND		12/30/92
cis-1,3-Dichloropropylene	ug/L	12	ND		12/30/92
Trans-1,3-dichloropropylene	ug/L	12	ND		12/30/92
Ethylbenzene	ug/L	12	69		12/30/92
2-Hexanone	ug/L	25	ND		12/30/92
4-Methyl-2-pentanone (MIBK)	ug/L	25	ND		12/30/92
Methylene chloride	ug/L	12	ND		12/30/92
Styrene	ug/L	12	ND		12/30/92
1,1,2,2-Tetrachloroethane	ug/L	12	ND		12/30/92
Tetrachloroethylene	ug/L	12	ND		12/30/92
Toluene	ug/L	12	550		12/30/92
1,1,1-Trichloroethane	ug/L	12	ND		12/30/92
1,1,2-Trichloroethane	ug/L	12	ND		12/30/92
Trichloroethylene	ug/L	12	ND		12/30/92
Vinyl acetate	ug/L	25	ND		12/30/92
Vinyl chloride	ug/L	25	ND		12/30/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 3

January 15, 1993
PACE Project Number: 121224504

Client Reference: Cranston Site

PACE Sample Number:			97 0111549		
Date Collected:			12/22/92		
Date Received:			12/24/92		
Client Sample ID:			RC-1		
Parameter	Units	MDL	PT8	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Xylenes (Total)	ug/L	12	210		12/30/92
Acetonitrile	ug/L	120	ND		12/30/92
Acrolein	ug/L	120	ND		12/30/92
Acrylonitrile	ug/L	120	ND		12/30/92
Allyl chloride	ug/L	12	ND		12/30/92
2-Chloroethylvinylether	ug/L	12	ND		12/30/92
Chloroprene	ug/L	12	ND		12/30/92
1,2-Dibromoethane	ug/L	12	ND		12/30/92
Dibromomethane	ug/L	12	ND		12/30/92
trans-1,4-Dichloro-2-butene	ug/L	12	ND		12/30/92
Dichlorodifluoromethane	ug/L	12	ND		12/30/92
1,4-Dioxane	ug/L	1200	ND		12/30/92
Iodomethane	ug/L	12	ND		12/30/92
Isobutanol	ug/L	1200	ND		12/30/92
Methacrylonitrile	ug/L	25	ND		12/30/92
Methyl Methacrylate	ug/L	25	ND		12/30/92
Propionitrile	ug/L	120	ND		12/30/92
1,1,1,2-Tetrachloroethane	ug/L	12	ND		12/30/92
Trichloromonofluoromethane	ug/L	12	ND		12/30/92
1,2,3-Trichloropropane	ug/L	12	ND		12/30/92
DCE (Surrogate Recovery)	%		103		12/30/92
TOL (Surrogate Recovery)	%		110		12/30/92
BFB (Surrogate Recovery)	%		114		12/30/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 4

January 15, 1993
PACE Project Number: 1212245

Client Reference: Cranston Site

PACE Sample Number:			97 0111557		
Date Collected:			12/22/92		
Date Received:			12/24/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT8	METHOD	DATE ANALYZED
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	ND	SW846 6010	01/07/93
Antimony	mg/L	0.01	ND	SW846 7041	01/12/93
Arsenic	mg/L	0.01	0.02	SW846 7060	01/11/93
Barium	mg/L	0.2	ND	SW846 6010	01/07/93
Beryllium	mg/L	0.005	ND	SW846 6010	01/07/93
Cadmium	mg/L	0.005	ND	SW846 6010	01/07/93
Calcium	mg/L	5	24	SW846 6010	01/07/93
Chromium	mg/L	0.01	ND	SW846 6010	01/07/93
Cobalt	mg/L	0.05	ND	SW846 6010	01/07/93
Copper	mg/L	0.02	ND	SW846 6010	01/07/93
Iron	mg/L	0.1	9.2	SW846 6010	01/07/93
Lead	mg/L	0.003	0.006	SW846 7421	01/11/93
Magnesium	mg/L	5	6.4	SW846 6010	01/07/93
Manganese	mg/L	0.01	1.2	SW846 6010	01/07/93
Mercury	mg/L	0.0002	ND	SW846 7470	01/07/93
Nickel	mg/L	0.04	ND	SW846 6010	01/07/93
Potassium	mg/L	5	ND	SW846 6010	01/07/93
Selenium	mg/L	0.005	ND	SW846 7740	01/12/93
Silver	mg/L	0.01	ND	SW846 6010	01/07/93
Sodium	mg/L	5	36	SW846 6010	01/07/93
Thallium	mg/L	0.01	ND	SW846 7841	01/10/93
Tin	mg/L	1	ND	SW846 6010	01/05/93
Vanadium	mg/L	0.05	ND	SW846 6010	01/07/93
Zinc	mg/L	0.02	ND	SW846 6010	01/07/93
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acetone	ug/L	25	ND		12/30/92
Benzene	ug/L	12	ND		12/30/92
Bromodichloromethane	ug/L	12	ND		12/30/92
Bromoform	ug/L	12	ND		12/30/92
Bromomethane	ug/L	25	ND		12/30/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 5

January 15, 1993
PACE Project Number: 121224504

Client Reference: Cranston Site

PACE Sample Number:			97 0111557		
Date Collected:			12/22/92		
Date Received:			12/24/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT8	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
2-Butanone (MEK)	ug/L	25	ND		12/30/92
Carbon disulfide	ug/L	12	ND		12/30/92
Carbon tetrachloride	ug/L	12	ND		12/30/92
Chlorobenzene	ug/L	12	220		12/30/92
Chloroethane	ug/L	25	ND		12/30/92
Chloroform	ug/L	12	ND		12/30/92
Chloromethane	ug/L	25	ND		12/30/92
Dibromochloromethane	ug/L	12	ND		12/30/92
1,1-Dichloroethane	ug/L	12	ND		12/30/92
1,2-Dichloroethane	ug/L	12	ND		12/30/92
1,1-Dichloroethylene	ug/L	12	ND		12/30/92
1,2-Dichloroethylene (Total)	ug/L	12	ND		12/30/92
1,2-Dichloropropane	ug/L	12	ND		12/30/92
cis-1,3-Dichloropropylene	ug/L	12	ND		12/30/92
Trans-1,3-dichloropropylene	ug/L	12	ND		12/30/92
Ethylbenzene	ug/L	12	ND		12/30/92
2-Hexanone	ug/L	25	ND		12/30/92
4-Methyl-2-pentanone (MIBK)	ug/L	25	ND		12/30/92
Methylene chloride	ug/L	12	ND		12/30/92
Styrene	ug/L	12	ND		12/30/92
1,1,2,2-Tetrachloroethane	ug/L	12	ND		12/30/92
Tetrachloroethylene	ug/L	12	ND		12/30/92
Toluene	ug/L	12	68		12/30/92
1,1,1-Trichloroethane	ug/L	12	ND		12/30/92
1,1,2-Trichloroethane	ug/L	12	ND		12/30/92
Trichloroethylene	ug/L	12	ND		12/30/92
Vinyl acetate	ug/L	25	ND		12/30/92
Vinyl chloride	ug/L	25	ND		12/30/92
Xylenes (Total)	ug/L	12	17		12/30/92
Acetonitrile	ug/L	120	ND		12/30/92
Acrolein	ug/L	120	ND		12/30/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 6

January 15, 1993
PACE Project Number: 12122[illegible]

Client Reference: Cranston Site

PACE Sample Number:			97 0111557		
Date Collected:			12/22/92		
Date Received:			12/24/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT8	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acrylonitrile	ug/L	120	ND		12/30/9[illegible]
Allyl chloride	ug/L	12	ND		12/30/9[illegible]
2-Chloroethylvinylether	ug/L	12	ND		12/30/92
Chloroprene	ug/L	12	ND		12/30/9[illegible]
1,2-Dibromoethane	ug/L	12	ND		12/30/9[illegible]
Dibromomethane	ug/L	12	ND		12/30/92
trans-1,4-Dichloro-2-butene	ug/L	12	ND		12/30/9[illegible]
Dichlorodifluoromethane	ug/L	12	ND		12/30/92
1,4-Dioxane	ug/L	1200	ND		12/30/92
Iodomethane	ug/L	12	ND		12/30/9[illegible]
Isobutanol	ug/L	1200	ND		12/30/9[illegible]
Methacrylonitrile	ug/L	25	ND		12/30/92
Methyl Methacrylate	ug/L	25	ND		12/30/9[illegible]
Propionitrile	ug/L	120	ND		12/30/92
1,1,1,2-Tetrachloroethane	ug/L	12	ND		12/30/92
Trichloromonofluoromethane	ug/L	12	ND		12/30/9[illegible]
1,2,3-Trichloropropane	ug/L	12	ND		12/30/9[illegible]
DCE (Surrogate Recovery)	%		110		12/30/92
TOL (Surrogate Recovery)	%		106		12/30/9[illegible]
BFB (Surrogate Recovery)	%		112		12/30/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 7

January 15, 1993
PACE Project Number: 121224504

Client Reference: Cranston Site

PACE Sample Number:			97 0111565		
Date Collected:			12/22/92		
Date Received:			12/24/92		
Client Sample ID:			INF		
Parameter	Units	MDL	PT8	METHOD	DATE ANALYZED
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	ND	SW846 6010	01/07/93
Antimony	mg/L	0.01	ND	SW846 7041	01/12/93
Arsenic	mg/L	0.01	0.02	SW846 7060	01/11/93
Barium	mg/L	0.2	ND	SW846 6010	01/07/93
Beryllium	mg/L	0.005	ND	SW846 6010	01/07/93
Cadmium	mg/L	0.005	ND	SW846 6010	01/07/93
Calcium	mg/L	5	24	SW846 6010	01/07/93
Chromium	mg/L	0.01	ND	SW846 6010	01/07/93
Cobalt	mg/L	0.05	ND	SW846 6010	01/07/93
Copper	mg/L	0.02	ND	SW846 6010	01/07/93
Iron	mg/L	0.1	14	SW846 6010	01/07/93
Lead	mg/L	0.003	ND	SW846 7421	01/11/93
Magnesium	mg/L	5	ND	SW846 6010	01/07/93
Manganese	mg/L	0.01	0.86	SW846 6010	01/07/93
Mercury	mg/L	0.0002	ND	SW846 7470	01/07/93
Nickel	mg/L	0.04	ND	SW846 6010	01/07/93
Potassium	mg/L	5	ND	SW846 6010	01/07/93
Selenium	mg/L	0.005	ND	SW846 7740	01/12/93
Silver	mg/L	0.01	ND	SW846 6010	01/07/93
Sodium	mg/L	5	36	SW846 6010	01/07/93
Thallium	mg/L	0.01	ND	SW846 7841	01/10/93
Tin	mg/L	1	ND	SW846 6010	01/05/93
Vanadium	mg/L	0.05	ND	SW846 6010	01/07/93
Zinc	mg/L	0.02	ND	SW846 6010	01/07/93
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acetone	ug/L	25	ND		12/30/92
Benzene	ug/L	12	ND		12/30/92
Bromodichloromethane	ug/L	12	ND		12/30/92
Bromoform	ug/L	12	ND		12/30/92
Bromomethane	ug/L	25	ND		12/30/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 8

January 15, 1993
PACE Project Number: 12122450[illegible]

Client Reference: Cranston Site

PACE Sample Number:			97 0111565		
Date Collected:			12/22/92		
Date Received:			12/24/92		
Client Sample ID:			INF		
Parameter	Units	MDL	PT8	METHOD	DATE ANALYZE[illegible]
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
2-Butanone (MEK)	ug/L	25	ND		12/30/92
Carbon disulfide	ug/L	12	ND		12/30/92
Carbon tetrachloride	ug/L	12	ND		12/30/92
Chlorobenzene	ug/L	12	200		12/30/92
Chloroethane	ug/L	25	ND		12/30/92
Chloroform	ug/L	12	85		12/30/92
Chloromethane	ug/L	25	ND		12/30/92
Dibromochloromethane	ug/L	12	ND		12/30/92
1,1-Dichloroethane	ug/L	12	ND		12/30/92
1,2-Dichloroethane	ug/L	12	ND		12/30/92
1,1-Dichloroethylene	ug/L	12	ND		12/30/92
1,2-Dichloroethylene (Total)	ug/L	12	85		12/30/92
1,2-Dichloropropane	ug/L	12	ND		12/30/92
cis-1,3-Dichloropropylene	ug/L	12	ND		12/30/92
Trans-1,3-dichloropropylene	ug/L	12	ND		12/30/92
Ethylbenzene	ug/L	12	ND		12/30/92
2-Hexanone	ug/L	25	ND		12/30/92
4-Methyl-2-pentanone (MIBK)	ug/L	25	ND		12/30/92
Methylene chloride	ug/L	12	ND		12/30/92
Styrene	ug/L	12	ND		12/30/92
1,1,2,2-Tetrachloroethane	ug/L	12	ND		12/30/92
Tetrachloroethylene	ug/L	12	ND		12/30/92
Toluene	ug/L	12	350		12/30/92
1,1,1-Trichloroethane	ug/L	12	ND		12/30/92
1,1,2-Trichloroethane	ug/L	12	ND		12/30/92
Trichloroethylene	ug/L	12	ND		12/30/92
Vinyl acetate	ug/L	25	ND		12/30/92
Vinyl chloride	ug/L	25	ND		12/30/92
Xylenes (Total)	ug/L	12	140		12/30/92
Acetonitrile	ug/L	120	ND		12/30/92
Acrolein	ug/L	120	ND		12/30/92

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 9

January 15, 1993
PACE Project Number: 121224504

Client Reference: Cranston Site

PACE Sample Number:			97 0111565		
Date Collected:			12/22/92		
Date Received:			12/24/92		
Client Sample ID:			INF		
Parameter	Units	MDL	PT8	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acrylonitrile	ug/L	120	ND		12/30/92
Allyl chloride	ug/L	12	ND		12/30/92
2-Chloroethylvinylether	ug/L	12	ND		12/30/92
Chloroprene	ug/L	12	ND		12/30/92
1,2-Dibromoethane	ug/L	12	ND		12/30/92
Dibromomethane	ug/L	12	ND		12/30/92
trans-1,4-Dichloro-2-butene	ug/L	12	ND		12/30/92
Dichlorodifluoromethane	ug/L	12	ND		12/30/92
1,4-Dioxane	ug/L	1200	ND		12/30/92
Iodomethane	ug/L	12	ND		12/30/92
Isobutanol	ug/L	1200	ND		12/30/92
Methacrylonitrile	ug/L	25	ND		12/30/92
Methyl Methacrylate	ug/L	25	ND		12/30/92
Propionitrile	ug/L	120	ND		12/30/92
1,1,1,2-Tetrachloroethane	ug/L	12	ND		12/30/92
Trichloromonofluoromethane	ug/L	12	ND		12/30/92
1,2,3-Trichloropropane	ug/L	12	ND		12/30/92
DCE (Surrogate Recovery)	%		111		12/30/92
TOL (Surrogate Recovery)	%		110		12/30/92
BFB (Surrogate Recovery)	%		113		12/30/92

These data have been reviewed and are approved for release.

Frank J. Resnick

Frank Resnick
Project Manager

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REPORT OF LABORATORY ANALYSIS

Ciba-Geigy Corporation
P.O. Box 18300
Greensboro, NC 27419-8800

January 15, 1993
PACE Project Number: 121230
WPPLAB3296

Attn: Ms. Diana Baldi

Client Reference: Cranston Site

PACE Sample Number:			97 0112138		
Date Collected:			12/29/92		
Date Received:			12/30/92		
			RC-1		
Parameter	Units	MDL	PT9	METHOD	DATE ANALYZE
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	0.2	SW846 6010	01/06/93
Antimony	mg/L	0.005	ND	SW846 7041	01/13/93
Arsenic	mg/L	0.01	0.01	SW846 7060	01/13/93
Barium	mg/L	0.2	ND	SW846 6010	01/06/93
Beryllium	mg/L	0.005	ND	SW846 6010	01/06/93
Cadmium	mg/L	0.005	ND	SW846 6010	01/06/93
Calcium	mg/L	5	22	SW846 6010	01/06/93
Chromium	mg/L	0.01	ND	SW846 6010	01/06/93
Cobalt	mg/L	0.05	ND	SW846 6010	01/06/93
Copper	mg/L	0.02	ND	SW846 6010	01/06/93
Iron	mg/L	0.1	18	SW846 6010	01/06/93
Lead	mg/L	0.003	ND	SW846 7421	01/13/93
Magnesium	mg/L	5	ND	SW846 6010	01/06/93
Manganese	mg/L	0.01	0.79	SW846 6010	01/06/93
Mercury	mg/L	0.0002	ND	SW846 7470	01/11/93
Nickel	mg/L	0.04	ND	SW846 6010	01/06/93
Potassium	mg/L	5	ND	SW846 6010	01/06/93
Selenium	mg/L	0.005	ND	SW846 7740	01/12/93
Silver	mg/L	0.01	ND	SW846 6010	01/06/93
Sodium	mg/L	5	36	SW846 6010	01/06/93
Thallium	mg/L	0.01	ND	SW846 7841	01/13/93
Tin	mg/L	1	ND	SW846 6010	01/12/93
Vanadium	mg/L	0.05	ND	SW846 6010	01/06/93
Zinc	mg/L	0.02	ND	SW846 6010	01/06/93
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acetone	ug/L	20	ND		01/14/93
Benzene	ug/L	10	ND		01/14/93

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Ms. Diana Baldi
Page 2

January 15, 1993
PACE Project Number: 121230501

Client Reference: Cranston Site

PACE Sample Number:			97 0112138		
Date Collected:			12/29/92		
Date Received:			12/30/92		
Client Sample ID:			RC-1		
Parameter	Units	MDL	PT9	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Bromodichloromethane	ug/L	10	ND		01/14/93
Bromoform	ug/L	10	ND		01/14/93
Bromomethane	ug/L	20	ND		01/14/93
2-Butanone (MEK)	ug/L	20	ND		01/14/93
Carbon disulfide	ug/L	10	ND		01/14/93
Carbon tetrachloride	ug/L	10	ND		01/14/93
Chlorobenzene	ug/L	10	55		01/14/93
Chloroethane	ug/L	20	ND		01/14/93
Chloroform	ug/L	10	ND		01/14/93
Chloromethane	ug/L	20	ND		01/14/93
Dibromochloromethane	ug/L	10	ND		01/14/93
1,1-Dichloroethane	ug/L	10	ND		01/14/93
1,2-Dichloroethane	ug/L	10	ND		01/14/93
1,1-Dichloroethylene	ug/L	10	ND		01/14/93
1,2-Dichloroethylene (Total)	ug/L	10	ND		01/14/93
1,2-Dichloropropane	ug/L	10	ND		01/14/93
cis-1,3-Dichloropropylene	ug/L	10	ND		01/14/93
Trans-1,3-dichloropropylene	ug/L	10	ND		01/14/93
Ethylbenzene	ug/L	10	83		01/14/93
2-Hexanone	ug/L	20	ND		01/14/93
4-Methyl-2-pentanone (MIBK)	ug/L	20	ND		01/14/93
Methylene chloride	ug/L	10	ND		01/14/93
Styrene	ug/L	10	ND		01/14/93
1,1,2,2-Tetrachloroethane	ug/L	10	ND		01/14/93
Tetrachloroethylene	ug/L	10	ND		01/14/93
Toluene	ug/L	10	370		01/14/93
1,1,1-Trichloroethane	ug/L	10	ND		01/14/93
1,1,2-Trichloroethane	ug/L	10	ND		01/14/93
Trichloroethylene	ug/L	10	ND		01/14/93
Vinyl acetate	ug/L	20	ND		01/14/93
Vinyl chloride	ug/L	20	ND		01/14/93

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 3

January 15, 1993
PACE Project Number: 121230501

Client Reference: Cranston Site

PACE Sample Number:			97 0112138		
Date Collected:			12/29/92		
Date Received:			12/30/92		
Client Sample ID:			RC-1		
Parameter	Units	MDL	PT9	METHOD	DATE ANALYZE
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Xylenes (Total)	ug/L	10	130		01/14/93
Acetonitrile	ug/L	100	ND		01/14/93
Acrolein	ug/L	100	ND		01/14/93
Acrylonitrile	ug/L	100	ND		01/14/93
Allyl chloride	ug/L	10	ND		01/14/93
2-Chloroethylvinylether	ug/L	10	ND		01/14/93
Chloroprene	ug/L	10	ND		01/14/93
1,2-Dibromoethane	ug/L	10	ND		01/14/93
Dibromomethane	ug/L	10	ND		01/14/93
trans-1,4-Dichloro-2-butene	ug/L	10	ND		01/14/93
Dichlorodifluoromethane	ug/L	10	ND		01/14/93
1,4-Dioxane	ug/L	1000	ND		01/14/93
Iodomethane	ug/L	10	ND		01/14/93
Isobutanol	ug/L	1000	ND		01/14/93
Methacrylonitrile	ug/L	20	ND		01/14/93
Methyl Methacrylate	ug/L	20	ND		01/14/93
Propionitrile	ug/L	100	ND		01/14/93
1,1,1,2-Tetrachloroethane	ug/L	10	ND		01/14/93
Trichloromonofluoromethane	ug/L	10	ND		01/14/93
1,2,3-Trichloropropane	ug/L	10	ND		01/14/93
DCE (Surrogate Recovery)	%		95		01/14/93
TOL (Surrogate Recovery)	%		90		01/14/93
BFB (Surrogate Recovery)	%		88		01/14/93

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 4

January 15, 1993
PACE Project Number: 121230501

Client Reference: Cranston Site

PACE Sample Number:			97 0112146		
Date Collected:			12/29/92		
Date Received:			12/30/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT9	METHOD	DATE ANALYZED
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	ND	SW846 6010	01/06/93
Antimony	mg/L	0.005	ND	SW846 7041	01/13/93
Arsenic	mg/L	0.01	0.02	SW846 7060	01/13/93
Barium	mg/L	0.2	ND	SW846 6010	01/06/93
Beryllium	mg/L	0.005	ND	SW846 6010	01/06/93
Cadmium	mg/L	0.005	ND	SW846 6010	01/06/93
Calcium	mg/L	5	24	SW846 6010	01/06/93
Chromium	mg/L	0.01	ND	SW846 6010	01/06/93
Cobalt	mg/L	0.05	ND	SW846 6010	01/06/93
Copper	mg/L	0.02	ND	SW846 6010	01/06/93
Iron	mg/L	0.1	10	SW846 6010	01/06/93
Lead	mg/L	0.003	ND	SW846 7421	01/13/93
Magnesium	mg/L	5	6.3	SW846 6010	01/06/93
Manganese	mg/L	0.01	1.4	SW846 6010	01/06/93
Mercury	mg/L	0.0002	ND	SW846 7470	01/11/93
Nickel	mg/L	0.04	ND	SW846 6010	01/06/93
Potassium	mg/L	5	ND	SW846 6010	01/06/93
Selenium	mg/L	0.005	ND	SW846 7740	01/13/93
Silver	mg/L	0.01	ND	SW846 6010	01/06/93
Sodium	mg/L	5	41	SW846 6010	01/06/93
Thallium	mg/L	0.01	ND	SW846 7841	01/13/93
Tin	mg/L	1	ND	SW846 6010	01/12/93
Vanadium	mg/L	0.05	ND	SW846 6010	01/06/93
Zinc	mg/L	0.02	ND	SW846 6010	01/06/93
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acetone	ug/L	10	ND		01/07/93
Benzene	ug/L	5.0	5.4		01/07/93
Bromodichloromethane	ug/L	5.0	ND		01/07/93
Bromoform	ug/L	5.0	ND		01/07/93
Bromomethane	ug/L	10	ND		01/07/93

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 5

January 15, 1993
PACE Project Number: 12123050

Client Reference: Cranston Site

PACE Sample Number:			97 0112146		
Date Collected:			12/29/92		
Date Received:			12/30/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT9	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
2-Butanone (MEK)	ug/L	10	ND		01/07/93
Carbon disulfide	ug/L	5.0	ND		01/07/93
Carbon tetrachloride	ug/L	5.0	ND		01/07/93
Chlorobenzene	ug/L	5.0	180		01/07/93
Chloroethane	ug/L	10	ND		01/07/93
Chloroform	ug/L	5.0	ND		01/07/93
Chloromethane	ug/L	10	ND		01/07/93
Dibromochloromethane	ug/L	5.0	ND		01/07/93
1,1-Dichloroethane	ug/L	5.0	ND		01/07/93
1,2-Dichloroethane	ug/L	5.0	ND		01/07/93
1,1-Dichloroethylene	ug/L	5.0	ND		01/07/93
1,2-Dichloroethylene (Total)	ug/L	5.0	ND		01/07/93
1,2-Dichloropropane	ug/L	5.0	ND		01/07/93
cis-1,3-Dichloropropylene	ug/L	5.0	ND		01/07/93
Trans-1,3-dichloropropylene	ug/L	5.0	ND		01/07/93
Ethylbenzene	ug/L	5.0	ND		01/07/93
2-Hexanone	ug/L	10	ND		01/07/93
4-Methyl-2-pentanone (MIBK)	ug/L	10	ND		01/07/93
Methylene chloride	ug/L	5.0	ND		01/07/93
Styrene	ug/L	5.0	ND		01/07/93
1,1,2,2-Tetrachloroethane	ug/L	5.0	ND		01/07/93
Tetrachloroethylene	ug/L	5.0	ND		01/07/93
Toluene	ug/L	5.0	ND		01/07/93
1,1,1-Trichloroethane	ug/L	5.0	ND		01/07/93
1,1,2-Trichloroethane	ug/L	5.0	ND		01/07/93
Trichloroethylene	ug/L	5.0	ND		01/07/93
Vinyl acetate	ug/L	10	ND		01/07/93
Vinyl chloride	ug/L	10	ND		01/07/93
Xylenes (Total)	ug/L	5.0	13		01/07/93
Acetonitrile	ug/L	50	ND		01/07/93
Acrolein	ug/L	50	ND		01/07/93

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THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 6

January 15, 1993
PACE Project Number: 121230501

Client Reference: Cranston Site

PACE Sample Number:			97 0112146		
Date Collected:			12/29/92		
Date Received:			12/30/92		
Client Sample ID:			RC-2		
Parameter	Units	MDL	PT9	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acrylonitrile	ug/L	50	ND		01/07/93
Allyl chloride	ug/L	5.0	ND		01/07/93
2-Chloroethylvinylether	ug/L	5.0	ND		01/07/93
Chloroprene	ug/L	5.0	ND		01/07/93
1,2-Dibromoethane	ug/L	5.0	ND		01/07/93
Dibromomethane	ug/L	5.0	ND		01/07/93
trans-1,4-Dichloro-2-butene	ug/L	5.0	ND		01/07/93
Dichlorodifluoromethane	ug/L	5.0	ND		01/07/93
1,4-Dioxane	ug/L	500	ND		01/07/93
Iodomethane	ug/L	5.0	ND		01/07/93
Isobutanol	ug/L	500	ND		01/07/93
Methacrylonitrile	ug/L	10	ND		01/07/93
Methyl Methacrylate	ug/L	10	ND		01/07/93
Propionitrile	ug/L	50	ND		01/07/93
1,1,1,2-Tetrachloroethane	ug/L	5.0	ND		01/07/93
Trichloromonofluoromethane	ug/L	5.0	ND		01/07/93
1,2,3-Trichloropropane	ug/L	5.0	ND		01/07/93
DCE (Surrogate Recovery)	%		81		01/07/93
TOL (Surrogate Recovery)	%		103		01/07/93
BFB (Surrogate Recovery)	%		87		01/07/93

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 7

January 15, 1993
PACE Project Number: 12123[illegible]

Client Reference: Cranston Site

PACE Sample Number:			97 0112154		
Date Collected:			12/29/92		
Date Received:			12/30/92		
Client Sample ID:			MW-2S		
Parameter	Units	MDL	PT9	METHOD	DATE ANALYZED
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Aluminum	mg/L	0.2	0.2	SW846 6010	01/06/93
Antimony	mg/L	0.005	ND	SW846 7041	01/13/93
Arsenic	mg/L	0.01	ND	SW846 7060	01/13/93
Barium	mg/L	0.2	0.3	SW846 6010	01/06/93
Beryllium	mg/L	0.005	ND	SW846 6010	01/06/93
Cadmium	mg/L	0.005	ND	SW846 6010	01/06/93
Calcium	mg/L	5	90	SW846 6010	01/06/93
Chromium	mg/L	0.01	ND	SW846 6010	01/06/93
Cobalt	mg/L	0.05	ND	SW846 6010	01/06/93
Copper	mg/L	0.02	ND	SW846 6010	01/06/93
Iron	mg/L	0.1	1.1	SW846 6010	01/06/93
Lead	mg/L	0.003	ND	SW846 7421	01/13/93
Magnesium	mg/L	5	ND	SW846 6010	01/06/93
Manganese	mg/L	0.01	0.39	SW846 6010	01/06/93
Mercury	mg/L	0.0002	ND	SW846 7470	01/11/93
Nickel	mg/L	0.04	ND	SW846 6010	01/06/93
Potassium	mg/L	5	11	SW846 6010	01/06/93
Selenium	mg/L	0.005	ND	SW846 7740	01/13/93
Silver	mg/L	0.01	ND	SW846 6010	01/06/93
Sodium	mg/L	5	68	SW846 6010	01/06/93
Thallium	mg/L	0.01	ND	SW846 7841	01/13/93
Tin	mg/L	1	ND	SW846 6010	01/12/93
Vanadium	mg/L	0.05	ND	SW846 6010	01/06/93
Zinc	mg/L	0.02	ND	SW846 6010	01/06/93
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
Acetone	ug/L	1000	ND		01/14/93
Benzene	ug/L	500	ND		01/14/93
Bromodichloromethane	ug/L	500	ND		01/14/93
Bromoform	ug/L	500	ND		01/14/93
Bromomethane	ug/L	1000	ND		01/14/93

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 8

January 15, 1993
PACE Project Number: 121230501

Client Reference: Cranston Site

PACE Sample Number:			97 0112154		
Date Collected:			12/29/92		
Date Received:			12/30/92		
Client Sample ID:			MW-2S		
Parameter	Units	MDL	PT9	METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
VOLATILES, APPENDIX IX LIST				SW846-8240	
2-Butanone (MEK)	ug/L	1000	ND		01/14/93
Carbon disulfide	ug/L	500	ND		01/14/93
Carbon tetrachloride	ug/L	500	ND		01/14/93
Chlorobenzene	ug/L	500	22000		01/14/93
Chloroethane	ug/L	1000	ND		01/14/93
Chloroform	ug/L	500	ND		01/14/93
Chloromethane	ug/L	1000	ND		01/14/93
Dibromochloromethane	ug/L	500	ND		01/14/93
1,1-Dichloroethane	ug/L	500	ND		01/14/93
1,2-Dichloroethane	ug/L	500	ND		01/14/93
1,1-Dichloroethylene	ug/L	500	ND		01/14/93
1,2-Dichloroethylene (Total)	ug/L	500	16000		01/14/93
1,2-Dichloropropane	ug/L	500	ND		01/14/93
cis-1,3-Dichloropropylene	ug/L	500	ND		01/14/93
Trans-1,3-dichloropropylene	ug/L	500	ND		01/14/93
Ethylbenzene	ug/L	500	ND		01/14/93
2-Hexanone	ug/L	1000	ND		01/14/93
4-Methyl-2-pentanone (MIBK)	ug/L	1000	ND		01/14/93
Methylene chloride	ug/L	500	ND		01/14/93
Styrene	ug/L	500	ND		01/14/93
1,1,2,2-Tetrachloroethane	ug/L	500	ND		01/14/93
Tetrachloroethylene	ug/L	500	ND		01/14/93
Toluene	ug/L	500	2000		01/14/93
1,1,1-Trichloroethane	ug/L	500	ND		01/14/93
1,1,2-Trichloroethane	ug/L	500	ND		01/14/93
Trichloroethylene	ug/L	500	ND		01/14/93
Vinyl acetate	ug/L	1000	ND		01/14/93
Vinyl chloride	ug/L	1000	ND		01/14/93
Xylenes (Total)	ug/L	500	ND		01/14/93
Acetonitrile	ug/L	5000	ND		01/14/93
Acrolein	ug/L	5000	ND		01/14/93

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REPORT OF LABORATORY ANALYSIS

Ms. Diana Baldi
Page 9

January 15, 1993
PACE Project Number: 12123[illegible]5

Client Reference: Cranston Site

Parameter	Units	MDL		METHOD	DATE ANALYZED
PACE Sample Number:			97 0112154		
Date Collected:			12/29/92		
Date Received:			12/30/92		
Client Sample ID:			MW-2S		
ORGANIC ANALYSIS			PT9		
VOLATILES, APPENDIX IX LIST					
Acrylonitrile	ug/L	5000	ND	SW846-8240	01/14/9[illegible]
Allyl chloride	ug/L	500	ND		01/14/9[illegible]
2-Chloroethylvinylether	ug/L	500	ND		01/14/9[illegible]
Chloroprene	ug/L	500	ND		01/14/93
1,2-Dibromoethane	ug/L	500	ND		01/14/9[illegible]
Dibromomethane	ug/L	500	ND		01/14/9[illegible]
trans-1,4-Dichloro-2-butene	ug/L	500	ND		01/14/93
Dichlorodifluoromethane	ug/L	500	ND		01/14/93
1,4-Dioxane	ug/L	50000	ND		01/14/93
Iodomethane	ug/L	500	ND		01/14/93
Isobutanol	ug/L	50000	ND		01/14/93
Methacrylonitrile	ug/L	1000	ND		01/14/93
Methyl Methacrylate	ug/L	1000	ND		01/14/93
Propionitrile	ug/L	5000	ND		01/14/93
1,1,1,2-Tetrachloroethane	ug/L	500	ND		01/14/93
Trichloromonofluoromethane	ug/L	500	ND		01/14/93
1,2,3-Trichloropropane	ug/L	500	ND		01/14/93
DCE (Surrogate Recovery)	%		94		01/14/93
TOL (Surrogate Recovery)	%		97		01/14/93
BFB (Surrogate Recovery)	%		93		01/14/93

These data have been reviewed and are approved for release.

Frank J. Resnick

Frank J. Resnick
Project Manager

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REPORT NUMBER: 93E-0013

27-Jan-93

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Date Sampled	Date Received
93010130	TRIP BLANK	1/05/1993	1/07/1993
93010131	P-35S PT-1	1/05/1993	1/07/1993
93010132	P-35S PT-2	1/05/1993	1/07/1993
93010133	P-35S PT-3	1/05/1993	1/07/1993
93010134	P-35S PT-4	1/05/1993	1/07/1993
93010135	P-35S PT-5	1/06/1993	1/07/1993

Sample #	Sample Description	Parameter	Date Analyzed
93010130	TRIP BLANK	Volatiles	1/07/1993
93010131	P-35S PT-1	Volatiles	1/07/1993
		Total Iron	1/19/1993
		Total Manganese	1/19/1993
93010132	P-35S PT-2	Volatiles	1/07/1993
		Total Iron	1/19/1993
		Total Manganese	1/19/1993
93010133	P-35S PT-3	Volatiles	1/07/1993
		Total Iron	1/19/1993
		Total Manganese	1/19/1993
93010134	P-35S PT-4	Volatiles	1/07/1993
		Total Iron	1/19/1993
		Total Manganese	1/19/1993
93010135	P-35S PT-5	Volatiles	1/07/1993
		Total Iron	1/19/1993
		Total Manganese	1/19/1993

Definitions

N/A	Not applicable
ND	Not detected at or above method detection limit.
J	Detected but below method detection limit.
B	Analyte detected in blank but not corrected for amount in blank.
Method Detection Limit	Lowest concentration (amount) that must be present before a reliable and recognizable response is observed for that method of analysis. When a sample has been diluted, the Method Detection Limit has been multiplied by the dilution factor.

Methodology

Volatile organic analyses were performed in accordance with Method 8240, SW-846, EPA Test Methods for Evaluating Solid Waste, 3rd edition.

ICP metals analyses were performed in accordance with Method 200.7, 40 CFR 136.

