RADIAN
CORPORATION

DCN 92-290-062-07
PN 290-062-02-02

LOCKHEED PROPULSION COMPANY
BEAUMONT NO. 1 FACILITY
HYDROGEOLOGIC REPORT

Prepared for:

Lockheed Corporation
4500 Park Granada Boulevard
Calabasas, California 91399

Prepared by:

Radian Corporation
10389 Old Placerville Road
Sacramento, CA 95827

1 December 1992

RADIAN
CORPORATION

The information contained herein has received appropriate technical review and approval. The conclusions of this report are based upon the data available and the interpretation of such data as dictated by our experience and background. The conclusions expressed herein are professional judgments.

W. Greg Hamer, CEG 1211
Project Hydrogeologist

REGISTERED GEOLOGIST
W. GREG HAMER
NO. 1211
CERTIFIED
ENGINEERING
GEOLOGIST 120
Exp. 6/94
STATE OF CALIFORNIA

RADIAN CORPORATION

TABLE OF CONTENTS

		Page
1.0	INTRODUCTION	1-1
1.1	Background	1-1
1.2	Scope of Work	1-4
2.0	FIELD WORK AND LABORATORY ANALYSES	2-1
2.1	Geophysical Survey	2-1
2.2	Vapor Sampling	2-2
2.3	Borehole Drilling, Well and Piezometer Installation	2-3
2.3.1	Exploratory Borings	2-4
2.3.2	Shallow Monitoring Wells and Piezometers	2-4
2.3.3	Deeper Monitoring Wells	2-5
2.3.4	Vapor Recovery and Vapor Monitoring Wells	2-5
2.4	Well Development and Groundwater Sampling	2-6
2.5	Aquifer Testing	2-7
2.5.1	Aquifer Test Layout	2-8
2.5.2	Aquifer Testing and Analysis Methods	2-9
2.6	Water Level Monitoring	2-10
3.0	GEOLOGY	3-1
3.1	Granitic and Metasedimentary Rocks	3-2
3.2	Mount Eden Formation	3-3
3.3	San Timoteo Formation	3-4
3.4	Older and Younger Alluvium	3-5
4.0	HYDROLOGY	4-1
4.1	Surface Water	4-1
4.2	Groundwater Occurrence and Movement	4-2
4.2.1	Groundwater Occurrence	4-3
4.2.2	Groundwater Movement	4-6
4.2.3	Aquifer Parameters	4-8
4.2.4	Water Level Fluctuations	4-10

RADIAN CORPORATION

TABLE OF CONTENTS

Page

5.0 DISTRIBUTION OF CONTAMINANTS 5-1

5.1 Contaminants in Soil Vapor 5-1
5.1.1 Surface Soil Vapors 5-1
5.1.2 Shallow Soil Vapors 5-2
5.1.3 Deep Soil Vapors 5-3
5.2 Contaminants in Soils 5-4
5.3 Contaminants in Groundwater 5-5
5.3.1 VOC Contamination 5-5
5.3.2 Distribution of Nitrates and Perchlorates in Groundwater 5-10
5.4 Mass Balance Distribution of Contaminants 5-13
5.5 Radioactivity 5-14

6.0 QUALITY ASSURANCE/QUALITY CONTROL SUMMARY 6-1

6.1 Soil Vapor Sampling from Shallow Probes and Downhole Flux Chamber (November and December 1991) 6-1
6.2 Surface Flux Chamber and Shallow Probe Sampling (August 1991) 6-1
6.3 Soil Samples from Borings (November and December 1990) 6-2
6.4 Groundwater Sampling Round 2 (October 1990), and Sampling of Treatability Study Wells (November 1990-March 1991 6-2
6.5 Groundwater Sampling Round 3 (September - October 1991) 6-3
6.6 Groundwater Sampling from Additional Wells (December 1991) 6-4

7.0 REFERENCES 7-1

APPENDIX A: SEISMIC SURVEY
APPENDIX B: ON-SITE LABORATORY SUMMARY
APPENDIX C: BORING LOGS, WELL DIAGRAMS AND SURVEYOR'S RECORDS
APPENDIX D: AQUIFER TEST ANALYSES
APPENDIX E: WATER LEVEL DATA AND HYDROGRAPHS
APPENDIX F: LABORATORY RESULTS FOR SOIL VAPOR, SOIL, AND GROUNDWATER
APPENDIX G: QUALITY ASSURANCE/QUALITY CONTROL SUMMARY FOR SOIL VAPOR, SOIL, AND GROUNDWATER

LIST OF FIGURES

		Page
1-1	Location of Lockheed Beaumont No. 1 Site	1-7
1-2	Lockheed Beaumont - Topographic Map	1-8
1-3	Lockheed Beaumont No. 1 Total Chlorinated Volatile Organic Compound Soil Vapor Isopleths (From 1990 Study)	1-9
1-4	Lockheed Beaumont No. 1 Total Chlorinated VOC Concentrations in Shallow Groundwater (Fall 1991)	1-10
2-1	Lockheed Beaumont No. 1 Location of Seismic Lines	2-19
2-2	Lockheed Beaumont No. 1 Surface Flux Chamber Measurements	2-20
2-3	Lockheed Beaumont No. 1 Shallow Soil Vapor Sampling	2-21
2-4	Lockheed Beaumont No. 1 Locations of Wells and Piezometers	2-22
2-5	Lockheed Beaumont No. 1 Locations of Wells and Borings in the Burn Pit Area	2-23
3-1	Lockheed Beaumont No. 1 Generalized North-South Geologic Cross-Section	3-8
3-2	Model of Lockheed Beaumont No. 1 Site	3-9
3-3	Lockheed Beaumont - Geologic Map	3-11
3-4	Lockheed Beaumont No. 1 Site Geologic Map	3-12
3-5	Lockheed Beaumont No. 1 Subsurface Profile Locations	3-13
3-6	Lockheed Beaumont No. 1 Geologic Cross-Section AA-AA'	3-14
3-7	Lockheed Beaumont No. 1 Geologic Cross-Section BB-BB'	3-15
3-8	Lockheed Beaumont No. 1 Detailed Cross Section Burn Pit Area	3-16
3-9	Lockheed Beaumont No. 1 Bottom of Quaternary Alluvium	3-17

LIST OF FIGURES

(Continued)

Page

3-10 Lockheed Beaumont No. 1 Areas of Gravelly Material in Saturated Alluvium 3-18

3-11 Lockheed Beaumont No. 1 Alluvial Soil Type at a Depth Approximately Equivalent to the Water Table 3-18

4-1 Lockheed Beaumont No. 1 Groundwater Conditions 30 September 1983 4-14

4-2 Lockheed Beaumont No. 1 Depth to Groundwater Below Ground Surface December 1991 4-15

4-3 Lockheed Beaumont No. 1 Thickness of Saturated Alluvium December 1991 4-16

4-4 Lockheed Beaumont No. 1 Water Table Elevations March 8, 1991 4-17

4-5 Lockheed Beaumont No. 1 Water Table Elevations June 27, 1991 4-18

4-6 Lockheed Beaumont No. 1 Water Table Elevations 13 January 1992 4-19

4-7 Lockheed Beaumont No. 1 Vertical Hydraulic Gradients in Paired Wells (January 1992) 4-20

5-1 Lockheed Beaumont No. 1 Total Chlorinated VOC Concentrations in Shallow Groundwater (Fall 1991) 5-26

5-2 Lockheed Beaumont No. 1 TCE Concentrations in Shallow Groundwater (Fall 1991) 5-27

5-3 Lockheed Beaumont No. 1 1,1-DCA Concentrations in Shallow Groundwater (Fall 1991) 5-28

5-4 Lockheed Beaumont No. 1 1,1-DCE Concentrations in Shallow Groundwater Fall 1991 5-29

LIST OF FIGURES

(Continued)

Page

5-5 Lockheed Beaumont No. 1 1,1,1-TCA Concentrations in Shallow Groundwater Fall 1991 5-30

5-6 Lockheed Beaumont No. 1 Distribution of Volatile Organic Compounds in Groundwater (EPA Method 8010) 5-31

5-7 Lockheed Beaumont No. 1 Nitrate Concentrations in Shallow Groundwater (Late 1990) 5-32

5-8 Lockheed Beaumont No. 1 Nitrate Concentrations in Shallow Groundwater (Late 1991) 5-33

5-9 Lockheed Beaumont No. 1 Perchlorate Concentrations in Shallow Groundwater (Spring 1991) 5-34

LIST OF TABLES

		Page
2-1	Well, Piezometer, and Borehole Summary	2-11
5-1	Soil Vapor Analyses, 1990 and 1991	5-15
5-2	Summary Organic Analyses in Soil	5-22
5-3	Range in Contaminant Concentrations in Groundwater	5-23
5-4	Groundwater Plume Volumes	5-25

1.0 INTRODUCTION

Previous investigations at the Lockheed Propulsion Company Beaumont No. 1 site, located to the south of Beaumont, California, detected the presence of volatile organic compounds (VOCs) in soil vapor and groundwater beneath the site. Shallow soil vapor contaminant concentrations range up to 10,000 parts per billion by volume (ppbv). Concentrations range up to 25,000,000 ppbv in deep soil vapor samples. Groundwater contaminant concentrations range up to 2,300 micrograms per liter (μg/L).

This report presents the findings of additional site characterization work conducted at the Beaumont No. 1 site, the intent of which was to provide better definition of the vertical and lateral extent of contamination in the soil vapor and groundwater, and to better determine the physical characteristics of the aquifer. This report builds upon previously reported information, particularly the *Source and Hydrogeologic Investigation* (Radian, 1990) conducted at the site. The information herein will be used to support engineering designs for remediation of the site.

1.1 Background

Radian Corporation has been retained by Lockheed Corporation to identify, characterize, and remediate potential sources of surface and subsurface contamination at the Lockheed Beaumont No. 1 facility. The work is being performed under a Consent Order with the California Department of Toxic Substances Control. The location of the facility is shown on Figure 1-1. The site was used by Lockheed Propulsion Company (LPC) from 1960 to 1974. Principal activities were the mixing and testing of solid rocket motor propellant, ballistics testing, motor casing wash out, and waste propellant burning. Since 1974, the site has been used primarily for sheep grazing, some farming, and as a training area for the Operating Engineers' Union.

Previous geologic and hydrologic studies by others at the site included the drilling and installation of several wells and borings. Of the wells, eight (OW-1 through OW-8) are still present and operable at the site.

Previous Radian studies at the site that focused on identifying the sources and extent of contamination include:

- *LPC Beaumont Test Facilities, Historical Report* (September 1986);
- *LPC Beaumont Test Facilities, Preliminary Remedial Investigation* (December 1986);
- *LPC Beaumont Test Facilities, Source and Hydrogeologic Investigation* (February 1990);
- *LPC Beaumont Test Facilities, Excavation Management Plan* (March 1991);
- *LPC Beaumont Test Facilities, Burn Pit Area Removal Action Plan* (April 1991); and
- *LPC Beaumont No. 1 Treatability Study* (February 1992).

The burn pit area had been identified as the primary source of contamination (Figure 1-2) (Radian, 1990). Soil vapors containing concentrations of chlorinated volatile organic compounds (VOCs) as high as 10,000 ppbv have been detected in shallow samples from beneath the burn pit area. As shown in Figure 1-3, a vapor plume lies under and extends to the west of the burn pit area. The estimated 1,000 ppbv isopleth of this plume (at 5 feet below the ground surface) measures approximately 800 feet wide and 1,300 feet long.

The vapor plume corresponds closely with the presence of chlorinated VOCs in the underlying groundwater. The groundwater contaminant plume is shown on Figure 1-4. In wells near the burn pit area, concentrations of contaminants in groundwater ranged as high as 3,500 $\mu g/L$ total VOCs.

Data gathered during the source and hydrogeologic investigation (Radian, 1990) indicate that geologic units in the area surrounding the burn pit area consist of alluvium, which extends to depths in excess of 100 feet, and is underlain by the reddish brown sandstone, siltstone, and conglomerate of the Mt. Eden Formation. The Mt. Eden Formation beneath the burn pit area is thought to be several hundred feet thick based on deep boreholes drilled by the Metropolitan Water District (Ransome, 1932). The Mt. Eden Formation is, in turn, underlain at depth by granitic rocks. The depth to the water table in the burn pit area is approximately 80 feet.

A treatability study was performed at the site (Radian, 1992) to evaluate potential methods for removing and treating contaminated soil vapors and groundwater. An analysis of the findings of the February 1990 source and hydrogeologic study and of observations made during borehole drilling for the Treatability Study made clear the need for additional characterization. Specifically, it was determined that:

- Geologic conditions in the area of contamination were more complex than previously anticipated;
- Shallow groundwater in the weathered Mt. Eden Formation directly beneath the burn pit area is contaminated with VOCs;
- The Mt. Eden Formation occurs at shallow depths and extends above the water table directly beneath the burn pit area;

- In at least one area (MW-1 and MW-7 well cluster), contaminant concentrations increased with depth just below the water table, and the maximum depth of contaminants was unknown; and

- Most importantly, additional definition of the contaminated areas was needed as one of the key inputs for performing groundwater modeling and in setting a design basis for final remediation.

A scope of work was developed to provide better definition of the vertical and lateral extent of contamination in the soil vapor and groundwater and to further assess the physical characteristics of the aquifer. This information will be used to support engineering design for soil vapor and groundwater remediation.

1.2 Scope of Work

The additional site characterization focused primarily on the burn pit area. Work included the following:

- Collecting two rounds of groundwater samples (Round 2 and Round 3) to supplement earlier sampling at the site. Round 2, in October 1990, included collecting samples from 19 monitoring wells (MW-1 through 19) constructed in December 1989 and from 7 previously existing wells (W-1, W-2, W-3 and W-5, OW-2, OW-3, and OW-8). Round 3, in September-October 1991, included collecting samples from all wells labeled "MW" (up to and including MW-40), W-1, W-2, W-3, W-5, OW-2, OW-3, and OW-8.

- Performing five seismic traverses before drilling borings to further define the subsurface elevation of the Mt. Eden Formation. Results were used to help determine the locations for 12 soil borings (below).

- Drilling 12 soil borings (IB-1, IB-2, FS-1, 3, 18, 19, 20, 21, 23, 25, 26, 27) in the burn pit area, one boring in the rocket motor production area (FS-2), and one boring downgradient of the rocket motor production area (FS-28). The purpose of the borings was to locate the subsurface Mount Eden Formation and to take soil samples.

- Drilling 28 new wells (MW-20 through 30 and 34 through 50) to better determine the lateral and vertical extent of contamination in groundwater. Four wells (MW-20, 22, 23, and 30) were used to supply water to the Treatability Study program, and were located in an arc downgradient of the burn pit area. MW-27 was installed as an injection well for the Treatability Study. MW-21 and MW-26 were installed to provide monitoring for aquifer testing.

- Drilling two deep wells (MW-31 and MW-32) to determine the maximum vertical extent of the groundwater contamination beneath the burn pit area and immediately downgradient.

- Drilling four piezometers (P-2 through P-5) in areas remote from the contaminant plume to provide the water level information needed for planned computer modeling of the groundwater flow.

- Installing three vapor recovery wells (VRW-1 through 3) near the burn pit area to provide soil vapor for extraction, characterization, and treatment during the Treatability Study; and 14 vapor monitoring wells to characterize the soil vapors beneath the burn pit area and to track changes in concentration during the Treatability Study.

- Monitoring water levels during the Treatability Study. Data were gathered to determine aquifer response to pumping and to evaluate the impact of winter rainfall that occurred during the monitoring period.

- Performing aquifer tests in the burn pit area and in downgradient wells to determine aquifer hydraulic conductivity and storage coefficient.

- Collecting 17 surface emission flux chamber samples and 28 shallow (3.5 to 7 feet below ground surface [BGS]) vapor probe samples in the burn pit area. The flux chamber samples were collected to evaluate the potential for contaminant emissions from surface soils in support of the Health Risk Assessment (Radian, 1992c). The shallow soil vapor probe samples were collected to further assess vapor emissions during anticipated soil excavation.

- Collecting 29 deep (below 7 feet) soil vapor probe or downhole flux chamber samples in the burn pit area, and two shallow and six deep soil vapor probe or downhole flux chamber samples in the rocket motor production area.

Figure 1-1

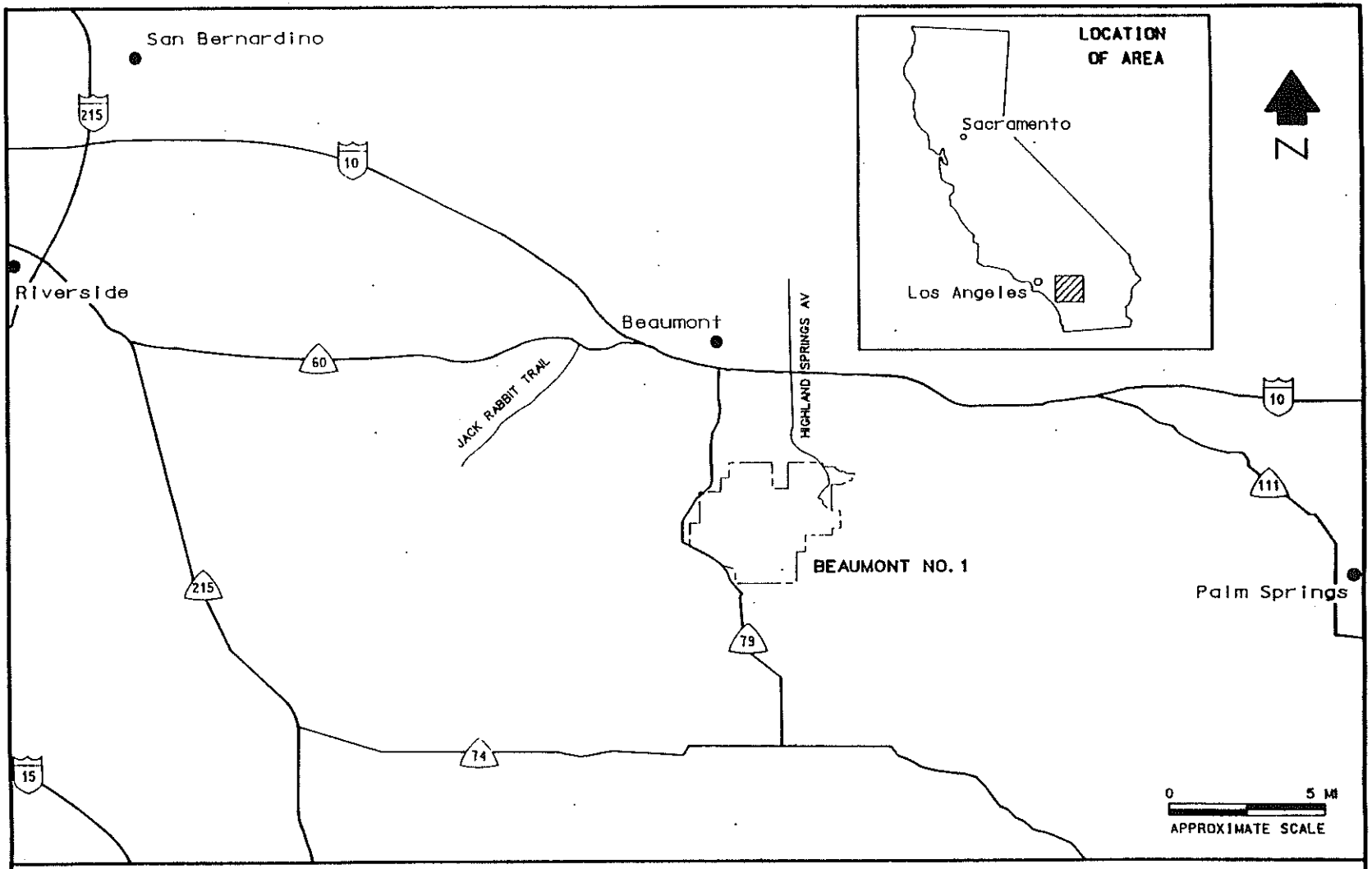


Figure 1-1. Location of Lockheed Beaumont No. 1 Site

LOCKHG LCB1-2 8/10/92

RADIAN CORPORATION

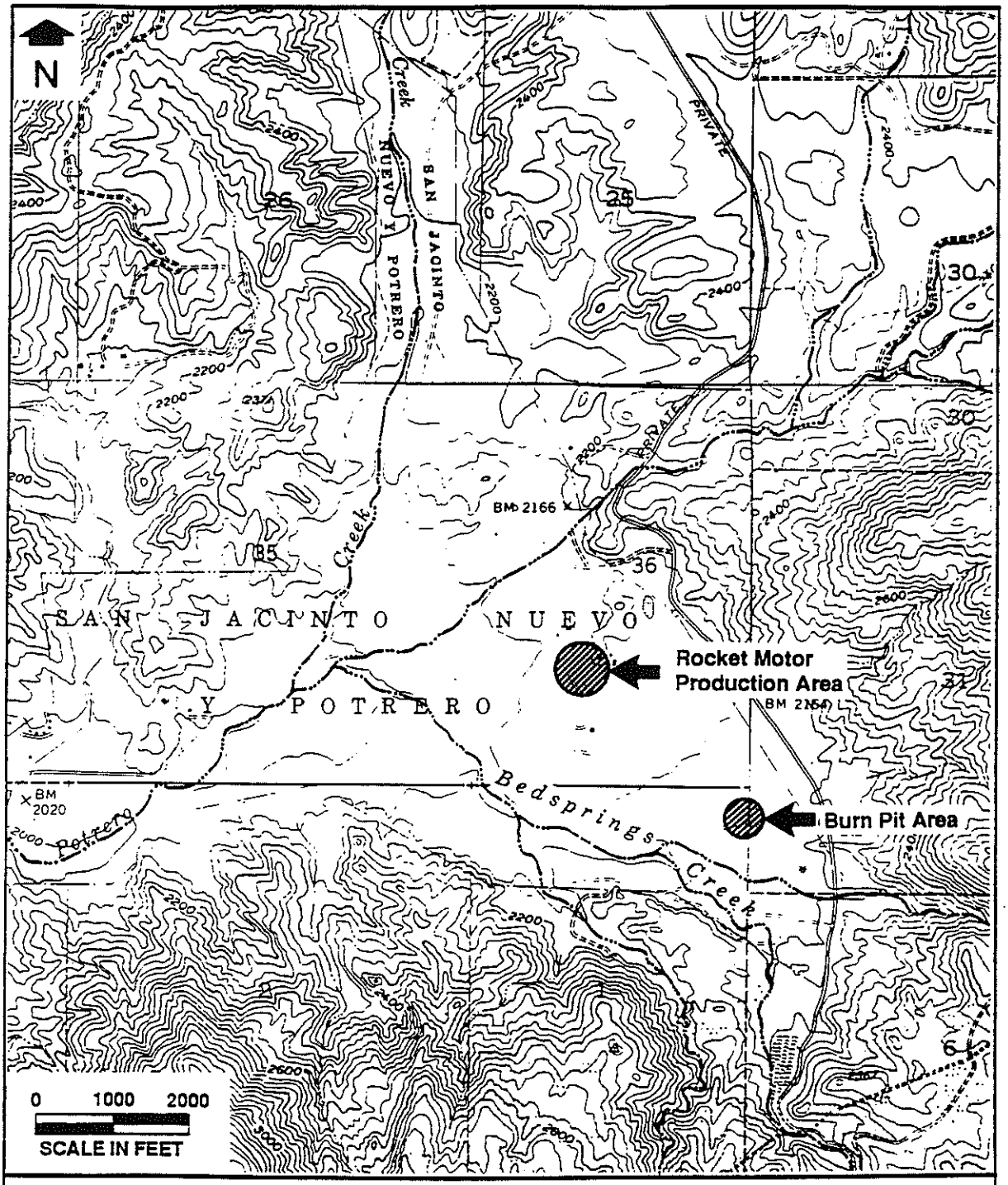


Figure 1-2. Lockheed Beaumont No. 1 - Topographic Map

REFERENCE: U.S.G.S. Beaumont, CA 7.5 Minute Quadrangle Map (1953, photorevised 1988)
U.S.G.S. San Jacinto, CA 7.5 Minute Quadrangle Map (1953, photorevised 1979)

VMG 8/11/92

2.0 FIELD WORK AND LABORATORY ANALYSES

The additional site characterization field work, in part, was performed in conjunction with field work for the Treatability Study. The characterization work occurred from late October 1990 (beginning with the groundwater resampling) through December 1991.

Methods used to collect data for this investigation were similar to those used during previous investigations at the facility. Detailed descriptions of the field methods for sample handling, drilling, and logging of borings and wells; vapor and groundwater well installation: soil, soil vapor, and groundwater sampling; water level monitoring; and aquifer testing are described in the following Radian reports:

- *LPC Beaumont Facilities Hydrogeologic Investigation Work Plan*, Draft, 27 October 1989;
- *LPC Beaumont Facilities Source and Hydrogeologic Investigation*, February 1990;
- *LPC Beaumont Facilities Treatability Study Work Plan*, 1 March 1991; and
- *LPC Beaumont Facilities Treatability Study*, February 1992.

The following subsections summarize the work performed and the techniques used for conducting the various tasks.

2.1 Geophysical Survey

A geophysical survey of the burn pit area and immediately downgradient was conducted to further define the subsurface configuration of the Mount Eden Formation beneath the alluvium. The survey consisted of five seismic refraction

traverses conducted by Gasch and Associates, a Radian subcontractor, on 14 and 15 November 1990.

The five seismic traverses are located as shown on Figure 2-1. Each traverse consisted of two or three 660-foot seismic lines. Locations of the traverses were selected by a Radian geophysicist in consultation with Gasch and Associates geophysicists. A more detailed description of the work performed is presented in Appendix A.

2.2 Vapor Sampling

Soil vapor samples were obtained from shallow (3.5 to 7 feet deep below ground surface) soil probes, from soil probes at various depths in boreholes, and from a flux chamber used at the surface and at various depths in boreholes. Figure 2-2 shows the locations of the surface measurements and Figure 2-3 shows the locations of the shallow soil probes (3.5 to 7 feet deep). Vapor samples obtained as part of the treatability study are discussed in the *Treatability Study* report (Radian, 1992a).

Seventeen soil vapor samples were collected in August 1991 at nine surface locations using a surface flux chamber. The samples were obtained from the existing ground surface and from a depth of approximately 4 inches and analyzed for chlorinated volatile organic compounds.

Shallow soil vapor samples were also obtained at 30 locations from depths of 3.5 to 7 feet. The locations of the samples (28 from the burn pit area and two from the rocket motor production area) are shown on Figure 2-3. Most of these samples were collected in November 1990; the rest were collected in August 1991.

Thirty-four deeper samples (greater than 7 feet BGS) were collected from: borings FS-2 in the rocket motor production area; and FS-1, FS-3, VRW-1, VRW-2, and

VRW-3 in the burn pit area. The samples were taken with a soil vapor probe or a downhole flux chamber.

The soil vapor samples were obtained using procedures described in the *Treatability Study Work Plan* (Radian, 1991c). In summary, samples were taken from the vapor probes or flux chamber using a laboratory syringe. The syringe was then placed in an ice chest and transported to Radian's on-site laboratory for analysis by gas chromatography/electrolytic conductivity detector for chlorinated volatile organic compounds. Compounds detectable by this method have previously been identified at the site in soil vapors and groundwater (Radian, 1990). Appendix B presents a summary of the procedures used in the on-site laboratory for soil vapor and groundwater sample analyses.

2.3 Borehole Drilling, Well and Piezometer Installation

Fourteen borings, 47 wells, and four piezometers were installed at the site as part of the additional site characterization and treatability studies. All soil borings, piezometers, and wells were logged during drilling by a Radian geologist or field engineer. Table 2-1 summarizes the depths for the borings and the elevations, diameters, and screen interval depths for wells and piezometers at the site.

Logging of borings included continuous observation of cuttings and the use of a photo ionization detector (PID) for health and safety monitoring. Figures 2-4 and 2-5 show boring, piezometer, and well locations. Boring logs and well construction diagrams and land surveyor records for each well, piezometer, and borehole are presented in Appendix C.

Soil samples were collected during drilling by the use of a split spoon sampler or continuous core. Sixteen soil samples from locations with the highest soil vapor concentrations (1990) study were selected for off-site analysis. The soil analyses

were for volatile organic compounds (by EPA Method 8010 and 8240). Samples were analyzed from Boring FS-2 in the rocket motor production area, and FS-1 and VMW-1 and MW-26 in the burn pit area.

2.3.1 Exploratory Borings

All exploratory boreholes and wells were drilled using a truck mounted, 8-inch diameter hollow-stem auger. Borehole depths ranged from 20 to 120 feet BGS. All boreholes were backfilled with a cement/bentonite grout.

2.3.2 Shallow Monitoring Wells and Piezometers

The 28 wells installed to determine the lateral and vertical extent of groundwater contamination were drilled using 10- and 12-inch hollow stem augers. All the wells except MW-27, MW-45, and MW-47 have wire wrapped stainless steel 0.020 slot well screens and stainless steel casing below the water table and polyvinyl chloride (PVC) casing above the water table. Well MW-27, used for injection of treated water, has a low carbon steel screen and is 5 inches in diameter. Wells MW-45 and MW-47 were installed under artesian groundwater conditions (water flowing out of the borehole), and 0.020-inch slot prepacked PVC well screens were used. Monitoring wells 20, 21, 22, 23, 26, and 28 were designed for pumping during the treatability study; they have 5-inch diameter casing to allow for installation of pumps and water level sounding tubes. Monitoring wells 25, 29, 30, 31, 32, and 34 through 50 are four inches in diameter. Well MW-24 (installed in Boring FS-3) is two inches in diameter and was installed to monitor aquifer pumping tests in well MW-26. The wells range from 23 to 130 feet BGS in depth.

The piezometers were installed using 8-inch diameter hollow stem augers. The piezometers are constructed of 2-inch diameter PVC casing and well screens (0.020-inch slots). The piezometers are located in areas that are remote from the contaminant

plume and are not intended for water quality sampling. They are intended to provide information on water levels and recharge to the aquifer from stream flow in order to perform groundwater modeling. Piezometers range from 35 to 72 feet deep BGS and have 10-foot long well screens.

2.3.3 Deeper Monitoring Wells

An air rotary casing drive drill rig was used to drill and install deeper wells MW-31 and MW-32. The depth of the wells (190 and 220 feet BGS) precluded the use of a hollow stem auger. The air rotary method effectively sealed off the upper soils during drilling and reduced the potential for movement of any contaminants down the borehole. Well MW-31 was installed in the burn pit area, and well MW-32 was installed downgradient of the burn pit area, near MW-1 and MW-7. Cuttings from these two wells were continuously logged. Wells MW-31 and 32 are four inches in diameter and have 10-foot long stainless steel well screens. Stainless steel well casing extends from the top of the well screen to at least 10 feet above the water table. Schedule 40 PVC casing extends from there to the ground surface.

2.3.4 Vapor Recovery and Vapor Monitoring Wells

The wells installed for monitoring and extracting vapors in the vadose zone beneath the burn pit area are shown on Figure 2-5. The three vapor recovery wells and fourteen vapor monitoring wells were drilled using 8- and 10-inch hollow stem augers. The wells are screened in the vadose zone; some extend to within a few feet of the water table. The vapor recovery wells are four inches in diameter and have 10-foot long Schedule 40 PVC screens. The vapor monitoring wells are two inches in diameter and have 2.5-foot long stainless steel screens. A detailed description of the purpose and use of these wells during treatability study testing is included in the *Treatability Study Work Plan* (Radian, 1991c) and in the *Treatability Study* report (Radian, 1992a). The wells ranged in depth from 24 to 80 feet BGS.

2.4 Well Development and Groundwater Sampling

After each well was drilled, it was bailed to remove any sediment from the well and to begin development of the sand filter pack. Wells were then pumped using a submersible pump (electric or pneumatic) to further develop them. Wells were pumped until the discharge water was clear and indicator parameters (pH, electrical conductivity, and temperature) had stabilized.

Following development, a minimum of three well volumes of water was purged from each well using a submersible pump and then sampled using a stainless steel bailer. If a well was sampled immediately after well development, it was not purged prior to sampling. For existing wells that were re-sampled or new wells not sampled immediately after development, a minimum of three well volumes were purged just before sampling.

Procedures described in the previously referenced documents were used to handle samples before and during shipment to the on-site lab or to an off-site laboratory.

During the drilling of some borings, groundwater samples were obtained from inside the hollow auger or air rotary drive casing. As the desired depth was reached in the borehole, drilling was stopped and groundwater allowed to flow into the borehole. The water was then sampled for analysis. These samples were used to provide groundwater data in locations where a well was not to be constructed or where data was needed quickly to aid in decisions regarding well construction. Laboratory results from these samples were used for field screening purposes only, and are not considered to be of the same data quality as samples collected from completed wells.

Two complete rounds of groundwater samples were collected, one each in October 1990 and September-October 1991. Each sampling round included all wells that

existed at the time. The second sampling round did not include MWs 29, 41, 42, 43, 44, 45, 46, 47, 48, 49, and 50, which were not installed or sampled until December 1991.

Water produced during the development and purging activities prior to May 1991 was placed in sealed 55-gallon drums and transferred to the storage tanks used for the treatability study. The water was then treated and discharged to the injection well (MW-27). Water produced during later sampling was stored on-site and then treated by use of carbon canisters, analyzed to ensure no contamination remained, and discharged to the ground on-site with approval of the Santa Ana Regional Water Quality Control Board.

2.5 Aquifer Testing

During the additional site characterization and the treatability study, 27 aquifer tests were performed, which included:

- 11 constant rate pumping tests;
- 11 recovery tests; and
- 5 slug tests.

The pumping and recovery tests were performed in wells capable of producing more than about 0.5 gallon per minute (gpm) consistently for an hour or more. Slug tests were performed in wells where the permeability of the surrounding materials was very low, and a pumping rate of at least 0.5 gpm could not be maintained for at least an hour.

The tests are summarized in Appendix D of this report. The pumping tests were performed using a submersible pump with a recovery test performed after each pump test. Where possible, the pumping and recovery tests were performed using multiple wells. Where multiple wells were monitored, drawdown and recovery water level data were analyzed to determine hydraulic conductivity and, if possible, the storage

coefficient. During both types of tests, water-level changes were monitored both by manually operated water level probes and by use of transducers and an electronic data logger. Slug tests were performed by measuring the change in water level in a well while withdrawing a PVC "slug" that displaced a known volume of water.

2.5.1 Aquifer Test Layout

Aquifer tests were performed in both the Mount Eden Formation (beneath the burn pit area and downgradient) and the alluvium (downgradient of the burn pit area) to evaluate the hydraulic characteristics of each unit.

Alluvial Wells

Wells used to test the alluvium, which represents most of the contaminant plume area, included MW-2, 20, 22, 23, and 30 in the burn pit area; MW-34, MW-35, and MW-39 further downgradient. The wells are located at varying distances from the burn pit area, and the groundwater quality in these wells reasonably represents the range of water quality for the entire plume. These test results, combined with the previous results of the site characterization (Radian, 1990), provide good overall coverage of the area within the contaminant plume.

Three of the alluvial wells tested (MW-20, 22, and 30) were drilled to provide influent water for the treatability study system. Monitoring wells 21 and 23 were drilled near MW-30 to provide additional drawdown and recovery data from the aquifer tests. Before these wells were drilled, drawdown modeling was performed using a Theis well field drawdown model (Walton, 1984) to estimate the aquifer test conditions and to determine the optimal spacing of the wells.

Multiple well alluvial tests included pumping and recovery of MW-2, 20, 23, and 30. During these tests, one well was pumped and one or more nearby wells were monitored for water level changes.

Mount Eden Formation Wells

The wells used to characterize the Mount Eden Formation included water table wells MW-25, 26, 31, 37, 38, and 40. Monitoring wells 24 and 26 are located near each other to provide adequate drawdown and recovery data for analysis using multiple wells. A slug test was performed in MW-37 downgradient of the burn pit area. One deep Mount Eden well, MW-31, was tested using the slug test method.

2.5.2 Aquifer Testing and Analysis Methods

The aquifer tests ranged in duration from about 1 to 50 hours. For tests lasting longer than approximately four hours, both pre- and post-test water-level measurements were used to determine background changes in water levels. The actual aquifer test data were then adjusted to account for the background changes in the water levels. The adjustment of the data consisted of first determining the background trend in water levels (if any) prior to the test, and then either adding or subtracting the background trend from the measurements taken during the tests. As the result of seasonal rainfall, water levels were generally increasing when most of the tests were performed.

The pumping and recovery test data were analyzed using the Theis, Jacob, or Neuman methods for unconfined aquifers (Todd, 1980). Slug test data were analyzed using the Bouwer-Rice method (Kruseman and Ridder, 1991). Hydraulic conductivity and storage coefficient values were computed by plotting drawdown or recovery versus time on log-log or semi-log plots, depending on the analytical method. Calculations were performed by hand and computer curve matching. Plotted data were matched to a "type

curve" or a straight line for the particular analytical method. Test results are discussed in Section 4.2.3 of this report.

2.6 Water Level Monitoring

Water levels in various wells were monitored at regular intervals (ranging from daily to monthly) from early March through August 1992. The purpose of the monitoring was to evaluate the response of water levels to treatability study pumping and to seasonal rainfall. Monitoring data also provides information useful in evaluating how water levels may respond to pumping for remediation, if required. Every well was monitored at least monthly from March through August 1992. Wells in the burn pit area were monitored more frequently during the treatability study. Hydrographs and water level data for all wells at the site are presented in Appendix E.

Water levels were monitored using an electric water level sounder. For each monitoring round, wells were monitored in the order of the cleanest to most contaminated, in order to reduce the potential for cross-contamination. The sounder was cleaned between wells by using a soap and water wash followed by a potable water rinse and a distilled water rinse.

A discussion of water level responses to pumping and rainfall recharge is presented in Section 4.2.

Table 2-1

Well, Piezometer, and Borehole Summary

Number	Gauging Point Elevation	Ground Surface Elevation	Total Borehole Depth (ft)	Depth to Mount Eden (ft)	Well Diameter (inches)	Depth to Top of Screen (ft)	Depth to Bottom of Screen (ft)	Geologic Unit Screened[a]
MW-1	2174.30	2173.22	128	93	4	116	126	ME
MW-2	2167.46	2166.27	102	92	4	73	93	Qal
MW-3	2166.44	2165.61	272	82	4	260	270	ME
MW-4	2157.39	2156.67	85	NE	4	62	82	Qal
MW-5	2118.71	2117.50	44.5	NE	4	23	43	Qal
MW-6	2119.11	2117.73	119	113	4	104	114	Qal
MW-7	2173.84	2172.63	93	NE	4	70	90	Qal
MW-8	2087.79	2086.54	35	NE	4	13	33	Qal
MW-9	2086.32	2085.28	132	125	4	115	125	Qal
MW-10	2176.72	2176.11	100	100[b]	4	79	99	Qal
MW-11	2119.90	2118.59	70	NE	4	46	66	Qal
MW-12	2095.79	2094.38	55	NE	4	29	49	Qal
MW-13	2055.19	2053.92	38	NE	4	16	36	Qal

Notes:

NA - Not Applicable or unknown
NE - Not Encountered
a Qal = Quaternary Alluvium, ME = Mount Eden Formation
b No Mount Eden encountered, hit granitic basement
c From pilot hole adjacent to well
d Estimated from topographic map, well destroyed in Spring 1991 rains.
e Locations FS-4 through FS-7 are shallow soil vapor probes (3.5 to 7 feet deep) FS-3 converted to Well MW-24

tbl-2-1.892/lock beau hydro rept/8/92

RADIAN CORPORATION

Table 2-1

(Continued)

Number	Gauging Point Elevation	Ground Surface Elevation	Total Borehole Depth (ft)	Depth to Mount Eden (ft)	Well Diameter (inches)	Depth to Top of Screen (ft)	Depth to Bottom of Screen (ft)	Geologic Unit Screened[a]
MW-14	2026.97	2025.89	50	NE	4	29	49	Qal
MW-15	2007.06	2006.24	93	91	4	81	91	Qal
MW-16	1818.00	1818.00	15	NE	2	8	13	Qal
MW-17	2137.72	2136.18	65	NE	4	44	64	Qal
MW-18	2006.00	2004.85	52	NE	4	30	50	Qal
MW-19	2115.79	2114.72	50	NE	4	25	45	Qal
MW-20	2156.86	2157.20	97	NE	5	64.6	95	Qal
MW-21	2158.13	2158.86	104	155[c]	5	69.7	100	Qal
MW-22	2168.22	2168.37	119	114	5	74	114.4	Qal
MW-23	2159.56	2159.72	119	NE	5	84.4	115	Qal
MW-24	2180.62	2179.83	105	52	2	85	105	ME
MW-25	2180.66	2179.97	110	52	4	80	100	ME
MW-26	2179.78	2180.06	129	75	5	87.6	128	ME
MW-27	2177.99	2178.27	92.2	NE	5	29.3	91.4	Qal

Notes:

NA - Not Applicable or unknown
NE - Not Encountered
a Qal = Quaternary Alluvium, ME = Mount Eden Formation
b No Mount Eden encountered, hit granitic basement
c From pilot hole adjacent to well
d Estimated from topographic map, well destroyed in Spring 1991 rains.
e Locations FS-4 through FS-7 are shallow soil vapor probes (3.5 to 7 feet deep) FS-3 converted to Well MW-24

tbl-2-1.892/lock beau hydro rept/8/92

RADIAN CORPORATION

Table 2-1

(Continued)

Number	Gauging Point Elevation	Ground Surface Elevation	Total Borehole Depth (ft)	Depth to Mount Eden (ft)	Well Diameter (inches)	Depth to Top of Screen (ft)	Depth to Bottom of Screen (ft)	Geologic Unit Screened[a]
MW-28	2158.25	2157.29	134	133	4	120	130	Qal
MW-29	2112.37	2109.54	50	22	4	23.7	49.2	ME
MW-30	2159.04	2159.31	125	NE	4	90	124.5	Qal
MW-31	2183.32	2181.80	195	62	4	180	190	ME
MW-32	2173.38	2171.86	223	133	4	210	220	ME
MW-34	2151.38	2150.39	83	NE	4	62	82	Qal
MW-35	2168.34	2166.05	140	138	4	60	80	Qal
MW-36	2202.53	2200.82	105	105[b]	4	85	105	Qal
MW-37	2038.25	2036.45	62	49.5	4	40	60	Qal/ME
MW-38	2027.58	2026.22	82	38.5	4	60	80	ME
MW-39	2141.54	2139.34	86	82	4	60	80	Qal
MW-40	2123.69	2122.18	67	29	4	46	66	ME
MW-41	2131.28	2129.74	55	49.5	4	35	55	ME
MW-42	2089.86	2088.68	36	NE	4	13.2	34.7	Qal

Notes:

NA - Not Applicable or unknown
NE - Not Encountered
a Qal = Quaternary Alluvium, ME = Mount Eden Formation
b No Mount Eden encountered, hit granitic basement
c From pilot hole adjacent to well
d Estimated from topographic map, well destroyed in Spring 1991 rains.
e Locations FS-4 through FS-7 are shallow soil vapor probes (3.5 to 7 feet deep) FS-3 converted to Well MW-24

RADIAN CORPORATION

Table 2-1

(Continued)

Number	Gauging Point Elevation	Ground Surface Elevation	Total Borehole Depth (ft)	Depth to Mount Eden (ft)	Well Diameter (inches)	Depth to Top of Screen (ft)	Depth to Bottom of Screen (ft)	Geologic Unit Screened[a]
MW-43	2065.81	2064.38	115.5	NE	4	8.4	23.4	Qal
MW-44	2124.42	2126.04	59	NE	4	34	54	Qal
MW-45	2068.88	2063.28	55	115	4	42.7	53.2	Qal
MW-46	2069.40	2068.32	89	NE	4	41.5	61.5	Qal
MW-47	2077.12	2073.00	54	NE	4	43.3	53.3	Qal
MW-48	2073.73	2072.29	25	NE	4	8.7	23.7	Qal
MW-49	2128.19	2127.18	113.5	111±[c]	4	30.5	52	Qal
MW-50	2148.76	2148.11	74.3	NE	4	54.3	74.3	Qal
Lockheed Water Production Wells								
W1	1972.02	1970.11	388	NA	14	NA	NA	NA
W2	2028.88	2028.73	250	NA	8	NA	NA	NA
W3	2124.42	2124.42	148	NA	12	124	148	NA
W5	2201.51	2200.38	127.5	NA	6.25	71	127.5	NA
W6	2236[d]	2236[d]	155.2	NA	NA	NA	NA	NA

Notes:

NA - Not Applicable or unknown
NE - Not Encountered
a Qal = Quaternary Alluvium, ME = Mount Eden Formation
b No Mount Eden encountered, hit granitic basement
c From pilot hole adjacent to well
d Estimated from topographic map, well destroyed in Spring 1991 rains.
e Locations FS-4 through FS-7 are shallow soil vapor probes (3.5 to 7 feet deep) FS-3 converted to Well MW-24

RADIAN CORPORATION

Table 2-1

(Continued)

Number	Gauging Point Elevation	Ground Surface Elevation	Total Borehole Depth (ft)	Depth to Mount Eden (ft)	Well Diameter (inches)	Depth to Top of Screen (ft)	Depth to Bottom of Screen (ft)	Geologic Unit Screened[a]
Leighton Associates Observation Wells								
OW-1	2202.31	2200.47	70	NE	2	60	70	Qal
OW-2	2076.60	2074.84	70	44	2	56	66	Qal
OW-3	2141.01	2139.40	70	NE	2	46	56	Qal
OW-4	NA	2236.57	70	NE	2	58	68	Qal
OW-5	NA	2155.75	66	66	2	56	66	Qal
OW-6	NA	2078.71	40	40	2	27	37	Qal
OW-7	NA	2102.73	49	49	2	37	47	Qal
OW-8	2033.66	2032.00	64	64	2	51	61	Qal
Piezometers								
P-2	2078.64		36	NE	2	24.7	35	Qal
P-3	2137.58		58[b]	NE	4	47.7	58	Qal
P-4	2109.02		49	NE	4	38.7	49	Qal
P-5	2159.51		120	NE	2	56.9	71.7	Qal

Notes:

NA - Not Applicable or unknown
NE - Not Encountered
a Qal = Quaternary Alluvium, ME = Mount Eden Formation
b No Mount Eden encountered, hit granitic basement
c From pilot hole adjacent to well
d Estimated from topographic map, well destroyed in Spring 1991 rains.
e Locations FS-4 through FS-7 are shallow soil vapor probes (3.5 to 7 feet deep) FS-3 converted to Well MW-24

tbl-2-1.892/lock beau hydro rept/8/92

RADIAN CORPORATION

Table 2-1

(Continued)

Number	Gauging Point Elevation	Ground Surface Elevation	Total Borehole Depth (ft)	Depth to Mount Eden (ft)	Well Diameter (inches)	Depth to Top of Screen (ft)	Depth to Bottom of Screen (ft)	Geologic Unit Screened[a]
Vapor Recovery Wells								
VRW-1	NA	2183.08	78	73	4	40	50	Qal
VRW-2	NA	2179.95	82	80	4	70	80	Qal
VRW-3	NA	2181.29	80	53	4	68	78	ME
Vapor Monitoring Wells								
VMW-1	NA	2180.96	80	47	2	75.4	77.9	ME
VMW-2	NA	2182.17	80	50	2	75.5	78	ME
VMW-3	NA	2182.21	48	47	2	43.3	45.8	Qal
VMW-4	NA	2182.59	80	49	2	75.5	78	ME
VMW-5	NA	2182.59	25	NE	2	21.5	24	Qal
VMW-6	NA	2182.59	50	50	2	45.5	48	Qal
VMW-7	NA	2183.13	52	NE	2	47.5	50	Qal
VMW-8	NA	2182.74	51.5	NE	2	47.5	50	Qal
VMW-9	NA	2182.74	27	NE	2	22.5	25	Qal

Notes:

NA - Not Applicable or unknown
NE - Not Encountered
a Qal = Quaternary Alluvium, ME = Mount Eden Formation
b No Mount Eden encountered, hit granitic basement
c From pilot hole adjacent to well
d Estimated from topographic map, well destroyed in Spring 1991 rains.
e Locations FS-4 through FS-7 are shallow soil vapor probes (3.5 to 7 feet deep) FS-3 converted to Well MW-24

tbl-2-1.892/lock beau hydro rept/8/92

RADIAN CORPORATION

Table 2-1

(Continued)

Number	Gauging Point Elevation	Ground Surface Elevation	Total Borehole Depth (ft)	Depth to Mount Eden (ft)	Well Diameter (inches)	Depth to Top of Screen (ft)	Depth to Bottom of Screen (ft)	Geologic Unit Screened[a]
VMW-10	NA	2181.43	52	NE	2	47.5	50	Qal
VMW-11	NA	2180.59	85	84	2	77.5	80	Qal
VMW-12	NA	2180.59	52	NE	2	47.5	50	Qal
VMW-13	NA	2180.09	52	NE	2	47.5	50	Qal
VMW-14	NA	2180.09	82	80	2	77.5	80	Qal
Boreholes								
IB-1	NA	2185.55	105	75	NA	NA	NA	NA
IB-2	NA	2187.91	115	75	NA	NA	NA	NA
FS-1	NA	2184.68	120	57.5	NA	NA	NA	NA
FS-2	NA	2143.77	53	NE	NA	NA	NA	NA
FS-18[e]	NA	2173.16	20	19	NA	NA	NA	NA
FS-19	NA	2175.69	45	43	NA	NA	NA	NA
FS-20	NA	2169.37	60	58	NA	NA	NA	NA
FS-21	NA	2167.55	90	75	NA	NA	NA	NA

Notes:

NA - Not Applicable or unknown
NE - Not Encountered
a Qal = Quaternary Alluvium, ME = Mount Eden Formation
b No Mount Eden encountered, hit granitic basement
c From pilot hole adjacent to well
d Estimated from topographic map, well destroyed in Spring 1991 rains.
e Locations FS-4 through FS-7 are shallow soil vapor probes (3.5 to 7 feet deep) FS-3 converted to Well MW-24

tbl-2-1.892/lock beau hydro rept/8/92

RADIAN CORPORATION

Table 2-1

(Continued)

Number	Gauging Point Elevation	Ground Surface Elevation	Total Borehole Depth (ft)	Depth to Mount Eden (ft)	Well Diameter (inches)	Depth to Top of Screen (ft)	Depth to Bottom of Screen (ft)	Geologic Unit Screened[a]
FS-23	NA	2188.04	52	52	NA	NA	NA	NA
FS-25	NA	2174.43	45	NE	NA	NA	NA	NA
FS-26	NA	2176.35	30	NE	NA	NA	NA	NA
FS-27	NA	2180.53	60	NE	NA	NA	NA	NA
FS-28	NA	2132±	50	45	NA	NA	NA	NA

Notes:

NA - Not Applicable or unknown
NE - Not Encountered
a Qal = Quaternary Alluvium, ME = Mount Eden Formation
b No Mount Eden encountered, hit granitic basement
c From pilot hole adjacent to well
d Estimated from topographic map, well destroyed in Spring 1991 rains.
e Locations FS-4 through FS-7 are shallow soil vapor probes (3.5 to 7 feet deep) FS-3 converted to Well MW-24

RADIAN CORPORATION

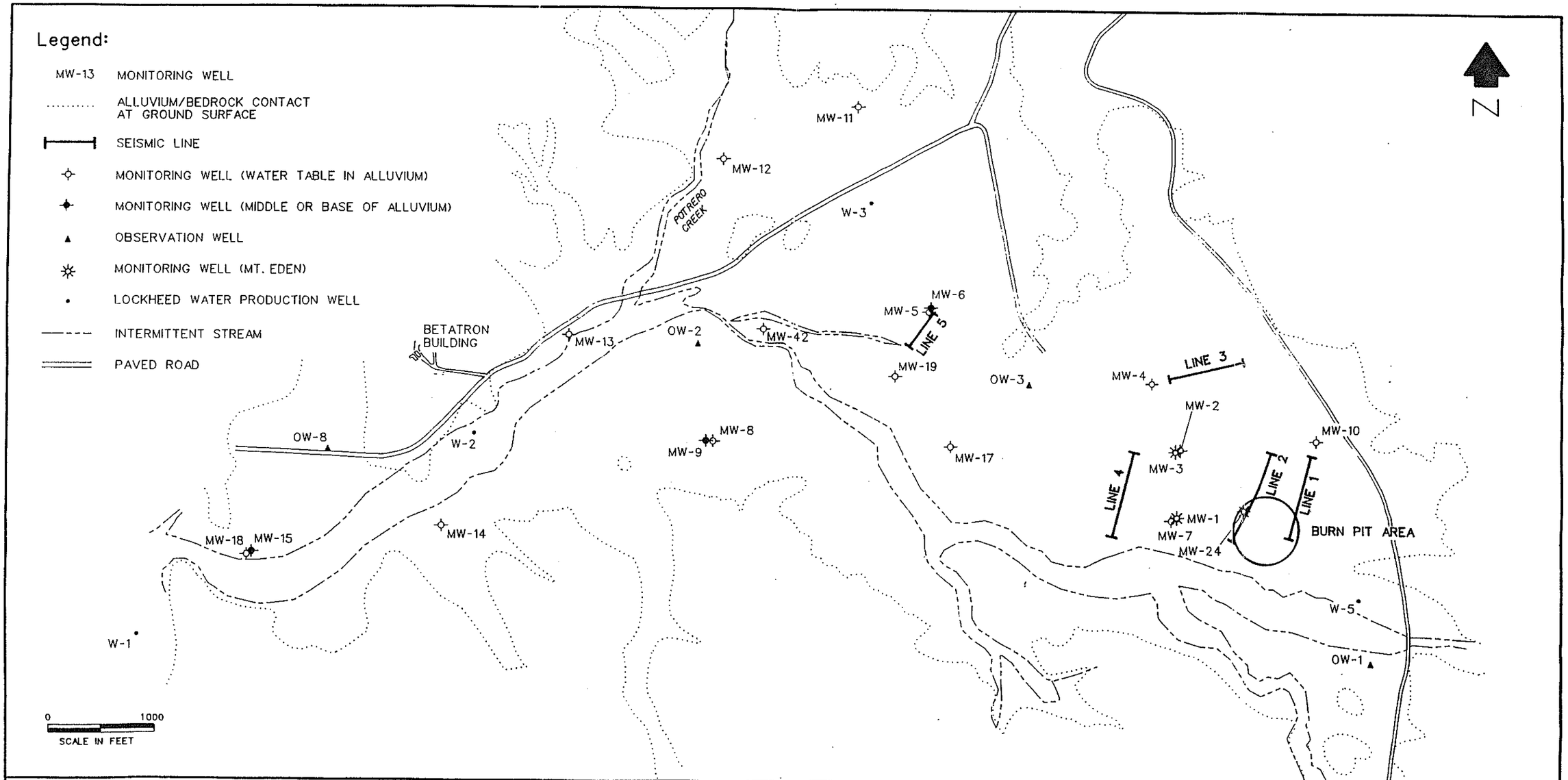


Figure 2-1. Lockheed Beaumont No. 1 Location of Seismic Lines

LOCKHG2 SEISMIC 09/30/92

RADIAN CORPORATION

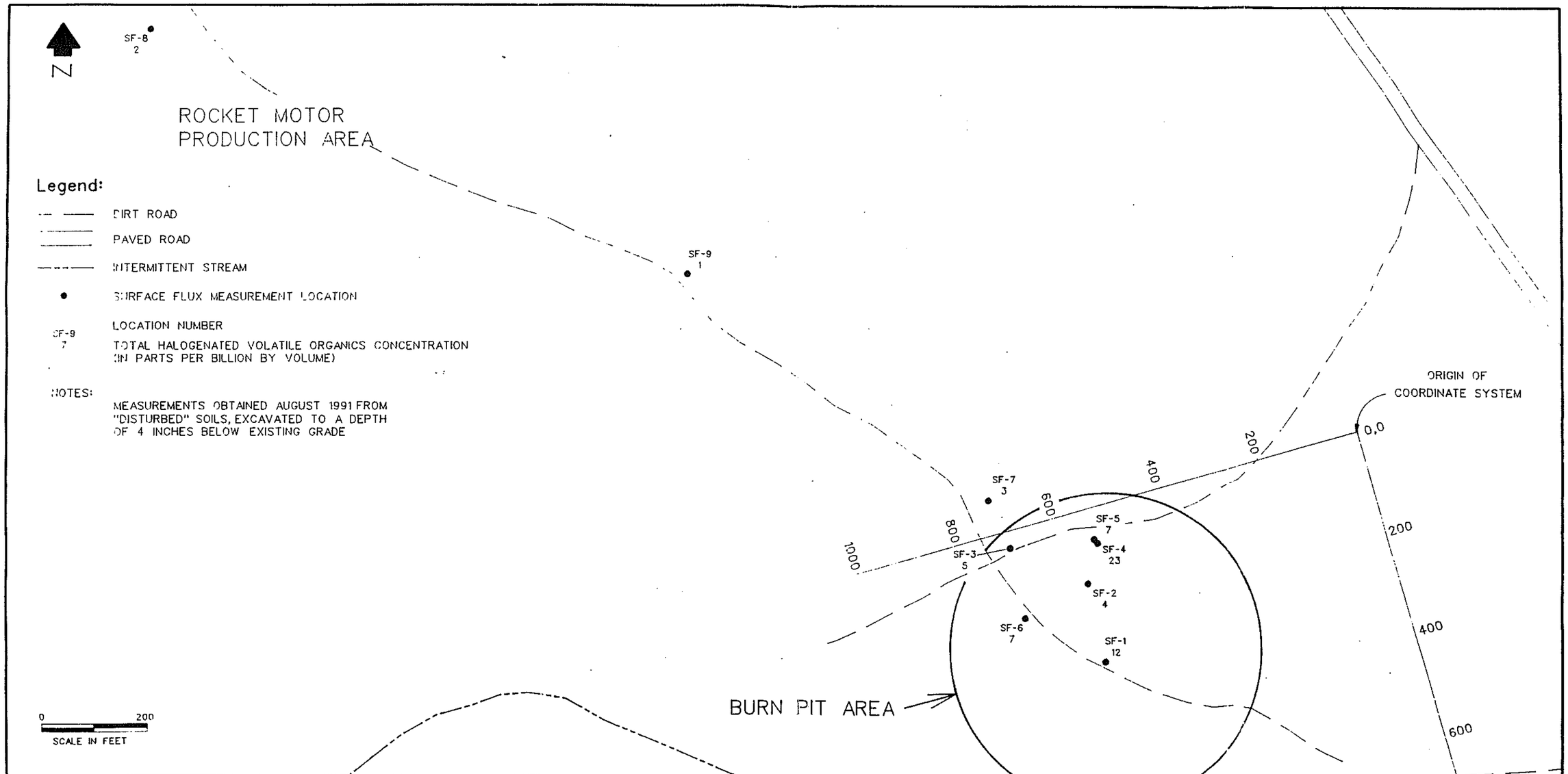


Figure 2-2. Lockheed Beaumont No. 1 Surface Flux Chamber Measurements

LOCKHG FSSURF 08/10/92

RADIAN CORPORATION

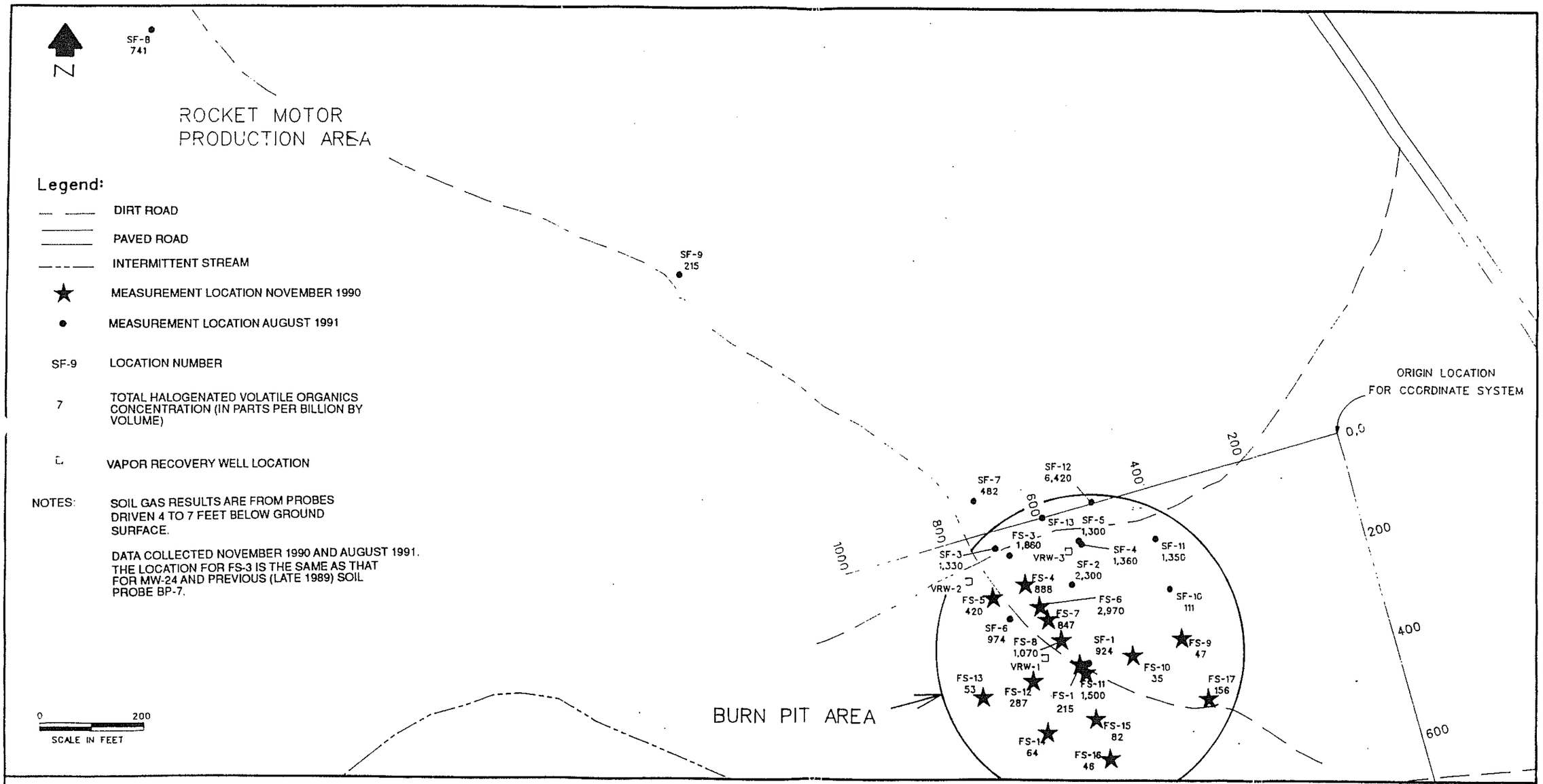


Figure 2-3. Lockheed Beaumont No. 1 Shallow Soil Vapor Sampling

LOCKHO02 FS1 09/30/92

RADIAN CORPORATION

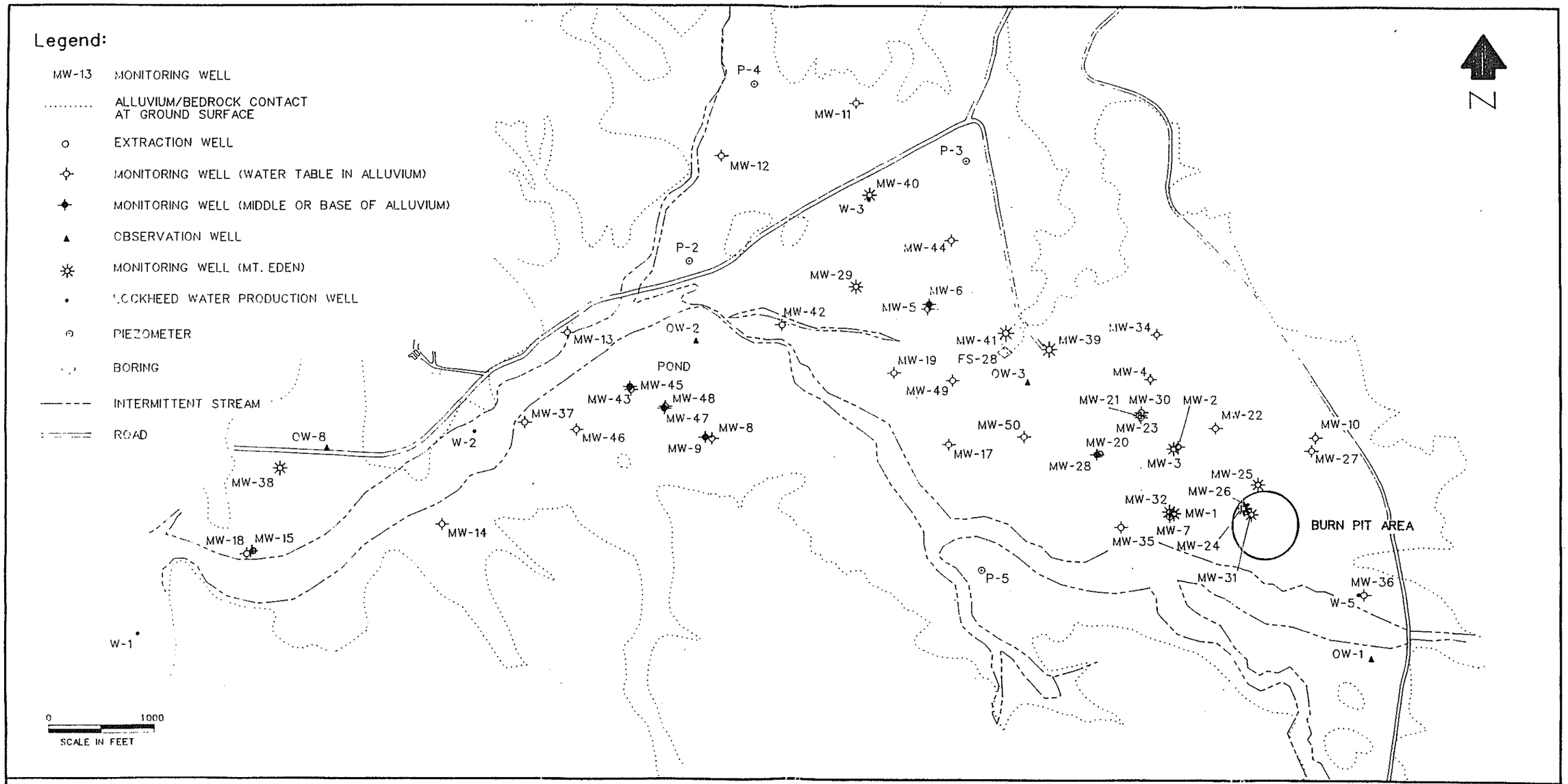


Figure 2-4. Lockheed Beaumont No. 1 Location of Wells and Piezometers

LOCKHG2 WELLSYMF 09/30/92

3.0 GEOLOGY

Previous reports by Radian (1990) and others describe the geology of the Lockheed Beaumont No. 1 site and the surrounding area. Geologic information presented in this report supplements the previous work by Radian and others. The geologic units, from oldest to youngest, consist of: the basement complex of late Paleozoic- to middle Mesozoic-age metasedimentary rocks and Mesozoic granitic rocks; sedimentary deposits of the Pliocene- to Pleistocene-age Mount Eden Formation overlain in places by the sedimentary San Timoteo Formation; and Quaternary alluvium, which is divided into Older and Recent alluviums.

A generalized cross-section of the site (Figure 3-1) shows the overall relationship between the main rock units at the site and the locations of the major faults and the San Jacinto tunnel. As shown on the cross-section, the granitic rocks (including some metasedimentary rocks) are overlain by the younger Mount Eden Formation. The alluvium, in turn, overlies the Mount Eden rocks. Prior to the deposition of the alluvium, the surface of the Mount Eden Formation was eroded to form a valley with canyons and ridges. The canyons and ridges were buried as the alluvium was deposited. The ridge and canyons are now only visible around the margins of the valley.

A physical model of the site is shown on Figure 3-2. The model allows the viewer to see the overall topography and physical features of the site (Figure 3-2A) including the burn pit area and riparian vegetation along Potrero and Bedsprings Creek. Each contour on the model represents a change in elevation of 10 vertical feet. The blue area in the center of the model is where the water table reaches within 10 feet of the ground surface, and where a small pond is present.

In Figure 3-2 (photo B), the alluvial soils above the water table have been removed to reveal the water table. Black lines on the water table show groundwater

plume concentrations. In this photo, ridges in the Mount Eden Formation (pink) can be seen protruding into the water table in several areas, including beneath the burn pits.

The photo in Figure 3-2C shows the estimated surface of the bedrock, including Mount Eden Formation beneath the alluvium.

The relationships among the various geologic units are complex, as shown on the geologic maps presented as Figures 3-3 and 3-4. Geologic cross-sections, developed from the wells at the site, also show the relationships between the various geologic units. The locations of the cross-sections are shown on Figure 3-5; the sections are presented as Figures 3-6, 3-7, and 3-8.