REPORT NUMBER: 93E-0013
27-Jan-93

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Volatiles

TRIP BLANK Parameter	93010130	Method Detection Limit	Units
Chloromethane	ND	10	ug/L
Bromomethane	ND	10	ug/L
Vinyl chloride	ND	10	ug/L
Chloroethane	ND	10	ug/L
Methylene chloride	ND	5.0	ug/L
Acetone	ND	100	ug/L
Carbon disulfide	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
2-Butanone	ND	100	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
Carbon tetrachloride	ND	5.0	ug/L
Vinyl acetate	ND	50	ug/L
Bromodichloromethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
Trichloroethene	ND	5.0	ug/L
Benzene	ND	5.0	ug/L
Chlorodibromomethane	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
2-Chloroethylvinyl ether	ND	10	ug/L
Bromoform	ND	5.0	ug/L
4-Methyl-2-pentanone	ND	50	ug/L
2-Hexanone	ND	50	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
Tetrachloroethene	ND	5.0	ug/L
Toluene	ND	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
Styrene	ND	5.0	ug/L
Total Xylene	ND	5.0	ug/L

REPORT NUMBER: 93E-0013

27-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Volatiles

P-35S PT-1 Parameter	93010131	Method Detection Limit	Units
Chloromethane	ND	100	ug/L
Bromomethane	ND	100	ug/L
Vinyl chloride	ND	100	ug/L
Chloroethane	ND	100	ug/L
Methylene chloride	ND	50	ug/L
Acetone	ND	1000	ug/L
Carbon disulfide	ND	50	ug/L
Trichlorofluoromethane	ND	50	ug/L
1,1-Dichloroethene	ND	50	ug/L
1,1-Dichloroethane	ND	50	ug/L
trans-1,2-Dichloroethene	47 J	50	ug/L
Chloroform	ND	50	ug/L
1,2-Dichloroethane	ND	50	ug/L
2-Butanone	ND	1000	ug/L
1,1,1-Trichloroethane	ND	50	ug/L
Carbon tetrachloride	ND	50	ug/L
Vinyl acetate	ND	500	ug/L
Bromodichloromethane	ND	50	ug/L
1,2-Dichloropropane	ND	50	ug/L
trans-1,3-Dichloropropene	ND	50	ug/L
Trichloroethene	ND	50	ug/L
Benzene	28 J	50	ug/L
Chlorodibromomethane	ND	50	ug/L
cis-1,3-Dichloropropene	ND	50	ug/L
1,1,2-Trichloroethane	ND	50	ug/L
2-Chloroethylvinyl ether	ND	100	ug/L
Bromoform	ND	50	ug/L
4-Methyl-2-pentanone	ND	500	ug/L
2-Hexanone	ND	500	ug/L
1,1,2,2-Tetrachloroethane	ND	50	ug/L
Tetrachloroethene	ND	50	ug/L
Toluene	19 J	50	ug/L
Chlorobenzene	4300	250	ug/L
Ethylbenzene	ND	50	ug/L
Styrene	ND	50	ug/L
Total Xylene	21 J	50	ug/L

REPORT NUMBER: 93E-0013

27-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

P-35S PT-1 Parameter	93010131	Method Detection Limit	Units
Total Iron	9400	7.2	ug/L
Total Manganese	550	0.60	ug/L

REPORT NUMBER: 93E-0013

27-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Volatiles

P-35S PT-2 Parameter	93010132	Method Detection Limit	Units
Chloromethane	ND	200	ug/L
Bromomethane	ND	200	ug/L
Vinyl chloride	ND	200	ug/L
Chloroethane	ND	200	ug/L
Methylene chloride	ND	100	ug/L
Acetone	ND	2000	ug/L
Carbon disulfide	ND	100	ug/L
Trichlorofluoromethane	ND	100	ug/L
1,1-Dichloroethene	ND	100	ug/L
1,1-Dichloroethane	ND	100	ug/L
trans-1,2-Dichloroethene	44 J	100	ug/L
Chloroform	ND	100	ug/L
1,2-Dichloroethane	ND	100	ug/L
2-Butanone	ND	2000	ug/L
1,1,1-Trichloroethane	ND	100	ug/L
Carbon tetrachloride	ND	100	ug/L
Vinyl acetate	ND	1000	ug/L
Bromodichloromethane	ND	100	ug/L
1,2-Dichloropropane	ND	100	ug/L
trans-1,3-Dichloropropene	ND	100	ug/L
Trichloroethene	ND	100	ug/L
Benzene	ND	100	ug/L
Chlorodibromomethane	ND	100	ug/L
cis-1,3-Dichloropropene	ND	100	ug/L
1,1,2-Trichloroethane	ND	100	ug/L
2-Chloroethylvinyl ether	ND	200	ug/L
Bromoform	ND	100	ug/L
4-Methyl-2-pentanone	ND	1000	ug/L
2-Hexanone	ND	1000	ug/L
1,1,2,2-Tetrachloroethane	ND	100	ug/L
Tetrachloroethene	ND	100	ug/L
Toluene	ND	100	ug/L
Chlorobenzene	4600	250	ug/L
Ethylbenzene	ND	100	ug/L
Styrene	ND	100	ug/L
Total Xylene	ND	100	ug/L

REPORT NUMBER: 93E-0013

27-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

P-35S PT-2 Parameter	93010132	Method Detection Limit	Units
Total Iron	9000	7.2	ug/L
Total Manganese	650	0.60	ug/L

REPORT NUMBER: 93E-0013
27-Jan-93

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Volatiles

P-35S PT-3 Parameter	93010133	Method Detection Limit	Units
Chloromethane	ND	200	ug/L
Bromomethane	ND	200	ug/L
Vinyl chloride	ND	200	ug/L
Chloroethane	ND	200	ug/L
Methylene chloride	ND	100	ug/L
Acetone	ND	2000	ug/L
Carbon disulfide	ND	100	ug/L
Trichlorofluoromethane	ND	100	ug/L
1,1-Dichloroethene	ND	100	ug/L
1,1-Dichloroethane	ND	100	ug/L
trans-1,2-Dichloroethene	92	100	ug/L
Chloroform	ND	100	ug/L
1,2-Dichloroethane	ND	100	ug/L
2-Butanone	ND	2000	ug/L
1,1,1-Trichloroethane	ND	100	ug/L
Carbon tetrachloride	ND	100	ug/L
Vinyl acetate	ND	1000	ug/L
Bromodichloromethane	ND	100	ug/L
1,2-Dichloropropane	ND	100	ug/L
trans-1,3-Dichloropropene	ND	100	ug/L
Trichloroethene	ND	100	ug/L
Benzene	ND	100	ug/L
Chlorodibromomethane	ND	100	ug/L
cis-1,3-Dichloropropene	ND	100	ug/L
1,1,2-Trichloroethane	ND	100	ug/L
2-Chloroethylvinyl ether	ND	200	ug/L
Bromoform	ND	100	ug/L
4-Methyl-2-pentanone	ND	1000	ug/L
2-Hexanone	ND	1000	ug/L
1,1,2,2-Tetrachloroethane	ND	100	ug/L
Tetrachloroethene	ND	100	ug/L
Toluene	21 J	100	ug/L
Chlorobenzene	5100	250	ug/L
Ethylbenzene	ND	100	ug/L
Styrene	ND	100	ug/L
Total Xylene	ND	100	ug/L

REPORT NUMBER: 93E-0013
27-Jan-93

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Metals

P-35S PT-3 Parameter	93010133	Method Detection Limit	Units
Total Iron	8800	7.2	ug/L
Total Manganese	720	0.60	ug/L

REPORT NUMBER: 93E-0013

27-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Volatiles

P-35S PT-4 Parameter	93010134	Method Detection Limit	Units
Chloromethane	ND	200	ug/L
Bromomethane	ND	200	ug/L
Vinyl chloride	ND	200	ug/L
Chloroethane	ND	200	ug/L
Methylene chloride	ND	100	ug/L
Acetone	ND	2000	ug/L
Carbon disulfide	ND	100	ug/L
Trichlorofluoromethane	ND	100	ug/L
1,1-Dichloroethene	ND	100	ug/L
1,1-Dichloroethane	ND	100	ug/L
trans-1,2-Dichloroethene	65 J	100	ug/L
Chloroform	ND	100	ug/L
1,2-Dichloroethane	ND	100	ug/L
2-Butanone	ND	2000	ug/L
1,1,1-Trichloroethane	ND	100	ug/L
Carbon tetrachloride	ND	100	ug/L
Vinyl acetate	ND	1000	ug/L
Bromodichloromethane	ND	100	ug/L
1,2-Dichloropropane	ND	100	ug/L
trans-1,3-Dichloropropene	ND	100	ug/L
Trichloroethene	ND	100	ug/L
Benzene	ND	100	ug/L
Chlorodibromomethane	ND	100	ug/L
cis-1,3-Dichloropropene	ND	100	ug/L
1,1,2-Trichloroethane	ND	100	ug/L
2-Chloroethylvinyl ether	ND	200	ug/L
Bromoform	ND	100	ug/L
4-Methyl-2-pentanone	ND	1000	ug/L
2-Hexanone	ND	1000	ug/L
1,1,2,2-Tetrachloroethane	ND	100	ug/L
Tetrachloroethene	ND	100	ug/L
Toluene	ND	100	ug/L
Chlorobenzene	5300	250	ug/L
Ethylbenzene	ND	100	ug/L
Styrene	ND	100	ug/L
Total Xylene	ND	100	ug/L

REPORT NUMBER: 93E-0013

27-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

P-35S PT-4 Parameter	93010134	Method Detection Limit	Units
Total Iron	7900	7.2	ug/L
Total Manganese	650	0.60	ug/L

REPORT NUMBER: 93E-0013
27-Jan-93

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Volatiles

P-35S PT-5 Parameter	93010135	Method Detection Limit	Units
Chloromethane	ND	200	ug/L
Bromomethane	ND	200	ug/L
Vinyl chloride	ND	200	ug/L
Chloroethane	ND	200	ug/L
Methylene chloride	ND	100	ug/L
Acetone	ND	2000	ug/L
Carbon disulfide	ND	100	ug/L
Trichlorofluoromethane	ND	100	ug/L
1,1-Dichloroethene	ND	100	ug/L
1,1-Dichloroethane	ND	100	ug/L
trans-1,2-Dichloroethene	91 J	100	ug/L
Chloroform	ND	100	ug/L
1,2-Dichloroethane	ND	100	ug/L
2-Butanone	ND	2000	ug/L
1,1,1-Trichloroethane	ND	100	ug/L
Carbon tetrachloride	ND	100	ug/L
Vinyl acetate	ND	1000	ug/L
Bromodichloromethane	ND	100	ug/L
1,2-Dichloropropane	ND	100	ug/L
trans-1,3-Dichloropropene	ND	100	ug/L
Trichloroethene	ND	100	ug/L
Benzene	ND	100	ug/L
Chlorodibromomethane	ND	100	ug/L
cis-1,3-Dichloropropene	ND	100	ug/L
1,1,2-Trichloroethane	ND	100	ug/L
2-Chloroethylvinyl ether	ND	200	ug/L
Bromoform	ND	100	ug/L
4-Methyl-2-pentanone	ND	1000	ug/L
2-Hexanone	ND	1000	ug/L
1,1,2,2-Tetrachloroethane	ND	100	ug/L
Tetrachloroethene	ND	100	ug/L
Toluene	21 J	100	ug/L
Chlorobenzene	5500	250	ug/L
Ethylbenzene	ND	100	ug/L
Styrene	ND	100	ug/L
Total Xylene	ND	100	ug/L

REPORT NUMBER: 93E-0013

27-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

P-35S PT-5 Parameter	93010135	Method Detection Limit	Units
Total Iron	6700	7.2	ug/L
Total Manganese	640	0.60	ug/L

REPORT NUMBER: 93E-0034

27-Jan-93

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Date Sampled	Date Received
93010374	TRIP BLANK	1/11/1993	1/14/1993
93010375	MW-13S PT-1	1/11/1993	1/14/1993
93010376	MW-13S PT-2	1/11/1993	1/14/1993
93010377	MW-13S PT-3	1/11/1993	1/14/1993
93010378	MW-13S PT-4	1/12/1993	1/14/1993
93010379	MW-13S PT-5	1/12/1993	1/14/1993

Sample #	Sample Description	Parameter	Date Analyzed
93010374	TRIP BLANK	Volatiles	1/18/1993
93010375	MW-13S PT-1	Volatiles	1/19/1993
		Total Iron	1/19/1993
		Total Manganese	1/19/1993
93010376	MW-13S PT-2	Volatiles	1/18/1993
		Total Iron	1/19/1993
		Total Manganese	1/19/1993
93010377	MW-13S PT-3	Volatiles	1/18/1993
		Total Iron	1/19/1993
		Total Manganese	1/19/1993
93010378	MW-13S PT-4	Volatiles	1/18/1993
		Total Iron	1/19/1993
		Total Manganese	1/19/1993
93010379	MW-13S PT-5	Volatiles	1/18/1993
		Total Iron	1/19/1993
		Total Manganese	1/19/1993

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Definitions

N/A	Not applicable
ND	Not detected at or above method detection limit.
J	Detected but below method detection limit.
B	Analyte detected in blank but not corrected for amount in blank.
Method Detection Limit	Lowest concentration (amount) that must be present before a reliable and recognizable response is observed for that method of analysis.
	When a sample has been diluted, the Method Detection Limit has been multiplied by the dilution factor.

Methodology

Volatile organic analyses were performed in accordance with Method 8240, SW-846, EPA Test Methods for Evaluating Solid Waste, 3rd edition.

ICP metals analyses were performed in accordance with Method 200.7, 40 CFR 136.

REPORT NUMBER: 93E-0034

27-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Volatiles

TRIP BLANK Parameter	93010374	Method Detection Limit	Units
Chloromethane	ND	10	ug/L
Bromomethane	ND	10	ug/L
Vinyl chloride	ND	10	ug/L
Chloroethane	ND	10	ug/L
Methylene chloride	ND	5.0	ug/L
Acetone	ND	100	ug/L
Carbon disulfide	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
2-Butanone	ND	100	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
Carbon tetrachloride	ND	5.0	ug/L
Vinyl acetate	ND	50	ug/L
Bromodichloromethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
Trichloroethene	ND	5.0	ug/L
Benzene	ND	5.0	ug/L
Chlorodibromomethane	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
2-Chloroethylvinyl ether	ND	10	ug/L
Bromoform	ND	5.0	ug/L
4-Methyl-2-pentanone	ND	50	ug/L
2-Hexanone	ND	50	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
Tetrachloroethene	ND	5.0	ug/L
Toluene	ND	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
Styrene	ND	5.0	ug/L
Total Xylene	ND	5.0	ug/L

REPORT NUMBER: 93E-0034

27-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Volatiles

MW-13S PT-1 Parameter	93010375	Method Detection Limit	Units
Chloromethane	ND	100	ug/L
Bromomethane	ND	100	ug/L
Vinyl chloride	ND	100	ug/L
Chloroethane	ND	100	ug/L
Methylene chloride	ND	50	ug/L
Acetone	ND	1000	ug/L
Carbon disulfide	ND	50	ug/L
Trichlorofluoromethane	ND	50	ug/L
1,1-Dichloroethene	ND	50	ug/L
1,1-Dichloroethane	ND	50	ug/L
trans-1,2-Dichloroethene	ND	50	ug/L
Chloroform	ND	50	ug/L
1,2-Dichloroethane	ND	50	ug/L
2-Butanone	ND	1000	ug/L
1,1,1-Trichloroethane	ND	50	ug/L
Carbon tetrachloride	ND	50	ug/L
Vinyl acetate	ND	500	ug/L
Bromodichloromethane	ND	50	ug/L
1,2-Dichloropropane	ND	50	ug/L
trans-1,3-Dichloropropene	ND	50	ug/L
Trichloroethene	ND	50	ug/L
Benzene	ND	50	ug/L
Chlorodibromomethane	ND	50	ug/L
cis-1,3-Dichloropropene	ND	50	ug/L
1,1,2-Trichloroethane	ND	50	ug/L
2-Chloroethylvinyl ether	ND	100	ug/L
Bromoform	ND	50	ug/L
4-Methyl-2-pentanone	ND	500	ug/L
2-Hexanone	ND	500	ug/L
1,1,2,2-Tetrachloroethane	ND	50	ug/L
Tetrachloroethene	ND	50	ug/L
Toluene	40 J	50	ug/L
Chlorobenzene	ND	50	ug/L
Ethylbenzene	150	50	ug/L
Styrene	ND	50	ug/L
Total Xylene	1500	50	ug/L

REPORT NUMBER: 93E-0034

27-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

MW-13S PT-1 Parameter	93010375	Method Detection Limit	Units
Total Iron	2500	7.2	ug/L
Total Manganese	2400	0.60	ug/L

REPORT NUMBER: 93E-0034

27-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Volatiles

MW-13S PT-2 Parameter	93010376	Method Detection Limit	Units
Chloromethane	ND	200	ug/L
Bromomethane	ND	200	ug/L
Vinyl chloride	ND	200	ug/L
Chloroethane	ND	200	ug/L
Methylene chloride	ND	100	ug/L
Acetone	ND	2000	ug/L
Carbon disulfide	ND	100	ug/L
Trichlorofluoromethane	ND	100	ug/L
1,1-Dichloroethene	ND	100	ug/L
1,1-Dichloroethane	ND	100	ug/L
trans-1,2-Dichloroethene	ND	100	ug/L
Chloroform	ND	100	ug/L
1,2-Dichloroethane	ND	100	ug/L
2-Butanone	ND	2000	ug/L
1,1,1-Trichloroethane	ND	100	ug/L
Carbon tetrachloride	ND	100	ug/L
Vinyl acetate	ND	1000	ug/L
Bromodichloromethane	ND	100	ug/L
1,2-Dichloropropane	ND	100	ug/L
trans-1,3-Dichloropropene	ND	100	ug/L
Trichloroethene	ND	100	ug/L
Benzene	ND	100	ug/L
Chlorodibromomethane	ND	100	ug/L
cis-1,3-Dichloropropene	ND	100	ug/L
1,1,2-Trichloroethane	ND	100	ug/L
2-Chloroethylvinyl ether	ND	200	ug/L
Bromoform	ND	100	ug/L
4-Methyl-2-pentanone	ND	1000	ug/L
2-Hexanone	ND	1000	ug/L
1,1,2,2-Tetrachloroethane	ND	100	ug/L
Tetrachloroethene	ND	100	ug/L
Toluene	49 J	100	ug/L
Chlorobenzene	35 J	100	ug/L
Ethylbenzene	580	100	ug/L
Styrene	ND	100	ug/L
Total Xylene	2300	100	ug/L

REPORT NUMBER: 93E-0034

27-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

MW-13S PT-2 Parameter	93010376	Method Detection Limit	Units
Total Iron	1800	7.2	ug/L
Total Manganese	1900	0.60	ug/L

REPORT NUMBER: 93E-0034

27-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Volatiles

MW-13S PT-3 Parameter	93010377	Method Detection Limit	Units
Chloromethane	ND	200	ug/L
Bromomethane	ND	200	ug/L
Vinyl chloride	ND	200	ug/L
Chloroethane	ND	200	ug/L
Methylene chloride	ND	100	ug/L
Acetone	ND	2000	ug/L
Carbon disulfide	ND	100	ug/L
Trichlorofluoromethane	ND	100	ug/L
1,1-Dichloroethene	ND	100	ug/L
1,1-Dichloroethane	ND	100	ug/L
trans-1,2-Dichloroethene	ND	100	ug/L
Chloroform	ND	100	ug/L
1,2-Dichloroethane	ND	100	ug/L
2-Butanone	ND	2000	ug/L
1,1,1-Trichloroethane	ND	100	ug/L
Carbon tetrachloride	ND	100	ug/L
Vinyl acetate	ND	1000	ug/L
Bromodichloromethane	ND	100	ug/L
1,2-Dichloropropane	ND	100	ug/L
trans-1,3-Dichloropropene	ND	100	ug/L
Trichloroethene	ND	100	ug/L
Benzene	ND	100	ug/L
Chlorodibromomethane	ND	100	ug/L
cis-1,3-Dichloropropene	ND	100	ug/L
1,1,2-Trichloroethane	ND	100	ug/L
2-Chloroethylvinyl ether	ND	200	ug/L
Bromoform	ND	100	ug/L
4-Methyl-2-pentanone	ND	1000	ug/L
2-Hexanone	ND	1000	ug/L
1,1,2,2-Tetrachloroethane	ND	100	ug/L
Tetrachloroethene	ND	100	ug/L
Toluene	41 J	100	ug/L
Chlorobenzene	39 J	100	ug/L
Ethylbenzene	970	100	ug/L
Styrene	ND	100	ug/L
Total Xylene	2400	100	ug/L

REPORT NUMBER: 93E-0034

27-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

MW-13S PT-3 Parameter	93010377	Method Detection Limit	Units
Total Iron	1500	7.2	ug/L
Total Manganese	2000	0.60	ug/L

REPORT NUMBER: 93E-0034

27-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Volatiles

MW-13S PT-4 Parameter	93010378	Method Detection Limit	Units
Chloromethane	ND	200	ug/L
Bromomethane	ND	200	ug/L
Vinyl chloride	ND	200	ug/L
Chloroethane	ND	200	ug/L
Methylene chloride	ND	100	ug/L
Acetone	ND	2000	ug/L
Carbon disulfide	ND	100	ug/L
Trichlorofluoromethane	ND	100	ug/L
1,1-Dichloroethene	ND	100	ug/L
1,1-Dichloroethane	ND	100	ug/L
trans-1,2-Dichloroethene	ND	100	ug/L
Chloroform	ND	100	ug/L
1,2-Dichloroethane	ND	100	ug/L
2-Butanone	ND	2000	ug/L
1,1,1-Trichloroethane	ND	100	ug/L
Carbon tetrachloride	ND	100	ug/L
Vinyl acetate	ND	1000	ug/L
Bromodichloromethane	ND	100	ug/L
1,2-Dichloropropane	ND	100	ug/L
trans-1,3-Dichloropropene	ND	100	ug/L
Trichloroethene	ND	100	ug/L
Benzene	ND	100	ug/L
Chlorodibromomethane	ND	100	ug/L
cis-1,3-Dichloropropene	ND	100	ug/L
1,1,2-Trichloroethane	ND	100	ug/L
2-Chloroethylvinyl ether	ND	200	ug/L
Bromoform	ND	100	ug/L
4-Methyl-2-pentanone	ND	1000	ug/L
2-Hexanone	ND	1000	ug/L
1,1,2,2-Tetrachloroethane	ND	100	ug/L
Tetrachloroethene	ND	100	ug/L
Toluene	26 J	100	ug/L
Chlorobenzene	26 J	100	ug/L
Ethylbenzene	1100	100	ug/L
Styrene	ND	100	ug/L
Total Xylene	2200	100	ug/L

REPORT NUMBER: 93E-0034

27-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

MW-13S PT-4 Parameter	93010378	Method Detection Limit	Units
Total Iron	1300	7.2	ug/L
Total Manganese	1900	0.60	ug/L

REPORT NUMBER: 93E-0034

27-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Volatiles

MW-13S PT-5 Parameter	93010379	Method Detection Limit	Units
Chloromethane	ND	200	ug/L
Bromomethane	ND	200	ug/L
Vinyl chloride	ND	200	ug/L
Chloroethane	ND	200	ug/L
Methylene chloride	ND	100	ug/L
Acetone	ND	2000	ug/L
Carbon disulfide	ND	100	ug/L
Trichlorofluoromethane	ND	100	ug/L
1,1-Dichloroethene	ND	100	ug/L
1,1-Dichloroethane	ND	100	ug/L
trans-1,2-Dichloroethene	ND	100	ug/L
Chloroform	ND	100	ug/L
1,2-Dichloroethane	ND	100	ug/L
2-Butanone	ND	2000	ug/L
1,1,1-Trichloroethane	ND	100	ug/L
Carbon tetrachloride	ND	100	ug/L
Vinyl acetate	ND	1000	ug/L
Bromodichloromethane	ND	100	ug/L
1,2-Dichloropropane	ND	100	ug/L
trans-1,3-Dichloropropene	ND	100	ug/L
Trichloroethene	ND	100	ug/L
Benzene	ND	100	ug/L
Chlorodibromomethane	ND	100	ug/L
cis-1,3-Dichloropropene	ND	100	ug/L
1,1,2-Trichloroethane	ND	100	ug/L
2-Chloroethylvinyl ether	ND	200	ug/L
Bromoform	ND	100	ug/L
4-Methyl-2-pentanone	ND	1000	ug/L
2-Hexanone	ND	1000	ug/L
1,1,2,2-Tetrachloroethane	ND	100	ug/L
Tetrachloroethene	ND	100	ug/L
Toluene	22 J	100	ug/L
Chlorobenzene	ND	100	ug/L
Ethylbenzene	1000	100	ug/L
Styrene	ND	100	ug/L
Total Xylene	2300	100	ug/L

REPORT NUMBER: 93E-0034

27-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

MW-13S PT-5 Parameter	93010379	Method Detection Limit	Units
Total Iron	1200	7.2	ug/L
Total Manganese	1900	0.60	ug/L

REPORT NUMBER: 93E-0049

11-Feb-93

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Date Sampled	Date Received
93010633	TRIP BLANK	1/18/1993	1/20/1993
93010634	MW-12S-PT 1	1/18/1993	1/20/1993
93010635	MW-12S-PT 2	1/18/1993	1/20/1993
93010636	MW-12S-PT 3	1/18/1993	1/20/1993
93010637	MW-12S-PT 4	1/19/1993	1/20/1993
93010638	MW-12S-PT 5	1/19/1993	1/20/1993
93010742	TRIP BLANK	1/20/1993	1/22/1993
93010743	MW-3S PT-1	1/20/1993	1/22/1993
93010744	MW-3S PT-2	1/20/1993	1/22/1993
93010745	MW-3S PT-3	1/20/1993	1/22/1993
93010746	MW-3S PT-4	1/20/1993	1/22/1993
93010747	MW-3S PT-5	1/20/1993	1/22/1993

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Parameter	Date Analyzed
93010633	TRIP BLANK	Volatiles	1/21/1993
93010634	MW-12S-PT 1	Volatiles	1/23/1993
		Total Iron	2/10/1993
		Total Manganese	2/10/1993
93010635	MW-12S-PT 2	Volatiles	1/21/1993
		Total Iron	2/10/1993
		Total Manganese	2/10/1993
93010636	MW-12S-PT 3	Volatiles	1/23/1993
		Total Iron	2/10/1993
		Total Manganese	2/10/1993
93010637	MW-12S-PT 4	Volatiles	1/23/1993
		Total Iron	2/10/1993
		Total Manganese	2/10/1993
93010638	MW-12S-PT 5	Volatiles	1/23/1993
		Total Iron	2/10/1993
		Total Manganese	2/10/1993
93010742	TRIP BLANK	Volatiles	1/25/1993
93010743	MW-3S PT-1	Volatiles	1/26/1993
		Total Iron	2/10/1993
		Total Manganese	2/10/1993
93010744	MW-3S PT-2	Volatiles	1/26/1993
		Total Iron	2/10/1993
		Total Manganese	2/10/1993
93010745	MW-3S PT-3	Volatiles	1/26/1993
		Total Iron	2/10/1993
		Total Manganese	2/10/1993
93010746	MW-3S PT-4	Volatiles	1/26/1993
		Total Iron	2/10/1993
		Total Manganese	2/10/1993
93010747	MW-3S PT-5	Volatiles	1/26/1993
		Total Iron	2/10/1993
		Total Manganese	2/10/1993

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Definitions

N/A	Not applicable
ND	Not detected at or above method detection limit.
J	Detected but below method detection limit.
B	Analyte detected in blank but not corrected for amount in blank.
Method Detection Limit	Lowest concentration (amount) that must be present before a reliable and recognizable response is observed for that method of analysis. When a sample has been diluted, the Method Detection Limit has been multiplied by the dilution factor.

Methodology

Volatile organic analyses were performed in accordance with Method 8240, SW-846, EPA Test Methods for Evaluating Solid Waste, 3rd edition.

ICP metals analyses were performed in accordance with Method 200.7, 40 CFR 136.

REPORT NUMBER: 93E-0049

11-Feb-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Volatiles

TRIP BLANK Parameter	93010633	Method Detection Limit	Units
Chloromethane	ND	10	ug/L
Bromomethane	ND	10	ug/L
Vinyl chloride	ND	10	ug/L
Chloroethane	ND	10	ug/L
Methylene chloride	ND	5.0	ug/L
Acetone	ND	100	ug/L
Carbon disulfide	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
2-Butanone	ND	100	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
Carbon tetrachloride	ND	5.0	ug/L
Vinyl acetate	ND	50	ug/L
Bromodichloromethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
Trichloroethene	ND	5.0	ug/L
Benzene	ND	5.0	ug/L
Chlorodibromomethane	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
2-Chloroethylvinyl ether	ND	10	ug/L
Bromoform	ND	5.0	ug/L
4-Methyl-2-pentanone	ND	50	ug/L
2-Hexanone	ND	50	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
Tetrachloroethene	ND	5.0	ug/L
Toluene	ND	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
Styrene	ND	5.0	ug/L
Total Xylene	ND	5.0	ug/L

REPORT NUMBER: 93E-0049

11-Feb-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Volatiles

MW-12S-PT 1 Parameter	93010634	Method Detection Limit	Units
Chloromethane	ND	20	ug/L
Bromomethane	ND	20	ug/L
Vinyl chloride	ND	20	ug/L
Chloroethane	ND	20	ug/L
Methylene chloride	ND	10	ug/L
Acetone	ND	200	ug/L
Carbon disulfide	ND	10	ug/L
Trichlorofluoromethane	ND	10	ug/L
1,1-Dichloroethene	ND	10	ug/L
1,1-Dichloroethane	ND	10	ug/L
trans-1,2-Dichloroethene	ND	10	ug/L
Chloroform	ND	10	ug/L
1,2-Dichloroethane	ND	10	ug/L
2-Butanone	ND	200	ug/L
1,1,1-Trichloroethane	ND	10	ug/L
Carbon tetrachloride	ND	10	ug/L
Vinyl acetate	ND	100	ug/L
Bromodichloromethane	ND	10	ug/L
1,2-Dichloropropane	ND	10	ug/L
trans-1,3-Dichloropropene	ND	10	ug/L
Trichloroethene	ND	10	ug/L
Benzene	ND	10	ug/L
Chlorodibromomethane	ND	10	ug/L
cis-1,3-Dichloropropene	ND	10	ug/L
1,1,2-Trichloroethane	ND	10	ug/L
2-Chloroethylvinyl ether	ND	20	ug/L
Bromoform	ND	10	ug/L
4-Methyl-2-pentanone	ND	100	ug/L
2-Hexanone	ND	100	ug/L
1,1,2,2-Tetrachloroethane	ND	10	ug/L
Tetrachloroethene	ND	10	ug/L
Toluene	ND	10	ug/L
Chlorobenzene	ND	10	ug/L
Ethylbenzene	120	10	ug/L
Styrene	ND	10	ug/L
Total Xylene	310	10	ug/L

REPORT NUMBER: 93E-0049

11-Feb-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

MW-12S-PT 1 Parameter	93010634	Method Detection Limit	Units
Total Iron	19000	72	ug/L
Total Manganese	2500	6.0	ug/L

REPORT NUMBER: 93E-0049

11-Feb-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Volatiles

MW-12S-PT 2 Parameter	93010635	Method Detection Limit	Units
Chloromethane	ND	10	ug/L
Bromomethane	ND	10	ug/L
Vinyl chloride	ND	10	ug/L
Chloroethane	ND	10	ug/L
Methylene chloride	ND	5.0	ug/L
Acetone	ND	100	ug/L
Carbon disulfide	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
2-Butanone	ND	100	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
Carbon tetrachloride	ND	5.0	ug/L
Vinyl acetate	ND	50	ug/L
Bromodichloromethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
Trichloroethene	ND	5.0	ug/L
Benzene	ND	5.0	ug/L
Chlorodibromomethane	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
2-Chloroethylvinyl ether	ND	10	ug/L
Bromoform	ND	5.0	ug/L
4-Methyl-2-pentanone	ND	50	ug/L
2-Hexanone	ND	50	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
Tetrachloroethene	ND	5.0	ug/L
Toluene	3.7 J	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
Ethylbenzene	46	5.0	ug/L
Styrene	ND	5.0	ug/L
Total Xylene	150	5.0	ug/L

REPORT NUMBER: 93E-0049

11-Feb-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

MW-12S-PT 2 Parameter	93010635	Method Detection Limit	Units
Total Iron	16000	7.2	ug/L
Total Manganese	2600	0.60	ug/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Volatiles

MW-12S-PT 3 Parameter	93010636	Method Detection Limit	Units
Chloromethane	ND	20	ug/L
Bromomethane	ND	20	ug/L
Vinyl chloride	ND	20	ug/L
Chloroethane	ND	20	ug/L
Methylene chloride	ND	10	ug/L
Acetone	ND	200	ug/L
Carbon disulfide	ND	10	ug/L
Trichlorofluoromethane	ND	10	ug/L
1,1-Dichloroethene	ND	10	ug/L
1,1-Dichloroethane	ND	10	ug/L
trans-1,2-Dichloroethene	ND	10	ug/L
Chloroform	ND	10	ug/L
1,2-Dichloroethane	ND	10	ug/L
2-Butanone	ND	200	ug/L
1,1,1-Trichloroethane	ND	10	ug/L
Carbon tetrachloride	ND	10	ug/L
Vinyl acetate	ND	100	ug/L
Bromodichloromethane	ND	10	ug/L
1,2-Dichloropropane	ND	10	ug/L
trans-1,3-Dichloropropene	ND	10	ug/L
Trichloroethene	ND	10	ug/L
Benzene	ND	10	ug/L
Chlorodibromomethane	ND	10	ug/L
cis-1,3-Dichloropropene	ND	10	ug/L
1,1,2-Trichloroethane	ND	10	ug/L
2-Chloroethylvinyl ether	ND	20	ug/L
Bromoform	ND	10	ug/L
4-Methyl-2-pentanone	ND	100	ug/L
2-Hexanone	ND	100	ug/L
1,1,2,2-Tetrachloroethane	ND	10	ug/L
Tetrachloroethene	ND	10	ug/L
Toluene	40	10	ug/L
Chlorobenzene	ND	10	ug/L
Ethylbenzene	52	10	ug/L
Styrene	ND	10	ug/L
Total Xylene	180	10	ug/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Metals

MW-12S-PT 3 Parameter	93010636	Method Detection Limit	Units
Total Iron	16000	7.2	ug/L
Total Manganese	2400	0.60	ug/L

REPORT NUMBER: 93E-0049

11-Feb-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Volatiles

MW-12S-PT 4 Parameter	93010637	Method Detection Limit	Units
Chloromethane	ND	20	ug/L
Bromomethane	ND	20	ug/L
Vinyl chloride	ND	20	ug/L
Chloroethane	ND	20	ug/L
Methylene chloride	ND	10	ug/L
Acetone	ND	200	ug/L
Carbon disulfide	ND	10	ug/L
Trichlorofluoromethane	ND	10	ug/L
1,1-Dichloroethene	ND	10	ug/L
1,1-Dichloroethane	ND	10	ug/L
trans-1,2-Dichloroethene	ND	10	ug/L
Chloroform	ND	10	ug/L
1,2-Dichloroethane	ND	10	ug/L
2-Butanone	ND	200	ug/L
1,1,1-Trichloroethane	ND	10	ug/L
Carbon tetrachloride	ND	10	ug/L
Vinyl acetate	ND	100	ug/L
Bromodichloromethane	ND	10	ug/L
1,2-Dichloropropane	ND	10	ug/L
trans-1,3-Dichloropropene	ND	10	ug/L
Trichloroethene	ND	10	ug/L
Benzene	ND	10	ug/L
Chlorodibromomethane	ND	10	ug/L
cis-1,3-Dichloropropene	ND	10	ug/L
1,1,2-Trichloroethane	ND	10	ug/L
2-Chloroethylvinyl ether	ND	20	ug/L
Bromoform	ND	10	ug/L
4-Methyl-2-pentanone	ND	100	ug/L
2-Hexanone	ND	100	ug/L
1,1,2,2-Tetrachloroethane	ND	10	ug/L
Tetrachloroethene	ND	10	ug/L
Toluene	110	10	ug/L
Chlorobenzene	ND	10	ug/L
Ethylbenzene	54	10	ug/L
Styrene	ND	10	ug/L
Total Xylene	200	10	ug/L

REPORT NUMBER: 93E-0049

11-Feb-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

MW-12S-PT 4 Parameter	93010637	Method Detection Limit	Units
Total Iron	16000	7.2	ug/L
Total Manganese	2400	0.60	ug/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Volatiles