3.1 Granitic and Metasedimentary Rocks

Granitic and metasedimentary rocks make up the basement complex in the area, and underlie the entire site. The granitic and metasedimentary rocks are exposed along the northeastern side of the San Jacinto Nuevo y Potrero Valley and in the hills to the north, south, and east. Figure 3-4, Geologic Map, shows the distribution of the granitic and metasedimentary rocks in the area of the site.

The metasedimentary rocks (of late Paleozoic and Mid-Mesozoic age) are the oldest rock unit exposed at the site. They occur as isolated exposures within the granitic rocks and are exposed at two small areas along the perimeter of the valley. The metasedimentary rocks consist of foliated, gray, micaceous schists and pink to gray gneiss. The rocks also contain some marble and quartzite.

The granitic rocks are Mesozoic in age, and originated as intrusions into the older metasedimentary rocks. Described by Miller (1944) as the San Jacinto Granodiorite, the granitic rocks are exposed primarily in the eastern and southern portions of the site. The granitics are directly overlain by Quaternary age alluvium in

the northeastern part of the site and by Tertiary age San Timoteo Formation in the northern portion. In the western and southern portions of the site, the granitics are overlain by the Tertiary age Mount Eden Formation. The granitic rocks are exposed only in small isolated areas. Where they are exposed, these rocks weather to bouldery terrain with relatively steep slopes.

Previous reports indicate that both the granitic and metasedimentary rocks are fractured and jointed as the result of faulting in the area.

3.2 Mount Eden Formation

The Mount Eden Formation, of Pliocene age, is exposed primarily in the southern and western portions of the site. The formation directly overlays the granitic and metasedimentary rocks. In the center of the site (on the valley floor) the Mount Eden Formation is overlain by Quaternary age alluvium. In the northern portion of the site, the Mount Eden Formation is directly overlain by the San Timoteo Formation. The Mount Eden Formation is not present in the northeastern portion of the site.

In the central portion of the site, the Mount Eden Formation ranges from approximately 170 feet thick near W-5 and OW-1 southeast of the burn pit area (Ransome, 1932), to 430 feet thick near the rocket motor production area, to 650 feet thick in the vicinity of piezometer P-5. The varying thickness of the Mount Eden in the deep boreholes is the result of faulting in the area, offset and displacement of the unit, and the erosional topography of the pre-Pliocene bedrock surface.

The Mount Eden Formation generally consists of red to reddish brown conglomeratic sandstone with minor clay and caliche. The upper portion of the unit grades to buff or tan color in some areas. The sandstone is generally massive with isolated conglomerate lenses or beds which often include boulders. The unit is variably cemented and, as a result, weathers irregularly.

Where encountered in boreholes, the Mount Eden Formation varies in the degree of weathering from being noticeably harder than the overlying alluvium to very similar to the overlying alluvium in hardness and the degree of induration. Where it is exposed, the Mount Eden Formation forms rounded, steep-sided ridges. In the southern and western portion of the site, exposures of the Mount Eden Formation are marked with potholes caused by the weathering and washing out of cobbles and boulders.

The exposed ridges in the Mount Eden Formation continue beneath the surface. Notably beneath the burn pit area, the rocket motor production area, and in the vicinity of MW-29 and MW-40, ridges in the Mount Eden Formation extend outward into the valley beneath the surface of the alluvium (Figure 3-2). These buried ridges or hills have shapes similar to exposed portions of the Mount Eden in that they often occur as rounded or flat, topped ridges with relatively steep sides. The presence of these features is significant because they influence the movement of contaminants in soil vapor and groundwater.

As shown in Figures 3-3 and 3-4, the Mount Eden Formation dips from 3 to 10 degrees to the north. In outcrops, few faults or joints are apparent. However, Woodward Clyde Consultants (September, 1990) observed joints in the Mount Eden Formation in bulldozer trenches excavated in the southwestern portion of the site. The joints do not follow any preferred trend, except near previously identified faults. The gentle northerly dip and relatively few fractures indicate relatively minor tectonic disruption in the area since the unit was deposited.

3.3 San Timoteo Formation

The San Timoteo Formation, of Pliocene or Pleistocene age, only occurs in the northern portion of the site. This area is, for the most part, north of the area where contaminated soil vapor and groundwater occur. As a result, the formation is of limited interest in this investigation.

3.4 Older and Younger Alluvium

The Older Alluvium is Pleistocene in age and occurs at the site as isolated exposures along the flanks of Potrero Creek near the entrance to Massacre Canyon. The Older Alluvium is composed of interbedded sand and gravel deposits and is difficult to distinguish from the Younger Alluvium in the subsurface.

Both the older and younger alluviums at the site were deposited as the result of erosion and subsequent infilling of channels in the older underlying rocks; predominantly the Mount Eden Formation. The infilling of the alluvium on top of the older eroded rocks has resulted in the current gently sloping valley floor.

The Younger Alluvium is Recent in age (less than 11,000 years old) and occurs throughout the San Jacinto y Potrero Valley floor (Figures 3-3 and 3-4). Derived from the surrounding hills and mountains, the alluvium extends laterally to the north along Potrero Creek and to the east a short distance up Bedsprings Creek. To the southwest, the alluvium becomes narrower along Potrero Creek as it enters Massacre Canyon, where exposures of the Mount Eden Formation extend out into the valley floor. The unit is not present at all in the lower reaches of the canyon where the width of the stream course is less than 50 feet wide.

The surface of the alluvium slopes gently towards the current stream channels. Along the upper reaches of Potrero Creek the stream channel is entrenched 30 feet or more into the alluvium. Along Bedsprings Creek (in the eastern portion of the valley) and along the southern portion of Potrero Creek, the stream bed is entrenched from about 5 to as much as 20 feet.

The alluvium varies in thickness across the site. The maximum thickness of alluvium encountered in a borehole is 134 feet in MW-28. Figure 3-9 is a contour map showing the elevation of the base of the alluvium. The contours are based primarily on

data from boreholes and interpretation of the surface geologic exposures. The shape of the bottom of the alluvium reflects the presence of a buried channel in the Mount Eden Formation beneath the alluvium. The center of the channel occurs near MW-17, southwest of the rocket motor production area, and extends southwest to the area of MW-15 and MW-18. Although not shown on Figure 3-9, the configuration of the bottom of the alluvium may be affected by the Potrero Fault or other faults in the area.

The alluvium generally consists of interbedded mixtures of sand, gravel, silt, and clay. The predominant lithologies are sand and silty sand, which range in color from yellow to gray brown or brown. Where the source material is the Mount Eden Formation or the granitic rocks (in the northeastern portion of the valley), the alluvium is generally fine to coarse grained; where the source material is the finer grained San Timoteo Formation, the alluvium is finer grained. The base of the alluvium is commonly coarser grained.

The grain size of the alluvium varies laterally across the site. In some areas (generally the center of the valley), gravelly or pebbly layers occur in the alluvium (Figure 3-10). The gravelly layers may provide pathways for increased groundwater flow, depending on the silt and clay content of the layers. The gravelly layers shown in Figure 3-10 are those occurring at or below the December 1991 water table.

In several other places in the valley, finer grained layers were also encountered in the alluvium. In the eastern (upper) portion of the valley, a yellowish brown sandy silt or sandy clay was observed in the upper portion of many borings. The thickness of the silt ranges from approximately 2 to 35 feet. The sandy silt in many cases grades to a silty sand. In three borings (MW-20, 28, and 39), thin yellowish brown silt layers were noted at depth. Near the burn pit area, a 5 to 10-foot clay layer was observed below a depth of 35 to 40 feet in VMW-2 and VMW-4 (see Figure 3-8).

RADIAN CORPORATION

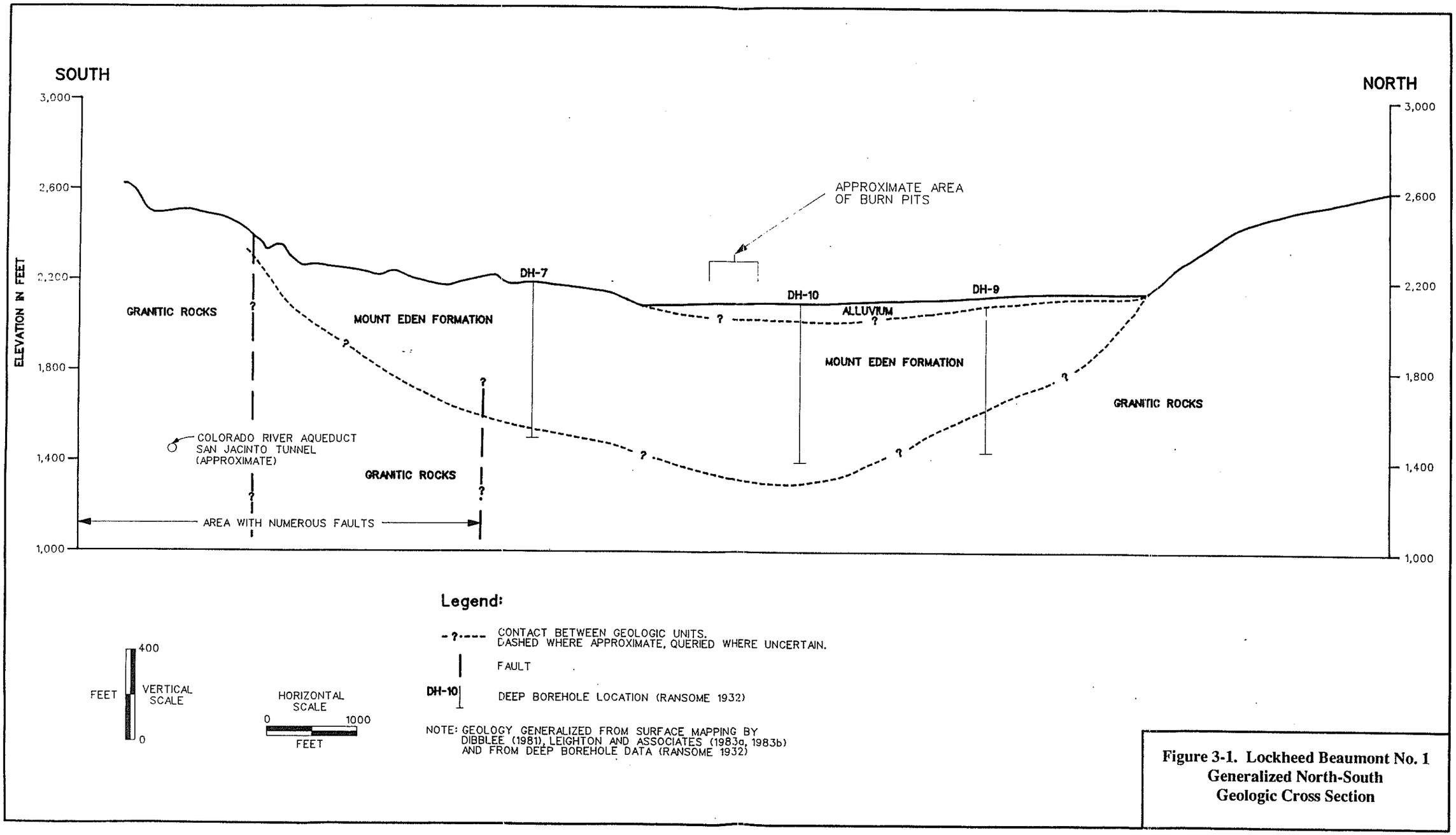
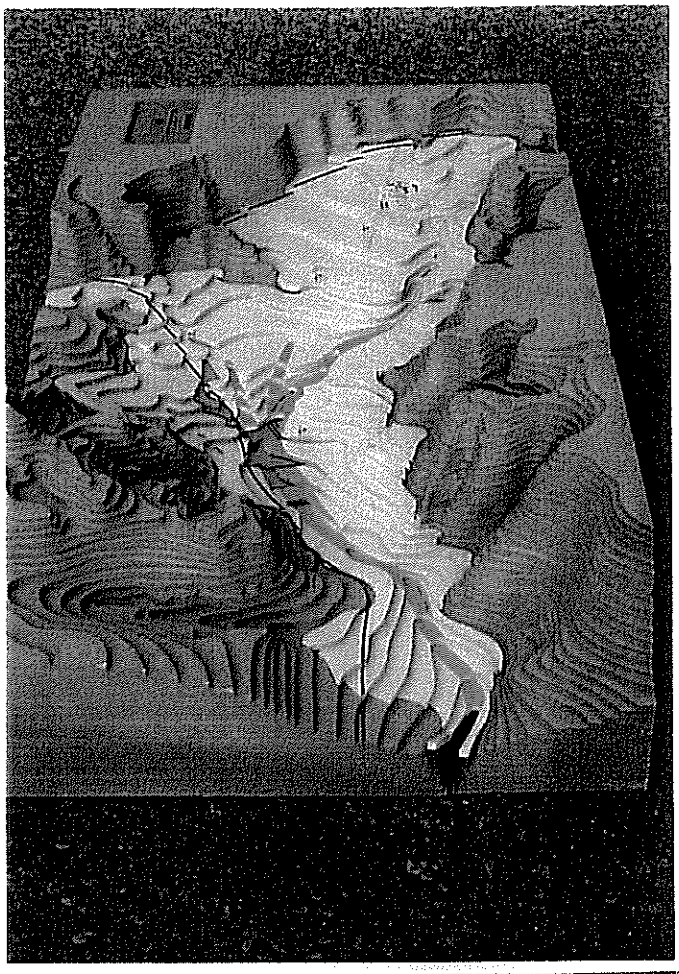


Figure 3-1. Lockheed Beaumont No. 1 Generalized North-South Geologic Cross Section

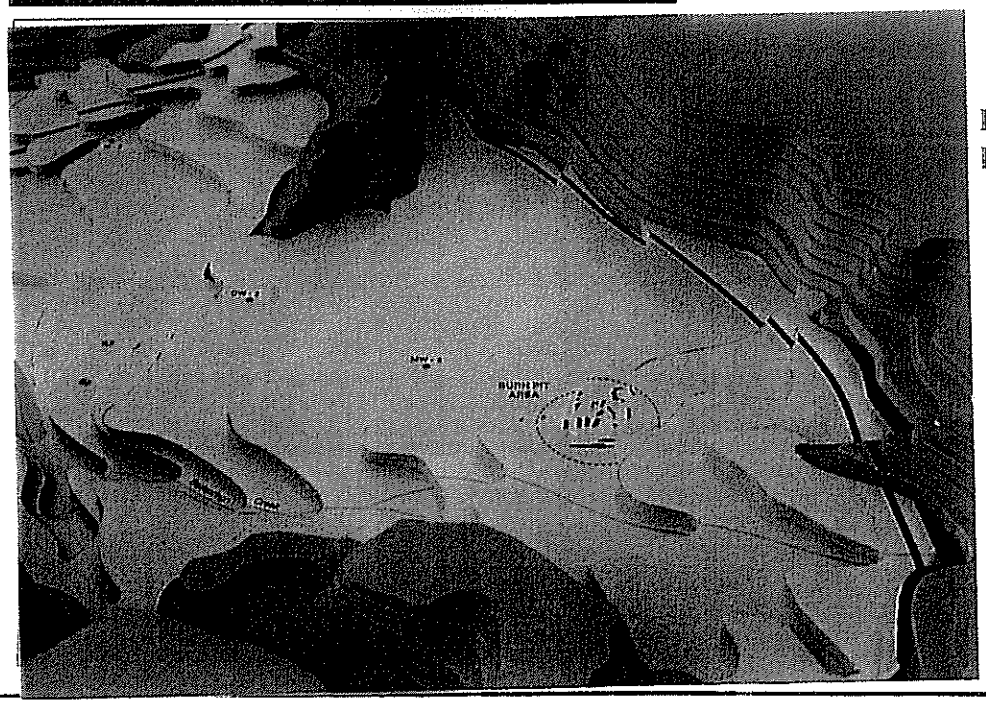
LOCKHG GCS1 8/12/92



D. View of San Jacinto Nuevo y Potrero Valley from the West

N

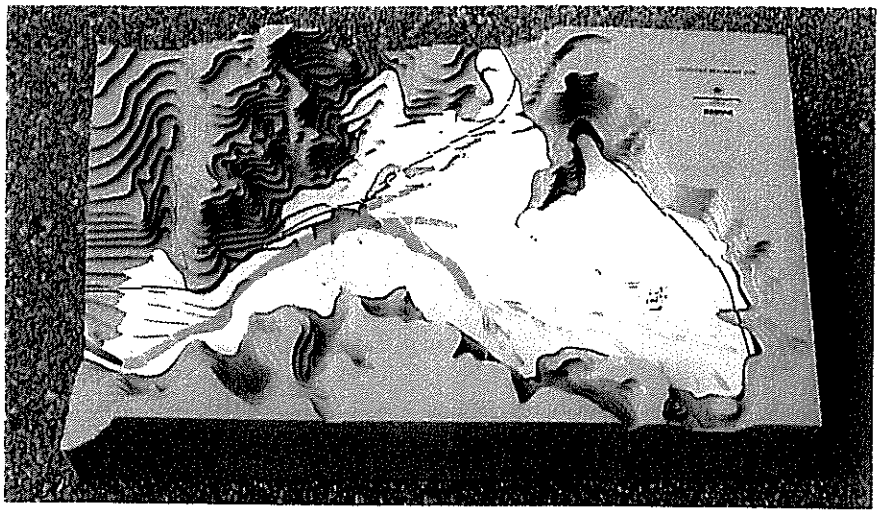
LEGEND:
Green = Riparian Habitat
Lavender = Underlying Bedrock
Tan = Alluvial Valley



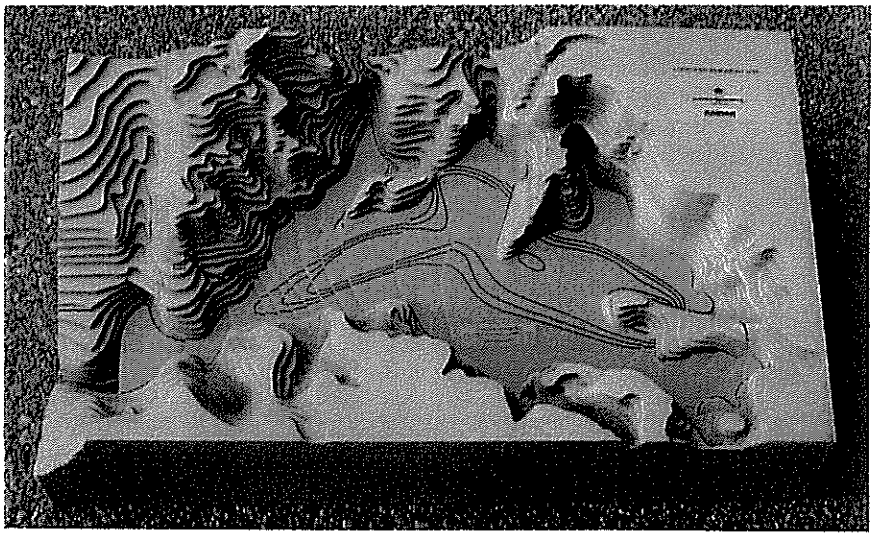
E. Closeup of Burn Pit Area

N

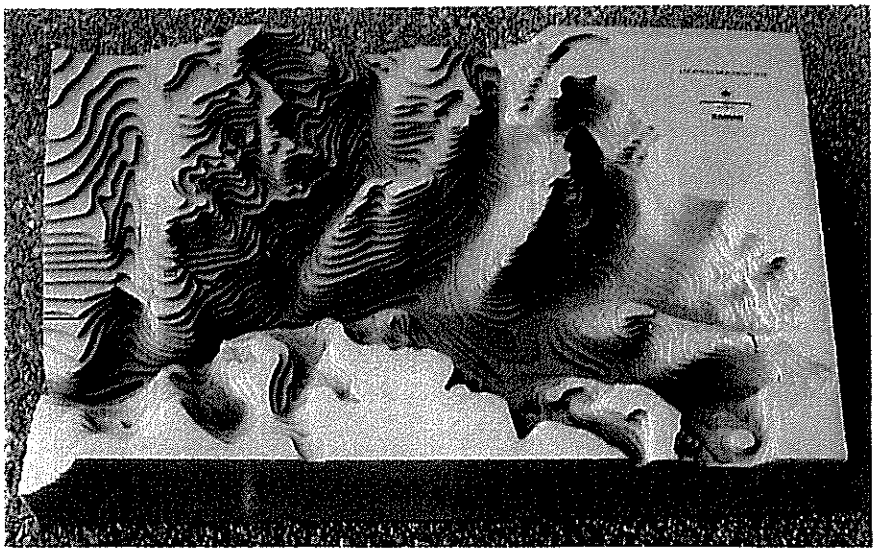
Figure 3-2. Model of Lockheed Beaumont No. 1 Site (continued)



A. Surface Features



B. Groundwater Table Surface



C. Underlying Bedrock (including Mt. Eden Formation)

LEGEND:

N

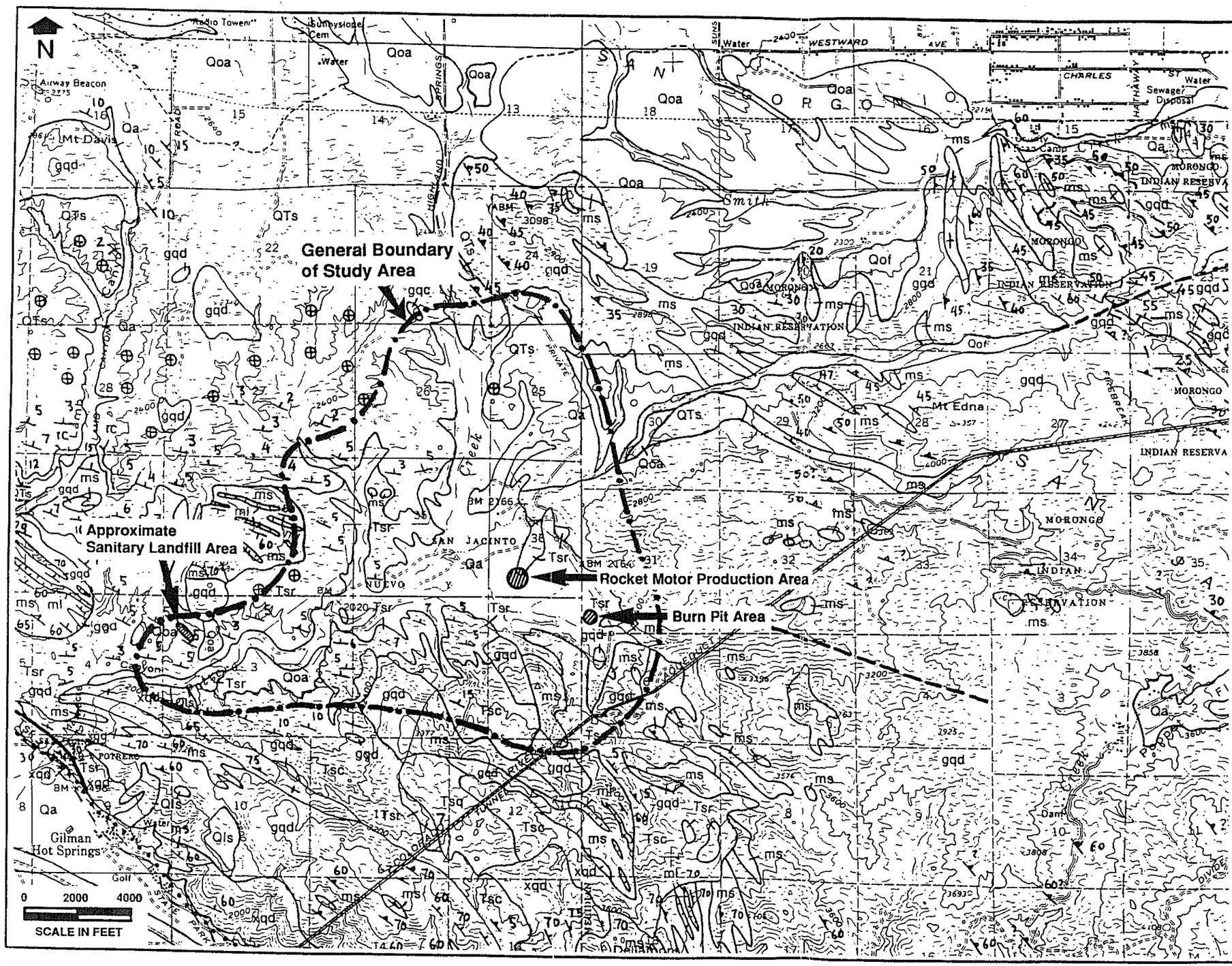
Green = Riparian Habitat

Lavender = Underlying Bedrock (including Mt. Eden Formation)

Blue = Groundwater/Water Table (black lines are logarithmic contours of groundwater contamination)

Tan = Alluvial Valley (Burn Pit in lower right corner)

Figure 3-2. Model of Lockheed Beaumont No. 1 Site



KEY:

Geologic Units in Study Area

Qa	Recent Alluvium (predominantly sand and gravel)
Qoa	Pleistocene Older Alluvium (predominantly sand and gravel)
QTs	Pliocene-Pleistocene San Timeteo Formation terrestrial sediments (interbedded sandstone, siltstone, shale, claystone, and conglomerate)
Tsr	Pliocene-Pleistocene Mount Eden Formation terrestrial sediments (reddish sandstone and clay)
gqd	Mesozoic granodiorite to quartz diorite
ms	Paleozoic or Mesozoic medasedimentary rocks (schist, gneiss)

Symbols

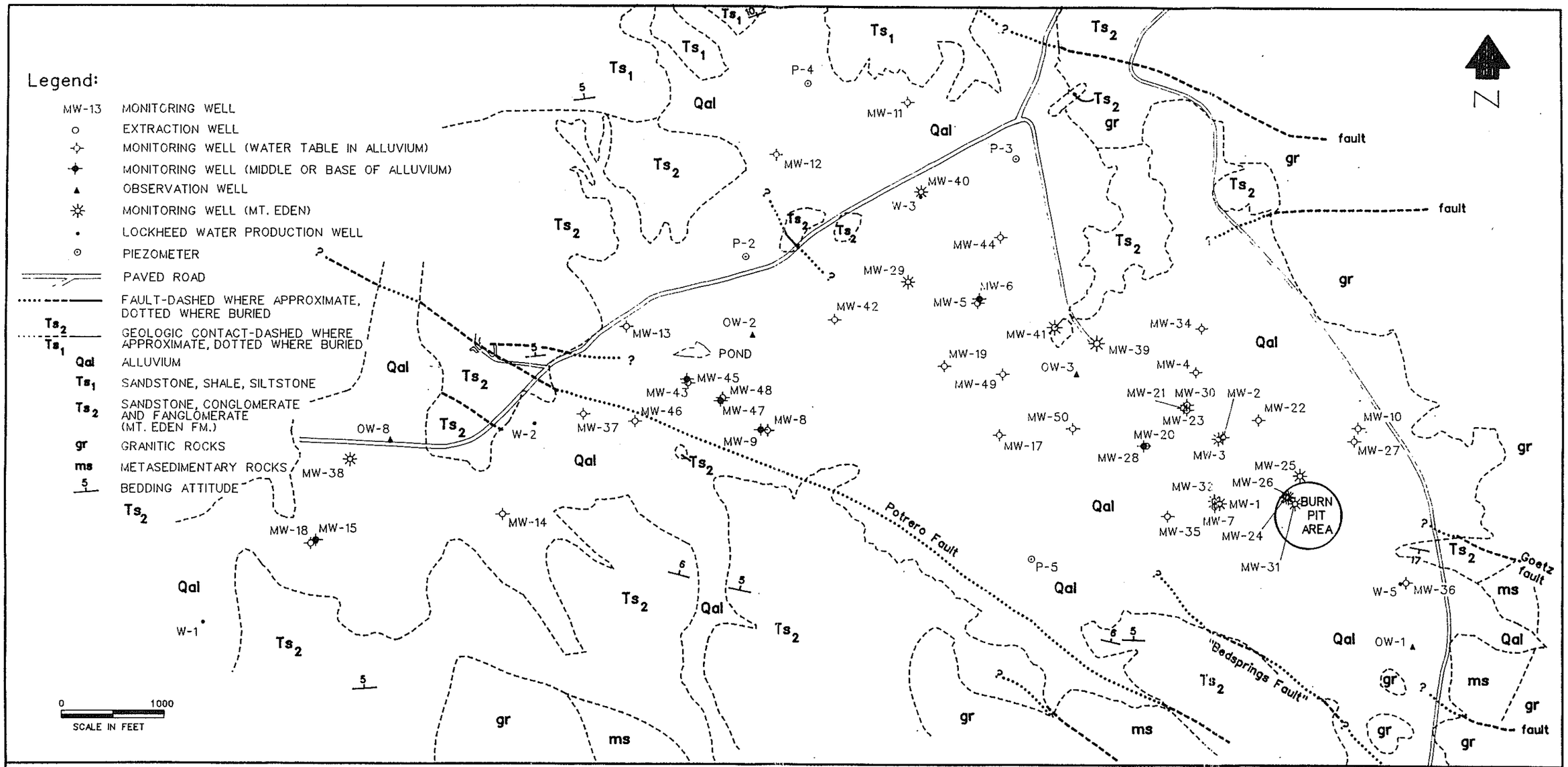
- Geologic contact
- Fault, dashed where approximately located
- 5 Strike & dip of bedding
- Horizontal bedding

Figure 3-3. Lockheed Beaumont No. 1 Geologic Map

REFERENCE: T.W. Dibblee Jr., 1981.

VMG 8/11/92

RADIAN CORPORATION



REFERENCE: Geology modified from Leighton and Associates, Inc. 3/4/83 & 11/4/83

Figure 3-4. Lockheed Beaumont No. 1 Site Geologic Map

LOCKHG2 GEOL 09/30/92

RADIAN CORPORATION

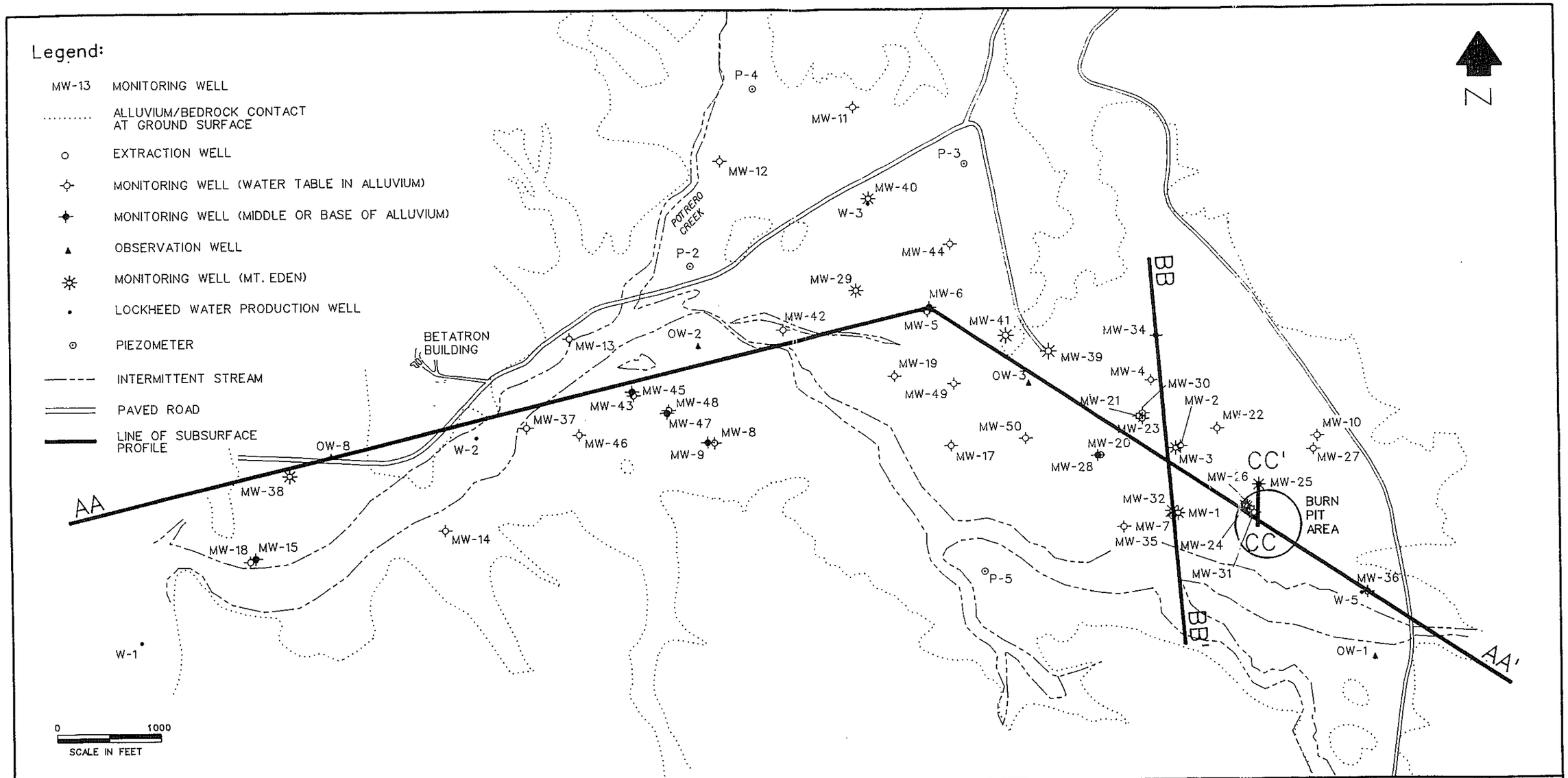
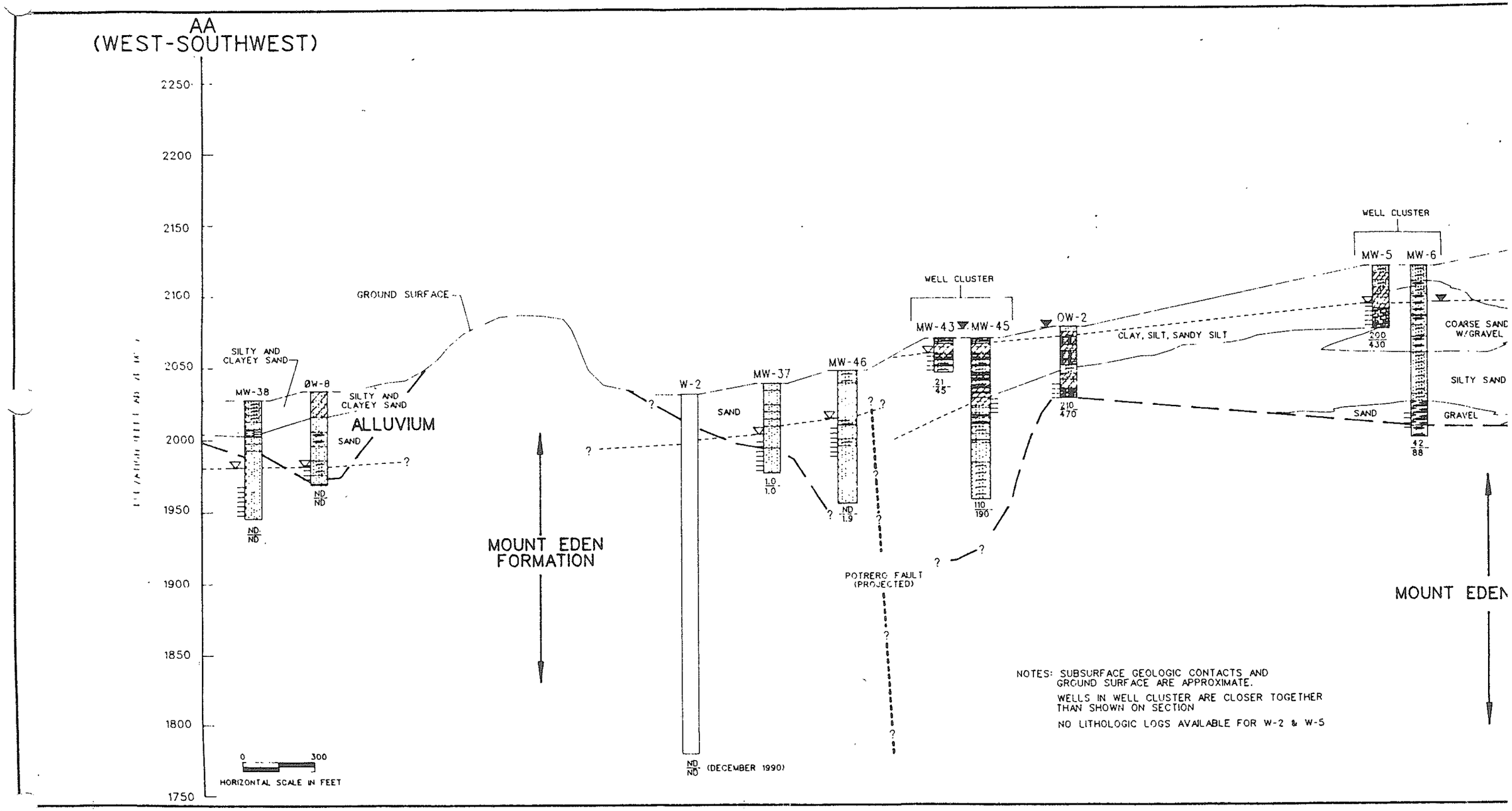


Figure 3-5. Lockheed Beaumont No. 1 Subsurface Profile Locations

LOCKHG2 PROFMAP2 9/30/92

RADIAN CORPORATION



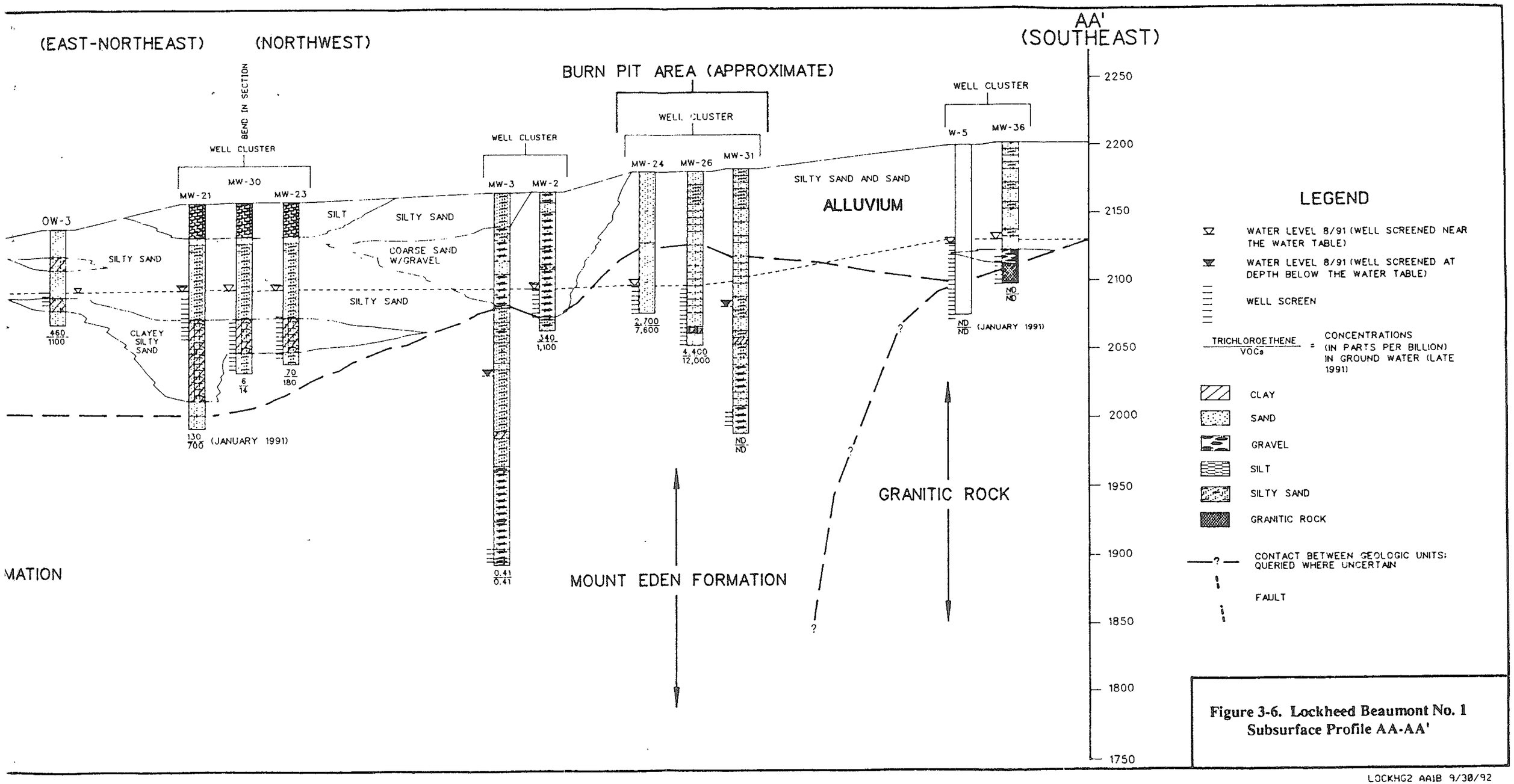


Figure 3-6. Lockheed Beaumont No. 1 Subsurface Profile AA-AA'

LOCKHG2 AA1B 9/30/92

RADIAN CORPORATION

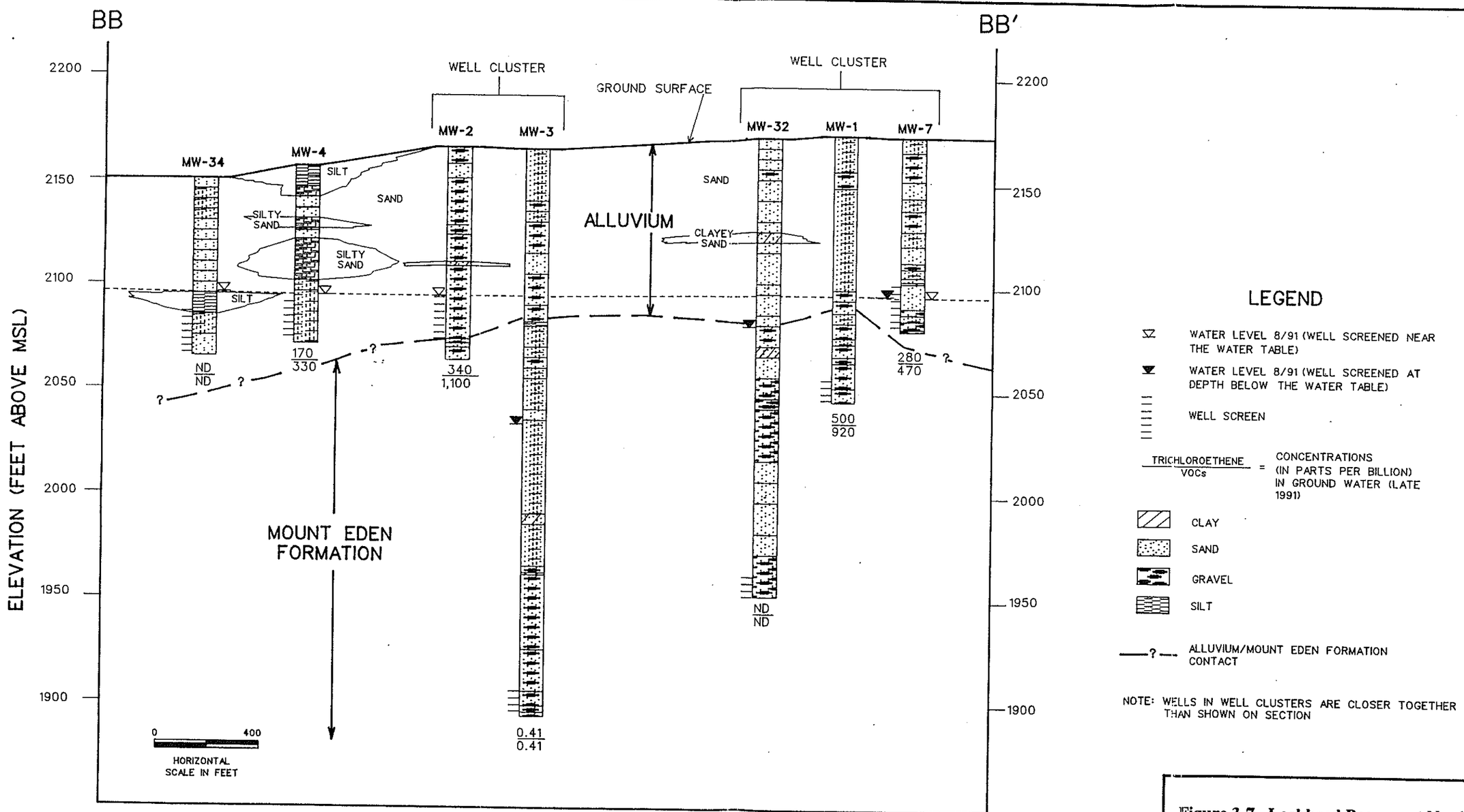


Figure 3-7. Lockheed Beaumont No. 1 Geologic Cross Section BB-BB'

LOCKH92 BB1 09/30/92

RADIAN CORPORATION

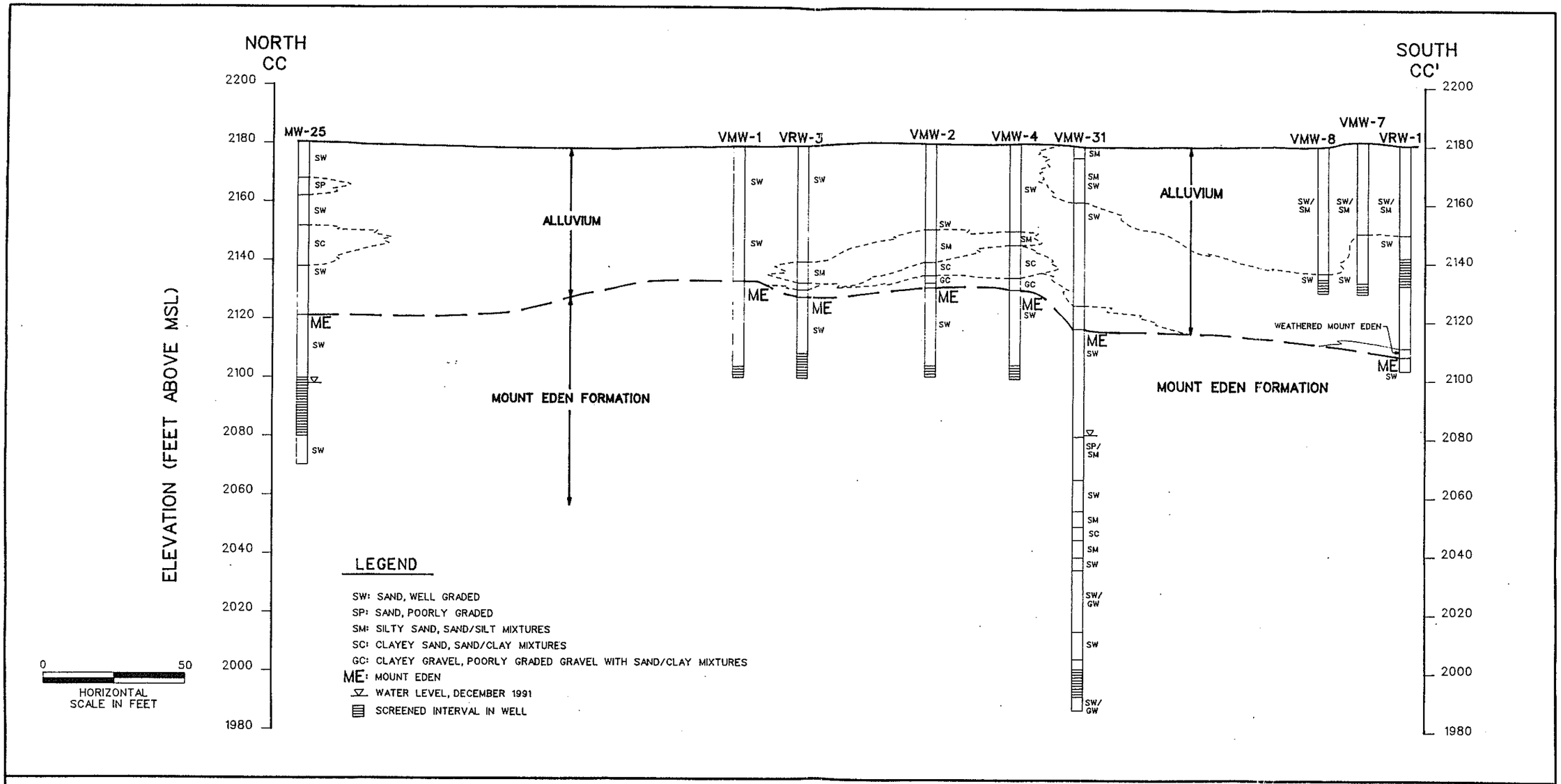


Figure 3-8. Lockheed Beaumont No. 1 Detailed Cross Section Burn Pit Area

LOCKHG2 GCS2 9/30/92

RADIAN CORPORATION

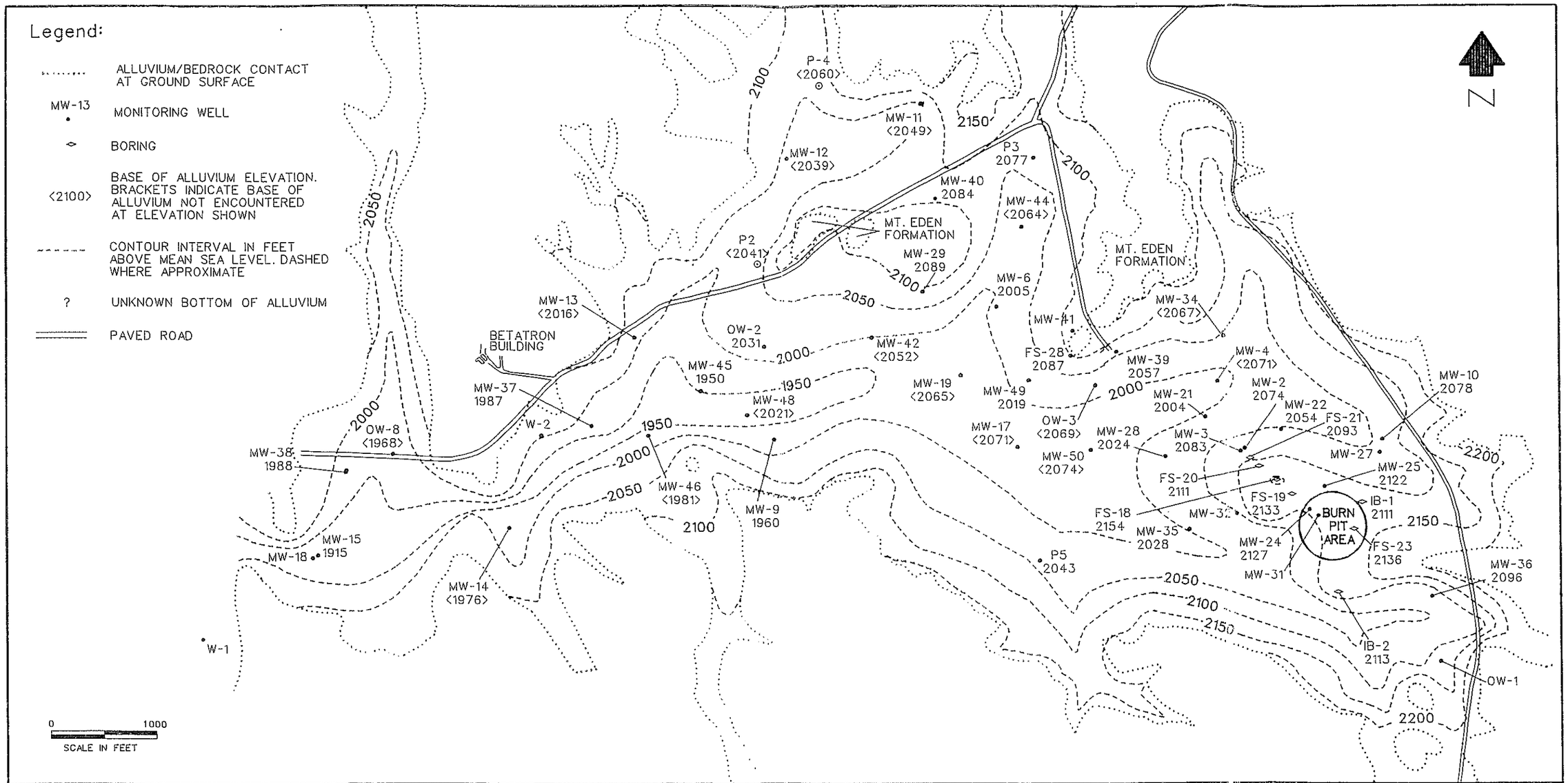


Figure 3-9. Lockheed Beaumont No. 1
Bottom of Quarternary Alluvium

LOCKHG ALLUV2 08/11/92

RADIAN CORPORATION

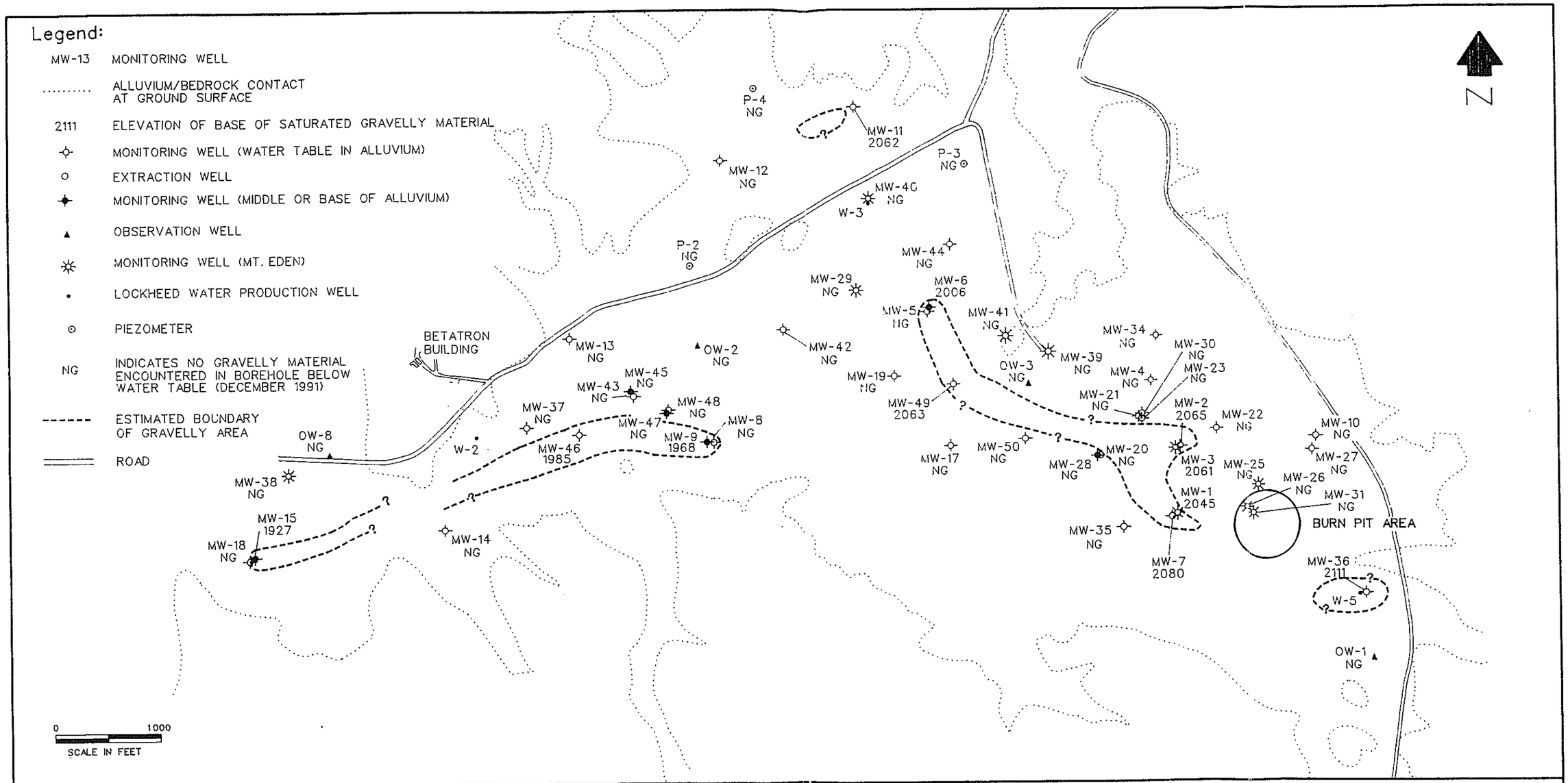


Figure 3-10. Lockheed Beaumont No. 1 Areas of Gravelly Material in Saturated Alluvium

LOCKHG2 GRAVEL2 9/30/92

RADIAN CORPORATION

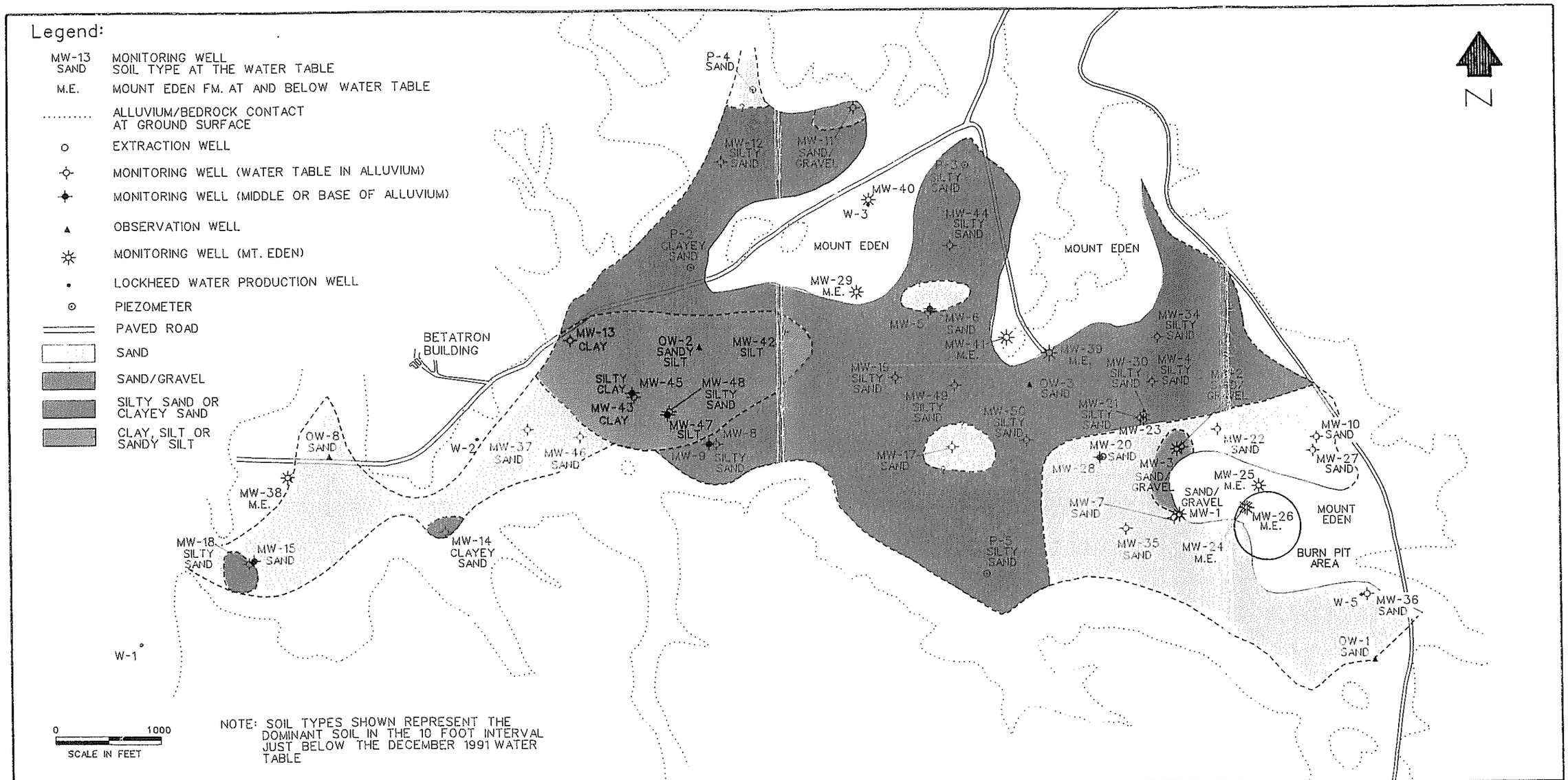


Figure 3-11. Lockheed Beaumont No. 1 Alluvial Soil Type at a Depth Approximately Equivalent to the Water Table

LOCKHG2 FORM 09/30/92

4.0 HYDROLOGY

4.1 Surface Water

As discussed in previous reports, the San Jacinto Nuevo y Potrero Valley watershed drains approximately 35 square miles. The valley itself is predominantly drained by Potrero Creek, an intermittent or seasonal stream which enters the valley from the north, and turns southwest to pass through Massacre Canyon toward the creek's confluence with the San Jacinto River. Potrero Creek is fed by local tributary drainage and storm runoff from the city of Beaumont to the north and by other ephemeral streams. Bedsprings Creek, located in the southeast area of the site near the burn pit area, is one of the largest tributary creeks. Both creeks are dry except during and immediately after periods of heavy rainfall.

In the 1920s and 1930s, there were as many as 50 springs in the valley area (Quimby, 1975). Following construction of the nearby San Jacinto tunnel in the 1930s, the number of springs was greatly reduced. The tunnel (located in the granitic rocks about 4,000 feet southeast of the burn pit area, and at elevation of approximately 500 feet below the elevation of the burn pit area) was constructed as part of the Colorado River Aqueduct. Construction and operating records for the tunnel indicate that it receives water from the overlying mountains through fractures and cracks in the bedrock (Thompson, 1966; Furukawa, 1991). The tunnel has drained water from fractures in the overlying rocks and has reduced the amount of water available to springs. The location of the tunnel is shown on Figures 3-1 and 3-2.

The U.S. Geological Survey San Jacinto 7.5 minute topographic map (1953, photo revised 1979) shows a spring along Potrero Creek in the southern portion of the valley area. Two springs were also noted as late as 1983 (Leighton and Associates, March, 1983 and October, 1983) north and southwest of OW-2. These springs, as well as other hydrologic features present in 1983, are shown on Figure 4-1.

In addition to the ephemeral streams, the only occurrence of surface water on the site is a small artificial pond, across the stream from the Betatron building (see Figure 2-4). This pond (referred to as the "upper pond") was constructed by the International Union of Operating Engineers equipment operators in the mid-1970s, in an area of shallow groundwater, to provide water for dust and fire control. The historical decline in groundwater levels, combined with the recent drought, has caused the pond to become almost dry.

The pond is elliptically shaped, approximately 350 feet long by 110 feet wide, and is estimated to be less than 6 feet deep. The pond is filled with a dense growth of willows, cattails, and other vegetation. The water surface in the pond is approximately 1 to 4 feet below the surrounding ground surface. Approximately 60 feet from the pond, the Potrero Creek channel is entrenched approximately 8 feet below the surrounding ground surface. The channel bottom which is below the pond level is dry, suggesting that the pond is sustained by a localized upward flow of groundwater within the pond excavation.

A temporary pond, constructed by the engineers in the western part of the site in the Potrero Creek streambed, was washed away by heavy rains in the spring of 1991. This pond has been referred to as the "lower pond."

4.2 Groundwater Occurrence and Movement

Several previous studies discussed groundwater occurrence and movement; these and the findings of initial Radian investigations are discussed in the *Source and Hydrogeologic Report* (Radian, 1990). Groundwater occurs in all geologic units at the site, including the alluvium beneath the majority of the valley floor, in the underlying Mount Eden Formation, and granitic rocks.

In the Mount Eden Formation, the groundwater generally occurs at depth beneath the saturated alluvium, and as a result, water in this unit is only impacted by the contamination in a minor way. Groundwater in the granitic rocks occurs only in fractures and joints in the rock at great depth, and as a result, is not directly impacted by contamination at the site.

Generally, groundwater flows to the west, with the slope of the water table parallel to the valley floor. Recharge primarily occurs in the eastern portion of the valley where coarser, more permeable sediments are present on the surface. Subsurface inflow from adjacent or underlying units may also recharge the alluvial aquifer; however, this is thought to be minor.

4.2.1 Groundwater Occurrence

A thorough understanding of the occurrence and movement of groundwater in the alluvium and the upper portion of the Mount Eden Formation is important in implementing a remediation program. Factors such as long-term and seasonal changes in water levels, confined and unconfined conditions, and variations in aquifer hydraulic conductivity affect the remediation of contaminated groundwater.

Groundwater in the Alluvium

The water table in the alluvium occurs as deep as 85 feet below ground surface in the upgradient portion of the valley in the burn pit area. As one moves downgradient in the valley, the depth to water generally decreases to about 5 to 10 feet BGS in the vicinity of the pond. Water level data for the site is presented in Appendix E. Figure 4-2 shows the depth to groundwater beneath the site in December 1991.

The thickness of saturated alluvium varies across the site, as shown on Figure 4-3. The saturated alluvium reaches a maximum thickness of approximately 100

feet or more in the center of the site and is thinner near the margins of the valley. There is no saturated alluvium directly beneath the burn pit area, as the underlying Mount Eden Formation rises above the water table in this area. In two other areas, near the rocket motor production area and in the vicinity of well MW-29, the Mount Eden Formation rises above the water table and saturated alluvium is not present.

In the upper (eastern) and lower (western) portions of the valley, groundwater is unconfined, and water levels did not rise significantly above the level first encountered in most wells or boreholes. The unconfined conditions occur because there are no laterally continuous confining layers across much of the valley.

In the central portion of the valley around the pond, groundwater is confined. In this area, the confining layer is an olive gray to gray black silt and clay layer, which is approximately 20 to 35 feet thick in the vicinity of OW-2, MW-8, MW-9, MW-43, MW-45, MW-47, and MW-48. Wells OW-2, MW-4, and MW-47, screened in sandy alluvium beneath the silt and clay layer, are artesian or have been in the past. The piezometric head in MW-45 and MW-47 was approximately 5.0 and 2.3 feet, respectively, above ground surface in January 1992. Figure 3-11 shows the lateral extent of the confining silt and clay layer.

Immediately downgradient (south) of MW-43 and MW-45, the silt and clay layer is not present, and the first encountered groundwater in the alluvium occurs at greater depth under unconfined conditions. At shallow well MW-43, the depth to water in January 1992 was less than 10 feet BGS. The depth to water in nearby well MW-46 was approximately 52 feet BGS in January 1992. The drop in the water level from MW-43 (and MW-45) to MW-46, and the absence of the silt and clay layer, strongly suggest that a fault exists in the alluvium in this area and acts as a barrier to groundwater flow. Figure 4-2 shows the depth to water contours, where a sharp change in groundwater depth can be seen between MW-43 and MW-46. (The ground surface in this area is relatively flat.)

Groundwater in the Mount Eden Formation

Of the approximately 60 groundwater wells at the site, eight are screened in the Mount Eden Formation. As a result, information regarding groundwater conditions in the Mount Eden Formation is not as extensive as that for the alluvium.

Groundwater is present in the Mount Eden Formation beneath the valley floor, and also in the hills along the southern side of the valley. Groundwater in the Mount Eden may move primarily through the coarser sand and gravel layers in the unit. Observation of exposed portions of the formation after spring rains indicates that coarse gravel layers generally remain wetter longer as a result of their ability to transmit water that has infiltrated into the unit.

Beneath the burn pit area, near the rocket motor production area, and near well MW-29, the Mount Eden Formation rises above the water table in the subsurface (see stippled areas on Figure 4-3 and see Figure 3-2). In these areas, shallow groundwater is present only in the Mount Eden Formation, since the overlying alluvium is unsaturated.

Groundwater in the Granitic Rocks

In general, the lateral and vertical extent of the contaminated groundwater plume at the site has been defined (Radian, 1990), and the plume is not known to occur in the granitic rocks. The bottom of the plume appears to be located in the Mount Eden Formation well above the deeper granitic rocks. As a result, none of the wells constructed at the site penetrate the granitic rocks.

Information on the occurrence and movement of groundwater in the granitic rocks is from studies conducted by the Metropolitan Water District (MWD) for construction of the San Jacinto tunnel (Ransome, 1932; Thompson, 1966). Several deep

boreholes drilled in the valley in preparation for tunnel construction penetrated the granitic rocks. Artesian flow from some borings indicated that at that time, there was significant artesian pressure in the groundwater in the granitic rocks.

In the borings, and during tunnel construction, groundwater was observed in fractures and joints in the rock, and significant flows of water entered the tunnel during construction (Thompson, 1966). Conversations with MWD personnel (David Furukawa, 1991) indicate that groundwater from the granitic rocks still enters the tunnel. This information, along with the reduction in natural springs in the area, indicates some hydraulic connection between springs in the area and the underlying granitic rocks.

4.2.2 Groundwater Movement

Groundwater in the alluvium moves laterally and vertically, with movement being predominantly lateral. As described in Radian's 1990 report for the site, groundwater in the alluvium flows northwest from the burn pit area, past the rocket motor production area, and then southwesterly down the valley towards Massacre Canyon. Flow generally follows the slope of the valley floor.