MW-12S-PT 5 Parameter	93010638	Method Detection Limit	Units
Chloromethane	ND	20	ug/L
Bromomethane	ND	20	ug/L
Vinyl chloride	ND	20	ug/L
Chloroethane	ND	20	ug/L
Methylene chloride	ND	10	ug/L
Acetone	ND	200	ug/L
Carbon disulfide	ND	10	ug/L
Trichlorofluoromethane	ND	10	ug/L
1,1-Dichloroethene	ND	10	ug/L
1,1-Dichloroethane	ND	10	ug/L
trans-1,2-Dichloroethene	ND	10	ug/L
Chloroform	ND	10	ug/L
1,2-Dichloroethane	ND	10	ug/L
2-Butanone	ND	200	ug/L
1,1,1-Trichloroethane	ND	10	ug/L
Carbon tetrachloride	ND	10	ug/L
Vinyl acetate	ND	100	ug/L
Bromodichloromethane	ND	10	ug/L
1,2-Dichloropropane	ND	10	ug/L
trans-1,3-Dichloropropene	ND	10	ug/L
Trichloroethene	ND	10	ug/L
Benzene	ND	10	ug/L
Chlorodibromomethane	ND	10	ug/L
cis-1,3-Dichloropropene	ND	10	ug/L
1,1,2-Trichloroethane	ND	10	ug/L
2-Chloroethylvinyl ether	ND	20	ug/L
Bromoform	ND	10	ug/L
4-Methyl-2-pentanone	ND	100	ug/L
2-Hexanone	ND	100	ug/L
1,1,2,2-Tetrachloroethane	ND	10	ug/L
Tetrachloroethene	ND	10	ug/L
Toluene	93	10	ug/L
Chlorobenzene	ND	10	ug/L
Ethylbenzene	73	10	ug/L
Styrene	ND	10	ug/L
Total Xylene	260	10	ug/L

REPORT NUMBER: 93E-0049

11-Feb-93

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Metals

MW-12S-PT 5 Parameter	93010638	Method Detection Limit	Units
Total Iron	16000	7.2	ug/L
Total Manganese	2300	0.60	ug/L

REPORT NUMBER: 93E-0049

11-Feb-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Volatiles

TRIP BLANK Parameter	93010742	Method Detection Limit	Units
Chloromethane	ND	10	ug/L
Bromomethane	ND	10	ug/L
Vinyl chloride	ND	10	ug/L
Chloroethane	ND	10	ug/L
Methylene chloride	ND	5.0	ug/L
Acetone	ND	100	ug/L
Carbon disulfide	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
2-Butanone	ND	100	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
Carbon tetrachloride	ND	5.0	ug/L
Vinyl acetate	ND	50	ug/L
Bromodichloromethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
Trichloroethene	ND	5.0	ug/L
Benzene	ND	5.0	ug/L
Chlorodibromomethane	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
2-Chloroethylvinyl ether	ND	10	ug/L
Bromoform	ND	5.0	ug/L
4-Methyl-2-pentanone	ND	50	ug/L
2-Hexanone	ND	50	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
Tetrachloroethene	ND	5.0	ug/L
Toluene	ND	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
Styrene	ND	5.0	ug/L
Total Xylene	ND	5.0	ug/L

REPORT NUMBER: 93E-0049

11-Feb-93

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Volatiles

MW-3S PT-1 Parameter	93010743	Method Detection Limit	Units
Chloromethane	ND	10	ug/L
Bromomethane	ND	10	ug/L
Vinyl chloride	ND	10	ug/L
Chloroethane	ND	10	ug/L
Methylene chloride	ND	5.0	ug/L
Acetone	ND	100	ug/L
Carbon disulfide	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
2-Butanone	ND	5.0	ug/L
1,1,1-Trichloroethane	ND	100	ug/L
Carbon tetrachloride	ND	5.0	ug/L
Vinyl acetate	ND	5.0	ug/L
Bromodichloromethane	ND	50	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
Trichloroethene	ND	5.0	ug/L
Benzene	ND	5.0	ug/L
Chlorodibromomethane	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
2-Chloroethylvinyl ether	ND	5.0	ug/L
Bromoform	ND	10	ug/L
4-Methyl-2-pentanone	ND	5.0	ug/L
2-Hexanone	ND	50	ug/L
1,1,2,2-Tetrachloroethane	ND	50	ug/L
Tetrachloroethene	ND	5.0	ug/L
Toluene	ND	5.0	ug/L
Chlorobenzene	3.3 J	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
Styrene	ND	5.0	ug/L
Total Xylene	ND	5.0	ug/L
	ND	5.0	ug/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Metals

MW-3S PT-1 Parameter	93010743	Method Detection Limit	Units
Total Iron	17000	7.2	ug/L
Total Manganese	1000	0.60	ug/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Volatiles

MW-3S PT-2 Parameter	93010744	Method Detection Limit	Units
Chloromethane	ND	10	ug/L
Bromomethane	ND	10	ug/L
Vinyl chloride	ND	10	ug/L
Chloroethane	ND	10	ug/L
Methylene chloride	ND	5.0	ug/L
Acetone	ND	100	ug/L
Carbon disulfide	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
2-Butanone	ND	100	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
Carbon tetrachloride	5.8	5.0	ug/L
Vinyl acetate	ND	50	ug/L
Bromodichloromethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
Trichloroethene	ND	5.0	ug/L
Benzene	ND	5.0	ug/L
Chlorodibromomethane	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
2-Chloroethylvinyl ether	ND	10	ug/L
Bromoform	ND	5.0	ug/L
4-Methyl-2-pentanone	ND	50	ug/L
2-Hexanone	ND	50	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
Tetrachloroethene	ND	5.0	ug/L
Toluene	3.0 J	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
Styrene	ND	5.0	ug/L
Total Xylene	ND	5.0	ug/L

REPORT NUMBER: 93E-0049

11-Feb-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

MW-3S PT-2 Parameter	93010744	Method Detection Limit	Units
Total Iron	8400	7.2	ug/L
Total Manganese	1100	0.60	ug/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Volatiles

MW-3S PT-3 Parameter	93010745	Method Detection Limit	Units
Chloromethane	ND	10	ug/L
Bromomethane	ND	10	ug/L
Vinyl chloride	ND	10	ug/L
Chloroethane	ND	10	ug/L
Methylene chloride	ND	5.0	ug/L
Acetone	ND	100	ug/L
Carbon disulfide	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
2-Butanone	ND	100	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
Carbon tetrachloride	3.9 J	5.0	ug/L
Vinyl acetate	ND	50	ug/L
Bromodichloromethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
Trichloroethene	ND	5.0	ug/L
Benzene	ND	5.0	ug/L
Chlorodibromomethane	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
2-Chloroethylvinyl ether	ND	10	ug/L
Bromoform	ND	5.0	ug/L
4-Methyl-2-pentanone	ND	50	ug/L
2-Hexanone	ND	50	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
Tetrachloroethene	ND	5.0	ug/L
Toluene	2.9 J	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
Styrene	ND	5.0	ug/L
Total Xylene	ND	5.0	ug/L

REPORT NUMBER: 93E-0049

11-Feb-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

MW-3S PT-3 Parameter	93010745	Method Detection Limit	Units
Total Iron	8700	7.2	ug/L
Total Manganese	1100	0.60	ug/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Volatiles

MW-3S PT-4 Parameter	93010746	Method Detection Limit	Units
Chloromethane	ND	10	ug/L
Bromomethane	ND	10	ug/L
Vinyl chloride	ND	10	ug/L
Chloroethane	ND	10	ug/L
Methylene chloride	ND	5.0	ug/L
Acetone	ND	100	ug/L
Carbon disulfide	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
2-Butanone	ND	100	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
Carbon tetrachloride	ND	5.0	ug/L
Vinyl acetate	ND	50	ug/L
Bromodichloromethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
Trichloroethene	ND	5.0	ug/L
Benzene	ND	5.0	ug/L
Chlorodibromomethane	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
2-Chloroethylvinyl ether	ND	10	ug/L
Bromoform	ND	5.0	ug/L
4-Methyl-2-pentanone	ND	50	ug/L
2-Hexanone	ND	50	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
Tetrachloroethene	ND	5.0	ug/L
Toluene	2.4 J	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
Styrene	ND	5.0	ug/L
Total Xylene	ND	5.0	ug/L

REPORT NUMBER: 93E-0049

11-Feb-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

MW-3S PT-4 Parameter	93010746	Method Detection Limit	Units
Total Iron	8800	7.2	ug/L
Total Manganese	1100	0.60	ug/L

REPORT NUMBER: 93E-0049

11-Feb-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Volatiles

MW-3S PT-5 Parameter	93010747	Method Detection Limit	Units
Chloromethane	ND	10	ug/L
Bromomethane	ND	10	ug/L
Vinyl chloride	ND	10	ug/L
Chloroethane	ND	10	ug/L
Methylene chloride	ND	5.0	ug/L
Acetone	ND	100	ug/L
Carbon disulfide	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
2-Butanone	ND	100	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
Carbon tetrachloride	ND	5.0	ug/L
Vinyl acetate	ND	50	ug/L
Bromodichloromethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
Trichloroethene	ND	5.0	ug/L
Benzene	ND	5.0	ug/L
Chlorodibromomethane	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
2-Chloroethylvinyl ether	ND	10	ug/L
Bromoform	ND	5.0	ug/L
4-Methyl-2-pentanone	ND	50	ug/L
2-Hexanone	ND	50	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
Tetrachloroethene	ND	5.0	ug/L
Toluene	1.9 J	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
Styrene	ND	5.0	ug/L
Total Xylene	ND	5.0	ug/L

REPORT NUMBER: 93E-0049

11-Feb-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

MW-3S PT-5 Parameter	93010747	Method Detection Limit	Units
Total Iron	8700	7.2	ug/L
Total Manganese	1100	0.60	ug/L

R.I. Analytical

Specialists in Environmental Services

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
201 Willowbrook Blvd.
P.O. Box 290
Wayne , NJ 07470
Attn: Mr. Mark Houlday

DATE RECEIVED: 10/14/92
DATE REPORTED: 10/19/92
P.O. #:
INVOICE NUMBER: E5986

SAMPLE DESCRIPTION: Five (5) wastewater samples labelled Ciba-Geigy, Cranston, collected 10/12-10/13/92

Subject samples have been analyzed by our laboratory with the attached results.

Reference: Guidelines Establishing Testing Procedures For The Analysis of Pollutants, 40CFR, Part 136, July 1986.

If you have any questions regarding this work or if we may be of further assistance, please contact us.

Approved by:

Michael S. Rose
Laboratory Manager

Anthony E. Perrotti
President

WCC:cmc

R.I. Analytical Laboratories, Inc.
41 Illinois Ave., Warwick, RI 02888, (401) 737-8500 · Fax: (401) 738-1970

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
DATE RECEIVED: 10/14/92
DATE REPORTED: 10/19/92

P.O. #:
INVOICE #: E5986

PARAMETER	EFFLUENT 2A	EFFLUENT 2B	EFFLUENT 2C	EFFLUENT 2D
Volatile Organic Compounds (Method#624):	ND	ND	ND	ND
Acrolein	<5 µg/l	<5 µg/l	<5 µg/l	<5 µg/l
Acrylontrile	<5 "	<5 "	<5 "	<5 "

Note: A list of volatile organic compounds tested for and their detection limits are attached.

R.I. ANALYTICAL LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
Date Received: 10/14/92
Date Reported: 10/19/92
Invoice #: E5986

PARAMETER	EFFLUENT 2
Total Cyanide	<0.01 mg/l
Total Metals:	
Antimony	<0.005 mg/l
Arsenic	<0.005 "
Beryllium	<0.001 "
Cadmium	<0.01 "
Chromium	<0.03 "
Copper	<0.05 "
Lead	<0.04 "
Manganese	<0.02 "
Mercury	<0.0005 "
Nickel	<0.02 "
Silver	<0.02 "
Zinc	<0.02 "
Semi- Volatile Organic Compounds (Method#625)	ND

Note: A list of semi volatile organic compounds tested for and their detection limits are attached.

R.I. ANALYTICAL LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
Date Received: 10/14/92
Date Reported: 10/19/92
Invoice #: E5986

Volatile Organic Compounds
Method #624

chloromethane
bromomethane
vinyl chloride
dichlorodifluoromethane
chloroethane
methylene chloride
trichlorofluoromethane
1,1-dichloroethylene
1,1-dichloroethane
trans-1,2-dichloroethylene
chloroform
1,2-dichloroethane
1,1,1-trichloroethane
carbon tetrachloride
bromodichloromethane
1,2-dichloropropane
cis-1,3-dichloropropylene
trichloroethylene
trans-1,3-dichloropropylene
1,1,2-trichloroethane
dibromochloromethane
bromoform
tetrachloroethylene
1,1,2,2-tetrachloroethane
chlorobenzene
2-chloroethyl vinyl ether
dichlorobenzenes
benzene
toluene
ethylbenzene
xylenes

Detection Limit: 1 μg/l

RI ANALYTICAL LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

Woodward Clyde Consultants
Date Received: 10/14/92
Date Reported: 10/19/92
Invoice #: E5986

SEMI-VOLATILE ORGANIC COMPOUNDS
Method #625

Base/Neutral Extractables:

acenaphthene
acenaphthylene
anthracene
benzidine
benzo(a)anthracene
benzo(b)fluoranthene
benzo(k)fluoranthene
benzo(g,h,i)perylene
benzo(a)pyrene
bis(2-chloroethyl)ether
bis(2-chloroethoxy)methane
bis(2-chloroisopropyl)ether
bis(2-ethylhexyl)phthalate
4-bromophenyl phenyl ether
butylbenzyl phthalate
2-chloronaphthalene
4-chlorophenyl phenyl ether
chrysene
dibenzo(a,h)anthracene
di-n-butyl phthalate
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
3,3'-dichlorobenzidine
diethyl phthalate
dimethyl phthalate
2,4-dinitrotoluene
2,6-dinitrotoluene
di-n-octyl phthalate
1,2-diphenylhydrazine
fluoranthene
fluorene
hexachlorobenzene
hexachlorobutadiene
hexachlorocyclopentadiene
hexachloroethane
Indeno(1,2,3-cd)pyrene
isophorone
naphthalene
nitrobenzene
N-nitrosodimethylamine
N-nitrosodiphenylamine
N-nitrosodi-n-propylamine
phenanthrene
pyrene
1,2,4-trichlorobenzene

Acid Extractables:

4-chloro-3-methylphenol
2-chlorophenol
2,4-dichlorophenol
2,4-dimethyl phenol
2-methyl-4,6-dinitrophenol
2,4-dinitrophenol
2-nitrophenol
4-nitrophenol
pentachlorophenol
phenol
2,4,6-trichlorophenol

DETECTION LIMIT: 10 μg/l

R.I. Analytical

Specialists in Environmental Services

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
201 Willowbrook Blvd.
P.O. Box 290
Wayne , NJ 07470
Attn: Mr. Mark Houlday

DATE RECEIVED: 10/29/92
DATE REPORTED: 11/02/92
P.O. #:
INVOICE NUMBER: E6254

SAMPLE DESCRIPTION: Ten (10) wastewater samples from Ciba-Geigy, Cranston, RI

Subject samples have been analyzed by our laboratory with the attached results.

Reference: Guidelines Establishing Testing Procedures For The Analysis of Pollutants, 40CFR, Part 136, July 1986.

If you have any questions regarding this work or if we may be of further assistance, please contact us.

Approved by:

Michael S. Rose
Laboratory Manager

Anthony E. Perrotti
President

WCC:cmc

R.I. Analytical Laboratories, Inc.
41 Illinois Ave., Warwick, RI 02888, (401) 737-8500 · Fax: (401) 738-1970

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
Date Received: 10/29/92
Date Reported: 11/02/92
Invoice #: E6254

PARAMETER	EFFLUENT 3
Total Cyanide	<0.01 mg/l
Total Metals:	
Antimony	<0.005 mg/l
Arsenic	<0.005 "
Beryllium	<0.001 "
Cadmium	<0.01 "
Chromium	<0.03 "
Copper	<0.05 "
Lead	<0.04 "
Manganese	<0.02 "
Mercury	<0.0005 "
Nickel	<0.02 "
Silver	<0.02 "
Zinc	<0.02 "
Semi- Volatile Organic Compounds (Method#625)	ND

Note: A list of semi volatile organic compounds tested for and their detection limits are attached.

R.I. ANALYTICAL LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
DATE RECEIVED: 10/29/92
DATE REPORTED: 11/02/92

P.O. #:
INVOICE #: E6254

PARAMETER	EFFLUENT 3A	EFFLUENT 3B	EFFLUENT 3C	EFFLUENT 3D
Volatile Organic Compounds (Method#624):	ND	ND	ND	ND
Acrolein	<5 µg/l	<5 µg/l	<5 µg/l	<5 µg/l
Acrylontrile	<5 "	<5 "	<5 "	<5 "

Note: A list of volatile organic compounds tested for and their detection limits are attached.

R.I. ANALYTICAL LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

Woodward Clyde Consultants
Date Received: 10/29/92
Date Reported: 11/02/92
Invoice #: E6254

SEMI-VOLATILE ORGANIC COMPOUNDS
Method #625

Base/Neutral Extractables:

acenaphthene
acenaphthylene
anthracene
benzidine
benzo(a)anthracene
benzo(b)fluoranthene
benzo(k)fluoranthene
benzo(g,h,i)perylene
benzo(a)pyrene
bis(2-chloroethyl)ether
bis(2-chloroethoxy)methane
bis(2-chloroisopropyl)ether
bis(2-ethylhexyl)phthalate
4-bromophenyl phenyl ether
butylbenzyl phthalate
2-chloronaphthalene
4-chlorophenyl phenyl ether
chrysene
dibenzo(a,h)anthracene
di-n-butyl phthalate
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
3,3'-dichlorobenzidine
diethyl phthalate
dimethyl phthalate
2,4-dinitrotoluene
2,6-dinitrotoluene
di-n-octyl phthalate
1,2-diphenylhydrazine
fluoranthene
fluorene
hexachlorobenzene
hexachlorobutadiene
hexachlorocyclopentadiene
hexachloroethane
Indeno(1,2,3-cd)pyrene
isophorone
naphthalene
nitrobenzene
N-nitrosodimethylamine
N-nitrosodiphenylamine
N-nitrosodi-n-propylamine
phenanthrene
pyrene
1,2,4-trichlorobenzene

Acid Extractables:

4-chloro-3-methylphenol
2-chlorophenol
2,4-dichlorophenol
2,4-dimethyl phenol
2-methyl-4,6-dinitrophenol
2,4-dinitrophenol
2-nitrophenol
4-nitrophenol
pentachlorophenol
phenol
2,4,6-trichlorophenol

DETECTION LIMIT: 10 μg/l

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
Date Received: 10/29/92
Date Reported: 11/02/92
Invoice #: E6254

Volatile Organic Compounds
Method #624

chloromethane
bromomethane
vinyl chloride
dichlorodifluoromethane
chloroethane
methylene chloride
trichlorofluoromethane
1,1-dichloroethylene
1,1-dichloroethane
trans-1,2-dichloroethylene
chloroform
1,2-dichloroethane
1,1,1-trichloroethane
carbon tetrachloride
bromodichloromethane
1,2-dichloropropane
cis-1,3-dichloropropylene
trichloroethylene
trans-1,3-dichloropropylene
1,1,2-trichloroethane
dibromochloromethane
bromoform
tetrachloroethylene
1,1,2,2-tetrachloroethane
chlorobenzene
2-chloroethyl vinyl ether
dichlorobenzenes
benzene
toluene
ethylbenzene
xylenes

Detection Limit: 1 μg/l

RI ANALYTICAL LABORATORIES, INC.

R.I. Analytical

Specialists in Environmental Services

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
201 Willowbrook Blvd.
P.O. Box 290
Wayne , NJ 07470
Attn: Mr. Mark Houlday

DATE RECEIVED: 11/25/92
DATE REPORTED: 12/01/92
P.O. #:
INVOICE NUMBER: E6724

SAMPLE DESCRIPTION: Six (6) wastewater samples labelled Ciba-Geigy, Cranston

---

Subject samples have been analyzed by our laboratory with the attached results.

Reference: Guidelines Establishing Testing Procedures For The Analysis of Pollutants, 40CFR, Part 136, July 1986.

If you have any questions regarding this work or if we may be of further assistance, please contact us.

Approved by:

Michael S. Rose
Laboratory Manager

Anthony E. Perrotti
President

WCC:cmc

R.I. Analytical Laboratories, Inc.
41 Illinois Ave., Warwick, RI 02888, (401) 737-8500 · Fax: (401) 738-1970

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
DATE RECEIVED: 11/25/92
DATE REPORTED: 12/01/92

P.O. #:
INVOICE #: E6724

PARAMETER	**SAM. #1**	**SAM. #2**	**SAM. #3**
Volatile Organic Compounds (Method #624):	ND	ND	ND

PARAMETER	**SAM. #4**	**SAM. #5**
Volatile Organic Compounds (Method #624):	ND	----
Semi- Volatile Organic Compounds (Method #625):	-----	ND

Note: A list of volatile organic compounds and semi- volatile organic compounds tested for and their detection limits is attached.

Sample Description:
Sample 1- Effluent -4A
Sample 2- Effluent -4B
Sample 3- Effluent -4C
Sample 4- Effluent -4D
Sample 5- Composite of Effluent 4-1,4-2, 4-3, and 4-4

R.I. ANALYTICAL LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
DATE RECEIVED: 11/25/92
DATE REPORTED: 12/01/92

P.O. #:
INVOICE #: E6724

PARAMETER	**EFFLUENT 4**
Total Cyanide	<0.01 mg/l
Total Metals:	
Antimony	<0.005 mg/l
Arsenic	<0.005 "
Beryllium	<0.001 "
Cadmium	<0.01 "
Chromium	<0.03 "
Copper	<0.05 "
Lead	<0.04 "
Manganese	<0.02 "
Mercury	<0.0005 "
Nickel	<0.02 "
Silver	<0.02 "
Zinc	<0.02 "

R.I. ANALYTICAL LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
Date Received: 11/25/92
Date Reported: 12/01/92
Invoice #: E6724

Volatile Organic Compounds
Method #624

chloromethane
bromomethane
vinyl chloride
dichlorodifluoromethane
chloroethane
methylene chloride
trichlorofluoromethane
1,1-dichloroethylene
1,1-dichloroethane
trans-1,2-dichloroethylene
chloroform
1,2-dichloroethane
1,1,1-trichloroethane
carbon tetrachloride
bromodichloromethane
1,2-dichloropropane
cis-1,3-dichloropropylene
trichloroethylene
trans-1,3-dichloropropylene
1,1,2-trichloroethane
dibromochloromethane
bromoform
tetrachloroethylene
1,1,2,2-tetrachloroethane
chlorobenzene
2-chloroethyl vinyl ether
dichlorobenzenes
benzene
toluene
ethylbenzene
xylenes

Detection Limit: 1 μg/l

RI ANALYTICAL LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
Date Received: 11/25/92
Date Reported: 12/01/92
Invoice #: E6724

SEMI-VOLATILE ORGANIC COMPOUNDS
Method #625

Base/Neutral Extractables:

acenaphthene
acenaphthylene
anthracene
benzidine
benzo(a)anthracene
benzo(b)fluoranthene
benzo(k)fluoranthene
benzo(g,h,i)perylene
benzo(a)pyrene
bis(2-chloroethyl)ether
bis(2-chloroethoxy)methane
bis(2-chloroisopropyl)ether
bis(2-ethylhexyl)phthalate
4-bromophenyl phenyl ether
butylbenzyl phthalate
2-chloronaphthalene
4-chlorophenyl phenyl ether
chrysene
dibenzo(a,h)anthracene
di-n-butyl phthalate
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
3,3'-dichlorobenzidine
diethyl phthalate
dimethyl phthalate
2,4-dinitrotoluene
2,6-dinitrotoluene
di-n-octyl phthalate
1,2-diphenylhydrazine
fluoranthene
fluorene
hexachlorobenzene
hexachlorobutadiene
hexachlorocyclopentadiene
hexachloroethane
Indeno(1,2,3-cd)pyrene
isophorone
naphthalene
nitrobenzene
N-nitrosodimethylamine
N-nitrosodiphenylamine
N-nitrosodi-n-propylamine
phenanthrene
pyrene
1,2,4-trichlorobenzene

Acid Extractables:

4-chloro-3-methylphenol
2-chlorophenol
2,4-dichlorophenol
2,4-dimethyl phenol
2-methyl-4,6-dinitrophenol
2,4-dinitrophenol
2-nitrophenol
4-nitrophenol
pentachlorophenol
phenol
2,4,6-trichlorophenol

DETECTION LIMIT: 10 μg/l

R.I. ANALYTICAL LABORATORIES, INC.

R.I. Analytical

Specialists in Environmental Services

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
Attn: Mr. Mark Houlday
201 Willowbrook Blvd.
P.O. Box 290
Wayne, NJ 07470

DATE RECEIVED: 12/04/92
DATE REPORTED: 12/11/92
P.O. #:
INVOICE NUMBER: E6892

SAMPLE DESCRIPTION: Six (6) wastewater samples labelled Ciba-Geigy, Cranston

---

Subject samples have been analyzed by our laboratory with the attached results.

Reference: Guidelines Establishing Testing Procedures For The Analysis of Pollutants, 40CFR, Part 136, July 1986.

If you have any questions regarding this work or if we may be of further assistance, please contact us.

Approved by:

Michael S. Rose
Laboratory Manager

Anthony E. Perrotti
President

wcc:sf

R.I. Analytical Laboratories, Inc.
41 Illinois Ave., Warwick, RI 02888, (401) 738-8500 · Fax: (401) 738-9[illegible]

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
DATE RECEIVED: 12/04/92
DATE REPORTED: 12/11/92

P.O. #:
INVOICE #: E6892

PARAMETER	SAM. #1	SAM. #2	SAM. #3
Volatile Organic Compounds (Method #624):	ND	ND	ND

PARAMETER	SAM. #4	SAM. #5
Volatile Organic Compounds (Method #624):	ND	----
Semi- Volatile Organic Compounds (Method #625):	-----	ND

Note: A list of volatile organic compounds and semi- volatile organic compounds tested for and their detection limits is attached.

Sample Description:
Sample 1- Effluent -5A
Sample 2- Effluent -5B
Sample 3- Effluent -5C
Sample 4- Effluent -5D
Sample 5- Composite of Effluent 5-1,5-2, 5-3, and 5-4

R.I. ANALYTICAL LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
DATE RECEIVED: 12/04/92
DATE REPORTED: 12/11/92

P.O. #:
INVOICE #: E6892

PARAMETER	**EFFLUENT 5**
Total Cyanide	0.02 mg/l
Total Metals:	
Antimony	<0.005 mg/l
Arsenic	<0.005 "
Beryllium	<0.001 "
Cadmium	<0.01 "
Chromium	<0.03 "
Copper	<0.05 "
Lead	<0.04 "
Manganese	0.04 "
Mercury	<0.0005 "
Nickel	<0.02 "
Silver	<0.02 "
Zinc	<0.02 "

R.I. ANALYTICAL LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
Date Received: 12/04/92
Date Reported: 12/11/92
Invoice #: E6892

Volatile Organic Compounds
Method #624

chloromethane
bromomethane
vinyl chloride
dichlorodifluoromethane
chloroethane
methylene chloride
trichlorofluoromethane
1,1-dichloroethylene
1,1-dichloroethane
trans-1,2-dichloroethylene
chloroform
1,2-dichloroethane
1,1,1-trichloroethane
carbon tetrachloride
bromodichloromethane
1,2-dichloropropane
cis-1,3-dichloropropylene
trichloroethylene
trans-1,3-dichloropropylene
1,1,2-trichloroethane
dibromochloromethane
bromoform
tetrachloroethylene
1,1,2,2-tetrachloroethane
chlorobenzene
2-chloroethyl vinyl ether
dichlorobenzenes
benzene
toluene
ethylbenzene
xylenes

Detection Limit: 1 μg/l

RI ANALYTICAL LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
Date Received: 12/04/92
Date Reported: 12/11/92
Invoice #: E6892

SEMI-VOLATILE ORGANIC COMPOUNDS
Method #625

Base/Neutral Extractables:

acenaphthene
acenaphthylene
anthracene
benzidine
benzo(a)anthracene
benzo(b)fluoranthene
benzo(k)fluoranthene
benzo(g,h,i)perylene
benzo(a)pyrene
bis(2-chloroethyl)ether
bis(2-chloroethoxy)methane
bis(2-chloroisopropyl)ether
bis(2-ethylhexyl)phthalate
4-bromophenyl phenyl ether
butylbenzyl phthalate
2-chloronaphthalene
4-chlorophenyl phenyl ether
chrysene
dibenzo(a,h)anthracene
di-n-butyl phthalate
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
3,3'-dichlorobenzidine
diethyl phthalate
dimethyl phthalate
2,4-dinitrotoluene
2,6-dinitrotoluene
di-n-octyl phthalate
1,2-diphenylhydrazine
fluoranthene
fluorene
hexachlorobenzene
hexachlorobutadiene
hexachlorocyclopentadiene
hexachloroethane
Indeno(1,2,3-cd)pyrene
isophorone
naphthalene
nitrobenzene
N-nitrosodimethylamine
N-nitrosodiphenylamine
N-nitrosodi-n-propylamine
phenanthrene
pyrene
1,2,4-trichlorobenzene

Acid Extractables:

4-chloro-3-methylphenol
2-chlorophenol
2,4-dichlorophenol
2,4-dimethyl phenol
2-methyl-4,6-dinitrophenol
2,4-dinitrophenol
2-nitrophenol
4-nitrophenol
pentachlorophenol
phenol
2,4,6-trichlorophenol

DETECTION LIMIT: 10 μg/l

R.I. ANALYTICAL LABORATORIES, INC.

R.I. Analytical

Specialists in Environmental Services

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
Attn: Mr. Mark Houlday
201 Willowbrook Blvd.
P.O. Box 290
Wayne, NJ 07470

DATE RECEIVED: 12/17/92
DATE REPORTED: 12/24/92
P.O. #:
INVOICE NUMBER: E7115

SAMPLE DESCRIPTION: Six (6) water samples labelled Ciba-Geigy, Cranston, RI

Subject samples have been analyzed by our laboratory with the attached results.

Reference: Guidelines Establishing Testing Procedures For The Analysis of Pollutants, 40CFR, Part 136, July 1986.

If you have any questions regarding this work or if we may be of further assistance, please contact us.

Approved by:

Michael S. Rose
Laboratory Manager

Anthony E. Perrotti
President

wcc:cmc

R.I. Analytical Laboratories, Inc.
41 Illinois Ave., Warwick, RI 02888, (401) 737-8500 · Fax: (401) 738-1970

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
DATE RECEIVED: 12/17/92 **P.O. #:**
DATE REPORTED: 12/24/92 **INVOICE #: E7115**

PARAMETER	**EFFLUENT 6B**	**EFFLUENT 6C**	**EFFLUENT 6D**	**EFFLUENT 6A**
Volatile Organic Compounds (Method#624):				
chlorobenzene	2 µg/l	<1 µg/l	<1 µg/l	2 µg/l
toluene	4 "	3 "	4 "	4 "
Acrolein	<5 µg/l	<5 µg/l	<5 µg/l	<5 µg/l
Acrylontrile	<5 "	<5 "	<5 "	<5 "

Note: A list of volatile organic compounds tested for and their detection limits are attached.

R.I. ANALYTICAL LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
DATE RECEIVED: 12/17/92
DATE REPORTED: 12/24/92
INVOICE #: E7115

PARAMETER	EFFLUENT 6
Total Cyanide	0.01 mg/l
Total Metals:	
Antimony	<0.005 mg/l
Arsenic	0.007 "
Beryllium	<0.001 "
Cadmium	<0.01 "
Chromium	<0.03 "
Copper	<0.05 "
Lead	<0.04 "
Manganese	0.33 "
Mercury	<0.0005 "
Nickel	<0.02 "
Silver	<0.02 "
Zinc	<0.02 "

PARAMETER	COMPOSITE OF EFFLUENT 6-1,6-2,6-3,6-4
Semi- Volatile Organic Compounds (Method#625)	ND

Note: A list of semi volatile organic compounds tested for and their detection limits are attached.

R.I. ANALYTICAL LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
DATE RECEIVED: 12/17/92
DATE REPORTED: 12/24/92
INVOICE #: E7115

Volatile Organic Compounds
Method #624

chloromethane
bromomethane
vinyl chloride
dichlorodifluoromethane
chloroethane
methylene chloride
trichlorofluoromethane
1,1-dichloroethylene
1,1-dichloroethane
trans-1,2-dichloroethylene
chloroform
1,2-dichloroethane
1,1,1-trichloroethane
carbon tetrachloride
bromodichloromethane
1,2-dichloropropane
cis-1,3-dichloropropylene
trichloroethylene
trans-1,3-dichloropropylene
1,1,2-trichloroethane
dibromochloromethane
bromoform
tetrachloroethylene
1,1,2,2-tetrachloroethane
chlorobenzene
2-chloroethyl vinyl ether
dichlorobenzenes
benzene
toluene
ethylbenzene
xylenes

Detection Limit: 1 μg/l

RI ANALYTICAL LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

Woodward Clyde Consultants
DATE RECEIVED: 12/17/92
DATE REPORTED: 12/24/92
INVOICE #: E7115

SEMI-VOLATILE ORGANIC COMPOUNDS
Method #625

Base/Neutral Extractables:

acenaphthene
acenaphthylene
anthracene
benzidine
benzo(a)anthracene
benzo(b)fluoranthene
benzo(k)fluoranthene
benzo(g,h,i)perylene
benzo(a)pyrene
bis(2-chloroethyl)ether
bis(2-chloroethoxy)methane
bis(2-chloroisopropyl)ether
bis(2-ethylhexyl)phthalate
4-bromophenyl phenyl ether
butylbenzyl phthalate
2-chloronaphthalene
4-chlorophenyl phenyl ether
chrysene
dibenzo(a,h)anthracene
di-n-butyl phthalate
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
3,3'-dichlorobenzidine
diethyl phthalate
dimethyl phthalate
2,4-dinitrotoluene
2,6-dinitrotoluene
di-n-octyl phthalate
1,2-diphenylhydrazine
fluoranthene
fluorene
hexachlorobenzene
hexachlorobutadiene
hexachlorocyclopentadiene
hexachloroethane
Indeno(1,2,3-cd)pyrene
isophorone
naphthalene
nitrobenzene
N-nitrosodimethylamine
N-nitrosodiphenylamine
N-nitrosodi-n-propylamine
phenanthrene
pyrene
1,2,4-trichlorobenzene

Acid Extractables:

4-chloro-3-methylphenol
2-chlorophenol
2,4-dichlorophenol
2,4-dimethyl phenol
2-methyl-4,6-dinitrophenol
2,4-dinitrophenol
2-nitrophenol
4-nitrophenol
pentachlorophenol
phenol
2,4,6-trichlorophenol

DETECTION LIMIT: 10 μg/l

R.I. Analytical

Specialists in Environmental Services

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
Attn: Mr. Mark Houlday
201 Willowbrook Blvd.
P.O. Box 290
Wayne, NJ 07470

DATE RECEIVED: 2/05/93
DATE REPORTED: 2/12/93
P.O. #:
INVOICE NUMBER: F1588

SAMPLE DESCRIPTION: Six (6) wastewater samples labelled Ciba-Geigy, Cranston, collected 2/4-2/5/93

Subject samples have been analyzed by our laboratory with the attached results.

Reference: Guidelines Establishing Testing Procedures For The Analysis of Pollutants, 40CFR, Part 136, July 1986.

If you have any questions regarding this work or if we may be of further assistance, please contact us.

Approved by:

Michael S. Rose
Laboratory Manager

Anthony E. Perrotti
President

WCC:afp

R.I. Analytical Laboratories, Inc.
41 Illinois Ave., Warwick, RI 02888, (401) 737-8500 · Fax: (401) 738-1970

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
DATE RECEIVED: 2/05/93
DATE REPORTED: 2/12/93
INVOICE #: F1588

PARAMETER	RESULTS EFFLUENT 7A	EFFLUENT 7B	EFFLUENT 7C	EFFLUENT 7D
Volatile Organic Compounds (Method 624):				
chlorobenzene	9 µg/l	9 µg/l	9 µg/l	8 µg/l
dichlorobenzenes	2 "	2 "	2 "	2 "
toluene	2 "	2 "	2 "	2 "
xylenes	3 "	3 "	3 "	2 "
Method 603:				
acrolein	<5 µg/l	<5 µg/l	<5 µg/l	<5 µg/l
acrylontrile	<5 "	<5 "	<5 "	<5 "

Note: A list of volatile organic compounds tested for and their detection limits is attached.

PARAMETER	COMPOSITE* RESULTS
Total Cyanide	0.11 mg/l
Semi-Volatile Organic Compounds (Method 625):	ND

Note: A list of semi-volatile organic compounds tested for and their detection limits is attached.