Figures 4-4, 4-5, and 4-6 show water table elevations and contours for March 1991, June 1991, and January 1992, respectively. Contours developed for January have additional detail, because data from recently drilled wells and piezometers were included.

The groundwater gradient varies across the site. In the eastern portion of the site (near OW-1, MW-36, and W-5), the gradient is relatively steep. Between March 1991 and January 1992 the gradient in this area ranged from 0.015 to 0.030 feet/foot. Beneath the burn pit area and in the surrounding field, the gradient was much flatter, ranging from 0.0014 to 0.0024 feet/foot between March and January.

Downgradient of the rocket motor production area, the gradient steepens to 0.037 feet/foot; this gradient remained relatively constant from March to January. In this same area, downgradient of MW-43, MW-45, MW-47, and MW-48, the gradient is steep, as groundwater passes over what is probably a fault barrier. The steep groundwater gradient is not caused by a reduction in the saturated thickness of the alluvium in the area, based on the data from a deeper borehole drilled at the location of well MW-45. The borehole indicates that the alluvium in the area is more than 110 feet thick.

Near MW-5, MW-40, MW-11, MW-12, and P-4, water level data indicate that the overall gradient direction in the area is northwest (from MW-5 towards MW-12). The gradient does not turn toward the southwest until the area between MW-12 and P-4 (Figure 4-6).

Vertical groundwater gradients have also been observed in the alluvium. Data from paired deep and shallow (water table) alluvium wells and paired alluvium and Mount Eden wells indicates that, in the eastern part of the site (upper portion of the groundwater basin), gradients are generally downward and, in the western (confined lower portion of the groundwater basin) part of the site, the vertical gradient is upward. Figure 4-7 shows the groundwater gradients for the paired wells. In each case the vertical gradient (feet/feet) is shown, as well as the vertical separation between the screened sections in the paired wells.

The downward gradient in the eastern portion of the valley is indicative of a groundwater recharge area. Recharge to groundwater basins typically occurs along stream channels and mountain fronts in the upper portion of the basin. The upward gradient in the confined portion of the valley is indicative of a groundwater discharge area. Discharge areas commonly occur in the lower portion of a groundwater basin. Groundwater discharge often occurs as springs or seeps, as base flows in creeks or streams, or is transpired by vegetation or evaporation from saturated surface soils.

Groundwater gradient data for the Mount Eden Formation are very limited. Data from MW-3, MW-31, and MW-32, the deep Mount Eden wells near the burn pit area, indicate a downward gradient. Based on water level responses to seasonal recharge, the Mount Eden Formation is not considered a separate aquifer system from the alluvium. The two rock units, although of varying hydraulic conductivity, are in hydraulic continuity.

4.2.3 Aquifer Parameters

The results of the aquifer testing performed at the site provide the information needed to evaluate the groundwater flow system and to design a remediation program. Overall, the results of the testing indicate that the hydraulic conductivity of the alluvium and the Mount Eden Formation are within reasonable published ranges for similar types of geologic materials (Todd, 1980). The results of the aquifer tests are summarized in Appendix D.

Calculated hydraulic conductivities for the alluvium range from about 5 x 10^{-1} to 6 x 10^{-6} centimeters per second (cm/sec), with most results indicating conductivities of 10^{-3} to 10^{-4} cm/sec. The logarithmic mean of the alluvial values is 1.2 x 10^{-3} cm/sec. Hydraulic conductivities of 10^{-3} to 10^{-4} cm/sec are typical of silty to clean fine sands (Todd, 1980). The hydraulic conductivity values of 5.2, 5.1, 1.3 and 1.1 x 10^{-1} cm/sec for the aquifer testing performed at well MW-30 (pumped during the Treatability Study) are approximately an order of magnitude higher than any of the other test results. Consequently, these results are considered to be somewhat anomalous.

The alluvial aquifer test results performed during the Treatability Study were compared with previous tests performed at the site. Recent results are similar to previous results (Radian, 1990). No obvious trend was discerned as to whether the hydraulic conductivity of the alluvium varied with depth or by area. The data indicate that the hydraulic conductivity of the alluvium varies over a broad range (several orders

of magnitude), and that more permeable intervals may occur at various depths within the alluvium. The range in hydraulic conductivity values obtained, although relatively broad, is considered reasonable for the types of alluvial materials present at the site.

Calculated hydraulic conductivities for the Mt. Eden Formation ranged from 1.2×10^{-3} to 3.0×10^{-5} cm/sec. The logarithmic mean for the data is 1.9×10^{-4} cm/sec. The range in values is considered reasonable for the types of geologic materials present in the Mt. Eden Formation. A review of the test results for the Mt. Eden Formation was limited, as only seven wells in the Mt. Eden Formation were tested. However, the two deepest wells (MW-3 and MW-31) which are screened more than 120 feet below the top of the formation, had relatively low hydraulic conductivities (9.5 and 7.1×10^{-5} cm/sec, respectively). This suggests that the hydraulic conductivity of the formation is lower where it has not been weathered.

A comparison of the results for the alluvial and Mount Eden Formation tests indicates:

- The logarithmic average of 1.2×10^{-3} cm/sec for the alluvial aquifer is approximately six times the logarithmic average of 1.9×10^{-4} cm/sec for the Mount Eden;
- The range in hydraulic conductivities for the alluvium is very broad—more than four orders of magnitude;
- The lowest hydraulic conductivity values for the alluvium (5.8×10^{-6} cm/sec and 1.2×10^{-5} cm/sec) are similar to the lowest values for the Mount Eden Formation (3.0×10^{-5} cm/sec and 7.1×10^{-5} cm/sec); and
- The range in hydraulic conductivity values for the Mount Eden Formation is approximately two orders of magnitude, much narrower than that for the alluvium.

The broad range in values for the alluvium indicate that the unit is very heterogeneous, as is common in alluvial aquifers. As a result, well yields in the alluvium vary considerably. The variations in well yield will affect the area of influence (and the capture area for contaminated groundwater) for each well.

Values for storage coefficients (specific yield) were determined from the results of tests where several wells were monitored. Specific yield was calculated to be 14% and 19% for the two tests in the alluvium. These values are well within the generally accepted range for this type of material (5% to 30% [Walton, 1984]).

For the Mt. Eden Formation, the specific yield values ranged from 1% to 2%. The specific yield values determined for the Mt. Eden Formation are considered low, and are probably not representative. As indicated by Walton (1984), the specific yield for sandstone and conglomerate ranged from 10 to 40%. The specific yield for clay and silt is 1 to 30%. Because the Mt. Eden sandstone and conglomerate is cemented and contains some clay (in the matrix of the rock), the specific yield for the Mt. Eden is estimated to range from 1 to 15%.

4.2.4 Water Level Fluctuations

Both long-term and seasonal water level changes have been observed at the site. Hydrographs and water level data for wells at the site are presented as Appendix E.

Long-term Decline in Water Levels

The earliest available water level data for wells at the site are from May 1983 for OW-1, OW-2, OW-3, OW-8, W-1, W-2, and W-3. Between 1983 and 1991, water levels in the eastern (upgradient) portion of the site declined as much as 58 feet at OW-1 and W-5, located upgradient of the burn pit area. In the central portion of the

site, at well OW-3, the water level has declined approximately 48 feet since 1983. In the area of confined groundwater, at well OW-2, the decline in piezometric head (confined water level) appears to have been much less. The well was flowing when constructed in mid-1983 (and also in December 1986) and in mid-1992 the water level was approximately 3.5 feet below the top of the well casing. Additionally, many of the ponds and springs in the area of OW-2 (and the existing pond) have dried up (compare Figures 4-1 and 4-2).

In the southwestern portion of the site, downgradient of the area of confined groundwater, the water level decline (at well OW-8) has been approximately 17 feet since 1983. Wells OW-6 and OW-7 in this area have gone dry during the same period.

In the burn pit area (between OW-1 and OW-3) the estimated decline in water levels between 1983 and 1991 is 50 feet. At one time, the water table beneath the burn pit area occurred in the alluvium above the Mount Eden Formation. Currently, the water table immediately beneath the burn pit area occurs in the Mount Eden Formation, and the alluvium is unsaturated. Additionally, the hydraulic gradient (and the rate of groundwater flow) appears to have been greater in 1983 (and, presumably, prior to 1983) than currently.

Seasonal Variations

Water levels in the wells at the site have been monitored monthly (and more frequently in some cases) since early 1991. The monthly data has provided information regarding seasonal fluctuations. This information was used to design the groundwater remediation system, as changes in water levels could affect the performance of any groundwater extraction wells.

In the upper portion of the valley, monitored water levels increased as much as 35 and 21 feet in response to recharge from the April 1991 and the March-April 1992 rains, respectively. The water level response in wells nearest the creek bed (e.g., MW-36, MW-35 and OW-1) began soon after the rains and peaked one or more months later. The greatest water level increases occurred at MW-36 and W-5, which are located at the upper portion of the alluvial fan along Bedsprings Creek near the mountain front. Increases in these wells were more than 30 feet in 1991 and 20 feet in 1992. The response at well MW-35 located near the creek further downgradient was about three to four feet for 1991 and 1992. Water level increases for other wells near the creek (MW-20, MW-1, and MW-7) ranged from 2 to 8 feet for 1991 and 1992.

Wells further from the creek (those wells farther north) responded to the rainfall somewhat later. In these wells, the increase in water levels ranged from 5 to 7 feet (MW-2, MW-21, and MW-23) in 1991 and about 2 feet in 1992. The response in the wells along the northern side of the valley peaked last (more than four months after the rains), and increases ranged from 3 to 4 feet in 1991 and 1 to 2 feet in 1992 (MW-4, MW-10, MW-27 and MW-34).

Mount Eden Formation wells (both deep and shallow) responded to the rainfall, indicating that the alluvium and Mount Eden Formation groundwaters are in continuity with each other. The water level response in the wells in the Mount Eden Formation beneath the burn pit area ranged from 3 to almost 8 feet in 1991 and 1 to 4 feet in 1992 (MW-24, MW-25, and MW-26). In deeper wells MW-31 and MW-32, the response was 8 and 11 feet (1991) and 3 and 4 feet (1992).

Water level increases in response to rainfall recharge were generally followed by declines in water levels to near pre-recharge conditions. Water level fluctuations from the seasonal rains were smaller in the central portion of the valley than those in the upper portion of the basin. The changes in MW-5, MW-8, MW-9, and OW-2 ranged from about 1 to 3 feet (for 1991 and 1992).

The wide seasonal range in water levels in the upper portion of the groundwater basin where contaminated water occurs indicates that wells constructed for groundwater recovery will need to be designed to accommodate similar seasonal changes in water levels, as well as longer term changes. Seasonal changes on the order of 5 to 10 feet are to be expected.

RADIAN CORPORATION

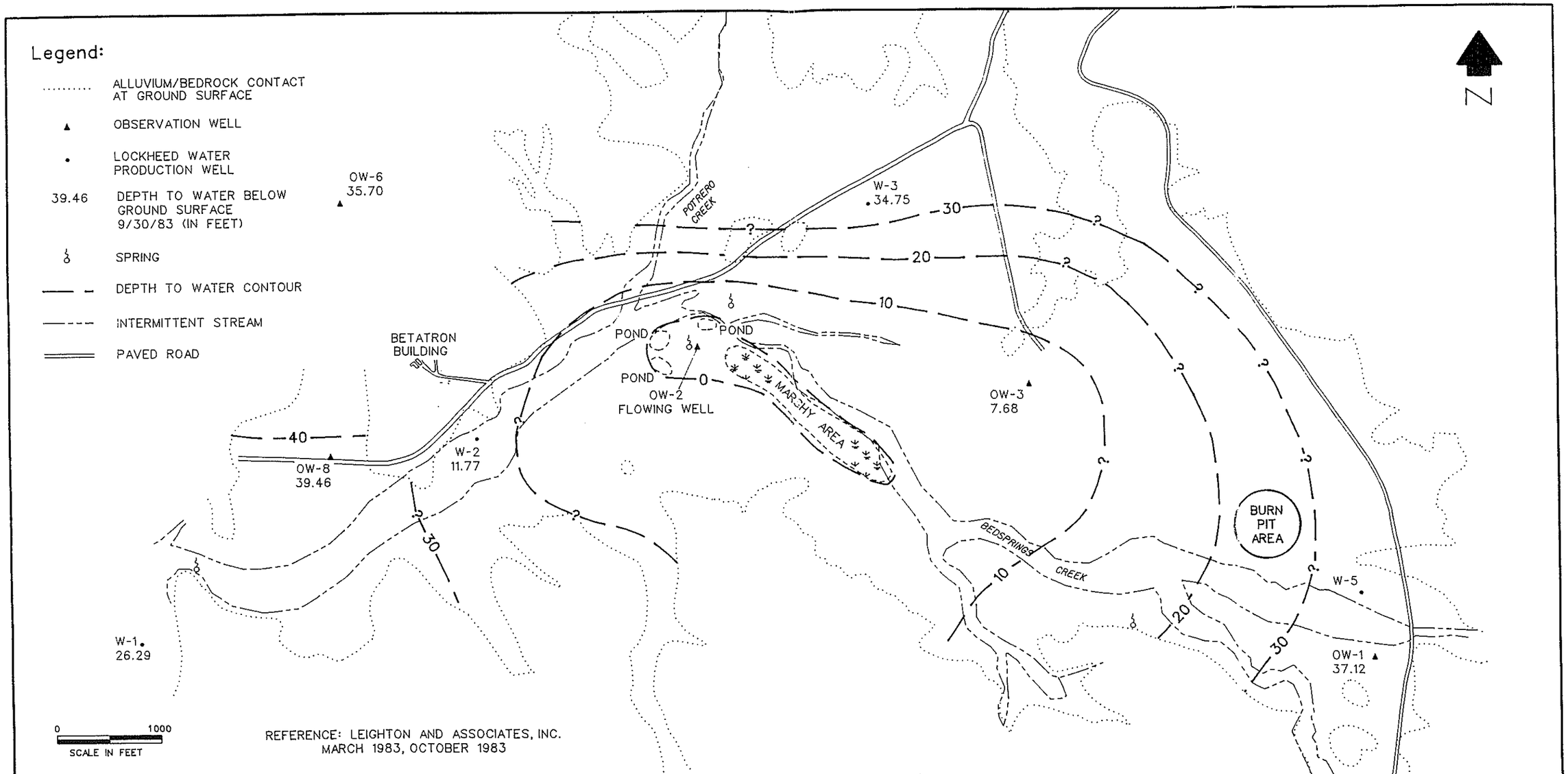


Figure 4-1. Lockheed Beaumont No. 1 Groundwater Conditions 30 September 1983

LOCKHG2 GW 09/30/92

RADIAN CORPORATION

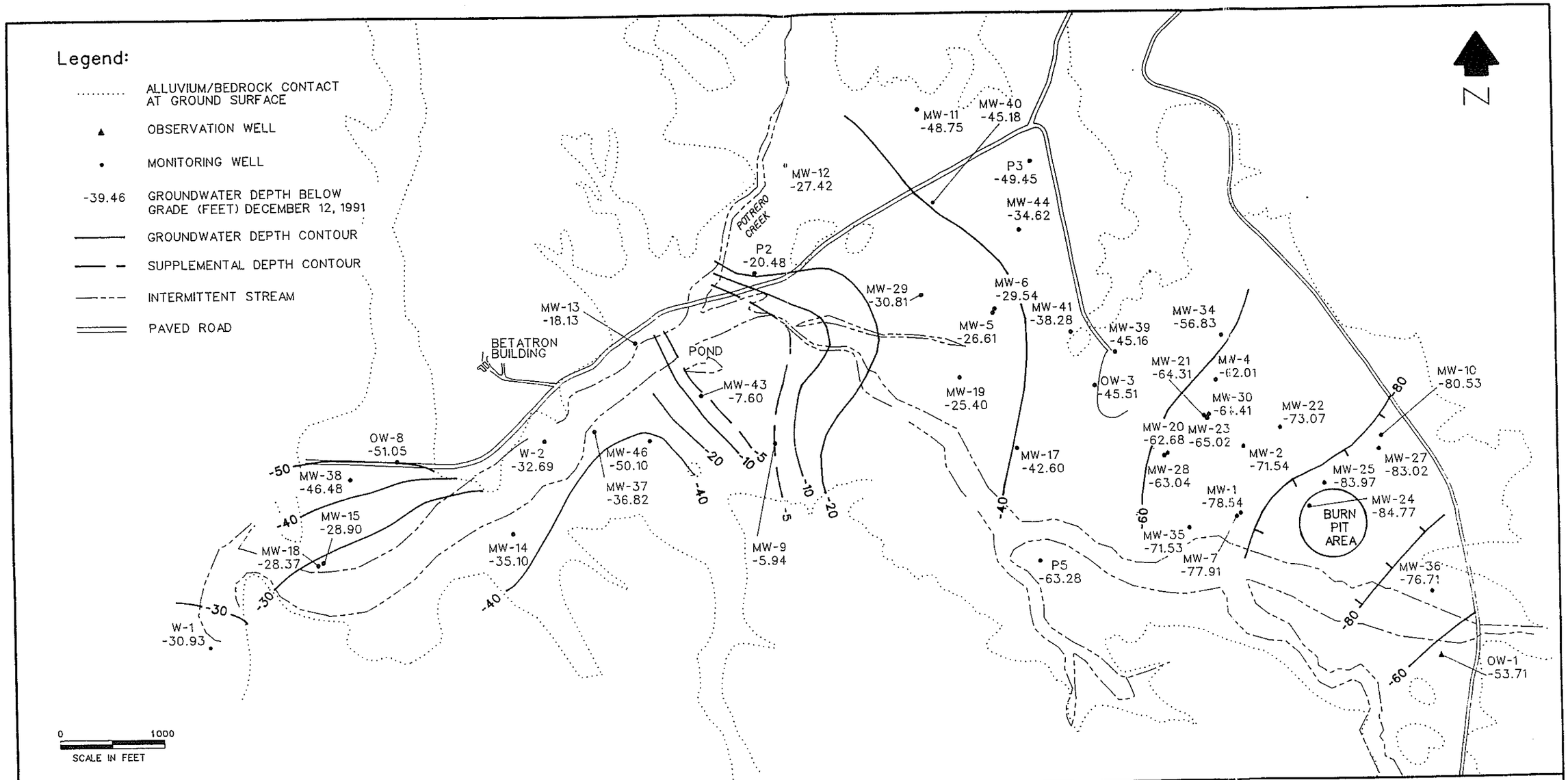


Figure 4-2. Lockheed Beaumont No. 1 Depth to Groundwater Below Ground Surface December 1991

LOCKHG GWATER 08/12/92

RADIAN CORPORATION

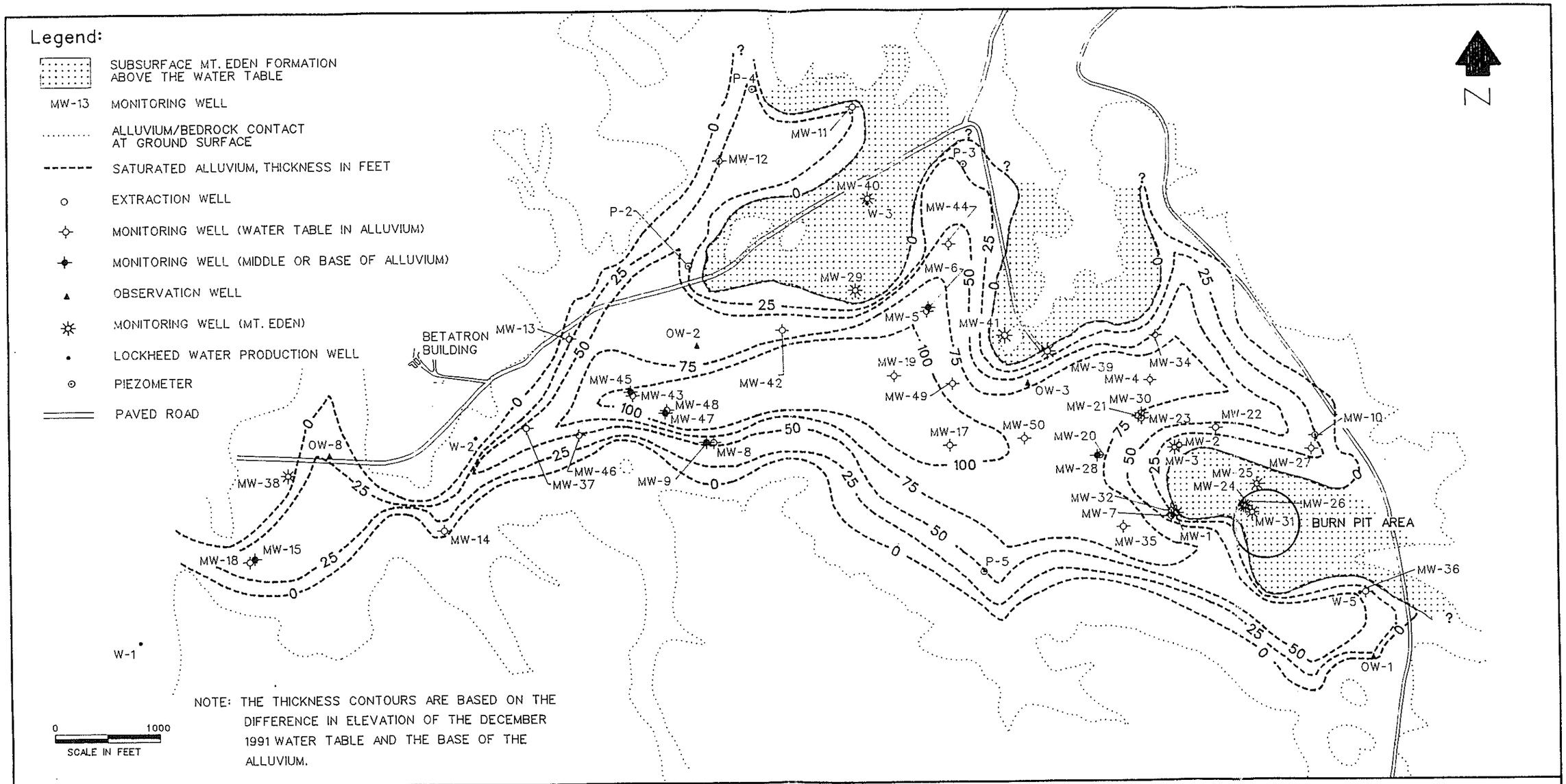


Figure 4-3. Lockheed Beaumont No. 1 Thickness of Saturated Alluvium December 1991

LOCKHG2 TSA1 10/01/92

RADIAN CORPORATION

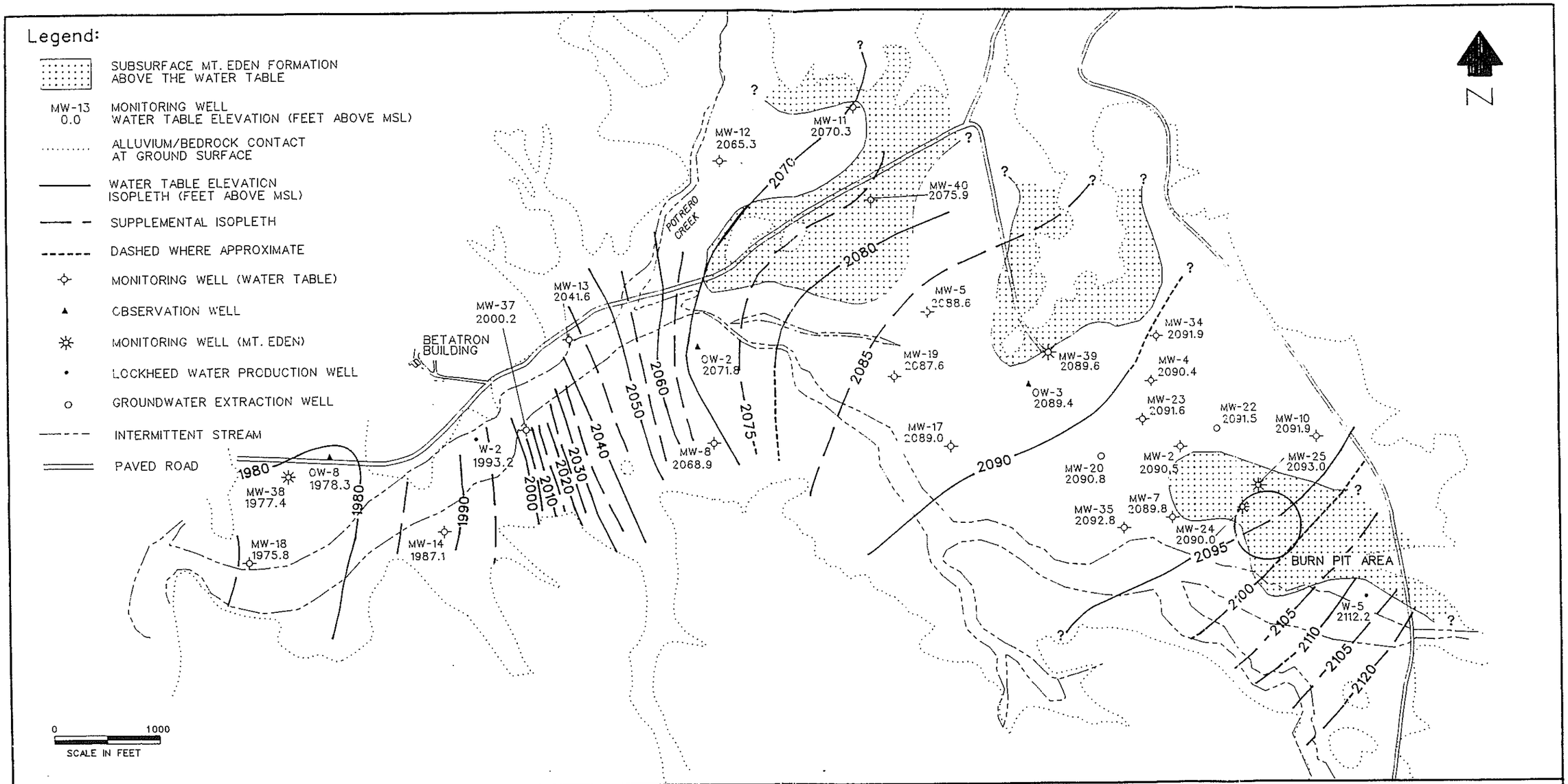


Figure 4-4. Lockheed Beaumont No. 1 Water Table Elevations 8 March 1991

LOCKHG2 FWL1 09/30/92

RADIAN CORPORATION

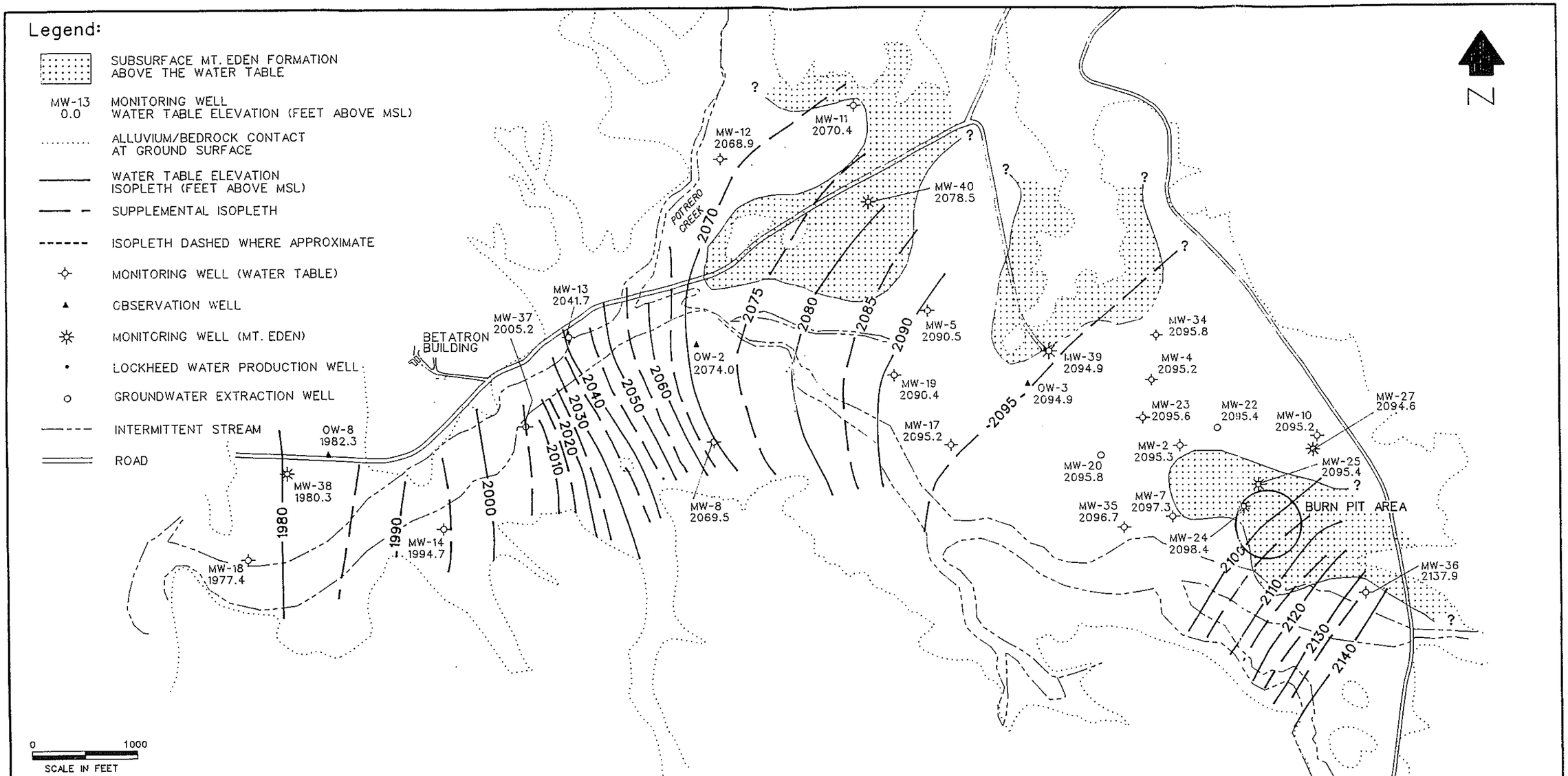


Figure 4-5. Lockheed Beaumont No. 1 Water Table Elevations 27 June 1991

LOCKHG2 FWLSC 09/30/92

RADIAN CORPORATION

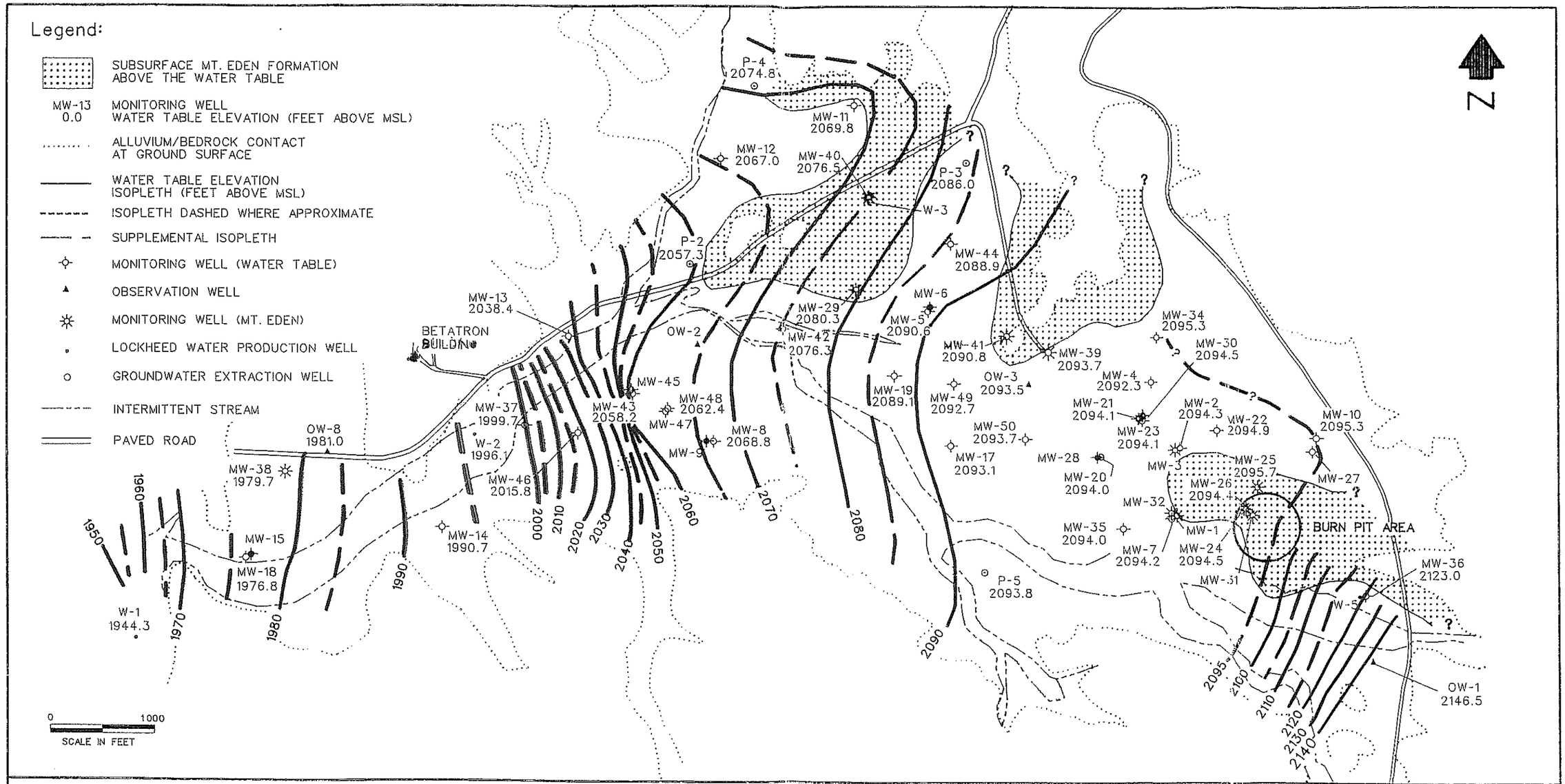


Figure 4-6. Lockheed Beaumont No. 1
Water Table Elevations
13 January 1992

LOCK6 GWJAN92B 02/07/92

RADIAN CORPORATION

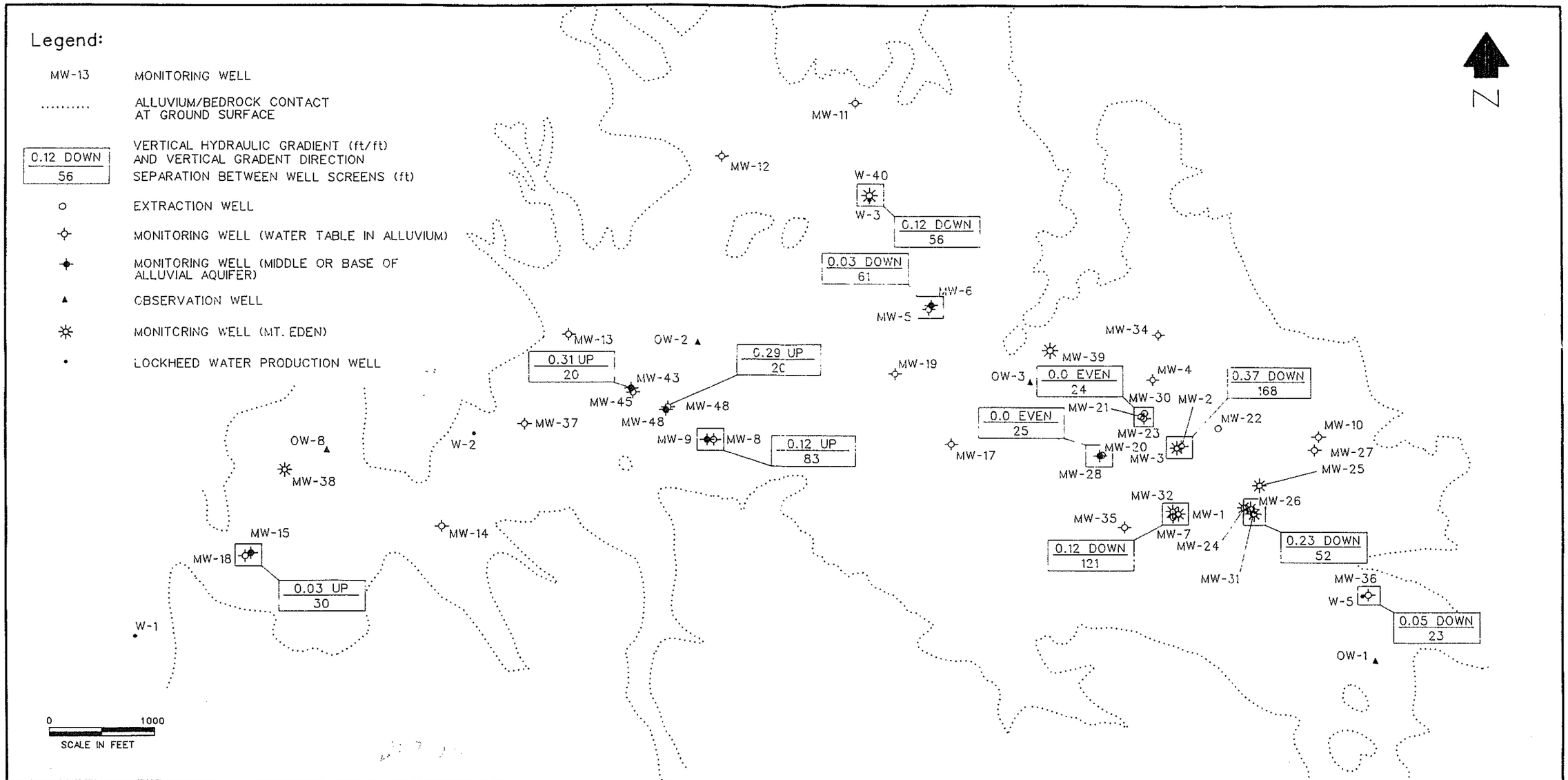


Figure 4-7. Lockheed Beaumont No.1 Vertical Hydraulic Gradients in Paired Wells January 1992

LOCKHG WELLDIFG 08/12/92

5.0 DISTRIBUTION OF CONTAMINANTS

Contaminants at the site primarily consist of VOCs, including 1,1,1-trichloroethane (1,1,1-TCA), 1,1-dichloroethane (1,1-DCA), 1,1-dichloroethene (1,1-DCE), 1,2-dichloroethane (1,2-DCA), and trichloroethene (TCE). Other contaminants attributed to industrial or ranching activities at the site include perchlorates and nitrates. The VOCs have been detected in soil vapors as well as in soil (very low levels in two samples) and groundwater samples. Analyses for nitrates and perchlorates were limited to groundwater only. The following report sections describe the occurrence of contamination at the site.

5.1 Contaminants in Soil Vapor

Previous investigations included shallow soil vapor sampling (5 to 6 feet BGS), and deep soil vapor sampling through groundwater monitoring wells. Those investigations had identified soil vapor plumes beneath the burn pit area and rocket motor production area. For this investigation, soil vapor samples were collected from the surface soils, shallow soils (depths of 3.5 to 7 feet), and soil borings (depths to 89.5 feet). Soil vapor analytical results are summarized in Table 5-1; complete data are presented in Appendix F.

5.1.1 Surface Soil Vapors

Surface soil vapor sampling was conducted to provide data for the Health Risk Assessment (Radian, 1992). Results of the surface soil vapor sampling (from undisturbed ground surface) and analysis for chlorinated VOCs ranged from 1 to 6 parts per billion by volume (ppbv). These concentrations are considered very low. Soil vapor concentrations (total chlorinated VOCs) from a depth of 4 inches below ground surface ranged from 1 to 23 ppbv. These concentrations (shown on Figure 2-2) are also considered very low. Sampling was conducted in August, when surface temperatures are

relatively high and volatilization of compounds in the shallow soils are most likely higher than at other times of the year. However, comparative data for other time periods were not obtained.

5.1.2 Shallow Soil Vapors

Analytical results of the most current (late 1990 and mid-1991) shallow soil vapor sampling (3.5 to 7 feet BGS) ranged from less than 50 to approximately 6,400 ppbv (shown on Figure 2-3). Except for results from one sample (SF-12), all concentrations were less than 3,000 ppbv.

The highest shallow soil vapor contaminant concentrations were detected in samples from the central and northern portions of the burn pit area (Figure 2-3). The distribution in concentrations varies, with locations yielding the two highest values (6,424 ppbv in samples from SF-12 and 2,970 ppbv in samples from FS-6) separated by locations with lower concentrations. As a result, the data does not suggest a single "hot spot," but rather several more concentrated points across the central and northern portion of the burn pit area.

Current data indicate that vapor concentrations have declined compared to the earlier concentrations. During the late 1989 soil vapor survey (Radian, 1990), soil vapor samples from depths of 5 to 6 feet were collected at 64 locations (31 in the burn pit area, and 33 in the rocket motor production area). The results of those analyses indicated total chlorinated VOC concentrations as high as 10,000 ppbv in the burn pit area (Figure 1-3). The maximum observed in the rocket motor production area was 840 ppbv.

In the area where the highest concentrations were observed in 1989, the late 1990 concentrations were 1,500 ppbv or less (locations FS-1, FS-11, and SF-1 on Figure 2-3). The reasons for the apparent decline in vapor concentrations have not been

determined. Potential factors include barometric pressure, a drop in the underlying water table over time, and the ambient temperature at the time of sampling.

5.1.3 Deep Soil Vapors

Results of deep soil vapor sampling indicate that contaminant concentrations generally decrease with depth in the rocket motor production area, but increase with depth in the burn pit area. In the rocket motor production area, the maximum chlorinated VOC vapor concentrations detected in boring FS-2 were 184 and 163 ppbv at depths of 3.5 and 15 feet, respectively. Below 15 feet, concentrations declined to near ambient levels.

In the burn pit area, vapor concentrations generally increased with depth. The highest concentrations detected in vapor probe samples were from near the water table in the borehole for VRW-3. At a depth of 80 feet (about five feet above the water table), the total concentration of chlorinated VOCs was approximately 1,000,000 ppbv.

Additional soil vapor samples were collected beneath the burn pit area during April 1991 for the Treatability Study (Radian, 1992a). Data were collected from the 14 vapor monitoring wells (VMWs) with the highest concentrations detected in VMW-2, located near VRW-3 and screened at a depth of 75.5 to 78 feet. The total chlorinated VOC concentration at this well varied during the vapor extraction test program, but averaged approximately 25,000,000 ppbv.

Concentrations varied considerably in some of the wells during the tests, but the average values provide a relative indication of where contaminated vapors are highest.

The soil vapor data collected at different depths with a downhole flux chamber, shallow soil vapor probes, downhole soil probes in borings, and vapor

monitoring wells are reasonably consistent in indicating that vapor concentrations are highest near VRW-3 and that they increase with depth.

The highest vapor contaminant concentrations were detected in the Mount Eden Formation near the water table. Although the contamination originated above the Mount Eden Formation in the alluvium, the higher concentrations in the Mount Eden Formation may be the result of the formation's lower permeability, and because of the absence of any direct exposure to the atmosphere thereby reducing the dispersion of vapors. The overlying alluvium is more permeable to air and is exposed at the ground surface, allowing shallow vapors to disperse with time.

Additional detailed discussion of soil vapors at the site is presented in the Treatability Study Report (Radian, 1992a).

5.2 Contaminants in Soils

Sixteen soil samples were analyzed for organic compounds. A summary of the analytical results is presented in Table 5-2. Laboratory data is presented in Appendix F. Chlorinated VOCs were detected at concentrations of 35 and 49 micrograms per kilogram (μg/kg) in a sample from VMW-1 collected at 80 feet depth and from MW-26 collected at 75 feet depth, respectively. All other results were not-detect. The sample from VMW-1, although located in an area of the highest soil vapor concentrations, showed very low concentrations of 1,2-DCA (20 μg/kg), 1,1,1-TCA (3 μg/kg), and TCE (12 μg/kg). The low concentrations in the soil could be the result of migrating soil vapors and not from direct contamination at the boring location.

Although little or no direct soil contamination was detected in the soil samples analyzed, the high soil vapor concentrations suggest that some residual contamination is present in the vadose zone soils. The location of any residual

contamination is likely to be in the vicinity of VRW-3 or VMW-1, based on the shallow and deep soil vapor data.

5.3 Contaminants in Groundwater

The major contaminants of concern in the groundwater are chlorinated VOCs. In addition, perchlorates and nitrates have also been detected in groundwater samples.

5.3.1 VOC Contamination

As discussed in a previous report (Radian, February 1990), contaminants in the groundwater occur over an "L"-shaped area approximately 10,000 feet long and ranging from about 500 to 1700 feet wide. The plume generally follows the shape of the valley. The plume extends from beneath the burn pit area to the area of MW-15 and MW-18. Table 5-3 shows the ranges in contaminant concentrations in groundwater.

The overall shape of the contaminant plume in the groundwater is controlled by the groundwater gradient, variations in the geology, and historic pumping of groundwater in the area. Contamination primarily occurs in the alluvium, but data from recently drilled wells MW-29, MW-40, and MW-41 indicates that contaminated groundwater also occurs in the upper portion of the Mount Eden Formation, not only directly beneath the burn pit area, but in other areas as well.

For this report, "shallow" groundwater means groundwater extending from the water table to approximately 40 feet beneath the water table surface, and "deep" groundwater means groundwater from 40 to approximately 200 feet beneath the water table surface.

Horizontal Extent of Contamination

Figure 5-1 shows the estimated distribution of total VOCs in shallow groundwater. Figures 5-2 through 5-5 show the distribution of the four main contaminants, TCE, 1,1-DCA, 1,1-DCE, and 1,1,1-TCA. Figure 5-6 presents a summary of the most recent sample data for each well.

Contaminants in the Alluvium--In the central and eastern portions of the valley, the contaminated plume occurs north of Bedsprings Creek. The plume is widest, approximately 1,700 feet wide, in the central and eastern portion of the valley.

In the central portion of the valley, near well MW-40, the plume extends to the north and into the Mount Eden Formation. This northern extension may have been caused by previous pumping of Lockheed wells W-3 and W-4 located in this area.

In the western portion of the site, beneath the pond, the plume narrows to approximately 1,000 feet maximum width. The contaminant concentrations in wells are much lower to the downgradient (west) of wells MW-43 and MW-45. Further downgradient, contaminants (VOCs) were not detected in wells, except at well MW-18, which had a relatively low concentration (total chlorinated VOCs) of 19 μg/L. The contaminant plume may end near MW-37 and MW-46, and the low concentrations of contaminants detected in MW-18 may indicate an isolated pocket of contamination.

Contaminants in the Mount Eden Formation--As shown on Figures 5-1 through 5-5, shallow groundwater is contaminated in the upper Mount Eden Formation beneath the burn pit area, near the rocket motor production area (around MW-39 and MW-41), and near MW-29 and MW-40.

The highest concentrations of contaminants in the groundwater occur in the Mount Eden Formation beneath the burn pit area. In this area, concentrations are

high because the area is close to the source, but also because the lower hydraulic conductivity of the Mount Eden Formation limits the ability of the contaminants to disperse and dilute with time. This condition is illustrated at nearby paired MW-1 and MW-7, where groundwater in the shallower alluvial well (MW-7) has lower contaminant concentrations than groundwater in the immediately underlying Mount Eden groundwater well (MW-1). The lower concentrations at MW-7 may be the result of dilution and dispersion with time.

Near the rocket motor production area, VOCs detected in MW-41 indicate that groundwater in the Mount Eden Formation is contaminated where it extends out into the valley. It appears that the Mount Eden generally retards the movement of contaminated groundwater, but does not completely prevent it.

The Mount Eden Formation also contains contaminated groundwater in the area of MW-29, MW-40, and W-3. However, as shown in Figures 5-1 through 5-5, the main portion of the plume occurs in the alluvium to the south of MW-29, rather than in the Mount Eden. This is evidenced by the relatively lower concentrations in MW-29.

Vertical Extent of Contamination

The estimated vertical distribution of contaminants in the groundwater was developed by comparing the data from paired wells. With the exception of conditions at paired wells MW-1 and MW-7 (previously discussed) and MW-43 and MW-45, contamination decreases with depth.

In the burn pit area, data from MW-3, MW-31, and MW-32 (screened 187, 95, and 130 feet below the January 1992 water table, respectively) indicate that there is no deep contamination of groundwater in the Mount Eden Formation. In repeated samplings, contaminants have not been detected in any samples from these wells.

Monitoring Well 31 is located directly beneath the burn pit area, and MW-3 and MW-32 are downgradient and within the lateral limits of the plume.

Data from other paired wells located within the contaminant plume (MW-5/-6, MW-2/-3, MW-20/-28, MW-23/-30, and MW-40/W-3) indicate contamination decreases with depth. Estimates show that the plume thickness ranges from approximately 25 to 90 feet below the water table. As the data are limited, the plume thickness can only be estimated. At the locations with paired wells, the plume appears to be thickest (approximately 90 feet thick) at the location of MW-40 and W-3, at the north end of the plume. Previous pumping of groundwater from the deeper W-3 and W-4 wells may have pulled contaminants downward and increased the thickness of the plume in the immediate area around the wells.

At paired wells MW-43 and MW-45, the deeper well (MW-45) showed higher contaminant concentrations than the shallower MW-43. The vertical distribution of contaminants in this area reflects shallow (approximately to 30 feet depth) very low permeability silts and clays underlain by more permeable sediments that allow groundwater at depth to move faster than the shallower groundwater. Monitoring Well 43 (with lower concentrations) is screened in the shallower sediments, and MW-45 (with higher concentrations) is screened in the deeper sediments.

Contaminant Movement

In the alluvium, contaminant movement is from the burn pit area down the valley. Flow is probably influenced by the presence of more permeable gravelly layers in the central portion of the valley (Figure 3-10). In the area upgradient (south and east) of MW-29, the plume follows the northern side of the valley, probably as the result of seasonal recharge of fresh water along the creek bed, which runs along the southern side of the valley. As each seasonal "pulse" of fresh water infiltrates from the creek bed, the plume is offset toward the opposite (northern) side of the valley.

Changes in Contaminant Concentration over Time

Repeated sampling of the wells indicates relatively little change in contaminant concentrations since the earliest extensive sampling in December 1989. The data for the various sampling rounds is summarized on Figure 5-6. Because many of the wells have only been sampled two or three times over a two-year period, it is not possible to determine if the variations in concentrations represent changes in the plume shape or concentration, seasonal variations, or variations in laboratory analyses. Regardless of the causes, the variations in concentrations do not appear to follow any overall trend, and do not affect the interpretation of the overall plume size or shape.

Variations in concentration at a few of the wells provides some insight into the nature of the contamination and its movement. In samples collected from MW-30, which was pumped extensively during the Treatability Study, concentrations of total chlorinated VOCs declined compared to those for adjacent MW-21 and MW-23. MW-30 was designed for pumping during the Treatability Study and has a screened interval that extends from approximately 20 feet to 60 feet below the static water table. The rapid decline in the contaminant concentrations in the well in less than a month of pumping suggests that much of the water entering the well was less contaminated and came from the lower portion of the screened interval or from below the screened interval in the well. As a result, it appears that the 40-foot screened interval in the well was too long for the well to be effective in recovering the most contaminated groundwater at and just below the water table.

At the location of MW-24, MW-25, and MW-26, each drilled with hollow stem augers in the Mount Eden Formation beneath the burn pit area, concentrations increased by 5 to more than 10 times between the sampling rounds in March 1991 and in October 1991. The cause(s) of the increases are not known; however, they may be related to insufficient initial development of the wells or movement of more contaminated water from an adjacent area into the wells after their initial development and sampling.

Volume of Contaminated Groundwater

An estimate was made of the volume of groundwater in the contaminant plume. The estimate was based on the isopleth lines shown on Figure 5-1. The average plume thickness within each isopleth varied from 20 to 90 feet based on the data from paired wells. The specific yield of the saturated sediments was assumed to be 20%. The specific yield value was used instead of the porosity of the saturated sediments because the specific yield more accurately represents the volume of water that is free to move or drain from the aquifer. The total volume of contaminated groundwater is greater, but a portion of the water is adsorbed onto the soil particles and is not free to move. Only the mobile portion of the plume was considered in the volume calculations.

Based on the above assumptions, the plume volume within the 1 μg/L isopleth is estimated to be 2,900 acre-feet (or 950 million gallons) of groundwater. This is a rough estimate and could vary considerably, given the geologic conditions and variations in the actual thickness and lateral extent of the plume.

Volume calculations were also performed for the portion of the plume upgradient of the rocket motor production area (from wells MW-41 and MW-17 east). These volumes are shown on Table 5-4. As indicated in the table, the estimated volume of contaminated groundwater within the 1,000 μg/L isopleth is 30.6 million gallons (94 acre-feet). Of this amount, 10.5 million gallons (32 acre-feet) occur in the Mount Eden Formation, and 20.1 million gallons (62 acre-feet) are in the alluvium.

5.3.2 Distribution of Nitrates and Perchlorates in Groundwater

Nitrates

Nitrate concentrations in groundwater range from less than 1 to 120 milligrams per liter (mg/L) (nitrate expressed as nitrogen). Except for one sample from

MW-1, all results were less than 31 mg/L. Figures 5-7 and 5-8 show the distribution of nitrates across the site for late 1990 and 1991.

As shown in Figure 5-7, the highest nitrate concentrations were found in the area north and northwest of the burn pit area, and east-southeast of the rocket motor production area. West of this area, nitrate levels in the aquifer gradually decrease.

The two potential sources of nitrate on the site are sheep urine and ammonium perchlorate, the oxidizer used in rocket motor propellant. Sheep have grazed the site since 1974, and perhaps early in this century, primarily on the grasslands on the flat alluvial plain located north and west of the burn pit area. The other possible nitrate source, ammonium perchlorate, would have been part of the rocket motor propellant burned in the burn pit area. Neither of these potential sources produce nitrate directly; however, both produce compounds--the sheep, ammonia (NH_3); the ammonium perchlorate, ammonium ions (NH_4^+)--that bacteria can oxidize to nitrite (NO_2^-). The nitrite, in turn, is oxidized to nitrate by other bacteria.

If the burn pit area were the only source of nitrate, the nitrate plume would be similar in distribution to the plumes of other chemicals that originate at this source. However, the nitrate plume has some significant differences from the chlorinated VOC plumes (compare Figures 5-1 and 5-7). For example, relatively high (15 - 30 mg/L NO_3-N) nitrate concentrations were reported in MW-10, MW-11, MW-34, and OW-8, all of which are outside the main VOC plume. These results indicate that the nitrate originated from sources other than the burn pit area.

The current U.S. EPA Maximum Contaminant Level (MCL) for nitrate nitrogen in drinking water is 10 mg/L (NO_3 - N). Nitrate is not considered a carcinogen, and the primary health risk posed by water high in nitrates by consumption by pregnant women and infants. As a result, the potential hazard from nitrates in the groundwater is considered very low if the aquifer is not used for drinking water.

Perchlorates

The distribution of perchlorates in groundwater at the site is shown on Figure 5-9. Perchlorates were used in Lockheed activities at the site. Perchlorates are regulated under CCR Title 22, Chapter 30, Article 9 as a hazardous material, however, this refers to the use of pure perchlorate as an oxidizer, not low levels dissolved in groundwater. No state or federal water quality standards have been established for perchlorates.

As shown on Figure 5-9, perchlorate concentrations ranged from not detected to 9.1 mg/L. The distribution of perchlorates is similar to the VOC plume; however, the perchlorate plume is much smaller.

5.4 Mass Balance Distribution of Contaminants

The additional site characterization included an estimate of the relative proportions of contamination present in soil vapor and groundwater. Efficient, active remediation of the site should focus on the area and type of occurrence for the greatest percentage of contamination. A comparison of the mass of contamination in the vadose zone and the groundwater suggests that approximately 70% of the contamination occurs in the vadose zone, and approximately 30% in the groundwater.

Mass balance calculations made during the *Feasibility Study* (Radian, 1992b) indicate that for soil vapor, approximately 76% of the mass of contaminants lies within the 1,000 ppbv soil vapor contour and more than 90% lies within the 400 ppbv contour (see Figure 1-3).

For groundwater, the greatest mass of contaminants--almost 56%--lies within the 1,000 μg/L contour. About 91%, nearly all, of the groundwater contaminants lie within the 400 μg/L contour (see Figure 5-1).

5.5 Radioactivity

The results of the radioactivity analyses for water samples from nine wells indicates that, in general, radiation levels are below analytical detection limits and regulatory levels for community water systems (California Code of Regulations Title 22, Chapter 15). The very low or non-detect concentrations in the groundwater confirm the results of the previous historical review for the site (Radian, 1986); that there is no reason to suspect increased radiation levels in groundwater. The wells sampled were located in various parts of the site and included MW-2 and MW-7 in the area just downgradient of the burn pit area, OW-3, MW-5, in the central portion of the site, and MW-14 and MW-18 in the western portion of the site.

Gross alpha readings ranged from <1.3 to 8.2 picocuries per liter (pCi/L). Gross beta readings ranged from <1.6 to 6.9 pCi/L. Four specific radioisotopes were reported above the detection limits in some of the samples. Isotopic gamma results ranged from <17 to 10 pCi/L for bismuth-214, <75 to 230 pCi/L for potassium-40, <17 to 39 pCi/L for lead-214, and <10 to 71 pCi/L for thallium-208. A summary of the gross alpha and gross beta results, the isotopic gamma results, and the mode of decay of specific isotopes are provided in Appendix F.

Table 5-1

Soil Vapor Analyses, 1990 and 1991

Boring or Well No.	Depth (feet BGS)[b]	Sampling Method[a]	Sampled Date	Total Chlorinated VOCs (parts per billion volume)	Remarks
FS-2	3.5	SVP	11/6/90	184	In Rocket Motor Washout Area
FS-2	7	DHF	11/6/90	3	
FS-2	9	DHF	11/6/90	18	
FS-2	15	SVP	11/6/90	163	
FS-2	18	DHF	11/6/90	56	
FS-2	36	SVP	11/6/90	2	
FS-2	39	DHF	11/7/90	--	Sample not analyzed
FS-2	50	DHF	11/7/90	--	Sample not analyzed
FS-1	4	SVP	11/7/90	215	In Burn Pit Area
FS-1	7	DHF	11/7/90	33	
FS-1	14.5	SVP	11/7/90	664	
FS-1	19.5	DHF	11/7/90	58	
FS-1	37	SVP	11/8/90	3,060	

Notes:

[a] Sampling methods:
- DHF - Down Hole Flux - Sweep Air Varied
- DSF - Disturbed Surface Flux (from a depth of 4 inches below grade)
- MDHF - Modified Down Hole Flux - No Sweep Air Introduced into Chamber
- SF - Surface Flux (undisturbed surface soil)
- SVP - Soil Vapor Probe

[b] GS: Sample taken from ground surface

RADIAN CORPORATION

Table 5-1

(Continued)

Boring or Well No.	Depth (feet BGS)[b]	Sampling Method[a]	Sampled Date	Total Chlorinated VOCs (parts per billion volume)	Remarks
FS-1	49.5	DHF	11/8/90	3,090	Mount Eden Formation below 98.5 feet
FS-1	62.5	DHF	11/8/90	1,380	
FS-1	89.5	DHF	11/8/90	536	
FS-3	7	SVP	11/9/90	1,860	Borehole converted to well MW-24
FS-3	7.5	DHF	11/9/90	24	
FS-3	15	SVP	11/9/90	6,200	
FS-3	35	SVP	11/9/90	6,530	
FS-3	50	SVP	11/9/90	16,100	Mount Eden Formation below 53 feet
FS-4	7	SVP	9/12/90	888	
FS-5	7	SVP	11/12/90	420	
FS-6	7	SVP	11/12/90	3,390	
FS-7	7	SVP	11/12/90	3,820	
FS-8	7	SVP	11/12/90	1,070	

Notes:

[a] Sampling methods:
- DHF - Down Hole Flux - Sweep Air Varied
- DSF - Disturbed Surface Flux (from a depth of 4 inches below grade)
- MDHF - Modified Down Hole Flux - No Sweep Air Introduced into Chamber
- SF - Surface Flux (undisturbed surface soil)
- SVP - Soil Vapor Probe

[b] GS: Sample taken from ground surface

RADIAN CORPORATION

Table 5-1

(Continued)

Boring or Well No.	Depth (feet BGS)[b]	Sampling Method[a]	Sampled Date	Total Chlorinated VOCs (parts per billion volume)	Remarks
FS-9	7	SVP	11/12/90	47	
FS-10	7	SVP	11/12/90	35	
FS-11	7	SVP	11/12/90	1,500	
FS-12	7	SVP	11/12/90	287	
FS-13	7	SVP	11/13/90	53	
FS-14	7	SVP	11/13/90	64	
FS-15	7	SVP	11/13/90	83	
FS-16	7	SVP	11/13/90	47	
FS-17	7	SVP	11/13/90	156	
VRW-2	60	MDHF	11/19/90	82,500	
VRW-2	70	MDHF	11/19/90	21,700	
VRW-2	80	MDHF	11/19/90	83,400	Mount Eden Formation below 80 feet
VRW-1	10	MDHF	11/19/90	3,100	

Notes:

[a] Sampling methods:
- DHF - Down Hole Flux - Sweep Air Varied
- DSF - Disturbed Surface Flux (from a depth of 4 inches below grade)
- MDHF - Modified Down Hole Flux - No Sweep Air Introduced into Chamber
- SF - Surface Flux (undisturbed surface soil)
- SVP - Soil Vapor Probe

[b] GS: Sample taken from ground surface

RADIAN CORPORATION

Table 5-1

(Continued)

Boring or Well No.	Depth (feet BGS)[b]	Sampling Method[a]	Sampled Date	Total Chlorinated VOCs (parts per billion volume)	Remarks
VRW-1	20	MDHF	11/19/90	2,730	
VRW-1	30	MDHF	11/19/90	1,010	
VRW-1	40	MDHF	11/19/90	10,700	
VRW-1	50	MDHF	11/19/90	18,700	
VRW-1	60	MDHF	11/19/90	23,200	
VRW-1	70	MDHF	11/19/90	63,300	Mount Eden Formation below 73 feet
VRW-3	10	MDHF	12/20/90	6,290	
VRW-3	20	MDHF	12/20/90	16,900	
VRW-3	30	MDHF	12/20/90	30,000	
VRW-3	40	MDHF	12/20/90	158,000	
VRW-3	50	MDHF	12/20/90	32,400	Mount Eden Formation below 53 feet
VRW-3	60	MDHF	12/20/90	29,200	
VRW-3	70	MDHF	12/20/90	403,000	

Notes:

[a] Sampling methods:
- DHF - Down Hole Flux - Sweep Air Varied
- DSF - Disturbed Surface Flux (from a depth of 4 inches below grade)
- MDHF - Modified Down Hole Flux - No Sweep Air Introduced into Chamber
- SF - Surface Flux (undisturbed surface soil)
- SVP - Soil Vapor Probe

[b] GS: Sample taken from ground surface

RADIAN CORPORATION

Table 5-1

(Continued)

Boring or Well No.	Depth (feet BGS)[b]	Sampling Method[a]	Sampled Date	Total Chlorinated VOCs (parts per billion volume)	Remarks
VRW-3	70	MDHF	12/20/90	532,000	
VRW-3	80	MDHF	12/20/90	1,000,000	
SF-1	GS	SF	8/21/91	6	
SF-1	0.3	DSF	8/21/91	12	
SF-1	4	SVP	8/21/91	924	
SF-2	GS	SF	8/21/91	3	
SF-2	0.3	DSF	8/21/91	4	
SF-2	4	SVP	8/21/91	2,300	
SF-3	GS	DSF	8/22/91	5	
SF-3	4.5	SVP	8/22/91	1,330	
SF-4	GS	SF	8/22/91	4	
SF-4	0.3	DSF	8/22/91	22	
SF-4	4.5	SVP	8/22/91	1,360	

Notes:

[a] Sampling methods:
- DHF - Down Hole Flux - Sweep Air Varied
- DSF - Disturbed Surface Flux (from a depth of 4 inches below grade)
- MDHF - Modified Down Hole Flux - No Sweep Air Introduced into Chamber
- SF - Surface Flux (undisturbed surface soil)
- SVP - Soil Vapor Probe

[b] GS: Sample taken from ground surface

RADIAN CORPORATION

Table 5-1

(Continued)

Boring or Well No.	Depth (feet BGS)[b]	Sampling Method[a]	Sampled Date	Total Chlorinated VOCs (parts per billion volume)	Remarks
SF-5	GS	SF	8/22/91	2	
SF-5	0.3	DSF	8/22/91	7	
SF-5	4	SVP	8/22/91	1,300	
SF-6	GS	SF	8/22/91	1	
SF-6	0.3	DSF	8/22/91	3	
SF-6	4.5	SVP	8/22/91	974	
SF-7	GS	SF	8/22/91	2	
SF-7	0.3	DSF	8/22/91	3	
SF-7	4.5	SVP	8/22/91	483	
SF-8	GS	SF	8/23/91	2	
SF-8	0.3	DSF	8/23/91	2	
SF-8	4.5	SVP	8/23/91	741	
SF-9	GS	SF	8/23/91	1	

Notes:

[a] Sampling methods:
- DHF - Down Hole Flux - Sweep Air Varied
- DSF - Disturbed Surface Flux (from a depth of 4 inches below grade)
- MDHF - Modified Down Hole Flux - No Sweep Air Introduced into Chamber
- SF - Surface Flux (undisturbed surface soil)
- SVP - Soil Vapor Probe

[b] GS: Sample taken from ground surface

RADIAN CORPORATION

Table 5-1

(Continued)

Boring or Well No.	Depth (feet BGS)[b]	Sampling Method[a]	Sampled Date	Total Chlorinated VOCs (parts per billion volume)	Remarks
SF-9	0.3	DSF	8/23/91	1	
SF-9	4.5	SVP	8/23/91	215	
SF-10	4.5	SVP	8/23/91	111	
SF-11	4.5	SVP	8/23/91	1,350	
SF-12	4.5	SVP	8/23/91	6,420	
SF-13	4.5	SVP	8/23/91	--	Sample not analyzed, syringe broke

Notes:

[a] Sampling methods:
- DHF - Down Hole Flux - Sweep Air Varied
- DSF - Disturbed Surface Flux (from a depth of 4 inches below grade)
- MDHF - Modified Down Hole Flux - No Sweep Air Introduced into Chamber
- SF - Surface Flux (undisturbed surface soil)
- SVP - Soil Vapor Probe

[b] GS: Sample taken from ground surface

Table 5-2

Summary Organic Analyses in Soil

Location	Depth (feet)[a]	Date	Analyses Performed[b]	Total VOCs[c]	Remarks
Boring FS-1	4.0	11/7/90	8240	ND	Burn Pit Area
Boring FS-1	14.5	11/7/90	8010	ND	
Boring FS-1	15.0	11/7/90	8010	ND	
Boring FS-1	33.5	11/8/90	8010	ND	
Boring FS-1	51	11/8/90	8010	ND	
Boring FS-1	74.5	11/8/90	8010	ND	
Boring FS-1	99.5	11/8/90	8010	ND	
Boring FS-2	4.0	11/6/90	8240	ND	Rocket Motor Prod Area
Boring FS-2	4.5	11/6/90	8240	ND	
Boring FS-2	14.5	11/6/90	8010	ND	
Boring FS-2	34	11/6/90	8010	ND	
Boring FS-2	51	11/6/90	8010	ND	
Well VMW-1	60	12/26/90	8010	ND	Burn Pit Area
Well VMW-1	80	12/26/90	8010	35	
Well MW-26	75	1/29/91	8010	49	Burn Pit Area
Well MW-26	85	1/29/91	8010	ND	

NOTES:

a Depth below ground surface

b All soil analyses were performed by off-site laboratories. U.S. EPA method numbers are shown.

c All results in micrograms per kilogram (µg/kg).

ND = Non detect. Detection limits for each 8010 compound are 50 µg/kg or less, with most being 5 µg/kg. Detection limits for each 8240 compound are 50 µg/kg or less, except acetone and 2-butanone, which have detection limits of 100 µg/kg.