*Composite of Effluent 7-1, 7-2, 7-3, and 7-4

R.I. ANALYTICAL LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
Date Received: 2/05/93
Date Reported: 2/12/93
Invoice #: F1588

PARAMETER	EFFLUENT 7 RESULTS
Total Metals:	
Antimony	<0.005 mg/l
Arsenic	<0.005 "
Beryllium	<0.001 "
Cadmium	<0.01 "
Chromium	<0.03 "
Copper	<0.05 "
Lead	<0.04 "
Manganese	0.73 "
Mercury	<0.0005 "
Nickel	<0.02 "
Silver	<0.02 "
Zinc	<0.02 "

R.I. ANALYTICAL LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

Woodward-Clyde Consultants
Date Received: 2/05/93
Date Reported: 2/12/93
Invoice #: F1588

Volatile Organic Compounds
Method #624

chloromethane
bromomethane
vinyl chloride
dichlorodifluoromethane
chloroethane
methylene chloride
trichlorofluoromethane
1,1-dichloroethylene
1,1-dichloroethane
trans-1,2-dichloroethylene
chloroform
1,2-dichloroethane
1,1,1-trichloroethane
carbon tetrachloride
bromodichloromethane
1,2-dichloropropane
cis-1,3-dichloropropylene
trichloroethylene
trans-1,3-dichloropropylene
1,1,2-trichloroethane
dibromochloromethane
bromoform
tetrachloroethylene
1,1,2,2-tetrachloroethane
chlorobenzene
2-chloroethyl vinyl ether
dichlorobenzenes
benzene
toluene
ethylbenzene
xylenes

Detection Limit: 1 μg/l

RI ANALYTICAL LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

Woodward Clyde Consultants
Date Received: 2/05/93
Date Reported: 2/12/93
Invoice #: F1588

SEMI-VOLATILE ORGANIC COMPOUNDS
Method #625

Base/Neutral Extractables:

acenaphthene
acenaphthylene
anthracene
benzidine
benzo(a)anthracene
benzo(b)fluoranthene
benzo(k)fluoranthene
benzo(g,h,i)perylene
benzo(a)pyrene
bis(2-chloroethyl)ether
bis(2-chloroethoxy)methane
bis(2-chloroisopropyl)ether
bis(2-ethylhexyl)phthalate
4-bromophenyl phenyl ether
butylbenzyl phthalate
2-chloronaphthalene
4-chlorophenyl phenyl ether
chrysene
dibenzo(a,h)anthracene
di-n-butyl phthalate
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
3,3'-dichlorobenzidine
diethyl phthalate
dimethyl phthalate
2,4-dinitrotoluene
2,6-dinitrotoluene
di-n-octyl phthalate
1,2-diphenylhydrazine
fluoranthene
fluorene
hexachlorobenzene
hexachlorobutadiene
hexachlorocyclopentadiene
hexachloroethane
Indeno(1,2,3-cd)pyrene
isophorone
naphthalene
nitrobenzene
N-nitrosodimethylamine
N-nitrosodiphenylamine
N-nitrosodi-n-propylamine
phenanthrene
pyrene
1,2,4-trichlorobenzene

Acid Extractables:

4-chloro-3-methylphenol
2-chlorophenol
2,4-dichlorophenol
2,4-dimethyl phenol
2-methyl-4,6-dinitrophenol
2,4-dinitrophenol
2-nitrophenol
4-nitrophenol
pentachlorophenol
phenol
2,4,6-trichlorophenol

DETECTION LIMIT: 10 μg/l

R.I. ANALYTICAL LABORATORIES, INC.

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Date Sampled	Date Received
92120220	INF-1	12/02/1992	12/04/1992
92120221	T4-1	12/02/1992	12/04/1992
92120222	REJECT-1	12/02/1992	12/04/1992
92120223	T5-1	12/02/1992	12/04/1992
92120224	SUMP-1	12/02/1992	12/04/1992
92120225	EFF-1	12/02/1992	12/04/1992
92120226	INF-2	12/03/1992	12/04/1992
92120227	T4-2	12/03/1992	12/04/1992
92120228	REJECT-2	12/03/1992	12/04/1992
92120229	T5-2	12/03/1992	12/04/1992
92120230	SUMP-2	12/03/1992	12/04/1992
92120231	EFF-2	12/03/1992	12/04/1992

Sample #	Sample Description	Parameter	Date Extracted
92120220	INF-1	Semivolatiles	12/10/1992
92120223	T5-1	Semivolatiles	12/07/1992
92120224	SUMP-1	Semivolatiles	12/07/1992
92120225	EFF-1	Semivolatiles	12/07/1992
92120226	INF-2	Semivolatiles	12/07/1992
92120229	T5-2	Semivolatiles	12/07/1992
92120230	SUMP-2	Semivolatiles	12/07/1992
92120231	EFF-2	Semivolatiles	12/07/1992

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Parameter	Date Analyzed
92120220	INF-1	Semivolatiles	12/17/1992
		Total Cyanide	12/09/1992
		Total Mercury	12/10/1992
		Total Chromium	12/15/1992
		Total Nickel	12/11/1992
		Total Zinc	12/11/1992
		Total Silver	12/09/1992
		Total Arsenic	12/11/1992
		Total Copper	12/14/1992
		Total Lead	12/11/1992
		Total Antimony	12/10/1992
		Total Beryllium	12/15/1992
		Total Calcium	12/15/1992
		Total Manganese	12/11/1992
		Total Iron	12/15/1992
92120221	T4-1	Total Cyanide	12/09/1992
		Total Mercury	12/10/1992
		Total Chromium	12/15/1992
		Total Nickel	12/11/1992
		Total Zinc	12/11/1992
		Total Silver	12/09/1992
		Total Arsenic	12/11/1992
		Total Copper	12/14/1992
		Total Lead	12/11/1992
		Total Antimony	12/10/1992
		Total Beryllium	12/15/1992
		Total Calcium	12/15/1992
		Total Manganese	12/11/1992
		Total Iron	12/15/1992

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Parameter	Date Analyzed
92120222	REJECT-1	Total Cyanide	12/09/1992
		Total Mercury	12/10/1992
		Total Chromium	12/15/1992
		Total Nickel	12/11/1992
		Total Zinc	12/11/1992
		Total Silver	12/09/1992
		Total Arsenic	12/11/1992
		Total Copper	12/14/1992
		Total Lead	12/11/1992
		Total Antimony	12/10/1992
		Total Beryllium	12/15/1992
		Total Calcium	12/15/1992
		Total Manganese	12/11/1992
		Total Iron	12/15/1992
92120223	T5-1	Semivolatiles	12/15/1992
		Total Cyanide	12/09/1992
		Total Mercury	12/10/1992
		Total Chromium	12/15/1992
		Total Nickel	12/11/1992
		Total Zinc	12/11/1992
		Total Silver	12/09/1992
		Total Arsenic	12/11/1992
		Total Copper	12/14/1992
		Total Lead	12/11/1992
		Total Antimony	12/10/1992
		Total Beryllium	12/15/1992
		Total Calcium	12/15/1992
		Total Manganese	12/11/1992
		Total Iron	12/15/1992

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Parameter	Date Analyzed
92120224	SUMP-1	Semivolatiles	12/15/1992
		Total Cyanide	12/09/1992
		Total Mercury	12/10/1992
		Total Chromium	12/15/1992
		Total Nickel	12/11/1992
		Total Zinc	12/11/1992
		Total Silver	12/09/1992
		Total Arsenic	12/11/1992
		Total Copper	12/14/1992
		Total Lead	12/11/1992
		Total Antimony	12/10/1992
		Total Beryllium	12/15/1992
		Total Calcium	12/15/1992
		Total Manganese	12/11/1992
		Total Iron	12/15/1992
92120225	EFF-1	Semivolatiles	12/15/1992
		Total Cyanide	12/09/1992
		Total Mercury	12/10/1992
		Total Chromium	12/15/1992
		Total Nickel	12/11/1992
		Total Zinc	12/11/1992
		Total Silver	12/09/1992
		Total Arsenic	12/11/1992
		Total Copper	12/14/1992
		Total Lead	12/11/1992
		Total Antimony	12/10/1992
		Total Beryllium	12/15/1992
		Total Calcium	12/15/1992
		Total Manganese	12/11/1992

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Parameter	Date Analyzed
92120226	INF-2	Semivolatiles	12/15/1992
		Total Cyanide	12/09/1992
		Total Mercury	12/10/1992
		Total Chromium	12/15/1992
		Total Nickel	12/11/1992
		Total Zinc	12/11/1992
		Total Silver	12/09/1992
		Total Arsenic	12/11/1992
		Total Copper	12/14/1992
		Total Lead	12/11/1992
		Total Antimony	12/10/1992
		Total Beryllium	12/15/1992
		Total Calcium	12/15/1992
		Total Manganese	12/11/1992
		Total Iron	12/15/1992
92120227	T4-2	Total Cyanide	12/09/1992
		Total Mercury	12/10/1992
		Total Chromium	12/15/1992
		Total Nickel	12/11/1992
		Total Zinc	12/11/1992
		Total Silver	12/09/1992
		Total Arsenic	12/11/1992
		Total Copper	12/14/1992
		Total Lead	12/11/1992
		Total Antimony	12/10/1992
		Total Beryllium	12/15/1992
		Total Calcium	12/15/1992
		Total Manganese	12/11/1992
		Total Iron	12/15/1992

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Parameter	Date Analyzed
92120228	REJECT-2	Total Cyanide	12/09/1992
		Total Mercury	12/10/1992
		Total Chromium	12/15/1992
		Total Nickel	12/11/1992
		Total Zinc	12/11/1992
		Total Silver	12/09/1992
		Total Arsenic	12/11/1992
		Total Copper	12/14/1992
		Total Lead	12/11/1992
		Total Antimony	12/10/1992
		Total Beryllium	12/15/1992
		Total Calcium	12/15/1992
		Total Manganese	12/11/1992
		Total Iron	12/15/1992
92120229	T5-2	Semivolatiles	12/15/1992
		Total Cyanide	12/09/1992
		Total Mercury	12/10/1992
		Total Chromium	12/15/1992
		Total Nickel	12/11/1992
		Total Zinc	12/11/1992
		Total Silver	12/09/1992
		Total Arsenic	12/11/1992
		Total Copper	12/14/1992
		Total Lead	12/11/1992
		Total Antimony	12/10/1992
		Total Beryllium	12/15/1992
		Total Calcium	12/15/1992
		Total Manganese	12/11/1992
		Total Iron	12/15/1992

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Parameter	Date Analyzed
92120230	SUMP-2	Semivolatiles	12/15/1992
		Total Cyanide	12/09/1992
		Total Mercury	12/10/1992
		Total Chromium	12/15/1992
		Total Nickel	12/15/1992
		Total Zinc	12/15/1992
		Total Silver	12/09/1992
		Total Arsenic	12/11/1992
		Total Copper	12/14/1992
		Total Lead	12/11/1992
		Total Antimony	12/10/1992
		Total Beryllium	12/15/1992
		Total Calcium	12/15/1992
		Total Manganese	12/15/1992
		Total Iron	12/15/1992
92120231	EFF-2	Semivolatiles	12/15/1992
		Total Cyanide	12/09/1992
		Total Mercury	12/10/1992
		Total Chromium	12/15/1992
		Total Nickel	12/15/1992
		Total Zinc	12/15/1992
		Total Silver	12/09/1992
		Total Arsenic	12/11/1992
		Total Copper	12/14/1992
		Total Lead	12/11/1992
		Total Antimony	12/10/1992
		Total Beryllium	12/15/1992
		Total Calcium	12/15/1992
		Total Manganese	12/15/1992
		Total Iron	12/15/1992

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Semivolatiles

INF-1 Parameter	92120220	Method Detection Limit	Units
N-Nitrosodimethylamine	ND	5.0	ug/L
Phenol	ND	5.0	ug/L
bis(2-Chloroethyl)ether	ND	5.0	ug/L
2-Chlorophenol	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Hexachloroethane	ND	5.0	ug/L
N-Nitrosodi-n-propylamine	ND	5.0	ug/L
Nitrobenzene	ND	5.0	ug/L
Isophorone	ND	5.0	ug/L
2-Nitrophenol	ND	5.0	ug/L
2,4-Dimethylphenol	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
2,4-Dichlorophenol	ND	5.0	ug/L
1,2,4-Trichlorobenzene	ND	5.0	ug/L
Naphthalene	ND	5.0	ug/L
Hexachlorobutadiene	ND	5.0	ug/L
4-Chloro-3-methylphenol	ND	5.0	ug/L
Hexachlorocyclopentadiene	ND	5.0	ug/L
2,4,6-Trichlorophenol	ND	5.0	ug/L
2-Chloronaphthalene	ND	5.0	ug/L
Acenaphthylene	ND	5.0	ug/L
Dimethyl phthalate	ND	5.0	ug/L
2,6-Dinitrotoluene	ND	5.0	ug/L

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Semivolatiles (Continued)

INF-1 Parameter	92120220	Method Detection Limit	Units
Acenaphthene	ND	5.0	ug/L
2,4-Dinitrophenol	ND	10	ug/L
4-Nitrophenol	ND	10	ug/L
2,4-Dinitrotoluene	ND	5.0	ug/L
Fluorene	ND	5.0	ug/L
Diethyl phthalate	4.9 J	5.0	ug/L
4-Chlorophenyl phenyl ether	ND	5.0	ug/L
4,6-Dinitro-2-methylphenol	ND	5.0	ug/L
N-Nitrosodiphenylamine	ND	5.0	ug/L
Azobenzene	ND	5.0	ug/L
4-Bromophenyl phenyl ether	ND	5.0	ug/L
Hexachlorobenzene	ND	5.0	ug/L
Pentachlorophenol	ND	5.0	ug/L
Phenanthrene	ND	5.0	ug/L
Anthracene	ND	5.0	ug/L
Di-n-butyl phthalate	ND	5.0	ug/L
Fluoranthene	ND	5.0	ug/L
Benzidine	ND	5.0	ug/L
Pyrene	ND	5.0	ug/L
Butylbenzyl phthalate	ND	5.0	ug/L
Benzo(a)anthracene	ND	5.0	ug/L
3,3-Dichlorobenzidine	ND	5.0	ug/L
Chrysene	ND	5.0	ug/L
bis(2-Ethylhexyl)phthalate	5.7	5.0	ug/L
Di-n-octyl phthalate	ND	5.0	ug/L
Benzo(b)fluoranthene	ND	5.0	ug/L
Benzo(k)fluoranthene	ND	5.0	ug/L
Benzo(a)pyrene	ND	5.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	5.0	ug/L
Dibenz(a,h)anthracene	ND	5.0	ug/L
Benzo(g,h,i)perylene	ND	5.0	ug/L

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

INF-1 Parameter	92120220	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	30	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	7.8	1.1	ug/L
Total Copper	4.2	0.51	ug/L
Total Lead	2.4	0.46	ug/L
Total Antimony	2.4	2.2	ug/L
Total Beryllium	1.9	1.8	ug/L
Total Calcium	24000	6.1	ug/L
Total Manganese	800	0.60	ug/L
Total Iron	14000	7.2	ug/L

Traditional Parameters

INF-1 Parameter	92120220	Method Detection Limit	Units
Total Cyanide	0.0020	0.0010	mg/L

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

T4-1 Parameter	92120221	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	540	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	5.0	1.1	ug/L
Total Copper	2.0	0.51	ug/L
Total Lead	ND	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	ND	1.8	ug/L
Total Calcium	17000	6.1	ug/L
Total Manganese	190	0.60	ug/L
Total Iron	5000	7.2	ug/L

Traditional Parameters

T4-1 Parameter	92120221	Method Detection Limit	Units
Total Cyanide	0.0080	0.0010	mg/L

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

REJECT-1 Parameter	92120222	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	150	100	ug/L
Total Nickel	110	26	ug/L
Total Zinc	18	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	12	1.1	ug/L
Total Copper	8.7	0.51	ug/L
Total Lead	3.0	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	2.6	1.8	ug/L
Total Calcium	38000	6.1	ug/L
Total Manganese	860	0.60	ug/L
Total Iron	20000	7.2	ug/L

Traditional Parameters

REJECT-1 Parameter	92120222	Method Detection Limit	Units
Total Cyanide	0.0080	0.0010	mg/L

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Semivolatiles

T5-1 Parameter	92120223	Method Detection Limit	Units
N-Nitrosodimethylamine	ND	5.0	ug/L
Phenol	ND	5.0	ug/L
bis(2-Chloroethyl)ether	ND	5.0	ug/L
2-Chlorophenol	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Hexachloroethane	ND	5.0	ug/L
N-Nitrosodi-n-propylamine	ND	5.0	ug/L
Nitrobenzene	ND	5.0	ug/L
Isophorone	ND	5.0	ug/L
2-Nitrophenol	ND	5.0	ug/L
2,4-Dimethylphenol	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
2,4-Dichlorophenol	ND	5.0	ug/L
1,2,4-Trichlorobenzene	ND	5.0	ug/L
Naphthalene	ND	5.0	ug/L
Hexachlorobutadiene	ND	5.0	ug/L
4-Chloro-3-methylphenol	1.8 J	5.0	ug/L
Hexachlorocyclopentadiene	ND	5.0	ug/L
2,4,6-Trichlorophenol	ND	5.0	ug/L
2-Chloronaphthalene	ND	5.0	ug/L
Acenaphthylene	ND	5.0	ug/L
Dimethyl phthalate	ND	5.0	ug/L
2,6-Dinitrotoluene	ND	5.0	ug/L

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Semivolatiles (Continued)

T5-1 Parameter	92120223	Method Detection Limit	Units
Acenaphthene	ND	5.0	ug/L
2,4-Dinitrophenol	ND	10	ug/L
4-Nitrophenol	ND	10	ug/L
2,4-Dinitrotoluene	ND	5.0	ug/L
Fluorene	ND	5.0	ug/L
Diethyl phthalate	ND	5.0	ug/L
4-Chlorophenyl phenyl ether	ND	5.0	ug/L
4,6-Dinitro-2-methylphenol	ND	5.0	ug/L
N-Nitrosodiphenylamine	ND	5.0	ug/L
Azobenzene	ND	5.0	ug/L
4-Bromophenyl phenyl ether	ND	5.0	ug/L
Hexachlorobenzene	ND	5.0	ug/L
Pentachlorophenol	ND	5.0	ug/L
Phenanthrene	ND	5.0	ug/L
Anthracene	ND	5.0	ug/L
Di-n-butyl phthalate	ND	5.0	ug/L
Fluoranthene	ND	5.0	ug/L
Benzidine	ND	5.0	ug/L
Pyrene	ND	5.0	ug/L
Butylbenzyl phthalate	ND	5.0	ug/L
Benzo(a)anthracene	ND	5.0	ug/L
3,3-Dichlorobenzidine	ND	5.0	ug/L
Chrysene	ND	5.0	ug/L
bis(2-Ethylhexyl)phthalate	ND	5.0	ug/L
Di-n-octyl phthalate	1.2 J	5.0	ug/L
Benzo(b)fluoranthene	ND	5.0	ug/L
Benzo(k)fluoranthene	ND	5.0	ug/L
Benzo(a)pyrene	ND	5.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	5.0	ug/L
Dibenz(a,h)anthracene	ND	5.0	ug/L
Benzo(g,h,i)perylene	ND	5.0	ug/L

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

T5-1 Parameter	92120223	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	9.3	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	3.0	1.1	ug/L
Total Copper	3.4	0.51	ug/L
Total Lead	0.90	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	ND	1.8	ug/L
Total Calcium	9400	6.1	ug/L
Total Manganese	93	0.60	ug/L
Total Iron	2000	7.2	ug/L

Traditional Parameters

T5-1 Parameter	92120223	Method Detection Limit	Units
Total Cyanide	0.0090	0.0010	mg/L

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Semivolatiles

SUMP-1 Parameter	92120224	Method Detection Limit	Units
N-Nitrosodimethylamine	ND	5.0	ug/L
Phenol	ND	5.0	ug/L
bis(2-Chloroethyl)ether	ND	5.0	ug/L
2-Chlorophenol	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Hexachloroethane	ND	5.0	ug/L
N-Nitrosodi-n-propylamine	ND	5.0	ug/L
Nitrobenzene	ND	5.0	ug/L
Isophorone	ND	5.0	ug/L
2-Nitrophenol	ND	5.0	ug/L
2,4-Dimethylphenol	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
2,4-Dichlorophenol	ND	5.0	ug/L
1,2,4-Trichlorobenzene	ND	5.0	ug/L
Naphthalene	ND	5.0	ug/L
Hexachlorobutadiene	ND	5.0	ug/L
4-Chloro-3-methylphenol	1.9 J	5.0	ug/L
Hexachlorocyclopentadiene	ND	5.0	ug/L
2,4,6-Trichlorophenol	ND	5.0	ug/L
2-Chloronaphthalene	ND	5.0	ug/L
Acenaphthylene	ND	5.0	ug/L
Dimethyl phthalate	ND	5.0	ug/L
2,6-Dinitrotoluene	ND	5.0	ug/L

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Semivolatiles (Continued)

SUMP-1 Parameter	92120224	Method Detection Limit	Units
Acenaphthene	ND	5.0	ug/L
2,4-Dinitrophenol	ND	10	ug/L
4-Nitrophenol	ND	10	ug/L
2,4-Dinitrotoluene	ND	5.0	ug/L
Fluorene	ND	5.0	ug/L
Diethyl phthalate	ND	5.0	ug/L
4-Chlorophenyl phenyl ether	ND	5.0	ug/L
4,6-Dinitro-2-methylphenol	ND	5.0	ug/L
N-Nitrosodiphenylamine	ND	5.0	ug/L
Azobenzene	ND	5.0	ug/L
4-Bromophenyl phenyl ether	ND	5.0	ug/L
Hexachlorobenzene	ND	5.0	ug/L
Pentachlorophenol	ND	5.0	ug/L
Phenanthrene	ND	5.0	ug/L
Anthracene	ND	5.0	ug/L
Di-n-butyl phthalate	ND	5.0	ug/L
Fluoranthene	ND	5.0	ug/L
Benzidine	ND	5.0	ug/L
Pyrene	ND	5.0	ug/L
Butylbenzyl phthalate	ND	5.0	ug/L
Benzo(a)anthracene	ND	5.0	ug/L
3,3-Dichlorobenzidine	ND	5.0	ug/L
Chrysene	ND	5.0	ug/L
bis(2-Ethylhexyl)phthalate	1.3 J	5.0	ug/L
Di-n-octyl phthalate	ND	5.0	ug/L
Benzo(b)fluoranthene	ND	5.0	ug/L
Benzo(k)fluoranthene	ND	5.0	ug/L
Benzo(a)pyrene	ND	5.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	5.0	ug/L
Dibenz(a,h)anthracene	ND	5.0	ug/L
Benzo(g,h,i)perylene	ND	5.0	ug/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Metals

SUMP-1 Parameter	92120224	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	3.5	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	3.4	1.1	ug/L
Total Copper	3.2	0.51	ug/L
Total Lead	0.50	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	ND	1.8	ug/L
Total Calcium	9100	6.1	ug/L
Total Manganese	91	0.60	ug/L
Total Iron	1900	7.2	ug/L

Traditional Parameters

SUMP-1 Parameter	92120224	Method Detection Limit	Units
Total Cyanide	0.0090	0.0010	mg/L

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Semivolatiles

EFF-1 Parameter	92120225	Method Detection Limit	Units
N-Nitrosodimethylamine	ND	5.0	ug/L
Phenol	ND	5.0	ug/L
bis(2-Chloroethyl)ether	ND	5.0	ug/L
2-Chlorophenol	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Hexachloroethane	ND	5.0	ug/L
N-Nitrosodi-n-propylamine	ND	5.0	ug/L
Nitrobenzene	ND	5.0	ug/L
Isophorone	ND	5.0	ug/L
2-Nitrophenol	ND	5.0	ug/L
2,4-Dimethylphenol	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
2,4-Dichlorophenol	ND	5.0	ug/L
1,2,4-Trichlorobenzene	ND	5.0	ug/L
Naphthalene	ND	5.0	ug/L
Hexachlorobutadiene	ND	5.0	ug/L
4-Chloro-3-methylphenol	ND	5.0	ug/L
Hexachlorocyclopentadiene	ND	5.0	ug/L
2,4,6-Trichlorophenol	ND	5.0	ug/L
2-Chloronaphthalene	ND	5.0	ug/L
Acenaphthylene	ND	5.0	ug/L
Dimethyl phthalate	ND	5.0	ug/L
2,6-Dinitrotoluene	ND	5.0	ug/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Semivolatiles (Continued)

EFF-1 Parameter	92120225	Method Detection Limit	Units
Acenaphthene	ND	5.0	ug/L
2,4-Dinitrophenol	ND	10	ug/L
4-Nitrophenol	ND	10	ug/L
2,4-Dinitrotoluene	ND	5.0	ug/L
Fluorene	ND	5.0	ug/L
Diethyl phthalate	ND	5.0	ug/L
4-Chlorophenyl phenyl ether	ND	5.0	ug/L
4,6-Dinitro-2-methylphenol	ND	5.0	ug/L
N-Nitrosodiphenylamine	ND	5.0	ug/L
Azobenzene	ND	5.0	ug/L
4-Bromophenyl phenyl ether	ND	5.0	ug/L
Hexachlorobenzene	ND	5.0	ug/L
Pentachlorophenol	ND	5.0	ug/L
Phenanthrene	ND	5.0	ug/L
Anthracene	ND	5.0	ug/L
Di-n-butyl phthalate	ND	5.0	ug/L
Fluoranthene	ND	5.0	ug/L
Benzidine	ND	5.0	ug/L
Pyrene	ND	5.0	ug/L
Butylbenzyl phthalate	ND	5.0	ug/L
Benzo(a)anthracene	ND	5.0	ug/L
3,3-Dichlorobenzidine	ND	5.0	ug/L
Chrysene	ND	5.0	ug/L
bis(2-Ethylhexyl)phthalate	1.1 J	5.0	ug/L
Di-n-octyl phthalate	ND	5.0	ug/L
Benzo(b)fluoranthene	ND	5.0	ug/L
Benzo(k)fluoranthene	ND	5.0	ug/L
Benzo(a)pyrene	ND	5.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	5.0	ug/L
Dibenz(a,h)anthracene	ND	5.0	ug/L
Benzo(g,h,i)perylene	ND	5.0	ug/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Metals

EFF-1 Parameter	92120225	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	11	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	2.3	1.1	ug/L
Total Copper	2.4	0.51	ug/L
Total Lead	ND	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	ND	1.8	ug/L
Total Calcium	5400	6.1	ug/L
Total Manganese	22	0.60	ug/L

Traditional Parameters

EFF-1 Parameter	92120225	Method Detection Limit	Units
Total Cyanide	ND	0.0010	mg/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Semivolatiles

INF-2 Parameter	92120226	Method Detection Limit	Units
N-Nitrosodimethylamine	ND	5.0	ug/L
Phenol	ND	5.0	ug/L
bis(2-Chloroethyl)ether	ND	5.0	ug/L
2-Chlorophenol	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Hexachloroethane	ND	5.0	ug/L
N-Nitrosodi-n-propylamine	ND	5.0	ug/L
Nitrobenzene	ND	5.0	ug/L
Isophorone	ND	5.0	ug/L
2-Nitrophenol	ND	5.0	ug/L
2,4-Dimethylphenol	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
2,4-Dichlorophenol	ND	5.0	ug/L
1,2,4-Trichlorobenzene	ND	5.0	ug/L
Naphthalene	ND	5.0	ug/L
Hexachlorobutadiene	ND	5.0	ug/L
4-Chloro-3-methylphenol	ND	5.0	ug/L
Hexachlorocyclopentadiene	ND	5.0	ug/L
2,4,6-Trichlorophenol	ND	5.0	ug/L
2-Chloronaphthalene	ND	5.0	ug/L
Acenaphthylene	ND	5.0	ug/L
Dimethyl phthalate	ND	5.0	ug/L
2,6-Dinitrotoluene	ND	5.0	ug/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Semivolatiles
(Continued)

INF-2 Parameter	92120226	Method Detection Limit	Units
Acenaphthene	ND	5.0	ug/L
2,4-Dinitrophenol	ND	10	ug/L
4-Nitrophenol	ND	10	ug/L
2,4-Dinitrotoluene	ND	5.0	ug/L
Fluorene	ND	5.0	ug/L
Diethyl phthalate	ND	5.0	ug/L
4-Chlorophenyl phenyl ether	ND	5.0	ug/L
4,6-Dinitro-2-methylphenol	ND	5.0	ug/L
N-Nitrosodiphenylamine	ND	5.0	ug/L
Azobenzene	ND	5.0	ug/L
4-Bromophenyl phenyl ether	ND	5.0	ug/L
Hexachlorobenzene	ND	5.0	ug/L
Pentachlorophenol	ND	5.0	ug/L
Phenanthrene	ND	5.0	ug/L
Anthracene	ND	5.0	ug/L
Di-n-butyl phthalate	ND	5.0	ug/L
Fluoranthene	ND	5.0	ug/L
Benzidine	ND	5.0	ug/L
Pyrene	ND	5.0	ug/L
Butylbenzyl phthalate	ND	5.0	ug/L
Benzo(a)anthracene	ND	5.0	ug/L
3,3-Dichlorobenzidine	ND	5.0	ug/L
Chrysene	ND	5.0	ug/L
bis(2-Ethylhexyl)phthalate	1.4 J	5.0	ug/L
Di-n-octyl phthalate	ND	5.0	ug/L
Benzo(b)fluoranthene	ND	5.0	ug/L
Benzo(k)fluoranthene	ND	5.0	ug/L
Benzo(a)pyrene	ND	5.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	5.0	ug/L
Dibenz(a,h)anthracene	ND	5.0	ug/L
Benzo(g,h,i)perylene	ND	5.0	ug/L

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

INF-2 Parameter	92120226	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	21	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	8.6	1.1	ug/L
Total Copper	3.9	0.51	ug/L
Total Lead	0.95	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	2.1	1.8	ug/L
Total Calcium	23000	6.1	ug/L
Total Manganese	750	0.60	ug/L
Total Iron	14000	7.2	ug/L

Traditional Parameters

INF-2 Parameter	92120226	Method Detection Limit	Units
Total Cyanide	0.0020	0.0010	mg/L

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

T4-2 Parameter	92120227	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	6.2	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	5.6	1.1	ug/L
Total Copper	1.8	0.51	ug/L
Total Lead	ND	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	ND	1.8	ug/L
Total Calcium	14000	6.1	ug/L
Total Manganese	280	0.60	ug/L
Total Iron	5700	7.2	ug/L

Traditional Parameters

T4-2 Parameter	92120227	Method Detection Limit	Units
Total Cyanide	0.011	0.0010	mg/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Metals

REJECT-2 Parameter	92120228	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	13	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	10	1.1	ug/L
Total Copper	2.6	0.51	ug/L
Total Lead	1.3	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	2.1	1.8	ug/L
Total Calcium	26000	6.1	ug/L
Total Manganese	840	0.60	ug/L
Total Iron	19000	7.2	ug/L

Traditional Parameters

REJECT-2 Parameter	92120228	Method Detection Limit	Units
Total Cyanide	0.0080	0.0010	mg/L

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Semivolatiles

T5-2 Parameter	92120229	Method Detection Limit	Units
N-Nitrosodimethylamine	ND	5.0	ug/L
Phenol	ND	5.0	ug/L
bis(2-Chloroethyl)ether	ND	5.0	ug/L
2-Chlorophenol	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Hexachloroethane	ND	5.0	ug/L
N-Nitrosodi-n-propylamine	ND	5.0	ug/L
Nitrobenzene	ND	5.0	ug/L
Isophorone	ND	5.0	ug/L
2-Nitrophenol	ND	5.0	ug/L
2,4-Dimethylphenol	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
2,4-Dichlorophenol	ND	5.0	ug/L
1,2,4-Trichlorobenzene	ND	5.0	ug/L
Naphthalene	ND	5.0	ug/L
Hexachlorobutadiene	ND	5.0	ug/L
4-Chloro-3-methylphenol	ND	5.0	ug/L
Hexachlorocyclopentadiene	2.8 J	5.0	ug/L
2,4,6-Trichlorophenol	ND	5.0	ug/L
2-Chloronaphthalene	ND	5.0	ug/L
Acenaphthylene	ND	5.0	ug/L
Dimethyl phthalate	ND	5.0	ug/L
2,6-Dinitrotoluene	ND	5.0	ug/L
	ND	5.0	ug/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Semivolatiles (Continued)

T5-2 Parameter	92120229	Method Detection Limit	Units
Acenaphthene	ND	5.0	ug/L
2,4-Dinitrophenol	ND	10	ug/L
4-Nitrophenol	ND	10	ug/L
2,4-Dinitrotoluene	ND	5.0	ug/L
Fluorene	ND	5.0	ug/L
Diethyl phthalate	ND	5.0	ug/L
4-Chlorophenyl phenyl ether	ND	5.0	ug/L
4,6-Dinitro-2-methylphenol	ND	5.0	ug/L
N-Nitrosodiphenylamine	ND	5.0	ug/L
Azobenzene	ND	5.0	ug/L
4-Bromophenyl phenyl ether	ND	5.0	ug/L
Hexachlorobenzene	ND	5.0	ug/L
Pentachlorophenol	ND	5.0	ug/L
Phenanthrene	ND	5.0	ug/L
Anthracene	ND	5.0	ug/L
Di-n-butyl phthalate	ND	5.0	ug/L
Fluoranthene	ND	5.0	ug/L
Benzidine	ND	5.0	ug/L
Pyrene	ND	5.0	ug/L
Butylbenzyl phthalate	ND	5.0	ug/L
Benzo(a)anthracene	ND	5.0	ug/L
3,3-Dichlorobenzidine	ND	5.0	ug/L
Chrysene	ND	5.0	ug/L
bis(2-Ethylhexyl)phthalate	1.6 J	5.0	ug/L
Di-n-octyl phthalate	ND	5.0	ug/L
Benzo(b)fluoranthene	ND	5.0	ug/L
Benzo(k)fluoranthene	ND	5.0	ug/L
Benzo(a)pyrene	ND	5.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	5.0	ug/L
Dibenz(a,h)anthracene	ND	5.0	ug/L
Benzo(g,h,i)perylene	ND	5.0	ug/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Metals

T5-2 Parameter	92120229	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	4.6	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	4.4	1.1	ug/L
Total Copper	2.6	0.51	ug/L
Total Lead	0.80	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	ND	1.8	ug/L
Total Calcium	11000	6.1	ug/L
Total Manganese	200	0.60	ug/L
Total Iron	4400	7.2	ug/L

Traditional Parameters

T5-2 Parameter	92120229	Method Detection Limit	Units
Total Cyanide	0.0080	0.0010	mg/L

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Semivolatiles

SUMP-2 Parameter	92120230	Method Detection Limit	Units
N-Nitrosodimethylamine	ND	5.0	ug/L
Phenol	ND	5.0	ug/L
bis(2-Chloroethyl)ether	ND	5.0	ug/L
2-Chlorophenol	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Hexachloroethane	ND	5.0	ug/L
N-Nitrosodi-n-propylamine	ND	5.0	ug/L
Nitrobenzene	ND	5.0	ug/L
Isophorone	ND	5.0	ug/L
2-Nitrophenol	ND	5.0	ug/L
2,4-Dimethylphenol	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
2,4-Dichlorophenol	ND	5.0	ug/L
1,2,4-Trichlorobenzene	ND	5.0	ug/L
Naphthalene	ND	5.0	ug/L
Hexachlorobutadiene	ND	5.0	ug/L
4-Chloro-3-methylphenol	2.7 J	5.0	ug/L
Hexachlorocyclopentadiene	ND	5.0	ug/L
2,4,6-Trichlorophenol	ND	5.0	ug/L
2-Chloronaphthalene	ND	5.0	ug/L
Acenaphthylene	ND	5.0	ug/L
Dimethyl phthalate	ND	5.0	ug/L
2,6-Dinitrotoluene	ND	5.0	ug/L

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Semivolatiles (Continued)

SUMP-2 Parameter	92120230	Method Detection Limit	Units
Acenaphthene	ND	5.0	ug/L
2,4-Dinitrophenol	ND	10	ug/L
4-Nitrophenol	ND	10	ug/L
2,4-Dinitrotoluene	ND	5.0	ug/L
Fluorene	ND	5.0	ug/L
Diethyl phthalate	ND	5.0	ug/L
4-Chlorophenyl phenyl ether	ND	5.0	ug/L
4,6-Dinitro-2-methylphenol	ND	5.0	ug/L
N-Nitrosodiphenylamine	ND	5.0	ug/L
Azobenzene	ND	5.0	ug/L
4-Bromophenyl phenyl ether	ND	5.0	ug/L
Hexachlorobenzene	ND	5.0	ug/L
Pentachlorophenol	ND	5.0	ug/L
Phenanthrene	ND	5.0	ug/L
Anthracene	ND	5.0	ug/L
Di-n-butyl phthalate	ND	5.0	ug/L
Fluoranthene	ND	5.0	ug/L
Benzidine	ND	5.0	ug/L
Pyrene	ND	5.0	ug/L
Butylbenzyl phthalate	ND	5.0	ug/L
Benzo(a)anthracene	ND	5.0	ug/L
3,3-Dichlorobenzidine	ND	5.0	ug/L
Chrysene	ND	5.0	ug/L
bis(2-Ethylhexyl)phthalate	1.1 J	5.0	ug/L
Di-n-octyl phthalate	ND	5.0	ug/L
Benzo(b)fluoranthene	ND	5.0	ug/L
Benzo(k)fluoranthene	ND	5.0	ug/L
Benzo(a)pyrene	ND	5.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	5.0	ug/L
Dibenz(a,h)anthracene	ND	5.0	ug/L
Benzo(g,h,i)perylene	ND	5.0	ug/L

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

SUMP-2 Parameter	92120230	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	11	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	3.9	1.1	ug/L
Total Copper	3.2	0.51	ug/L
Total Lead	0.55	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	ND	1.8	ug/L
Total Calcium	10000	6.1	ug/L
Total Manganese	190	0.60	ug/L
Total Iron	4300	7.2	ug/L

Traditional Parameters

SUMP-2 Parameter	92120230	Method Detection Limit	Units
Total Cyanide	0.0080	0.0010	mg/L

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Semivolatiles

EFF-2 Parameter	92120231	Method Detection Limit	Units
N-Nitrosodimethylamine	ND	5.0	ug/L
Phenol	ND	5.0	ug/L
bis(2-Chloroethyl)ether	ND	5.0	ug/L
2-Chlorophenol	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Hexachloroethane	ND	5.0	ug/L
N-Nitrosodi-n-propylamine	ND	5.0	ug/L
Nitrobenzene	ND	5.0	ug/L
Isophorone	ND	5.0	ug/L
2-Nitrophenol	ND	5.0	ug/L
2,4-Dimethylphenol	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
2,4-Dichlorophenol	ND	5.0	ug/L
1,2,4-Trichlorobenzene	ND	5.0	ug/L
Naphthalene	ND	5.0	ug/L
Hexachlorobutadiene	ND	5.0	ug/L
4-Chloro-3-methylphenol	ND	5.0	ug/L
Hexachlorocyclopentadiene	ND	5.0	ug/L
2,4,6-Trichlorophenol	ND	5.0	ug/L
2-Chloronaphthalene	ND	5.0	ug/L
Acenaphthylene	ND	5.0	ug/L
Dimethyl phthalate	ND	5.0	ug/L
2,6-Dinitrotoluene	ND	5.0	ug/L

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Semivolatiles (Continued)

EFF-2 Parameter	92120231	Method Detection Limit	Units
Acenaphthene	ND	5.0	ug/L
2,4-Dinitrophenol	ND	10	ug/L
4-Nitrophenol	ND	10	ug/L
2,4-Dinitrotoluene	ND	5.0	ug/L
Fluorene	ND	5.0	ug/L
Diethyl phthalate	1.5 J	5.0	ug/L
4-Chlorophenyl phenyl ether	ND	5.0	ug/L
4,6-Dinitro-2-methylphenol	ND	5.0	ug/L
N-Nitrosodiphenylamine	ND	5.0	ug/L
Azobenzene	ND	5.0	ug/L
4-Bromophenyl phenyl ether	ND	5.0	ug/L
Hexachlorobenzene	ND	5.0	ug/L
Pentachlorophenol	ND	5.0	ug/L
Phenanthrene	ND	5.0	ug/L
Anthracene	ND	5.0	ug/L
Di-n-butyl phthalate	ND	5.0	ug/L
Fluoranthene	ND	5.0	ug/L
Benzidine	ND	5.0	ug/L
Pyrene	ND	5.0	ug/L
Butylbenzyl phthalate	ND	5.0	ug/L
Benzo(a)anthracene	ND	5.0	ug/L
3,3-Dichlorobenzidine	ND	5.0	ug/L
Chrysene	ND	5.0	ug/L
bis(2-Ethylhexyl)phthalate	ND	5.0	ug/L
Di-n-octyl phthalate	ND	5.0	ug/L
Benzo(b)fluoranthene	ND	5.0	ug/L
Benzo(k)fluoranthene	ND	5.0	ug/L
Benzo(a)pyrene	ND	5.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	5.0	ug/L
Dibenz(a,h)anthracene	ND	5.0	ug/L
Benzo(g,h,i)perylene	ND	5.0	ug/L

REPORT NUMBER: 92E-0890

22-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

EFF-2 Parameter	92120231	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	10	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	2.9	1.1	ug/L
Total Copper	2.8	0.51	ug/L
Total Lead	0.75	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	ND	1.8	ug/L
Total Calcium	5500	6.1	ug/L
Total Manganese	40	0.60	ug/L
Total Iron	760	7.2	ug/L

Traditional Parameters

EFF-2 Parameter	92120231	Method Detection Limit	Units
Total Cyanide	0.0020	0.0010	mg/L

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

INF-3A

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120112

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1763

Level: (low/med) LOW Date Received: 12/05/92

% Moisture: not dec.---- Date Analyzed: 12/07/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	5.	U D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	370.	D
108-90-7	Chlorobenzene	110.	D
100-41-4	Ethylbenzene	17.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	31.	D
XXX-XX-X	m&p-Xylene	80.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	250.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

T5-3A

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120113

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1764

Level: (low/med) LOW Date Received: 12/05/92

% Moisture: not dec.---- Date Analyzed: 12/07/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	5.	U D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	280.	D
108-90-7	Chlorobenzene	84.	D
100-41-4	Ethylbenzene	13.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	21.	D
XXX-XX-X	m&p-Xylene	45.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	190.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

SUMP-3A

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120114

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1765

Level: (low/med) LOW Date Received: 12/05/92

% Moisture: not dec.---- Date Analyzed: 12/07/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene_Chloride	1.	U
34-04-4	Methyl t-Butyl_Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene,_trans	1.	U
150-60-5	1,2-Dichloroethene,_cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	15.	
108-90-7	Chlorobenzene	7.	
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	
XXX-XX-X	m&p-Xylene	2.	
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	14.	
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

1 1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

EFF-3A

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120115

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1766

Level: (low/med) LOW Date Received: 12/05/92

% Moisture: not dec.---- Date Analyzed: 12/07/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	1.	U
108-90-7	Chlorobenzene	1.	U
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	1.	U
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

INF-3B

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120116

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1767

Level: (low/med) LOW Date Received: 12/05/92

% Moisture: not dec.---- Date Analyzed: 12/07/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	5.	U D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	350.	D
108-90-7	Chlorobenzene	110.	D
100-41-4	Ethylbenzene	16.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	29.	D
XXX-XX-X	m&p-Xylene	70.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	230.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

T5-3B

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120117

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1768

Level: (low/med) LOW Date Received: 12/05/92

% Moisture: not dec.---- Date Analyzed: 12/07/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	5.	U D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	280.	D
108-90-7	Chlorobenzene	86.	D
100-41-4	Ethylbenzene	12.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	20.	D
XXX-XX-X	m&p-Xylene	44.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	180.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

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VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

SUMP-3B

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120118

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1769

Level: (low/med) LOW Date Received: 12/05/92

% Moisture: not dec.---- Date Analyzed: 12/07/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	13.	
108-90-7	Chlorobenzene	6.	
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	1.	
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	12.	
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

EFF-3B

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120119

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1770

Level: (low/med) LOW Date Received: 12/05/92

% Moisture: not dec.---- Date Analyzed: 12/07/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	1.	U
108-90-7	Chlorobenzene	1.	U
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	1.	U
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

INF-3C

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120120

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1771

Level: (low/med) LOW Date Received: 12/05/92

% Moisture: not dec.---- Date Analyzed: 12/07/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene_Chloride	5.	U D
34-04-4	Methyl t-Butyl_Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene,_trans	5.	U D
150-60-5	1,2-Dichloroethene,_cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	380.	D
108-90-7	Chlorobenzene	120.	D
100-41-4	Ethylbenzene	18.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	33.	D
XXX-XX-X	m&p-Xylene	83.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	250.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

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VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

T5-3C

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120121

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1773

Level: (low/med) LOW Date Received: 12/05/92

% Moisture: not dec.---- Date Analyzed: 12/08/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	5.	U D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	280.	D
108-90-7	Chlorobenzene	83.	D
100-41-4	Ethylbenzene	12.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	21.	D
XXX-XX-X	m&p-Xylene	48.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	170.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

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VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

SUMP-3C

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120122

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1776

Level: (low/med) LOW Date Received: 12/05/92

% Moisture: not dec.---- Date Analyzed: 12/08/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene_Chloride	1.	U
34-04-4	Methyl t-Butyl_Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene,_trans	1.	U
150-60-5	1,2-Dichloroethene,_cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	11.	
108-90-7	Chlorobenzene	7.	
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	2.	
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	11.	
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

EFF-3C

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120123

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1777

Level: (low/med) LOW Date Received: 12/05/92

% Moisture: not dec.---- Date Analyzed: 12/08/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	1.	U
108-90-7	Chlorobenzene	1.	U
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	1.	U
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

Environmental Technology Center

CIBA-GEIGY Corporation
P.O. Box 18300
410 Swing Road
Greensboro, North Carolina 27419
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CIBA–GEIGY

December 8, 1992

Diana Baldi
Corporate Enivronmental Technology Center
CIBA-GEIGY Corporation
P.O. Box 18300
Greensboro, North Carolina 27419-8300

Diana:

Attached are GC/MS results for CETAC samples 92120077 through 92120100. These samples were submitted under the "Cranston In Lab" project.

If you have any questions, please call Tom Barber at extension 7297.

Respectfully Submitted,

Susan Price 12/8/92
Susan Price Date
Assistant Chemist

Data Reviewed by,

Tom Bl 12/9/92
Tom Barber Date
Group Leader

D:\DECEMBER\BALD1208

1 1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

INF-1A

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120077

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1729

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/05/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	5.	U D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	1.	J D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	230.	D
108-90-7	Chlorobenzene	86.	D
100-41-4	Ethylbenzene	6.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	19.	D
XXX-XX-X	m&p-Xylene	39.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	150.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

T5-1A

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120078

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1730

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/05/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene_Chloride	5.	U D
34-04-4	Methyl t-Butyl_Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene,_trans	5.	U D
150-60-5	1,2-Dichloroethene,_cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	120.	D
108-90-7	Chlorobenzene	58.	D
100-41-4	Ethylbenzene	5.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	14.	D
XXX-XX-X	m&p-Xylene	27.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	95.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

SUMP-1A

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120079

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1731

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/05/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	1.	U
108-90-7	Chlorobenzene	6.	
100-41-4	Ethylbenzene	4.	
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	1.	U
96-18-4	1,2,3-Trichloropropane	1.	
95-49-8	2-Chlorotoluene	1.	U
106-43-4	4-Chlorotoluene	6.	
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

1 1A CUSTOMER SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

EFF-1A

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120080

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1732

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/05/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	1.	U
108-90-7	Chlorobenzene	1.	U
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	1.	U
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

1 1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

INF-1B

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120081

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1733

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/05/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	5.	U D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	310.	D
108-90-7	Chlorobenzene	67.	D
100-41-4	Ethylbenzene	10.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	23.	D
XXX-XX-X	m&p-Xylene	54.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	170.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

T5-1B

Lab Name: CET ANALYTICAL CHEMISTRY Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120082

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1734

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/05/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	5.	U D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	5.	U D
108-90-7	Chlorobenzene	200.	D
100-41-4	Ethylbenzene	50.	D
100-42-5	Styrene	9.	D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	5.	U D
XXX-XX-X	m&p-Xylene	19.	D
96-18-4	1,2,3-Trichloropropane	43.	D
95-49-8	2-Chlorotoluene	5.	U D
106-43-4	4-Chlorotoluene	120.	D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

SUMP-1B

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120083

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1735

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/05/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	7.	
108-90-7	Chlorobenzene	3.	
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	1.	
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	6.	
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

EFF-1B

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120084

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1736

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/05/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	1.	U
108-90-7	Chlorobenzene	1.	U
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	1.	U
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

INF-1C

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120085

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1737

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/05/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	5.	U D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	360.	D
108-90-7	Chlorobenzene	100.	D
100-41-4	Ethylbenzene	12.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	27.	D
XXX-XX-X	m&p-Xylene	61.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	210.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

T5-1C

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120086

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1739

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/05/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	5.	U D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	220.	D
108-90-7	Chlorobenzene	55.	D
100-41-4	Ethylbenzene	9.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	18.	D
XXX-XX-X	m&p-Xylene	43.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	130.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

SUMP-1C

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120087

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1740

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/05/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	8.	
108-90-7	Chlorobenzene	4.	
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	9.	
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

EFF-1C

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120088

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1741

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/06/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	4.	
108-90-7	Chlorobenzene	2.	
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	1.	U
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

INF-2A

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120089

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1746

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/06/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	5.	U D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	440.	D
108-90-7	Chlorobenzene	110.	D
100-41-4	Ethylbenzene	19.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	33.	D
XXX-XX-X	m&p-Xylene	90.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	240.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

INF-2B

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120090

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1747

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/06/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	5.	U D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	420.	D
108-90-7	Chlorobenzene	93.	D
100-41-4	Ethylbenzene	18.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	32.	D
XXX-XX-X	m&p-Xylene	83.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	230.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

INF-2C

Lab Name: CET ANALYTICAL CHEMISTRY Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120091

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1748

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/06/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	5.	U D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	5.	U D
108-90-7	Chlorobenzene	430.	D
100-41-4	Ethylbenzene	88.	D
100-42-5	Styrene	19.	D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	5.	U D
XXX-XX-X	m&p-Xylene	33.	D
96-18-4	1,2,3-Trichloropropane	89.	D
95-49-8	2-Chlorotoluene	5.	U D
106-43-4	4-Chlorotoluene	230.	D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

T5-2A

Lab Name: CET ANALYTICAL CHEMISTRY Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120092

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1749

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/06/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	5.	U D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	340.	D
108-90-7	Chlorobenzene	80.	D
100-41-4	Ethylbenzene	13.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	21.	D
XXX-XX-X	m&p-Xylene	51.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	170.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

T5-2B

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120093

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1750

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/06/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	5.	U D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	340.	D
108-90-7	Chlorobenzene	77.	D
100-41-4	Ethylbenzene	13.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	21.	D
XXX-XX-X	m&p-Xylene	49.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	180.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

T5-2C

Lab Name: CET ANALYTICAL CHEMISTRY Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120094

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1752

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/06/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	5.	U D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	320.	D
108-90-7	Chlorobenzene	75.	D
100-41-4	Ethylbenzene	13.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	20.	D
XXX-XX-X	m&p-Xylene	47.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	170.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

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VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

SUMP-2A

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120095

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1755

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/06/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	18.	
108-90-7	Chlorobenzene	7.	
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	1.	
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	13.	
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

SUMP-2B

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120096

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1756

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/06/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	15.	
108-90-7	Chlorobenzene	5.	
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	1.	
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	11.	
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

SUMP-2C

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120097

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1757

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/06/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	13.	
108-90-7	Chlorobenzene	5.	
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	1.	
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	10.	
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

EFF-2A

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120098

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1758

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/07/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene_Chloride	1.	U
34-04-4	Methyl t-Butyl_Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene,_trans	1.	U
150-60-5	1,2-Dichloroethene,_cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	1.	U
108-90-7	Chlorobenzene	1.	U
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	1.	U
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

EFF-2B

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120099

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1759

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/07/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	1.	U
108-90-7	Chlorobenzene	1.	U
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	1.	U
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

EFF-2C

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120100

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1760

Level: (low/med) LOW Date Received: 12/04/92

% Moisture: not dec.---- Date Analyzed: 12/07/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	1.	U
108-90-7	Chlorobenzene	1.	U
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	1.	U
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

REPORT NUMBER: 92E-0900

23-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Date Sampled	Date Received
92120300	INF-3	12/04/1992	12/07/1992
92120301	T5-3	12/04/1992	12/07/1992
92120302	SUMP-3	12/04/1992	12/07/1992
92120304	REJECT-3	12/04/1992	12/07/1992
92120305	T4-3	12/04/1992	12/07/1992
92120336	INF-4	12/05/1992	12/08/1992
92120337	T5-4	12/05/1992	12/08/1992
92120338	SUMP-4	12/05/1992	12/08/1992
92120339	REJECT-4	12/05/1992	12/08/1992
92120340	T4-4	12/05/1992	12/08/1992

Sample #	Sample Description	Parameter	Date Extracted
92120300	INF-3	Semivolatiles	12/08/1992
92120301	T5-3	Semivolatiles	12/08/1992
92120302	SUMP-3	Semivolatiles	12/08/1992
92120336	INF-4	Semivolatiles	12/09/1992
92120337	T5-4	Semivolatiles	12/09/1992
92120338	SUMP-4	Semivolatiles	12/09/1992

REPORT NUMBER: 92E-0900

23-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Parameter	Date Analyzed
92120300	INF-3	Semivolatiles	12/16/1992
		Total Cyanide	12/09/1992
		Total Mercury	12/10/1992
		Total Chromium	12/15/1992
		Total Nickel	12/15/1992
		Total Zinc	12/15/1992
		Total Silver	12/09/1992
		Total Arsenic	12/11/1992
		Total Copper	12/14/1992
		Total Lead	12/11/1992
		Total Antimony	12/10/1992
		Total Beryllium	12/15/1992
		Total Calcium	12/15/1992
		Total Manganese	12/15/1992
		Total Iron	12/15/1992
92120301	T5-3	Semivolatiles	12/16/1992
		Total Cyanide	12/09/1992
		Total Mercury	12/10/1992
		Total Chromium	12/15/1992
		Total Nickel	12/15/1992
		Total Zinc	12/15/1992
		Total Silver	12/09/1992
		Total Arsenic	12/11/1992
		Total Copper	12/14/1992
		Total Lead	12/11/1992
		Total Antimony	12/10/1992
		Total Beryllium	12/15/1992
		Total Calcium	12/15/1992
		Total Manganese	12/15/1992
		Total Iron	12/15/1992

REPORT NUMBER: 92E-0900

23-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Parameter	Date Analyzed
92120302	SUMP-3	Semivolatiles	12/16/1992
		Total Cyanide	12/09/1992
		Total Mercury	12/10/1992
		Total Chromium	12/15/1992
		Total Nickel	12/15/1992
		Total Zinc	12/15/1992
		Total Silver	12/09/1992
		Total Arsenic	12/11/1992
		Total Copper	12/14/1992
		Total Lead	12/11/1992
		Total Antimony	12/10/1992
		Total Beryllium	12/15/1992
		Total Calcium	12/15/1992
		Total Manganese	12/15/1992
		Total Iron	12/15/1992
92120304	REJECT-3	Total Cyanide	12/09/1992
		Total Mercury	12/10/1992
		Total Chromium	12/15/1992
		Total Nickel	12/15/1992
		Total Zinc	12/15/1992
		Total Silver	12/09/1992
		Total Arsenic	12/11/1992
		Total Copper	12/14/1992
		Total Lead	12/11/1992
		Total Antimony	12/10/1992
		Total Beryllium	12/15/1992
		Total Calcium	12/15/1992
		Total Manganese	12/15/1992
		Total Iron	12/15/1992

REPORT NUMBER: 92E-0900

23-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Parameter	Date Analyzed
92120305	T4-3	Total Cyanide	12/09/1992
		Total Mercury	12/10/1992
		Total Chromium	12/15/1992
		Total Nickel	12/15/1992
		Total Zinc	12/15/1992
		Total Silver	12/09/1992
		Total Arsenic	12/11/1992
		Total Copper	12/14/1992
		Total Lead	12/11/1992
		Total Antimony	12/10/1992
		Total Beryllium	12/15/1992
		Total Calcium	12/15/1992
		Total Manganese	12/15/1992
		Total Iron	12/15/1992
92120336	INF-4	Semivolatiles	12/17/1992
		Total Cyanide	12/09/1992
		Total Mercury	12/10/1992
		Total Chromium	12/15/1992
		Total Nickel	12/15/1992
		Total Zinc	12/15/1992
		Total Silver	12/09/1992
		Total Arsenic	12/11/1992
		Total Copper	12/14/1992
		Total Lead	12/11/1992
		Total Antimony	12/10/1992
		Total Beryllium	12/15/1992
		Total Calcium	12/15/1992
		Total Manganese	12/15/1992
		Total Iron	12/15/1992

REPORT NUMBER: 92E-0900

23-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Parameter	Date Analyzed
92120337	T5-4	Semivolatiles	12/17/1992
		Total Cyanide	12/09/1992
		Total Mercury	12/10/1992
		Total Chromium	12/15/1992
		Total Nickel	12/15/1992
		Total Zinc	12/15/1992
		Total Silver	12/09/1992
		Total Arsenic	12/11/1992
		Total Copper	12/14/1992
		Total Lead	12/11/1992
		Total Antimony	12/10/1992
		Total Beryllium	12/15/1992
		Total Calcium	12/15/1992
		Total Manganese	12/15/1992
		Total Iron	12/15/1992
92120338	SUMP-4	Semivolatiles	12/17/1992
		Total Cyanide	12/09/1992
		Total Mercury	12/10/1992
		Total Chromium	12/15/1992
		Total Nickel	12/15/1992
		Total Zinc	12/15/1992
		Total Silver	12/09/1992
		Total Arsenic	12/11/1992
		Total Copper	12/14/1992
		Total Lead	12/11/1992
		Total Antimony	12/10/1992
		Total Beryllium	12/15/1992
		Total Calcium	12/15/1992
		Total Manganese	12/15/1992
		Total Iron	12/15/1992

REPORT NUMBER: 92E-0900

23-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Parameter	Date Analyzed
92120339	REJECT-4	Total Cyanide	12/09/1992
		Total Mercury	12/10/1992
		Total Chromium	12/15/1992
		Total Nickel	12/15/1992
		Total Zinc	12/15/1992
		Total Silver	12/09/1992
		Total Arsenic	12/11/1992
		Total Copper	12/14/1992
		Total Lead	12/11/1992
		Total Antimony	12/10/1992
		Total Beryllium	12/15/1992
		Total Calcium	12/15/1992
		Total Manganese	12/15/1992
		Total Iron	12/15/1992
92120340	T4-4	Total Cyanide	12/09/1992
		Total Mercury	12/10/1992
		Total Chromium	12/15/1992
		Total Nickel	12/15/1992
		Total Zinc	12/15/1992
		Total Silver	12/09/1992
		Total Arsenic	12/11/1992
		Total Copper	12/14/1992
		Total Lead	12/11/1992
		Total Antimony	12/10/1992
		Total Beryllium	12/15/1992
		Total Calcium	12/15/1992
		Total Manganese	12/15/1992
		Total Iron	12/15/1992

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Definitions

N/A	Not applicable
ND	Not detected at or above method detection limit.
J	Detected but below method detection limit.
B	Analyte detected in blank but not corrected for amount in blank.
Method Detection Limit	Lowest concentration (amount) that must be present before a reliable and recognizable response is observed for that method of analysis. When a sample has been diluted, the Method Detection Limit has been multiplied by the dilution factor.

Methodology

Semivolatile organic analyses were performed in accordance with Method 625, 40 CFR 136.

ICP metals analyses were performed in accordance with Method 200.7, 40 CFR 136.

Furnace metals and cyanide analyses were performed in accordance with EPA Test Methods for the Chemical Analysis of Water and Wastes.

REPORT NUMBER: 92E-0900

23-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Semivolatiles

INF-3 Parameter	92120300	Method Detection Limit	Units
N-Nitrosodimethylamine	ND	5.0	ug/L
Phenol	ND	5.0	ug/L
bis(2-Chloroethyl)ether	ND	5.0	ug/L
2-Chlorophenol	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	1.6 J	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Hexachloroethane	ND	5.0	ug/L
N-Nitrosodi-n-propylamine	ND	5.0	ug/L
Nitrobenzene	ND	5.0	ug/L
Isophorone	ND	5.0	ug/L
2-Nitrophenol	ND	5.0	ug/L
2,4-Dimethylphenol	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
2,4-Dichlorophenol	ND	5.0	ug/L
1,2,4-Trichlorobenzene	ND	5.0	ug/L
Naphthalene	ND	5.0	ug/L
Hexachlorobutadiene	ND	5.0	ug/L
4-Chloro-3-methylphenol	ND	5.0	ug/L
Hexachlorocyclopentadiene	ND	5.0	ug/L
2,4,6-Trichlorophenol	ND	5.0	ug/L
2-Chloronaphthalene	ND	5.0	ug/L
Acenaphthylene	ND	5.0	ug/L
Dimethyl phthalate	ND	5.0	ug/L
2,6-Dinitrotoluene	ND	5.0	ug/L

REPORT NUMBER: 92E-0900
23-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Semivolatiles
(Continued)

INF-3 Parameter	92120300	Method Detection Limit	Units
Acenaphthene	ND	5.0	ug/L
2,4-Dinitrophenol	ND	10	ug/L
4-Nitrophenol	ND	10	ug/L
2,4-Dinitrotoluene	ND	5.0	ug/L
Fluorene	ND	5.0	ug/L
Diethyl phthalate	1.9 J	5.0	ug/L
4-Chlorophenyl phenyl ether	ND	5.0	ug/L
4,6-Dinitro-2-methylphenol	ND	5.0	ug/L
N-Nitrosodiphenylamine	ND	5.0	ug/L
Azobenzene	ND	5.0	ug/L
4-Bromophenyl phenyl ether	ND	5.0	ug/L
Hexachlorobenzene	ND	5.0	ug/L
Pentachlorophenol	ND	5.0	ug/L
Phenanthrene	ND	5.0	ug/L
Anthracene	ND	5.0	ug/L
Di-n-butyl phthalate	ND	5.0	ug/L
Fluoranthene	ND	5.0	ug/L
Benzidine	ND	5.0	ug/L
Pyrene	ND	5.0	ug/L
Butylbenzyl phthalate	ND	5.0	ug/L
Benzo(a)anthracene	ND	5.0	ug/L
3,3-Dichlorobenzidine	ND	5.0	ug/L
Chrysene	ND	5.0	ug/L
bis(2-Ethylhexyl)phthalate	1.3 JB	5.0	ug/L
Di-n-octyl phthalate	ND	5.0	ug/L
Benzo(b)fluoranthene	ND	5.0	ug/L
Benzo(k)fluoranthene	ND	5.0	ug/L
Benzo(a)pyrene	ND	5.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	5.0	ug/L
Dibenz(a,h)anthracene	ND	5.0	ug/L
Benzo(g,h,i)perylene	ND	5.0	ug/L

REPORT NUMBER: 92E-0900

23-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

INF-3 Parameter	92120300	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	17	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	9.0	1.1	ug/L
Total Copper	2.1	0.51	ug/L
Total Lead	0.90	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	2.3	1.8	ug/L
Total Calcium	22000	6.1	ug/L
Total Manganese	720	0.60	ug/L
Total Iron	16000	7.2	ug/L

Traditional Parameters

INF-3 Parameter	92120300	Method Detection Limit	Units
Total Cyanide	0.0060	0.0010	mg/L

REPORT NUMBER: 92E-0900

23-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Semivolatiles

T5-3 Parameter	92120301	Method Detection Limit	Units
N-Nitrosodimethylamine	ND	5.0	ug/L
Phenol	ND	5.0	ug/L
bis(2-Chloroethyl)ether	ND	5.0	ug/L
2-Chlorophenol	1.0 J	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	1.2 J	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Hexachloroethane	ND	5.0	ug/L
N-Nitrosodi-n-propylamine	ND	5.0	ug/L
Nitrobenzene	ND	5.0	ug/L
Isophorone	ND	5.0	ug/L
2-Nitrophenol	ND	5.0	ug/L
2,4-Dimethylphenol	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
2,4-Dichlorophenol	ND	5.0	ug/L
1,2,4-Trichlorobenzene	ND	5.0	ug/L
Naphthalene	ND	5.0	ug/L
Hexachlorobutadiene	ND	5.0	ug/L
4-Chloro-3-methylphenol	2.3 J	5.0	ug/L
Hexachlorocyclopentadiene	ND	5.0	ug/L
2,4,6-Trichlorophenol	ND	5.0	ug/L
2-Chloronaphthalene	ND	5.0	ug/L
Acenaphthylene	ND	5.0	ug/L
Dimethyl phthalate	ND	5.0	ug/L
2,6-Dinitrotoluene	ND	5.0	ug/L

REPORT NUMBER: 92E-0900

23-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Semivolatiles
(Continued)

T5-3 Parameter	92120301	Method Detection Limit	Units
Acenaphthene	ND	5.0	ug/L
2,4-Dinitrophenol	ND	10	ug/L
4-Nitrophenol	ND	10	ug/L
2,4-Dinitrotoluene	ND	5.0	ug/L
Fluorene	ND	5.0	ug/L
Diethyl phthalate	2.7 J	5.0	ug/L
4-Chlorophenyl phenyl ether	ND	5.0	ug/L
4,6-Dinitro-2-methylphenol	ND	5.0	ug/L
N-Nitrosodiphenylamine	ND	5.0	ug/L
Azobenzene	ND	5.0	ug/L
4-Bromophenyl phenyl ether	ND	5.0	ug/L
Hexachlorobenzene	ND	5.0	ug/L
Pentachlorophenol	ND	5.0	ug/L
Phenanthrene	ND	5.0	ug/L
Anthracene	ND	5.0	ug/L
Di-n-butyl phthalate	ND	5.0	ug/L
Fluoranthene	ND	5.0	ug/L
Benzidine	ND	5.0	ug/L
Pyrene	ND	5.0	ug/L
Butylbenzyl phthalate	ND	5.0	ug/L
Benzo(a)anthracene	ND	5.0	ug/L
3,3-Dichlorobenzidine	ND	5.0	ug/L
Chrysene	ND	5.0	ug/L
bis(2-Ethylhexyl)phthalate	ND	5.0	ug/L
Di-n-octyl phthalate	2.3 JB	5.0	ug/L
Benzo(b)fluoranthene	ND	5.0	ug/L
Benzo(k)fluoranthene	ND	5.0	ug/L
Benzo(a)pyrene	ND	5.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	5.0	ug/L
Dibenz(a,h)anthracene	ND	5.0	ug/L
Benzo(g,h,i)perylene	ND	5.0	ug/L

REPORT NUMBER: 92E-0900

23-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Metals

T5-3 Parameter	92120301	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	11	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	3.8	1.1	ug/L
Total Copper	2.5	0.51	ug/L
Total Lead	1.8	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	ND	1.8	ug/L
Total Calcium	9800	6.1	ug/L
Total Manganese	170	0.60	ug/L
Total Iron	3700	7.2	ug/L

Traditional Parameters

T5-3 Parameter	92120301	Method Detection Limit	Units
Total Cyanide	0.013	0.0010	mg/L

REPORT NUMBER: 92E-0900

23-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Semivolatiles

SUMP-3 Parameter	92120302	Method Detection Limit	Units
N-Nitrosodimethylamine	ND	5.0	ug/L
Phenol	ND	5.0	ug/L
bis(2-Chloroethyl)ether	ND	5.0	ug/L
2-Chlorophenol	1.1 J	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Hexachloroethane	ND	5.0	ug/L
N-Nitrosodi-n-propylamine	ND	5.0	ug/L
Nitrobenzene	ND	5.0	ug/L
Isophorone	ND	5.0	ug/L
2-Nitrophenol	ND	5.0	ug/L
2,4-Dimethylphenol	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
2,4-Dichlorophenol	ND	5.0	ug/L
1,2,4-Trichlorobenzene	ND	5.0	ug/L
Naphthalene	ND	5.0	ug/L
Hexachlorobutadiene	ND	5.0	ug/L
4-Chloro-3-methylphenol	2.8 J	5.0	ug/L
Hexachlorocyclopentadiene	ND	5.0	ug/L
2,4,6-Trichlorophenol	ND	5.0	ug/L
2-Chloronaphthalene	ND	5.0	ug/L
Acenaphthylene	ND	5.0	ug/L
Dimethyl phthalate	ND	5.0	ug/L
2,6-Dinitrotoluene	ND	5.0	ug/L

REPORT NUMBER: 92E-0900

23-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Semivolatiles
(Continued)

SUMP-3 Parameter	92120302	Method Detection Limit	Units
Acenaphthene	ND	5.0	ug/L
2,4-Dinitrophenol	ND	10	ug/L
4-Nitrophenol	ND	10	ug/L
2,4-Dinitrotoluene	ND	5.0	ug/L
Fluorene	ND	5.0	ug/L
Diethyl phthalate	2.6 J	5.0	ug/L
4-Chlorophenyl phenyl ether	ND	5.0	ug/L
4,6-Dinitro-2-methylphenol	ND	5.0	ug/L
N-Nitrosodiphenylamine	ND	5.0	ug/L
Azobenzene	ND	5.0	ug/L
4-Bromophenyl phenyl ether	ND	5.0	ug/L
Hexachlorobenzene	ND	5.0	ug/L
Pentachlorophenol	ND	5.0	ug/L
Phenanthrene	ND	5.0	ug/L
Anthracene	ND	5.0	ug/L
Di-n-butyl phthalate	ND	5.0	ug/L
Fluoranthene	ND	5.0	ug/L
Benzidine	ND	5.0	ug/L
Pyrene	ND	5.0	ug/L
Butylbenzyl phthalate	ND	5.0	ug/L
Benzo(a)anthracene	ND	5.0	ug/L
3,3-Dichlorobenzidine	ND	5.0	ug/L
Chrysene	ND	5.0	ug/L
bis(2-Ethylhexyl)phthalate	1.0 JB	5.0	ug/L
Di-n-octyl phthalate	ND	5.0	ug/L
Benzo(b)fluoranthene	ND	5.0	ug/L
Benzo(k)fluoranthene	ND	5.0	ug/L
Benzo(a)pyrene	ND	5.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	5.0	ug/L
Dibenz(a,h)anthracene	ND	5.0	ug/L
Benzo(g,h,i)perylene	ND	5.0	ug/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Metals

SUMP-3 Parameter	92120302	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	5.6	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	4.1	1.1	ug/L
Total Copper	2.8	0.51	ug/L
Total Lead	1.1	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	ND	1.8	ug/L
Total Calcium	9600	6.1	ug/L
Total Manganese	170	0.60	ug/L
Total Iron	3600	7.2	ug/L

Traditional Parameters

SUMP-3 Parameter	92120302	Method Detection Limit	Units
Total Cyanide	0.012	0.0010	mg/L

REPORT NUMBER: 92E-0900

23-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

REJECT-3 Parameter	92120304	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	180	100	ug/L
Total Nickel	91	26	ug/L
Total Zinc	20	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	18	1.1	ug/L
Total Copper	6.2	0.51	ug/L
Total Lead	3.4	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	3.8	1.8	ug/L
Total Calcium	54000	6.1	ug/L
Total Manganese	1800	0.60	ug/L
Total Iron	38000	7.2	ug/L

Traditional Parameters

REJECT-3 Parameter	92120304	Method Detection Limit	Units
Total Cyanide	0.011	0.0010	mg/L

REPORT NUMBER: 92E-0900

23-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Metals

T4-3 Parameter	92120305	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	9.5	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	5.3	1.1	ug/L
Total Copper	3.2	0.51	ug/L
Total Lead	1.4	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	ND	1.8	ug/L
Total Calcium	16000	6.1	ug/L
Total Manganese	360	0.60	ug/L
Total Iron	7700	7.2	ug/L

Traditional Parameters

T4-3 Parameter	92120305	Method Detection Limit	Units
Total Cyanide	0.012	0.0010	mg/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Semivolatiles

INF-4 Parameter	92120336	Method Detection Limit	Units
N-Nitrosodimethylamine	ND	5.0	ug/L
Phenol	ND	5.0	ug/L
bis(2-Chloroethyl)ether	ND	5.0	ug/L
2-Chlorophenol	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Hexachloroethane	ND	5.0	ug/L
N-Nitrosodi-n-propylamine	ND	5.0	ug/L
Nitrobenzene	ND	5.0	ug/L
Isophorone	ND	5.0	ug/L
2-Nitrophenol	ND	5.0	ug/L
2,4-Dimethylphenol	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
2,4-Dichlorophenol	ND	5.0	ug/L
1,2,4-Trichlorobenzene	ND	5.0	ug/L
Naphthalene	ND	5.0	ug/L
Hexachlorobutadiene	ND	5.0	ug/L
4-Chloro-3-methylphenol	ND	5.0	ug/L
Hexachlorocyclopentadiene	ND	5.0	ug/L
2,4,6-Trichlorophenol	ND	5.0	ug/L
2-Chloronaphthalene	ND	5.0	ug/L
Acenaphthylene	ND	5.0	ug/L
Dimethyl phthalate	ND	5.0	ug/L
2,6-Dinitrotoluene	ND	5.0	ug/L