RADIAN CORPORATION

RADIAN CORPORATION

Table 5-3

Range in Contaminant Concentrations in Groundwater

Location	Total 8010 (Total VOC) µ g/L	1,1-Dichloroethane (1,1-DCA) µ g/L	1,2-Dichloroethane (1,2-DCA) µ g/L	1,1-Dichloroethene (1,1-DCE) µ g/L	1,1,1-Trichloroethane (1,1,1-TCA) µ g/L	Trichloroethene (TCE) µ g/L	Nitrate as N mg/L	Perchlorate mg/L
IB-1	29 - 29	ND	ND	7.8 - 7.8	3.9	15 - 15	N/A	N/A
IB-2	ND	ND	ND	ND	ND	ND	N/A	N/A
Lower Pond	ND - 190	ND - 7.2	ND - 1.2	ND - 93	ND - 32	ND - 53	2.9 - 2.9	1.5 - 1.5
MW-01	390 - 920	ND - 55	ND - 6.9	97 - 320	52 - 200	180 - 500	4.2 - 120	1.0 - 1.0
MW-02	1100 - 2400	ND - 30	ND - 27	550 - 1500	170 - 450	330 - 590	4.8 - 18*	9.0 - 9.1
MW-03	ND - 0.73	ND	ND	ND - 0.45	ND	ND - 0.73	ND	ND
MW-04	330 - 610	ND - 5.1	ND	120 - 290	34 - 50	170 - 280	31 - 31	1.8 - 1.8
MW-05	200 - 430	ND - 6.2	ND	110 - 180	ND - 45	63 - 200	6.4 - 6.4	7.6 - 7.6
MW-06	3.0 - 88	ND - 0.53	ND	1.7 - 2.8	ND - 15	1.3 - 42	0.042 - 0.042	ND
MW-07	61 - 470	ND - 3.1	ND - 7.0	16 - 100	12 - 87	31 - 280	1.7 - 1.7	0.62 - 0.62
MW-08	ND - 0.22	ND	ND	ND	ND	ND - 0.22	ND	ND
MW-09	ND - 0.23	ND	ND	ND	ND - 0.23	ND	0.034 - 0.034	ND
MW-10	ND - 5.5	ND	ND - 0.12	ND	ND	ND	22 - 22	ND
MW-11	ND	ND	ND	ND	ND.	ND	16 - 16	ND
MW-12	ND - 0.61	ND	ND	ND	ND - 0.61	ND	ND	ND
MW-13	ND	ND	ND	ND	ND	ND	ND	ND
MW-14	ND - 3.7	ND	ND	ND - 1.4	ND - 0.92	ND - 1.4	1.7 - 1.7	ND
MW-15	ND - 0.49	ND	ND	ND - 0.49	ND	ND	ND	ND
MW-16	ND - 0.53	ND	ND	ND	ND	ND	0.12 - 0.12	ND
MW-17	5.9 - 16	ND - 0.85	ND	1.6 - 4.1	3.5 - 8.6	ND - 2.3	2.8 - 2.8	0.34 - 0.34
MW-18	4.4 - 19	0.92 - 3.0	ND - 0.14	2.1 - 7.6	ND - 2.2	1.2 - 6.4	0.060 - 0.060	ND
MW-19	4.2 - 6.8	1.0 - 2.0	ND	0.86 - 3.0	ND - 0.37	0.66 - 1.3	ND	ND
MW-20	390 - 590	ND - 5.0	ND	200 - 260	46 - 79	130 - 240	N/A	N/A
MW-21	700 - 700	12 - 12	ND	360 - 360	190 - 190	130 - 130	N/A	N/A
MW-22	100 - 340	ND	ND	60 - 170	19 - 50	22 - 110	N/A	N/A
MW-23	180 - 180	ND	ND	74 - 74	31 - 31	70 - 70	N/A	N/A
MW-24	1600 - 7600	ND - 25	50 - 150	740 - 3800	ND - 970	740 - 2700	12 - 12	5.1 - 5.1
MW-25	ND - 8500	ND - 12	ND - 510	ND - 4500	ND - 1700	ND - 1800	20 - 21*	6.8 - 6.8
MW-26	770 - 12000	ND - 26	ND - 170	400 - 6200	140 - 1300	180 - 4400	N/A	N/A
MW-27	ND	ND	ND	ND	ND	ND	N/A	N/A
MW-28	2.2 - 81	ND - 1.2	ND - 1.1	1.2 - 33	ND - 12	1.0 - 34	N/A	N/A
MW-29	28 - 28	8.0 - 8.0	ND	8.3 - 8.3	ND	12 - 12	N/A	N/A

Table 5-3

(Continued)

Location	Total 8010 (Total VOC) µ g/L	1,1-Dichloroethane (1,1-DCA) µ g/L	1,2-Dichloroethane (1,2-DCA) µ g/L	1,1-Dichloroethene (1,1-DCE) µ g/L	1,1,1-Trichloroethane (1,1,1-TCA) µ g/L	Trichloroethene (TCE) µ g/L	Nitrate as N mg/L	Perchlorate mg/L
MW-30	14 - 14	ND	ND	7.0 - 7.0	1.3 - 1.3	5.8 - 5.8	N/A	N/A
MW-31	ND - 41	ND	ND	ND - 20	ND - 14	ND - 6.5	N/A	N/A
MW-32	ND	ND	ND	ND	ND	ND	N/A	N/A
MW-34	ND	ND	ND	ND	ND	ND	N/A	N/A
MW-35	1.7 - 5.4	ND	ND	ND - 1.4	1.3 - 1.7	ND - 2.7	N/A	N/A
MW-36	ND	ND	ND	ND	ND	ND	N/A	N/A
MW-37	0.93 - 1.1	ND	ND	ND	ND	0.93 - 1.1	N/A	N/A
MW-38	ND	ND	ND	ND	ND	ND	N/A	N/A
MW-39	110 - 110	ND	ND	49 - 52	8.0 - 15	47 - 50	N/A	N/A
MW-40	88 - 120	ND - 2.4	ND	31 - 38	5.2 - 18	48 - 66	N/A	N/A
MW-41	390 - 390	ND	ND	160 - 160	21 - 21	200 - 200	N/A	N/A
MW-42	250 - 260	ND - 5.9	ND	100 - 130	ND	130 - 140	N/A	N/A
MW-43	45 - 45	1.3 - 1.3	ND	17 - 17	5.9 - 5.9	21 - 21	N/A	N/A
MW-44	300 - 300	6.3 - 6.3	ND	120 - 120	9.5 - 9.5	150 - 150	N/A	N/A
MW-45	77 - 190	ND - 1.1	ND	29 - 54	12 - 22	35 - 110	N/A	N/A
MW-46	1.9 - 1.9	0.57 - 0.57	ND	1.3 - 1.3	ND	ND	N/A	N/A
MW-47	ND	ND	ND	ND	ND	ND	N/A	N/A
MW-48	ND	ND	ND	ND	ND	ND	N/A	N/A
MW-49	230 - 230	ND	ND	84 - 84	32 - 32	110 - 110	N/A	N/A
MW-50	420 - 420	2.8 - 2.8	1.2 - 1.2	200 - 200	69 - 69	140 - 140	N/A	N/A
OW-01	ND - 2.0	ND	ND	ND	ND	ND	N/A	N/A
OW-02	370 - 620	ND - 6.5	ND - 2.5	120 - 270	78 - 110	150 - 240	7.1 - 7.1	2.8 - 2.8
OW-03	720 - 1400	ND - 29	ND - 11	160 - 660	130 - 210	180 - 460	11 - 11	3.8 - 3.8
OW-08	ND - 1.6	ND	ND	ND	ND	ND	4.2 - 4.2	ND
P-02	1.3 - 1.3	ND	ND	ND	ND	ND	N/A	N/A
Tank	53 - 450	ND - 1.6	1.1 - 12	5.7 - 220	13 - 58	32 - 160	N/A	N/A
Upper Pond	180 - 270	ND - 6.7	ND	64 - 99	44 - 60	72 - 100	N/A	N/A
W-01	ND - 1.5	ND	ND	ND - 0.49	ND	ND - 0.52	ND	ND
W-02	ND - 27	ND - 1.3	ND	ND - 25	ND	ND - 0.27	0.82 - 0.82	ND
W-03	21 - 49	ND - 0.68	ND	6.8 - 19	ND - 7.6	11 - 18	16 - 16*	ND
W-05	ND	ND	ND	ND	ND	ND	5.3 - 5.3	N/A
W-06	2.2 - 2.2	ND	ND	ND	ND	ND	N/A	N/A

ND = Not detected
N/A = Not applicable
*This range is based on results from a pair of lab duplicates or field duplicates.

RADIAN CORPORATION

Table 5-4

Groundwater Plume Volumes

Surface Isopleth Boundary	Formation	Volume (million gallons)
1,000 μg/L	Mt. Eden Alluvium Total	10.5 20.1 30.6
400 μg/L	Mt. Eden Alluvium Total	70.3 93.8 164.1
1 μg/L	Mt. Eden Alluvium Total	115 336 451

Note: Plume volumes are for the area east of wells MW-17 and MW-41 (upgradient of the rocket motor production area).

RADIAN CORPORATION

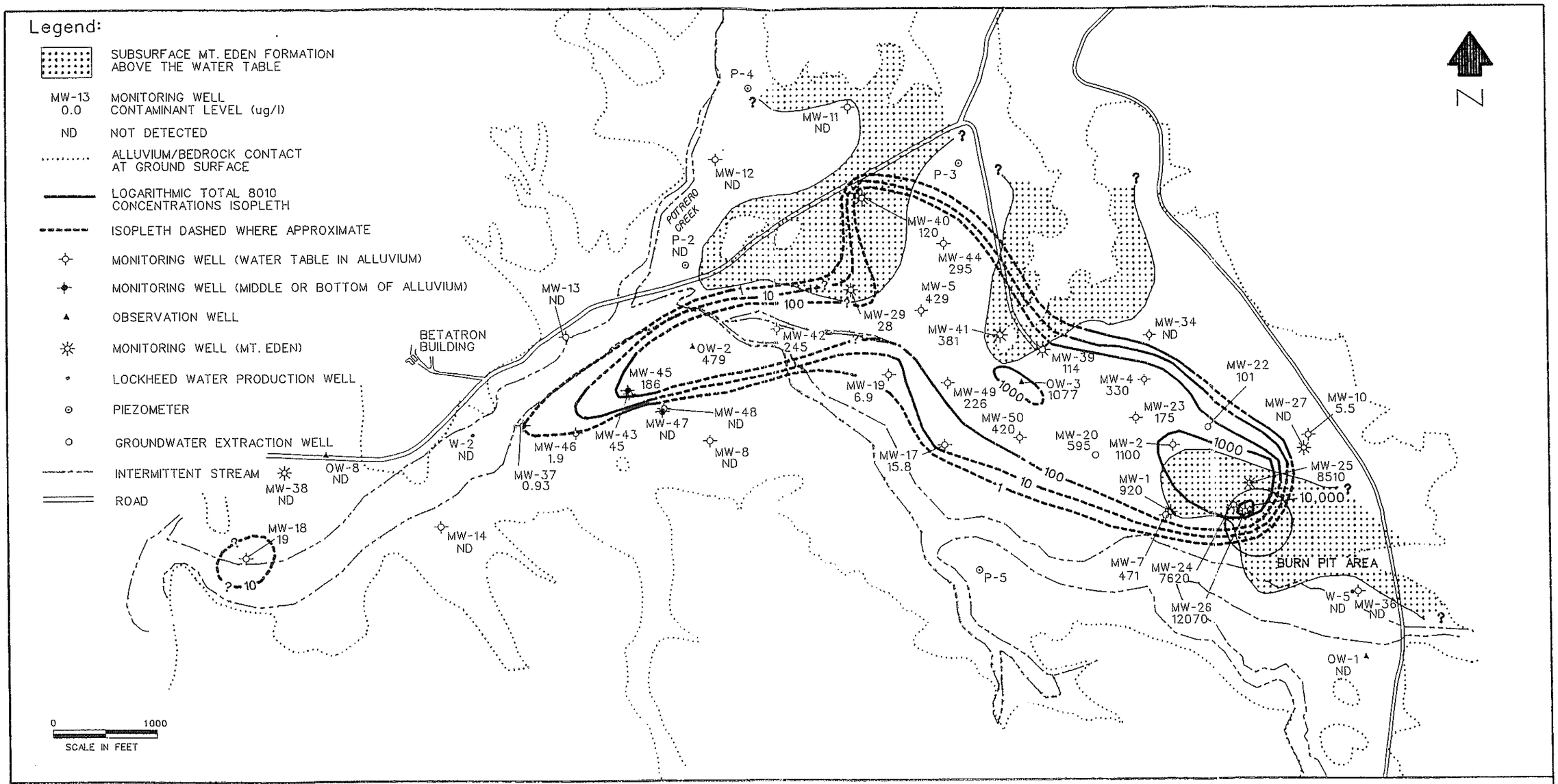


Figure 5-1. Lockheed Beaumont No. 1 Total Chlorinated VOC Concentrations in Shallow Groundwater (Fall 1991)

LOCKHG2 8010A 09/30/92

RADIAN CORPORATION

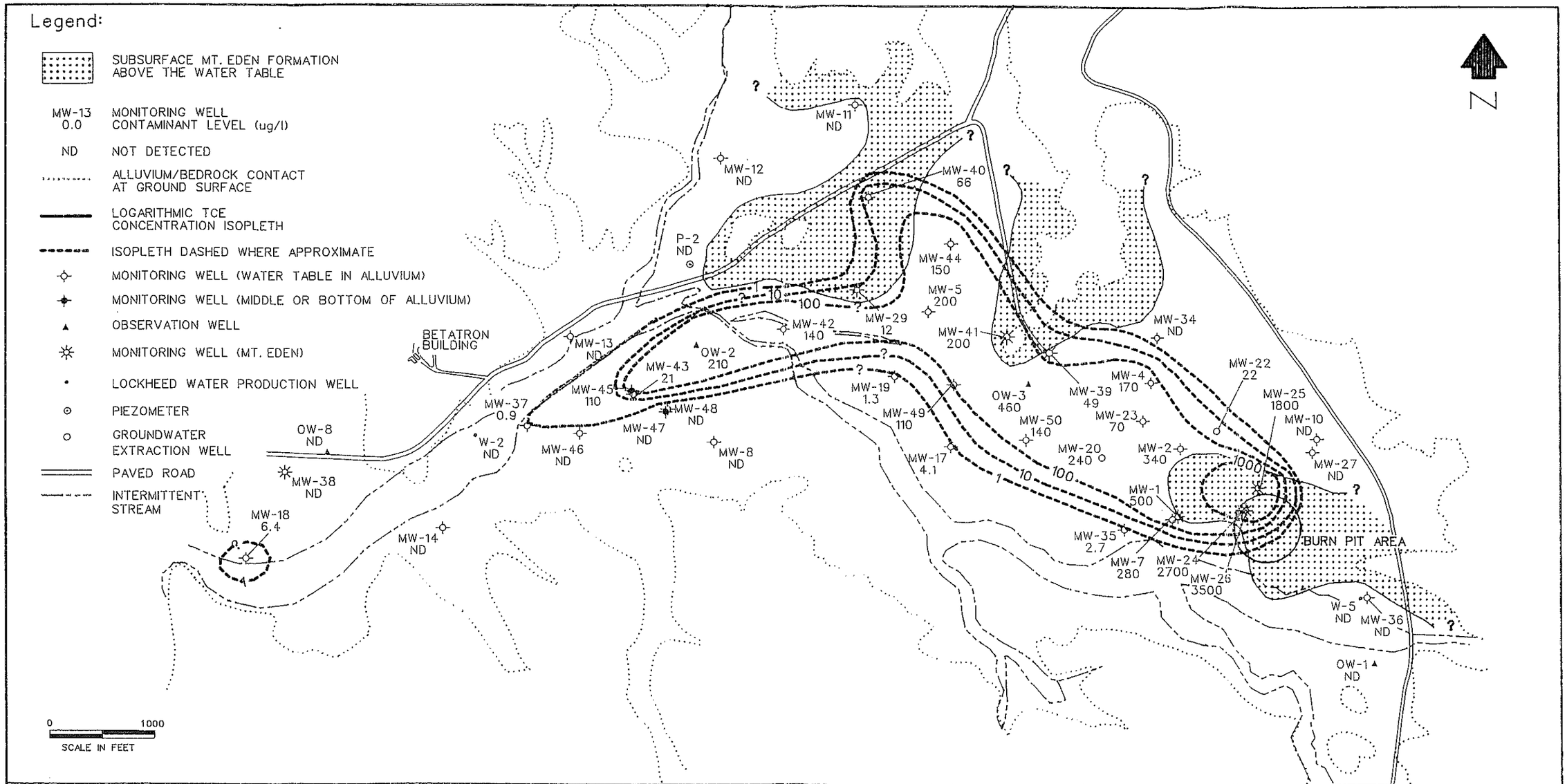


Figure 5-2. Lockheed Beaumont No. 1 TCE Concentrations in Shallow Groundwater (Fall 1991)

LOCKHG2 TCE 09/30/92

RADIAN CORPORATION

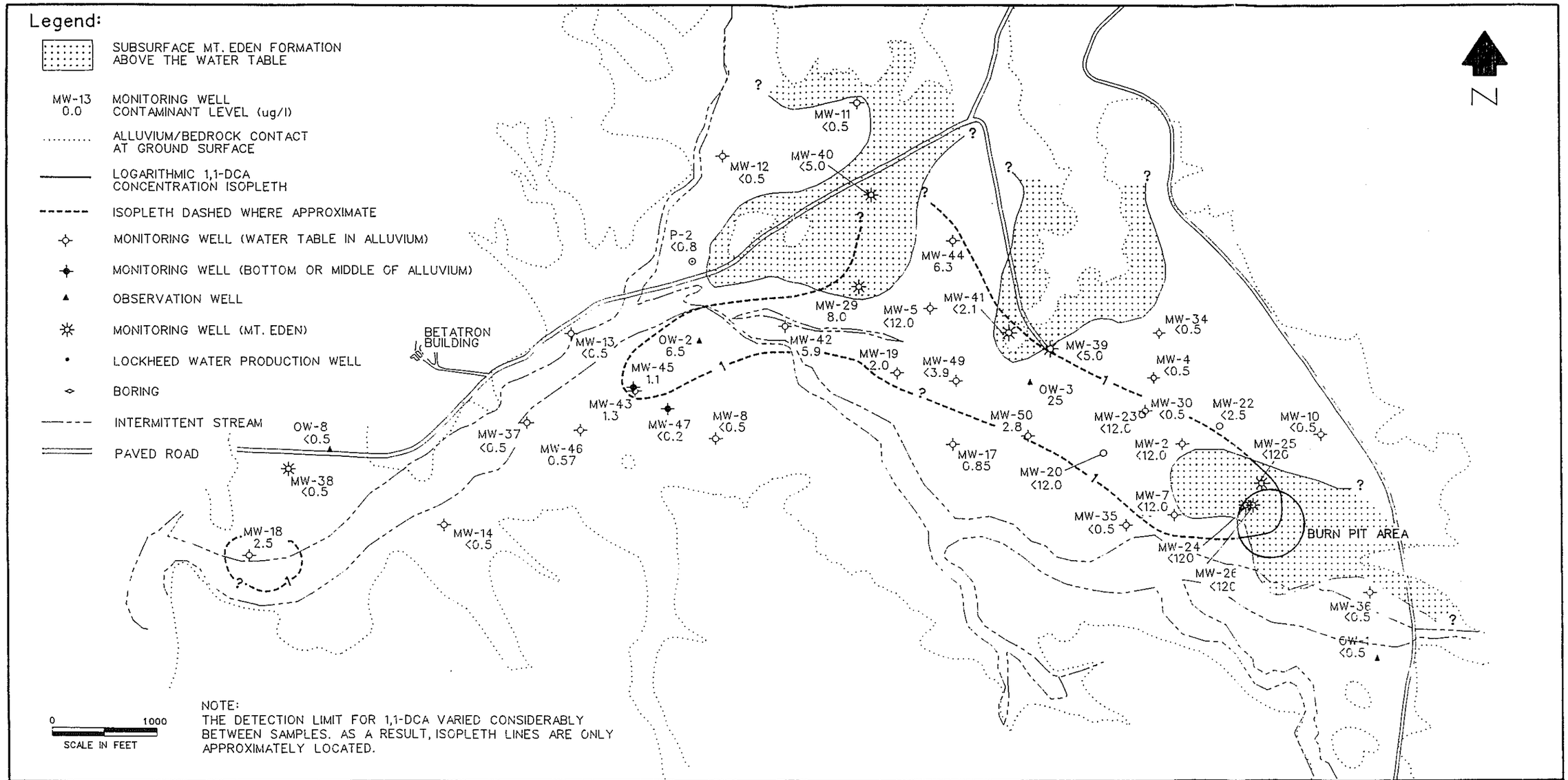


Figure 5-3. Lockheed Beaumont No. 1 1,1-DCA Concentrations in Shallow Groundwater (Fall 1991)

LOCKH2 11DCA 09/30/92

RADIAN CORPORATION

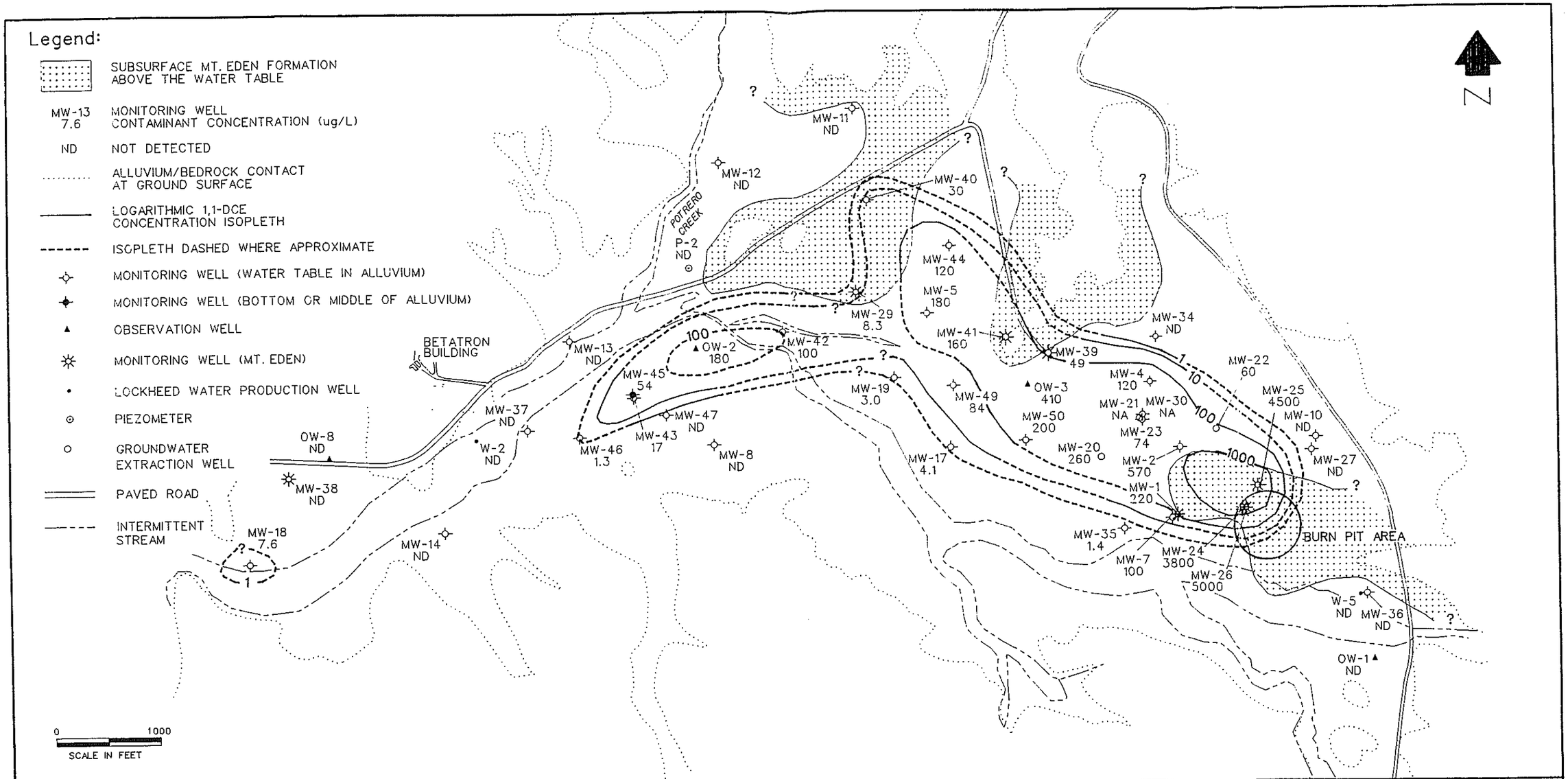


Figure 5-4. Lockheed Beaumont No. 1 1,1-DCE Concentrations in Shallow Groundwater (Fall 1991)

LOCKHG2 11DCE 09/30/92

RADIAN CORPORATION

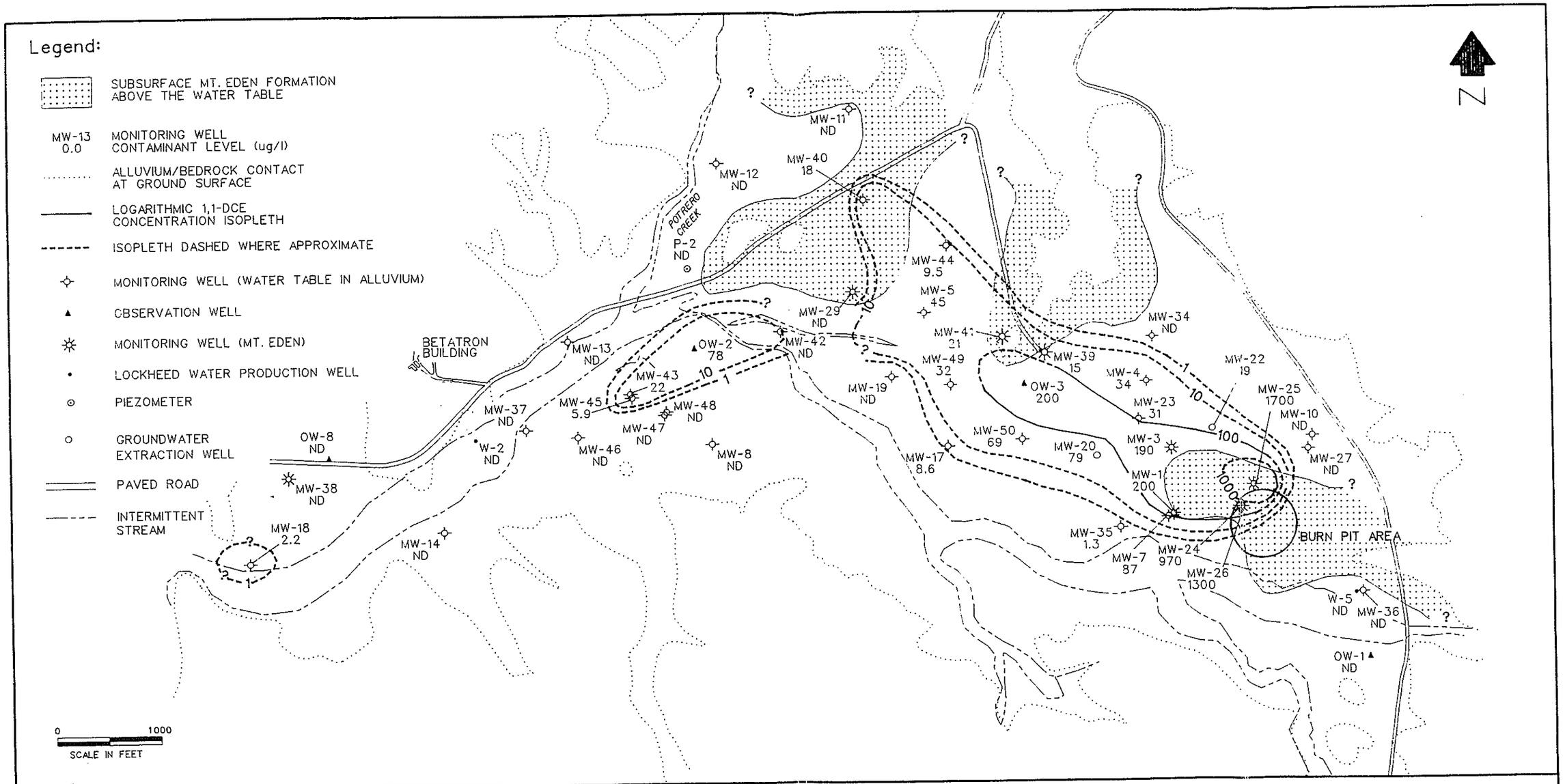


Figure 5-5. Lockheed Beaumont No. 1 1,1,1-TCA Concentrations in Shallow Groundwater (Fall 1991)

LOCKHG2 111TCA 09/30/92

RADIAN CORPORATION

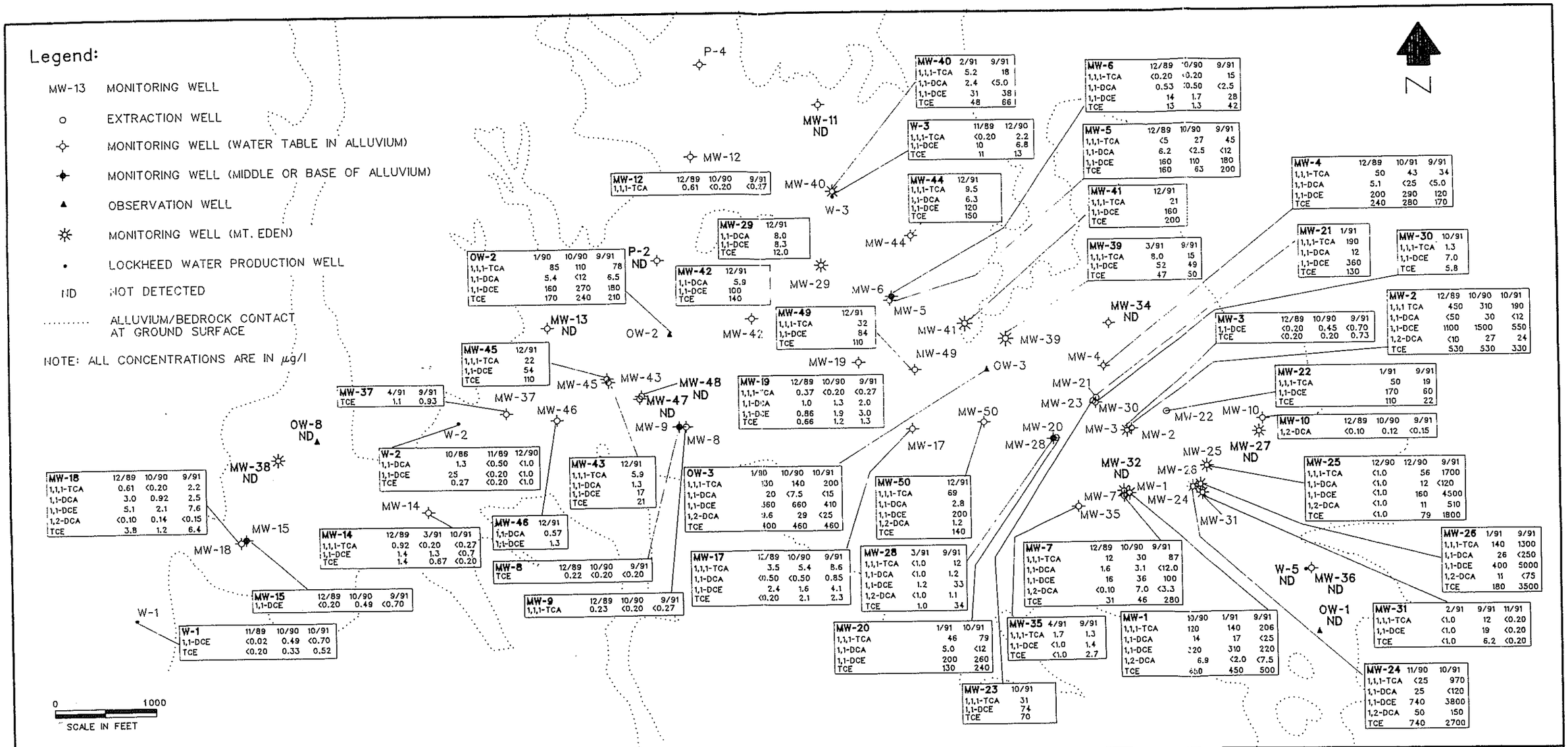


Figure 5-6. Lockheed Beaumont No. 1 Distribution of Chlorinated VOC's in Groundwater

LOCKHG WELDAT7 08/12/92

RADIAN CORPORATION

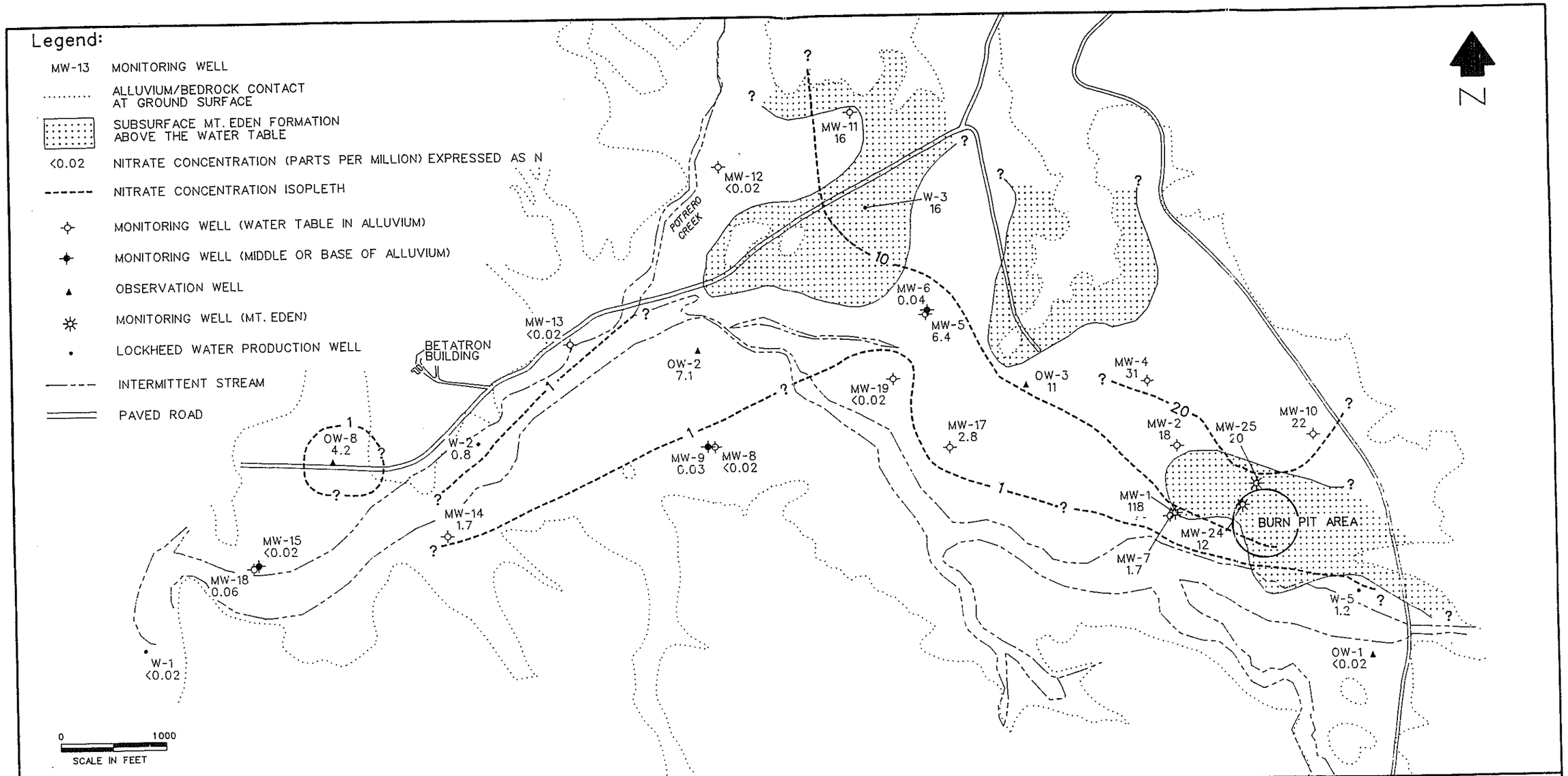


Figure 5-7. Lockheed Beaumont No. 1 Nitrate Concentrations in Shallow Groundwater (Late 1990)

LOCKHG2 NIT90 09/30/92

RADIAN CORPORATION

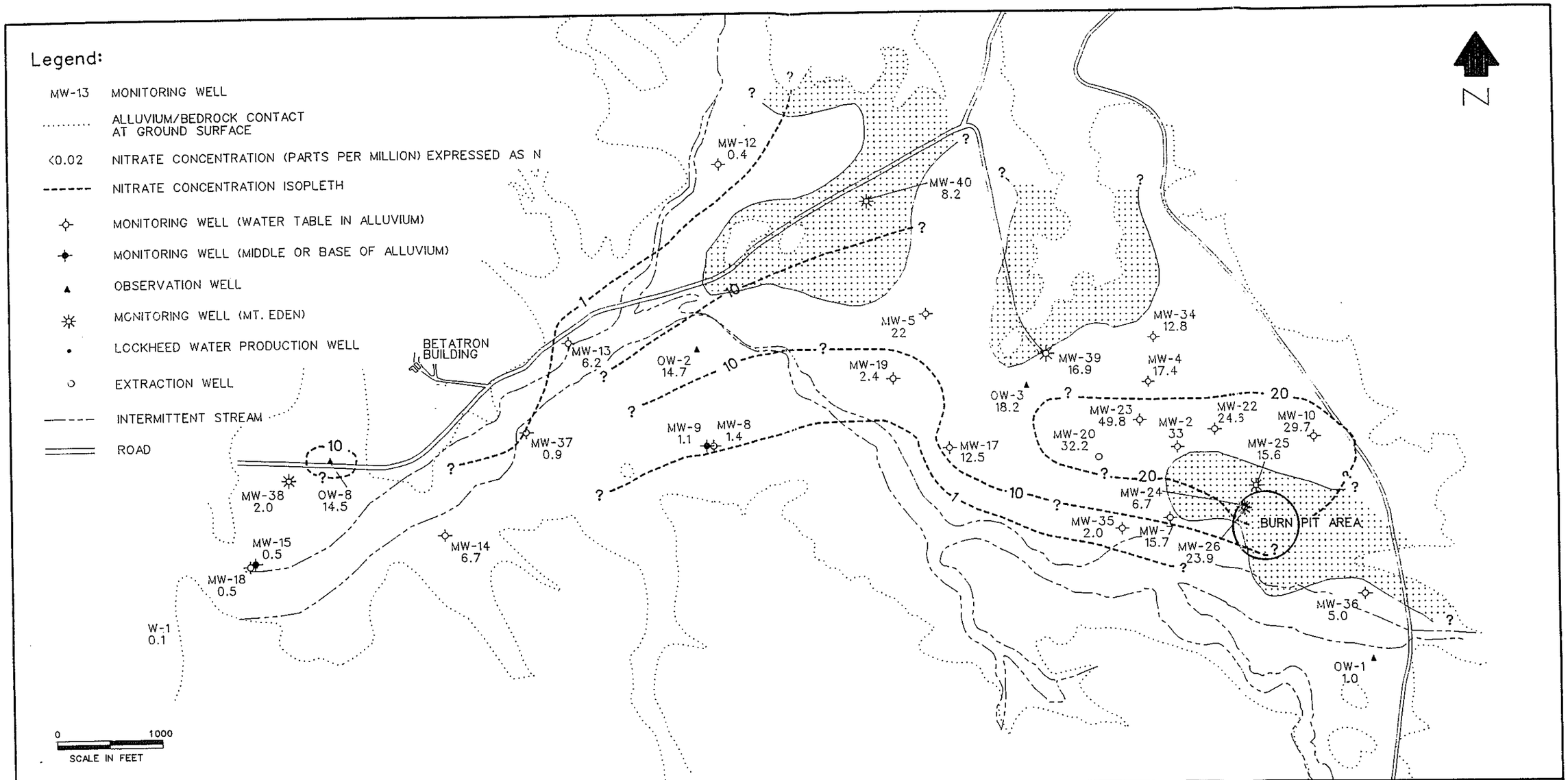


Figure 5-8. Lockheed Beaumont No. 1 Nitrate Concentrations in Shallow Groundwater (Late 1991)

LOCKHG2 NIT91 09/30/92

RADIAN CORPORATION

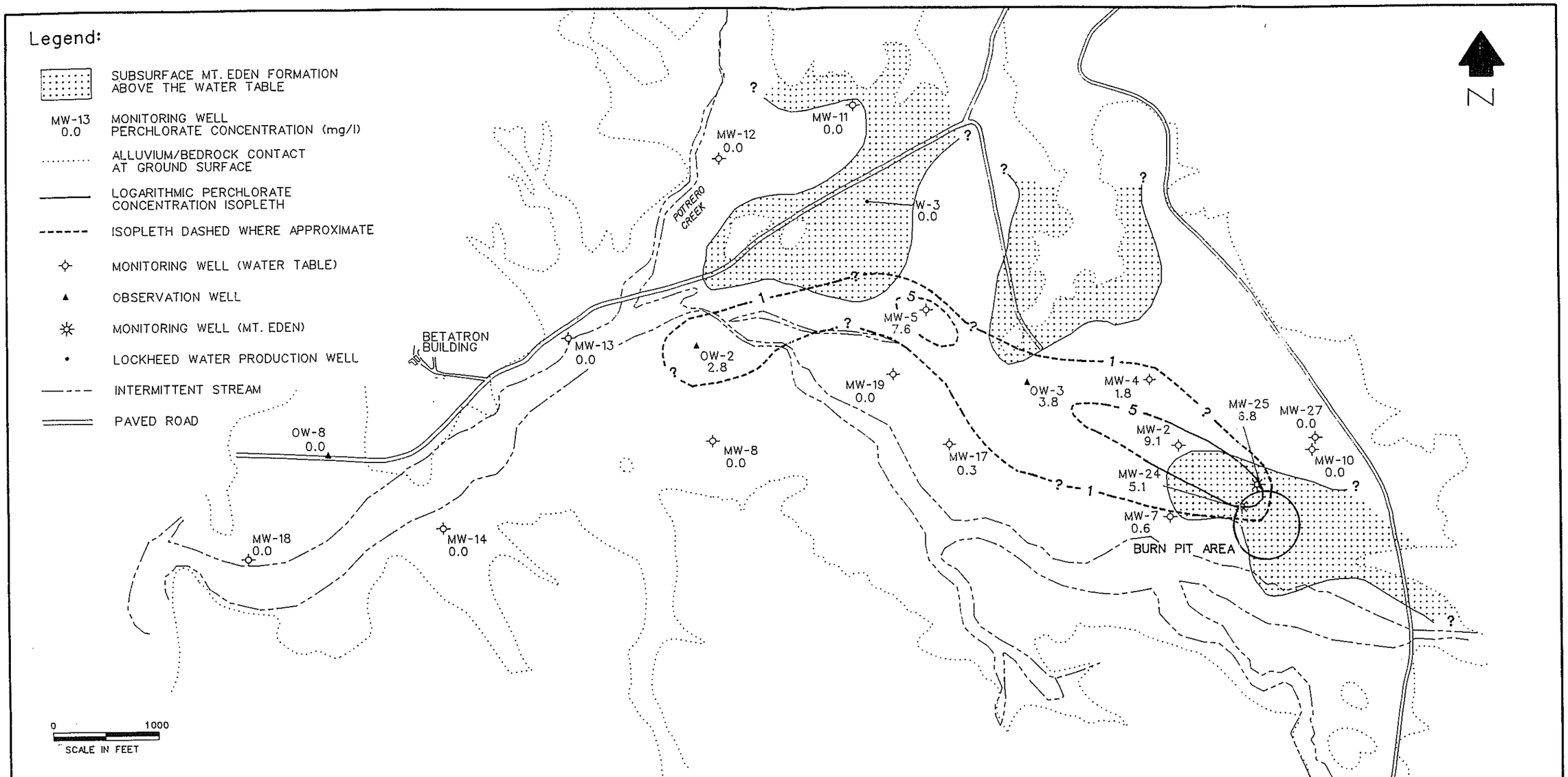


Figure 5-9. Lockheed Beaumont No. 1 Perchlorate Concentrations in Shallow Groundwater (Spring 1991)

LOCKHG2 PERCH 09/30/92

6.0 QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

This section summarizes the quality assurance/quality control (QA/QC) data assessments for the laboratory analyses of samples collected during various sampling events at the Lockheed Beaumont site. Detailed data quality assessments for each event are presented in Appendix G. A brief description of the six sampling events are summarized below.

6.1 Soil Vapor Sampling from Shallow Probes and Downhole Flux Chamber (November and December 1991)

All soil vapor samples during this event were analyzed in an on-site laboratory. Most of the data met the quality assurance objectives of accuracy, precision, representativeness, comparability, and completeness for this project.

A few minor problems were noted with soil gas results. Due to low response and elution pattern, quantitation for 1,2-dichloroethane was estimated. Tetrachloroethane, for a two week period, was estimated due to calibration problems. Also, because of blank contamination, trichloroethene results for the first week of sampling are qualified.

6.2 Surface Flux Chamber and Shallow Probe Sampling (August 1991)

All soil vapor samples were analyzed by an on-site laboratory. Overall, the data met the quality assurance objectives for precision (duplicate injections) and accuracy (calibration check samples). Some chlorinated compounds were detected in both the syringe blanks and the ambient blanks at levels determined to be background concentrations (<1 ppbv); one exception was 1,1-dichloroethene which was detected at >10 ppbv on one day.

6.3 Soil Samples from Borings (November and December 1990)

The majority of the soil samples were analyzed by BTC Environmental in Ventura, California with the remaining samples analyzed by Radian Analytical Services (RAS) in Austin, Texas, and Enseco - CRL in Garden Grove, California. Overall, the soil samples met the data quality objectives according to the EPA guidelines for accuracy, precision, representativeness, detectability, comparability, and completeness.

Two problems were noted with bromoform analyzed by EPA Method 8240 by BTC Environmental: low spike recoveries were noted indicating a potential for low bias or false negative results and excessive variability was indicated by a high relative percent difference (RPD). No other problems were noted. Limited QC samples were collected for other methods analyzed by the other two laboratories.

6.4 Groundwater Sampling Round 2, (October 1990), and Sampling of Treatability Study Wells (November 1990 - March 1991)

Analyses were performed by four different laboratories: RAS - Sacramento, RAS -Austin, BTC Environmental, and Performance Analytical Incorporated (PAI). A few outliers were noted during data assessment as well as variations in protocol for volatile organic compounds analyzed by BTC and RAS, Austin. BTC used a three-point calibration while RAS used a five-point calibration. BTC also used gas chromatography/mass spectrometry for some of the primary analyses as well as for confirmation for other analyses.

Several results for different analyses are qualified because the laboratory did not analyze the samples within the method specified holding time. Although target analytes were detected in the method blanks (methylene chloride) and field blanks (tetrachloroethene), only a few compounds were qualified for contamination.

Overall, precision and accuracy met the data quality objectives. Only four RPDs for field duplicate samples and two RPDs for matrix spike duplicate analysis exceeded the precision objectives. Only 17 of 198 measurable spike recoveries exceeded the data quality objectives; most of these results appear to be affected by the sample matrix. Two samples were also qualified for low surrogate recoveries in Method 8040 indicating a potential for low bias.

Two major problems were identified in a data quality audit performed for purgeable halocarbon analyses by BTC. The three-point calibration curve was not verified for the working range or response factors; the results for these volatile organic compounds should not be considered quantitative. Some of the analytes were quantitated outside of the instrument calibration range and the reported concentrations are uncertain because the linearity of the instrument was not established.

6.5 Groundwater Sampling Round 3 (September - October 1991)

All samples were initially analyzed by EPA Methods 8010 and 8020 by RAS, Austin. One resample was analyzed by National Environmental Testing, Inc. (NET). The data results are valid and the quality (measured by accuracy and precision) met the acceptance criteria for the analytical methods.

Only a few data results were considered estimated. There appears to be a systematic contamination problem because methylene chloride was detected in all blanks analyzed by NET; All sample results for this compound are qualified. All spike recoveries met the accuracy criteria, and only two results exhibited higher than expected variability for the entire sampling and analysis process.

6.6 Groundwater Sampling from Additional Wells (December 1991)

All analyses were performed by Enseco - CRL using EPA Method 8010. The data are valid and useable for its intended purpose. The accuracy and precision met the data quality objectives for this method. With the exception of some low-level blank contamination, no systematic problems were detected. Only four individual data results required qualification (three for blank contamination and one for excessive variability).

7.0 REFERENCES

1. Allen, C.R., 1957, Geologic Society of America, San Andreas Fault Zone in San Gorgonio Pass, Southern California, Bull. V. 68, No. 3, pp. 315-350.

2. American Society of Civil Engineers, 1959, "Water Use by Naturally Occurring Vegetation: Including an Annotated Bibliography," Report prepared by the Task Committee on Water Requirements, Irrigation and Drainage Division.

3. Bloyd, Jr., R.M., 1971, U.S.G.S. Water Supply Paper 1999-D, Underground Storage of Imported Water in the San Gorgonio Pass Area, Southern California, 37 pp., 2 plates.

4. California Department of Water Resources, 1978. "Water Resources Evaluation of the San Jacinto Area," D.W.R. Southern District Report, April 1978.

5. Dibblee, T.W., 1981, Geologic Map of Banning (15-minute) Quadrangle, California, South Coast Geologic Society Map 2.

6. Fraser, D.M., 1931, California Division of Mines, Mining in California, Vol. 27, R. 4, pp. 494-540.

7. Furukawa, D., 1991. Personal communication with David Furukawa, Controller, Metropolitan Water District, 22 November 1991.

8. Johns, E.L. (Editor), 1989. "Water Use by Naturally Occurring Vegetation, including an annotated bibliography." Irrigation and Mining Division, American Society of Civil Engineers.

9. Kruseman, G.P. and de Ridder, N.A., 1991. "Analysis and Evaluation of Pumping Test Data" Publication 47, International Institute for Land Reclamation and Improvement, Wagenengen, The Netherlands.

10. Leighton and Associates, 1983a. "Geotechnical and Water Resources Management Feasibility Study, Potrero Creek Area South of Beaumont, Riverside County, California," March 24, 1983.

11. Leighton and Associates 1983b. "Hydrogeologic Investigation for Water Resources Development, Potrero Creek, Riverside County, California," October 27, 1983.

12. Leighton and Associates, 1984. "Summary of Data from Continued Hydrogeologic Monitoring, Potrero Creek, Riverside County, California," August 23, 1984.

13. Miller, W.J., 1944, Geology of Palm Springs--Blythe Strip, Riverside County, California. California Journal of Mines and Geology, V. 40, No. 1, pp. 11-72.

14. Nilsen, E.T. et. al, 1984, "Productivity in Native Stands of Prosopis Grandulosa, Mesquite, in the Sonoran Desert of Southern California and Some Management Implications," pp. 722-727 in R.E. Warner and K.M. Hendrix (Editors) California Riparian Systems Ecology, Conservation and Productive Management. U. of California Press.

15. Parson, Ralph M. Company, 1960, "Site Evaluation Study Potrero Ranch Site," April 4, 1960.

16. Quimby, Garfield M., 1975, "History of Potrero Ranch and its Neighbors," 1975.

17. Radian Corporation, 1986a. "Lockheed Propulsion Company, Beaumont Test Facilities, Historical Report," September 1986.

18. Radian Corporation, 1986b. "Lockheed Propulsion Company, Beaumont Facilities Preliminary Remedial Investigation Report," December 1986.

19. Radian Corporation, 1989a. "Lockheed Propulsion Company, Beaumont Facilities, Site Investigation Work Plan," September 1989.

20. Radian Corporation, 1989b. "Lockheed Propulsion Company, Beaumont Facilities, Draft Hydrogeologic Investigation Work Plan," October 1989.

21. Radian Corporation, 1989c. "Community Relations Plan, Lockheed Beaumont No. 1 Site," November 1989.

22. Radian Corporation, 1989d. "Community Relations Plan, Lockheed Beaumont No. 1 Site," November 30, 1989.

23. Radian Corporation, 1990. "Lockheed Propulsion Company, Beaumont Test Facilities, Source and Hydrologic Investigation," February 1990.

24. Radian Corporation, 1991a. "Lockheed Propulsion Company, Beaumont Test Facilities, Excavation Management Plan," March 1991.

25. Radian Corporation, 1991b. "Lockheed Propulsion Company, Beaumont Test Facilities, Burn Pit Area Removal Action Plan," April 1991.

26. Radian Corporation, 1991c. "Lockheed Propulsion Company, Beaumont Test Facilities, Treatability Study Work Plan," March 1991.

40. Woodward Clyde Consultants, 1990. "Interim Report on Field Exploration and Laboratory Testing, Potrero Reservoir Site, East Reservoir Project, Riverside County, California," 7 September 1990.

27. Radian Corporation, 1992a. "Lockheed Propulsion Company, Beaumont Test Facilities, Treatability Study," February 1992.

28. Radian Corporation, 1992b. "Lockheed Beaumont No. 1 Treatment Design Feasibility Study," March 1992.

29. Radian Corporation, 1992c. "Lockheed Beaumont Test Facilities Health Risk Assessment for Site No. 1," Draft, March 1992.

30. Ransome, F.L., 1932. "Final Geological Report on the San Jacinto Tunnel Line, Colorado River Aqueduct, for M.W.D. of Southern California," March 12, 1932.

31. Sharp, R.P., "Geology Field Guide to Southern California," Kendall/Hunt Geology Field Guide Series, Second Edition, 1975.

32. State of California Department of Health Services, Consent Order issued to Lockheed Corporation, County of Beaumont Test Facilities. Docket #HSA 88/89-034.

33. Thompson, T.F. "San Jacinto Tunnel." In: Engineering Geology in Southern California. R. Lung and R. Proctor, eds. Special Publication of Association of Engineering Geologists, October 1966.

34. Todd, D.K., 1980, "Groundwater Hydrology," Second Edition, John Wiley & Sons, Publishers, 535 pp.

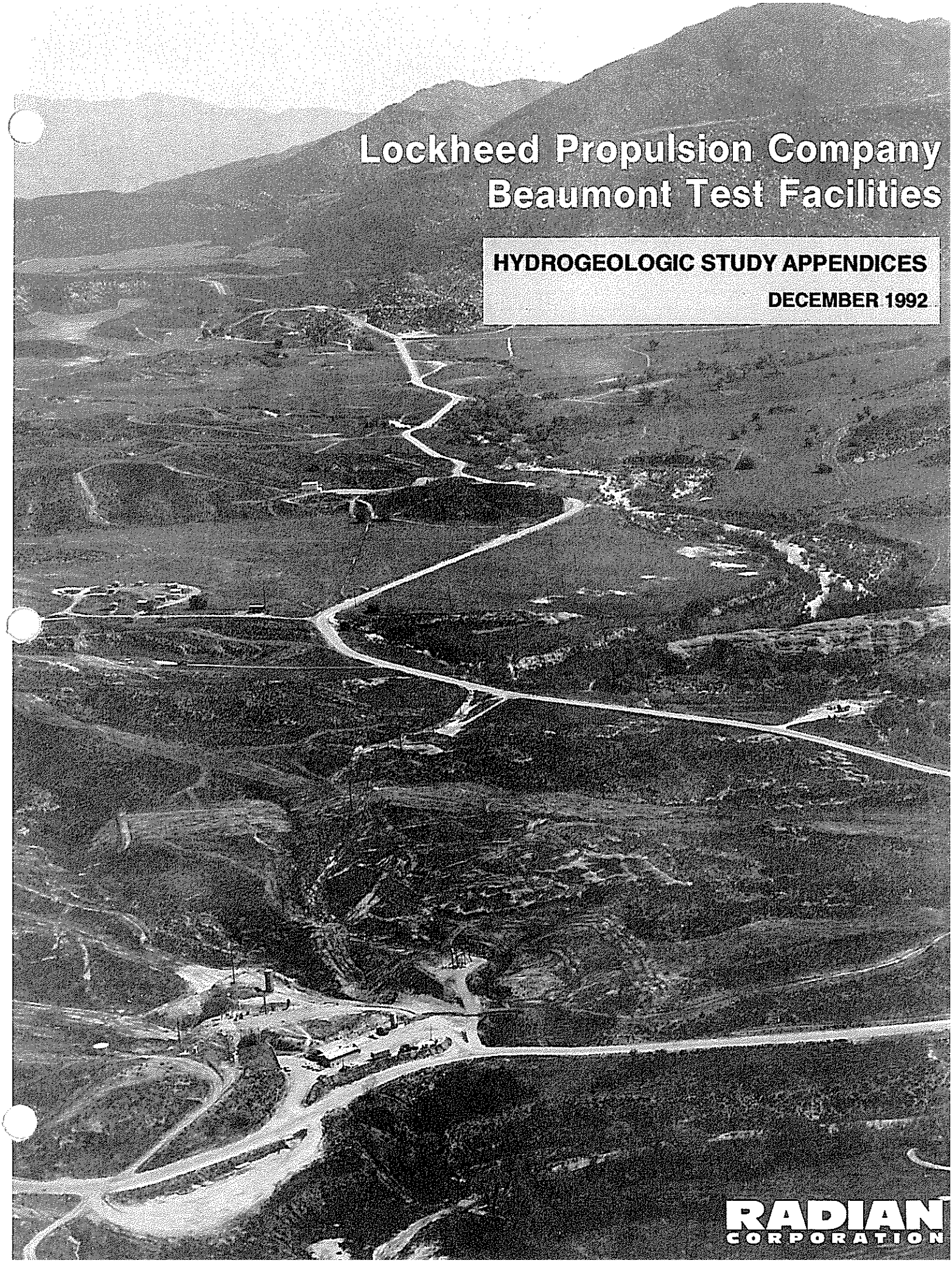
35. United States Environmental Protection Agency, "Test Methods for Evaluating Solid Waste (SW-846)," Third Edition, November 1986.

36. United States Geological Survey, 1971, "A Summary of Methods for the Collection and Analysis of Basic Hydrologic Data for Arid Regions," S.E. Rantz and T.E. Eakin. Open File Report no. 72-305, February, 1971.

37. Walton, W.C., 1984, "Practical Aspects of Ground Water Modeling," National Water Well Association.

38. United States Geological Survey, 1985, "Study and Interpretation of the Chemical Characteristics of Natural Water," Third Edition, J.D. Hem, Water Supply Paper 2254.

39. Woodward Clyde Consultants, 1989. Potrero Reservoir Site Area Geology Map (Scale/inch = 1,000 feet), September 1989.



Lockheed Propulsion Company Beaumont Test Facilities

HYDROGEOLOGIC STUDY APPENDICES

DECEMBER 1992

RADIAN CORPORATION

RADIAN
CORPORATION

DCN 92-290-062-07
PN 290-062-02-02

LOCKHEED PROPULSION COMPANY
BEAUMONT NO. 1 FACILITY
HYDROGEOLOGIC REPORT

APPENDICES

Prepared for:

Lockheed Corporation
4500 Park Granada Boulevard
Calabasas, California 91399

Prepared by:

Radian Corporation
10389 Old Placerville Road
Sacramento, CA 95827

1 December 1992

RADIAN CORPORATION

LIST OF APPENDICES

APPENDIX A: SEISMIC SURVEY

APPENDIX B: ON-SITE LABORATORY SUMMARY

APPENDIX C: BORING LOGS, WELL DIAGRAMS AND SURVEYOR'S RECORDS

APPENDIX D: AQUIFER TEST ANALYSES

APPENDIX E: WATER LEVEL DATA AND HYDROGRAPHS

APPENDIX F: LABORATORY RESULTS FOR SOIL VAPOR, SOIL, AND GROUNDWATER

APPENDIX G: QUALITY ASSURANCE/QUALITY CONTROL SUMMARY FOR SOIL VAPOR, SOIL, AND GROUNDWATER

RADIAN CORPORATION

APPENDIX A

SEISMIC SURVEY

1.0 INTRODUCTION

This appendix summarizes the seismic survey performed at the site on 14 and 15 November 1990. The purpose of the survey was to provide additional information regarding the subsurface contact between Quaternary alluvium present in the burn pit area, and the underlying Mount Eden Formation.

During drilling of initial boreholes for the Treatability Study, it was determined that the alluvium/Mount Eden Formation contact beneath the burn pits and in the surrounding area was variable in depth. As a result, the depth to the Mount Eden Formation was recognized as an important factor in the nature of groundwater flow in the area. A clear understanding of the geologic conditions and groundwater flow is necessary for efficient groundwater remediation.

A refraction seismic survey was proposed as a method for defining the Mount Eden contact. On being authorized, Radian subcontracted with Gasch and Associates to conduct a seismic survey over the area of interest.

It was generally believed that the Mount Eden Formation, which was known to be more dense and less permeable than the alluvium, would have a higher seismic wave velocity and, therefore, be detectable by the refraction seismic method. This method utilizes an energy source at the ground surface to generate a compressional wave that radiates out in all directions from the source. The wave travels into and through the ground with a velocity that is a function of the properties of the material through which it is traveling.

Geophones are spaced along the ground surface and respond to the energy of the seismic wave as it reaches them. The refraction method utilizes only the first energy impulse that arrives at each geophone. Because only the first arrival is used, the recording instrument amplifies the signal from the geophone so that the recorded wave

has a sharp break at the "arrival time," and then goes offscale. This gives a good definition of the arrival time, but causes later arriving waveforms to be very difficult to detect and therefore much less usable.

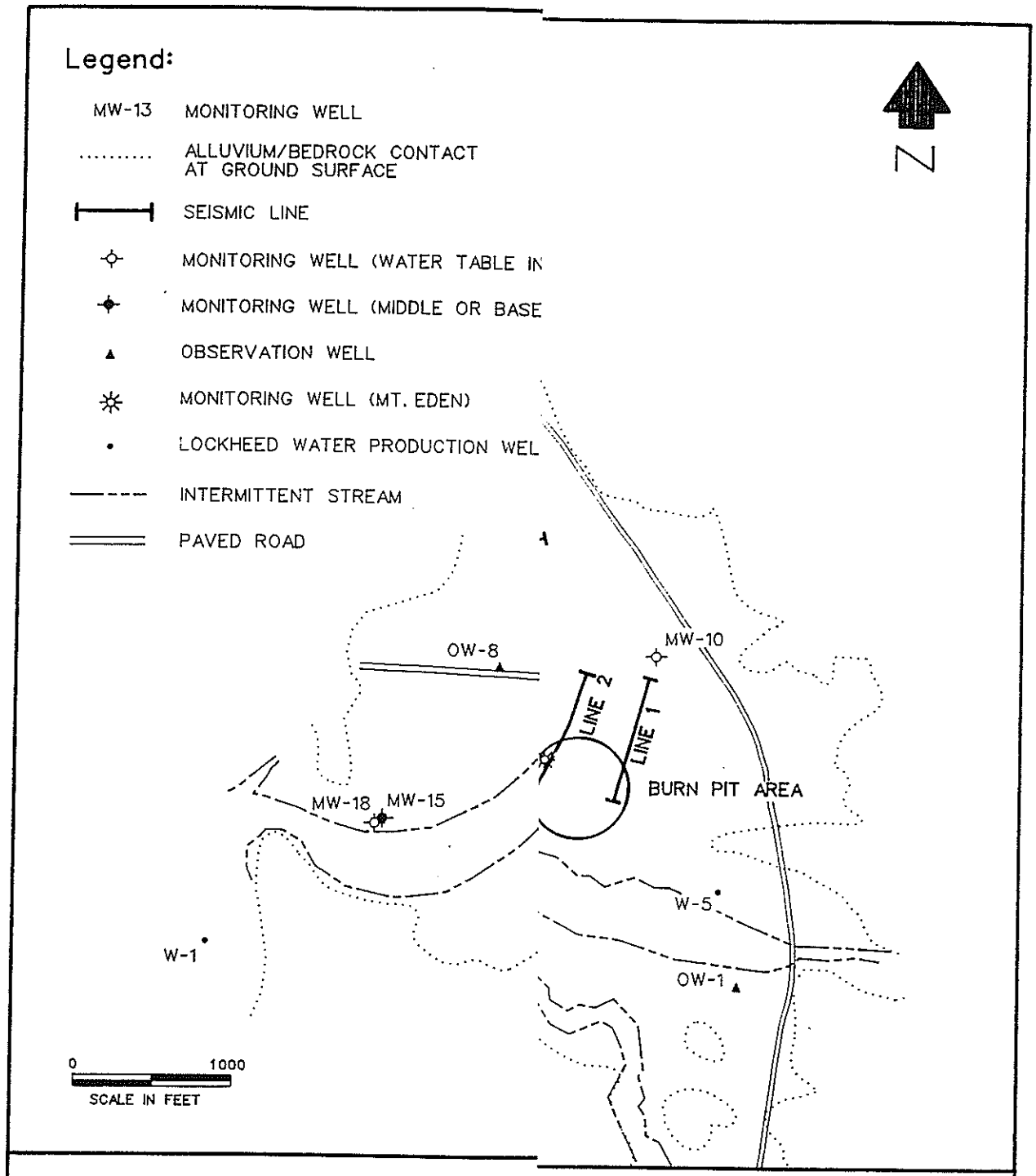
The time of each first arrival at each geophone is determined and is plotted in graphical format against the distance along the ground surface between the energy source and the arrival geophone. The first arrival signal is the one that traveled by the fastest path, but may not have traveled the shortest distance. Each "ray" of energy travels outward from the source at the velocity of the material in which it is traveling. When another layer of higher velocity is reached a new wave front is generated and that new wave then travels at the new velocity. At some distance from the energy source, waves traveling in a deeper higher velocity layer overtake those still traveling in the lower velocity layer and become the first arrivals at more distant geophones. These deeper traveling waves are returned to the ground surface by refraction, hence the method is called the refraction method. A mathematical relationship exists between the velocity of individual layers, the refraction angle, and the depth to each layer.

2.0 SCOPE OF WORK

Gasch and Associates conducted the survey by completing five refraction seismic lines along five traces. The locations of the lines are shown on Figure A-1. Each line was "shot" in both the forward and reverse direction using a weight dropped by a drill rig as an energy source and 24 - 14 hertz geophones to receive the signals. The signals were recorded with a 24 trace Digital High Resolution recording system which produced both a hard copy and a magnetic tape recording.

The hard copy was examined in the field and a field interpretation made by Mr. Casey Endacott, a subcontractor to Gasch and Associates. Mr. Endacott selected arrival times and performed preliminary processing and interpretation using a portable PC. This preliminary interpretation of each line was then used as a guide to the

RADIAN CORPORATION



igure A-1. Lockheed Beaumont No. 1 Location of Seismic Lines

LOCKHG2 SEISMIC 09/30/92

placement of subsequent lines. A Radian geophysicist, Mr. Elgar Stephens, provided technical input during and after the field work.

3.0 FINDINGS

Based on the field work, a seismic survey report was prepared by Gasch and Associates. The report is presented at the back of this appendix.

The preliminary interpretation of the data indicated a rather irregular "bedrock" (i.e., Mount Eden Formation) interface. Because of this irregularity, Mr. Endacott was asked to rework the data and provide another interpretation. Concurrently, Elgar Stephens used hand-drawn time distance graphs to develop an interpretation of the subsurface at each of the five lines.

Known depths to groundwater or Mount Eden Formation from existing wells were incorporated into the interpretations. The interpretations indicated an irregular Mount Eden surface but did not provide enough data to confirm the presence of either faults or buried ridges, the hypothesized explanations for the irregularities.

It was then recommended that the raw seismic data be processed for seismic reflectors. This plan was approved and the tape data were sent to Excel Geophysical Services in Colorado and to Mr. Scott Hulse with Lockheed in Las Vegas.

The data were given single-fold processing by Excel and did show reflectors, although most of them were too deep to be of practical value. The shallowest reflectors were found at a depth that corresponded to a travel time of about 30 milliseconds. Thus the shallowest reflection point detected was at a depth of about 36 feet. Depths were determined beneath all lines that provided enough of a reflection to be of use. Unfortunately, because of the high amplification of the incoming signal, reflections were not visible within that part of the records after the first arriving signal

was received and before the high amplification had died out. This allowed only very limited and somewhat tentative reflection traces to be defined within the first 60 to 100 feet of the surface. Good reflectors are visible on the records but are at depths of 150 to 500 feet.

It is the opinion of the subcontractor, Gasch and Associates, that a reflection seismic study would be successful at delineating the subsurface of the site. Based on the evidence of this study, Radian agrees that this is probably the case. Such a study would require a more intensive field effort and be significantly more costly to conduct.

Interpretations of Individual Lines

Seismic Line 1

The following paragraphs provide a summary of the interpretation from each of the five seismic lines. Information is separated into Refraction, Reflection, interpretations, and related drilling or well data.

Refraction

The refraction method indicates a 50-80 feet thick layer of low velocity alluvium overlying a higher velocity material (likely Mount Eden Formation). The averaging nature of this method indicates the interface to be subparallel to the ground surface.

Reflection

There are three reflections visible with the shallowest from a depth of about 55 feet and the next deeper one at about 180 feet. Both depths seem to be in agreement with refraction depths.

Drilling Data

The Mount Eden Formation was found to be at a depth of 52 feet in Boring FS-23, which is located near the middle of this seismic line.

Seismic Line 2

Refraction

This method indicates three layers under the south end of the line and a very high velocity layer at a shallow depth under the north end of the line. Thickness of the alluvium is indicated to be about 50 feet at the south end with another higher velocity layer at a depth of about 100 feet.

Reflection

The shallow reflections were not visible on the records. The shallowest reflector that was visible was at a depth of about 250 feet.

Drilling Data

The Mount Eden Formation was encountered at a depth of about 50 feet in wells MW-24 and MW-26 and well MW-27. These wells are located near the southern end of the line. Data from Borings FS-25 and FS-26 at the north end of the

seismic line determined that the shallow high velocity interface near the north end of the line was incorrect. Consequently, the apparent high velocity may be the result of the seismic wave being carried by an unknown foreign object or material.

Seismic Line 3

Refraction

This method found the alluvium extended to a depth of about 70-75 feet, a significantly higher velocity layer beneath that depth and an extremely high velocity layer at a depth of about 160 feet.

Reflection

There are three reflections visible on the records, with the shallowest one from a depth of about 70 feet. The next deeper reflector is from a depth of about 150 feet.

Drilling Data

The south end of this line is close to well MW-4, which did not penetrate the Mount Eden Formation, but does show the water table to be at a depth of 69 feet. Well MW-4 extends to a depth of 85 feet.

Seismic Line 4

Refraction

This method detected three layers beneath the south end of the line and two beneath the north end. The low velocity layer was found to extend to a depth of about 50 feet beneath the south end and to about 70 feet beneath the north end.

Reflection

The shallowest reflector was from a depth of about 55 feet. The next deeper reflector was at a depth of about 180 feet.

Drilling Data

No formation information is available beneath this line. Water level data projected from some distance indicate the water table is at a depth of about 75 feet.

Seismic Line 5

Refraction

This method found three layers with the lowest velocity material extending to a depth of approximately 23-25 feet. A high velocity material was interpreted to be below a depth of about 65 feet on the south end and below about 140 feet on the north end.

Reflection

Only reflections from relatively deep layers were visible on the records. The shallowest reflector is at a depth of about 150 feet.

Drilling Data

Well MW-6 is at the north end of this line and MW-19 is at the south end. There is no information available on formational contacts but the water table is found at a depth of 30 feet on the south end and 20 feet on the north end.

There is rather good agreement between the depths indicated by both seismic methods and the data from borings and wells. Unfortunately, the usefulness of these data points is less than might be supposed. Because of the extreme irregularity of the top of the Mount Eden, the projected depths from the refraction seismic method do not adequately define the interface. The reflection method should be better at depicting such irregularities, but in this case was limited by the sparse raw data that resulted from both the use of high amplification and the method of generating and receiving the signals. Thus the good agreement is supportive but does not define the interface.

BEAUMONT, CA REFRACTION SEISMIC SURVEY

AT LOCKHEED SITE

FOR

RADIAN CORPORATION
(S115511)

GASCH & ASSOCIATES • P.O. BOX 661013 • SACRAMENTO, CA 95866 • (916) 635-8906 • FAX (916) 635-8907

January 3, 1991

Mr. Elgar Stephens
RADIAN CORPORATION
10395 Old Placerville Road
Sacramento, CA 95827

Re: Beaumont - Lockheed Refraction Seismic Survey
G&A Project No. 9068

Dear Mr. Stephens:

As requested and authorized by purchase order No. S115511, Gasch & Associates has completed 10 refraction seismic lines at locations selected by Radian Corporation personnel.

The purpose of the seismic survey was to aid in determining the depth and configuration of the higher velocity "bedrock" beneath the site. To accomplish this, Gasch & Associates utilized a 24 trace Digital High Resolution seismic recording system. All data was recorded on 1/2 inch 1200 BPI magnetic tape and a hard copy field record was generated from a "shot point" stacked energy source.

As the field records were generated, they were picked and the data entered into a portable PC for preliminary processing and interpretation.

The field generated "bedrock" profiles were then tied to existing drill hole data and this information was used to determine the location of additional lines to be acquired.

The energy source was a 300 pound weight drop operated from the cat head of the West Hazmat drill rig. After several tests using various numbers of impacts we found that typically 10 impacts were adequate to generate a good quality record. Each of the ten lines shot had 24 - 14 hertz geophones spread at 20 foot intervals giving a 460 foot spread. Energy was input at 20 feet and 100 feet off each end of each line. This gave a length of 660 feet for each line.

During the survey a total of five areas were selected for refraction profiles. Locations of all lines were plotted on field maps maintained by Radian Corporation personnel. Gasch & Associates had only a rough field copy of the site map and it is not included with this report.

After a preliminary look at the field processed bedrock profiles, Mr. Endacott of Endacott & Associates Inc., who was contracted by Gasch & Associates to complete the refraction data reduction and bedrock profiles was requested to rework the critical data. The final profiles were sent to Jeffery Hensel of

Radian as requested by Radian personnel. Gasch & Associates received a fax copy of the final product and copies are attached as received.

In summary, it became apparent that the "bedrock" surface which we were attempting to map with refraction methods is quite irregular. Later drill hole data tended to further confirm that theory.

In a further effort to understand the subsurface configuration Gasch & Associates was asked by Radain to submit the magnetic data tape for single fold reflection processing. After considerable effort by the processor, Excel Geophysical Services of Englewood, Colorado, a single fold stack was generated for each series of lines. Line 4, forty eight stations in length, is included as an example of the reflection data. It should be noted that the data was not originally shot with reflection parameters which are significantly different than for refraction data. After processing, the reflection data did show reflectors as shallow as about 60 milliseconds. Also, a more continuous reflector at 130 to 150 milliseconds is clearly evident and has been highlighted.

From the reflection processing results it is our opinion that a closely spaced and properly shot reflection survey would have generated diagnostic subsurface data.

In summary, the 6600 lineal feet of refraction line acquired gave a general picture of the "bedrock" surface beneath each line or series of lines. However, it appears that the irregular nature of the subsurface horizon considered as bedrock will require more detailed seismic data to be fully understood.

A future option would be closely spaced lines to allow the generation of a 3-D "bedrock" surface via the refraction or reflection technique.

Thank you for the opportunity to work with you on this interesting and challenging project.

Sincerely,

Kent L. Gasch
Geologist
Geophysical Technician

Jerrie W. Gasch
Registered Geologist No.1203
Registered Geophysicist No.516
Engineering Geologist No.450

ENDACOTT & ASSOCIATES, INC.
545 N. SUNNYSLOPE AVE.
PASADENA, CALIFORNIA 91107
(818) 577-2020

G&A 9068

November 19, 1990

RADIAN CORPORATION
7 Corporate Park Suite 240
Irvine, CA 92714

To: Jeffrey Hensel
(714) 261-8611
FAX (714) 261-6505
cc Elgar Stephens
(916) 362-2318

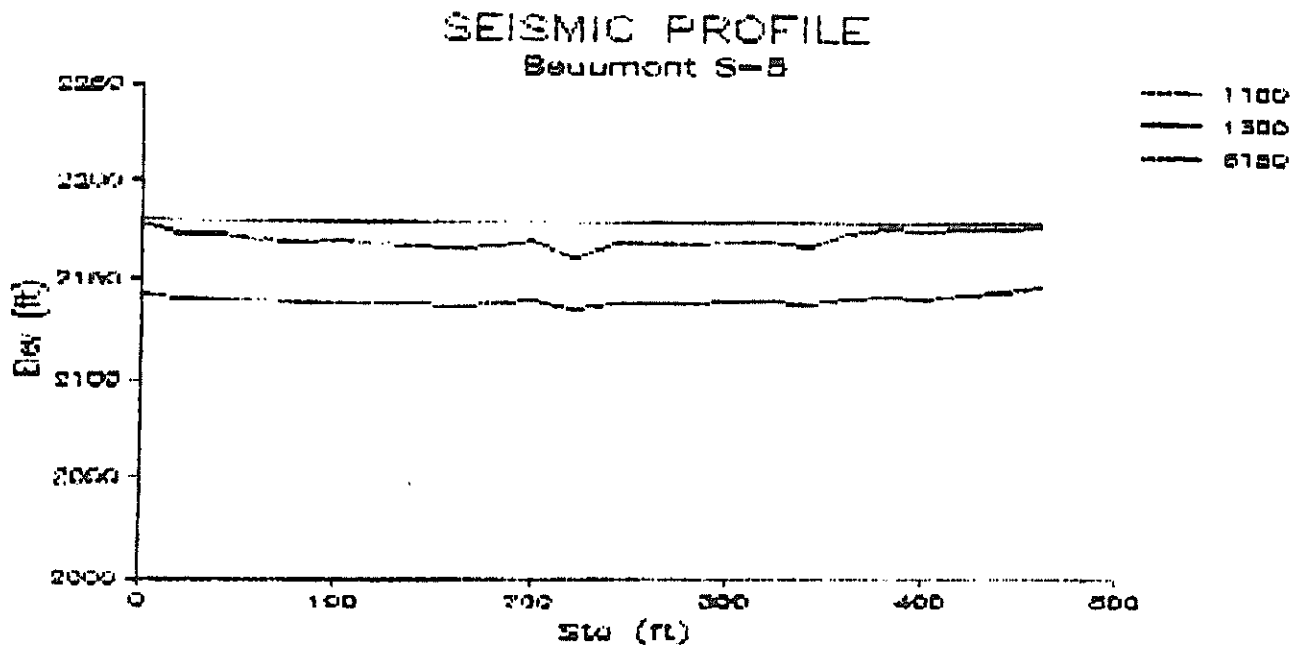
Seismic Profiles Lockhead Beaumont Lines S1 To S5

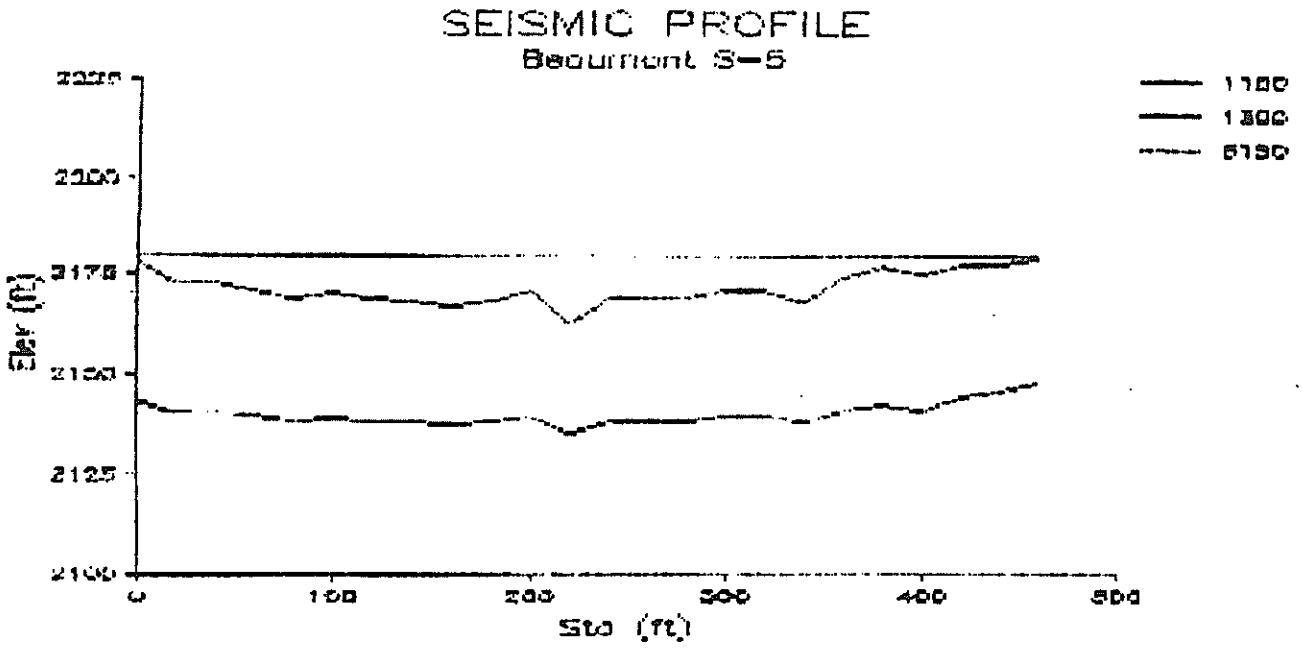
Be posted 11/21/90

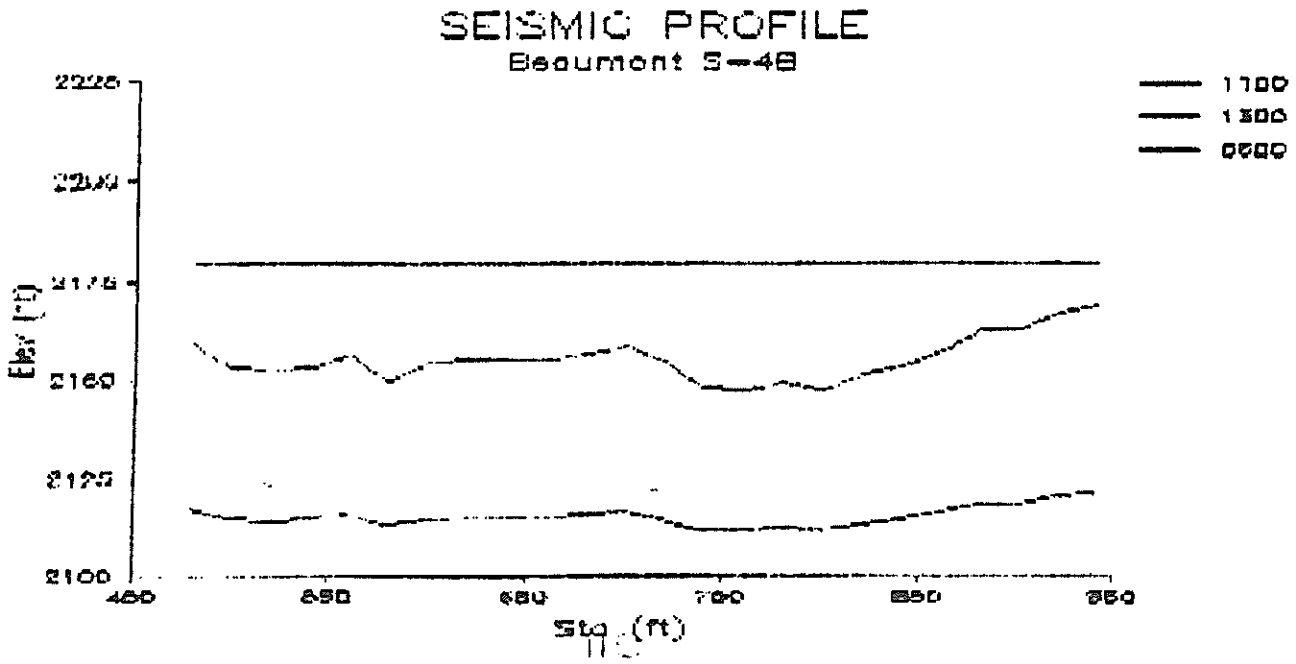
Fax

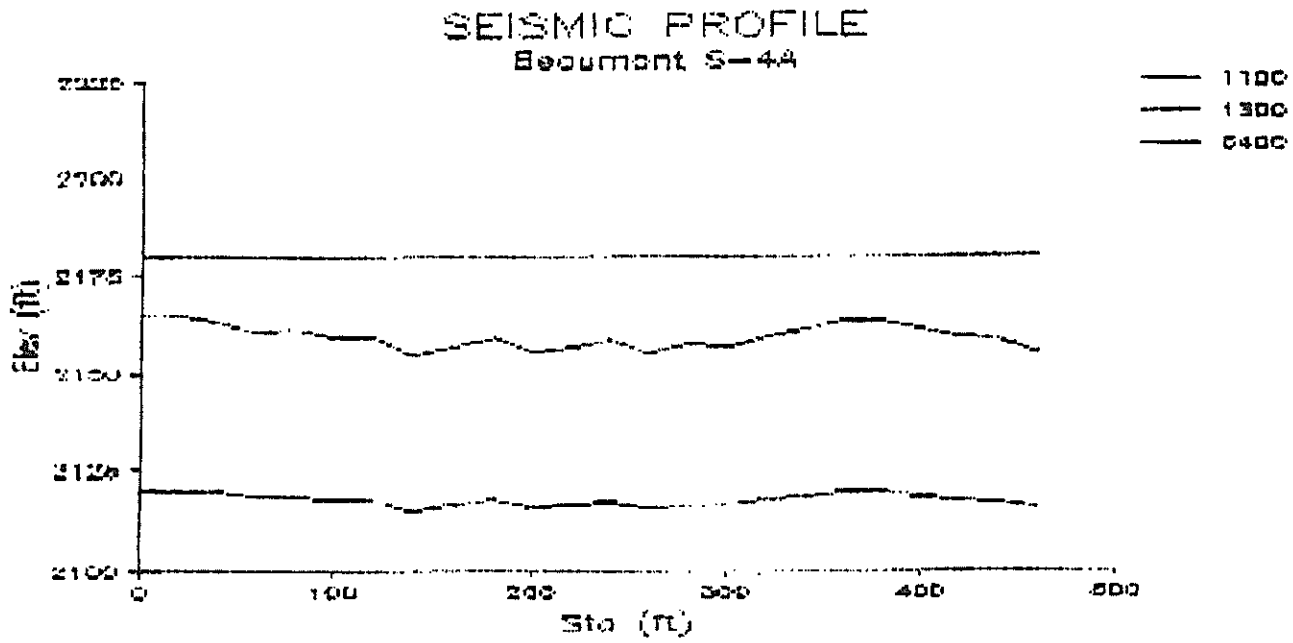
GASCH 11/26

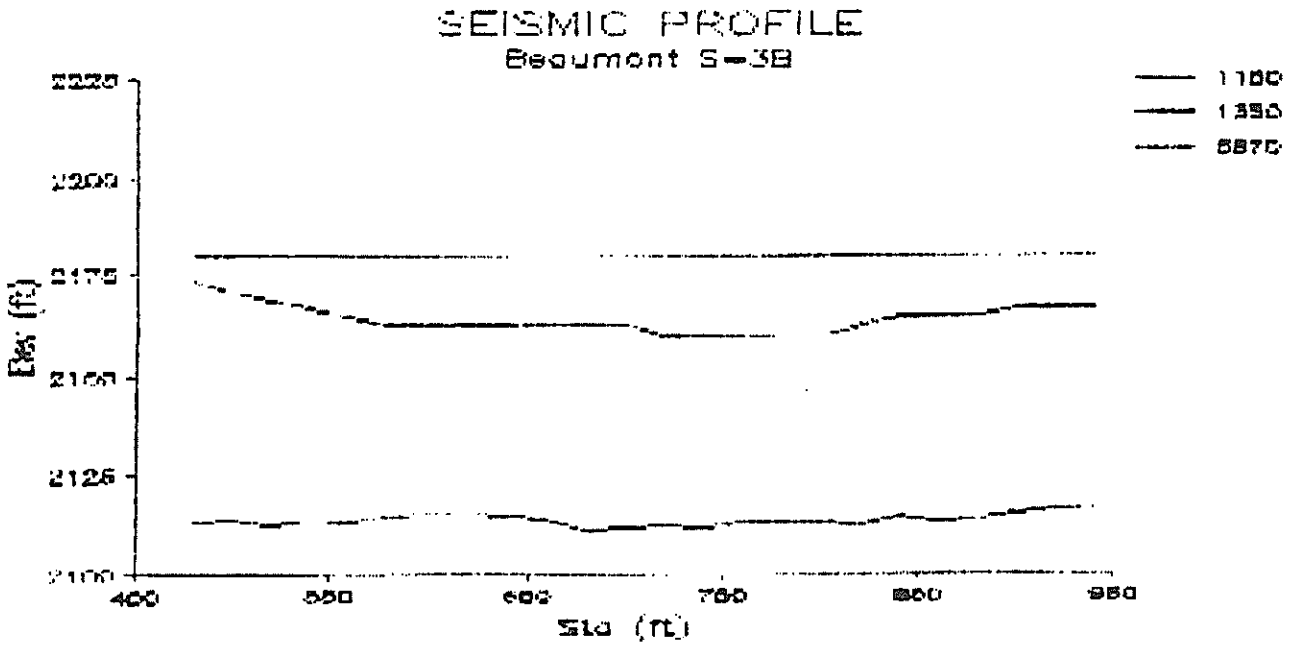
1-916 635 8907

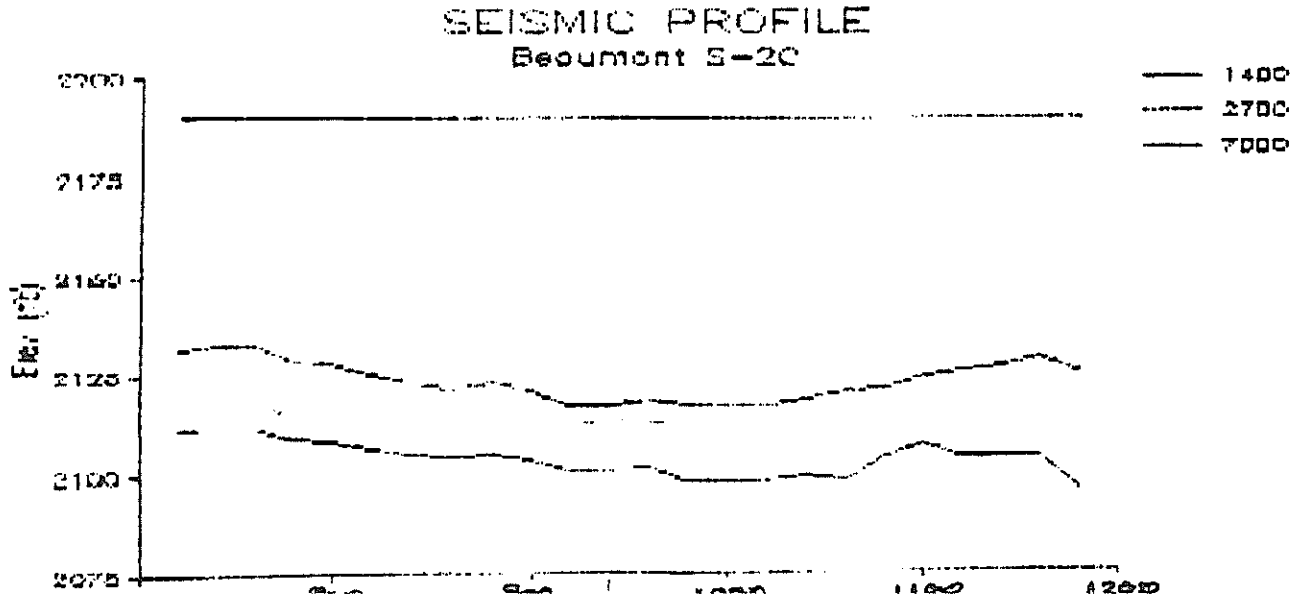

SEISMIC PROFILE
Beaumont S-5
1100
1300
6150
Elev (ft)
2200
2100
2000
0
100
200
300
400
500
Sta (ft)

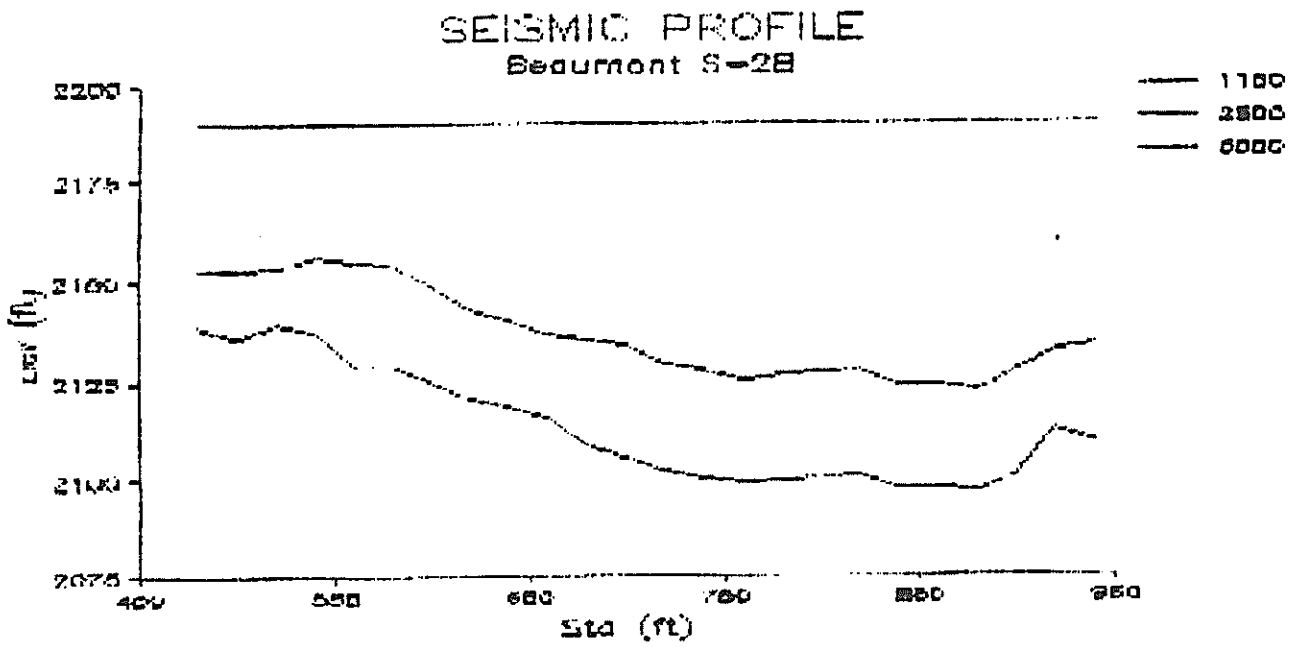

SEISMIC PROFILE
Beaumont S-5
1100
1300
6150
Elev (ft)
2200
2175
2150
2125
2100
0
100
200
300
400
500
Sta (ft)

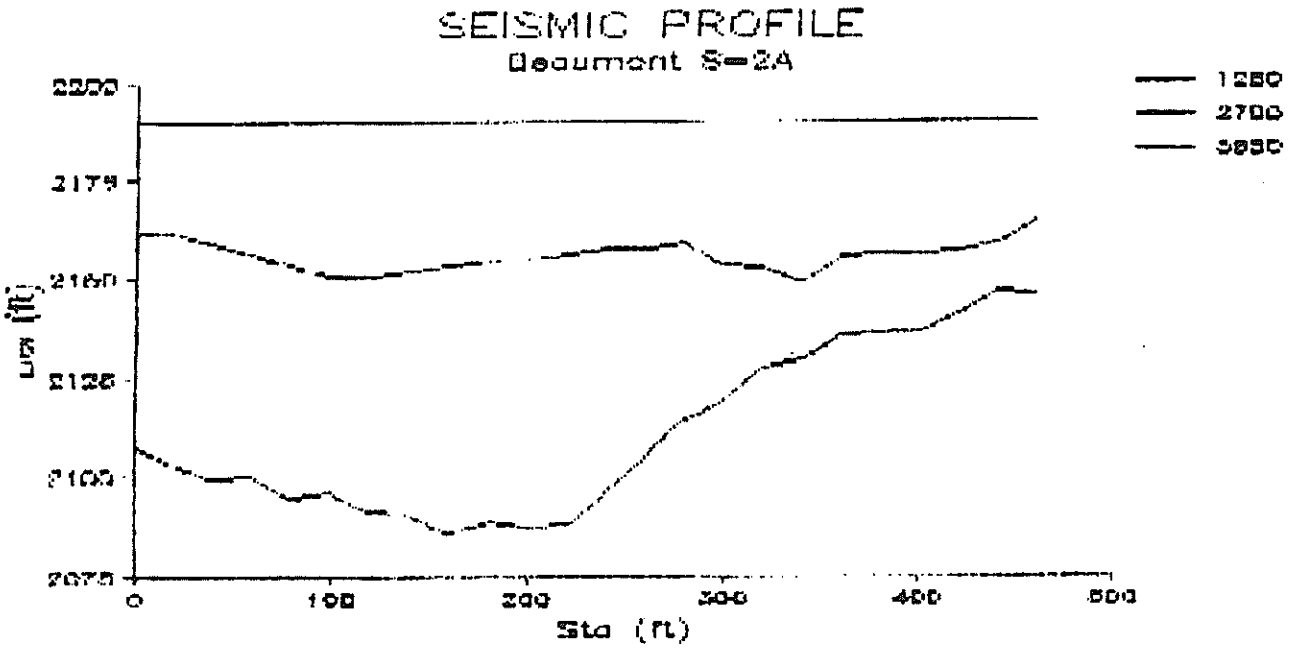

SEISMIC PROFILE
Beaumont S-4B
1100
1300
0000
Elev (ft)
2160
2100
650
700
750
Sta (ft)

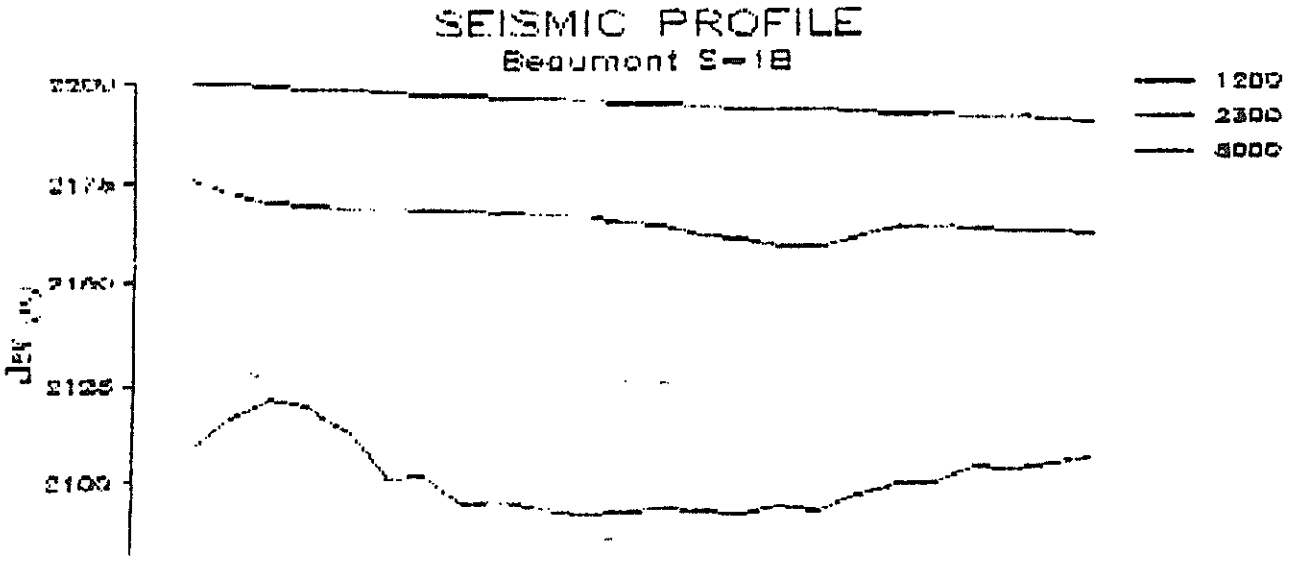

SEISMIC PROFILE
Beaumont S-4A
1100
1300
0400
2175
2100
0
100
200
300
400
500
Sta (ft)

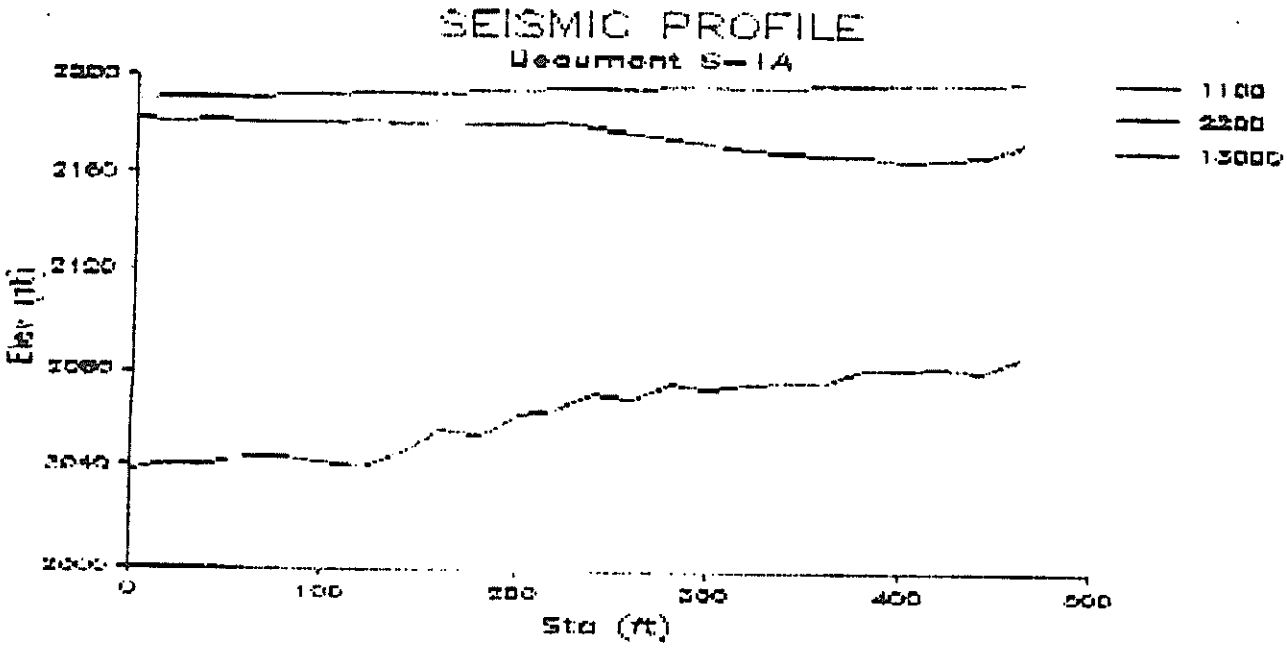

SEISMIC PROFILE
Beaumont S-3B
1100
1350
0870
2175
2126
400
550
700
850
950
Sta (ft)

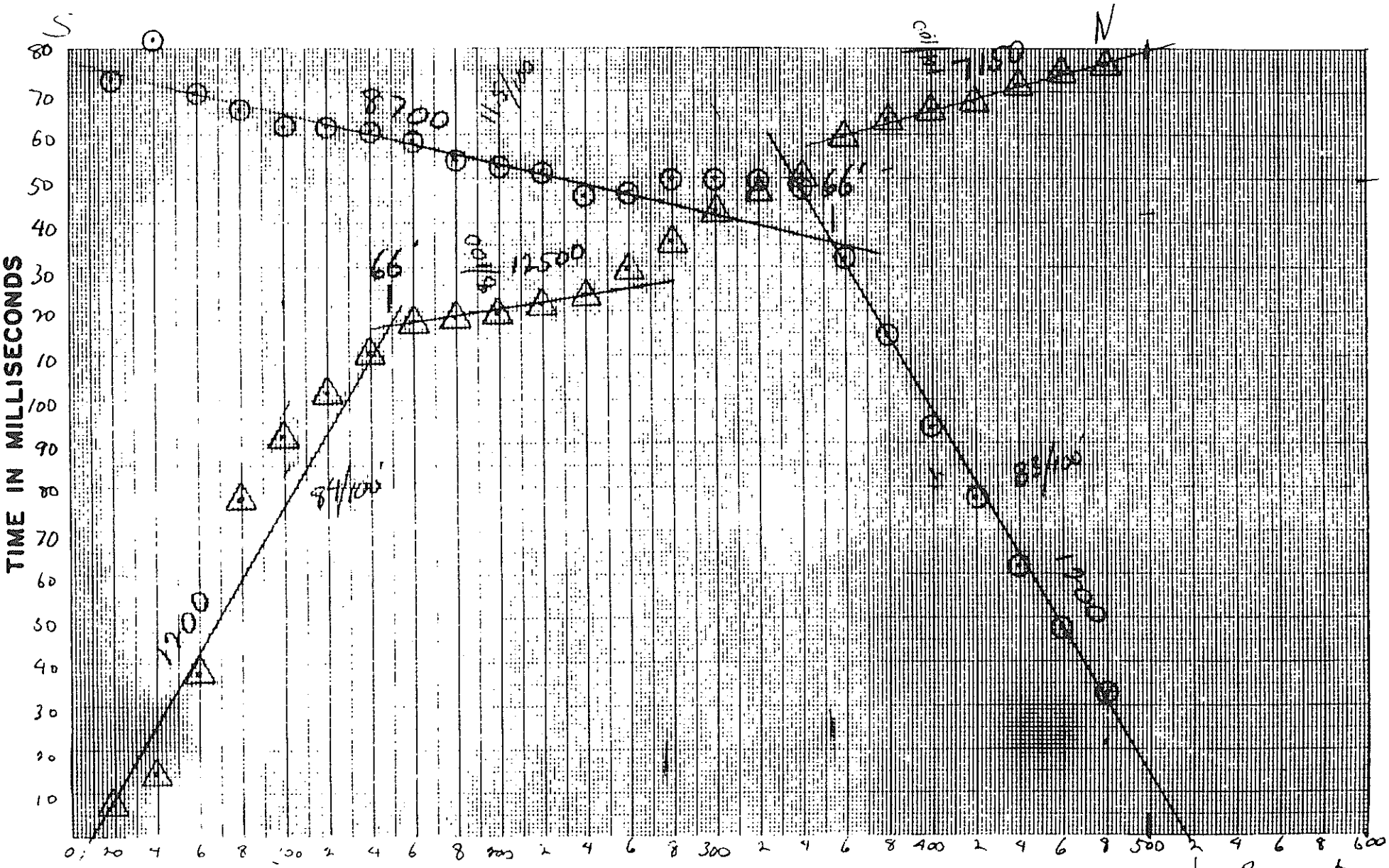

SEISMIC PROFILE
Beaumont S-2C
1400
2700
7000
2175
2125
2100


SEISMIC PROFILE
Beaumont S-2B
1100
2500
6000
2200
2175
2150
2125
2100
2075
Elev (ft)
400
550
600
750
850
950
Sta (ft)


SEISMIC PROFILE
Beaumont S-2A
1250
2700
5850
2200
2175
2150
2125
2100
2075
Elev (ft)
0
100
200
300
400
500
Sta (ft)

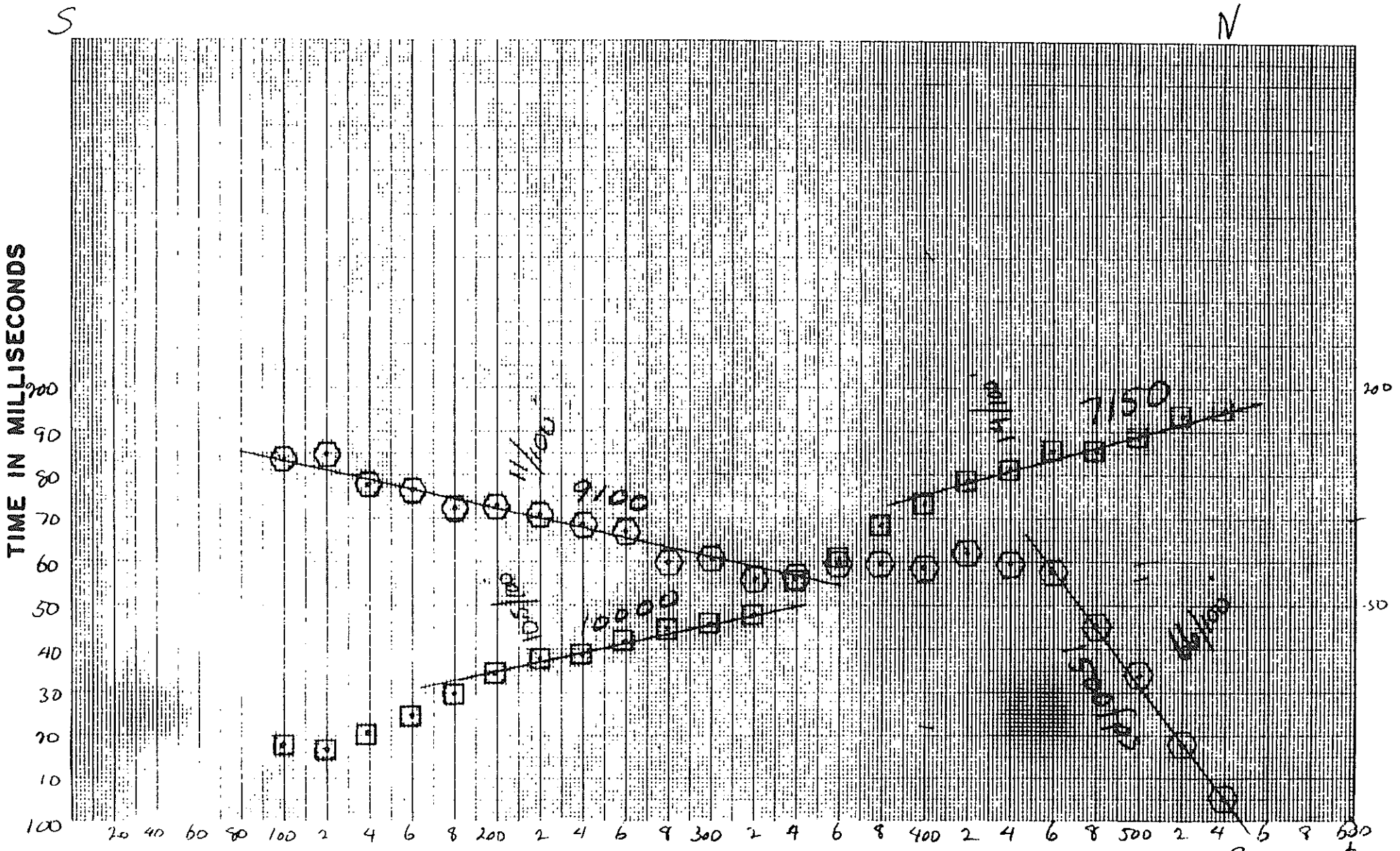

SEISMIC PROFILE
Beaumont S-1B
1200
2300
6000
2175
2125
2100
Elev (ft)


SEISMIC PROFILE
Beaumont S-1A
2200
2160
2120
2080
2040
2000
Elev (ft)
0
100
200
300
400
500
Sta (ft)
1100
2200
13000



TIME-DISTANCE GRAPH

Job No. Beaumont
Line No. 1A, 20' offset
Date 11/14/90



DISTANCE IN FEET

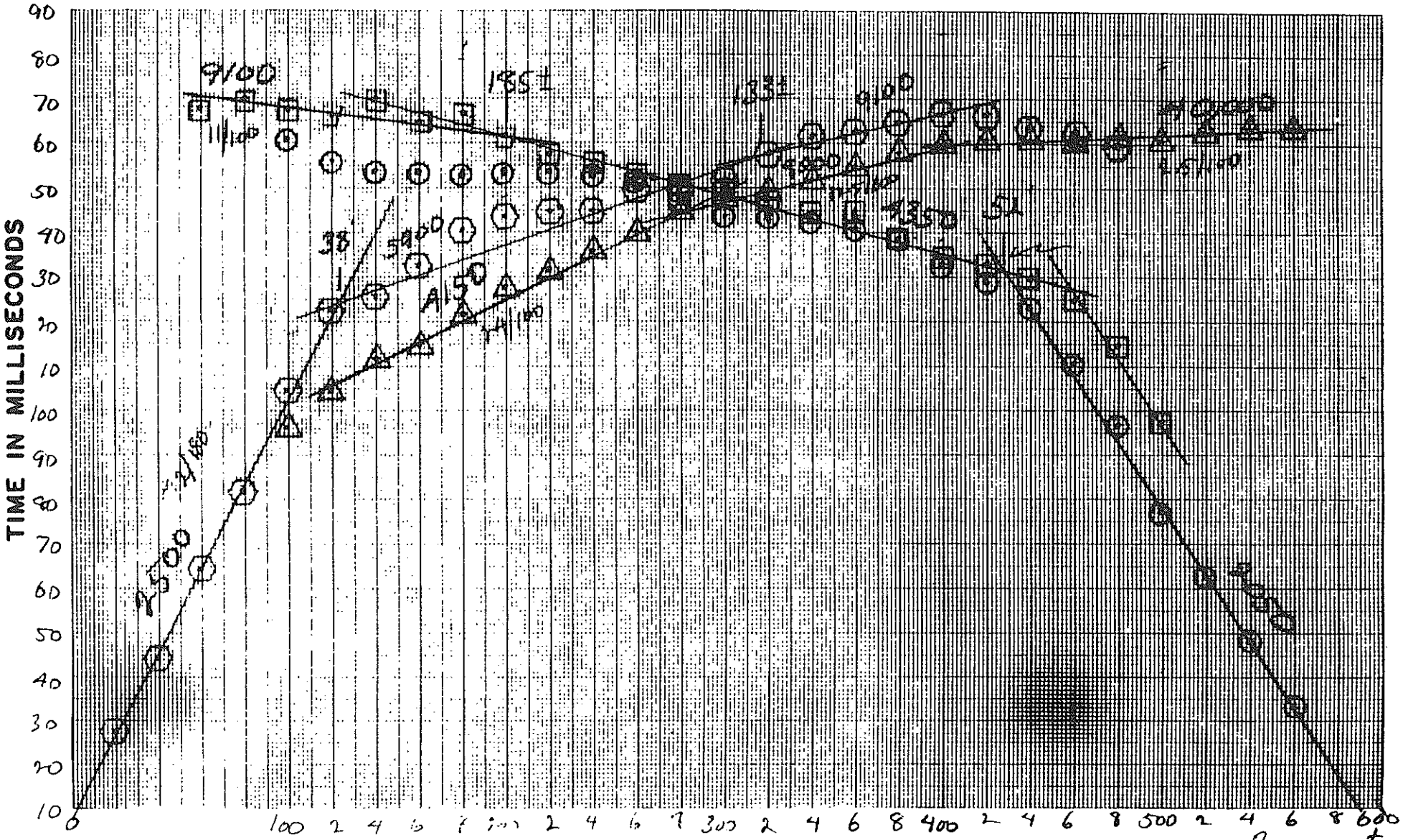
TIME-DISTANCE GRAPH

Job No. Beaumont

Line No. 1A, 100' offset

Date 11/14/90

S



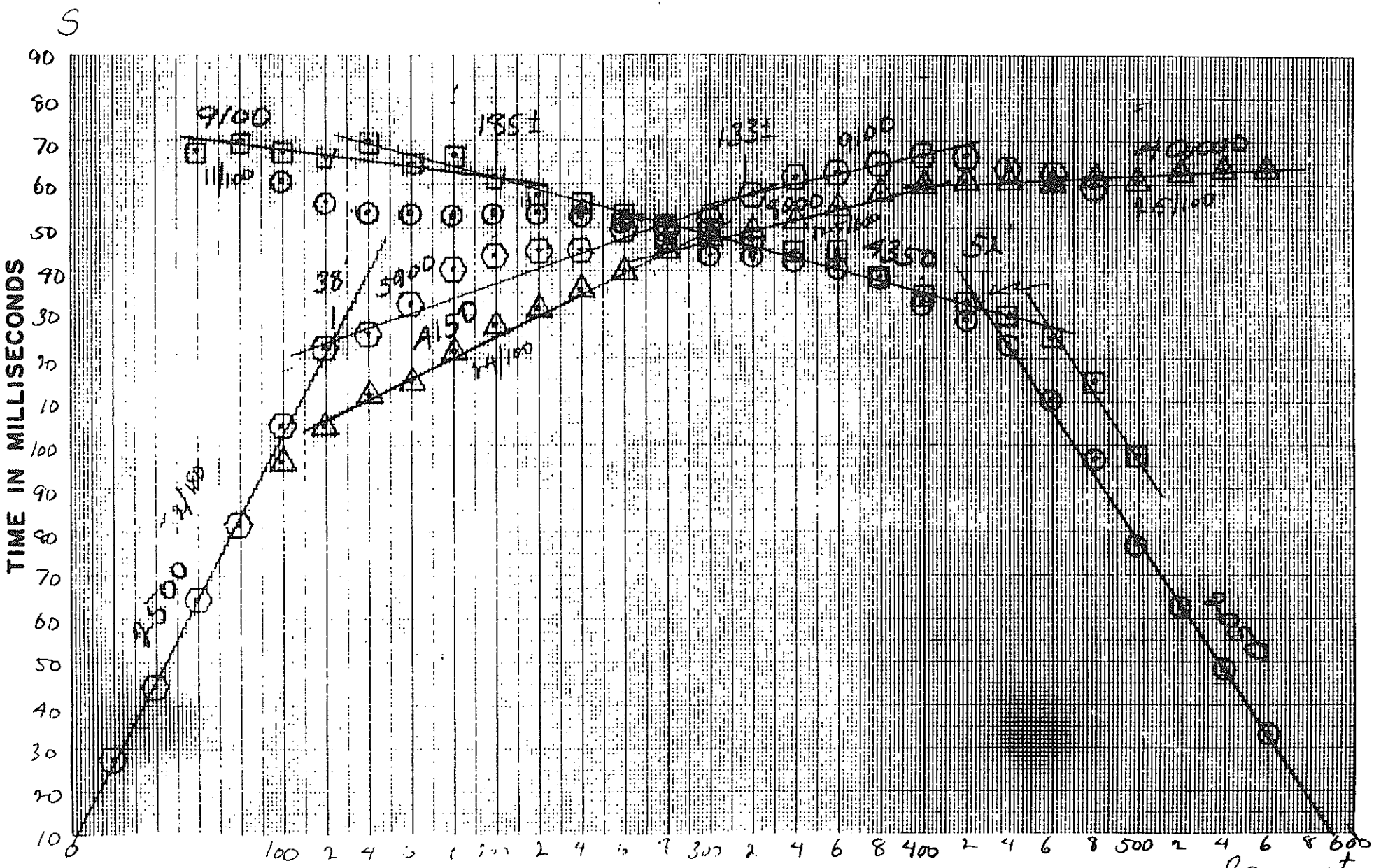
DISTANCE IN FEET

TIME-DISTANCE GRAPH

Job No. Beaumont

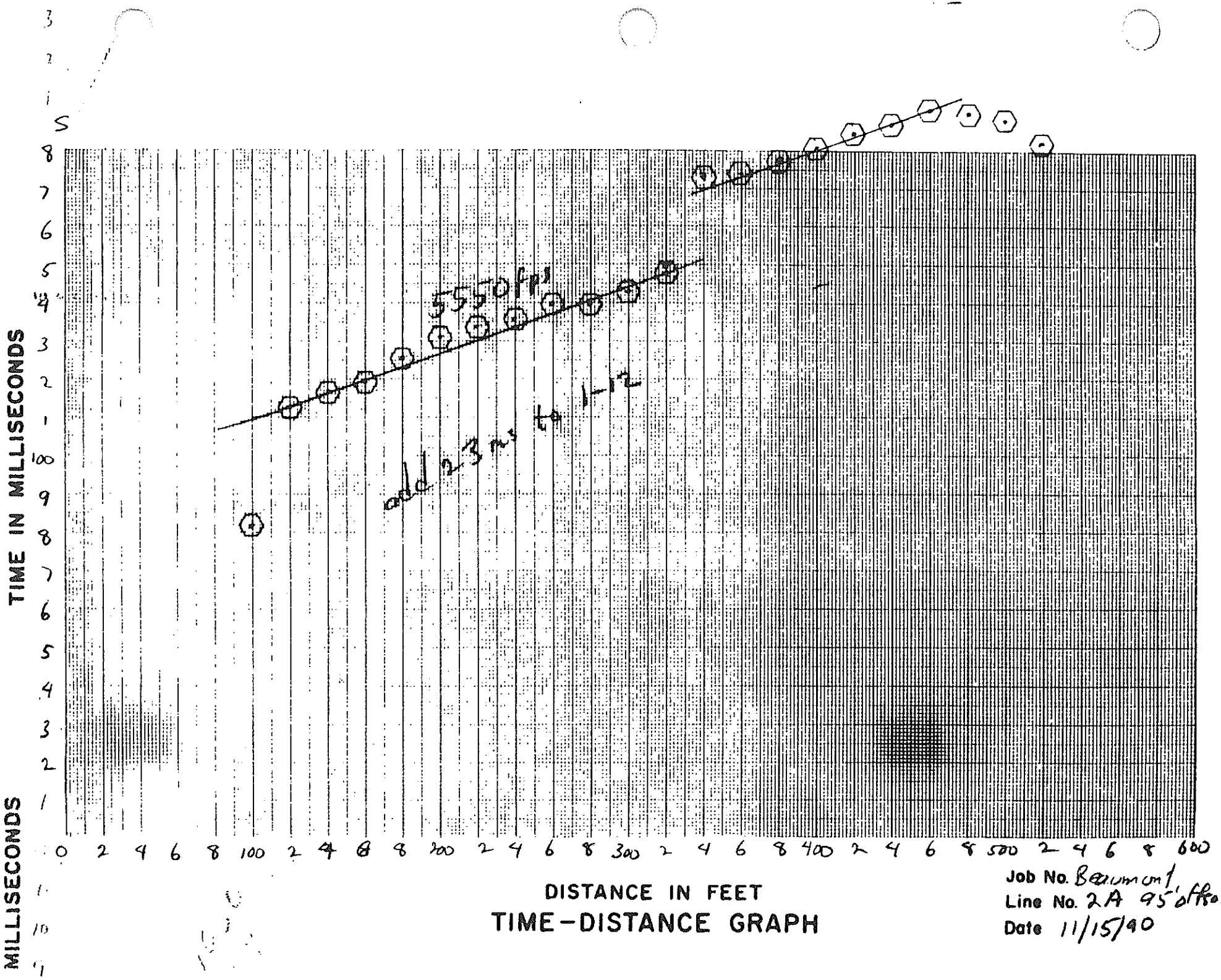
Line No. 1B, 100' offset

Date 11/14/90



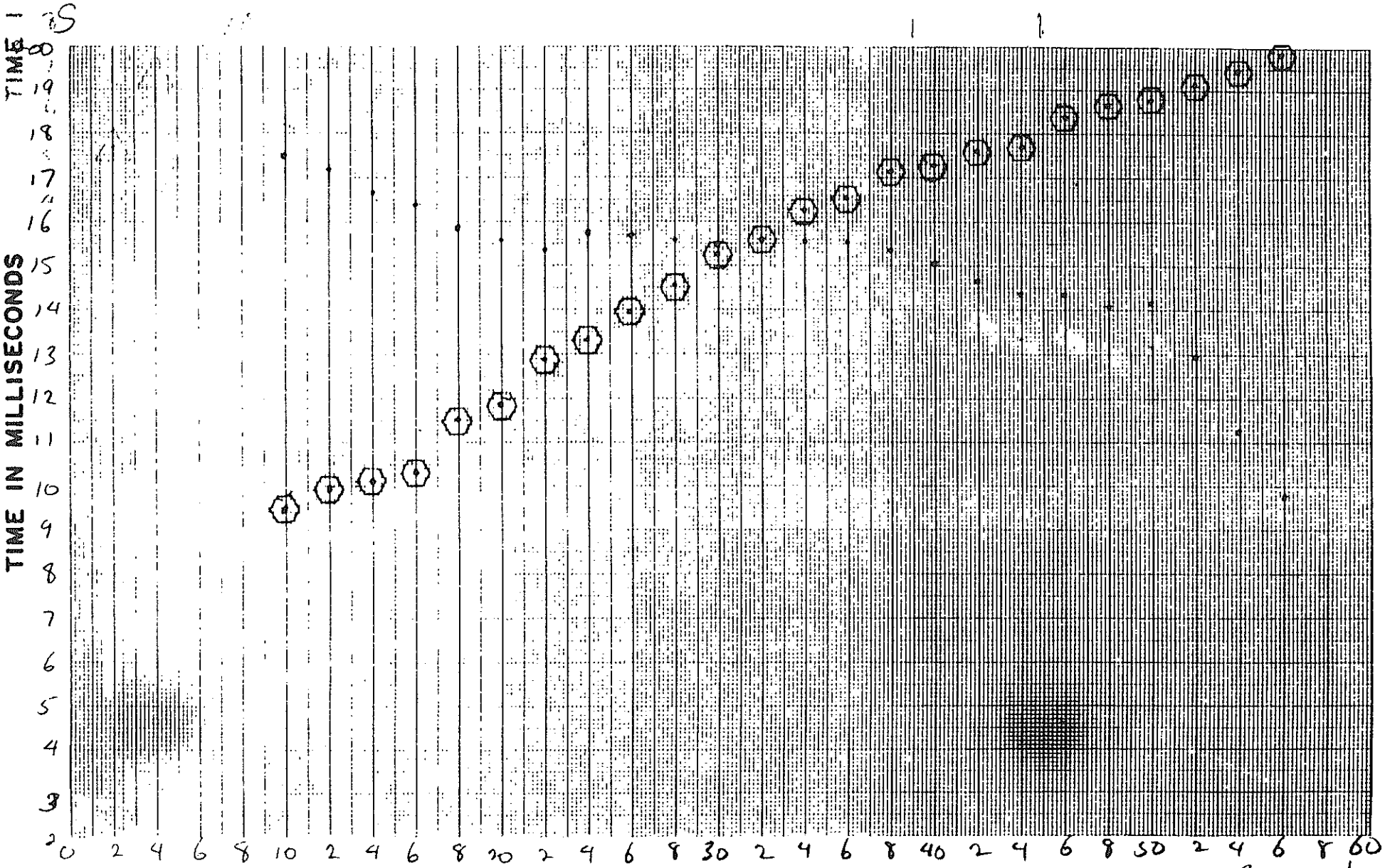
TIME-DISTANCE GRAPH

Job No. Beaumont
Line No. 1B 100' offset
Date 11/14/90



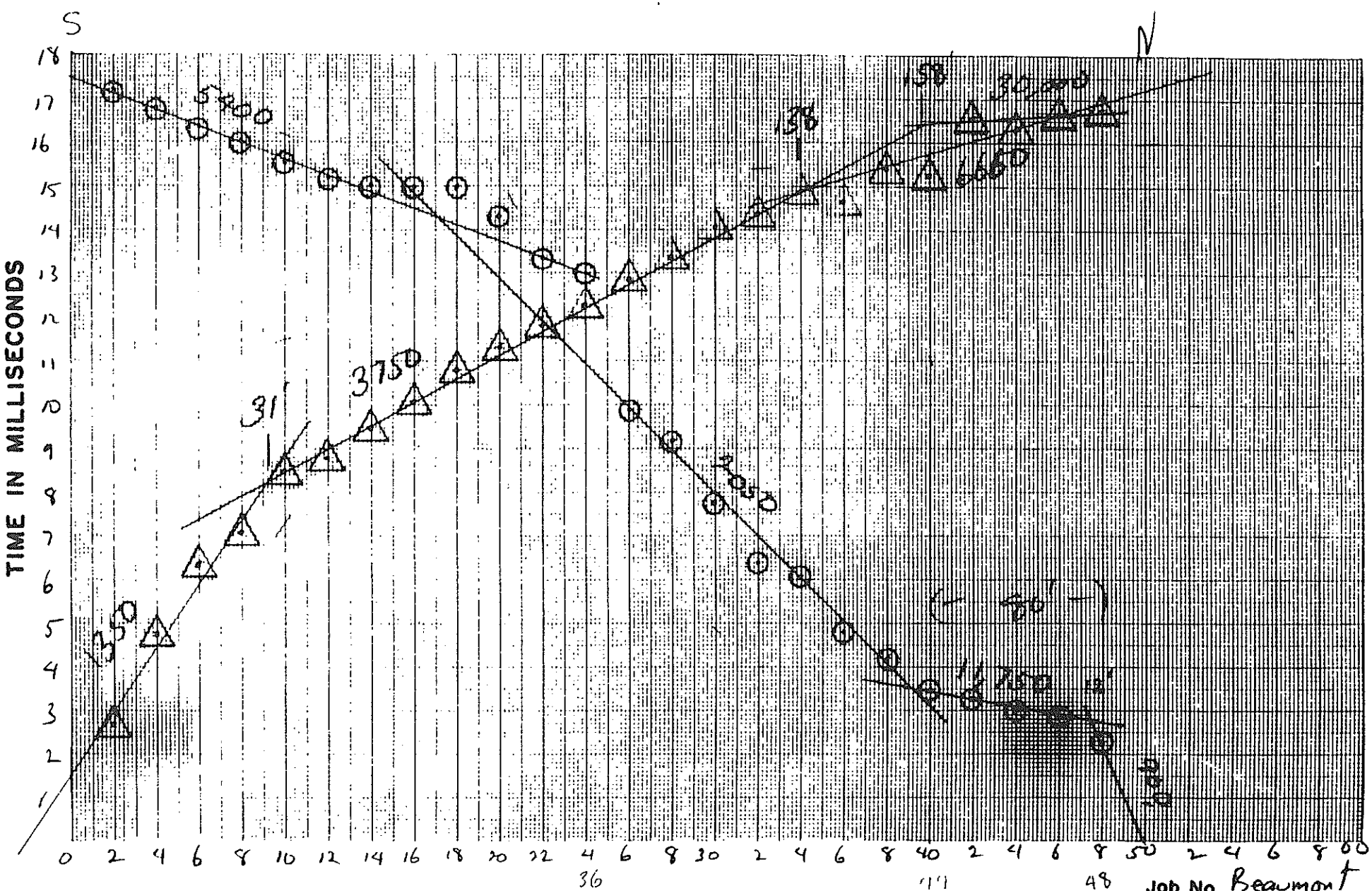
TIME–DISTANCE GRAPH

Job No. Beaumont
Line No. 2A 95' offset
Date 11/15/90



TIME-DISTANCE GRAPH

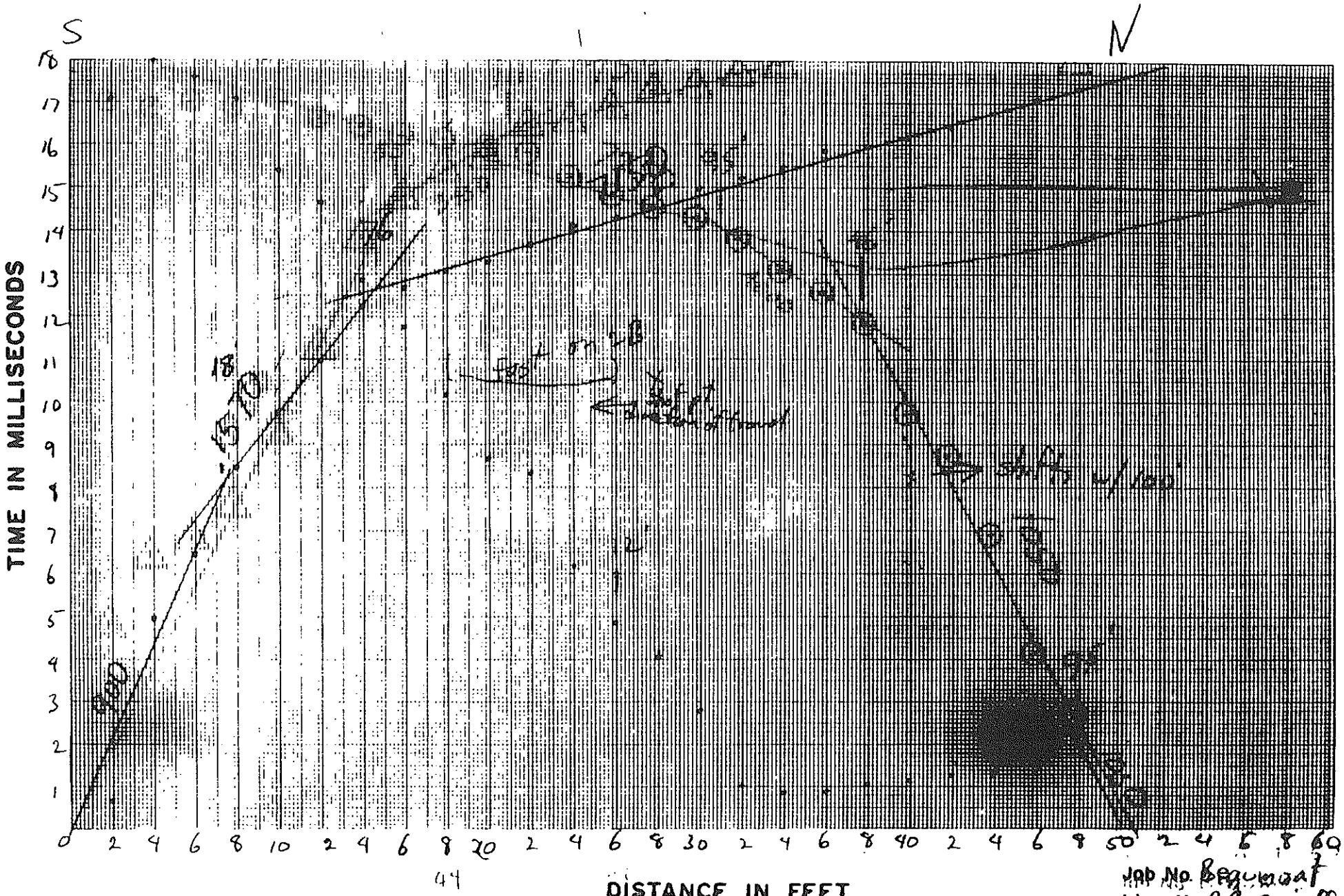
Job No. Beaumont
Line No. 2B 100' offset
Date 11/15/90



Job No. Beaumont
Line No. 2B 90' offset
Date 11/15/90

TIME-DISTANCE GRAPH

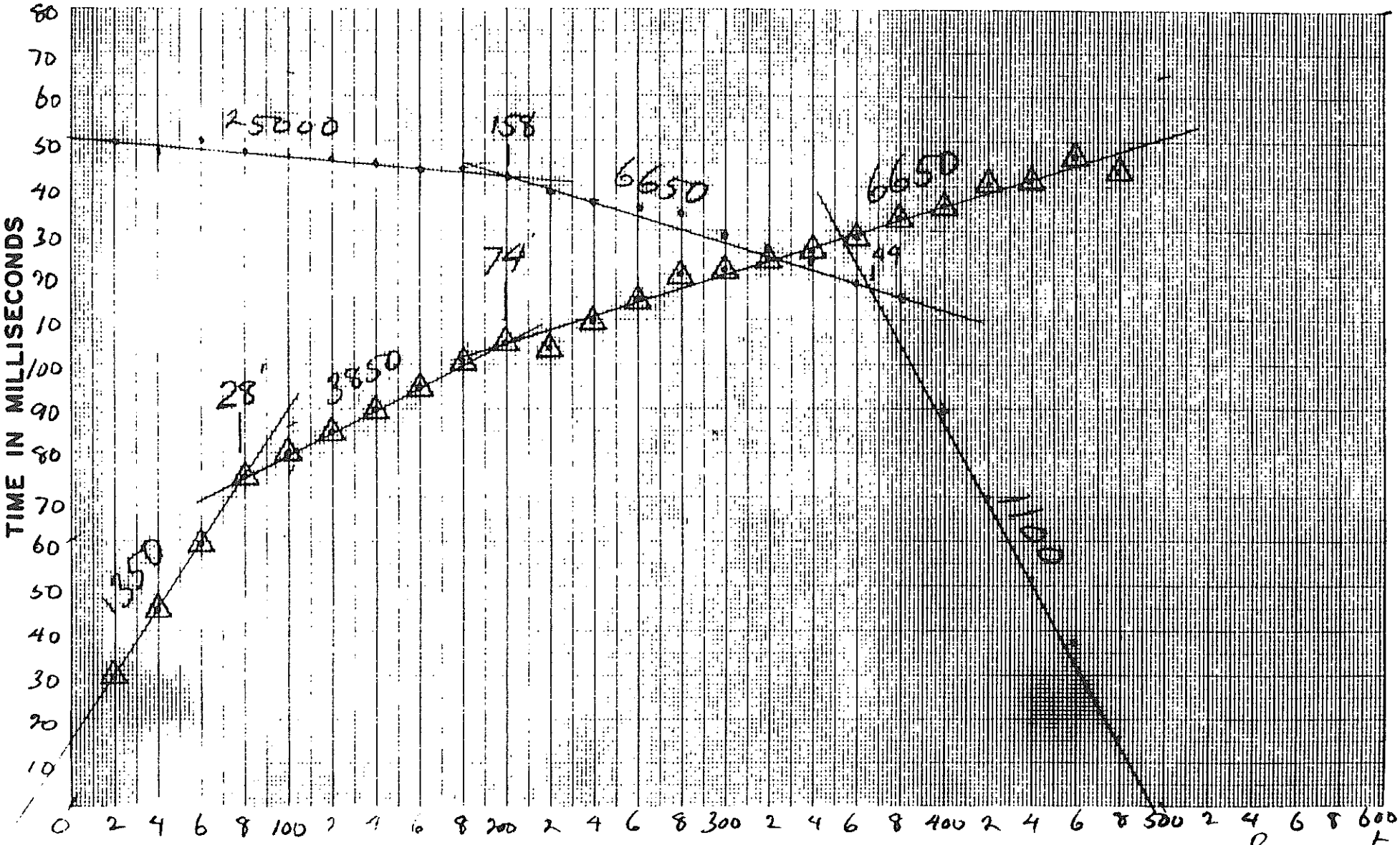
Phones 25-48



TIME-DISTANCE GRAPH

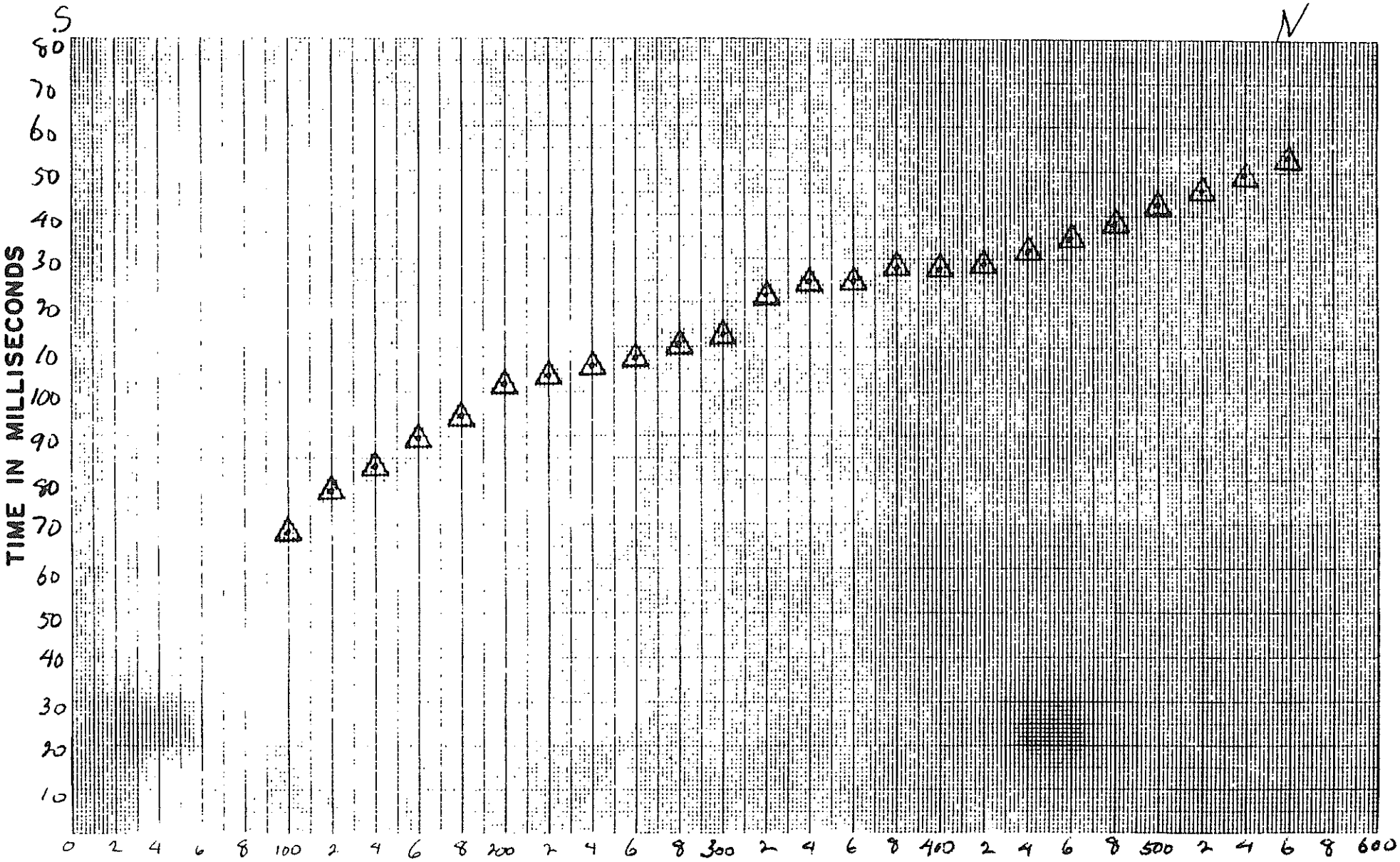
Job No. Bequeaat
Line No. 2A, 20 offset
Date 11/15/90