REPORT NUMBER: 92E-0900
23-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Semivolatiles

INF-4 Parameter	92120336	Method Detection Limit	Units
Acenaphthene	ND	5.0	ug/L
2,4-Dinitrophenol	ND	10	ug/L
4-Nitrophenol	ND	10	ug/L
2,4-Dinitrotoluene	ND	5.0	ug/L
Fluorene	ND	5.0	ug/L
Diethyl phthalate	ND	5.0	ug/L
4-Chlorophenyl phenyl ether	ND	5.0	ug/L
4,6-Dinitro-2-methylphenol	ND	5.0	ug/L
N-Nitrosodiphenylamine	ND	5.0	ug/L
Azobenzene	ND	5.0	ug/L
4-Bromophenyl phenyl ether	ND	5.0	ug/L
Hexachlorobenzene	ND	5.0	ug/L
Pentachlorophenol	ND	5.0	ug/L
Phenanthrene	ND	5.0	ug/L
Anthracene	ND	5.0	ug/L
Di-n-butyl phthalate	ND	5.0	ug/L
Fluoranthene	ND	5.0	ug/L
Benzidine	ND	5.0	ug/L
Pyrene	ND	5.0	ug/L
Butylbenzyl phthalate	ND	5.0	ug/L
Benzo(a)anthracene	ND	5.0	ug/L
3,3-Dichlorobenzidine	ND	5.0	ug/L
Chrysene	ND	5.0	ug/L
bis(2-Ethylhexyl)phthalate	1.3 J	5.0	ug/L
Di-n-octyl phthalate	ND	5.0	ug/L
Benzo(b)fluoranthene	ND	5.0	ug/L
Benzo(k)fluoranthene	ND	5.0	ug/L
Benzo(a)pyrene	ND	5.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	5.0	ug/L
Dibenz(a,h)anthracene	ND	5.0	ug/L
Benzo(g,h,i)perylene	ND	5.0	ug/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Metals

INF-4 Parameter	92120336	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	9.7	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	8.9	1.1	ug/L
Total Copper	2.2	0.51	ug/L
Total Lead	1.6	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	2.3	1.8	ug/L
Total Calcium	22000	6.1	ug/L
Total Manganese	720	0.60	ug/L
Total Iron	16000	7.2	ug/L

Traditional Parameters

INF-4 Parameter	92120336	Method Detection Limit	Units
Total Cyanide	0.0080	0.0010	mg/L

REPORT NUMBER: 92E-0900

23-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Semivolatiles

T5-4 Parameter	92120337	Method Detection Limit	Units
N-Nitrosodimethylamine	ND	5.0	ug/L
Phenol	ND	5.0	ug/L
bis(2-Chloroethyl)ether	ND	5.0	ug/L
2-Chlorophenol	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	1.2 J	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Hexachloroethane	ND	5.0	ug/L
N-Nitrosodi-n-propylamine	ND	5.0	ug/L
Nitrobenzene	ND	5.0	ug/L
Isophorone	ND	5.0	ug/L
2-Nitrophenol	ND	5.0	ug/L
2,4-Dimethylphenol	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
2,4-Dichlorophenol	ND	5.0	ug/L
1,2,4-Trichlorobenzene	ND	5.0	ug/L
Naphthalene	ND	5.0	ug/L
Hexachlorobutadiene	ND	5.0	ug/L
4-Chloro-3-methylphenol	2.7 J	5.0	ug/L
Hexachlorocyclopentadiene	ND	5.0	ug/L
2,4,6-Trichlorophenol	ND	5.0	ug/L
2-Chloronaphthalene	ND	5.0	ug/L
Acenaphthylene	ND	5.0	ug/L
Dimethyl phthalate	ND	5.0	ug/L
2,6-Dinitrotoluene	ND	5.0	ug/L

REPORT NUMBER: 92E-0900

23-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Semivolatiles
(Continued)

T5-4 Parameter	92120337	Method Detection Limit	Units
Acenaphthene	ND	5.0	ug/L
2,4-Dinitrophenol	ND	10	ug/L
4-Nitrophenol	ND	10	ug/L
2,4-Dinitrotoluene	ND	5.0	ug/L
Fluorene	ND	5.0	ug/L
Diethyl phthalate	ND	5.0	ug/L
4-Chlorophenyl phenyl ether	ND	5.0	ug/L
4,6-Dinitro-2-methylphenol	ND	5.0	ug/L
N-Nitrosodiphenylamine	ND	5.0	ug/L
Azobenzene	ND	5.0	ug/L
4-Bromophenyl phenyl ether	ND	5.0	ug/L
Hexachlorobenzene	ND	5.0	ug/L
Pentachlorophenol	ND	5.0	ug/L
Phenanthrene	ND	5.0	ug/L
Anthracene	ND	5.0	ug/L
Di-n-butyl phthalate	ND	5.0	ug/L
Fluoranthene	ND	5.0	ug/L
Benzidine	ND	5.0	ug/L
Pyrene	ND	5.0	ug/L
Butylbenzyl phthalate	ND	5.0	ug/L
Benzo(a)anthracene	ND	5.0	ug/L
3,3-Dichlorobenzidine	ND	5.0	ug/L
Chrysene	ND	5.0	ug/L
bis(2-Ethylhexyl)phthalate	ND	5.0	ug/L
Di-n-octyl phthalate	ND	5.0	ug/L
Benzo(b)fluoranthene	ND	5.0	ug/L
Benzo(k)fluoranthene	ND	5.0	ug/L
Benzo(a)pyrene	ND	5.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	5.0	ug/L
Dibenz(a,h)anthracene	ND	5.0	ug/L
Benzo(g,h,i)perylene	ND	5.0	ug/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Metals

T5-4 Parameter	92120337	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	10	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	2.5	1.1	ug/L
Total Copper	3.4	0.51	ug/L
Total Lead	1.8	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	ND	1.8	ug/L
Total Calcium	11000	6.1	ug/L
Total Manganese	120	0.60	ug/L
Total Iron	2300	7.2	ug/L

Traditional Parameters

T5-4 Parameter	92120337	Method Detection Limit	Units
Total Cyanide	0.012	0.0010	mg/L

REPORT NUMBER: 92E-0900

23-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Semivolatiles

SUMP-4 Parameter	92120338	Method Detection Limit	Units
N-Nitrosodimethylamine	ND	5.0	ug/L
Phenol	ND	5.0	ug/L
bis(2-Chloroethyl)ether	ND	5.0	ug/L
2-Chlorophenol	1.1 J	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Hexachloroethane	ND	5.0	ug/L
N-Nitrosodi-n-propylamine	ND	5.0	ug/L
Nitrobenzene	ND	5.0	ug/L
Isophorone	ND	5.0	ug/L
2-Nitrophenol	ND	5.0	ug/L
2,4-Dimethylphenol	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
2,4-Dichlorophenol	ND	5.0	ug/L
1,2,4-Trichlorobenzene	ND	5.0	ug/L
Naphthalene	ND	5.0	ug/L
Hexachlorobutadiene	ND	5.0	ug/L
4-Chloro-3-methylphenol	2.9 J	5.0	ug/L
Hexachlorocyclopentadiene	ND	5.0	ug/L
2,4,6-Trichlorophenol	ND	5.0	ug/L
2-Chloronaphthalene	ND	5.0	ug/L
Acenaphthylene	ND	5.0	ug/L
Dimethyl phthalate	ND	5.0	ug/L
2,6-Dinitrotoluene	ND	5.0	ug/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Semivolatiles
(Continued)

SUMP-4 Parameter	92120338	Method Detection Limit	Units
Acenaphthene	ND	5.0	ug/L
2,4-Dinitrophenol	ND	10	ug/L
4-Nitrophenol	ND	10	ug/L
2,4-Dinitrotoluene	ND	5.0	ug/L
Fluorene	ND	5.0	ug/L
Diethyl phthalate	ND	5.0	ug/L
4-Chlorophenyl phenyl ether	ND	5.0	ug/L
4,6-Dinitro-2-methylphenol	ND	5.0	ug/L
N-Nitrosodiphenylamine	ND	5.0	ug/L
Azobenzene	ND	5.0	ug/L
4-Bromophenyl phenyl ether	ND	5.0	ug/L
Hexachlorobenzene	ND	5.0	ug/L
Pentachlorophenol	ND	5.0	ug/L
Phenanthrene	ND	5.0	ug/L
Anthracene	ND	5.0	ug/L
Di-n-butyl phthalate	ND	5.0	ug/L
Fluoranthene	ND	5.0	ug/L
Benzidine	ND	5.0	ug/L
Pyrene	ND	5.0	ug/L
Butylbenzyl phthalate	ND	5.0	ug/L
Benzo(a)anthracene	ND	5.0	ug/L
3,3-Dichlorobenzidine	ND	5.0	ug/L
Chrysene	ND	5.0	ug/L
bis(2-Ethylhexyl)phthalate	1.1 J	5.0	ug/L
Di-n-octyl phthalate	ND	5.0	ug/L
Benzo(b)fluoranthene	ND	5.0	ug/L
Benzo(k)fluoranthene	ND	5.0	ug/L
Benzo(a)pyrene	ND	5.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	5.0	ug/L
Dibenz(a,h)anthracene	ND	5.0	ug/L
Benzo(g,h,i)perylene	ND	5.0	ug/L

REPORT NUMBER: 92E-0900

23-Dec-92

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

SUMP-4 Parameter	92120338	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	8.2	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	3.0	1.1	ug/L
Total Copper	3.3	0.51	ug/L
Total Lead	9.7	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	ND	1.8	ug/L
Total Calcium	9900	6.1	ug/L
Total Manganese	110	0.60	ug/L
Total Iron	2100	7.2	ug/L

Traditional Parameters

SUMP-4 Parameter	92120338	Method Detection Limit	Units
Total Cyanide	0.010	0.0010	mg/L

REPORT NUMBER: 92E-0900
23-Dec-92

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Metals

REJECT-4 Parameter	92120339	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	190	100	ug/L
Total Nickel	85	26	ug/L
Total Zinc	19	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	14	1.1	ug/L
Total Copper	9.2	0.51	ug/L
Total Lead	2.4	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	2.8	1.8	ug/L
Total Calcium	44000	6.1	ug/L
Total Manganese	1500	0.60	ug/L
Total Iron	30000	7.2	ug/L

Traditional Parameters

REJECT-4 Parameter	92120339	Method Detection Limit	Units
Total Cyanide	0.014	0.0010	mg/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Metals

T4-4 Parameter	92120340	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	180	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	4.8	1.1	ug/L
Total Copper	2.4	0.51	ug/L
Total Lead	2.0	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	ND	1.8	ug/L
Total Calcium	17000	6.1	ug/L
Total Manganese	290	0.60	ug/L
Total Iron	6200	7.2	ug/L

Traditional Parameters

T4-4 Parameter	92120340	Method Detection Limit	Units
Total Cyanide	0.015	0.0010	mg/L

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

INF-4A

Lab Name: CET ANALYTICAL CHEMISTRY Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120154

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1780

Level: (low/med) LOW Date Received: 12/08/92

% Moisture: not dec.---- Date Analyzed: 12/09/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	5.	U D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	330.	D
108-90-7	Chlorobenzene	90.	D
100-41-4	Ethylbenzene	17.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	30.	D
XXX-XX-X	m&p-Xylene	84.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	240.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

1 1A CUSTOMER SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

T5-4A

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120155

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1781

Level: (low/med) LOW Date Received: 12/08/92

% Moisture: not dec.---- Date Analyzed: 12/09/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	5.	U D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	280.	D
108-90-7	Chlorobenzene	70.	D
100-41-4	Ethylbenzene	14.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	23.	D
XXX-XX-X	m&p-Xylene	61.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	190.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

1 1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

SUMP-4A

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120156

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1782

Level: (low/med) LOW Date Received: 12/08/92

% Moisture: not dec.---- Date Analyzed: 12/09/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	13.	
108-90-7	Chlorobenzene	4.	
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	
XXX-XX-X	m&p-Xylene	2.	
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	11.	
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

1 1A CUSTOMER SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

EFF-4A

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120157

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1783

Level: (low/med) LOW Date Received: 12/08/92

% Moisture: not dec.---- Date Analyzed: 12/09/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	1.	U
108-90-7	Chlorobenzene	1.	U
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	1.	U
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

INF-4B

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120158

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1784

Level: (low/med) LOW Date Received: 12/08/92

% Moisture: not dec.---- Date Analyzed: 12/09/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	5.	U D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	350.	D
108-90-7	Chlorobenzene	85.	D
100-41-4	Ethylbenzene	19.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	34.	D
XXX-XX-X	m&p-Xylene	94.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	260.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

T5-4B

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120159

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1785

Level: (low/med) LOW Date Received: 12/08/92

% Moisture: not dec.---- Date Analyzed: 12/09/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	5.	U D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	240.	D
108-90-7	Chlorobenzene	58.	D
100-41-4	Ethylbenzene	17.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	25.	D
XXX-XX-X	m&p-Xylene	68.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	160.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

SUMP-4B

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120160

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1786

Level: (low/med) LOW Date Received: 12/08/92

% Moisture: not dec.---- Date Analyzed: 12/09/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	12.	
108-90-7	Chlorobenzene	4.	
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	
XXX-XX-X	m&p-Xylene	3.	
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	10.	
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

EFF-4B

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120161

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1787

Level: (low/med) LOW Date Received: 12/08/92

% Moisture: not dec.---- Date Analyzed: 12/09/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	1.	U
108-90-7	Chlorobenzene	1.	U
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	1.	U
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

INF-4C

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120162

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1788

Level: (low/med) LOW Date Received: 12/08/92

% Moisture: not dec.---- Date Analyzed: 12/09/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	5.	U D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	340.	D
108-90-7	Chlorobenzene	87.	D
100-41-4	Ethylbenzene	18.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	33.	D
XXX-XX-X	m&p-Xylene	91.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	250.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

T5-4C

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120163

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1790

Level: (low/med) LOW Date Received: 12/08/92

% Moisture: not dec.---- Date Analyzed: 12/09/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	5.	U D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	280.	D
108-90-7	Chlorobenzene	62.	D
100-41-4	Ethylbenzene	14.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	23.	D
XXX-XX-X	m&p-Xylene	61.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	180.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

SUMP-4C

Lab Name: CET ANALYTICAL CHEMISTRY Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120164

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1793

Level: (low/med) LOW Date Received: 12/08/92

% Moisture: not dec.---- Date Analyzed: 12/10/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	15.	
108-90-7	Chlorobenzene	12.	
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	2.	
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	1.	U
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

EFF-4C

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120165

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1794

Level: (low/med) LOW Date Received: 12/08/92

% Moisture: not dec.---- Date Analyzed: 12/10/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene_Chloride	1.	U
34-04-4	Methyl t-Butyl_Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene,_trans	1.	U
150-60-5	1,2-Dichloroethene,_cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	1.	U
108-90-7	Chlorobenzene	1.	U
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	1.	U
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

Environmental Technology Center

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410 Swing Road
Greensboro, North Carolina 27419
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CIBA–GEIGY

December 31, 1992

Diana Baldi
Corporate Enivronmental Technology Center
CIBA-GEIGY Corporation
P.O. Box 18300
Greensboro, North Carolina 27419-8300

Diana:

Attached are GC/MS results for CETAC samples 92120282 through 92120290. These samples were submitted under the "Cranston In Lab" project.

If you have any questions, please call Tom Barber at extension 7297.

Respectfully Submitted,

12/31/92

Daniel Winn Date
Senior Chemist

Data Reviewed by,

12/31/92

Tom Barber Date
Group Leader

VOLATILE ORGANICS ANALYSIS DATA SHEET

INF-5A

Lab Name: CET ANALYTICAL CHEMISTRY Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120282

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1866

Level: (low/med) LOW Date Received: 12/17/92

% Moisture: not dec.---- Date Analyzed: 12/29/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	230.	D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	340.	D
108-90-7	Chlorobenzene	220.	D
100-41-4	Ethylbenzene	50.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	41.	D
XXX-XX-X	m&p-Xylene	110.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	260.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	14.	D
120-82-1	1,2,4-Trichlorobenzene	6.	D
87-61-6	1,2,3-Trichlorobenzene	6.	D

VOLATILE ORGANICS ANALYSIS DATA SHEET

INF-5B

Lab Name: CET ANALYTICAL CHEMISTRY Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120283

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1867

Level: (low/med) LOW Date Received: 12/17/92

% Moisture: not dec.---- Date Analyzed: 12/29/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	220.	D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	320.	D
108-90-7	Chlorobenzene	220.	D
100-41-4	Ethylbenzene	46.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	36.	D
XXX-XX-X	m&p-Xylene	100.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	250.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	12.	D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

VOLATILE ORGANICS ANALYSIS DATA SHEET

INF-5C

Lab Name: CET ANALYTICAL CHEMISTRY Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120284

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1868

Level: (low/med) LOW Date Received: 12/17/92

% Moisture: not dec.---- Date Analyzed: 12/29/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	200.	D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	300.	D
108-90-7	Chlorobenzene	210.	D
100-41-4	Ethylbenzene	43.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	35.	D
XXX-XX-X	m&p-Xylene	94.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	230.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	16.	D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

T5-5A

Lab Name: CET ANALYTICAL CHEMISTRY Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120285

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1869

Level: (low/med) LOW Date Received: 12/17/92

% Moisture: not dec.---- Date Analyzed: 12/29/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	160.	D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	220.	D
108-90-7	Chlorobenzene	170.	D
100-41-4	Ethylbenzene	30.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	20.	D
XXX-XX-X	m&p-Xylene	47.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	190.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

VOLATILE ORGANICS ANALYSIS DATA SHEET

T5-5B

Lab Name: CET ANALYTICAL CHEMISTRY Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120286

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1870

Level: (low/med) LOW Date Received: 12/17/92

% Moisture: not dec.---- Date Analyzed: 12/29/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	160.	D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	210.	D
108-90-7	Chlorobenzene	180.	D
100-41-4	Ethylbenzene	29.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	20.	D
XXX-XX-X	m&p-Xylene	47.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	190.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	5.	U D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

VOLATILE ORGANICS ANALYSIS DATA SHEET

T5-5C

Lab Name: CET ANALYTICAL CHEMISTRY Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120287

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1871

Level: (low/med) LOW Date Received: 12/17/92

% Moisture: not dec.---- Date Analyzed: 12/29/92

Column: (pack/cap) CAP Dilution Factor: 5.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U D
75-01-4	Vinyl Chloride	5.	U D
74-83-9	Bromomethane	5.	U D
75-00-3	Chloroethane	5.	U D
75-09-2	Methylene Chloride	5.	U D
34-04-4	Methyl t-Butyl Ether	5.	U D
75-35-4	1,1-Dichloroethene	5.	U D
75-34-3	1,1-Dichloroethane	5.	U D
78-93-3	2-Butanone	5.	U D
110-75-8	Chloroethylvinylether	5.	U D
540-59-0	1,2-Dichloroethene, trans	160.	D
150-60-5	1,2-Dichloroethene, cis	5.	U D
67-66-3	Chloroform	5.	U D
107-02-2	1,2-Dichloroethane	5.	U D
71-55-6	1,1,1-Trichloroethane	5.	U D
56-23-5	Carbon Tetrachloride	5.	U D
78-87-5	1,2-Dichloropropane	5.	U D
75-27-4	Bromodichloromethane	5.	U D
108-10-1	4-Methyl-2-Pentanone	5.	U D
10061-01-5	cis-1,3-Dichloropropene	5.	U D
79-01-6	Trichloroethene	5.	U D
79-00-5	1,1,2-Trichloroethane	5.	U D
71-43-2	Benzene	5.	U D
10061-02-6	trans-1,3-Dichloropropene	5.	U D
127-18-4	Tetrachloroethene	5.	U D
124-48-1	Dibromochloromethane	5.	U D
79-34-5	1,1,2,2-Tetrachloroethane	5.	U D
108-88-3	Toluene	250.	D
108-90-7	Chlorobenzene	180.	D
100-41-4	Ethylbenzene	35.	D
100-42-5	Styrene	5.	U D
75-25-2	Bromoform	5.	U D
133-02-7	o-Xylene	29.	D
XXX-XX-X	m&p-Xylene	78.	D
96-18-4	1,2,3-Trichloropropane	5.	U D
95-49-8	2-Chlorotoluene	200.	D
106-43-4	4-Chlorotoluene	5.	U D
541-73-1	1,3-Dichlorobenzene	5.	U D
106-46-7	1,4-Dichlorobenzene	5.	U D
95-50-2	1,2-Dichlorobenzene	12.	D
120-82-1	1,2,4-Trichlorobenzene	5.	U D
87-61-6	1,2,3-Trichlorobenzene	5.	U D

VOLATILE ORGANICS ANALYSIS DATA SHEET

SUMP-5A

Lab Name: CET ANALYTICAL CHEMISTRY Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120288

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1872

Level: (low/med) LOW Date Received: 12/17/92

% Moisture: not dec.---- Date Analyzed: 12/29/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	6.	
150-60-5	1,2-Dichloroethene, cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	5.	
108-90-7	Chlorobenzene	11.	
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	10.	
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

SUMP-5B

Lab Name: CET ANALYTICAL CHEMISTRY Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120289

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1873

Level: (low/med) LOW Date Received: 12/17/92

% Moisture: not dec.---- Date Analyzed: 12/29/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	6.	
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	1.	U
108-90-7	Chlorobenzene	4.	
100-41-4	Ethylbenzene	10.	
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	1.	U
106-43-4	4-Chlorotoluene	9.	
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

SUMP-5C

Lab Name: CET ANALYTICAL CHEMISTRY Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92120290

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1874

Level: (low/med) LOW Date Received: 12/17/92

% Moisture: not dec.---- Date Analyzed: 12/30/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
34-04-4	Methyl t-Butyl Ether	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	6.	
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	12.	
108-90-7	Chlorobenzene	11.	
100-41-4	Ethylbenzene	2.	
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	2.	
XXX-XX-X	m&p-Xylene	4.	
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	11.	
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Date Sampled	Date Received
92120625	INF-5	12/16/1992	12/17/1992
92120626	T5-5	12/16/1992	12/17/1992
92120627	SUMP-5	12/16/1992	12/17/1992
92120628	REJECT-5	12/16/1992	12/17/1992
92120629	T4-5	12/16/1992	12/17/1992

Sample #	Sample Description	Parameter	Date Extracted
92120625	INF-5	Semivolatiles	12/18/1992
92120626	T5-5	Semivolatiles	12/18/1992
92120627	SUMP-5	Semivolatiles	12/18/1992

REPORT NUMBER: 92E-0922

11-Jan-93

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Parameter	Date Analyzed
92120625	INF-5	Semivolatiles	12/23/1992
		Total Cyanide	12/21/1992
		Total Mercury	12/28/1992
		Total Chromium	1/07/1993
		Total Nickel	1/07/1993
		Total Zinc	1/07/1993
		Total Silver	1/04/1993
		Total Arsenic	1/05/1993
		Total Copper	12/30/1992
		Total Lead	1/05/1993
		Total Antimony	1/06/1993
		Total Beryllium	1/07/1993
		Total Calcium	1/07/1993
		Total Manganese	1/07/1993
		Total Iron	1/07/1993
92120626	T5-5	Semivolatiles	12/23/1992
		Total Cyanide	12/21/1992
		Total Mercury	12/28/1992
		Total Chromium	1/07/1993
		Total Nickel	1/07/1993
		Total Zinc	1/07/1993
		Total Silver	1/04/1993
		Total Arsenic	1/05/1993
		Total Copper	12/30/1992
		Total Lead	1/05/1993
		Total Antimony	1/06/1993
		Total Beryllium	1/07/1993
		Total Calcium	1/07/1993
		Total Manganese	1/07/1993
		Total Iron	1/07/1993

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Parameter	Date Analyzed
92120627	SUMP-5	Semivolatiles	12/29/1992
		Total Cyanide	12/21/1992
		Total Mercury	12/28/1992
		Total Chromium	1/07/1993
		Total Nickel	1/07/1993
		Total Zinc	1/07/1993
		Total Silver	1/04/1993
		Total Arsenic	1/05/1993
		Total Copper	12/30/1992
		Total Lead	1/05/1993
		Total Antimony	1/06/1993
		Total Beryllium	1/07/1993
		Total Calcium	1/07/1993
		Total Manganese	1/07/1993
		Total Iron	1/07/1993
92120628	REJECT-5	Total Cyanide	12/21/1992
		Total Mercury	12/28/1992
		Total Chromium	1/07/1993
		Total Nickel	1/07/1993
		Total Zinc	1/07/1993
		Total Silver	1/04/1993
		Total Arsenic	1/05/1993
		Total Copper	12/30/1992
		Total Lead	1/05/1993
		Total Antimony	1/06/1993
		Total Beryllium	1/07/1993
		Total Calcium	1/07/1993
		Total Manganese	1/07/1993
		Total Iron	1/07/1993

REPORT NUMBER: 92E-0922

11-Jan-93

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Parameter	Date Analyzed
92120629	T4-5	Total Cyanide	12/21/1992
		Total Mercury	12/28/1992
		Total Chromium	1/07/1993
		Total Nickel	1/07/1993
		Total Zinc	1/07/1993
		Total Silver	1/04/1993
		Total Arsenic	1/05/1993
		Total Copper	12/30/1992
		Total Lead	1/05/1993
		Total Antimony	1/06/1993
		Total Beryllium	1/07/1993
		Total Calcium	1/07/1993
		Total Manganese	1/07/1993
		Total Iron	1/07/1993

Definitions

N/A	Not applicable
ND	Not detected at or above method detection limit.
J	Detected but below method detection limit.
B	Analyte detected in blank but not corrected for amount in blank.
Method Detection Limit	Lowest concentration (amount) that must be present before a reliable and recognizable response is observed for that method of analysis. When a sample has been diluted, the Method Detection Limit has been multiplied by the dilution factor.

Methodology

Semivolatile organic analyses were performed in accordance with Method 625, 40 CFR 136.

ICP metals analyses were performed in accordance with Method 200.7, 40 CFR 136.

Furnace metals and cyanide analyses were performed in accordance with EPA Test Methods for the Chemical Analysis of Water and Waste.

REPORT NUMBER: 92E-0922

11-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Semivolatiles

INF-5 Parameter	92120625	Method Detection Limit	Units
N-Nitrosodimethylamine	ND	5.0	ug/L
Phenol	ND	5.0	ug/L
bis(2-Chloroethyl)ether	ND	5.0	ug/L
2-Chlorophenol	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	4.0 J	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Hexachloroethane	ND	5.0	ug/L
N-Nitrosodi-n-propylamine	ND	5.0	ug/L
Nitrobenzene	ND	5.0	ug/L
Isophorone	ND	5.0	ug/L
2-Nitrophenol	ND	5.0	ug/L
2,4-Dimethylphenol	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
2,4-Dichlorophenol	ND	5.0	ug/L
1,2,4-Trichlorobenzene	ND	5.0	ug/L
Naphthalene	ND	5.0	ug/L
Hexachlorobutadiene	ND	5.0	ug/L
4-Chloro-3-methylphenol	ND	5.0	ug/L
Hexachlorocyclopentadiene	ND	5.0	ug/L
2,4,6-Trichlorophenol	ND	5.0	ug/L
2-Chloronaphthalene	ND	5.0	ug/L
Acenaphthylene	ND	5.0	ug/L
Dimethyl phthalate	ND	5.0	ug/L
2,6-Dinitrotoluene	ND	5.0	ug/L
Acenaphthene	ND	5.0	ug/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Semivolatiles
(Continued)

INF-5 Parameter	92120625	Method Detection Limit	Units
2,4-Dinitrophenol	ND	10	ug/L
4-Nitrophenol	ND	10	ug/L
2,4-Dinitrotoluene	ND	5.0	ug/L
Fluorene	ND	5.0	ug/L
Diethyl phthalate	1.4 J	5.0	ug/L
4-Chlorophenyl phenyl ether	ND	5.0	ug/L
4,6-Dinitro-2-methylphenol	ND	5.0	ug/L
N-Nitrosodiphenylamine	ND	5.0	ug/L
Azobenzene	ND	5.0	ug/L
4-Bromophenyl phenyl ether	ND	5.0	ug/L
Hexachlorobenzene	ND	5.0	ug/L
Pentachlorophenol	ND	5.0	ug/L
Phenanthrene	ND	5.0	ug/L
Anthracene	ND	5.0	ug/L
Di-n-butyl phthalate	1.3 JB	5.0	ug/L
Fluoranthene	ND	5.0	ug/L
Benzidine	ND	5.0	ug/L
Pyrene	ND	5.0	ug/L
Butylbenzyl phthalate	ND	5.0	ug/L
Benzo(a)anthracene	ND	5.0	ug/L
3,3-Dichlorobenzidine	ND	5.0	ug/L
Chrysene	ND	5.0	ug/L
bis(2-Ethylhexyl)phthalate	4.6 JB	5.0	ug/L
Di-n-octyl phthalate	ND	5.0	ug/L
Benzo(b)fluoranthene	ND	5.0	ug/L
Benzo(k)fluoranthene	ND	5.0	ug/L
Benzo(a)pyrene	ND	5.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	5.0	ug/L
Dibenz(a,h)anthracene	ND	5.0	ug/L
Benzo(g,h,i)perylene	ND	5.0	ug/L

REPORT NUMBER: 92E-0922

11-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

INF-5 Parameter	92120625	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	3.4	2.2	ug/L
Total Silver	0.15	0.12	ug/L
Total Arsenic	11	1.1	ug/L
Total Copper	2.8	0.51	ug/L
Total Lead	2.0	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	ND	1.8	ug/L
Total Calcium	2400	6.1	ug/L
Total Manganese	830	0.60	ug/L
Total Iron	15000	7.2	ug/L

Traditional Parameters

INF-5 Parameter	92120625	Method Detection Limit	Units
Total Cyanide	0.012	0.0010	mg/L

REPORT NUMBER: 92E-0922

11-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Semivolatiles

T5-5 Parameter	92120626	Method Detection Limit	Units
N-Nitrosodimethylamine	ND	5.0	ug/L
Phenol	ND	5.0	ug/L
bis(2-Chloroethyl)ether	ND	5.0	ug/L
2-Chlorophenol	1.2 J	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	4.3 J	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Hexachloroethane	ND	5.0	ug/L
N-Nitrosodi-n-propylamine	ND	5.0	ug/L
Nitrobenzene	ND	5.0	ug/L
Isophorone	ND	5.0	ug/L
2-Nitrophenol	ND	5.0	ug/L
2,4-Dimethylphenol	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
2,4-Dichlorophenol	ND	5.0	ug/L
1,2,4-Trichlorobenzene	ND	5.0	ug/L
Naphthalene	ND	5.0	ug/L
Hexachlorobutadiene	ND	5.0	ug/L
4-Chloro-3-methylphenol	ND	5.0	ug/L
Hexachlorocyclopentadiene	ND	5.0	ug/L
2,4,6-Trichlorophenol	ND	5.0	ug/L
2-Chloronaphthalene	ND	5.0	ug/L
Acenaphthylene	ND	5.0	ug/L
Dimethyl phthalate	ND	5.0	ug/L
2,6-Dinitrotoluene	ND	5.0	ug/L
Acenaphthene	ND	5.0	ug/L

REPORT NUMBER: 92E-0922

11-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Semivolatiles
(Continued)

T5-5 Parameter	92120626	Method Detection Limit	Units
2,4-Dinitrophenol	ND	10	ug/L
4-Nitrophenol	ND	10	ug/L
2,4-Dinitrotoluene	ND	5.0	ug/L
Fluorene	ND	5.0	ug/L
Diethyl phthalate	ND	5.0	ug/L
4-Chlorophenyl phenyl ether	ND	5.0	ug/L
4,6-Dinitro-2-methylphenol	ND	5.0	ug/L
N-Nitrosodiphenylamine	ND	5.0	ug/L
Azobenzene	ND	5.0	ug/L
4-Bromophenyl phenyl ether	ND	5.0	ug/L
Hexachlorobenzene	ND	5.0	ug/L
Pentachlorophenol	ND	5.0	ug/L
Phenanthrene	ND	5.0	ug/L
Anthracene	ND	5.0	ug/L
Di-n-butyl phthalate	ND	5.0	ug/L
Fluoranthene	ND	5.0	ug/L
Benzidine	ND	5.0	ug/L
Pyrene	ND	5.0	ug/L
Butylbenzyl phthalate	ND	5.0	ug/L
Benzo(a)anthracene	ND	5.0	ug/L
3,3-Dichlorobenzidine	ND	5.0	ug/L
Chrysene	ND	5.0	ug/L
bis(2-Ethylhexyl)phthalate	ND	5.0	ug/L
Di-n-octyl phthalate	ND	5.0	ug/L
Benzo(b)fluoranthene	ND	5.0	ug/L
Benzo(k)fluoranthene	ND	5.0	ug/L
Benzo(a)pyrene	ND	5.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	5.0	ug/L
Dibenz(a,h)anthracene	ND	5.0	ug/L
Benzo(g,h,i)perylene	ND	5.0	ug/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Metals

T5-5 Parameter	92120626	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	7.0	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	4.8	1.1	ug/L
Total Copper	3.6	0.51	ug/L
Total Lead	2.2	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	ND	1.8	ug/L
Total Calcium	8900	6.1	ug/L
Total Manganese	220	0.60	ug/L
Total Iron	3900	7.2	ug/L

Traditional Parameters

T5-5 Parameter	92120626	Method Detection Limit	Units
Total Cyanide	0.014	0.0010	mg/L

REPORT NUMBER: 92E-0922

11-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Semivolatiles

SUMP-5 Parameter	92120627	Method Detection Limit	Units
N-Nitrosodimethylamine	ND	5.0	ug/L
Phenol	ND	5.0	ug/L
bis(2-Chloroethyl)ether	ND	5.0	ug/L
2-Chlorophenol	1.4 J	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Hexachloroethane	ND	5.0	ug/L
N-Nitrosodi-n-propylamine	ND	5.0	ug/L
Nitrobenzene	ND	5.0	ug/L
Isophorone	ND	5.0	ug/L
2-Nitrophenol	ND	5.0	ug/L
2,4-Dimethylphenol	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
2,4-Dichlorophenol	ND	5.0	ug/L
1,2,4-Trichlorobenzene	ND	5.0	ug/L
Naphthalene	ND	5.0	ug/L
Hexachlorobutadiene	ND	5.0	ug/L
4-Chloro-3-methylphenol	ND	5.0	ug/L
Hexachlorocyclopentadiene	ND	5.0	ug/L
2,4,6-Trichlorophenol	ND	5.0	ug/L
2-Chloronaphthalene	ND	5.0	ug/L
Acenaphthylene	ND	5.0	ug/L
Dimethyl phthalate	ND	5.0	ug/L
2,6-Dinitrotoluene	ND	5.0	ug/L
Acenaphthene	ND	5.0	ug/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Semivolatiles
(Continued)

SUMP-5 Parameter	92120627	Method Detection Limit	Units
2,4-Dinitrophenol	ND	10	ug/L
4-Nitrophenol	ND	10	ug/L
2,4-Dinitrotoluene	ND	5.0	ug/L
Fluorene	ND	5.0	ug/L
Diethyl phthalate	ND	5.0	ug/L
4-Chlorophenyl phenyl ether	ND	5.0	ug/L
4,6-Dinitro-2-methylphenol	ND	5.0	ug/L
N-Nitrosodiphenylamine	ND	5.0	ug/L
Azobenzene	ND	5.0	ug/L
4-Bromophenyl phenyl ether	ND	5.0	ug/L
Hexachlorobenzene	ND	5.0	ug/L
Pentachlorophenol	ND	5.0	ug/L
Phenanthrene	ND	5.0	ug/L
Anthracene	ND	5.0	ug/L
Di-n-butyl phthalate	ND	5.0	ug/L
Fluoranthene	ND	5.0	ug/L
Benzidine	ND	5.0	ug/L
Pyrene	ND	5.0	ug/L
Butylbenzyl phthalate	ND	5.0	ug/L
Benzo(a)anthracene	ND	5.0	ug/L
3,3-Dichlorobenzidine	ND	5.0	ug/L
Chrysene	ND	5.0	ug/L
bis(2-Ethylhexyl)phthalate	1.0 JB	5.0	ug/L
Di-n-octyl phthalate	ND	5.0	ug/L
Benzo(b)fluoranthene	ND	5.0	ug/L
Benzo(k)fluoranthene	ND	5.0	ug/L
Benzo(a)pyrene	ND	5.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	5.0	ug/L
Dibenz(a,h)anthracene	ND	5.0	ug/L
Benzo(g,h,i)perylene	ND	5.0	ug/L

REPORT NUMBER: 92E-0922

11-Jan-93

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

Metals

REJECT-5 Parameter	92120628	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	9.5	2.2	ug/L
Total Silver	0.15	0.12	ug/L
Total Arsenic	23	1.1	ug/L
Total Copper	6.4	0.51	ug/L
Total Lead	2.8	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	4.2	1.8	ug/L
Total Calcium	6600	6.1	ug/L
Total Manganese	2400	0.60	ug/L
Total Iron	43000	7.2	ug/L

Traditional Parameters

REJECT-5 Parameter	92120628	Method Detection Limit	Units
Total Cyanide	0.020	0.0010	mg/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Metals

T4-5 Parameter	92120629	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	6.7	2.2	ug/L
Total Silver	ND	0.12	ug/L
Total Arsenic	7.8	1.1	ug/L
Total Copper	1.5	0.51	ug/L
Total Lead	1.9	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	ND	1.8	ug/L
Total Calcium	1800	6.1	ug/L
Total Manganese	550	0.60	ug/L
Total Iron	9200	72	ug/L

Traditional Parameters

T4-5 Parameter	92120629	Method Detection Limit	Units
Total Cyanide	0.014	0.0010	mg/L

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Metals

SUMP-5 Parameter	92120627	Method Detection Limit	Units
Total Mercury	ND	0.47	ug/L
Total Chromium	ND	100	ug/L
Total Nickel	ND	26	ug/L
Total Zinc	ND	2.2	ug/L
Total Silver	0.20	0.12	ug/L
Total Arsenic	4.8	1.1	ug/L
Total Copper	4.2	0.51	ug/L
Total Lead	2.6	0.46	ug/L
Total Antimony	ND	2.2	ug/L
Total Beryllium	ND	1.8	ug/L
Total Calcium	8900	6.1	ug/L
Total Manganese	220	0.60	ug/L
Total Iron	3800	7.2	ug/L

Traditional Parameters

SUMP-5 Parameter	92120627	Method Detection Limit	Units
Total Cyanide	0.016	0.0010	mg/L

CIBA-GEIGY CORPORATION

ENVIRONMENTAL TESTING LABORATORY

TOMS RIVER, NEW JERSEY

CLIENT NAME:	CIBA-GEIGY Corporation Cranston, Rhode Island
PROJECT NAME:	Sludge
PROJECT CODE:	RI-TCLP
CHARGE NUMBER:	CLA-61
REPORT NUMBER:	93E-0012
REPORT DATE:	29-Jan-93

Denis Mitchell
Laboratory Director

REPORT NUMBER: 93E-0012

29-Jan-93

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Date Sampled	Date Received
93010128	SLUDGE-NFP1	1/06/1993	1/07/1993
93010129	SLUDGE-FP1	1/06/1993	1/07/1993

Sample #	Sample Description	Parameter	Date Extracted
93010128	SLUDGE-NFP1	TCLP-ALL	1/08/1993
		Semivolatiles-TCLP	1/12/1993
		Pesticides-TCLP	1/12/1993
		Herbicides-TCLP	1/13/1993
93010129	SLUDGE-FP1	TCLP-ALL	1/08/1993
		Semivolatiles-TCLP	1/12/1993
		Pesticides-TCLP	1/12/1993
		Herbicides-TCLP	1/13/1993
		Semivolatiles-TCLP	1/18/1993

REPORT NUMBER: 93E-0012

29-Jan-93

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Laboratory Chronicle

Sample #	Sample Description	Parameter	Date Analyzed
93010128	SLUDGE-NFP1	Volatiles	1/12/1993
		Semivolatiles	1/15/1993
		Pesticides	1/14/1993
		Herbicides	1/18/1993
		Total Mercury TCLP	1/15/1993
		Total Barium TCLP	1/22/1993
		Total Cadmium TCLP	1/22/1993
		Total Chromium TCLP	1/22/1993
		Total Silver TCLP	1/18/1993
		Total Arsenic TCLP	1/14/1993
		Total Lead TCLP	1/14/1993
		Total Selenium TCLP	1/14/1993
93010129	SLUDGE-FP1	Volatiles	1/12/1993
		Semivolatiles	1/26/1993
		Pesticides	1/14/1993
		Herbicides	1/18/1993
		Total Mercury TCLP	1/15/1993
		Total Barium TCLP	1/22/1993
		Total Cadmium TCLP	1/22/1993
		Total Chromium TCLP	1/22/1993
		Total Silver TCLP	1/18/1993
		Total Arsenic TCLP	1/14/1993
		Total Lead TCLP	1/14/1993
		Total Selenium TCLP	1/14/1993

REPORT NUMBER: 93E-0012
29-Jan-93

GIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Definitions

N/A	Not applicable
ND	Not detected at or above method detection limit.
J	Detected but below method detection limit.
B	Analyte detected in blank but not corrected for amount in blank.
Method Detection Limit	Lowest concentration (amount) that must be present before a reliable and recognizable response is observed for that method of analysis.