Phones 36-60



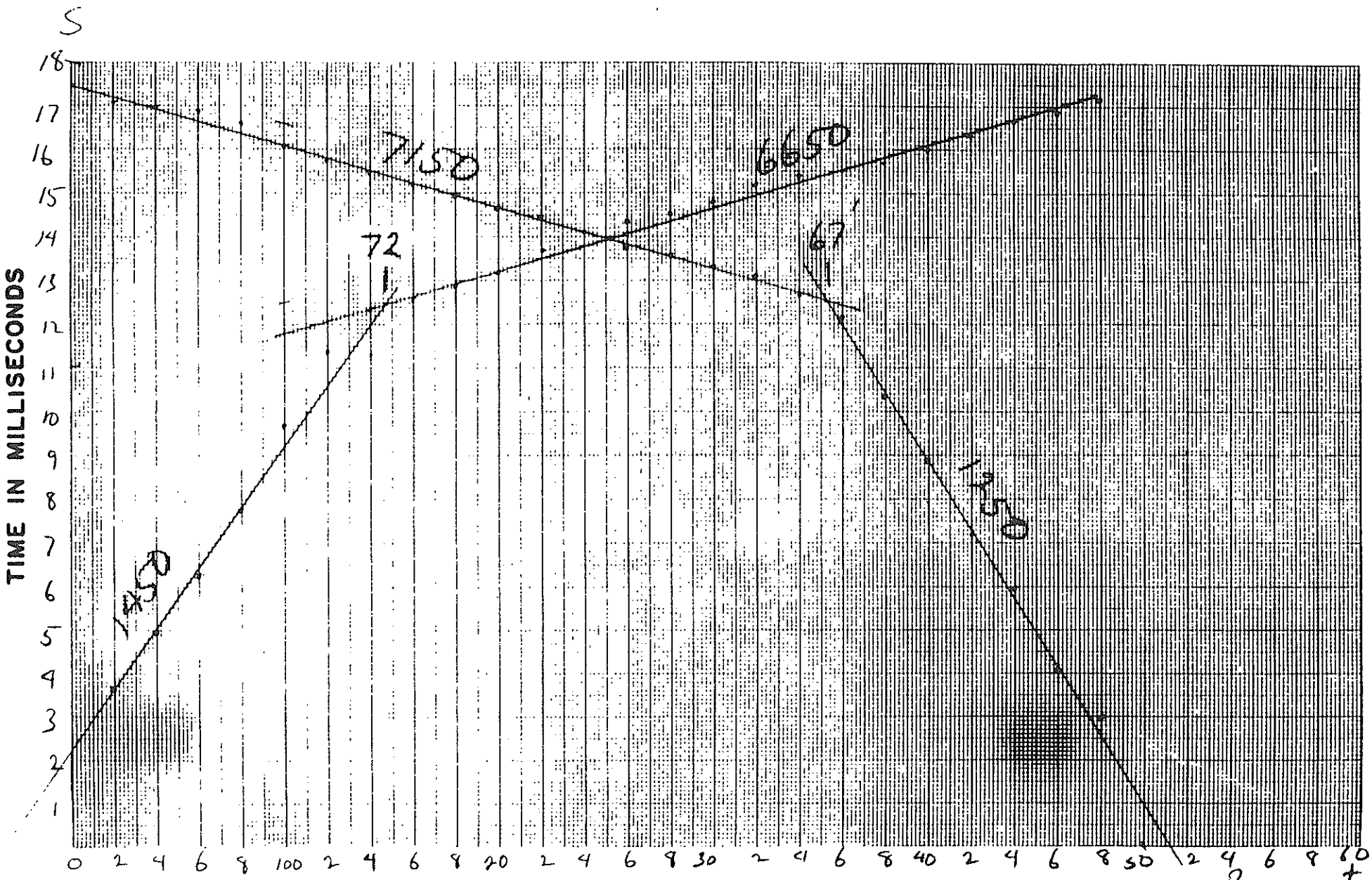
TIME-DISTANCE GRAPH

Job No. Beaumont
Line No. 3A 20' offset
Date 11/15/90



TIME-DISTANCE GRAPH

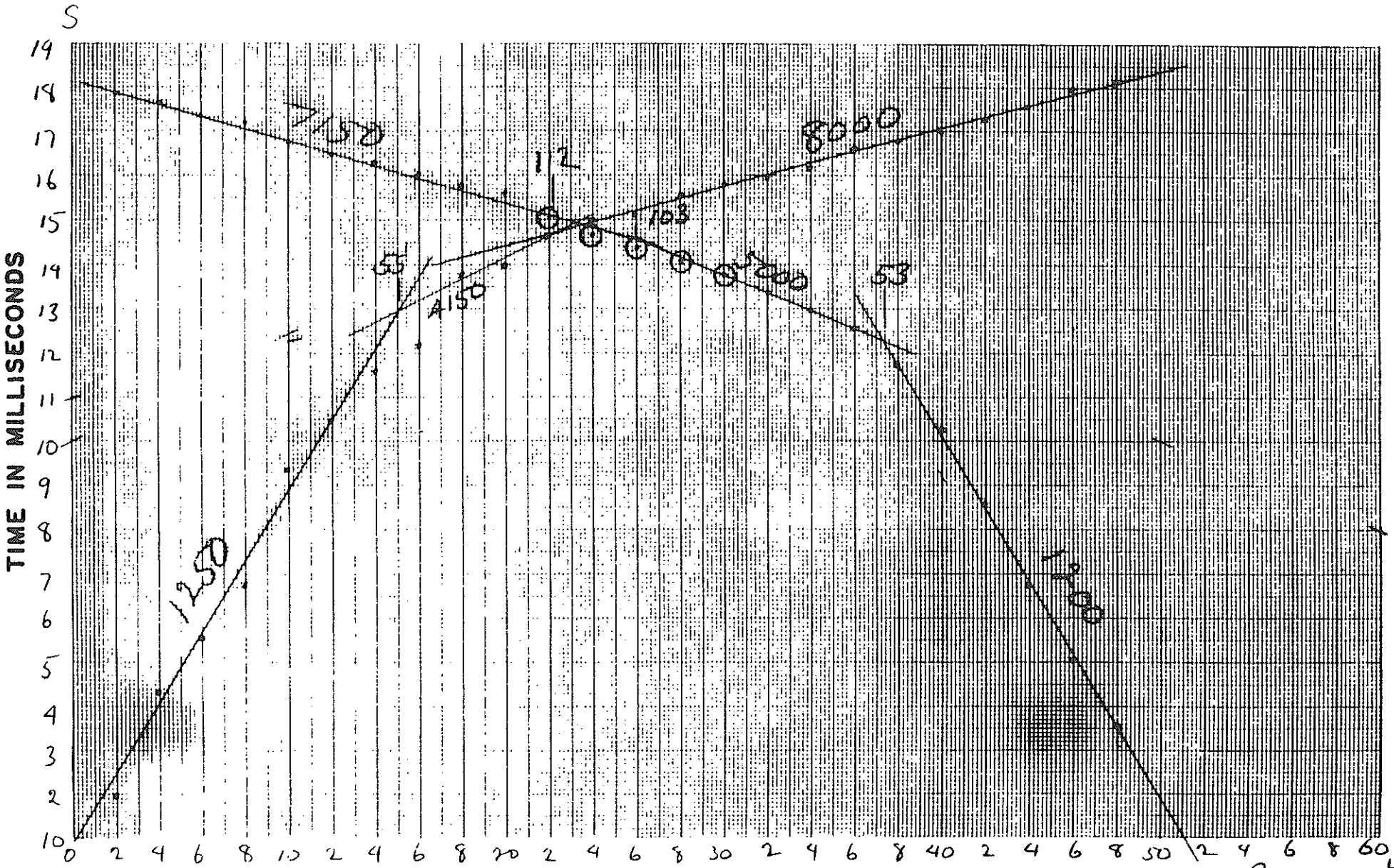
Job No. Beaumont
Line No. 3A 100' offset
Date 11/15/90



DISTANCE IN FEET

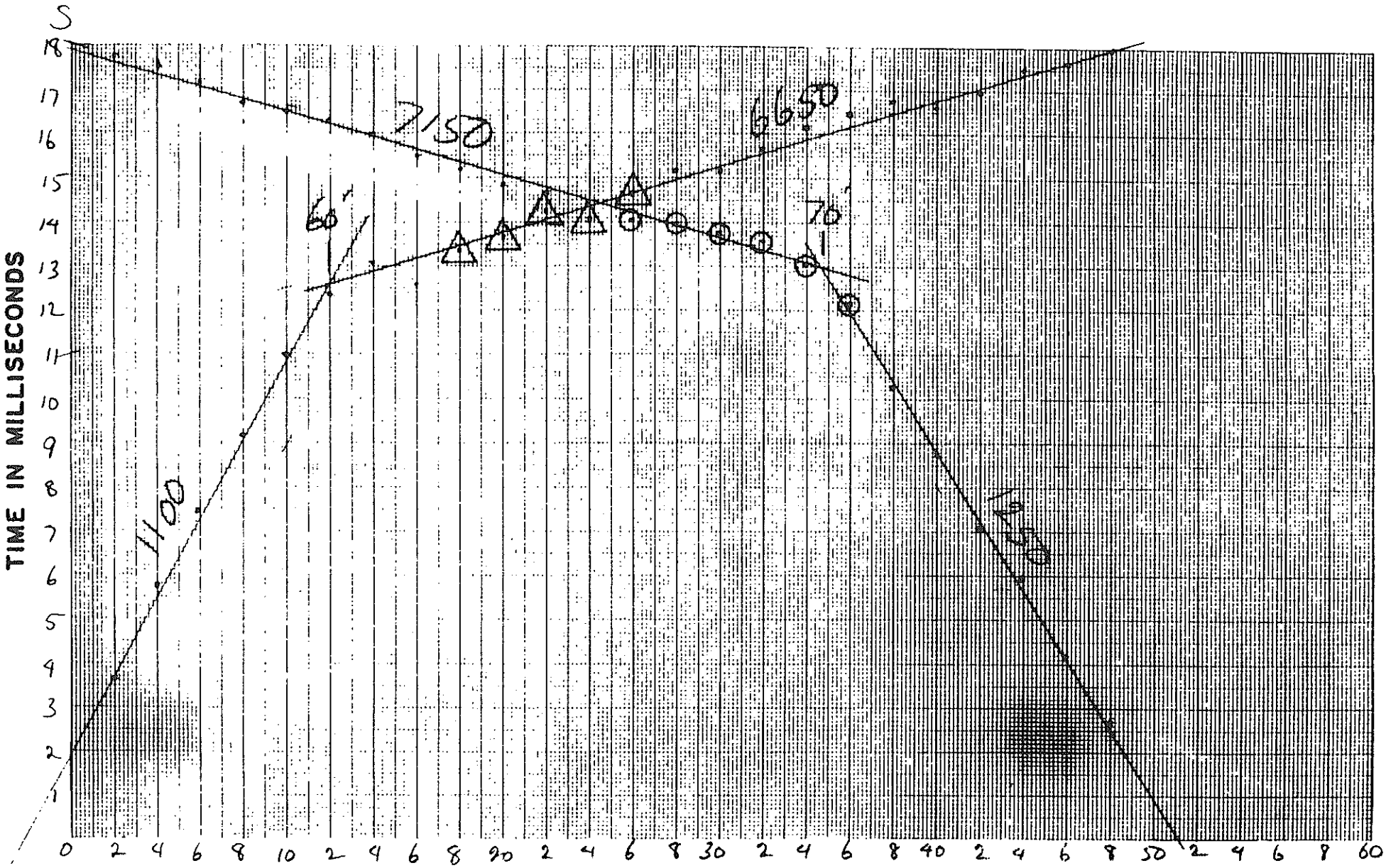
TIME-DISTANCE GRAPH

Job No. Beaumont
Line No. 3B, 20' offset
Date 11/15/90



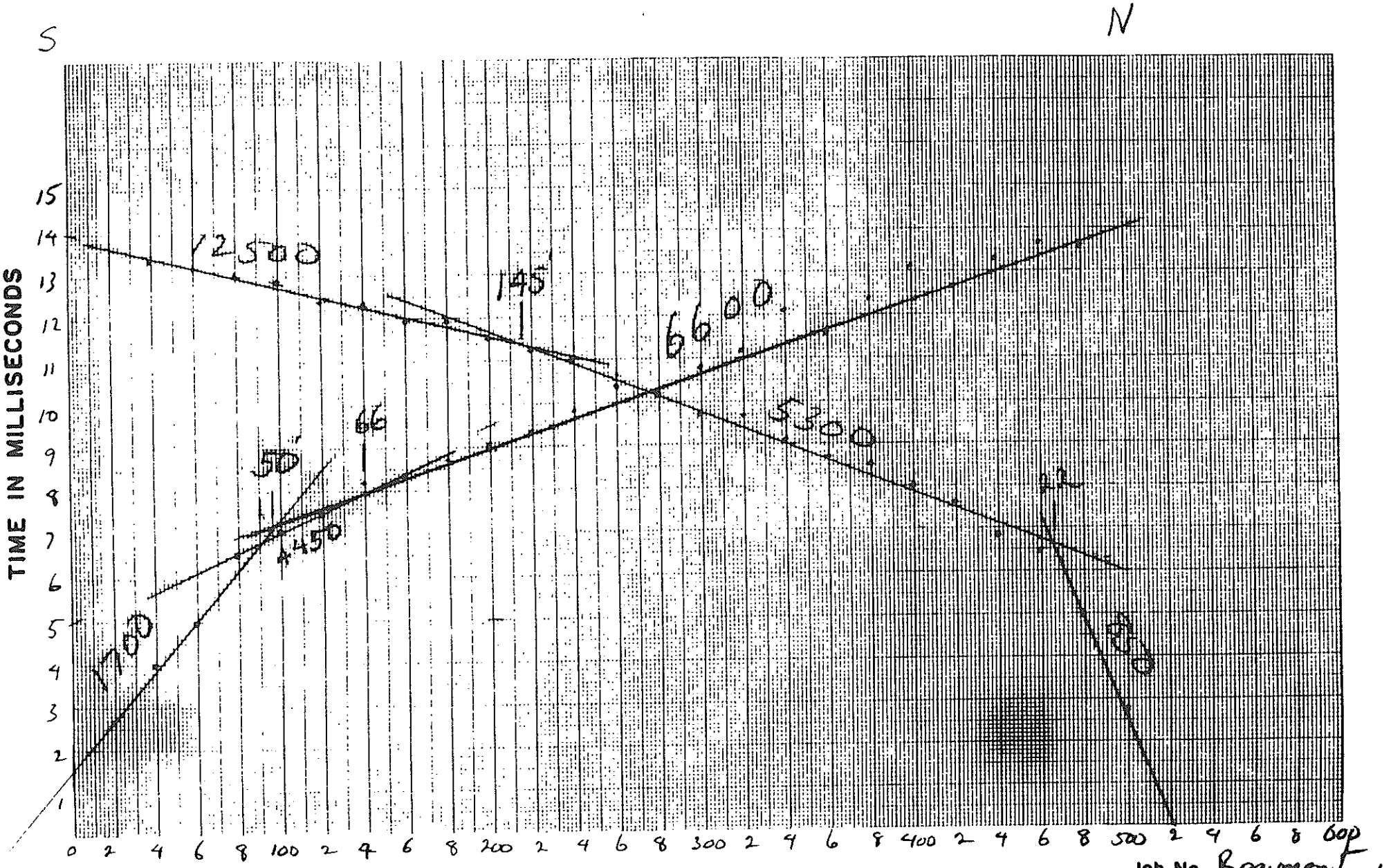
TIME-DISTANCE GRAPH

Job No. Beaumont
Line No. 4A 20' offset
Date 11/15/90



TIME-DISTANCE GRAPH

Job No. Beaumont
Line No. AB 90' offset
Date 11/15/90



TIME-DISTANCE GRAPH

Job No. Beaumont
Line No. 5 20' offset
Date 11/15/90

INPUT HISTORY
13:19 11 DECEMBER 1990

GPZ$WORK:GASH4.STK

EXCEL GEOPHYSICAL SERVICES INC.

LINE 4

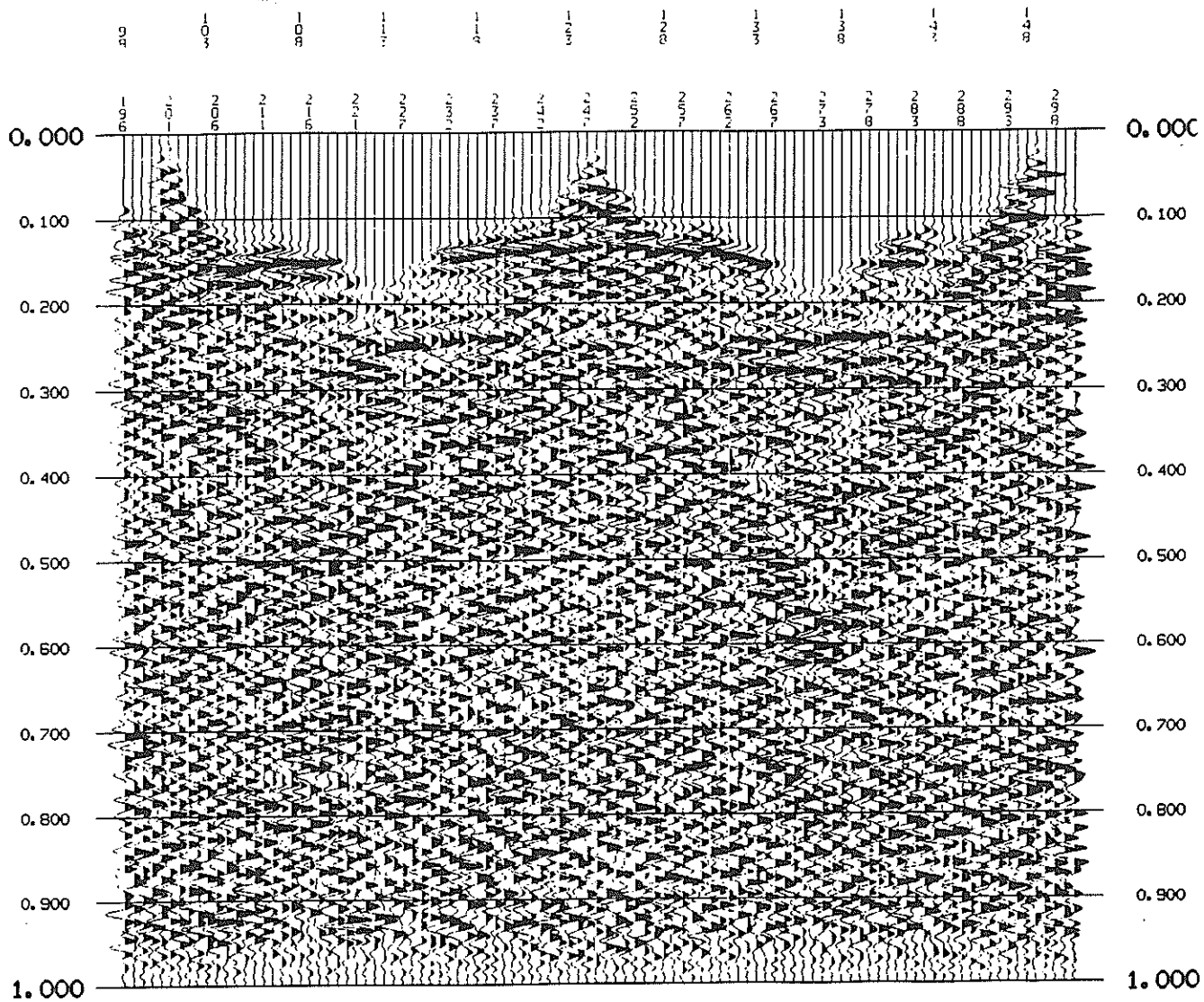
S.P. 1 - 48

NORTH

VELOCITY FPS DATUM FEET

SPECTRAL WHITENING
BRUTE STAK
REVISED VELOCITIES

GASCH GEOPHYSICAL COMPANY - GGC
(A Subsidiary of Gasch & Assoc.)
P.O. Box 661013
Sacramento, CA 95866

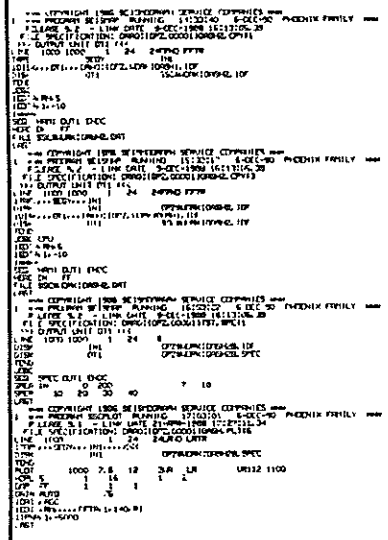


LINE 2.

INPUT HISTORY

17:03 6 DECEMBER 1990

GPZ$WORK:GASH2B.SPEC



GASH 2

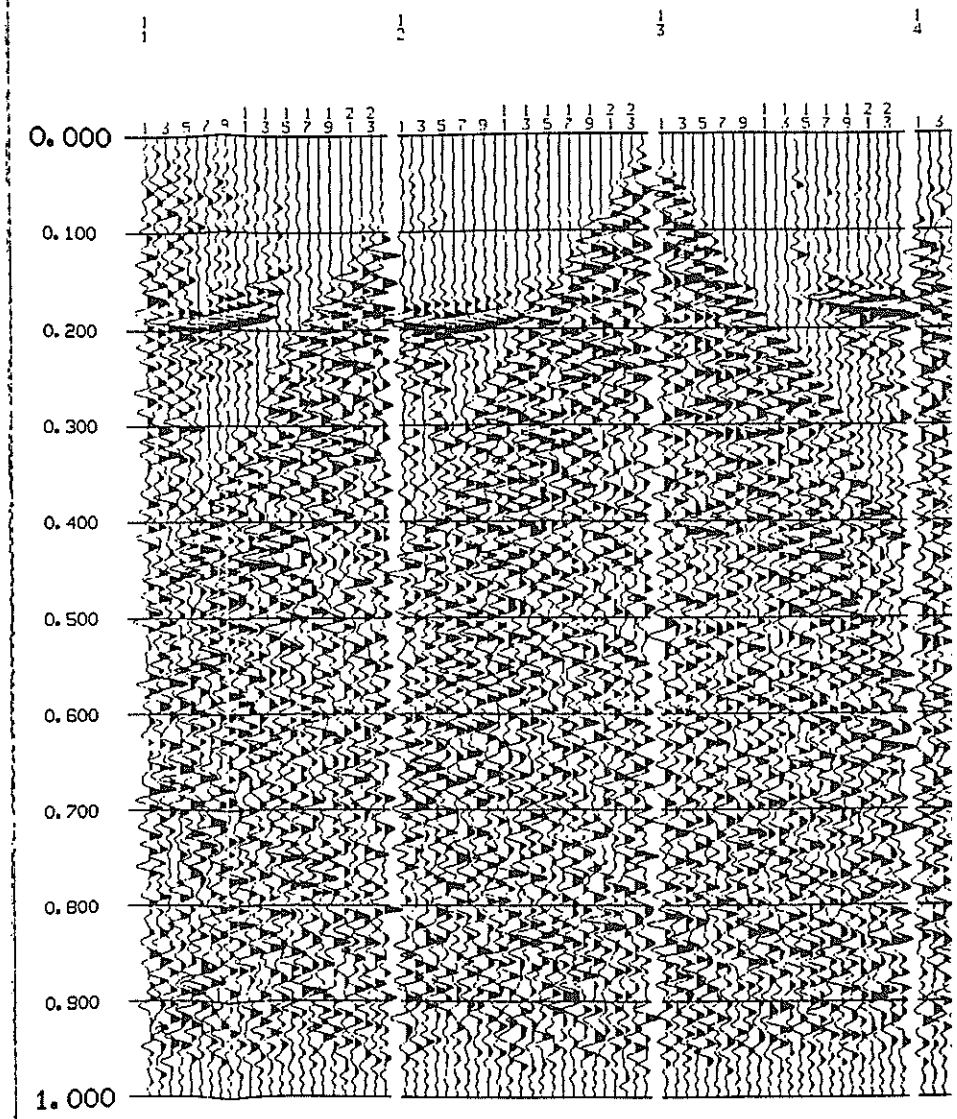
SPEC ONLY

LINE 2 SPECTRAL WHITENING

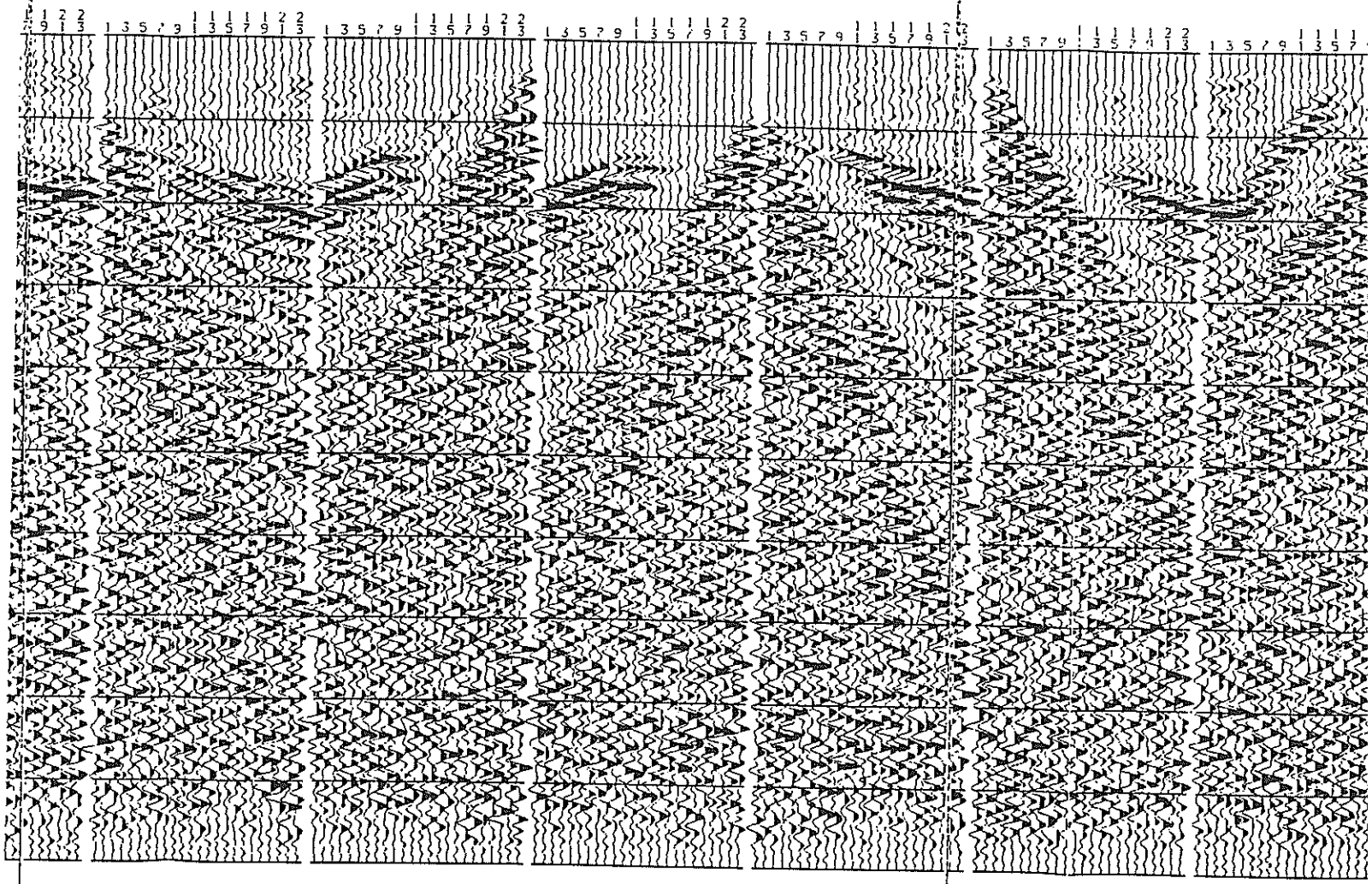
USER BOX

GASCH & ASSOCIATES INC.
CONSULTANTS IN GEOPHYSICS AND GEOLOGY
OIL, GAS AND MINING
P.O. Box 661013
Sacramento, CA 95866

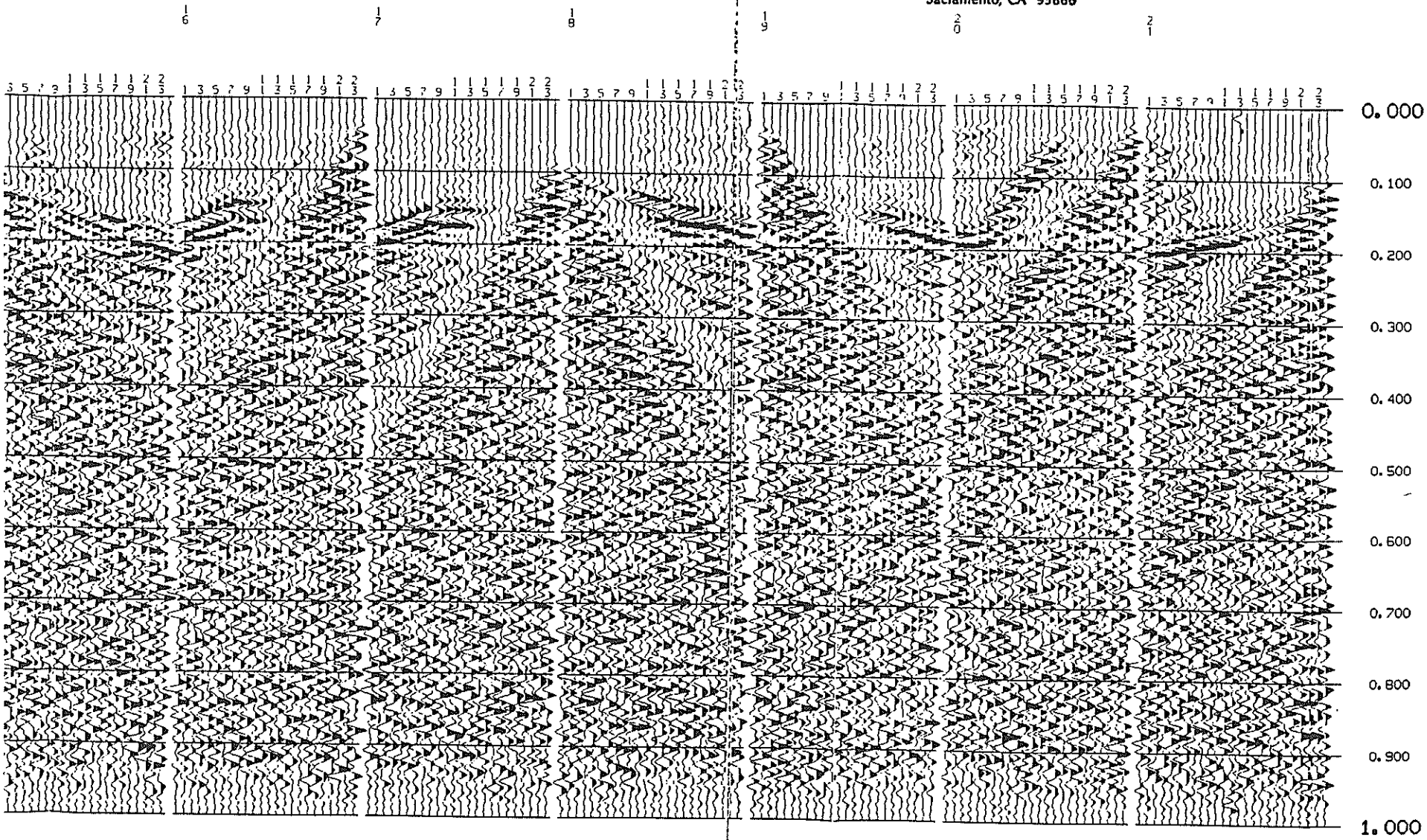
GASCH & ASSOCIATES INC.
CONSULTANTS IN GEOPHYSICS AND GEO
OIL, GAS AND MINING
P.O. Box 661013
Sacramento, CA 95866

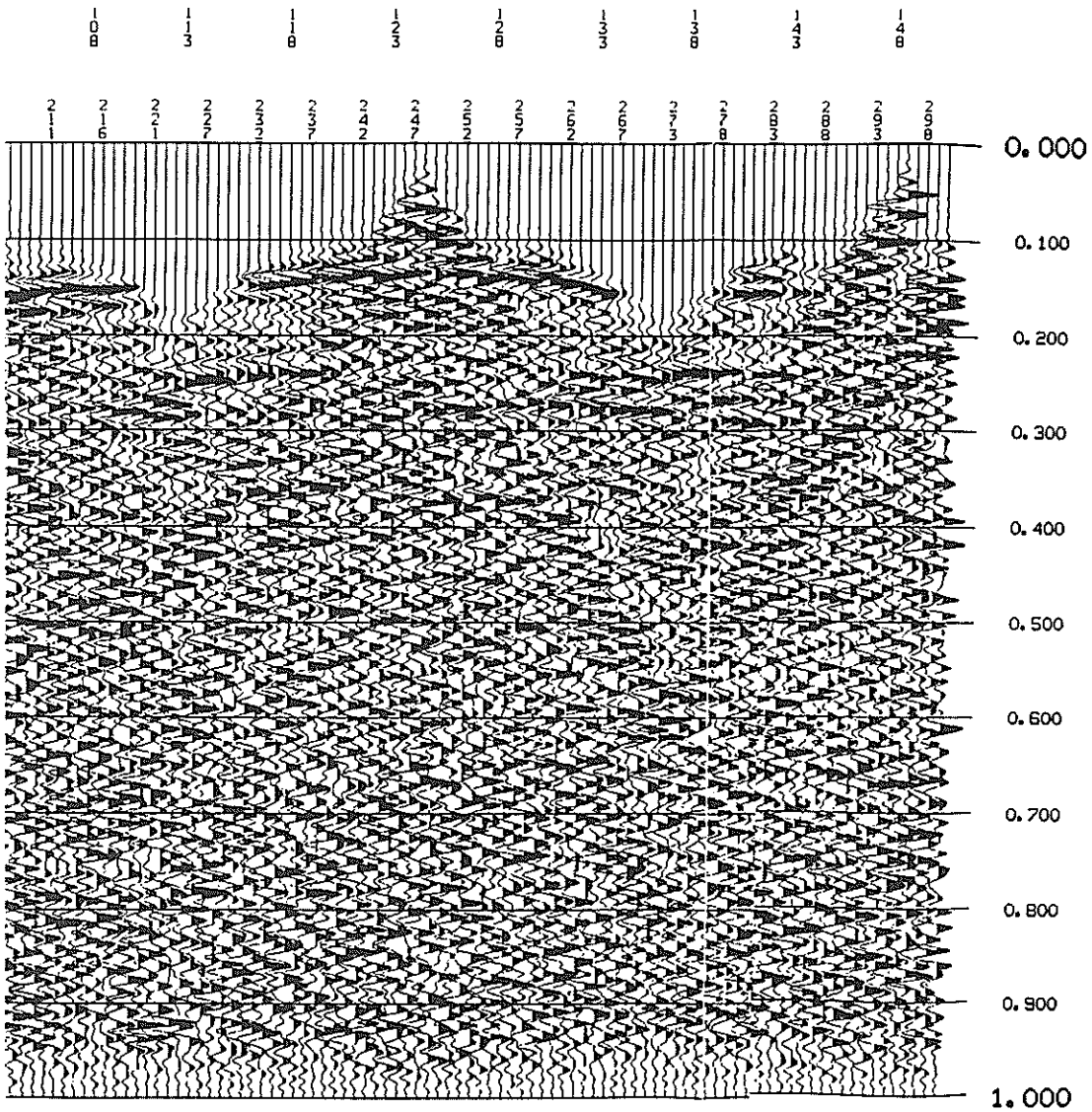


CH & ASSOCIATE
LTANTS IN GEOPHYSICS AN
OIL, GAS AND MINING
P.O. Box 661013
Sacramento, CA 95866



GASCH & ASSOCIATES INC.
CONSULTANTS IN GEOPHYSICS AND GEOLOGY
OIL, GAS AND MINING
P.O. Box 661013
Sacramento, CA 95866





EXCEL GEOPHYSICAL SERVICES INC.

LINE 4

S. P. 1 - 48

NORTH

VELOCITY FPS DATUM FEET

SPECTRAL WHITENING
BRUTE STAK

REVISED VELOCITIES.

GASCH & ASSOCIATES INC.
CONSULTANTS IN GEOPHYSICS AND GEOLOGY
OIL, GAS AND MINING
P.O. Box 661013
Sacramento, CA 95866

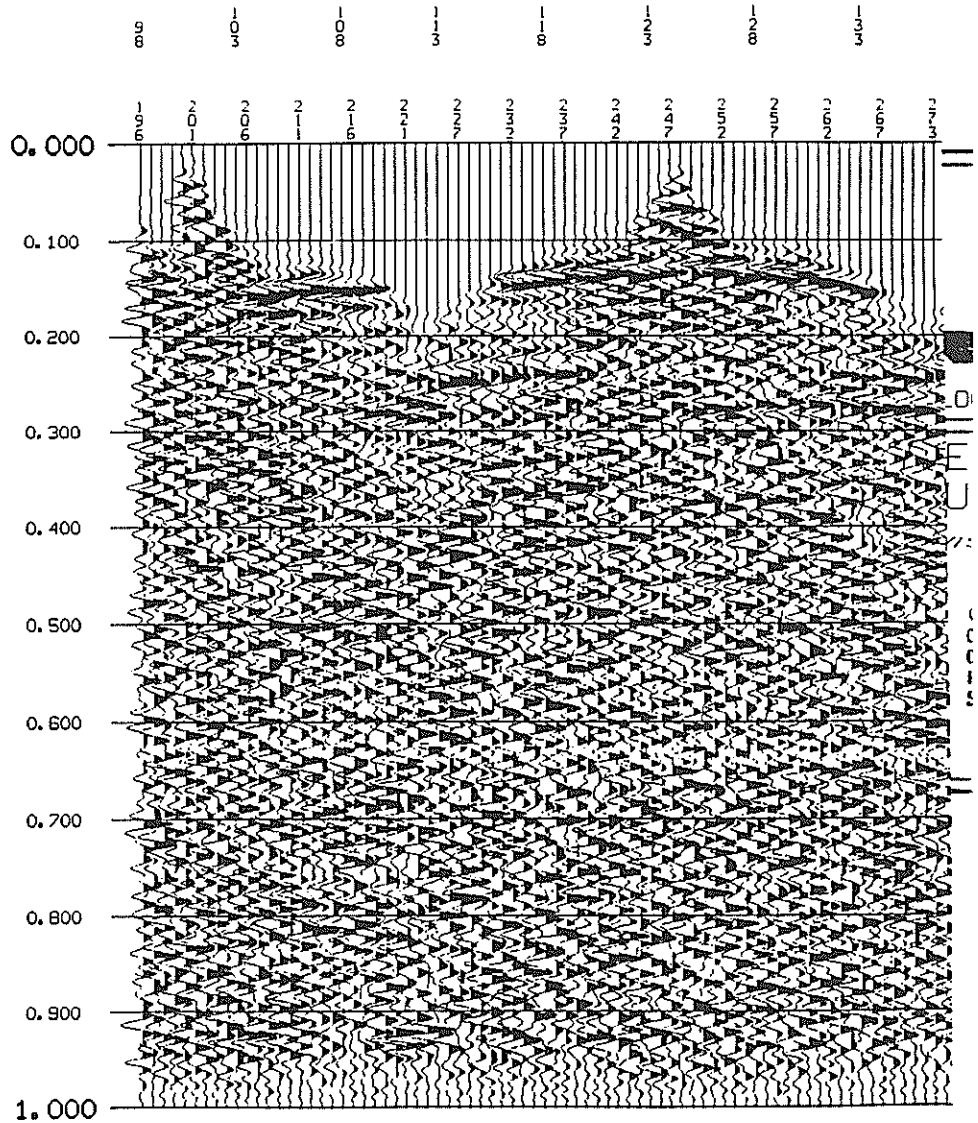
INPUT HISTORY

13:19 11 DECEMBER 1990

GPZ$WORK:GASH4.STK

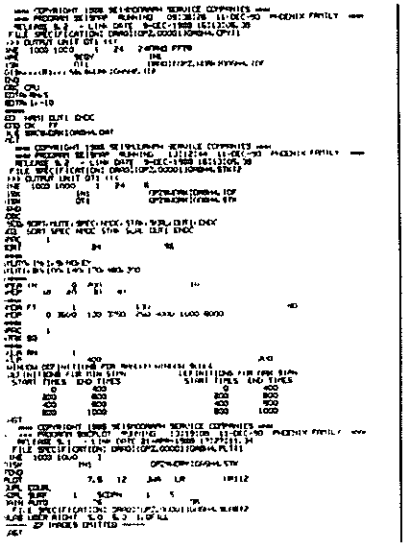
```
*** COPYRIGHT 1986 SEISMOGRAPH SERVICE COMPANIES ***
1 *** PROGRAM SELSMP  RUNNING  00:30:20  11-DEC-90  PHOENIX FAMILY  ***
  RELEASE 5.2 - LINK DATE  9-DEC-1988 16:13:20.20
 FILE SPECIFICATION: DRA01:[GPZ.0.0001]GASH4.DPT1
>>> OUTPUT UNIT DT1 [ ]
FMT   1000 1000     1    24   24MTHO FTTR
FIL                 SEGY          IN
FIL                 /DT1          DRA01:[GPZ.0.0001]GASH4.IDF
DIS
DIS
TOD
DBR  CPU
TEST1 N=5
TEST2 N=10
LIST
FIL  TRN1 OUT1 EXEC
FIL  IN   TF
FIL  SEC=DRA01:[GPZ]GASH4.DAT
LIST
*** COPYRIGHT 1986 SEISMOGRAPH SERVICE COMPANIES ***
1 *** PROGRAM SELSMP  RUNNING  13:13:54  11-DEC-90  PHOENIX FAMILY  ***
  RELEASE 5.2 - LINK DATE  9-DEC-1988 16:13:20.20
 FILE SPECIFICATION: DRA01:[GPZ.0.0001]GASH4.STK12
>>> OUTPUT UNIT DT1 [ ]
FMT   1000 1000     1    24    6
FIL                 IN1           GPZ$WORK:[GPZ]GASH4.IDF
FIL                 DT1           GPZ$WORK:[GPZ]GASH4.STK
DIS
DIS
DIS
DIS  SORT=OUT1=SPEC=MOD=STM=SORT=OUT1=EXEC
SOR  SORT SPEC MODE STAK SCAL OUT1 EXEC
SORT    1                24                96
SORT
TITLE IN 1=5 N=20
TITLE 80 100 140 170 180 200
SPEC
SPEC IN    0  200                 7  10
SPEC  10  20  30  40
SPEC
SPEC FT    1                 120                          80
SPEC  0 2600  130 3750  250 4000 1000 6000
SPEC
SPEC   1
SPEC SO
SPEC
SPEC PR    1     400                              200
SPEC
 WINDOW DEFINITIONS FOR AMPLITUDE WINDOW SCALE
  DEFINITIONS FOR MIN SIMM          DEFINITIONS FOR MAX SIMM
   START TIMES  END TIMES            START TIMES  END TIMES
       0          400                    0          400
     200          600                  200          600
     400          800                  400          800
     600         1000                  600         1000
LIST
*** COPYRIGHT 1986 SEISMOGRAPH SERVICE COMPANIES ***
1 *** PROGRAM SLPLOT  RUNNING  13:13:50  11-DEC-90  PHOENIX FAMILY  ***
  RELEASE 5.1 - LINK DATE 31-MAR-1988 17:22:11.34
 FILE SPECIFICATION: DRA01:[GPZ.0.0001]GASH4.PLT11
FMT   1000 1000     1
FIL                 IN1           GPZ$WORK:[GPZ]GASH4.STK
TOD
TOD
PLOT            2.5   12   JUN   LR          (P112
PLOT
PLOT CDL
PLOT SCL     1    SCDPN    1    5
PLOT AUTO          96                    96
 FILE SPECIFICATION: DRA01:[GPZ.0.0001]GASH4.SL/B12
SLAB USER RIGHT  5.0  5.0  1.0 IN.
     87 IMAGES OMITTED
LIST
```


GASCH & ASSOCIATES INC.
CONSULTANTS IN GEOPHYSICS AND GEOLOGY
OIL, GAS AND MINING
P.O. Box 661013
Sacramento, CA 95866



INPUT HISTORY
13:19 11 DECEMBER 1990

GPZ$WORK:GASH4.STK



EXCEL GEOPHYSICAL SERVICES INC.

LINE 4

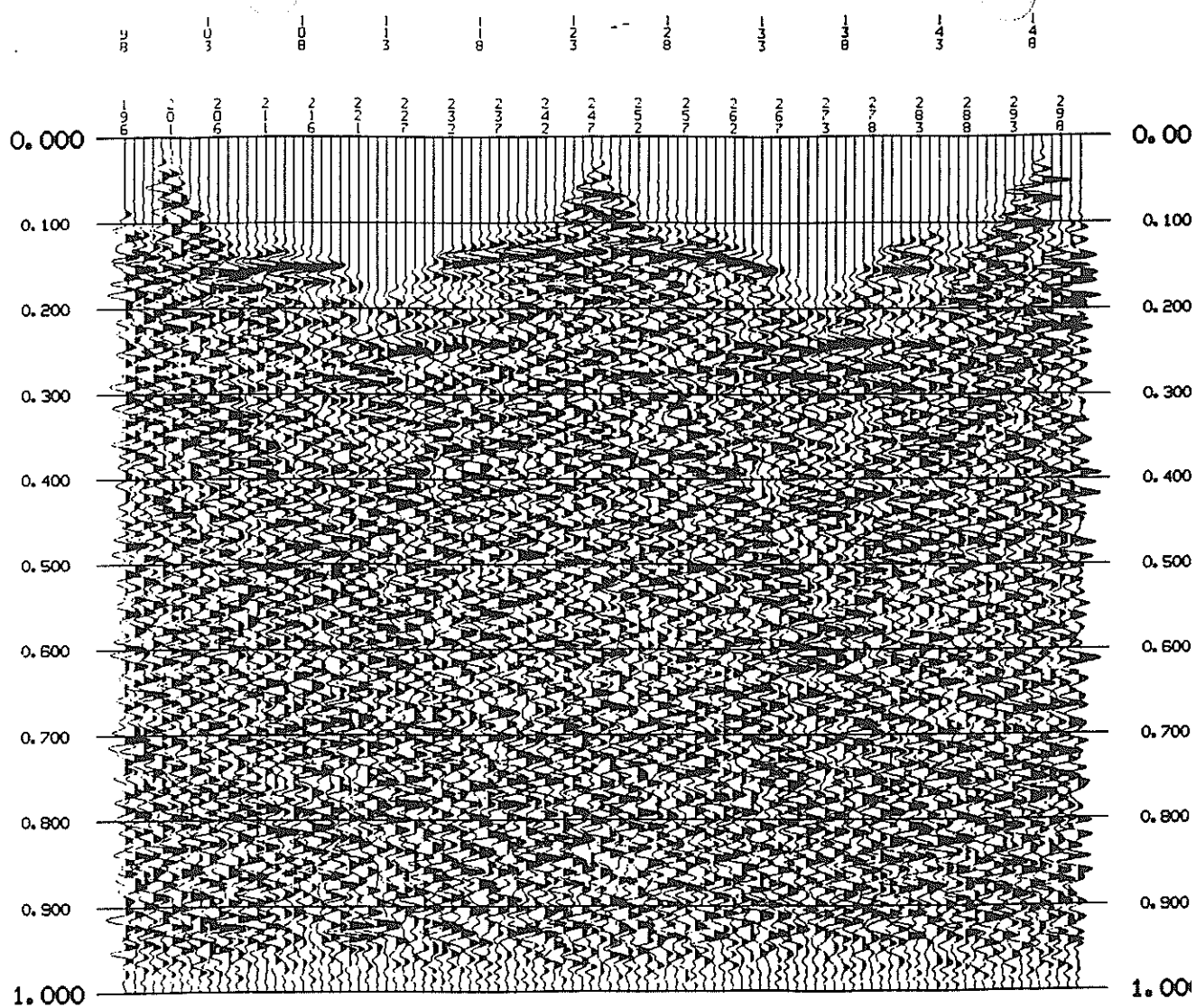
S.P. 1 - 48

NORTH

VELOCITY FPS DATUM FEET

SPECTRAL WHITENING
BRUTE STAK
REVISED VELOCITIES

GASCH GEOPHYSICAL COMPANY - GGC
(A Subsidiary of Gasch & Assoc.)
P.O. Box 661013
Sacramento, CA 95866



LINE 2.

INPUT HISTORY

17:03 6 DECEMBER 1990

GPZ$WORK:GASH2B.SPEC

```
*** COPYRIGHT 1986 SEISPROGRAM SERVICE COMPANIES ***
1  *** PROGRAM SEISPRP  RUNNING  17:03:40   6-DEC-90   PHOENIX FAMILY  ***
   * LEVEL 5.2  - LINK DATE  3-DEC-1990 16:12:05.39
   * I.D. SPECIFICATION: DRAG:[GPZ,0000]GASH2B.CMD;1
   >> OUTPUT UNIT DT1 <<<
LINE  1000 1000      1   24   24-MPHD FFTW
INPU***SEDY***  IN1                  IN1
IDIS***DT1***DRAG:[GPZ,WORK]GASH2L.IDF
DISK            DT1                  $SCRATCH:GASH2L.IDF
TDIC
LOOP
IDIS* % MN=5
IDIS* % X=-10
LAST
SEQ  MPHD OUT1 DNCC
ADC  DT   FT
FILE $SCRATCH:GASH2L.DAT
LAST
*** COPYRIGHT 1986 SEISPROGRAM SERVICE COMPANIES ***
1  *** PROGRAM SEISPRP  RUNNING  17:03:41   6-DEC-90   PHOENIX FAMILY  ***
   * LEVEL 5.2  - LINK DATE  3-DEC-1990 16:12:05.39
   * I.D. SPECIFICATION: DRAG:[GPZ,0000]GASH2L.CMD;1
   >> OUTPUT UNIT DT1 <<<
LINE  1001 1000      1   24   24-MPHD FFTW
INPU***SEDY***  IN1                  IN1                  GPZ$WORK:GASH2L.IDF
IDIS***DT1***DRAG:[GPZ,WORK]GASH2L.IDF
DISK            DT1                  $SCRATCH:GASH2L.IDF
TDIC
 IDB  IN1
IDIS* % MN=5
IDIS* % X=-10
LAST
SEQ  MPHD OUT1 DNCC
ADC  DT   FT
FILE $SCRATCH:GASH2L.DAT
LAST
*** COPYRIGHT 1986 SEISPROGRAM SERVICE COMPANIES ***
1  *** PROGRAM SEISPRP  RUNNING  17:03:42   6-DEC-90   PHOENIX FAMILY  ***
   * LEVEL 5.2  - LINK DATE  3-DEC-1990 16:12:05.39
   * I.D. SPECIFICATION: DRAG:[GPZ,0000]GASH2L.CMD;1
   >> OUTPUT UNIT DT1 <<<
LINE  1001 1001      1   24   6
INPU***SEDY***  IN1                  GPZ$WORK:GASH2L.IDF
IDIS***DT1***DRAG:[GPZ,WORK]GASH2L.SPEC
DISK            DT1                  $SCRATCH:GASH2L.SPEC
TDIC
SEQ  SPEC OUT1 DNCC
ADC  IN   0  200                  7   10
ADC* 10   80   30   40
LAST
*** COPYRIGHT 1986 SEISPROGRAM SERVICE COMPANIES ***
1  *** PROGRAM SSCPLOT  RUNNING  17:03:43   6-DEC-90   PHOENIX FAMILY  ***
   * LEVEL 5.1  - LINK DATE 21-APR-1988 12:12:11.34
   * I.D. SPECIFICATION: DRAG:[GPZ,0000]GASH2L.PLTIN
LINE  1002      1   24   24-AUTO DATA
INPU***SEDY***  IN1***XXX            GPZ$WORK:GASH2L.SPEC
TDIC
SEQ  SSCPLOT      1000  7.5   12   3.R   LR        UR112 1100
ADC  S            1    16    1    1     2
ADC  FT           1    1     1
GAIN AUTO         .5
IDIS* % MN=
IDIS* % MN=****FFTW (-140:R)
IDIS* % X=-5000
LAST
```

GASH 2

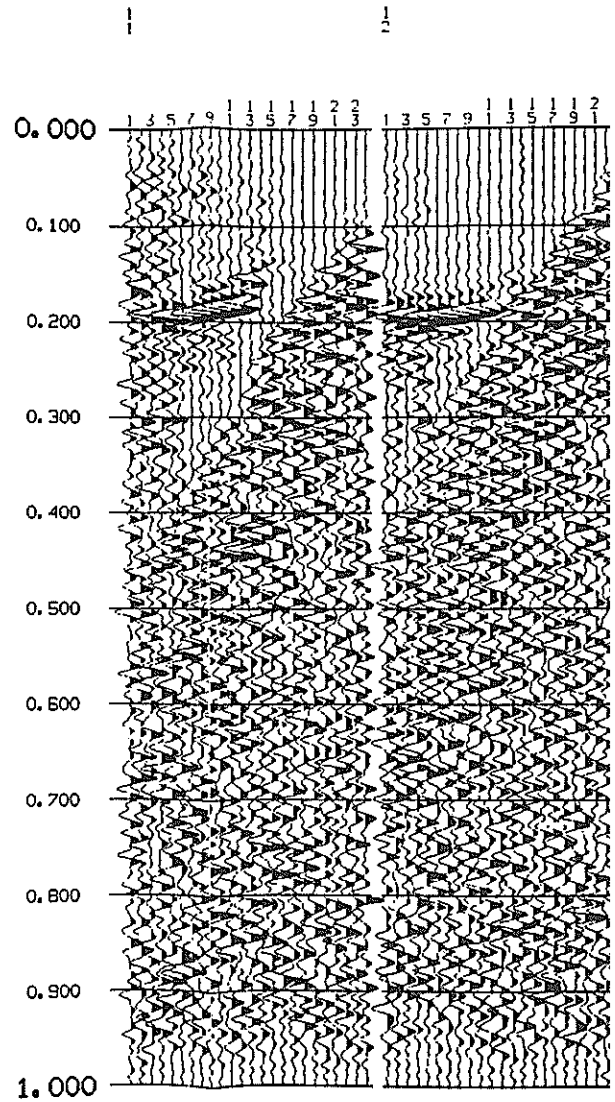
SPEC ONLY

Line 2 Spectral whitening

USER BOX

GASCH & ASSOCIATES INC.
CONSULTANTS IN GEOPHYSICS AND GEOLOGY
OIL, GAS AND MINING
P.O. Box 661013
Sacramento, CA 95866

CONSULTANTS IN GEOPHY
OIL, GAS AND MINING
P.O. Box 661013
Sacramento, CA 95

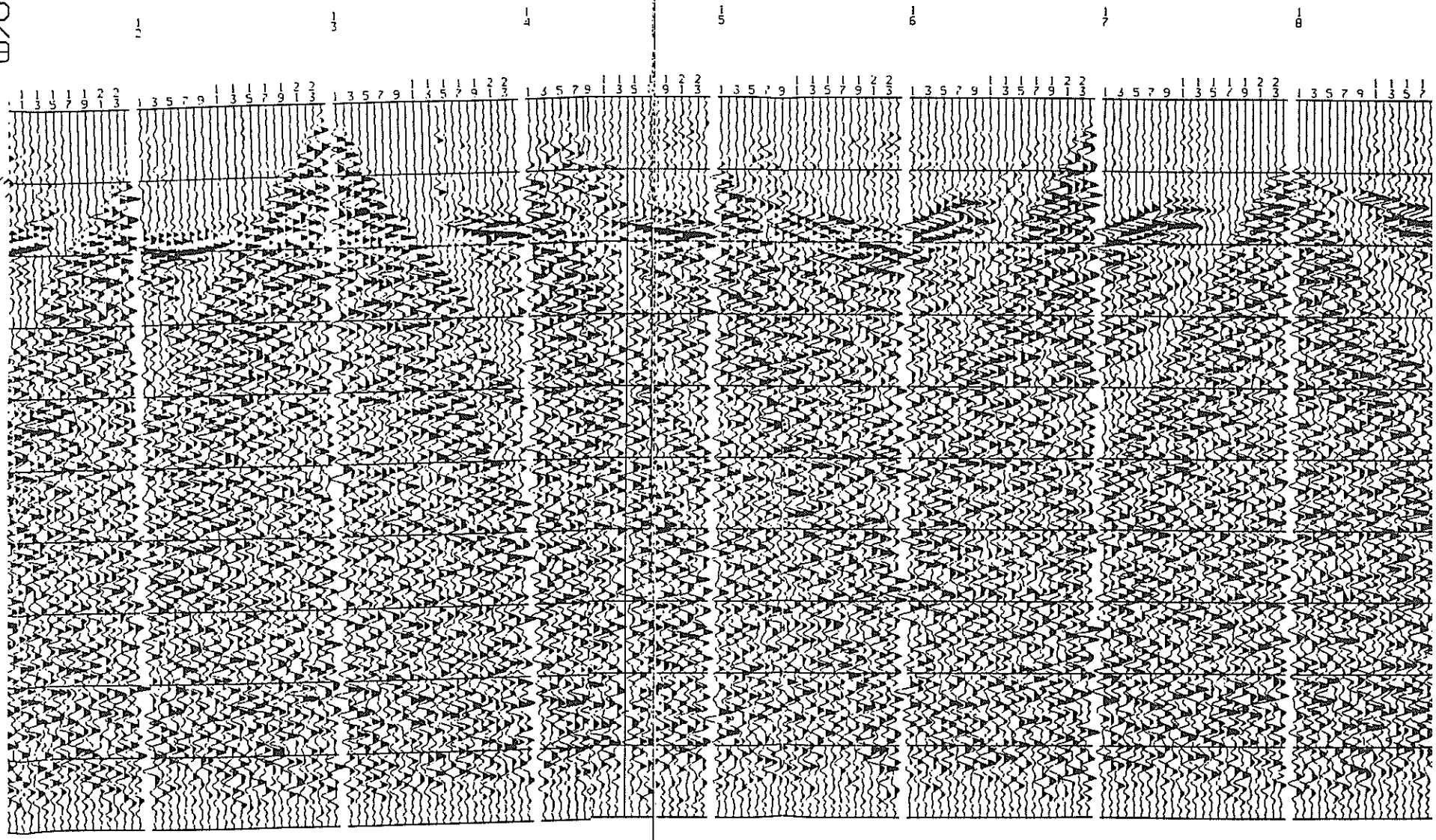


GASCH & ASSOCIATES INC.
CONSULTANTS IN GEOPHYSICS AND GEOLOGY
OIL, GAS AND MINING
P.O. Box 661013
Sacramento, CA 95866

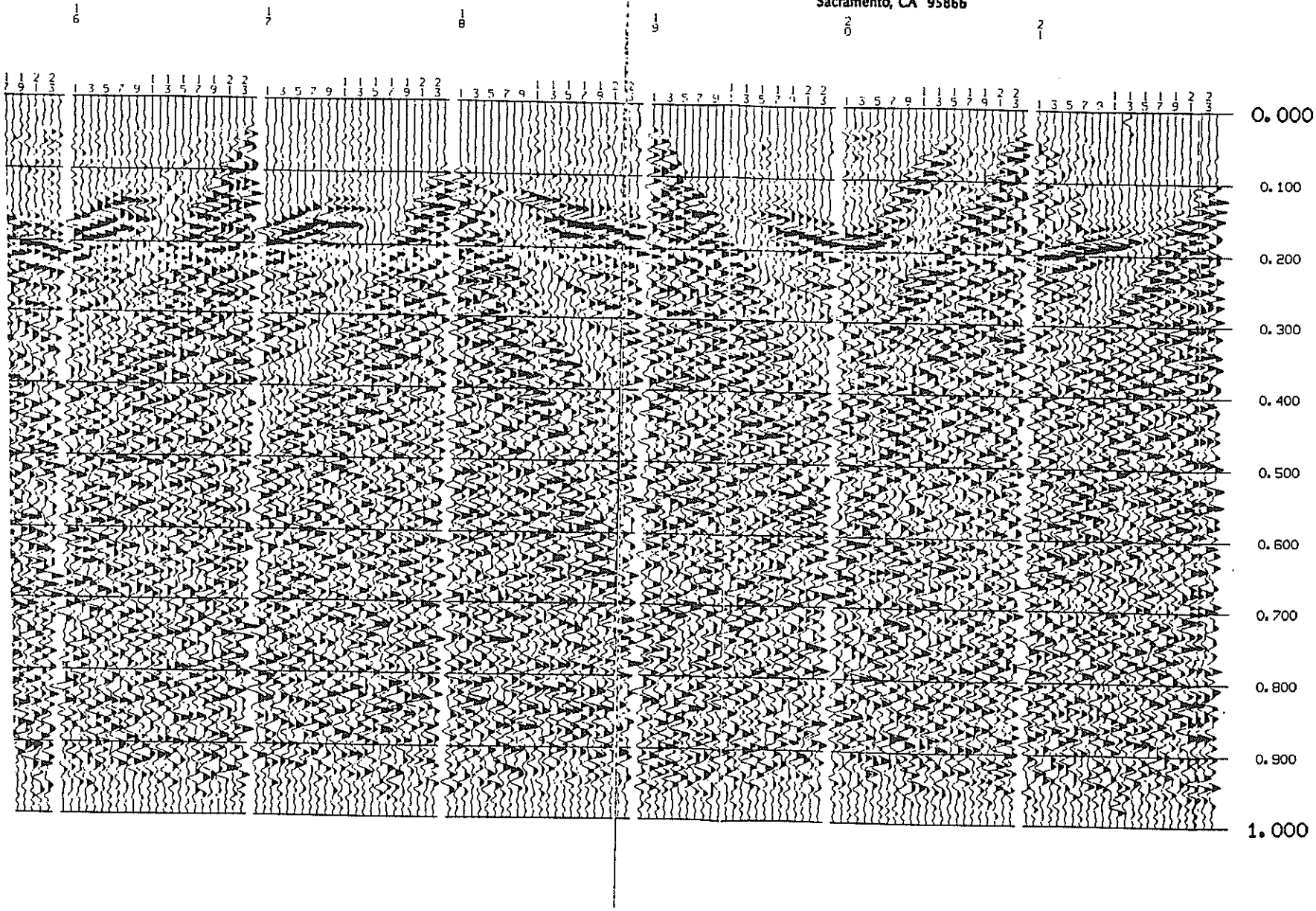
STOR
BER 199
. SPEC

FISH 2
STEC ON

line 2



GASCH & ASSOCIATES INC.
CONSULTANTS IN GEOPHYSICS AND GEOLOGY
OIL, GAS AND MINING
P.O. Box 661013
Sacramento, CA 95866



INPUT HISTORY

13:19 11 DECEMBER 1990

GPZ$WORK:GASH4.STK

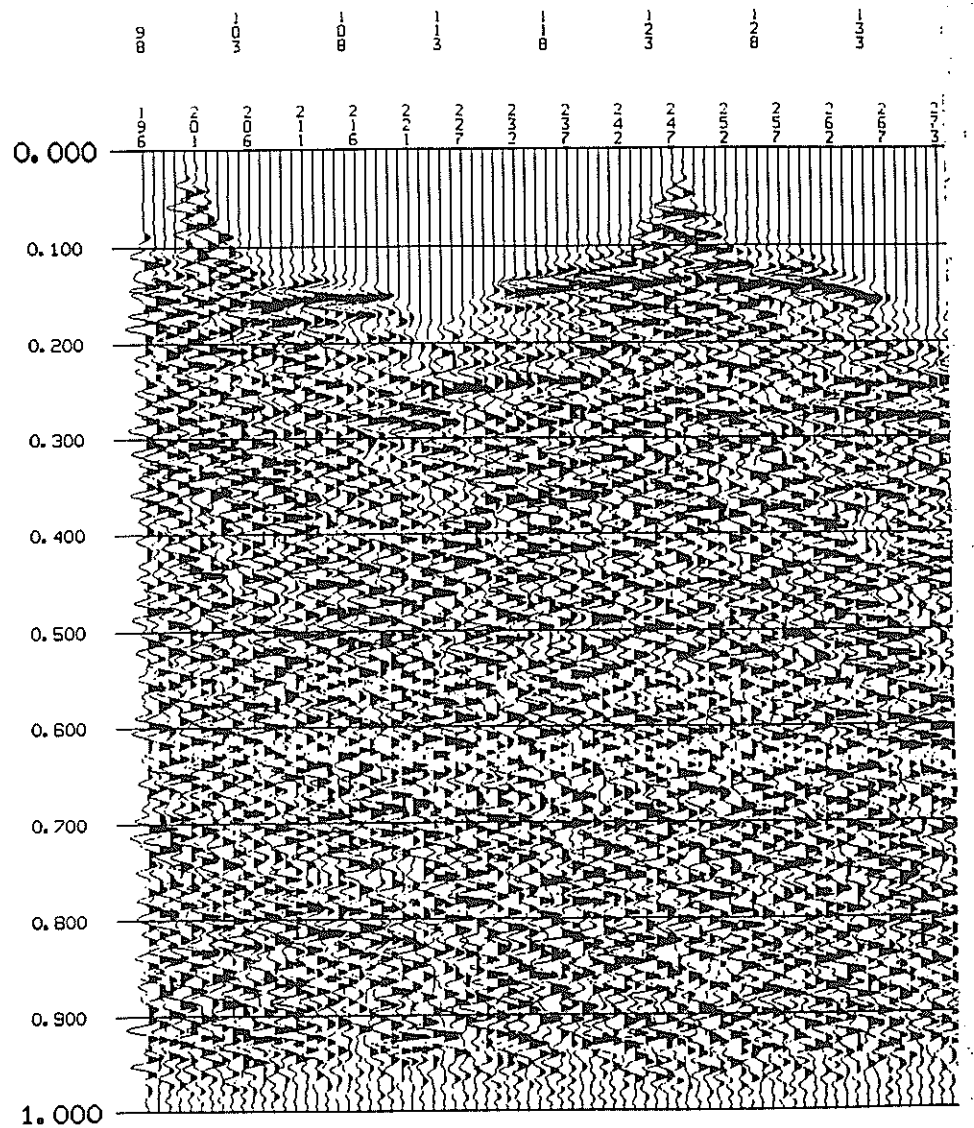
```
*** COPYRIGHT 1986 SEISMOGRAPH SERVICE COMPANIES ***
*** PROGRAM SEISPRP  RUNNING  00:35:26  11-DEC-90  PHOENIX FAMILY  ***
RELEASE 9.2  - LINK DATE  9-DEC-1988 16:13:06.38
FILE SPECIFICATION: DRA0:[GPZ.000010]GASH4.DPYIL
>>> OUTPUT UNIT OTI <<<
  1000 1000      1    24    24MMO FTTR
                 SCDY                 INL
                  OTI                 DRA0:[GPZ.WORK]GASH4.IDF
>>>...OTI:[...]GASH4.DAT
>>> CPU
STK-N=5
STK-I=10
>>> HDR1 OUTI INDC
  DC    1    2
  BK-DRA0:[GASH4.DAT
*** COPYRIGHT 1986 SEISMOGRAPH SERVICE COMPANIES ***
*** PROGRAM SEISPRP  RUNNING  11:12:44  11-DEC-90  PHOENIX FAMILY  ***
RELEASE 9.2  - LINK DATE  9-DEC-1988 16:13:06.38
FILE SPECIFICATION: DRA0:[GPZ.000010]GASH4.STK;2
>>> OUTPUT UNIT OTI <<<
  1000 1000      1    24    8
                 INL                 GPZ$:[WORK]GASH4.IDF
                  OTI                GPZ$:[WORK]GASH4.STK

SORT-MITE-SPEC-MOD-STAK-SCRU OUTI INDC
SORT SPEC MOD STAK SCRL OUTI INDC
    1        24              96

FUTA IN L S-MO-DY
FUTA BO 100-140-170- 400-200

  IN  10   20   30   40          0   200                7   10
                                 1                 130                                  80
  FT                0 2600   130 2750   250 4000 1100 6000
  SD   1
  SM   1                 1                400                                  200
WINDOW DEFINITIONS FOR WINDOW WINDOW SCALE
DEFINITIONS FOR MIN SIPN                DEFINITIONS FOR MAX SIPN
START TIMES  END TIMES                  START TIMES  END TIMES
      0      400                              0      400
    888     888                            888     888
    888     888                            888     888
    888    1888                            888    1888
>>> COPYRIGHT 1986 SEISMOGRAPH SERVICE COMPANIES ***
*** PROGRAM SEISPLOT  RUNNING  12:18:51  11-DEC-90  PHOENIX FAMILY  ***
RELEASE 5.1  - LINK DATE 21-Nov-1988 17:07:11.34
FILE SPECIFICATION: DRA0:[GPZ.000010]GASH4.PLT11
  1000 1000      1
                 INL                 GPZ$:[WORK]GASH4.STK
                 7.5   12    JUN   18          1R112
  EDIT
  SUM    1    SCDPN    1    5    96
  MIN PLOT    96
  FILE SPECIFICATION: DRA0:[GPZ.000010]GASH4.SLP812
  GEN OPERATION:  C-0   S-0   L-OFILL
  ---- ZP IMAGES OMITTED ----
```


GASCH & ASSOCIATES INC.
CONSULTANTS IN GEOPHYSICS AND GEOLOGY
OIL, GAS AND MINING
P.O. Box 661013
Sacramento, CA 95866



RADIAN CORPORATION

APPENDIX B

ON-SITE LABORATORY SUMMARY

1.0 GENERAL PROCEDURES

During the hydrogeologic investigation and the Treatability Study, an on-site laboratory was set up and operated in the Betatron building. The primary purpose of the lab was to provide rapid turnaround for analysis of volatile organic compounds (VOCs) in soil vapors, air, and water. A gas chromatograph was set up for the analysis of VOCs in air and soil vapor samples. The instrument used was an HP 5890 series II gas chromatograph with flame ionization (FID) and electron capture (ECD) detectors. A 30 meter DB-624 megabor capillary column was used to separate the compounds of interest. The column effluent was split 1:1 to the FID/ECD detectors so that benzene, toluene, and xylenes (BTX) as well as chlorinated solvents could be detected simultaneously from a single injection.

Gas and water standards prepared by Radian Austin Quality Assurance lab were used in calibrating the GC-FID/ECD. This standard contained the following compounds and concentrations:

Compounds	Concentration (ppbv)
1,1,1 Trichloroethane (1,1,1 TCA)	90.8
Trichloroethene (TCE)	101
Tetrachloroethene (PCE)	113
1,1 Dichloroethene (1,1 DCE)	89.0
1,2 Dichloroethane (1,2 DCA)	115
Benzene (B)	33,000
Toluene (T)	33,000
p-xylene (X)	33,000
o-xylene (X)	33,000

Gas samples for injection into the GC were taken in the 250 ml gas-tight syringe through a teflon on/off valve on the 50 cc glass sampling syringes. Gas standards for injection into the GC were transferred from the canister into a 50 cc glass syringe and sampled in the same manner as described above.

A summary of QA/QC procedures observed on the GC are as follows:

- Three point calibration of GC-FID and GC-ECD was performed using a gas standard.
- Linear regression of three point calibration data was performed to give correlation coefficient, intercept, and slope (Response Factor) for each compound.
- Integrators for the GC-FID and GC-ECD were programmed to read directly in parts-per-billion volume (ppbv) by entering Response Factors.
- A correlation coefficient of at least 0.990 for each compound was required or calibration was repeated.
- A midpoint calibration check standard was run as the first and last run of each day that a multipoint was not done. Acceptance levels for these checks were 50 to 150% recovery. If recovery exceeded this range a new three point calibration was done.
- A duplicate injection was made for samples at the rate of one per day. Relative percent difference (RPD) was calculated for the two runs with acceptance level of ± RPD.
- If a duplicate injection exceeded the acceptance range another sample was run in duplicate. If the second sample fell outside the range a new three point calibration was done.
- Following high level samples (>50 ppbv per compound on ECD) the column was heated to 100°C and ultra high purity (UHP) air was injected until the digital readout for the detector indicated the system was clean.

- 50 cc syringes were disassembled and baked in an oven overnight at 150°C to remove contamination.

- A syringe blank was done each day by filling a 50 cc syringe with UHP air and injecting an aliquot into the GC.

2.0 QA/QC RESULTS

2.1 Multipoint Calibration

A three point calibration was done on the GC-FID and GC-ECD prior to running any samples. A linear regression was done for each compound in the calibration standard by plotting area counts versus concentration. All compounds had correlation coefficients of better than 0.990, exceeding the acceptance criteria.

Calibration check standards were run at the beginning and end of each day that a multipoint was not done on the GC. Recoveries for all calibrated compounds were within the acceptance range of 50 to 150%.

2.2 Duplicates

2.2.1 Duplicate Injections

Precision was determined on the GC-FID and FC-ECD by calculating RPD for duplicate injections. One sample was run in duplicate on each of the three days the instrument was in use. Results for these analyses are shown in Table A-1. All three duplicate injections had RPD's within the acceptance range of ±50% for the GC-ECD samples so no values were calculated for RPD.

2.2.2 Field Duplicates

Field duplicate samples were analyzed for more than 10% of the field sampling locations. Results are presented in Appendix G.

RADIAN CORPORATION

Table B-1

Duplicates

Sample Control #:	L4009			L4029			L4037		
Date:	8-21			8-22			8-23		
Compounds	Conc. (ppbv) Run 1	Conc. (ppbv) Run 2	RPD %	Conc. (ppbv) Run 1	Conc. (ppbv) Run 2	RPD %	Conc. (ppbv) Run 1	Conc. (ppbv) Run 2	RPD %
1,1,1-TCA	1650	1590	3.7	82.3	85.7	4.0	0.2	0.3	40.0
TCE	354	348	1.7	154	155	0.6	0.2	0.3	40.0
PCE	8.3	8.5	2.4	1.2	1.0	18.2	ND	ND	0
1,1-DCE	288	283	1.8	245	257	5.2	0.4	0.5	22.2
1,2-DCA	ND	ND	-	ND	ND	-	ND	ND	-
Benzene	ND	ND	-	ND	ND	-	ND	ND	-
Toluene	ND	ND	-	ND	ND	-	ND	ND	-
O-xylene	ND	ND	-	ND	ND	-	ND	ND	-
O-xylene	ND	ND	-	ND	ND	-	ND	ND	-

$$RPD = \left[\frac{X_1 - X_2}{X_1 + X_2}\right] \times 100 \times 2$$

2.3 Blanks

Four different kinds of blanks were taken and analyzed to assess potential contamination problems. Syringe blanks were taken in the lab to assess GC system contamination. Ambient blanks and equipment blanks were taken in the field to assess contributions from the sampling process. Equipment blanks are further divided into flux chamber blanks and vapor probe blanks. Table A-2 shows the data for blanks and a discussion of the results for each type of blank follows.

2.3.1 Syringe Blanks

A syringe blank was prepared by taking a 50 cc syringe from the cleaning oven and filling it with UHP air. The syringe blank was run immediately following the calibration check standard to prove that the GC system did not have carryover and that the 50 cc sampling syringes were sufficiently clean for use in sampling that day.

No BTX compounds were detected in the syringe blanks. Chlorinated VOCs were present at less than 1 ppb except for 1,1 DCE at 13.8 ppbv on August 23. This higher level of 1,1 DCE was traced to a tank of UHP air which was used to fill the syringe on this day. The ambient blank taken on August 23, L4033, showed a concentration of 0.4 ppbv for 1,1 DCE confirming that the contamination was not present in the 50 cc sampling syringes. No syringe blank was run on August 22 due to a heavy demand for sampling syringes on this day; the ambient air blank L4010, was used to assess GC system blank levels on this day.

2.3.2 Ambient Blanks

Ambient blanks were taken in the field on each day of sampling by filling a 50 cc syringe with ambient air. No BTX compounds were detected in the ambient blanks. Chlorinated VOCs were detected at less than 1 ppbv per compound in ambient

Table B-2

Blanks

Compound	Concentration (ppmv)											
	Syringe Blanks			Ambient Blanks			Flux Chamber			V. Probe Blank		
	8-21	8-22	8-23	L4001	L4010	L4033	L4002	L4011	L4030	L4005	L4014	L40
1,1-TCA	0.1	NR	0.2	0.4	0.5	0.5	0.1	0.4	0.5	0.3	0.7	1.0
TCE	0.2	NR	0.1	ND	0.1	0.1	0.1	0.1	0.3	ND	0.3	0.1
PCE	0.02	NR	0.04	0.1	0.1	0.03	0.03	0.01	0.02	0.1	0.1	0.2
1,1-DCE	0.8	NR	13.8	0.3	0.4	0.4	12.7	0.4	0.4	ND	0.4	ND
Benzene	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
P-xylene	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
O-xylene	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

NR = Not Run

blanks; this is essentially the same level that were measured for syringe blanks. In other words, no compounds were detected above background levels in ambient blanks.

2.3.3 Equipment Blanks

Blanks were taken in the parking lot at the Betatron Building by pulling ambient air through the soil gas sampling apparatus. Results for equipment blanks are presented in Appendix G. Equipment blanks were taken for more than 10% of the field samples. Equipment blanks were analyzed using the same procedures and methods as the regular samples.

2.4 Detection Limits

Method detection limits (MDL) were determined previously (Dec. 1990) on the GC-FID/ECD by EPA methodology. Detection limits for each compound in the calibration standard are shown below:

Compound	MDL
1,1,1 TCA	0.6
TCE	0.8
PCE	0.2
1,1 DCE	3.0
1,2 DCA	ND
Benzene	250
Toluene	130
p-xylene	220
o-xylene	240

ND - Not Determined

RADIAN CORPORATION

APPENDIX C

BORING LOGS, WELL DIAGRAMS AND SURVEYOR'S RECORDS

RADIAN CORPORATION

GUIDE TO BORING LOG SYMBOLS

UNIFIED SOIL CLASSIFICATION SYSTEM - ADAPTED FOR gINT

	ASPHALT PAVING		CLAYEY SILT (ML)
	CONCRETE FLOORING		SILT (ML)
	FILL MIXTURE OF INORGANIC DEBRIS, SAND, SILTY SANDS		SANDY CLAY (CL)
	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES (GW)		SILTY CLAY (CL)
	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES (GP)		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS (CL)
	SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES (GM)		**WELL CONSTRUCTION SYMBOLS**
	CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES (GC)		CONCRETE SEAL TO SURFACE
	WELL GRADED SANDS, GRAVELLY SANDS, POORLY SORTED (SW)		GROUT-VOLCLAY/BENTONITE MIXTURE
	POORLY GRADED SANDS, GRAVELLY SANDS, WELL SORTED (SP)		BENTONITE SEAL AROUND WELL CASING (CHIPS OR PELLETS)
	SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES (SM)		SAND PACK ABOVE SCREEN
	SANDY SILT (SM)		SCREEN SET IN SAND PACK
	CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES (SC)		SAND PACK BELOW SCREEN (BACKFILL)
	INORGANIC SILTS AND ROCK FLOUR, SILT OR CLAYEY SILTS WITH SLIGHT PLASTICITY (ML)		NATURAL BACKFILL BELOW SCREEN, SLUFF.

- ▽ - MEASURED DEPTH TO WATER
- ▼ - STATIC WATER LEVEL
- FID - FLAME IONIZATION DETECTOR
- PID - PHOTO IONIZATION DETECTOR
- pH - FIELD pH TEST KIT
- BG - BACKGROUND (AMBIENT)
- R - READING FROM SAMPLE
- PPM - PARTS PER MILLION (CONCENTRATION)

90017-21

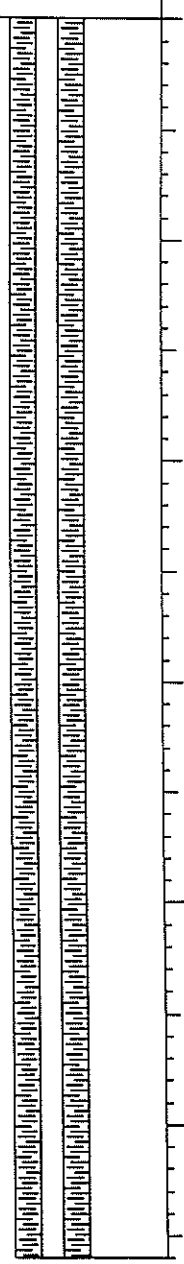
RADIAN CORPORATION

Monitoring #: MW-20

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S./F.S./H.I. LOCATION Beaumont Ca.
TOTAL DEPTH 135.00 START DATE 1/18/91 WELL COMPLETION DATE 1/21/91
GEOLOGIST R. Horwath APPROVED BY W.G. Homer CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER R. Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 12" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION Approximately 500' down gradient of Burn Pits.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2157.70	5" Diameter Well Casing & Screen Top of PVC (MSL) = 2156.86
0	SAND yellowish brown (10 YR 5/4), fine to coarse grained sand, some fine pebble, slightly moist, (SM/SW).		2155	Top of Grout Interval 0.0'
5	SAND light yellowish brown (10 YR 6/4), medium to coarse grained sand, fine to medium pebble, no fines, dry, (SW).		2150	Blow count = 11,7,7 3 lithologies present: 1).SM/SW 2).SW 3).GM All are interlayed at 6" to 18" beds.
10	SAND light yellowish brown (10 YR 6/4), medium to coarse grained sand, fine to medium pebbles, no fines, dry, (SW).		2145	Blow count = 10,9,9 All are interlayered at approx. 6" to 10" beds.
15	SILTY SAND dark yellowish brown (10 YR 4/4), fine to medium grained sand, slight clay, some coarse grained sand, slightly moist, (SM).		2140	Blow count = 6,7,7
20	SAND (SW).		2135	Blow count = 10,11,14
25	Same, slight SM/SW.		2130	Blow count = 11,11,11



First Water Encountered ▽ 67.00 (bgs)

Water Level - May 1991 ▼ 61.15 (bgs)

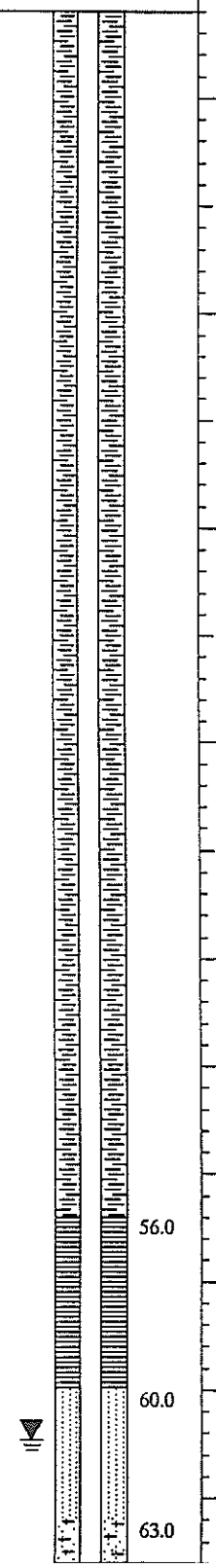
RADIAN CORPORATION

Monitoring #: **MW-20**

LOG OF DRILLING OPERATIONS

PROJECT **Lockheed Beaumont #1 T.S./F.S/H.I.** LOCATION **Beaumont Ca.**

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	SILTY SAND some clay, SW in S.S. shoe, very moist, (SM).			Blow count = 8,8,12
			2125	
35				Blow count = 11,11,18
			2120	
40	Same, 1" sandy clay layer.			Blow count = 18,18,18
			2115	
45				Blow count = 21,25,26
			2110	
50	SAND			
			2105	
55	Same, with SW/SM.			Blow count = 18,19,20
				Top of Bentonite Seal 56'
			2100	
60	Same, grades SW/SM and then SC.			Top of Sand Pack 60' Blow count = 18,20,22
			2095	2/12 Sand >



RADIAN CORPORATION

Monitoring #: MW-20

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S./F.S/H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	SAND			Top of 0.020" slot Stainless Steel screen 64.65'
			2090	
70				Added 4" x 70' H2O.
			2085	
75				Heaving sands - 8' up augers.
			2080	
80				
			2075	
85				
			2070	
90				Added 4" x 90' H2O.
			2065	
95				Bottom of screen 95'
			2060	
100				

RADIAN CORPORATION

Monitoring #: MW-20

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S./F.S./H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
100	SAND			Attempted to sample, cannot.
			2055	
105				
			2050	
110				
			2045	
115				3" of sand in auger.
			2040	
120	SANDY SILT yellowish brown (10 YR 5/4), fine grained sand, to wet, (SM).			Blow count = 20,20,25, 30 12 shoe (last 1") of SS.
			2035	
				Stopped for the day. Resumed 1/21/91. Formation more stable.
125	SANDY SILT yellowish brown (10 YR 4/4), fine to coarse grained sand, clayey, silty sand with some fine pebbles, wet, (SW).			
			2030	Blow count = 27,20,30
130	SAND yellowish brown (10 YR 5/4), fine to coarse grained sand, clayey, silty, some fine pebbles, 5% Mount Eden red clasts, (SW).			Alluvium Weathered Mount Eden contact at 130'. Blow count = 100 for 3"
			2025	Stiffer drilling, consolidated Mount Eden contact. Blow count = 19 for 3"
135				Total depth 135'

135.0

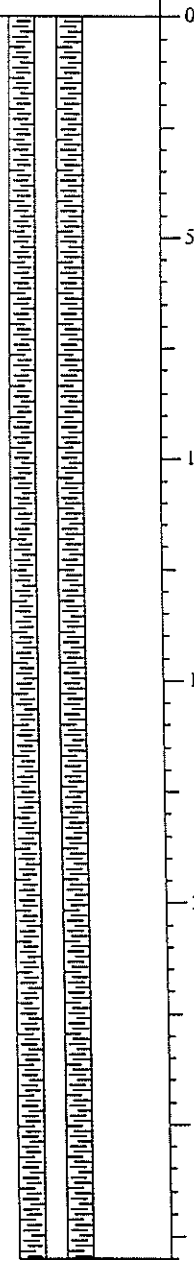
RADIAN CORPORATION

Monitoring #: **MW-21**

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S./F.S/H.I. LOCATION Beaumont Ca.
TOTAL DEPTH 165.00 START DATE 1/21/91 WELL COMPLETION DATE 1/24/91
GEOLOGIST R. Horwath APPROVED BY [illegible] CALIF R.G.# 5878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 12" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION Approximately 500' down gradient of Burn Pits.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2158.86	5" Diameter Well Casing & Screen Top of PVC (MSL) = 2158.13
0	SANDY SILT light yellowish brown (10 YR 6/4), fine to medium grained sand, some coarse grained sand, moist, (SM).			Top of Grout Interval 0.0'
			2155	Very windy.
5				Blow count = 6,6,7
			2150	
10	Same, yellowish brown (10 YR 5/4).			Blow count = 6,6,7
			2145	
15				Blow count = 8,6,6
			2140	
20				Blow count = 5,8,12
			2135	
25	SAND light yellowish brown (10 YR 6/4), medium to coarse grained sand, some fine pebbles and fine grained sand, slight silt, (SW).			Blow count = 8,10,8



First Water Encountered ▽ 70.00 (bgs)

Water Level - May 1991 ▼ 63.03 (bgs)

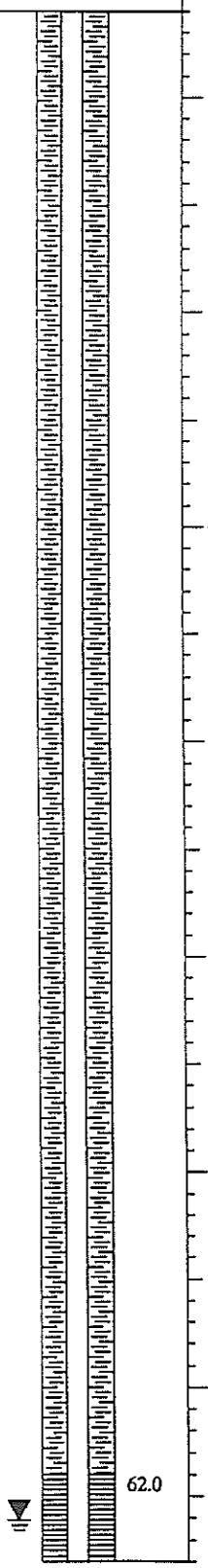
RADIAN CORPORATION

Monitoring #: MW-21

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S./F.S/H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2130	
30	SAND yellowish brown (10 YR 5/4), fine to coarse grained sand, slight fine pebbles, (SM/SW).			Blow count = 9,9,9
			2125	Grout partially collapsed well.
35	SILTY SAND yellowish brown (10 YR 4/4), fine to medium grained silty sand, slightly clayey, (SM/SW).			SW in shoe. Blow count = 8,9,12
			2120	
40				Blow count = 8,9,9
			2115	
45				
			2110	
50				Blow count = 15,15,18
			2105	
55				
			2100	
60				Blow count = 14,14,14
				Top of Bentonite Seal 62'
			2095	



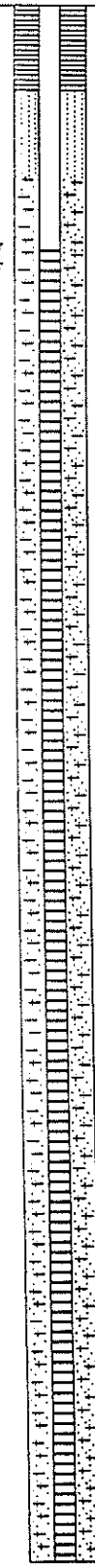
RADIAN CORPORATION

Monitoring #: MW-21

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S./F.S/H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	SILTY SAND yellowish brown (10 YR 4/4), fine to medium grained silty sand, slightly claycy, (SM/SW).			Blow count = 14,16,18
				Top of Sand Pack 66'
				2/12 Sand >
				#3 Sand 68'
			2090	Top of 0.020" slot Stainless Steel screen 69.7'
70	Same, with clay, SW in shoe, wet.			
			2085	
75				
			2080	
80				Added H2O to hole to prevent heaving sands. Hole staying open, slight heaving sands.
			2075	
85	CLAYEY SILTY SAND light olive brown (2.5 Y 5/4), some fine grained gravel, (SM/SW).			Blow count = 21,50 for 6"
			2070	
90				SW in Split Spoon maybe all slough.
			2065	
95				SW in Split Spoon heavy heaving sands, 10' up augers.
			2060	SW in Split Spoon.
100				



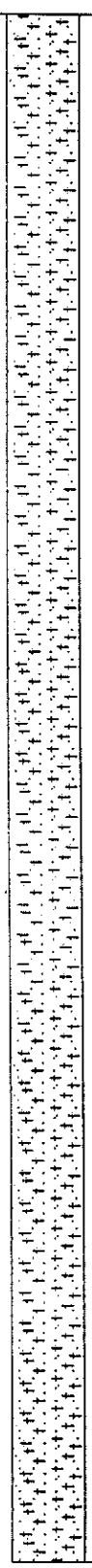
RADIAN CORPORATION

Monitoring #: MW-21

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S./F.S/H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
100				Bottom of screen 100'
			2055	
105				
			2050	
110	SILTY SAND light yellowish brown (10 YR 6/4), when dry, some clay and fine pebbles, (SM).			Some large pebbles and small cobbles in Split Spoon, slough.
			2045	
115	Same, increased clay.			Blow count = - 27,20,50 for 5"
				Hole staying open.
			2040	
120	Same, interbedded SM and SW is 1/4" to 1" layers, the SM layer has some clay, the SW is the typical SW.			Blow count = 37,50 for 3"
			2035	
125				Hole still open.
			2030	
130				Heaving sands.
			2025	
135				



RADIAN CORPORATION

Monitoring #: MW-21

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S./F.S./H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
140			2020	
			2015	
145	SAND olive gray (5 Y 5/2) - wet, light gray (5 Y 7/2) - dry, fine to coarse grained sand, slight fine pebbles, (SW).			Slight heavey sands, clays somewhere.
			2010	
150				13 1/5 - slight heaving sands.
	boulders.			Denser material, very resistant (more than typical).
	SW, slough in S.S.		2005	
155	SAND very dense material, harder than Mount Eden, crunchy, sandstone. (Mount Eden Formation), (SW).			Alluvium Mount Eden contact at 155' Heaving sands.
			2000	
160				
			1995	Boulders and sand 4" up augers, can't push out, pulled out of hole without sample. Total depth 165'
165				165.0

RADIAN CORPORATION

Monitoring #: MW-22

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S./F.S/H.I. LOCATION Beaumont Ca.
TOTAL DEPTH 120.00 START DATE 1/25/91 WELL COMPLETION DATE 1/28/91
GEOLOGIST R. Horwath APPROVED BY [illegible] CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 12" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION Approximately 500 ' down gradient of Burn Pits.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2168.37	5" Diameter Well Casing & Screen Top of PVC (MSL) = 2168.22
0	SAND light gray (2.5 Y 7/2), fine to coarse grained sand, some silt, fine pebbles, dry, (SM/SW).			Top of Grout Interval 0.0'
			2165	
5				Blow count = 10,5,7
			2160	
10	SAND yellowish brown (10 YR 5/3), fine to medium grained sand, some coarse grains, silt, slight fine pebbles, slightly moist, (SM).			Lithologies are interlayered in 6" to 1' beds of SM and SW. Blow count = 8,8,8
			2155	
15	Same, medium grayish brown (10 YR 5/4).			Blow count = 7,8,8
			2150	
20	SAND light yellowish brown (10 YR 6/4), medium to coarse grained sand, fine pebbles, dry, (SW).			Blow count = 7,7,7
			2145	
25	Same, some fine pebbles.			Blow count = 7,11,12

First Water Encountered ▽ 77.10 (bgs)

Water Level - May 1991 ▼ 73.61 (bgs)

RADIAN CORPORATION

Monitoring #: MW-22

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S./F.S/H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2140	
30	SAND yellowish brown (10 YR 4/3), some pebbles, (SM/SW).			Blow count = 7,12,15
			2135	
35	SILTY SAND some fine grained pebbles. slight clay, (SM).			Blow count = 9,13,11
			2130	
40	SAND medium brown (10 YR 6/4), medium to coarse grained sand, some fine grains, some fine pebbles, (SW).			Blow count = 12,16,16
			2125	
45	SAND medium grayish brown (10 YR 5/4), fine to coarse grained sand, silt and some fine pebbles, (SW).			Blow count = 5,8,12 A small clasp of Mount Eden.
			2120	
50	SAND medium brown (10 YR 6/4), fine to coarse grained sand, some fine pebbles and some silt, (SW).			Blow count = 10,10,2 Lithologies are still layered.
			2115	
55	SILTY SAND light yellowish brown (10 YR 6/4), mostly SW with 2" layer of SM with some clay, (SM).			Lithologies layered in 2" to 1' beds. Blow count = 15,30,27
			2110	
60	SILTY SAND medium grayish brown (10 YR 5/4), fine to coarse grained sand, some fine pebbles, some silt, (SM/SW).			
			2105	

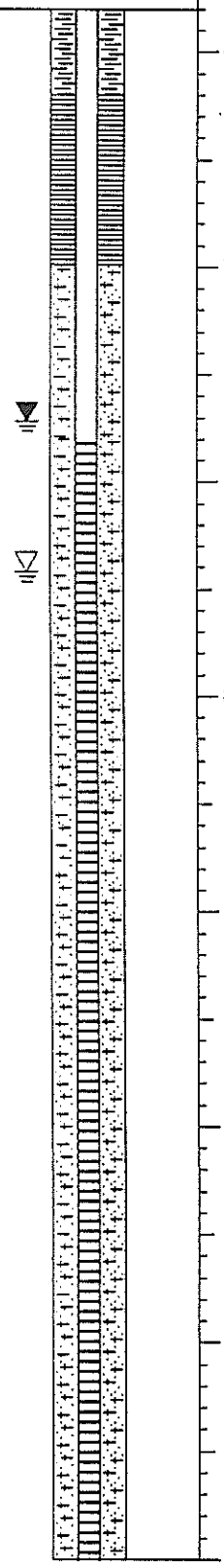
RADIAN CORPORATION

Monitoring #: MW-22

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S./F.S/H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	SAND light yellowish brown (10 YR 6/4), slightly clayey, (SM/SW).			Blow count = 15,15,15 Top of Bentonite Seal 66'
			2100	Blow count 27,31,24
70	SAND light yellowish brown (10 YR 6/4), fine to coarse grained sand, with some fine pebbles, (SW).			Top of Sand Pack 70' #3 Sand >
			2095	Top of 0.020" slot Stainless Steel screen 73.96'
75	SAND medium grayish brown (10 YR 5/4), fine grained pebbles, slightly clayey, very moist, (SW/SM).			Blow count = 12,13,13
			2090	
80	SAND brown (10 YR 5/3), SW and some SW/SM, wet, (SM/SW).			Blow count = 11,12,12
			2085	
85	SAND medium grayish brown (10 YR 5/4), fine to medium grained sand, some coarse grains, (SM/SW).			Blow count = 19,22,33
			2080	
90	SILTY SAND brown (10 YR 5/3), fine pebbles, clayey, (SM).			Blow count = 27,30,30
			2075	
95	SILTY SAND brown (10 YR 5/3), some fine pebbles, slightly clayey, (SW/SM).			Hole staying open and no heaving sands. Blow count = 40,40,40
			2070	
100				



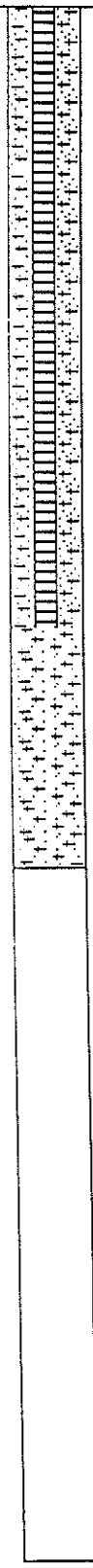
RADIAN CORPORATION

Monitoring #: MW-22

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S./F.S/H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
100	SAND medium grayish brown (10 YR 5/4), fine grained pebbles, slightly clayey, (SW/SM).		2065	Blow count = 21,27,50 for 6"
105	SILTY SAND some fine pebbles, slightly clayey, (SW/SM).		2060	Blow count = 40,40,41
110	SILTY SAND dark yellowish brown (10 YR 4/4), some fine grained pebbles, slightly clayey, (SW/SM).		2055	Blow count = 30,30,30
115	SILTY SAND red (2.5 YR 4/3), some fine grained pebbles, (Mount Eden Formation), (SM).		2050	Bottom of screen 114.41' Alluvium Mount Eden contact at 114.41' Blow count = 50 for 6", 50 for 5", 50 for 5".
	SILTY SAND medium grayish brown (10 YR 5/4), some fine grained pebbles, (SM).			Blow count = 20 for 6"
120				Total depth 120'



RADIAN CORPORATION

Monitoring #: MW-23

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S./F.S/H.I. LOCATION Beaumont Ca.
TOTAL DEPTH 119.00 START DATE 1/30/91 WELL COMPLETION DATE 1/31/91
GEOLOGIST R. Horwath APPROVED BY [illegible] CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 12" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION Adjacent to MW-21.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SANDY SILT light yellowish brown (10 YR 6/4), fine to medium grained sand, some coarse grained sand, moist, (SM).		2159.72	5" Diameter Well Casing & Screen Top of PVC (MSL) = 2159.56 Top of Grout Interval 0.0'
5			2155	
10	Same, yellowish brown (10 YR 5/4).		2150	
15			2145	
20			2140	
25	SAND light yellowish brown (10 YR 6/4), medium to coarse grained sand, some fine pebbles and fine grained sand, slight silt, (SW).		2135	

Water Level - May 1991 ▼ 63.98 (bgs)

RADIAN CORPORATION

Monitoring #: **MW-23**

LOG OF DRILLING OPERATIONS

PROJECT **Lockheed Beaumont #1 T.S./F.S/H.I.** LOCATION **Beaumont Ca.**

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	SAND yellowish brown (10 YR 5/4), fine to coarse grained sand, slight fine pebbles, (SM/SW).		2130	
35	SILTY SAND yellowish brown (10 YR 4/4), fine to medium grained silty sand, slightly clayey, (SM/SW).		2125	
40			2120	
45			2115	
50			2110	
55			2105	
60			2100	

RADIAN CORPORATION

Monitoring #: MW-23

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S./F.S/H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	SILTY SAND yellowish brown (10 YR 4/4), fine to medium grained silty sand, slightly clayey, (SM/SW).		2095	
				Top of Bentonite Seal 67'
70	Same, with clay, SW in shoe, wet.		2090	
75			2085	
80			2080	Top of Sand Pack 80'
85	CLAYEY SILTY SAND light olive brown (2.5 Y 5/4), some fine grained gravel, not H2O saturated, (SM/SW).		2075	Top of 0.020" slot Stainless Steel screen 84.4'
90			2070	
95			2065	
100			2060	

RADIAN CORPORATION

Monitoring #: MW-23

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S./F.S/H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
100				
105			2055	
110	SILTY SAND light yellowish brown (10 YR 6/4), when dry, some clay and fine pebbles, (SM).		2050	
115	Same, increased clay.		2045	Bottom of screen 115'
				Total depth of borehole 119'

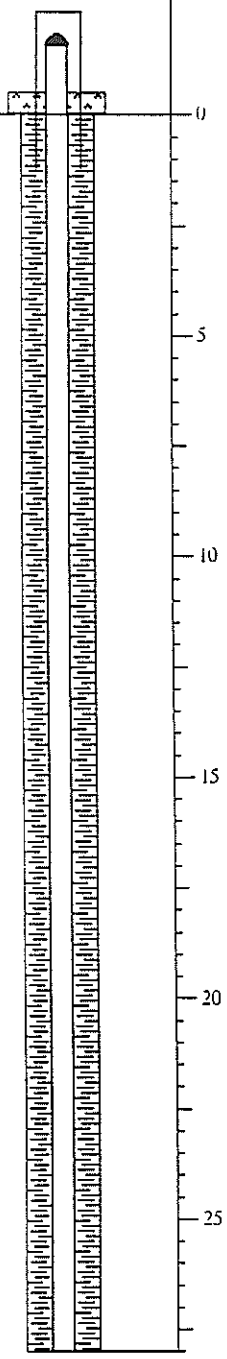
RADIAN CORPORATION

Monitoring #: **MW-24**

LOG OF DRILLING OPERATIONS

PROJECT **Lockheed Beaumont #1 T.S.** LOCATION **Beaumont Ca.**
TOTAL DEPTH **105.00** START DATE **11/9/91** WELL COMPLETION DATE **11/10/91**
GEOLOGIST **J.Hensel** APPROVED BY W G Hamm CALIF R.G.# 3878
DRILLING COMPANY **West Hazmat** DRILLER **Rob Slagle**
DRILLING METHOD **Hollow Stem Auger** EQUIPMENT **CME-75**
DRILL BIT TYPE AND SIZE **8" Diameter Auger Head Bit**
APPROXIMATE BOREHOLE/WELL LOCATION **FS-3 / BP-7 vapor point.**

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SAND yellowish brown (10 YR 5/4), fine to medium grained, some coarse sand and pebbles, some silt, slightly compact, slightly moist, (SP).		2179.83	2" Diameter Well Casing & Screen Top of PVC (MSL) = 2180.62 Top of Grout Interval 0.0'
5			2175	
				Probe at 7' Flux at 7.5'
10			2170	
15			2165	Probe at 15'
20			2160	
25			2155	



First Water Encountered ▽ **89.30** (bgs)

Water Level - May 1991 ▼ **81.38** (bgs)

RADIAN CORPORATION

Monitoring #: MW-24

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	SAND yellowish brown (10 YR 5/4), fine to medium grained, some coarse sand and pebbles, some silt, slightly compact, slightly moist, (SP).		2150	
35			2145	Probe at 35'
40			2140	Use standard pin to fine contact.
45			2135	
50			2130	Probe at 50'
				Drilling very difficult.
	SAND strong brown (7.5 YR 5/6) to yellowish red (5 YR 4/6), very fine to coarse grained sandstone, very fine to fine pebbles and minor silt, angular to subrounded, very stiff, poorly cemented, dry, (Mount Eden Formation), (SW).			Alluvium Mount Eden contact at 53'.
55			2125	
60			2120	

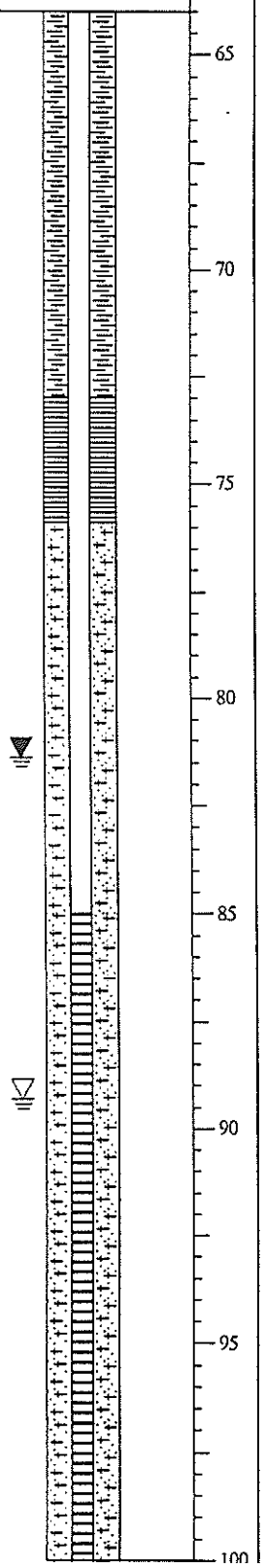
RADIAN CORPORATION

Monitoring #: MW-24

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	SAND strong brown (7.5 YR 5/6) to yellowish red (5 YR 4/6), very fine to coarse grained sandstone, very fine to fine pebbles and minor silt, angular to subrounded, very stiff, poorly cemented, dry, (Mount Eden Formation), (SW).		2115	
70			2110	
				Top of Bentonite Seal 73'
75			2105	
				Top of Sand Pack 76'
80			2100	
85			2095	Top of 2" slot Stainless Steel screen 85'
				Lone Star #3 Sand Pack
90			2090	
95			2085	
100			2080	



RADIAN CORPORATION

Monitoring #: MW-24

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
100				
105			2075	Bottom of screen 105' Total depth 105'

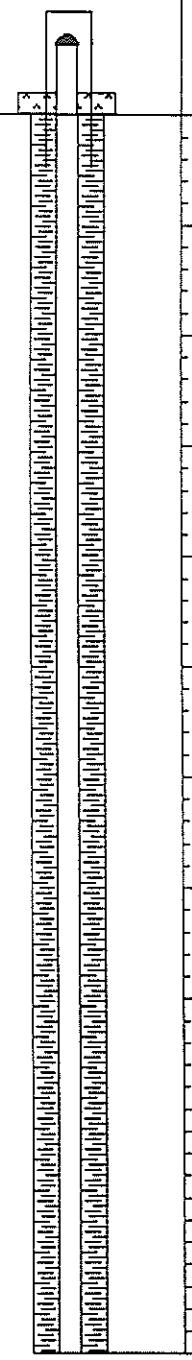
RADIAN CORPORATION

Boring Well #: MW-25

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.
TOTAL DEPTH 110.00 START DATE 11/27/90 WELL COMPLETION DATE 11/27/90
GEOLOGIST J.D. Long APPROVED BY WG Farmer CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 8"Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION Approximately 250' along seismic line #2, from MW-24.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
			2179.97	2" Diameter Well Casing & Screen Top of PVC (MSL) = 2180.66
0	SAND light brownish gray (10 YR 6/2), well graded, poorly sorted, subrounded to subangular quartz sand with biotite mica, some 1-3 mm quartz grains, not much clay, moist, (SW).			Top of Grout interval 0.0'
5			2175	Blow Count = 6,6,7.
10	Same, remaining coarse.		2170	Blow Count = 6,7,5.
15	SAND olive brown (2.5 Y 4/3), fine to medium grained quartz sand, with mica, some clay, slightly moist, cohesive, (SP).		2165	Blow Count = 7,8,10.
20	SAND brown (10 YR 5/2), fine to coarse grained sand, well graded quartz, sand with large 1-2 mm mica flakes, no clay, not cohesive, (SW).		2160	Blow Count = 6,6,5.
25			2155	



Water Level - May 1991 ▼ 85.84 (bgs)

RADIAN CORPORATION

Boring Well #: MW-25

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
30	Same, coarser in texture, more moist, slightly cohesive.		2150	Blow Count = 8,8,12.
35			2145	
40	SAND dark grayish brown (10 YR 4/2), fine to coarse quartz sand with smaller mica, more moist, cohesive with greater clay, (SC).		2140	Blow Count = 5,10,12.
45			2135	
50	SAND fine to medium grained quartz, sand with mica, occasional 1-2 mm grains, decrease in clay content, moist, (SW).		2130	Blow Count = 15,12,14.
55			2125	
60	SAND dark brown (7.5 YR 4/6), medium to coarse grained quartz sand, with biotite mica, small portions are redder, contact is in sampler,(Mount Eden Formation), (SW).		2120	Blow Count = 9,12,50 for 4". Alluvium Mount Eden contact in sampler.

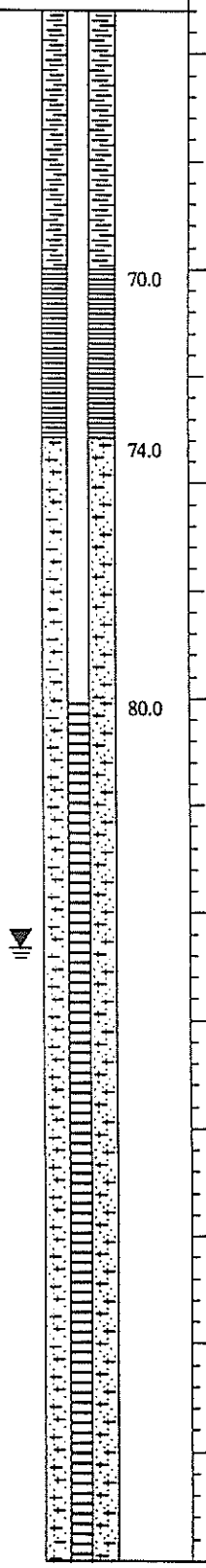
RADIAN CORPORATION

Boring Well #: MW-25

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
65	SAND yellowish red (5 YR 5/8), fine to coarse grained quartz sand, with mica, minor amounts of clay, red coatings on grains, moist, (SW).		2115	Blow Count = 50 for 3".
70	Same, sample is cohesive in sampler, but falls apart when crushed.		2110	Blow Count = 50 for 3". Top of Bentonite Seal 70'
	SAND dark brown (7.5 YR 4/4), occasional coarser grained sand, (SW).			Top of Sand Pack 74'
75	SAND yellowish red (5 YR 5/8), fine to coarse grained quartz sand, well graded, more compact, little clay, moist, (SW).		2105	Blow Count = 50 for 2". Drilling difficult.
80	Same, increased moisture.		2100	Top of 0.020" slot stainless steel screen 80' Blow Count = 50 for 2". Similar obs about moisture made in a nearby boring. Probable water at 80'.
85	Same, yellowish red (5 Y 5/8) and more moisture.		2095	Blow Count = 50 for 4".
90	Same, brown (7.5 YR 5/4), wet.		2090	Blow Count = 50 for 5". 8" augers left in hole; pulled up to 70' to check for ground water.
95			2085	
100			2080	



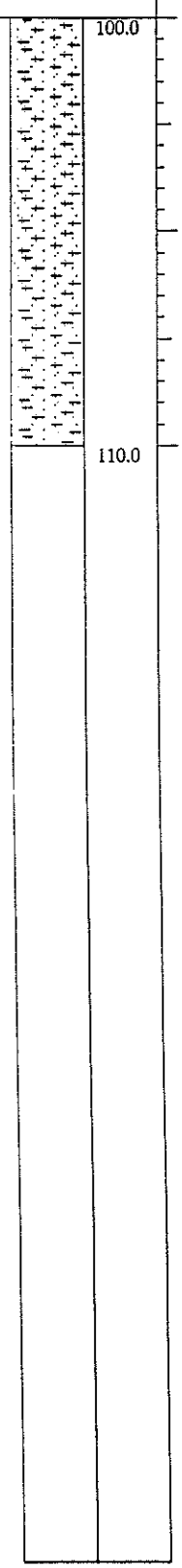
RADIAN CORPORATION

Boring Well #: MW-25

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
100	SAND dark brown (7 YR 4/3), fine to medium grained, occasionally coarse grained quartz, sand with mica, a little clay, wet, sampler filled with soupy, muddy sediment (sediment in augers), (SW).			Bottom of screen 100' Blow Count = 50 for 5".
105			2075	
110	SAND reddish brown (5 YR 4/4), fine to coarse grained, quartz, mica sand, very little clay, saturated, water in sampler, (SW).		2070	Blow Count = 50 for 4". Drilling halted. Total depth 110.0'



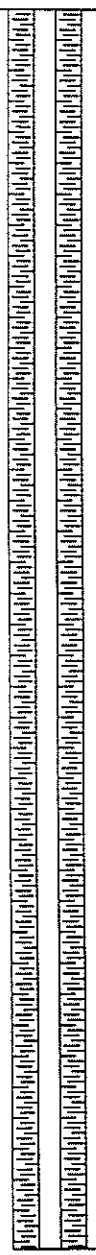
RADIAN CORPORATION

Monitoring #: **MW-26**

LOG OF DRILLING OPERATIONS

PROJECT	Lockheed Beaumont #1 T.S./F.S./H.I.	LOCATION	Beaumont Ca.
TOTAL DEPTH	129.00	START DATE	1/29/91
WELL COMPLETION DATE	1/30/91	GEOLOGIST	R. Horwath
APPROVED BY	W G Hamer	CALIF R.G.#	3878
DRILLING COMPANY	West Hazmat	DRILLER	Rob Slagle
DRILLING METHOD	Hollow Stem Auger	EQUIPMENT	CME-75
DRILL BIT TYPE AND SIZE	12" Diameter Auger Head Bit		
APPROXIMATE BOREHOLE/WELL LOCATION	Approximately 17' Southeast of MW-24.		

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SAND medium brown (10 YR 6/4), fine to coarse grained sand, well graded, some fine pebbles, (SW).		2180.06 2180	5" Diameter Well Casing & Screen Top of PVC (MSL) = 2179.78 Top of Grout Interval 0.0'
5			2175	
10	SILTY SAND dark yellowish brown (10 YR 4/4), fine to medium grained sand, some coarse grains, very slight fine pebbles, (SM).		2170	
15	SILTY SAND medium brown (10 YR 6/4), well graded sand, fine pebbles, (SW/SM).		2165	
20	SILTY SAND medium grayish brown (10 YR 5/4), fine pebbles, SM/SW and SW, (SM/SW).		2160	
25	SAND medium brown (10 YR 6/4), fine pebbles, (SW).		2155	



First Water Encountered ▽ **90.00** (bgs)

Water Level - May 1991 ▼ **80.56** (bgs)

RADIAN CORPORATION

Monitoring #: MW-26

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S./F.S./H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	SAND medium grayish brown (10 YR 5/4), fine pebbles, silty sand, some clayey silt, (SW).		2150	Lithologies layered between 3"-6". Blow count = 11,15,12
35	SAND medium brown (10 YR 6/4), medium to coarse grained sand, some fine grained sand, with some fine pebbles, (SW).		2145	Blow count = 15,22,20
40	SAND medium grayish brown (10 YR 5/4), fine to medium grained sand, some silt, (SW).		2140	Blow count = 11,11,11
45	SAND medium brown (10 YR 6/4), fine to medium grained sand, some fine sand and some fine pebbles, (SW).		2135	Blow count = 17,17,17
50			2130	Blow count = 12,14,15
55	SAND yellowish red (5 Y 5/8), fine to medium grained sand, some coarse grained sand, some pebbles, (Mount Eden Formation), (SW).		2125	Alluvium Mount Eden contact at 54' Blow count = 50 for 6"
60	SAND reddish brown (5 Y 5/8), fine to medium grained sand, some coarse grains, some fine pebbles, (SW).		2120	Blow count = 75 for 6"

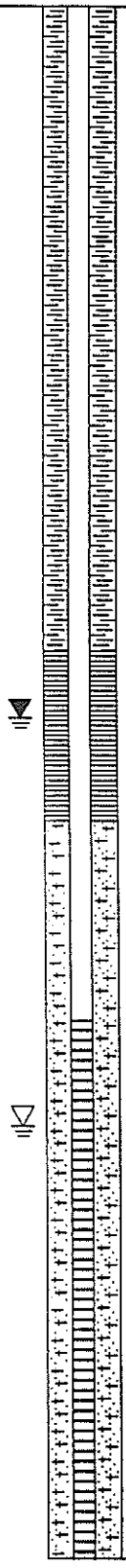
RADIAN CORPORATION

Monitoring #: **MW-26**

LOG OF DRILLING OPERATIONS

PROJECT **Lockheed Beaumont #1 T.S./F.S./H.I.** LOCATION **Beaumont Ca.**

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65			2115	Blow count = 50 for 3"
70	SAND reddish brown (5 YR 5/8), fine to medium grained sand, some coarse grained sand, some fine pebbles, (SW).		2110	Blow count = 200 for 6" Sleeve sample taken at 09:20
75	SAND reddish brown (5 YR 5/8), fine to medium grained sand, with some coarse grains, some fine pebbles, (SW).		2105	
80	SAND yellowish red (5 YR 4/6), fine to medium grained sand, some coarse grained sand, some silt and slight fine pebbles, (SW).		2100	Top of Bentonite Seal 79' Blow count = 50 for 4" Top of Sand Pack 83'
85	SAND olive (7.5 YR 3/4), fine to medium grained sand, some coarse grains, slight fine pebbles, (SW).		2095	Blow count = 150 for 6" Sleeve sample taken at 09:48 Top of slot PVC screen 87.58'
90	SAND yellowish red (5 YR 4/6), fine to medium grained sand, some coarse grains, slight fine pebbles, (SW).		2090	Blow count = 50 for 4-5" Lost center bit down hole. Sample taken at 10:21
95	SAND yellowish red (5 YR 4/6), fine to medium grained sand, some coarse grains, slight fine pebbles, slight silt, (SW).		2085	Blow count = 50 for 5"
100				



RADIAN CORPORATION

Monitoring #: **MW-26**

LOG OF DRILLING OPERATIONS

PROJECT **Lockheed Beaumont #1 T.S./F.S./H.I.** LOCATION **Beaumont Ca.**

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
100	SAND light yellowish brown (10 YR 5/6), fine to medium grained sand, some coarse grained sand, slight fine pebbles, (SW).		2080	Blow count = 50 for 5"
105	SAND yellowish red (5 YR 4/6), fine to medium grained sand, some coarse grained sand, slight fine pebbles, (SW).		2075	Blow count = 50 for 6"
110	Same, yellowish brown (5 YR 5/8).		2070	Blow count = 50 for 6"
115	CLAYEY SILT brown (10 YR 4/3), fine grained sand, (ML).		2065	Blow count = 50 for 3"
120	SAND light yellowish brown (10 YR 5/6), fine to medium grained sand, some coarse grained sand, (SW).		2060	Blow count = 50 for 3"
125	Same, pebbles.		2055	Blow count = 50 for 3"
				Bottom of screen 128'
				Total depth 129'

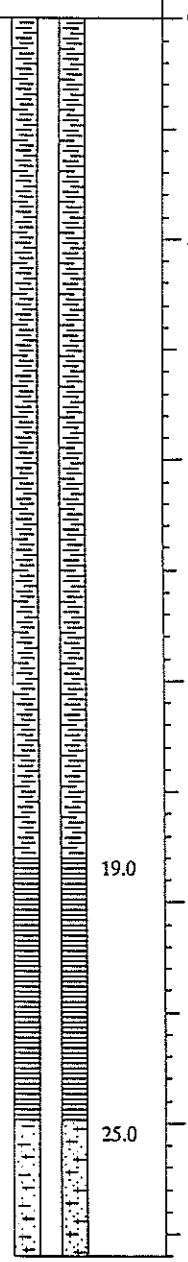
RADIAN CORPORATION

Boring #: MW-27

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S. LOCATION Beaumont Ca.
TOTAL DEPTH 98.00 START DATE 2/6/91 WELL COMPLETION DATE 2/8/91
GEOLOGIST P.Quandt APPROVED BY W G Hamer CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 10" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION Approximately 125' Southwest from MW-10 (62.6'), from 200N, 1000W (37.7'), from 300N, 1000W.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2178.27	4" Diameter Well Casing & Screen Top of PVC (MSL) = 2177.99
0	SILTY SAND pale brown (10 YR 3/6), some fine pebbles. (SM).			Top of Grout interval 0.0'
			2175	
5				Blow count = 3,3,4
			2170	
10	SILTY SAND yellowish brown (10 YR 5/6), some fine pebbles, (SM).			Blow count = 11,11,15
			2165	
15	SAND very pale brown (10 YR 7/3), fine to coarse grained sand, some fine pebbles, (SW).			Blow count = 12,6,6
			2160	
				Top of Bentonite Seal 19'
20	SILTY SAND yellowish brown (10 YR 5/4), fine to medium grained sand, some coarse and some fine pebbles, (SM).			Blow count = 6,6,9
			2155	
25				Top of Sand Pack 25' Blow count = 7,7,7



First Water Encountered ▽ 95.00 (bgs)

Water Level - May 1991 ▼ 83.94 (bgs)

RADIAN CORPORATION

Boring #: MW-27

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2150	
30	SILTY SAND light yellowish brown (10 YR 6/4), fine to medium grained sand, some fine and coarse pebbles, (SM).			Top of 0.020" slot Carbon Steel screen 29.28' Blow count = 11,8,9
			2145	
35	SILTY SAND dark yellowish brown (10 YR 4/4), slightly clayey, (SM).			Blow count = 6,7,7
			2140	
40	SAND light yellowish brown (10 YR 6/4), fine to coarse grained sand, with some fine pebbles, (SW).			Blow count = 7,7,7
			2135	
45				Blow count = 10,11,10
			2130	
50				Blow count = 10,10,11
			2125	
55	SILTY SAND dark yellowish brown (10 YR 4/6), some fine pebbles, (SM).			Blow count = 7,13,13,
			2120	
60	SILTY SAND yellowish brown (10 YR 5/4), some fine pebbles, (SM).			Blow count = 11,9,9
			2115	

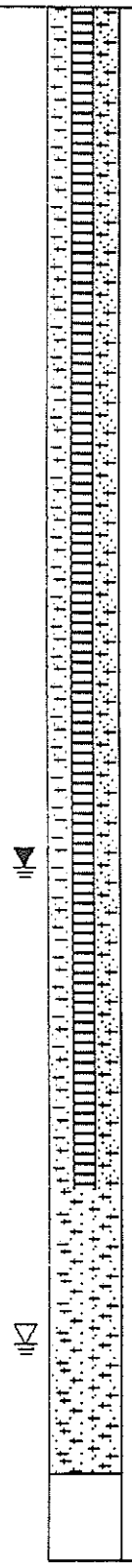
RADIAN CORPORATION

Boring #: MW-27

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	SAND light yellowish brown (10 YR 6/4), fine to coarse grained sand, with some fine pebbles, (SW).			Blow count = 10,10,10
			2110	
70				Blow count = 13,13,14
			2105	
75	SAND yellowish brown (10 YR 5/4), fine to medium grained sand, some coarse and some fine pebble, silt, (SM).			Blow count = 35,30,15
			2100	
80				Blow count = 30,11,11 Hit big rock, augers separated.
			2095	
85	SAND light yellowish brown (10 YR 6/4), fine to coarse grained sand, slightly fine pebbles, (SW).			Blow count = 15,20,20 Static H2O at 85.8', 2/7/91 at 09:00.
			2090	
90	SAND yellowish brown (10 YR 5/4), fine to coarse grained sand, some fine pebbles and silt, (SW).			Blow count = 14,17,50 for 1" Bottom of screen 91.4'
			2085	
95	SAND light gray (10 YR 7/2), fine to coarse grained sand, with some fine pebbles and silt, (SW).			
				Total depth 98' Granitic basement 98'



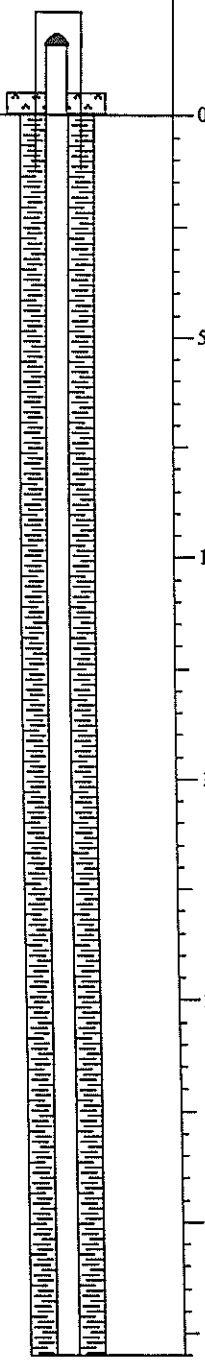
RADIAN CORPORATION

Boring #: MW-28

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.
TOTAL DEPTH 134.00 START DATE 2/20/91 WELL COMPLETION DATE 2/20/91
GEOLOGIST G. McKelvey APPROVED BY [illegible] CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Split Spoon thru Augers EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 10" Auger Head Drill Bit
APPROXIMATE BOREHOLE/WELL LOCATION Adjacent to MW-20, 500' down gradient of Burn Pits.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SAND yellowish brown (10 YR 5/4), fine to coarse grained sand, some fine pebble, slightly moist, (SM/SW).		2157.29	4" Diameter Well Casing & Screen Top of PVC (MSL) = 2158.25 Top of Grout Interval 0.0'
5	SAND light yellowish brown (10 YR 6/4), medium to coarse grained sand, no fines, fine to medium pebble, dry, (SW).		2155 2150	
10			2145	
15	SILTY SAND dark yellowish brown (10 YR 4/4), fine to medium grained sand, slight clay, some coarse sand, slightly moist, (SM).		2140	
20	SAND (SW).		2135	
25	Same, slight SM/SW.		2130	



Water Level - May 1991 ▼ 63.00 (bgs)

RADIAN CORPORATION

Boring #: MW-28

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	SILTY SAND some clay, SW in S.S. shoe, very moist, (SM).			
			2125	
35				
			2120	
40	Same, 1" sandy clay layer.			
			2115	
45				
			2110	
50	SAND			
			2105	
55	Same, with SW/SM.			
			2100	
60	Same, grades SW/SM and then SC.			
			2095	

RADIAN CORPORATION

Boring #: MW-28

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	SAND			
			2090	
70				
			2085	
75				
			2080	
80				
			2075	
85				
			2070	
90				
			2065	
95				
			2060	
100				

RADIAN CORPORATION

Boring #: MW-28

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details	
100	SAND				100
			2055		
105					105
			2050		
				Top of Bentonite Seal 109'	109.0
110					110
				Top of Sand Pack 111'	111.0
			2045		
115				Top of # 0/30 Sand Filter Pack 114.5'	114.5
			2040		115
120	SANDY SILT yellowish brown (10 YR 5/4), fine grained sand, very moist to wet, (SM).			Top of 0.020" slot Stainless Steel screen 120'	120.0
			2035		120
125	SAND yellowish brown (10 YR 4/4), fine to coarse grained sand, clayey, silty sand with some fine pebbles, wet, (SW).				125
			2030		
130	SAND yellowish brown (10 YR 5/4), fine to coarse grained sand, clayey, silty, some fine pebbles, 5% Mount Eden red clasts, (SW).			Bottom of screen 130'	130.0
			2025		130
				Total depth 134'	134.0

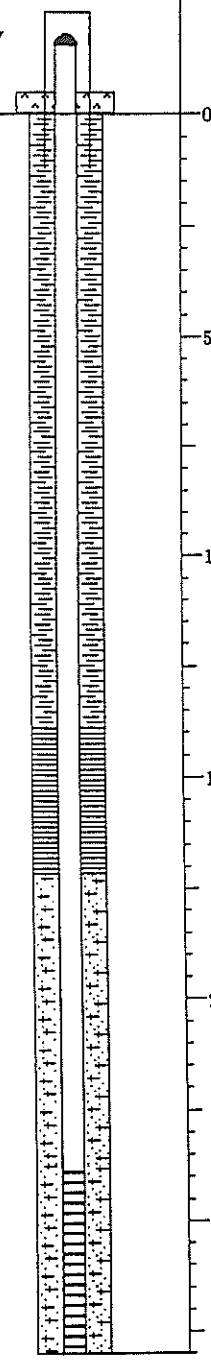
RADIAN CORPORATION

Well #: MW-29

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.
TOTAL DEPTH 50.00 START DATE 12/3/91 9:00 WELL COMPLETION DATE 12/3/91 13:10
GEOLOGIST J.C. Shulters APPROVED BY W G Fahner CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER D. Marocchi
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME 75
DRILL BIT TYPE AND SIZE 8" for borehole, 10" for well installation
APPROXIMATE WELL LOCATION

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2109.54	Top of PVC (MSL)= 2112.37
0	SILTY SAND yellowish brown (10YR 5/4), fine grained, M=0.1 mm, pebbles to 2 cm, very poorly sorted, dry, (SM).			Top of grout interval at surface
	No recovery			4" diameter Schedule 40 blank PVC casing
	SAND as above, slightly moist.		2105	
5	No recovery			
	CLAYEY SILT very dark brown (10YR 2/2), micaceous, slightly moist, (ML).		2100	
10	SILTY SAND yellowish brown (10YR 5/4), fine grained, M=0.1 mm, pebbles to 2 cm, poorly sorted, moist, (SM).			
	CLAYEY SAND dark yellowish brown (10YR 4/4), fine grained, poorly sorted, slightly moist, (SC).			
	SILTY SAND yellowish brown (10YR 5/4), medium grained, slightly moist, (SM).			
	No recovery			
	SAND as above			Top of bentonite seal 13.9'
15	SILTY CLAY dark brown (10YR 3/3), micaceous, slightly moist, (CL).		2095	
	CLAYEY SAND dark yellowish brown (10YR 4/4), fine grained, M=0.1 mm, very poorly sorted, subangular, subround, slightly moist, (SC).			
	SILTY SAND dark yellowish brown (10YR 4/4), medium grained, M=0.3 mm, pebbles to 5 mm, abundant feldspar grains, very poorly sorted, subangular, moist, (SM).			Top of #3 filter pack sand 17.2'
	No recovery			
	Fine grained, M=0,1 mm, poorly sorted.		2090	
20	Medium grained, M=0.3 mm.			
	SANDSTONE, of Mt. Eden Formation, yellowish red (5YR 5/8), dry, consolidated, arkosic in composition.			Mount Eden contact
			2085	Top of 0.02" slot, 4" diameter stainless well screen 23.7
25				Blow Count = 84
				Switch to 5 ft sampling due to difficulty of drilling



Water Level - January 1992 ▽ 32.97 (bgs)

RADIAN CORPORATION

Well #: MW-29

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	Very moist to wet.		2080	Water stabilized to 29 feet after letting level stabilize for 40 minutes during drilling Blow Count = 91
35	Hard and dry to 35 feet.		2075	Blow Count = 50
40	Wet.		2070	Blow Count = 50
45			2065	Blow Count = 50
				Very hard drilling Blow Count = 100
50			2060	Bottom of well screen 48.7' Bottom of end cap Blow Count = 100 Total depth at 50'

RADIAN CORPORATION

Monitoring #: **MW-30**

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S./F.S./H.I. LOCATION Beaumont Ca.
TOTAL DEPTH 125.00 START DATE 2/13/91 WELL COMPLETION DATE 2/13/91
GEOLOGIST R. Horwath APPROVED BY W G Hamer CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 12" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION Adjacent to MW-21 and MW-23, 500' down gradient of Burn Pits.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2159.31	5" Diameter Well Casing & Screen Top of PVC (MSL) = 2159.04
0	SANDY SILT light yellowish brown (10 YR 6/4), fine to medium grained sand, some coarse grained sand, moist, (SM).			Top of Grout Interval 0.0'
			2155	
5				
			2150	
10	Same, yellowish brown (10 YR 5/4).			
			2145	
15				
			2140	
20				
			2135	
25	SAND light yellowish brown (10 YR 6/4), medium to coarse grained sand, some fine pebbles and fine grained sand, slight silt, (SW).			

Water Level - May 1991 ▼ 64.26 (bgs)

RADIAN CORPORATION

Monitoring #: MW-30

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S./F.S./H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	SAND yellowish brown (10 YR 5/4), fine to coarse grained sand, slight fine pebbles, (SM/SW).		2130	
35	SILTY SAND yellowish brown (10 YR 4/4), fine to medium grained silty sand, slightly clayey, (SM/SW).		2125	
40			2120	
45			2115	
50			2110	
55			2105	
60			2100	

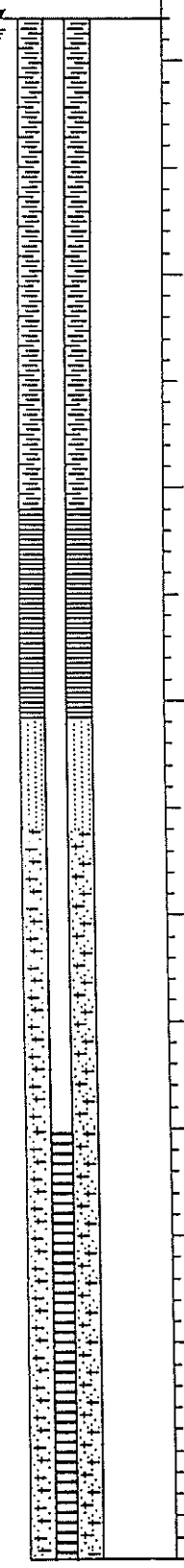
RADIAN CORPORATION

Monitoring #: MW-30

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S./F.S./H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	SILTY SAND yellowish brown (10 YR 4/4), fine to medium grained silty sand, slightly clayey, (SM/SW).		2095	
			2090	
70	Same, with clay, SW in shoe, wet.			
			2085	
75				Top of Bentonite Seal 75.5'
			2080	
80				Top of Sand Pack 80.5' # 0 Sand >
			2075	
85	CLAYEY SILTY SAND light olive brown (2.5 Y 5/4), some fine grained gravel, not H2O saturated, (SM/SW).			
			2070	
90				Top of 0.02" slot Stainless Steel screen 90'
			2065	
95				
			2060	
100				



RADIAN CORPORATION

Monitoring #: MW-30

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S./F.S./H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
100				
			2055	
105				
			2050	
110	SILTY SAND light yellowish brown (10 YR 6/4), when dry, some clay and fine pebbles, (SM).			
			2045	
115	Same, increased clay.			
			2040	
120	Same, interbedded SM and SW is 1/4" to 1" layers, the SM layer has some clay, the SW is the typical SW.			
			2035	
125				Bottom of screen 124.5' Total depth 125'

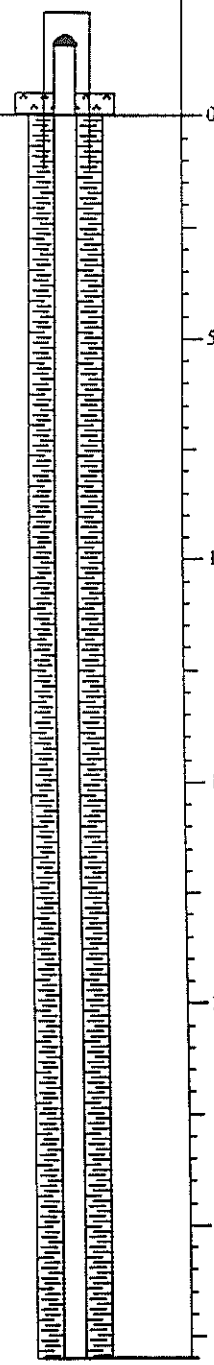
RADIAN CORPORATION

Boring #: MW-31

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.
TOTAL DEPTH 195.00 START DATE 2/6/91 WELL COMPLETION DATE 2/9/91
GEOLOGIST G. Childs APPROVED BY W O Hamer CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Scott Smith
DRILLING METHOD Air Rotary/Casing Drive EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 10" Diameter Tri-cone Bit
APPROXIMATE BOREHOLE/WELL LOCATION Burn Pit Area.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2181.80	4" Diameter Well Casing & Screen Top of PVC (MSL) = 2183.32
0	SILTY SAND medium grayish brown (10 YR 5/4), fine to coarse grained sand. (SM).		2180	Top of Grout Interval 0.0'
5	SAND medium grayish brown (10 YR 5/4), fine to coarse grained sand, some fine pebbles, common silt. (SM/SW).		2175	Drive casing falling GSC at bit.
10	SAND light brown (10 YR 5/4), fine to coarse grained sand, increased quartz pebbles, (SW).		2170	
15	SILTY SAND medium brown (10 YR 5/4), fine to coarse grained, common angular quartz pebbles. (SW/SM).		2165	Rig chatter.
20	SILTY SAND medium brown (10 YR 5/4), fine to coarse grained sand, frequent pebbles, dry, (SW).		2160	At 20' connect 14:46.
25	Same, increased pebbles.		2155	Constant drilling rate.