When a sample has been diluted, the Method Detection Limit has been multiplied by the dilution factor.

Methodology

TCLP extracts were prepared in accordance with Toxicity Characteristics Revisions; Final Rule, 40 CFR 261, March 29, 1990.

Volatile organic analyses were performed in accordance with Method 8240, SW-846, EPA Test Methods for Evaluating Solid Wastes, 3rd edition.

Semivolatile organic analyses were performed in accordance with Method 8270, SW-846, EPA Test Methods for Evaluating Solid Wastes, 3rd edition.

Pesticides analyses were performed in accordance with Method 8080, SW-846, EPA Test Methods for Evaluating Solid Wastes, 3rd edition.

Herbicide analyses were performed in accordance with Method 509B, Standard Methods for the Examination of Water and Wastewater, 15th edition.

ICP metals analyses were performed in accordance with Method 200.7, 40 CFR 136.

Furnace metals and inorganics analyses were performed in accordance with EPA Test Methods for the Chemical Analysis of Water and Wastes.

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

TCLP REGULATORY LEVELS

PARAMETER	MAXIMUM CONC. LIMITS
Vinyl chloride	200
1,1-Dichloroethene	700
2-Butanone	200000
Chloroform	6000
Carbon tetrachloride	500
1,2 Dichloroethane	500
Trichloroethene	500
Benzene	500
Tetrachloroethene	700
Chlorobenzene	100000
1,4-Dichlorobenzene	7500
Total Cresols	200000
Hexachloroethane	3000
Nitrobenzene	2000
Hexachlorobutadiene	500
2,4,6-Trichlorophenol	2000
2,4,5-Trichlorophenol	400000
2,4-Dinitrotoluene	130
Hexachlorobenzene	130
Pentachlorophenol	100000
Pyridine	5000
Gamma BHC (Lindane)	400
Chlordane	30
Endrin	20
Heptachlor	8.0
Heptachlor Epoxide	8.0
Toxaphene	500
Methoxychlor	10000
2,4-D	10000
2,4,5-TP(Silvex)	1000
Barium	100000
Cadmium	1000
Chromium	5000
Arsenic	5000
Lead	5000
Selenium	1000
Silver	5000
Mercury	200
	(ug/L)

REPORT NUMBER: 93E-0012

29-Jan-93

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Volatiles

TCLP BLANK Parameter	93010238	Method Detection Limit	Units
Vinyl chloride	ND	100	ug/L
1,1-Dichloroethene	ND	50	ug/L
2-Butanone	ND	1000	ug/L
Chloroform	ND	50	ug/L
Carbon tetrachloride	ND	50	ug/L
1,2-Dichloroethane	ND	50	ug/L
Trichloroethene	ND	50	ug/L
Benzene	ND	50	ug/L
Tetrachloroethene	ND	50	ug/L
Chlorobenzene	ND	50	ug/L

Semivolatiles

TCLP BLANK Parameter	93010238	Method Detection Limit	Units
1,4-Dichlorobenzene	ND	40	ug/L
Total Cresol	ND	40	ug/L
Hexachloroethane	ND	40	ug/L
Nitrobenzene	ND	40	ug/L
Hexachlorobutadiene	ND	40	ug/L
2,4,6-Trichlorophenol	ND	40	ug/L
2,4,5-Trichlorophenol	ND	40	ug/L
2,4-Dinitrotoluene	ND	40	ug/L
Hexachlorobenzene	ND	40	ug/L
Pentachlorophenol	ND	40	ug/L
Pyridine	ND	200	ug/L
	ND	80	ug/L

REPORT NUMBER: 93E-0012

29-Jan-93

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Pesticides

TCLP BLANK Parameter	93010238	Method Detection Limit	Units
Gamma BHC(Lindane)	ND	0.076	ug/L
Heptachlor	ND	0.084	ug/L
Heptachlor epoxide	ND	0.12	ug/L
Endrin	ND	0.11	ug/L
Methoxychlor	ND	0.92	ug/L
Chlordane	ND	2.2	ug/L
Toxaphene	ND	4.8	ug/L

Herbicides

TCLP BLANK Parameter	93010238	Method Detection Limit	Units
2,4-D	ND	9.7	ug/L
2,4,5-TP(Silvex)	ND	5.5	ug/L

Metals

TCLP BLANK Parameter	93010238	Method Detection Limit	Units
Total Mercury	ND	47	ug/L
Total Barium	ND	50	ug/L
Total Cadmium	ND	75	ug/L
Total Chromium	ND	1000	ug/L
Total Silver	ND	12	ug/L
Total Arsenic	ND	160	ug/L
Total Lead	ND	46	ug/L
Total Selenium	ND	90	ug/L

REPORT NUMBER: 93E-0012

29-Jan-93

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Pesticides

SLUDGE-NFP1 Parameter	93010128	Method Detection Limit	Units
Gamma BHC(Lindane)	ND	0.076	ug/L
Heptachlor	ND	0.084	ug/L
Heptachlor epoxide	ND	0.12	ug/L
Endrin	ND	0.11	ug/L
Methoxychlor	ND	0.92	ug/L
Chlordane	ND	2.2	ug/L
Toxaphene	ND	4.8	ug/L

Herbicides

SLUDGE-NFP1 Parameter	93010128	Method Detection Limit	Units
2,4-D	ND	0.97	ug/L
2,4,5-TP(Silvex)	ND	0.55	ug/L

Metals

SLUDGE-NFP1 Parameter	93010128	Method Detection Limit	Units
Total Mercury	ND	47	ug/L
Total Barium	490	50	ug/L
Total Cadmium	ND	75	ug/L
Total Chromium	ND	1000	ug/L
Total Silver	ND	12	ug/L
Total Arsenic	ND	160	ug/L
Total Lead	ND	46	ug/L
Total Selenium	ND	90	ug/L

REPORT NUMBER: 93E-0012

29-Jan-93

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Volatiles

SLUDGE-NFP1 Parameter	93010128	Method Detection Limit	Units
Vinyl chloride	ND	100	ug/L
1,1-Dichloroethene	ND	50	ug/L
2-Butanone	ND	1000	ug/L
Chloroform	ND	50	ug/L
Carbon tetrachloride	ND	50	ug/L
1,2-Dichloroethane	ND	50	ug/L
Trichloroethene	ND	50	ug/L
Benzene	ND	50	ug/L
Tetrachloroethene	ND	50	ug/L
Chlorobenzene	ND	50	ug/L

Semivolatiles

SLUDGE-NFP1 Parameter	93010128	Method Detection Limit	Units
1,4-Dichlorobenzene	ND	40	ug/L
Total Cresol	ND	40	ug/L
Hexachloroethane	ND	40	ug/L
Nitrobenzene	ND	40	ug/L
Hexachlorobutadiene	ND	40	ug/L
2,4,6-Trichlorophenol	ND	40	ug/L
2,4,5-Trichlorophenol	ND	40	ug/L
2,4-Dinitrotoluene	ND	40	ug/L
Hexachlorobenzene	ND	40	ug/L
Pentachlorophenol	ND	200	ug/L
Pyridine	ND	80	ug/L

REPORT NUMBER: 93E-0012

29-Jan-93

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Volatiles

SLUDGE-FP1 Parameter	93010129	Method Detection Limit	Units
Vinyl chloride	ND	100	ug/L
1,1-Dichloroethene	ND	50	ug/L
2-Butanone	ND	1000	ug/L
Chloroform	ND	50	ug/L
Carbon tetrachloride	ND	50	ug/L
1,2-Dichloroethane	ND	50	ug/L
Trichloroethene	ND	50	ug/L
Benzene	ND	50	ug/L
Tetrachloroethene	ND	50	ug/L
Chlorobenzene	ND	50	ug/L

Semivolatiles

SLUDGE-FP1 Parameter	93010129	Method Detection Limit	Units
1,4-Dichlorobenzene	ND	40	ug/L
Total Cresol	ND	40	ug/L
Hexachloroethane	ND	40	ug/L
Nitrobenzene	ND	40	ug/L
Hexachlorobutadiene	ND	40	ug/L
2,4,6-Trichlorophenol	ND	40	ug/L
2,4,5-Trichlorophenol	ND	40	ug/L
2,4-Dinitrotoluene	ND	40	ug/L
Hexachlorobenzene	ND	40	ug/L
Pentachlorophenol	ND	40	ug/L
Pyridine	ND	200	ug/L
		80	ug/L

REPORT NUMBER: 93E-0012

29-Jan-93

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Pesticides

SLUDGE-FP1 Parameter	93010129	Method Detection Limit	Units
Gamma BHC(Lindane)	ND	0.076	ug/L
Heptachlor	ND	0.084	ug/L
Heptachlor epoxide	ND	0.12	ug/L
Endrin	ND	0.11	ug/L
Methoxychlor	ND	0.92	ug/L
Chlordane	ND	2.2	ug/L
Toxaphene	ND	4.8	ug/L

Herbicides

SLUDGE-FP1 Parameter	93010129	Method Detection Limit	Units
2,4-D	ND	9.7	ug/L
2,4,5-TP(Silvex)	ND	5.5	ug/L

Metals

SLUDGE-FP1 Parameter	93010129	Method Detection Limit	Units
Total Mercury	ND	47	ug/L
Total Barium	9300	50	ug/L
Total Cadmium	61	75	ug/L
Total Chromium	ND	1000	ug/L
Total Silver	15	12	ug/L
Total Arsenic	ND	160	ug/L
Total Lead	ND	46	ug/L
Total Selenium	ND	90	ug/L

REPORT NUMBER: 93E-0012

29-Jan-93

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Surrogates

TCLP BLANK Parameter	93010238 % Recovery	QC Limits
1,2-Dichloroethane-d4	91	76 to 114
Toluene-d8	92	88 to 110
4-Bromofluorobenzene	97	86 to 115
2-Fluorophenol	63	21 to 100
Phenol-d6	66	10 to 94
Nitrobenzene-d5	66	35 to 114
2-Fluorobiphenyl	59	43 to 116
2,4,6-Tribromophenol	71	10 to 123
Terphenyl-d14	81	33 to 141
Dibutylchlorendate	106	24 to 154
2,4,5-T	104	30 to 128

SLUDGE-NFP1 Parameter	93010128 % Recovery	QC Limits
1,2-Dichloroethane-d4	94	76 to 114
Toluene-d8	91	88 to 110
4-Bromofluorobenzene	95	86 to 115
2-Fluorophenol	50	21 to 100
Phenol-d6	55	10 to 94
Nitrobenzene-d5	68	35 to 114
2-Fluorobiphenyl	59	43 to 116
2,4,6-Tribromophenol	67	10 to 123
Terphenyl-d14	74	33 to 141
Dibutylchlorendate	96	24 to 154
2,4,5-T	111	30 to 128

REPORT NUMBER: 93E-0012

29-Jan-93

CIBA-GEIGY CORPORATION
ENVIRONMENTAL TESTING LABORATORY

Surrogates

SLUDGE-FP1 Parameter	93010129 % Recovery		QC Limits
1,2-Dichloroethane-d4	97		76 to 114
Toluene-d8	97		88 to 110
4-Bromofluorobenzene	100		86 to 115
2-Fluorophenol	0	*	21 to 100
Phenol-d6	4	*	10 to 94
Nitrobenzene-d5	66		35 to 114
2-Fluorobiphenyl	67		43 to 116
2,4,6-Tribromophenol	2	*	10 to 123
Terphenyl-d14	69		33 to 141
Dibutylchlorendate	43		24 to 154
2,4,5-T	118		30 to 128

* Outside QC limits due to matrix interference.

1 1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

TRIP BLANK

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92100284

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1589

Level: (low/med) LOW Date Received: 10/22/92

% Moisture: not dec.---- Date Analyzed: 10/22/92

Column: (pack/cap) CAP Dilution Factor: 1.00000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl Chloride	1.	U
74-83-9	Bromomethane	1.	U
75-00-3	Chloroethane	1.	U
75-09-2	Methylene Chloride	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
78-93-3	2-Butanone	1.	U
110-75-8	Chloroethylvinylether	1.	U
540-59-0	1,2-Dichloroethene, trans	1.	U
150-60-5	1,2-Dichloroethene, cis	1.	U
67-66-3	Chloroform	1.	U
107-02-2	1,2-Dichloroethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
56-23-5	Carbon Tetrachloride	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
108-10-1	4-Methyl-2-Pentanone	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
79-01-6	Trichloroethene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
71-43-2	Benzene	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
127-18-4	Tetrachloroethene	1.	U
124-48-1	Dibromochloromethane	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
108-88-3	Toluene	2.	
108-90-7	Chlorobenzene	1.	U
100-41-4	Ethylbenzene	1.	U
100-42-5	Styrene	1.	U
75-25-2	Bromoform	1.	U
133-02-7	o-Xylene	1.	U
XXX-XX-X	m&p-Xylene	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U
95-49-8	2-Chlorotoluene	1.	U
106-43-4	4-Chlorotoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
95-50-2	1,2-Dichlorobenzene	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U

1 1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

VEGW-1

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92100259

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1590

Level: (low/med) LOW Date Received: 10/22/92

% Moisture: not dec.---- Date Analyzed: 10/22/92

Column: (pack/cap) CAP Dilution Factor: 100.0000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	100.	U D
75-01-4	Vinyl Chloride	100.	U D
74-83-9	Bromomethane	100.	U D
75-00-3	Chloroethane	100.	U D
75-09-2	Methylene Chloride	100.	U D
75-35-4	1,1-Dichloroethene	100.	U D
75-34-3	1,1-Dichloroethane	100.	U D
78-93-3	2-Butanone	100.	U D
110-75-8	Chloroethylvinylether	100.	U D
540-59-0	1,2-Dichloroethene, trans	100.	U D
150-60-5	1,2-Dichloroethene, cis	100.	U D
67-66-3	Chloroform	100.	U D
107-02-2	1,2-Dichloroethane	100.	U D
71-55-6	1,1,1-Trichloroethane	100.	U D
56-23-5	Carbon Tetrachloride	100.	U D
78-87-5	1,2-Dichloropropane	100.	U D
75-27-4	Bromodichloromethane	100.	U D
108-10-1	4-Methyl-2-Pentanone	100.	U D
10061-01-5	cis-1,3-Dichloropropene	100.	U D
79-01-6	Trichloroethene	100.	U D
79-00-5	1,1,2-Trichloroethane	100.	U D
71-43-2	Benzene	100.	U D
10061-02-6	trans-1,3-Dichloropropene	100.	U D
127-18-4	Tetrachloroethene	100.	U D
124-48-1	Dibromochloromethane	100.	U D
79-34-5	1,1,2,2-Tetrachloroethane	100.	U D
108-88-3	Toluene	23000.	E D
108-90-7	Chlorobenzene	260.	D
100-41-4	Ethylbenzene	1200.	D
100-42-5	Styrene	100.	U D
75-25-2	Bromoform	100.	U D
133-02-7	o-Xylene	1200.	D
XXX-XX-X	m&p-Xylene	4600.	D
96-18-4	1,2,3-Trichloropropane	100.	U D
95-49-8	2-Chlorotoluene	7900.	D
106-43-4	4-Chlorotoluene	100.	U D
541-73-1	1,3-Dichlorobenzene	100.	U D
106-46-7	1,4-Dichlorobenzene	100.	U D
95-50-2	1,2-Dichlorobenzene	100.	U D
120-82-1	1,2,4-Trichlorobenzene	100.	U D
87-61-6	1,2,3-Trichlorobenzene	100.	U D

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VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

VEGW-1

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92100259

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1598

Level: (low/med) LOW Date Received: 10/22/92

% Moisture: not dec.---- Date Analyzed: 10/23/92

Column: (pack/cap) CAP Dilution Factor: 2000.000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	2000.	U D
75-01-4	Vinyl Chloride	2000.	U D
74-83-9	Bromomethane	2000.	U D
75-00-3	Chloroethane	2000.	U D
75-09-2	Methylene_Chloride	2000.	U D
75-35-4	1,1-Dichloroethene	2000.	U D
75-34-3	1,1-Dichloroethane	2000.	U D
78-93-3	2-Butanone	2000.	U D
110-75-8	Chloroethylvinylether	2000.	U D
540-59-0	1,2-Dichloroethene,_trans	2000.	U D
150-60-5	1,2-Dichloroethene,_cis	2000.	U D
67-66-3	Chloroform	2000.	U D
107-02-2	1,2-Dichloroethane	2000.	U D
71-55-6	1,1,1-Trichloroethane	2000.	U D
56-23-5	Carbon Tetrachloride	2000.	U D
78-87-5	1,2-Dichloropropane	2000.	U D
75-27-4	Bromodichloromethane	2000.	U D
108-10-1	4-Methyl-2-Pentanone	2000.	U D
10061-01-5	cis-1,3-Dichloropropene	2000.	U D
79-01-6	Trichloroethene	2000.	U D
79-00-5	1,1,2-Trichloroethane	2000.	U D
71-43-2	Benzene	2000.	U D
10061-02-6	trans-1,3-Dichloropropene	2000.	U D
127-18-4	Tetrachloroethene	2000.	U D
124-48-1	Dibromochloromethane	2000.	U D
79-34-5	1,1,2,2-Tetrachloroethane	2000.	U D
108-88-3	Toluene	190000.	D
108-90-7	Chlorobenzene	2000.	U D
100-41-4	Ethylbenzene	2000.	U D
100-42-5	Styrene	2000.	U D
75-25-2	Bromoform	2000.	U D
133-02-7	o-Xylene	2000.	U D
XXX-XX-X	m&p-Xylene	4900.	D
96-18-4	1,2,3-Trichloropropane	2000.	U D
95-49-8	2-Chlorotoluene	9900.	D
106-43-4	4-Chlorotoluene	2000.	U D
541-73-1	1,3-Dichlorobenzene	2000.	U D
106-46-7	1,4-Dichlorobenzene	2000.	U D
95-50-2	1,2-Dichlorobenzene	2000.	U D
120-82-1	1,2,4-Trichlorobenzene	2000.	U D
87-61-6	1,2,3-Trichlorobenzene	2000.	U D

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VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

VEGW-2

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92100260

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1591

Level: (low/med) LOW Date Received: 10/22/92

% Moisture: not dec.---- Date Analyzed: 10/22/92

Column: (pack/cap) CAP Dilution Factor: 100.0000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	100.	U D
75-01-4	Vinyl Chloride	100.	U D
74-83-9	Bromomethane	100.	U D
75-00-3	Chloroethane	100.	U D
75-09-2	Methylene Chloride	180.	D
75-35-4	1,1-Dichloroethene	100.	U D
75-34-3	1,1-Dichloroethane	100.	U D
78-93-3	2-Butanone	100.	U D
110-75-8	Chloroethylvinylether	100.	U D
540-59-0	1,2-Dichloroethene, trans	100.	U D
150-60-5	1,2-Dichloroethene, cis	100.	U D
67-66-3	Chloroform	100.	U D
107-02-2	1,2-Dichloroethane	100.	U D
71-55-6	1,1,1-Trichloroethane	100.	U D
56-23-5	Carbon Tetrachloride	100.	U D
78-87-5	1,2-Dichloropropane	100.	U D
75-27-4	Bromodichloromethane	100.	U D
108-10-1	4-Methyl-2-Pentanone	100.	U D
10061-01-5	cis-1,3-Dichloropropene	100.	U D
79-01-6	Trichloroethene	100.	U D
79-00-5	1,1,2-Trichloroethane	100.	U D
71-43-2	Benzene	100.	U D
10061-02-6	trans-1,3-Dichloropropene	100.	U D
127-18-4	Tetrachloroethene	100.	U D
124-48-1	Dibromochloromethane	100.	U D
79-34-5	1,1,2,2-Tetrachloroethane	100.	U D
108-88-3	Toluene	100.	U D
108-90-7	Chlorobenzene	22000.	E D
100-41-4	Ethylbenzene	100.	U D
100-42-5	Styrene	420.	D
75-25-2	Bromoform	100.	U D
133-02-7	o-Xylene	100.	U D
XXX-XX-X	m&p-Xylene	380.	D
96-18-4	1,2,3-Trichloropropane	1500.	D
95-49-8	2-Chlorotoluene	100.	U D
106-43-4	4-Chlorotoluene	4000.	D
541-73-1	1,3-Dichlorobenzene	100.	U D
106-46-7	1,4-Dichlorobenzene	100.	U D
95-50-2	1,2-Dichlorobenzene	100.	U D
120-82-1	1,2,4-Trichlorobenzene	100.	U D
87-61-6	1,2,3-Trichlorobenzene	100.	U D

1 1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

VEGW-2

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92100260

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1599

Level: (low/med) LOW Date Received: 10/22/92

% Moisture: not dec.---- Date Analyzed: 10/23/92

Column: (pack/cap) CAP Dilution Factor: 2000.000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	2000.	U D
75-01-4	Vinyl Chloride	2000.	U D
74-83-9	Bromomethane	2000.	U D
75-00-3	Chloroethane	2000.	U D
75-09-2	Methylene Chloride	2000.	U D
75-35-4	1,1-Dichloroethene	2000.	U D
75-34-3	1,1-Dichloroethane	2000.	U D
78-93-3	2-Butanone	2000.	U D
110-75-8	Chloroethylvinylether	2000.	U D
540-59-0	1,2-Dichloroethene, trans	2000.	U D
150-60-5	1,2-Dichloroethene, cis	2000.	U D
67-66-3	Chloroform	2000.	U D
107-02-2	1,2-Dichloroethane	2000.	U D
71-55-6	1,1,1-Trichloroethane	2000.	U D
56-23-5	Carbon Tetrachloride	2000.	U D
78-87-5	1,2-Dichloropropane	2000.	U D
75-27-4	Bromodichloromethane	2000.	U D
108-10-1	4-Methyl-2-Pentanone	2000.	U D
10061-01-5	cis-1,3-Dichloropropene	2000.	U D
79-01-6	Trichloroethene	2000.	U D
79-00-5	1,1,2-Trichloroethane	2000.	U D
71-43-2	Benzene	2000.	U D
10061-02-6	trans-1,3-Dichloropropene	2000.	U D
127-18-4	Tetrachloroethene	2000.	U D
124-48-1	Dibromochloromethane	2000.	U D
79-34-5	1,1,2,2-Tetrachloroethane	2000.	U D
108-88-3	Toluene	150000.	D
108-90-7	Chlorobenzene	2000.	U D
100-41-4	Ethylbenzene	2000.	U D
100-42-5	Styrene	2000.	U D
75-25-2	Bromoform	2000.	U D
133-02-7	o-Xylene	2000.	U D
XXX-XX-X	m&p-Xylene	2000.	U D
96-18-4	1,2,3-Trichloropropane	2000.	U D
95-49-8	2-Chlorotoluene	3700.	D
106-43-4	4-Chlorotoluene	2000.	U D
541-73-1	1,3-Dichlorobenzene	2000.	U D
106-46-7	1,4-Dichlorobenzene	2000.	U D
95-50-2	1,2-Dichlorobenzene	2000.	U D
120-82-1	1,2,4-Trichlorobenzene	2000.	U D
87-61-6	1,2,3-Trichlorobenzene	2000.	U D

1 1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

VEGW-3

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92100261

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1592

Level: (low/med) LOW Date Received: 10/22/92

% Moisture: not dec.---- Date Analyzed: 10/22/92

Column: (pack/cap) CAP Dilution Factor: 100.0000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	100.	U D
75-01-4	Vinyl Chloride	100.	U D
74-83-9	Bromomethane	100.	U D
75-00-3	Chloroethane	100.	U D
75-09-2	Methylene Chloride	180.	D
75-35-4	1,1-Dichloroethene	100.	U D
75-34-3	1,1-Dichloroethane	100.	U D
78-93-3	2-Butanone	100.	U D
110-75-8	Chloroethylvinylether	100.	U D
540-59-0	1,2-Dichloroethene, trans	100.	U D
150-60-5	1,2-Dichloroethene, cis	100.	U D
67-66-3	Chloroform	100.	U D
107-02-2	1,2-Dichloroethane	100.	U D
71-55-6	1,1,1-Trichloroethane	100.	U D
56-23-5	Carbon Tetrachloride	100.	U D
78-87-5	1,2-Dichloropropane	100.	U D
75-27-4	Bromodichloromethane	100.	U D
108-10-1	4-Methyl-2-Pentanone	100.	U D
10061-01-5	cis-1,3-Dichloropropene	100.	U D
79-01-6	Trichloroethene	100.	U D
79-00-5	1,1,2-Trichloroethane	100.	U D
71-43-2	Benzene	100.	U D
10061-02-6	trans-1,3-Dichloropropene	100.	U D
127-18-4	Tetrachloroethene	100.	U D
124-48-1	Dibromochloromethane	100.	U D
79-34-5	1,1,2,2-Tetrachloroethane	100.	U D
108-88-3	Toluene	22000.	E D
108-90-7	Chlorobenzene	120.	D
100-41-4	Ethylbenzene	460.	D
100-42-5	Styrene	100.	U D
75-25-2	Bromoform	100.	U D
133-02-7	o-Xylene	390.	D
XXX-XX-X	m&p-Xylene	1700.	D
96-18-4	1,2,3-Trichloropropane	100.	U D
95-49-8	2-Chlorotoluene	4700.	D
106-43-4	4-Chlorotoluene	100.	U D
541-73-1	1,3-Dichlorobenzene	100.	U D
106-46-7	1,4-Dichlorobenzene	100.	U D
95-50-2	1,2-Dichlorobenzene	100.	U D
120-82-1	1,2,4-Trichlorobenzene	100.	U D
87-61-6	1,2,3-Trichlorobenzene	100.	U D

1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

VEGW-3

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92100261

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1600

Level: (low/med) LOW Date Received: 10/22/92

% Moisture: not dec.---- Date Analyzed: 10/23/92

Column: (pack/cap) CAP Dilution Factor: 2000.000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	2000.	U D
75-01-4	Vinyl Chloride	2000.	U D
74-83-9	Bromomethane	2000.	U D
75-00-3	Chloroethane	2000.	U D
75-09-2	Methylene Chloride	2000.	U D
75-35-4	1,1-Dichloroethene	2000.	U D
75-34-3	1,1-Dichloroethane	2000.	U D
78-93-3	2-Butanone	2000.	U D
110-75-8	Chloroethylvinylether	2000.	U D
540-59-0	1,2-Dichloroethene, trans	2000.	U D
150-60-5	1,2-Dichloroethene, cis	2000.	U D
67-66-3	Chloroform	2000.	U D
107-02-2	1,2-Dichloroethane	2000.	U D
71-55-6	1,1,1-Trichloroethane	2000.	U D
56-23-5	Carbon Tetrachloride	2000.	U D
78-87-5	1,2-Dichloropropane	2000.	U D
75-27-4	Bromodichloromethane	2000.	U D
108-10-1	4-Methyl-2-Pentanone	2000.	U D
10061-01-5	cis-1,3-Dichloropropene	2000.	U D
79-01-6	Trichloroethene	2000.	U D
79-00-5	1,1,2-Trichloroethane	2000.	U D
71-43-2	Benzene	2000.	U D
10061-02-6	trans-1,3-Dichloropropene	2000.	U D
127-18-4	Tetrachloroethene	2000.	U D
124-48-1	Dibromochloromethane	2000.	U D
79-34-5	1,1,2,2-Tetrachloroethane	2000.	U D
108-88-3	Toluene	2000.	U D
108-90-7	Chlorobenzene	160000.	D
100-41-4	Ethylbenzene	2000.	U D
100-42-5	Styrene	2000.	U D
75-25-2	Bromoform	2000.	U D
133-02-7	o-Xylene	2000.	U D
XXX-XX-X	m&p-Xylene	2000.	U D
96-18-4	1,2,3-Trichloropropane	2000.	U D
95-49-8	2-Chlorotoluene	2000.	U D
106-43-4	4-Chlorotoluene	4300.	D
541-73-1	1,3-Dichlorobenzene	2000.	U D
106-46-7	1,4-Dichlorobenzene	2000.	U D
95-50-2	1,2-Dichlorobenzene	2000.	U D
120-82-1	1,2,4-Trichlorobenzene	2000.	U D
87-61-6	1,2,3-Trichlorobenzene	2000.	U D

1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

VEGW-4

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92100262

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1593

Level: (low/med) LOW Date Received: 10/22/92

% Moisture: not dec.---- Date Analyzed: 10/22/92

Column: (pack/cap) CAP Dilution Factor: 100.0000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	100.	U D
75-01-4	Vinyl Chloride	100.	U D
74-83-9	Bromomethane	100.	U D
75-00-3	Chloroethane	100.	U D
75-09-2	Methylene_Chloride	160.	D
75-35-4	1,1-Dichloroethene	100.	U D
75-34-3	1,1-Dichloroethane	100.	U D
78-93-3	2-Butanone	100.	U D
110-75-8	Chloroethylvinylether	100.	U D
540-59-0	1,2-Dichloroethene,_trans	100.	U D
150-60-5	1,2-Dichloroethene,_cis	100.	U D
67-66-3	Chloroform	100.	U D
107-02-2	1,2-Dichloroethane	100.	U D
71-55-6	1,1,1-Trichloroethane	100.	U D
56-23-5	Carbon Tetrachloride	100.	U D
78-87-5	1,2-Dichloropropane	100.	U D
75-27-4	Bromodichloromethane	100.	U D
108-10-1	4-Methyl-2-Pentanone	100.	U D
10061-01-5	cis-1,3-Dichloropropene	100.	U D
79-01-6	Trichloroethene	100.	U D
79-00-5	1,1,2-Trichloroethane	100.	U D
71-43-2	Benzene	100.	U D
10061-02-6	trans-1,3-Dichloropropene	100.	U D
127-18-4	Tetrachloroethene	100.	U D
124-48-1	Dibromochloromethane	100.	U D
79-34-5	1,1,2,2-Tetrachloroethane	100.	U D
108-88-3	Toluene	21000.	E D
108-90-7	Chlorobenzene	150.	D
100-41-4	Ethylbenzene	480.	D
100-42-5	Styrene	100.	U D
75-25-2	Bromoform	100.	U D
133-02-7	o-Xylene	410.	D
XXX-XX-X	m&p-Xylene	1700.	D
96-18-4	1,2,3-Trichloropropane	100.	U D
95-49-8	2-Chlorotoluene	5600.	D
106-43-4	4-Chlorotoluene	100.	U D
541-73-1	1,3-Dichlorobenzene	100.	U D
106-46-7	1,4-Dichlorobenzene	100.	U D
95-50-2	1,2-Dichlorobenzene	100.	U D
120-82-1	1,2,4-Trichlorobenzene	100.	U D
87-61-6	1,2,3-Trichlorobenzene	100.	U D

1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

VEGW-4

Lab Name:CET ANALYTICAL CHEMISTRY Contract:N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 92100262

Sample wt/vol: 25 (g/mL) ML Lab File ID: >V1601

Level: (low/med) LOW Date Received: 10/22/92

% Moisture: not dec.---- Date Analyzed: 10/23/92

Column: (pack/cap) CAP Dilution Factor: 2000.000

Final extract Volume: ----- (uL) Conversion Factor: 1.0000

Aliquot Volume: --- (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	2000.	U D
75-01-4	Vinyl Chloride	2000.	U D
74-83-9	Bromomethane	2000.	U D
75-00-3	Chloroethane	2000.	U D
75-09-2	Methylene_Chloride	2000.	U D
75-35-4	1,1-Dichloroethene	2000.	U D
75-34-3	1,1-Dichloroethane	2000.	U D
78-93-3	2-Butanone	2000.	U D
110-75-8	Chloroethylvinylether	2000.	U D
540-59-0	1,2-Dichloroethene,_trans	2000.	U D
150-60-5	1,2-Dichloroethene,_cis	2000.	U D
67-66-3	Chloroform	2000.	U D
107-02-2	1,2-Dichloroethane	2000.	U D
71-55-6	1,1,1-Trichloroethane	2000.	U D
56-23-5	Carbon Tetrachloride	2000.	U D
78-87-5	1,2-Dichloropropane	2000.	U D
75-27-4	Bromodichloromethane	2000.	U D
108-10-1	4-Methyl-2-Pentanone	2000.	U D
10061-01-5	cis-1,3-Dichloropropene	2000.	U D
79-01-6	Trichloroethene	2000.	U D
79-00-5	1,1,2-Trichloroethane	2000.	U D
71-43-2	Benzene	2000.	U D
10061-02-6	trans-1,3-Dichloropropene	2000.	U D
127-18-4	Tetrachloroethene	2000.	U D
124-48-1	Dibromochloromethane	2000.	U D
79-34-5	1,1,2,2-Tetrachloroethane	2000.	U D
108-88-3	Toluene	160000.	D
108-90-7	Chlorobenzene	2000.	U D
100-41-4	Ethylbenzene	2000.	U D
100-42-5	Styrene	2000.	U D
75-25-2	Bromoform	2000.	U D
133-02-7	o-Xylene	2000.	U D
XXX-XX-X	m&p-Xylene	2000.	U D
96-18-4	1,2,3-Trichloropropane	2000.	U D
95-49-8	2-Chlorotoluene	6300.	D
106-43-4	4-Chlorotoluene	2000.	U D
541-73-1	1,3-Dichlorobenzene	2000.	U D
106-46-7	1,4-Dichlorobenzene	2000.	U D
95-50-2	1,2-Dichlorobenzene	2000.	U D
120-82-1	1,2,4-Trichlorobenzene	2000.	U D
87-61-6	1,2,3-Trichlorobenzene	2000.	U D

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5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S2-45194

Received: 22 OCT 92

Purchase Order: E-6484

Ms. Diana Baldi
Ciba-Geigy, Corporate Environmental Technology
410 Swing Road, P.O.Box 18300
Greensboro, NC 27419-8300

CC: Mark Houlday

Project: 87X4660 Ciba/Woodward Clyde
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , AIR SAMPLES	DATE SAMPLED
45194-1	SG-1	10-20-92
45194-2	SG-2	10-21-92
45194-3	SG-3	10-21-92
45194-4	BLK-1	10-21-92

PARAMETER	45194-1	45194-2	45194-3	45194-4
Volatiles by GC/MS				
Chloromethane, ug/l	<500	<500	<500	<50
Bromomethane, ug/l	<500	<500	<500	<50
Vinyl Chloride, ug/l	<500	<500	<500	<50
Chloroethane, ug/l	<500	<500	<500	<50
Methylene Chloride, ug/l	<250	<250	<250	<250
Acetone, ug/l	<5000	<5000	<5000	<500
Carbon Disulfide, ug/l	<250	<250	<250	<25
1,1-Dichloroethene, ug/l	<250	<250	<250	<25
1,1-Dichloroethane, ug/l	<250	<250	<250	<25
Trans-1,2-Dichloroethene, ug/l	<250	<250	<250	<25
Cis-1,2-Dichloroethene, ug/l	<250	<250	<250	<25
Chloroform, ug/l	<250	<250	<250	<25
1,2-Dichloroethane, ug/l	<250	<250	<250	<25
2-Butanone (MEK), ug/l	<5000	<5000	<5000	<500
1,1,1-Trichloroethane, ug/l	<250	<250	<250	<25
Carbon Tetrachloride, ug/l	<250	<250	<250	<25
Vinyl Acetate, ug/l	<5000	<5000	<5000	<500
Bromodichloromethane, ug/l	<250	<250	<250	<25
1,1,2,2-Tetrachloroethane, ug/l	<250	<250	<250	<25
1,2-Dichloropropane, ug/l	<250	<250	<250	<25

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Project: 87X4660 Ciba/Woodward Clyde
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , AIR SAMPLES	DATE SAMPLED
45194-1	SG-1	10-20-92
45194-2	SG-2	10-21-92
45194-3	SG-3	10-21-92
45194-4	BLK-1	10-21-92

PARAMETER	45194-1	45194-2	45194-3	45194-4
Trans-1,3-Dichloropropene, ug/l	<250	<250	<250	<25
Trichloroethene, ug/l	<250	<250	<250	<25
Dibromochloromethane, ug/l	<250	<250	<250	<25
1,1,2-Trichloroethane, ug/l	<250	<250	<250	<25
Benzene, ug/l	<250	<250	<250	<25
Cis-1,3-Dichloropropene, ug/l	<250	<250	<250	<25
Bromoform, ug/l	<250	<250	<250	<25
2-Hexanone, ug/l	<2500	<2500	<2500	<250
4-Methyl-2-pentanone , ug/l	<2500	<2500	<2500	<250
Tetrachloroethene, ug/l	<250	<250	<250	<25
Toluene, ug/l	40000	22000	42000	520
Chlorobenzene, ug/l	<250	<250	<250	<25
Ethylbenzene, ug/l	<250	<250	<250	<25
Styrene, ug/l	<250	<250	<250	<25
Xylenes, ug/l	<250	<250	<250	<25

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Greensboro, NC 27419-8300

CC: Mark Houlday

Project: 87X4660 Ciba/Woodward Clyde
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR AIR SAMPLES
45194-5	Method Blank
45194-6	LCS % Recovery
45194-7	LCS % RPD
45194-8	Date Analyzed

PARAMETER	45194-5	45194-6	45194-7	45194-8
Volatiles by GC/MS				
Chloromethane, ug/l	<0.20	---	---	11.06.92
Bromomethane, ug/l	<0.20	---	---	11.06.92
Vinyl Chloride, ug/l	<0.20	---	---	11.06.92
Chloroethane, ug/l	<0.20	---	---	11.06.92
Methylene Chloride, ug/l	<0.10	---	---	11.06.92
Acetone, ug/l	<2.0	---	---	11.06.92
Carbon Disulfide, ug/l	<0.10	---	---	11.06.92
1,1-Dichloroethene, ug/l	<0.10	139 %	9.4 %	11.06.92
1,1-Dichloroethane, ug/l	<0.10	---	---	11.06.92
Trans-1,2-Dichloroethene, ug/l	<0.10	---	---	11.06.92
Cis-1,2-Dichloroethene, ug/l	<0.10	---	---	11.06.92
Chloroform, ug/l	<0.10	---	---	11.06.92
1,2-Dichloroethane, ug/l	<0.10	---	---	11.06.92
2-Butanone (MEK), ug/l	<2.0	---	---	11.06.92
1,1,1-Trichloroethane, ug/l	<0.10	---	---	11.06.92
Carbon Tetrachloride, ug/l	<0.10	---	---	11.06.92
Vinyl Acetate, ug/l	<2.0	---	---	11.06.92
Bromodichloromethane, ug/l	<0.10	---	---	11.06.92
1,1,2,2-Tetrachloroethane, ug/l	<0.10	---	---	11.06.92
1,2-Dichloropropane, ug/l	<0.10	---	---	11.06.92

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Purchase Order: E-6484

CC: Mark Houlday

Project: 87X4660 Ciba/Woodward Clyde
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR AIR SAMPLES
45194-5	Method Blank
45194-6	LCS % Recovery
45194-7	LCS % RPD
45194-8	Date Analyzed

PARAMETER	45194-5	45194-6	45194-7	45194-8
Trans-1,3-Dichloropropene, ug/l	<0.10	---	---	11.06.92
Trichloroethene, ug/l	<0.10	77 %	2.6 %	11.06.92
Dibromochloromethane, ug/l	<0.10	---	---	11.06.92
1,1,2-Trichloroethane, ug/l	<0.10	---	---	11.06.92
Benzene, ug/l	<0.10	108 %	2.2 %	11.06.92
Cis-1,3-Dichloropropene, ug/l	<0.10	---	---	11.06.92
Bromoform, ug/l	<0.10	---	---	11.06.92
2-Hexanone, ug/l	<1.0	---	---	11.06.92
4-Methyl-2-pentanone , ug/l	<1.0	---	---	11.06.92
Tetrachloroethene, ug/l	<0.10	---	---	11.06.92
Toluene, ug/l	0.11	113 %	0 %	11.06.92
Chlorobenzene, ug/l	<0.10	64 %	7.9 %	11.06.92
Ethylbenzene, ug/l	<0.10	---	---	11.06.92
Styrene, ug/l	<0.10	---	---	11.06.92
Xylenes, ug/l	<0.10	---	---	11.06.92

Appendix P

P

PRELIMINARY ENGINEERING CALCULATIONS

P.1 OVERVIEW

This appendix presents the preliminary engineering calculations performed during the development of the conceptual design for the overall stabilization action proposed for the Production Area of the CIBA-GEIGY facility at Cranston, Rhode Island. This appendix has three sections (corresponding to the three systems proposed for the overall stabilization action):

- Section P.2 presents calculations related to the *full-scale groundwater capture system;*
- Section P.3 presents calculations related to the *full-scale groundwater pretreatment system;* and
- Section P.4 presents calculations related to the *soil vapor extraction system.*

References cited throughout this appendix are listed after Section P.4.

P.2 GROUNDWATER CAPTURE SYSTEM CALCULATIONS

The groundwater capture system is designed to reverse the hydraulic gradient at the bulkhead. Well locations and depths were selected based on the drawdown they could achieve and the distance at which that drawdown could be achieved. Calculations were performed to evaluate drawdown at distance both from the existing recovery wells (RC-1 and RC-2) and from the proposed recovery wells (RC-3, RC-4, and RC-5). Since the bulkhead acts as an impermeable boundary (based on its construction and the response to drawdown observed in wells near it during the constant rate tests), image well analysis (also known as "the method of images") was selected as the most appropriate way to determine whether a hydraulic gradient reversal could be achieved by the groundwater capture system proposed.

Image Well Analysis

When an aquifer is bounded on one side by an impermeable boundary, drawdown due to pumping will be greater near the boundary than what would be predicted on the basis of the Theis equation for an aquifer of infinite areal extent. Image well analysis can be used to predict the additional drawdown that occurs due to the presence of an impermeable boundary (Walton, 1970).

In the image well analysis for the Production Area, the shallow and deep aquifers were analyzed as if they were infinite in areal extent and a "mirror image" pumping well was present at an equal but opposite distance from the bulkhead as the real pumping well (e.g. RC-1).

The cone of depression from pumping a well such as RC-1 would extend equally and uniformly in all directions if the bulkhead (and river) were not present and if the stratigraphy were consistent in all directions (as suggested in frame A of Figure P-1).

When an impermeable boundary is encountered such as shown in frame B of Figure P-1, the cone of depression from the pumping well steepens in the direction of the impermeable boundary. If an imaginary ("image") recovery well were placed on the other side of the boundary from the real recovery well, on a line perpendicular to the boundary and at an equal distance from the boundary as the real recovery well (as shown in frame C of Figure P-1), a groundwater divide would be created. The resultant cone of depression from the real and image wells is the sum of the two drawdowns; the minimum of this sum occures at the groundwater divide (which, for this site, is at the bulkhead). Frame D of Figure P-1 illustrates the resultant cone of depression due to the effect of the impermeable boundary.

Drawdown in an aquifer with an impermeable boundary is given by:

$$s = \frac{Q}{4 \pi T} (W(u_r) + (u_i))$$

where:

Q = discharge rate (feet^3/day)

T = transmissivity (feet^2/day)

$W(u_r)$ = well function of u_r for the real recovery well (from Fetter, 1988).

u_r = $\frac{r_r^2 S}{4 T t}$

S = storativity

r_r = linear distance from the recovery well to a selected observation point (feet)

t = time (days)

$W(u_i)$ = well function of u_i for the image recovery well (from Fetter, 1988)

u_i = $\frac{r_i^2 S}{4 T t}$

r_i = linear distance from the image recovery well to a selected observation point (feet)

Results

The image well analysis is presented for recovery wells RC-1 and RC-2, and for the locations and depths (discussed in Section 5.2 of Chapter 5) selected for proposed recovery wells RC-3, RC-4, and RC-5.

RC-1 Analyses

Drawdown at the bulkhead (48 feet directly downgradient of RC-1) from pumping RC-1 was predicted using the following values:

T	$= 4.05\ ft^2/min = 5830\ ft^2/day$	(from Table 2-12 in Chapter 2)
S	$= 0.003$	(from Table 2-13 in Chapter 2)
r_r	$= 48\ ft = r_i$	
T	$= 50$ days	
Q	$= 38\ gpm = 7316\ ft^3/day$	
$W(u_r)$	$= W(u_i) = 11.45$	

$$s = \frac{7316\ ft^3/day}{4\ (3.14)(5830\ ft^2/day)}\ (11.45 + 11.45)$$

$$s = 2.2\ feet$$

Drawdown at P-37S (36 feet from RC-1) by pumping RC-1 was predicted using the same values as for drawdown near the bulkhead, except:

r_r	$= 36$ feet
r_i	$= 60$ feet
$W(u_r)$	$= 12.05$
$W(u_i)$	$= 11.00$

$$s = \frac{7316\ ft^3/day}{4\ (3.14)(5830\ ft^2/day)}\ (12.05 + 11.00)$$

$$s = 2.3\ feet$$

The actual drawdown in P-37S during the 30-day constant rate test was 2.55 feet.

Drawdown at P-38S (75 feet from RC-1 near the Gravelly Sand unit boundary) from pumping RC-1 was predicted using the same values except:

r_r = 75 feet
r_i = 78 feet
$W(u_r)$ = 10.50
$W(u_i)$ = 10.40

$$s = \frac{7316\ ft^3/day}{4(3.14)(5830\ ft^2/day)}\ (10.50 + 10.40)$$

$$s = 2.1\ feet$$

The actual drawdown in P-38S during the 30-day constant rate test was 0.23 feet.

RC-2 Analysis

Drawdown at P-35S (50 feet directly downgradient from RC-2) from pumping RC-2 was predicted using these values:

$T = 0.58\ ft^2/min = 835\ ft^2/d$ (from Table 2-12)
$S = 0.0045$ (from Table 2-13)
$r_r = 50\ feet = r_i$

$t = 50$ days

$Q = 12$ gpm $= 2310$ ft^3/day

$W(u_r) = W(u_i) = 9.03$

$$s = \frac{2310 \text{ ft}^3/\text{day}}{4(3.14)(835 \text{ ft}^2/\text{day})} (9.03 + 9.03)$$

$s = 3.98$ feet

The actual drawdown at P-35S during the 30-day constant rate test was 1.08 feet.

In a second analysis, drawdown at P-35S from pumping RC-2 was predicted using the same values, except the time was changed from 50 to 10 days:

$t = 10$ days

$W(u_r) = W(u_i) = 7.40$

$$s = \frac{2310 \text{ ft}^3/\text{day}}{4(3.14)(835 \text{ ft}^2/\text{day})} (7.40 + 7.40)$$

$s = 3.26$ feet

Image well analysis for RC-2 over-predicts drawdown near the bulkhead -- the actual drawdown in P-35S after pumping RC-2 for 10 days was 1.08 feet.

RC-3 Analysis

Drawdown near the bulkhead (10 feet from RC-3) from pumping proposed recovery well RC-3 was predicted using these values:

$T = 4.05\ ft^2/min = 5380\ ft^2/day$ (from Table 2-12)
$S = 0.003$ (from Table 2-13)
$r_r = 10$ feet
$r_i = 28.3$ feet
$t = 10$ days
$Q = 50\ gpm = 9626\ ft^3/day$
$W(u_r) = 13.00$
$W(u_i) = 10.94$

$$s = \frac{9626\ ft^3/day}{4(3.14)(5830\ ft^2 day)}(13.00 + 10.94)$$

$$s = 3.1\ feet$$

Drawdown at P-38S (54 feet from RC-3) from pumping proposed recovery well RC-3 was predicted using the same values as for drawdown near the bulkhead, except:

$r_r = 54$ feet
$r_i = 66$ feet
$W(u_r) = 9.60$
$W(u_i) = 9.20$

$$s = \frac{9626\ ft^3/\ day}{4(3.14)(5830\ ft^2/day)}(9.60 + 9.20)$$

$$s = 2.7\ feet$$

In a second analysis, drawdown at P-38S from pumping proposed recovery well RC-3 was predicted using the same values, except:

$Q = 40 \text{ gpm} = 7700 \text{ ft}^3/\text{day}$

$$s = \frac{700 \text{ ft}^3/\text{day}}{4(3.14)(5830 \text{ ft}^2/\text{day})}(13.00 + 10.94)$$

$s = 2.5$ feet

Drawdown at a point near the bulkhead and the boundary of the Gravelly Sand unit (84 feet from RC-3) from pumping RC-3 was predicted using the same drawdown values as P-38S, except:

$r_r = 84$ feet
$r_i = 87$ feet
$W(u_r) = 8.74$
$W(u_i) = 8.67$

$$s = \frac{9626 \text{ ft}^3/\text{day}}{4(3.14)(5830 \text{ ft}^2/\text{day})}(8.74 + 8.67)$$

$s = 2.3$ ft

RC-4 Analysis

Drawdown near the bulkhead (66 feet from RC-4) from pumping proposed recovery well RC-4 was predicted using these values:

$T = 0.58 \text{ ft}^2/\text{min} = 835 \text{ ft}^2/\text{day}$ (from Table 2-12)
$S = 0.0045$ (from Table 2-13)
$r_r = 66 \text{ ft} = r_i$
$t = 10$ days
$Q = 10 \text{ gpm} = 1925 \text{ ft}^3/\text{day}$
$W(u_r) = W(u_i) = 7.05$

$$s = \frac{1925 \text{ ft}^3/\text{day}}{4(3.14)(835 \text{ ft}^2/\text{day})}(7.05 + 7.05)$$

$s = 2.6$ feet

Drawdown near the bulkhead (84 feet from RC-4) from pumping proposed recovery well RC-4 was predicted using the same values, except:

$r_r = 84 \text{ feet} = r_i$
$W(u_r) = 4.09 = W(u_i)$

$$s = \frac{1925 \text{ ft}^3/\text{day}}{4(3.14)(835 \text{ ft}^2/\text{day})} (4.09 + 4.09)$$

$s = 1.4$ feet

Drawdown near the bulkhead (120 feet from RC-4) from pumping proposed recovery well RC-4 was predicted using the same values, except:

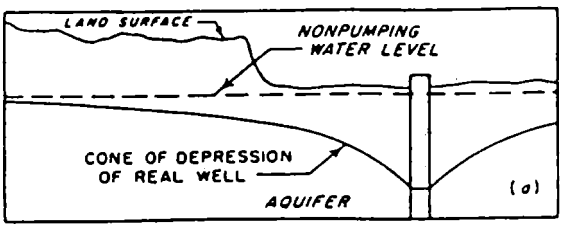
$r_r = 120 \text{ ft} = r_i$
$W(u_r) = 3.35 = W(u_i)$

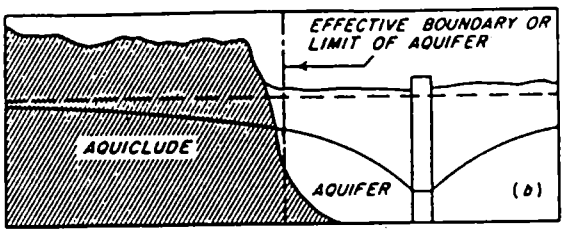
$$s = \frac{1925 \text{ ft}^3/\text{day}}{4(3.14)(835 \text{ ft}^2/\text{day})} (3.35 + 3.35)$$

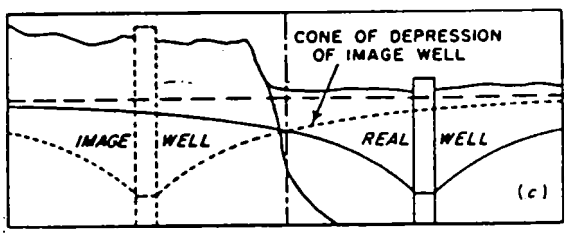
$s = 1.40$ feet

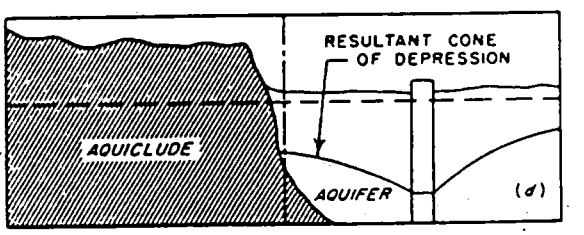
RC-5 Analysis

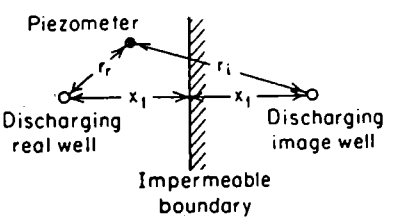
No calculations were performed for recovery well RC-5 since the conditions at this well were similar to those for RC-4, thus making the image well analysis for RC-5 the same as for RC-4. However, as a result of the presence of the Transitional Gravel unit, drawdown from pumping RC-5 likely will be different than drawdown from pumping RC-4. These factors are accounted for in the proposed location and construction of RC-5 based on the results of the RC-2 72-hour constant rate test and the 30-day constant rate test.











REPRESENTATION OF IMAGE – WELL THEORY

WOODWARD – CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

DR. BY:	KJF	SCALE:	NOT TO SCALE	PROJ. NO.:	87X4660
CK'D BY:	TRP	DATE:	APR. 20, 1993	FIG. NO.:	P – 1

SOURCE:
WALTON, 1970.

P.3 GROUNDWATER PRETREATMENT SYSTEM CALCULATIONS

This section of Appendix P presents preliminary equipment sizing calculations for the groundwater pretreatment system. Calculations are presented for the equalization tanks, oxidation tank, inclined plate separator, sand filter, air strippers, and sludge handling equipment. Manufacturers' information on the liquid-phase and vapor-phase activated carbon systems also is presented in this section. Information presented in Chapters 2, 3, and 4 of this report was used as the basis for the equipment sizing calculations presented here.

Liquid Phase Treatment

The preliminary sizing calculations for the equalization tanks, oxidation tank, inclined plate separator, sand filter, and air strippers are presented here.

Equalization Tank No. 1

Tank volume = (groundwater flow x hydraulic retention time) + activated carbon backwash

$$\text{Tank volume} = \left(120 \frac{\text{gallons}}{\text{minute}} \times 60 \frac{\text{minutes}}{\text{hour}} \times 6 \text{ hours}\right) + 3500 \text{ gallons}$$

Tank volume = 46,500 gallons

Equalization Tank No. 2

Tank volume = groundwater flow from SVE system x hydraulic retention time

$$\text{Tank volume} = 5 \frac{\text{gallons}}{\text{minute}} \times 60 \frac{\text{minutes}}{\text{hour}} \times 24 \text{ hours}$$

Tank volume = 7200 gallons

Oxidation Tank

Tank volume = (groundwater flow + sludge recycle + sand filter reject) x hydraulic retention time

Tank volume = (125 gpm + 3 gpm + 5 gpm) x 30 minutes

Tank volume = (133 gpm) x 30 minutes

Tank volume = 3990 gallons

Inclined Plate Separator

The calculations for the plate settling area are as follows:

Plate settling area = total groundwater flow / upflow velocity

Assume a maximum upflow velocity of 0.35 gpm/ft^2

Plate settling area = 133 gpm / (0.35 gpm/ft^2)

Plate settling area = 380 feet^2

The calculations for the flash-mixing zone are as follows:

Flash-Mixing volume = total groundwater flow x hydraulic retention time

Flash-Mixing volume = 133 gpm x 0.5 minutes

Flash-Mixing volume = 67 gallons

The calculations for the flocculation zone are as follows:

Flocculation zone volume = total groundwater flow x hydraulic retention time

Flocculation zone volume = 133 gpm x 30 minutes

Flocculation zone volume = 3990 gallons

Sand Filter

Sand filter area = (groundwater flow + sand filter reject) / surface loading rate

Sand filter area = (125 gpm + 5 gpm) / 3.5 gpm/ft^2

Sand filter area = 37.1 feet^2

Air Strippers

Blower requirements = total groundwater flow x air:water ratio

Blower requirements = 125 gpm x 100

Blower requirements = 12,500 standard cubic feet per minute

Sludge Handling

The preliminary sizing calculations for the filter press are presented here.

$$\text{Sludge production} = \text{mg/l Fe} \times \frac{106 \text{ MW } Fe(OH)_3}{55 \text{ MW Fe}} \times \text{millon gallons groundwater} \times 8.34$$

$$\text{Sludge production} = 15 \text{ mg/l Fe} \times \frac{106 \text{ MW } Fe(OH)_3}{55 \text{ MW Fe}} \times 0.173 \text{ mgd} \times 8.34$$

Sludge production = 41.7 lbs/day $Fe(OH)_3$

Sludge cake volume = 41.7 lbs/day $Fe(OH)_3$ / (sludge cake concentration) / (density)

Sludge cake volume = 41.7 lbs/day $Fe(OH)_3$ /(0.2) / (80 lbs/ft^3)

Sludge cake volume = 2.6 ft^3/day

Assume filter press operation once per week

Filter press volume = sludge cake volume x days of capacity

Filter press volume = 2.6 ft^3/day x 7 days

Filter press volume = 18.2 ft^3

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MODEL 7.5 ADSORPTION SYSTEM

DESCRIPTION

The Calgon Carbon Model 7.5 Adsorption System has been designed for the removal of soluble organic chemical contaminants from water, waste water, or liquid process streams using granular activated carbon. The system is particularly suitable for applications with low levels of organic chemicals and flows up to 350 gallons per minute per vessel, or lower flow situations that will benefit from economical bulk handling of the activated carbon.

The Model 7.5 System is a complete liquid treatment system that has been preassembled on a structual steel skid so that it is easily installed and ready for operation. The skid feature allows it to be simply installed on a level foundation pad. The preassembled piping allows the system to be operated with the two adsorbers in series or parallel, and will isolate either vessel from the treatment process for carbon exchange operations.

All piping and valving are on the skid for a completely operational adsorption system. When on-site, connections are made for influent and treated liquids, utility water, compressed air and vent/drain services.

The Model 7.5 adsorber vessels are ASME coded for 75 psig and lined for corrosion resistance. Each adsorber is designed to contain 10,000 lbs. of Calgon Carbon's granular activated carbon. Spent carbon is transferred as a slurry from the bottom of the vessel, and fresh carbon can be loaded dry through the top fill opening or as a slurry through an optional fill line. The system allows use of Calgon Carbon's convenient Carbon Exchange Service utilizing special transfer trailers. With 10,000 lbs. of carbon, each adsorber provides 15 minutes of contact time at 175 gpm.

Your Calgon Carbon Technical Sales Representative can help in the evaluation of the suitability of the Model 7.5 System to satisfy your industrial process or environmental treatment requirements. If needed, adsorption evaluation studies to determine applicability and economics can be arranged. Calgon Carbon offers adsorption equipment in many other sizes, and carbon supply and exchange service to meet your particular needs.

FEATURES

- Proven design - downflow fixed bed adsorption.
- Completely preassembled package — simple and quick installation.
- ASME code vessels.
- Vessels lined with low maintenance vinyl ester coating suitable for potable liquids (EPA/USDA approved).
- Distributor underdrain for treated water collection.
- 20 inch flanged manway for maintenance access.
- Backwash capability can be added if suspended solids are present (will require reduced amount of carbon in vessel).
- Designed to minimize operating labor in handling of carbon exchange.
- Capable of bulk carbon filling and slurry discharge of spent carbon to minimize handling.

AVAILABLE AUXILIARY SERVICES

- Carbon Exchange Service

OPTIONAL OPERATION MODES

- Downflow fixed bed or
  Downflow fixed bed with backwash capability
- Series or Parallel flow

SPECIFICATIONS

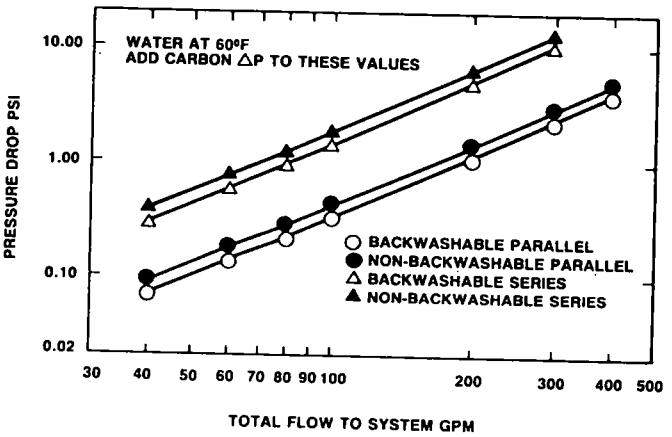
Vessel Diameter:.....7.5 ft.
ASME Code:.....Design 75 psig @150°F
(higher pressure vessel ratings available)
Pipe Connections:....Process Pipe: 4" flange connection
Water Pipe: 1.5" flange connection
Carbon Volume
per vessel:.....357 cu. ft. (nominal 10,000 lbs—
granular activated carbon)
Weight:.....Empty: 19,000 lbs.
Operating: 78,000 lbs.
Pressure Relief:.....72 psig nominal setting
Backwash Rate:.....560 GPM (if required)
Transfer Mode:.....Air pressurized slurry transfer

TYPICAL FLOW RATES AND CONTACT TIMES

SERIES OPERATION		PARALLEL OPERATION	
GPM	CONTACT TIME; MINUTES	GPM	CONTACT TIME; MINUTES
175	30	350	15

NOTE: Other Calgon Carbon Adsorption Systems are available for greater or smaller flow rates and other carbon usage aplications.

PRESSURE DROP CURVE



MATERIALS OF CONSTRUCTION

- Vessel Lining: Vinyl ester coating (nominal 40 mil film thickness) suitable for potable water or waste water or industrial process applications.
- Piping and Valves: Carbon steel piping and cast iron butterfly valves (water/process). polypropylene lined steel piping and stainless steel ball valves (carbon discharge).
- Underdrain Collection System: Header-lateral system constructed of PVC Pipe with polypropylene slotted nozzles.
- External Coating: Epoxy Mastic Coating (nominal 6 mil film thickness).

CAUTION

Wet activated carbon preferentially removes oxygen from air. In closed or partially closed containers and vessels, oxygen depletion may reach hazardous levels. If workers are to enter a vessel containing carbon, appropriate sampling and work procedures for potentially low-oxygen spaces should be followed, including all applicable Federal and State requirements.

For information regarding human and environmental exposure, call (412) 787-6700 and request to speak to Regulatory and Trade Affairs.

Calgon Carbon Corporation reserves the right to change specifications without notice for components of equal quality.

For additional information contact Calgon Carbon Corporation, Box 717, Pittsburgh, PA 15230-0717 Phone (412) 787-6700

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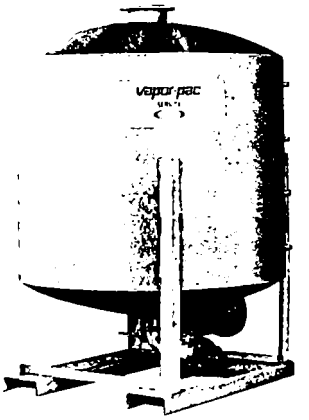
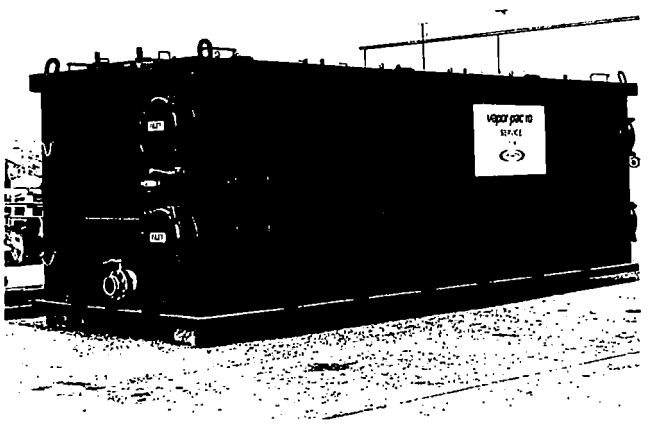
Vapor-Pac

The Vapor-Pac unit provided under a service agreement contains 1,800 pounds of activated carbon and is capable of handling flows up to 1,000 scfm. These units are available either in polyethylene or stainless steel construction, and can be arranged in parallel or series modes for specific site requirements. The Vapor-Pac unit is portable, can be moved by fork lift, and can be conveniently transported.



Vapor-Pac 10

The Vapor-Pac 10 unit is provided under a service agreement also. However, this unit contains 12,500 pounds of activated carbon and can treat flows up to 10,000 scfm. As an option, this unit has been designed to contain two separate beds to accommodate series operation, or to operate one bed while leaving the second bed in a standby position. Sample ports are provided to monitor breakthrough or exhaustion of the first-stage bed. The Vapor-Pac 10 design allows transport by special trucks which can load, transport and unload the unit without the use of a crane.



Reactivation Service

Calgon Carbon operates two granular activated carbon reactivation sites in the U.S.; one at Neville Island, Pennsylvania, and the other at Catlettsburg, Kentucky. These plants operate closed loop systems designed for maximum environmental safety and are the largest, most sophisticated facilities in the world dedicated to the reactivation of carbon. Regular reviews by Calgon Carbon's "Carbon Acceptance Committee" assure that its facilities are always operating in full compliance with laws and regulations applying to transport and reactivation of the spent carbon. Both the Neville Island and Catlettsburg reactivation facilities are fully permitted under RCRA Part B to accept manifested spent activated carbon, and each plant carries sudden and accidental pollution insurance as required by federal and state laws. In addition, the Company owns and operates a trailer fleet specifically designed for the transport of reactivated and spent carbon. Every driver in the private fleet is fully trained in changeout procedures. Transport trailers are licensed and insured up to $1 million in case of an accident.

For more information describing any of the air purification systems or services described in this bulletin, write or call Calgon Carbon Corporation, P.O. Box 717, Pittsburgh, PA 15230, (412) 787-6700. Bulletin 27-264, "Activated Carbon Products for Liquid and Vapor Phase Applications" is also available to assist in the selection of the appropriate activated carbon product for a specific application.

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P.4 SOIL VAPOR EXTRACTION SYSTEM CALCULATIONS

This section of Appendix P presents the calculations of the mass removal rates for volatile organics in the vapor and aqueous phases from SWMU-11 during the HIVAC pilot test. Table 4-2 in Chapter 4 presents the flow rates of water and air through the HIVAC system. Table 4-3 summarizes the analytical data for groundwater and soil gas. In all cases, the mean concentrations were used to determine the mass removal rates. The mass removal rates were calculated using the following equation:

mass removed = air/groundwater discharge rate from system x density air/water x VOC concentration in air/groundwater

Calculation of Mass Removal Rates for Volatile Organics in Vapor and Aqueous Phases

Vapor Phase

The calculations for the mass removal of volatile organics in the vapor phase portion of the SVE system are presented here:

Air flow through system = 30 to 42 cfm
Concentration of toluene in vapor (mean) = 40 ppm

Assume: t = 50°C, moist air
Calculation of density of moist air:

$$d_t = D_t \times \frac{(P - 0.3783e)}{760}$$ where

D_t = density dry air @ 50°C
P = corrected barometric pressure in mm Hg
e = vapor pressure of water @ dew pt in mm Hg
[Lange's chemistry Handbook, p.10-92]

D_{50} = 0.064 lb/ft³
P = 755 mm Hg
e = 92.51 mm Hg

$$d_{50} = \frac{0.064\ \text{lb}}{\text{ft}^3} \times \frac{[755 - (0.3783 \times 92.51)]}{760} = 0.061\ \text{lb/ft}^3$$

mass removed = toluene @ 30 cfm

$$\frac{30\ \text{ft}^3}{\text{min}} \times \frac{0.061\ \text{lb}}{\text{ft}^3} \times \frac{60\ \text{min}}{\text{hr}} \times \frac{40}{10^6} = 4.4 \times 10^{-3}\ \text{lb/hr}$$

mass removed = toluene @ 42 cfm

$$\frac{4.4 \times 10^{-3}\ \text{lb}}{\text{hr}} \times \frac{42}{30} = 6.2 \times 10^{-3}\ \text{lb/hr}$$

Aqueous Phase

The calculations for the mass removal of volatile organics in the aqueous phase portion of the SVE system are presented here:

Water flow through system = 2.5 to 4.3 gpm
Concentration of total VOCs in water (mean) = 168 ppm

Assume: T = 20°C, ρ_{20} = 62.3 lb/ft³

mass removed = VOCs @ 2.5 gpm

$$\frac{2.5\ \text{gal}}{\text{min}} \times \frac{62.3\ \text{lb}}{\text{ft}^3} \times \frac{0.133\ \text{ft}^3}{\text{gal}} \times \frac{60\ \text{min}}{\text{hr}} \times \frac{168}{10^6} = 0.21\ \text{lb/hr}$$

mass removed = VOCs @ 4.3 gpm

$$\frac{0.21\ \text{lb}}{\text{hr}} \times \frac{4.3}{2.5} = 0.36\ \text{lb/hr}$$

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