Water Level - May 1991 ▼ 97.03 (bgs)

RADIAN CORPORATION

Boring #: MW-31

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	SAND medium brown (7.5 YR 5/4), fine to coarse grained sand, common fine gravel, dry, (SW).		2150	
35			2145	
40	SAND medium brown (10 YR 5/3), medium to coarse grained sand, decreased fine sand, minor fine gravel, (SW).		2140	At 40' connect.
45			2135	
50	SAND medium brown (10 YR 5/3), increased medium pebbles to fine cobbles, (SW).		2130	
55	SAND reddish brown (2.5 YR 4/6), fine to medium grained sand, occasional coarse grains, infrequent poorly cemented S.S., silt matrix, slightly moist, (SW).		2125	
60			2120	At 60' connect 15:23. Use Pile Driver Casing Hammer. Alluvium Mount Eden contact at 62' BGS.

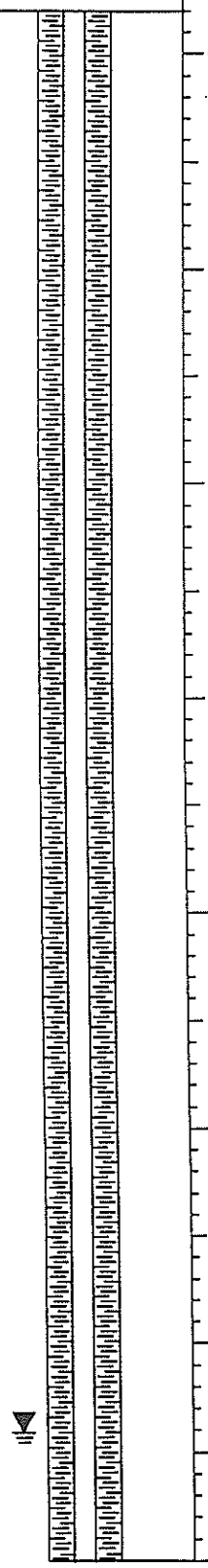
RADIAN CORPORATION

Boring #: MW-31

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	SAND reddish brown (2.5 YR 4/6), (SW).		2115	Cuttings return as loose sand.
70	SAND reddish brown (2.5 YR 4/6), some fine pebbles, slightly moist, (SW).		2110	Casing driving hard.
75	SAND reddish brown (2.5 YR 4/6), fine to coarse grained, occasional fine pebbles, subangular, slightly moist, (SW).		2105	
80	GRAVELLY SAND reddish brown (2.5 YR 4/6), fine to coarse grained sand, fine gravel, slightly moist, (SW/GW).		2100	At 80' connect - 15:58.
85	SAND reddish brown (2.5 YR 4/6), fine to medium grained sand, some coarse grained, slightly fine pebbles, moist, (SW).		2095	30 blows per minute.
90			2090	
95	SAND reddish brown (5 YR 5/6), fine to medium grained, some coarse some silt, slightly moist, (SP/SM).		2085	
100				



RADIAN CORPORATION

Boring #: MW-31

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
100				At 100' connect - 16:34.
			2080	
105	SAND reddish brown (5 YR 5/6), fine to medium grained, occasional coarse grains, slightly moist, (SP/SM).			
			2075	
110	SAND reddish brown (7.5 YR 4/4), fine to coarse grained sand, some very coarse, subangular, moist, (SW).			
			2070	
115				
			2065	
120	SILTY SAND dark brown (10 YR 4/2), fine to coarse grained, some very coarse grains, moist, (SM).			Terminate drilling at 120' - 17:30.
			2060	
125	SANDY CLAY dark brown (10 YR 4/2), fine to very coarse grained sand, minor fine pebbles, soft, very moist to wet, (CL).			Blow count = 100 for 5" (hard). Circulate water at 120'.
			2055	
130	SILTY SAND dark brown (10 YR 4/2), fine to very coarse grained sand, occasional fine pebbles, moist, (SM).			
			2050	
135				

RADIAN CORPORATION

Boring #: MW-31

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2045	
140	SAND olive brown (10 YR 5/3), fine to coarse grained sand, decreased silt, (SW).			at 140' connect - 09:33.
			2040	
145	GRAVELLY SAND frosted gray, white, brown (10 YR 6/3), dominantly coarse to very coarse grained, subangular, fine to occasional medium pebbles, moist, (SW/GW).		2035	
150			2030	
155			2025	
160			2020	at 160' connect - 10:30.
165	SAND light brown (7.5 YR 6/4), fine to coarse grained sand, rare fine pebbles, subangular to subrounded, (SW).		2015	At 165' inject water; no cutting returns.
170	SAND light brown (7.5 YR 6/4), fine to coarse grained sand, (SW).			Top of Bentonite Seal 170'

171.0

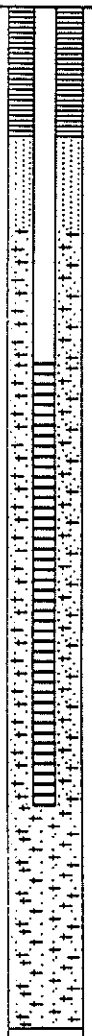
RADIAN CORPORATION

Boring #: MW-31

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
175	GRAVELLY SAND frosted gray, white, brown (10 YR 6/3), coarse to very coarse grained sand, fine subangular pebbles, (SW/GW).			Top of Sand Pack 175'
			2005	Top of #30 Lone Star Bridge Sand 177'
180				Top of 0.020" slot Stainless Steel screen 180'
			2000	Drive casing driving very hard to almost refusal at 180'
185				Open hole all rotary from 180'- 190'
			1995	
190				Bottom of screen 190'
			1990	
195				Total depth 195'



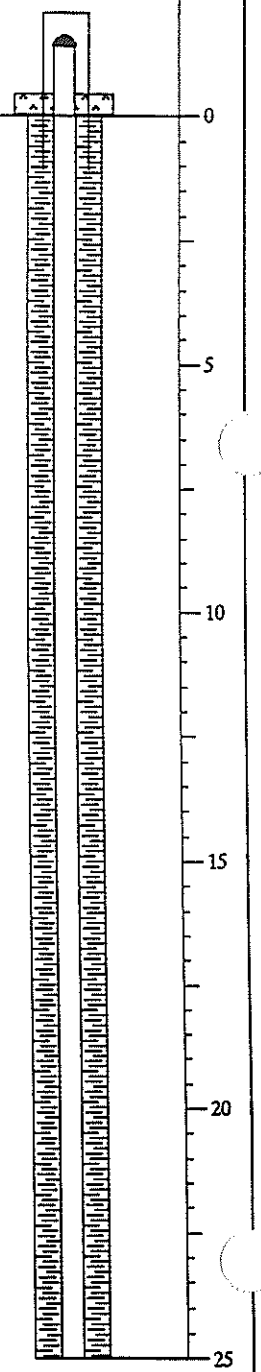
RADIAN CORPORATION

Boring #: MW-32

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.
TOTAL DEPTH 223.00 START DATE 2/9/91 WELL COMPLETION DATE 2/11/91
GEOLOGIST G. Childs APPROVED BY _____ CALIF R.G.# _____
DRILLING COMPANY West Hazmat DRILLER Scott Smith
DRILLING METHOD Air Rotary/Casing Drive EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 10" Diameter Tri-cone Bit
APPROXIMATE BOREHOLE/WELL LOCATION Approximately 500' down gradient from burn pit in a cluster with MW-1 and MW-7.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2171.86	4" Diameter Well Casing & Screen Top of PVC (MSL) = 2173.38
0	SAND medium brown (10 YR 5/3), fine to coarse grained, silty, dry, (SM).		2170	Top of Grout Interval 0.0' Begin drilling at 08:00.
5	SAND medium brown (10 YR 3/3), fine to coarse grained, some very coarse grained, silty, dry, (SM).		2165	Casing falling at bit.
10	SAND medium brown (10 YR 6/4), fine to very coarse grained, some fine pebbles, minor silt, dry, (SM).		2160	
15	GRAVELLY SAND medium brown (10 YR 6/4), fine to very coarse grained with fine to medium pebbles, occasional fine cobbles, dry, (SW/GW). Cobbles fine to medium grained.		2155	Rig chatter.
20	SAND medium brown (10 YR 5/4), fine to coarse grained sand, decreased fine pebbles, some silt, slightly moist, (SW).		2150	At 20' connect - 08:08.
25				



First Water Encountered ▽ 100.00 (bgs)

Water Level - May 1991 ▼ 90.56 (bgs)

RADIAN CORPORATION

Boring #: MW-32

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
25			2145	
30	SAND medium brown (10 YR 5/4), fine to coarse grained, minor silt, slightly moist, (SW).		2140	
35	Same, increased coarse grained sand.		2135	
40	SAND medium brown (10 YR 5/4), fine to very coarse grained, with some fine pebbles, slightly moist, (SW).		2130	At 40' connect - 08:31.
45	CLAYEY SAND medium brown (10 YR 4/3), fine to coarse grained, soft, soupy clay, silt, moist, (SC).		2125	
50	SAND medium brown (10 YR 5/4), fine to very coarse grained, scattered fine subangular pebbles, slightly moist, (SW).		2120	Drive casing falling with drill bit.
55	SAND medium brown (10 YR 5/4), dominantly fine to medium grained with some coarse to very coarse grains, rare fine pebbles, (SW).		2115	

RADIAN CORPORATION

Boring #: MW-32

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
60			2110	At 60' connect - 08:45.
65			2105	
70	SAND medium to light brown (10 YR 6/3), fine to very coarse grained, some fine pebbles, subangular, dry, (SW).		2100	
75	SAND medium brown (10 YR 4/3), fine to medium grained, occasional coarse grains, few very coarse to fine pebbles, silt, (SW).		2095	
80			2090	At 80' connect - 09:20.
85	SAND medium brown (10 YR 4/3), fine to very coarse grained, scattered fine pebbles, some silt, moist, (SW).		2085	

RADIAN CORPORATION

Boring #: MW-32

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
90	GRAVELLY SAND medium brown (10 YR 5/4), dominantly coarse to very coarse grained, abundant subangular fine to medium pebbles, wet, (SW/GP).		2080	Begin to drive casing at 90', (slow), Alluvium Mount Eden contact at 90'
95	Same, but wet.		2075	
100	SANDY CLAY medium brown (10 YR 5/4), fine to coarse grained sand, soft, low plasticity, silt, wet, (CL).		2070	At 100' connect - 10:05. Water at 100' and casing driving harder.
105	SAND medium brown (10 YR 5/4), fine to coarse grained sand, silt, dry, (SW).		2065	
110	Same, increased coarse grains.		2060	
115	SANDY GRAVEL frosted, white, gray, brown (10 YR 6/4), dominantly coarse to very coarse grained sand, fine to medium pebbles, very silty, (SW/GW).		2055	Casing driving harder.
120				At 120' connect - 120'.

RADIAN CORPORATION

Boring #: MW-32

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2050	
125	GRAVEL frosted, white, gray, brown (10 YR 6/4), sandy, abundant fine to medium pebbles, (GW).			Inject water at 125' due to poor cutting returns.
			2045	
130	SANDY GRAVEL medium brown (10 YR 6/4), frosted, white, gray, brown, very coarse to fine grained sand, decreased grain size, (SW/GW).			
			2040	
135				
			2035	
140				At 140' connect - 12:00.
			2030	
145	Same, decreased gravel.			Injection water off little formation, poor returns.
			2025	
150				Inject water at 150'.
			2020	

RADIAN CORPORATION

Boring #: MW-32

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
155	SAND medium brown (10 YR 5/3), fine to very coarse grained sand, some subangular, fine gravel, silt, (SW).		2015	
160			2010	At 160' connect - 12:40. Very slow driving casing.
165	SAND medium brown (10 YR 5/3), fine to very coarse grained sand, common medium to coarse grained, occasional fine pebbles, silt, (SW).		2005	
170			2000	
175	SAND grayish brown (10 YR 6/3), fine to very coarse grained sand, occasional subangular to angular pebbles, (SW).		1995	
180			1990	At 180' connect - 14:40.
185	Same, slight decreased coarse grain.			At 15:15 drive casing refusal, cut casing, open

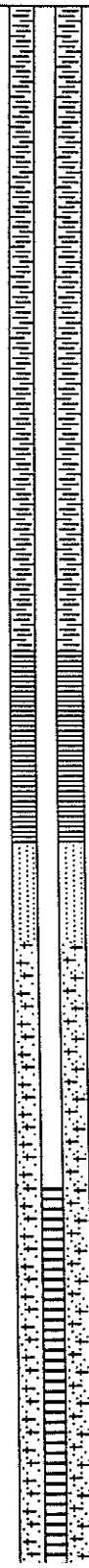
RADIAN CORPORATION

Boring #: MW-32

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			1985	hole air rotary from 185'.
190	SAND grayish brown (10 YR 6/3), fine to coarse grained sand, with some very coarse grains, subangular, silty, (SW).			
			1980	
195				
			1975	
				Top of Bentonite Seal 199'
200	COBBLE/SAND white, black (10 YR 7/1), mixed with fine to medium grained sand with some fine to medium quartz fragments, angular, some feldspar, very micaceous, (GW/SW).			
			1970	
				Top of #30 Lonestar bridge sand 203'
205	Same, increased sand.			Top of Sand Pack 205'
			1965	
				Rig chatter between 205' - 210'.
210	COBBLE/SAND white, black (10 YR 7/1), mixed with fine to medium grained sand with some fine to medium quartz fragments, angular, some feldspar, very micaceous, (GW/SW).			Top of 0.020" slot Stainless Steel screen 210'
			1960	
				#3 Lone star >
215				
			1955	



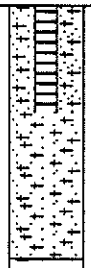
RADIAN CORPORATION

Boring #: MW-32

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
220				Bottom of screen 220'
				Rig chatter at 220'
				Total depth 223'.



220.0

223.0

220

RADIAN CORPORATION

Boring #: MW-34

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.
TOTAL DEPTH 85.00 START DATE 2/18/91 WELL COMPLETION DATE 2/18/91
GEOLOGIST G. McKelvey APPROVED BY [illegible] CALIF R.G.# 5878
DRILLING COMPANY West Hazmat DRILLER Roger
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 10" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION Approximately 200 yards NNE of MW-4

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2150.39	4" Diameter Well Casing & Screen Top of PVC (MSL) = 2151.38
0	SAND brown (10 YR 5/3), very fine to coarse grained, loose, dry, (SW).		2150	Top of Grout Interval 0.0' Begin at 10:00 with 7" HSA.
5	SILTY SAND brown (10 YR 5/3), semi-stiff, quartz pebbles, organic material, poorly sorted, dry, (SM).		2145	Blow count = 6,5,7
10	SILTY SAND dark yellowish brown (10 YR 3/4), fine to coarse grained sand, fine quartz pebbles, semi-stiff, semi-moist, 5% poorly sorted, (SM).		2140	Blow count = 17,15,14
15	SILTY SAND dark yellowish brown(10 YR 3/4), fine to coarse grained, loose, fine quartz pebbles, 5% poorly sorted, semi-moist, (SM).		2135	Blow count = 11,11,10
20	SAND fine to coarse grained sand, fine quartz pebbles, 10% poorly sorted, loose, semi-moist, (SW).		2130	Blow count = 7,7,7
25	SAND dark yellowish brown (10 YR 4/4), very fine to medium grained sand, some as above sample, coarse to fine common quartz pebbles, poorly sorted, (SW).		2125	Blow count = 7,7,10

Water Level - May 1991 ▼ 56.04 (bgs)

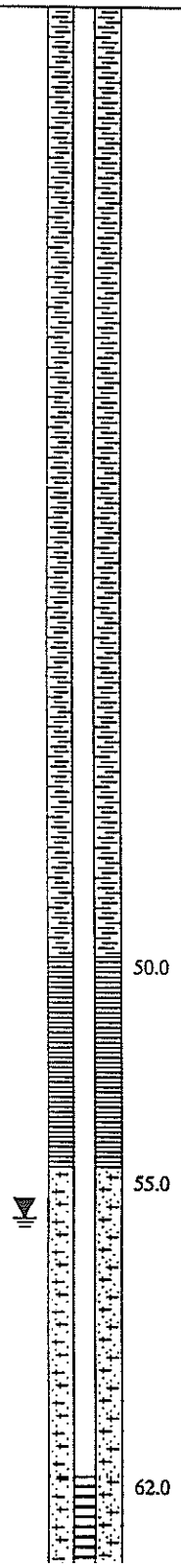
RADIAN CORPORATION

Boring #: MW-34

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	SAND dark yellowish brown (10 YR 3/6), very fine to medium grained sand, coarse common quartz pebbles, moderately sorted, loose, semi-moist, (SW).		2120	Blow count = 9,7,7
35	SAND yellowish brown (10 YR 5/4), fine grained sand, medium grained common quartz, moderately sorted, loose, semi-moist, (SW).		2115	Blow count = 8,8,8
40	SAND dark yellowish brown (10 YR 4/4), very fine to medium grained sand, very coarse common quartz (10%), semi-stiff, stratified material, alternating silt layers (approx. 1mm thick), semi-moist, (SW).		2110	Blow count = 8,10,20
45	SAND brown (10 YR 5/3), medium grained sand, very coarse common quartz (5%), moderately sorted, very loose, semi-moist, (SW).		2105	Blow count = 15,15,10
				Blow count = 12,14,14
50	SAND yellowish brown (10 YR 5/4), very fine t very coarse grained sand, fine common quartz pebbles, (5%) poorly sorted, very loose, moist, (SW).		2100	Top of Bentonite Seal 50'
				Thin, perched, moist layer 53'-54'
55	SILT dark grayish brown (10 YR 4/2), compact, very moist, (ML).		2095	Top of Sand Pack 55' Blow count = 12,10,9
60			2090	Blow count = 4,9,9
				Top of 0.020" slot Stainless Steel screen 62'



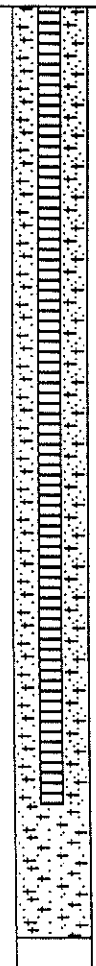
RADIAN CORPORATION

Boring #: MW-34

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	SILTY SAND light brownish gray (7.5 YR 6/2), fine to coarse grained sand, poorly sorted, stiff, saturated, (SM).		2085	Let augers stand at 64' between 11:20 - 12:00. Blow count = 7,8,10
70			2080	Blow count = 12,14,15 12:00 sample number L2252; saturated (H2O).
75	SAND brown (10 YR 5/3), coarse to very coarse grained sand, moderately sorted, loose, saturated, (SW).		2075	Blow count = 10,10,11
80			2070	Blow count = 10,10,13 Bottom of screen 82'
85	Reamed out and set well.			Blow count = 5,7,9 Sample lost; finish at 12:25 with 7" HSA. Total depth 85'



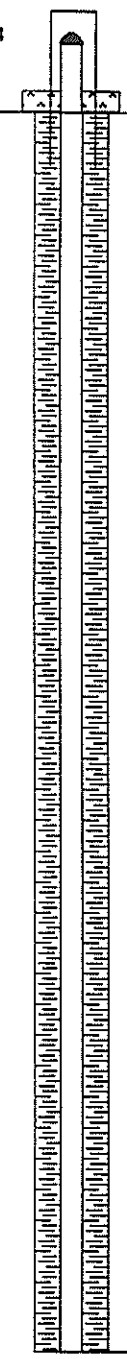
RADIAN CORPORATION

Boring #: MW-35

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.
TOTAL DEPTH 140.00 START DATE 3/6/91 WELL COMPLETION DATE 3/7/91
GEOLOGIST G. McKelvey APPROVED BY [illegible] CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Roger
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 10" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION 500' West of MW-32.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SILTY SAND yellowish brown (10 YR 5/4), very fine to medium grained sand, common quartz coarse grained sand (approx. 5%), moderately well sorted, rounded, very loose, dry, (SM).		2166.05	4" Diameter Well Casing & Screen Top of PVC (MSL) = 2168.34 Top of Grout Interval 0.0' Began drilling 10:30.
5	SANDY SILT dark yellowish brown (10 YR 4/4), fine to medium grained sand, common quartz (10% medium grained sand), loose, dry, (ML/SM).		2165 2160	Blow count = 7,8,8
10	SAND dark yellowish brown (10 YR 4/4), fine to coarse grained sand, moderately well sorted, loose, dry, (SW).		2155	Blow count = 9,11,20
15	SILTY SAND dark yellowish brown (10 YR 4/4), very fine to fine grained sand, moderately sorted, common quartz (5% coarse sand), loose, moist, (SM).		2150	Blow count = 8,8,10
20	SAND brown (10 YR 5/3), fine to coarse grained sand, medium gravel (5%), poorly sorted, subrounded, loose, dry, (SW).		2145	Blow count = 8,11,15
25			2140	Blow count = 10,12,18



First Water Encountered ▽ 78.00 (bgs)

Water Level - May 1991 ▼ 71.56 (bgs)

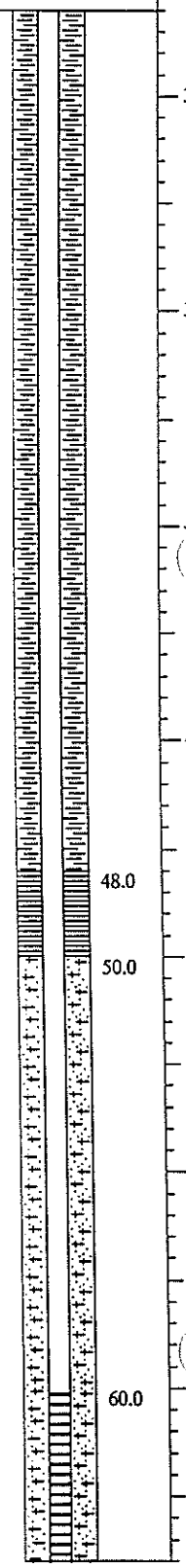
RADIAN CORPORATION

Boring #: MW-35

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	Same, fine gravel.		2135	Blow count = 10,11,12
35	SILTY SAND dark yellowish brown (10 YR 4/4), fine to medium grained sand, moderately well sorted, approx. 10% common fine gravel quartz, loose, moist. (SM).		2130	Blow count = 13,13,18
40	SILTY SAND dark yellowish brown (10 YR 4/4), fine to medium grained sand, moderately well sorted, medium dense, moist, (SM).		2125	Blow count = 8,11,11
45	SAND dark yellowish brown (10 YR 4/4), fine grained sand, well sorted, 5% common coarse sand quartz, loose, moist, (SW).		2120	Blow count = 10,11,15
				Top of Bentonite Seal 48' Blow count = 8,11,11
50	SAND brown (10 YR 5/3), fine to coarse grained sand, moderately sorted, subrounded, loose, dry, (SW).		2115	Top of Sand Pack 50'
55	Same, fine to medium grained sand.		2110	Blow count = 11,20,18
60	SILTY SAND brown (10 YR 4/3), silt to medium grained sand, moderately sorted, approx. 5% common coarse sand quartz, loose, moist, (SM).		2105	Top of 0.020" slot Stainless Steel screen 60' Blow count = 11,20,20



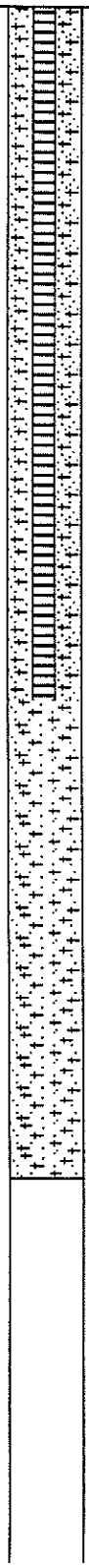
RADIAN CORPORATION

LOG OF DRILLING OPERATIONS

Boring #: MW-35

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	Same, color change to brown (10 YR 5/3).		2100	Blow count = 10,15,15 Very stiff drillings 66'
70	SAND brown (10 YR 5/3), fine to medium coarse grained sand, medium sorted, loose, very moist, (SW).		2095	Blow count = 15,20,21
75	SAND brown (10 YR 4/3), fine to coarse grained sand, poorly sorted, medium dense, approx. 15% common coarse sand quartz, subrounded, wet, (SW).		2090	Blow count = 18,18,18 Water approximately 78'
80	SILTY SAND yellowish brown (10 YR 5/4), very fine to medium grained sand, common quartz coarse grained sand (approx. 5%), moderately well sorted, rounded, very loose, dry, (SM).		2085	Bottom of screen 80' Blow count = 18,25,33 Saturated.
85			2080	
90			2075	Total depth of borehole for well 91'. Total depth of adjacent pilothole 140'. Pilot hole back filled with grout.
95			2070	



RADIAN CORPORATION

Boring #: MW-35

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
100	SAND brown (10 YR 5/3), saturated, (SW).		2065	
	(Note: last sample).			
105			2060	
110			2055	
115			2050	
120			2045	
125			2040	
130			2035	
135				

RADIAN CORPORATION

Boring #: MW-35

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2030	
	Mount Eden formation, no sample, rig bogged down, 138'			Alluvium Mount Eden Formation at 138'.
140				Total depth 140'

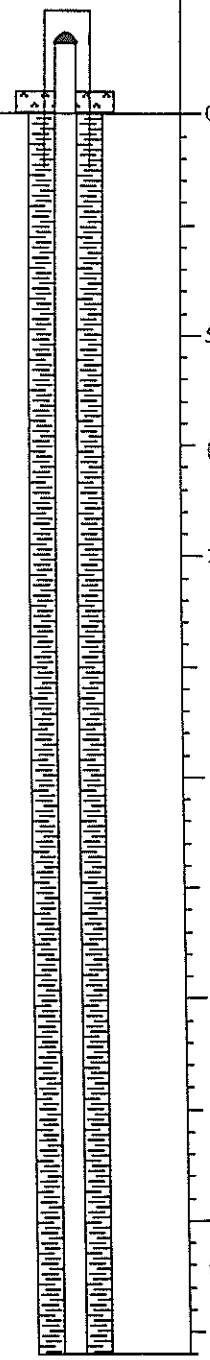
RADIAN CORPORATION

Monitoring #: MW-36

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.
TOTAL DEPTH 105.00 START DATE 3/8/91 WELL COMPLETION DATE 3/14/91
GEOLOGIST G.McKelvey APPROVED BY W G Hamm CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Roger
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 8" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION Approximately 25' East of production well W-5; approximately 1100' Southeast of Burn Pit area.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2200.82	2" Diameter Well Casing & Screen Top of PVC (MSL) = 2202.53
0	SAND pale brown (10 YR 6/3), fine to coarse grained sand, poorly sorted, subangular to subrounded, loose, dry, (SW).		2200	Top of Grout Interval 0.0'
5	SILTY SAND brown (10 YR 5/3), fine grained sand, moderately well sorted, common quartz grains, (5-10%) medium grained sand, loose, dry, (SM).		2195	Blow count = 8,6,6
10	SAND pale brown (10 YR 6/3), fine grained sand to fine pebbles, poorly sorted, subangular, loose, dry, (SW).		2190	Blow count = 8,7,10
15	SILTY SAND brown (10 YR 5/3), silt to very fine grained sand, well sorted, loose, high % of mica, loose, moist, (SM).		2185	Blow count = 13,10,11
20	SAND pale brown (10 YR 6/3), fine to very coarse grained sand, poorly sorted, subangular, loose, moist, (SW).		2180	Blow count = 8,8,11 Moist silt interbeds between 23'-25'
25			2175	Blow count = 8,10,12



Water Level - May 1991 ▼ 59.96 (bgs)

RADIAN CORPORATION

Monitoring #: MW-36

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	SILTY SAND brown (10 YR 5/3), silt to fine grained sand, moderately dense, well sorted, approx. 5% quartz- medium grained sand, moist, (SM).		2170	Blow count = 10,12,16
35	SAND brown (10 YR 5/3), fine to medium coarse grained sand, moderately well sorted, moderately dense, approx. 5% quartz-coarse grained sand, moist, (SP).		2165	Blow count = 13,14,18
40			2160	Blow count = 14,19,21 Sample fell out of Split Spoon.
45	SILTY SAND brown (10 YR 5/3), silt to very coarse grained sand, poorly sorted, 10% quartz - coarse grained sand, subangular, high % of biotite and mica, moderately dense, moist, (SM).		2155	Blow count = 36,50,0
50	SAND brown (10 YR 5/3), fine to coarse grained sand, poorly sorted, subangular to subrounded, moderately dense, moist, (SW).		2150	Blow count = 18,20,32
55			2145	Blow count = 15,15,20 Silt interbeds at 58'
60			2140	Blow count = 18,22,25

RADIAN CORPORATION

Monitoring #: MW-36

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	SILTY SAND brown (10 YR 5/3), silt to coarse grained sand, poorly sorted, moderately dense, 5% quartz - very coarse grained sand, subrounded, (SM).		2135	Blow count = 15,20,27
70	SAND brown (10 YR 5/3), fine to coarse grained sand, moderately well sorted, moderately dense, subrounded, (SW).		2130	Blow count = 14,19,21
				Blow count = 18,23,27
75	Same, with 5-10% quartz (fine pebbles), subangular.		2125	Top of Bentonite Seal 75'
				Top of Sand Pack 79'
80	SILTY GRAVEL grayish brown (10 YR 5/2), silt to fine grained gravel, very dense, poorly sorted, angular to subrounded, very moist, (GW/ML).		2120	Blow count = 16,27,28
85	Same, wet.		2115	Top of 0.020" slot Stainless Steel screen 85' Blow count = 29,50 for 5"
90	WEATHERED GRANITE brown (10 YR 4/3), very dense, common quartz, biotite, ground up pretty well, wet, (GR).		2110	Blow count = 50 for 3"
95			2105	Blow count = 50 for 4"
100				

RADIAN CORPORATION

Monitoring #: MW-36

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
100	No sample		2100	
				Blow count = 100 for 4"
	GRANITIC BASEMENT white (2.5 Y 8/0), reddish biotite degradation, quartz matrix, biotite inclusions (10-15%), very dense. (GRANITE).			Bottom of screen 105'
105				Total depth 105'

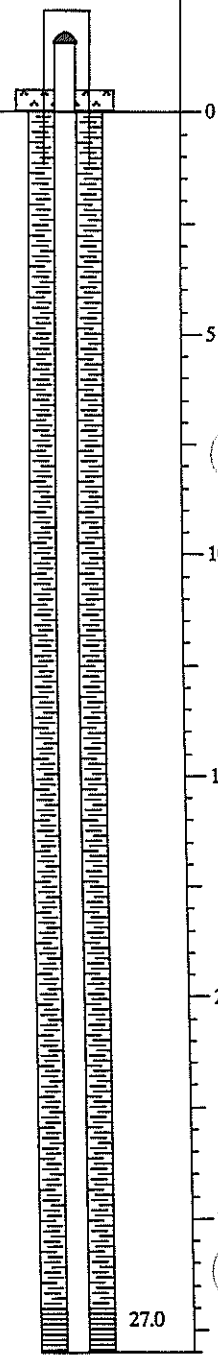
RADIAN CORPORATION

Boring #: MW-37

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.
TOTAL DEPTH 62.00 START DATE 2/26/91 WELL COMPLETION DATE 2/27/91
GEOLOGIST G. McKelvey APPROVED BY [illegible] CALIF R.G.#
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 10" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION Approximately 1000' South of Betatron, South of Main Wash

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SAND pale brown (10 YR 6/3), fine to medium grained sand, very poorly sorted, subangular, approx. 30% common quartz, very angular pebbles, loose, soft, dry, (SW).		2036.45	4" Diameter Well Casing & Screen Top of PVC (MSL) = 2038.25 Top of Grout Interval 0.0'
5	SAND brown (10 YR 5/3), fine grained sand, fine grained pebbles, very poorly sorted, 30% common quartz, loose, soft, dry, (SW).		2035 2030	Blow count = 10,15,22 Very coarse granite between 6'-7.5'
10			2025	Blow count = 10,9,9
15	SAND very dark grayish brown (10 YR 3/2), medium to very coarse grained sand, moderately well sorted, subrounded, 25% common quartz, loose, soft, moist, (SW).		2020	Blow count = 12,16,20
20	SAND yellowish brown (10 YR 5/4), medium to very coarse grained sand, moderately well sorted, subrounded, 25% common quartz, loose, soft, semi-moist, (SW).		2015	Blow count = 10,15,16
25	SAND brown (10 YR 5/3), medium to coarse grained sand, moderately well sorted, subangular, approx. 5% common quartz pebbles, loose, soft, semi-moist, (SW).		2010	Blow count = 13,10,11 Top of Bentonite Seal 27'



First Water Encountered ▽ 38.00 (bgs)

Water Level - May 1991 ▼ 32.66 (bgs)

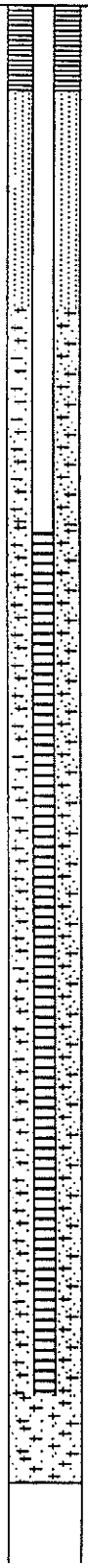
RADIAN CORPORATION

Boring #: MW-37

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
				Blow count = 16,13,14
30	SAND very dark grayish brown (10 YR 3/2), medium to very coarse grained sand, moderately well sorted, loose, soft, (SW).			Top of Sand Pack 30'
			2005	# 0/30 Sand Filter Pack >
				Very dense layer at 33'-34.5'
35	SAND brown (10 YR 5/4), very coarse grained sand to fine pebbles, moderately sorted, loose, soft, saturated, (SW).			Blow count = 15,30,30
			2000	# 3 Sand Filter Pack > First water approximately 38'
40				Top of 0.020" slot Stainless Steel screen 40' Saturated. Blow count = 18,20,22
			1995	
45	SAND red (2.5 YR 4/6), medium to very coarse grained sandstone, moderately sorted, very dense, very hard, saturated, (Mount Eden Formation). (GW/SW).			No sample.
			1990	
50	No sample.			Alluvium Mount Eden contact at 49.5'
			1985	
				Saturated at 53'
55	Same, Mount Eden FM, sandstone.			
			1980	
60				Bottom of screen 60'
	(Note: completed with MW-37 Well).		1975	
				Total depth 62'



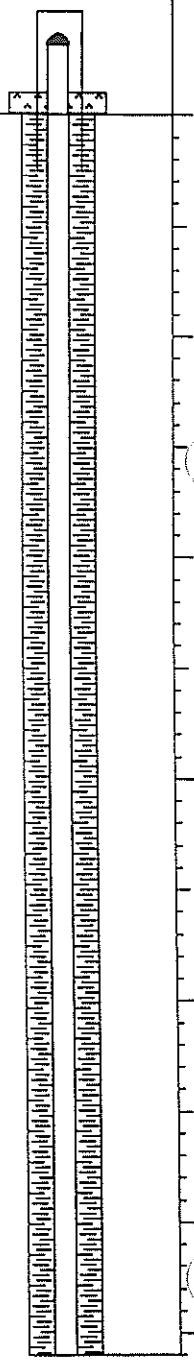
RADIAN CORPORATION

Boring #: **MW-38**

LOG OF DRILLING OPERATIONS

PROJECT	Lockheed Beaumont #1 H.I.	LOCATION	Beaumont Ca.
TOTAL DEPTH	82.00	START DATE 2/21/91	WELL COMPLETION DATE 2/25/91
GEOLOGIST	G. McKelvey	APPROVED BY	CALIF R.G.#
DRILLING COMPANY	West Hazmat	DRILLER	Rob Slagle
DRILLING METHOD	Hollow Stem Auger	EQUIPMENT	CME-75
DRILL BIT TYPE AND SIZE	10" Diameter Auger Head Bit		
APPROXIMATE BOREHOLE/WELL LOCATION	Approximately .25 miles West of Betatron Building.		

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SILTY SAND pale brown (10 YR 6/3), silt to very fine grained sand, well sorted, loose, soft, dry, (SM).		2026.22	4" Diameter Well Casing & Screen Top of PVC (MSL) = 2027.28 Top of Grout Interval 0.0' Began drilling 15:30.
5	SILTY SAND grayish brown (2.5 Y 5/2), silt to very fine grained sand, well sorted, approx. 5% common quartz pebbles, loose, semi-stiff, semi-moist, (SM).		2025 2020	Blow count = 9,7,8
10	SILTY SAND brown (10 YR 5/3), fine to coarse grained sand, moderately sorted, common quartz, 5% very fine pebbles, loose, soft, dry, (SM).		2015	Blow count = 5,7,7
15	SAND brown (10 YR 5/3), medium to very coarse grained sand, poorly sorted, common quartz, 10% very coarse sand to very fine pebbles, loose, soft, dry, (SW).		2010	Blow count = 9,9,9
20	SILT pale olive (5Y 6/3), very well sorted, soft, loose, dry, (ML).		2005	Blow count = 13,15,18
25	SAND brown (10 YR 5/3), fine to coarse grained sand, poorly sorted, gravel, common quartz, 10% very fine pebbles, loose, soft, dry, (SW).		2000	Blow count = 9,11,15



Water Level - May 1991 ▼ 47.52 (bgs)

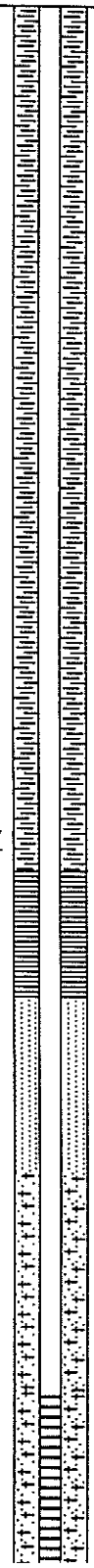
RADIAN CORPORATION

Boring #: MW-38

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	SAND brown (10 YR 5/3), fine to very coarse grained sand, poorly sorted, common quartz, 10% very fine pebbles, loose, soft, dry, (SW).		1995	Blow count = 12,15,15
				Very fine gravel quartzite 33'
35	SAND red (2.5 YR 5/6), sandstone, very hard, very dense, dry, (Mount Eden Formation), (GW/SW).		1990	Blow count = 14,16,18
				Alluvium Mount Eden contact at 38.5'
40			1985	Blow count = 100 for 4"
45			1980	
				Top of Bentonite Seal 48'
50			1975	Blow count = 100 for 4" Top of Sand Pack 51'
				# 0/30 Sand Filter Pack >
55			1970	Bottom of screen 55'.
60			1965	Top of 0.020" slot Stainless Steel screen 60' No water yet. Blow count = 100 for 2"



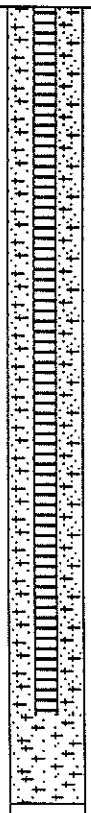
RADIAN CORPORATION

Boring #: MW-38

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	MOUNT EDEN FM SANDSTONE red (2.5 YR 5/6), very hard, very dense, dry, (GW/SW).		1960	
70			1955	Blow count = 100 for 3"
75			1950	Pull up auger to 70' and will let stand overnight.
80			1945	Blow count = 100 for 3"
				Total depth 82'



RADIAN CORPORATION

Boring #: MW-39

LOG OF DRILLING OPERATIONS

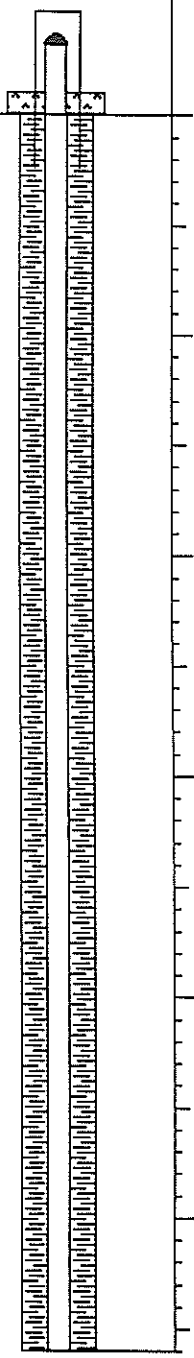
PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.
TOTAL DEPTH 86.00 START DATE 3/8/91 WELL COMPLETION DATE 3/11/91
GEOLOGIST G. McKelvey APPROVED BY [illegible] CALIF R.G.# [illegible]
DRILLING COMPANY West Hazmat DRILLER Roger
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 10" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION North boundary of Burn Pit field where pavement road turns into dirt road.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SAND pale brown (10 YR 6/3), fine to coarse grained sand, moderately well sorted, subrounded, loose, dry, (SW).		2139.34	Top of Grout Interval 0.0' Drilling began 14:20.
			2135	
5	SILTY SAND brown (10 YR 5/3), silt to very fine grained sand, well sorted, 10% common coarse grained sand quartz, subangular, loose, dry, (SM).			Blow count = 7,7,10
			2130	
10	SILTY SAND dark yellowish brown (10 YR 4/4), silt to medium grained sand, moderately sorted, 10% common coarse grained sand quartz, subangular, loose, dry, (SM).			Blow count = 6,6,8
			2125	
15	Same, moist.			Blow count = 10,10,10
			2120	
20	SAND brown (10 YR 4/3), fine grained sand, very well sorted, loose, moist, (SW).			Blow count = 6,6,10
			2115	
25	No recovery.			Blow count = 9,13,14

Drilling Notes/Construction Details

4" Diameter Well Casing & Screen

Top of PVC (MSL) = 2141.54



First Water Encountered ▽ 55.00 (bgs)

Water Level - May 1991 ▼ 47.22 (bgs)

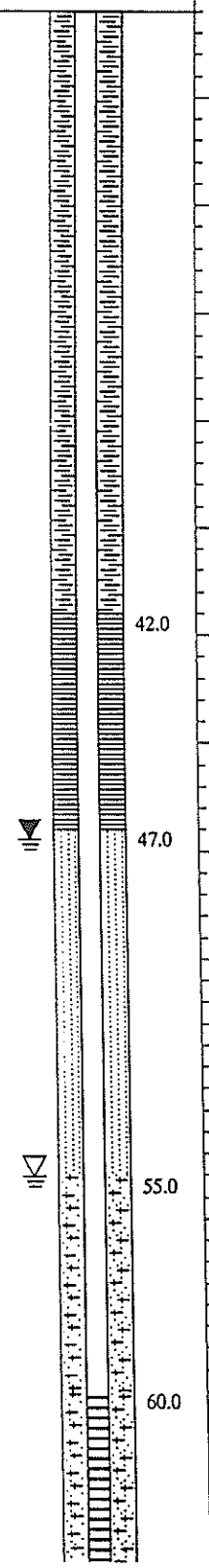
RADIAN CORPORATION

Boring #: MW-39

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	SILTY SAND dark yellowish brown (10 YR 4/4), silt to medium grained sand, moderately well sorted, common medium grained sand quartz, 10% subangular, moderately dense, moist, (SM).		2110	Blow count = 50 for 5"
			2105	
35	No sample.			Blow count = 21,26,26 Hard drilling began 36'
			2100	
40	SANDY GRAVEL pale brown (10 YR 6/3), fine grained sand to fine grained gravel, very poorly sorted, angular to subangular, very dense, dry, (GW/SW).			Blow count = 50 for 4" Top of Bentonite Seal 42'
			2095	
45	CLAYEY SILT yellowish brown (10 YR 5/4), fine grained silt, very moist, (CL/ML).			Blow count = 100 for 4" Top of Sand Pack 47'
			2090	# 0/30 Sand Filter Pack >
50	SANDY CLAY yellowish brown (10 YR 5/4), 15-20% fine to coarse grained sand, subrounded, very moist, (CL/SC).			Blow count = 4,6,6
			2085	
55	Same, wet.			Water 55' Blow count = 8,8,10
			2080	
60	CLAYEY SAND dark yellowish brown (10 YR 4/4), clay to medium grained sand, very poorly sorted, subangular, firm, wet, (SC).			Top of 0.020" slot Stainless steel screen 60' Blow count = 10,198 Stop here for 3/8/91.



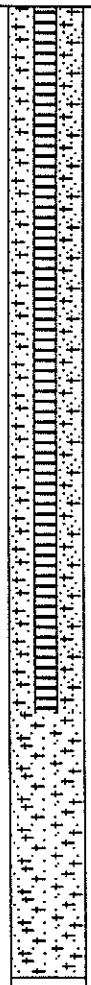
RADIAN CORPORATION

Boring #: MW-39

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65			2075	
70			2070	Very noticable stain on rug 69' Blow count = 10,10,10
75	SAND brown (10 YR 5/3), fine to medium coarse grained sand, poorly sorted, very dense, wet, (GW/SW).		2065	Blow count = 100 for 5"
80	SAND reddish brown (5 YR 4/4), very dense, wet, (Mount Eden Formation), (GW/SW).		2060	18:00 PSI on rig, very slow drilling 81.5'-82'. Alluvium Mount Eden contact at 82'.
85			2055	Blow count = 100 for 1" Total depth 86'



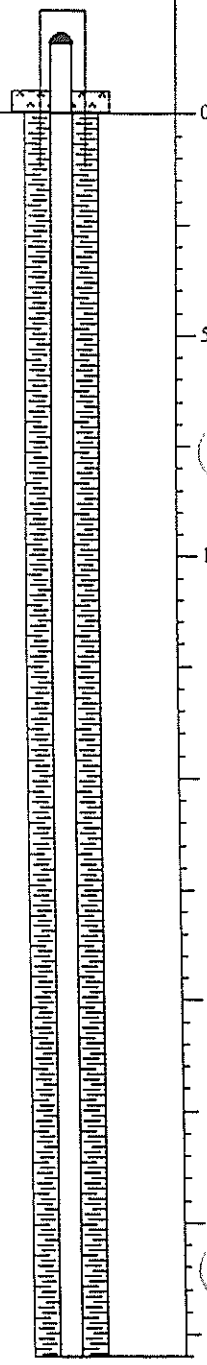
RADIAN CORPORATION

Boring #: MW-40

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.
TOTAL DEPTH 67.00 START DATE 2/19/91 WELL COMPLETION DATE 2/19/91
GEOLOGIST G McKelvey APPROVED BY [illegible] CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 10" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION Approximately 40' East of Engineering Trailer (rock crusher).

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SILTY SAND grayish brown (10 YR 5/2), silt to very fine grained sand, moderate to well sorted, organic material, common quartz pebbles, loose, dry, (SM).		2122.18	4" Diameter Well Casing & Screen Top of PVC (MSL) = 2123.69 Top of Grout Interval 0.0'
			2120	
5	SAND dark yellowish brown (10 YR 4/4), silt to very fine grained sand, moderately to well sorted, organic material, common quartz, very coarse grained sand, loose, soft, semi-moist, (SW).		2115	Blow count = 15,17,19
10	SAND yellowish brown (10 YR 5/4), very fine to fine grained pebbles, poorly sorted, common quartz pebbles, very loose, very soft, semi-moist, (SW).		2110	Blow count = 7,7,7
15	SAND yellowish brown (10 YR 5/4), fine to coarse grained sand, common quartz, 5% very fine grained pebbles, very loose, very soft, dry, (SW).		2105	Blow count = 7,11,10
20	SAND dark brown (10 YR 4/3), very fine to fine grained sand, moderately to well sorted, coarse grained sand, 5% common quartz, loose, soft, semi-moist, (SW).		2100	Blow count = 9,9,9
25	SAND grayish brown (10 YR 5/2), fine to coarse grained sand, moderately to well sorted, fine pebbles, common quartz (5%), very loose, very soft, semi-moist, (SW).		2095	Blow count = 13,12,11



First Water Encountered ▽ 47.00 (bgs)

Water Level - May 1991 ▼ 45.29 (bgs)

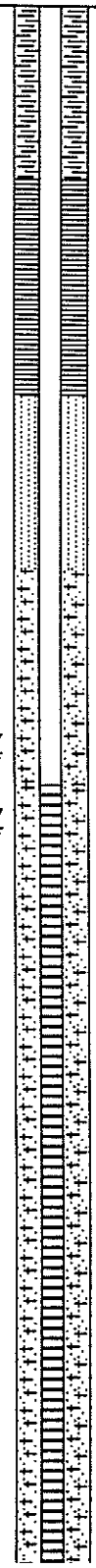
RADIAN CORPORATION

Boring #: MW-40

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	SILTY SAND dark grayish brown (10 YR 4/2), silt to fine grained sand, well sorted, common quartz very coarse grained sand (5%), semi-loose, soft, moist, (SM).			Blow count= 13,11,15
			2090	Top of Bentonite Seal 32'
35	SAND yellowish brown (10 YR 5/6), fine to medium grained sandstone, moderately well sorted, dense, hard, very moist, (Mount Eden Formation), (GW/SW).			Blow count= 7,12,15
			2085	Top of Sand Pack 37' # 0/30 Sand Filter Pack > Alluvium Mount Eden contact at 38'
40				Blow count= 50 for 6"
			2080	# 3 Sand Filter Pack >
45	SAND grayish brown (10 YR 5/2), medium grained sandstone to very fine grained pebbles, poorly sorted, dense, soft, saturated, (Mount Eden Formation), (GW/SW).			Blow count= 50 for 4"
			2075	Top of 0.020" slot Stainless Steel screen 46' Sample (H2O) # L2253, 47'
50	SAND brown (10 YR 4/3), very fine to fine grained sandstone, well sorted, very dense, very hard, very moist, (Mount Eden Formation), (GW/SW).			Blow count= 50 for 6"
			2070	
55				Blow count= 50 for 4"
			2065	
60				Blow count= 5o for 5"
			2060	
				1000 finish with 7" HSA.



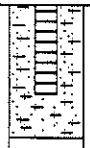
RADIAN CORPORATION

Boring #: MW-40

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 H.I. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65				1005 Began pulling 7" HSA. 1030 Began redrill w/10" HSA. Reamed out with 10" HSA and well casing set. Total depth 67'



66.0

67.0

65

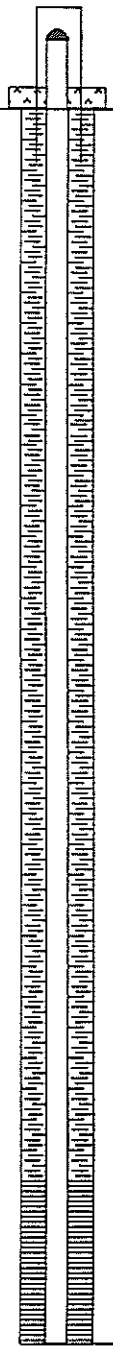
RADIAN CORPORATION

Well #: MW-41

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.
TOTAL DEPTH 55.00 START DATE 12/9/91 WELL COMPLETION DATE 12/10/91
GEOLOGIST J.C. Shulters APPROVED BY [illegible] CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER D. Marocchi
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME 75
DRILL BIT TYPE AND SIZE 8" for borehole, 10" for well installation
APPROXIMATE WELL LOCATION

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0			2129.74	Top of PVC (MSL)= 2131.29
				Grout interval to surface
				4" diameter Schedule 40 blank PVC casing
5	SANDY SILT dark grayish brown (10YR 4/2), occasional pebbles to 5 mm, slightly moist, (ML).		2125	Blow Count = 4,4,6
10	SAND yellow (5Y 7/6), coarse, M=1.5 mm, slightly silty, abundant gravel to 1 cm, very poorly sorted, angular, slightly moist, (SM).		2120	Blow Count = 10,24,35
	SILTSTONE light reddish brown (5Y 6/3), semi-consolidated, with minor fine to coarse sand, slightly moist.			Mount Eden contact 10.5'
15			2115	Blow Count = 25,61
20	SANDSTONE light reddish brown (7.5YR 4/4), semi-consolidated, fine grained, M=0.1 mm, silty, moderately sorted, subround, slightly moist.		2110	Blow Count = 89
25	SILTSTONE light reddish brown (5Y 6/3), semi-consolidated, with minor fine to coarse sand, moist.		2105	Top of bentonite seal 24.3' Blow Count = 65



Water Level - January 1992 ▽ 40.47 (bgs)

RADIAN CORPORATION

Well #: MW-41

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
				Top of #0/30 bridge sand 28.4'
30	SANDSTONE (2.5YR 6/4), fine grained, M=0.1 mm, silty, minor medium to coarse grained sand, poorly sorted, subangular, moist.		2100	Blow Count = 84 Top of #3 filter pack sand 30.8'
35			2095	Blow Count = 73 Top of 0.02" slot, 4" diameter stainless steel well screen 35'
40	Color change to olive (5Y 5/3), fine grained, M=0.2 mm, pebbly, very moist.		2090	Blow Count = 50
45	SILTY SAND light olive gray (5Y 6/2), coarse grained, abundant fine to medium grained sand, micaceous, very poorly sorted, subangular, wet.		2085	Blow Count = 70
	SILTSTONE olive gray (5Y 4/2), with minor fine to coarse grained sand, wet.			
50	SANDSTONE, Mt. Eden Formation, dark reddish brown (5YR 3/4), fine to coarse grained sand with minor mica, wet.		2080	Blow Count = 100
55	SILTY SAND dark reddish brown (5YR 3/4), Mt. Eden Formation, fine grained, M=0.2 mm, moderately sorted, subround, wet.		2075	Blow Count = 100 Bottom of well screen 55' Total depth at 55'
	SILTY CLAY dark brown, micaceous.			

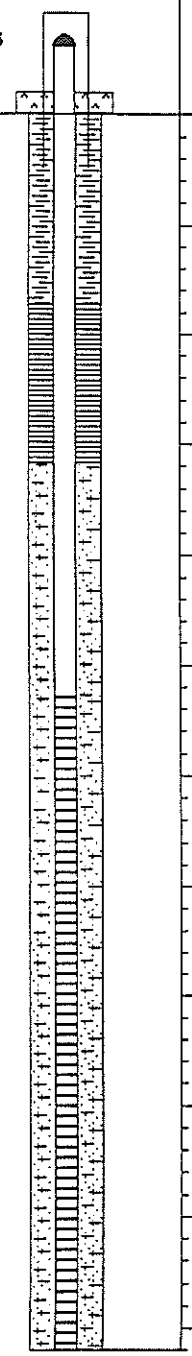
RADIAN CORPORATION

Well #: MW-42

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.
TOTAL DEPTH 36.00 START DATE 12/3/91 WELL COMPLETION DATE 12/4/91
GEOLOGIST J.C. Shulters APPROVED BY [illegible] CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER D. Marocchi
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME 75
DRILL BIT TYPE AND SIZE 8" for borehole, 10" for well installation
APPROXIMATE WELL LOCATION

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0			2088.68	Top of PVC (MSL)= 2089.86
				Top of grout interval at surface
			2085	4" diameter Schedule 40 blank PVC casing
5	SILTY SAND dark grayish brown (10YR 4/2), fine grained, M=0.1 mm, abundant feldspar crystals to 2 mm, poorly sorted, subround, slightly moist, (SM).			Top of bentonite seal 4.3' Blow Count = 6,7,10
			2080	Top of #3 filter pack sand 7.9'
10	M=0.15 mm, moderately sorted. SILTY CLAY very dark grayish brown (10YR 3/2), micaceous, slightly moist, (CL).			Blow Count = 6,6,8
			2075	Top of 0.02" slot 4" diameter stainless steel well screen 13.2'
15	Color change to brown (7.5YR 5/2). SILTY SAND very dark brown (10YR 2/2), fine grained, M=0.1 mm, with root hairs, moderately sorted, subround, moist, (SM). Color change to very dark grayish brown (10YR 3/2), medium grained, M=0.3 mm, pebbles to 4 mm, very poorly sorted, subangular, moist, (SM).			Blow Count = 3,7,9
			2070	
20	CLAYEY SILT very dark gray (10YR 3/1), micaceous, lenses of silt and sand, very moist, (ML).			Blow Count = 4,4,5
			2065	
25	SILTY SAND grayish brown (10YR 5/2), medium grained, M=0.4 mm, pebbles to 5 mm, very poorly sorted, subangular, micaceous, wet, (SM).			Blow Count = 4,4,9



Water Level - January 1992 ▽ 13.66 (bgs)

RADIAN CORPORATION

Well #: MW-42

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2060	
30	SAND, as above with pebbles to 3 cm.			Blow Count = 7,13,20
	SILTY SAND black (7.5YR 2/0), fine grained, M=0.1 mm, moderately sorted, subround, wet, (SM).		2055	
35	CLAYEY SILT dark olive gray (5Y 3/2), micaceous, wet (ML).			Bottom of well screen 34.2' Blow Count = 5,7,11 Bottom end cap Total depth at 36'

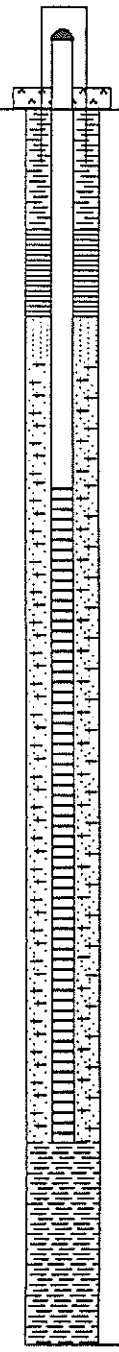
RADIAN CORPORATION

Well #: MW-43

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.
TOTAL DEPTH 115.50 START DATE 12/5/91 WELL COMPLETION DATE 12/6/91
GEOLOGIST J.C. Shulters APPROVED BY [illegible] CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER D. Marocchi
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME 75
DRILL BIT TYPE AND SIZE 8" for borehole, 10" for well installation
APPROXIMATE WELL LOCATION

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2064.38	Top of PVC (MSL)= 2065.81
0	CLAYEY SILT dark yellowish brown (10YR 4/4), minor sand, occasional pebbles to 2 cm, slightly moist, (ML).			Top of grout interval at surface 4" diameter Schedule 40 blank PVC casing
	SILTY SAND dark yellowish brown (10YR 3/6), fine grained, M=0.1 mm, very poorly sorted, subround, micaceous, moist, (SM). No recovery			Top of bentonite seal 2.7' Top of 4" diameter stainless steel blank casing 2.9'
5	SAND, as above SILTY CLAY black (10YR 2/1), minor sand, occasional igneous rock fragments to 5 mm, sand increasing at 8 feet, moist, (CL).		2060	Top of #0/30 bridge sand 4.7' Top of #3 filter pack sand 5.7'
10	Becoming very moist		2055	Top of 0.02" slot, 4" diameter stainless steel well screen 8.4'
	SILTY SAND very dark gray (10YR 3/1), medium grained, M=0.3 mm, poorly sorted, subangular, micaceous, wet, (SM). SILTY CLAY, micaceous, wet, (CL). No recovery			
15	SILTY CLAYEY SAND very dark brown (10YR 2/2), fine to medium grained, M=0.25 mm, micaceous, poorly sorted, subangular, wet, (SM-SC). CLAYEY SANDY SILT (5YR 2/2), micaceous, pebbles to 5 mm, plant debris, wet, (ML). SILTY SAND (5YR 2/2), fine grained, M=0.2 mm, poorly sorted, subround, occasional pebbles to 5 mm, wet, (SM). No recovery		2050	
20	Very pale brown (10YR 8/4), coarse grained, M=0.7 mm, micaceous, very poorly sorted, subangular to subround. CLAYEY SILT very dark gray (10YR 3/1), minor fine sand, micaceous, plant debris, wet, (ML). SILTY SAND pale red (2.5YR 6/2), fine grained, M=0.2 mm, moderately sorted, subround, wet, (SM). No recovery		2045	
			2040	Bottom of screen 23.4'
25	SILTY CLAY black (10YR 2/1), micaceous, large pieces of carbonized plant debris, pebbles to 5 mm, wet, (CL). CLAYEY SAND very dark gray (10YR 3/1), fine grained, M=0.1 mm, moderately sorted, subround, wet, (SC). CLAY black (2.5YR 2.5/0), silty, micaceous, plant debris, with some fine sand and few pebbles, wet, (CL).			Well casing installed at a location adjacent to borehole--borehole was grouted to ground



Water Level - January 1992 ▽7.60 (bgs)

RADIAN CORPORATION

Well #: MW-43

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
	No recovery SILTY SAND very dark gray (7.5YR 3/0), medium to coarse sand, M=0.5mm, pebbles to 2 cm, very poorly sorted, subangular, with some silt and clay, wet, (SM-SW).		2035	surface
30				
	CLAY very dark gray (10YR 3/1), some silt, micaceous, plant debris, with thin fine sand interbeds, wet (CL).		2030	
35				
			2025	
40				Sand heaving into auger during drilling
	SILTY CLAY very dark gray (5Y 3/1), minor fine sand, occasional pebbles to 4 cm, micaceous, sparse plant debris, wet, (CL).		2020	
45				
	No recovery SILTY SAND dark gray (5Y 4/1), medium grained, M=0.3 mm, moderately sorted, subround, micaceous, wet, (SM).		2015	
50				
	SAND dark gray (5Y 4/1), coarse grained, M=1.0 mm, abundant gravel (igneous rock fragments), poorly sorted, subangular to subround, wet, (SW). No recovery			
	SILTY SAND dark gray (5YR 4/1), medium grained, M=0.3 mm, moderately sorted, subround, wet, (SM).		2010	
55				
	SILTY CLAY very dark gray (10YR 3/1), minor sand, micaceous, wet, (CL).			
	SILTY SAND dark gray (5YR 4/1), medium grained, M=0.3 mm, moderately sorted, subround, wet, (SM).			
	SILTY CLAY very dark gray (10YR 3/1), minor sand, micaceous, wet, (CL).			
	SILTY SAND very dark gray (10YR 3/1), fine grained, M=0.1 mm, moderately sorted, subround, micaceous, (SM).		2005	
60	No recovery Color change to dark olive gray (5Y 3/2).			
	SILTY CLAY reddish gray (5YR 5/2), minor sand, plant debris, wet, (CL).			
	SILTY SAND dark olive gray (5Y 3/2), fine grained, M=0.1 mm, slightly clayey, moderately sorted, subround, wet, (SM).			
	SAND olive (5Y 5/4), medium grained, M=0.4 mm, very poorly sorted, subangular, abundant igneous rock fragments to 1 cm,			

RADIAN CORPORATION

Well #: MW-43

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
	wet, (SW).		2000	
65	No recovery			
	SILTY SAND olive (5Y 4/3), medium grained, M=0.4 mm, micaceous, moderately sorted, subangular, pebbles to 5 mm, wet, (SM-SW).			
	No recovery			
	SAND as above		1995	
70				
	CLAYEY SILT dark grayish brown (2.5Y 4/2), minor fine sand, 1-2 mm laminae, wet, (ML).			
	SILTY SAND light yellowish brown (2.5Y 6/4), medium grained, M=0.4 mm, pebbles to 1 cm, very poorly sorted, subangular, wet, (SM-SW).		1990	
75	No recovery			
	Color change to olive gray (5Y 4/2), M=0.5 mm.			
	SAND olive gray (5Y 4/2), coarse grained, M=1.0 mm, abundant granule gravel, slightly silty, poorly sorted, subangular to subround, wet, (SW).			
	No recovery			
	Medium grained, M=0.4 mm, subangular.		1985	
80				
	No recovery		1980	
85				
			1975	
90	SILTY SAND olive gray (5Y 4/2), fine grained, M=0.2 mm, poorly sorted, subangular, wet, (SM).			Switch to 18" sampler
			1970	
95				
			1965	
100				

RADIAN CORPORATION

Well #: MW-43

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
100				Heaving sands-could not obtain samples
			1960	
105				
			1955	
110	Color change to light brownish gray (2.5Y 6/2), medium grained, M=0.3 mm.			
			1950	
115	Color change to dark reddish brown (2.5YR 3/4), fine grained, M=0.2 mm, micaceous, poorly sorted, subangular, pebbles to 5 mm.			Total depth at 115.5'

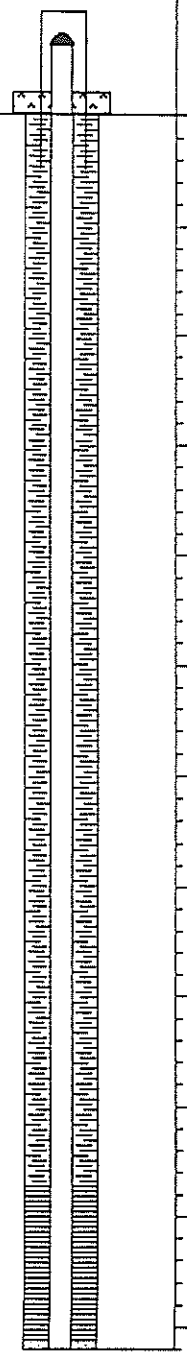
RADIAN CORPORATION

Well #: MW-44

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.
TOTAL DEPTH 59.00 START DATE 12/11/91 WELL COMPLETION DATE 12/11/91
GEOLOGIST J.C. Shulters APPROVED BY W G Hamer CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER D. Marocchi
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME 75
DRILL BIT TYPE AND SIZE 8" for borehole, 10" for well installation
APPROXIMATE WELL LOCATION

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2124.42	Top of PVC (MSL)= 2126.04
0	SILTY SAND very dark grayish brown (10YR 3/2), fine grained, M=0.1 mm, poorly sorted, subangular, dry to slightly moist, (SM). No recovery			Grout interval to surface; 4" diameter Schedule 40 blank PVC casing
5	CLAYEY SAND dark yellowish brown (10YR 4/4), fine grained, M=0.2 mm, abundant coarse sand, micaceous, very poorly sorted, subangular to subround, moist, (SC).		2120	
	SILTY SAND dark brown (10YR 3/3), fine grained, M=0.2 mm, abundant coarse sand (plagioclase crystals), very poorly sorted, subangular, micaceous, moist, (SM). No recovery			
10	SAND light yellowish brown (10YR 6/4), coarse grained, M=0.7 mm, slightly silty, abundant granule gravel, occasional rock fragments to 5 cm, micaceous, very poorly sorted, subangular, moist, (SW).		2115	
	SILTY SAND dark brown (10YR 3/3), fine grained, M=0.2 mm, abundant coarse sand, very poorly sorted, subangular, micaceous, moist, (SM). No recovery			
15	Color change to yellowish brown (10YR 5/4), abundant medium to coarse grained sand, subangular to subround.		2110	
	SAND light yellowish brown (10YR 6/4), coarse grained, M=0.7 mm, slightly silty, abundant granule gravel, micaceous, very poorly sorted, subangular, moist, (SW). No recovery			
20	SILTY SAND yellowish brown (10YR 5/4), fine grained, M=0.2 mm, abundant medium to coarse sand, very poorly sorted, subangular to subround, micaceous, moist, (SM). Color change to dark yellowish brown (10YR 4/4), M=0.1 mm, moderately sorted, subround.		2105	
	SAND light yellowish brown (10YR 6/4), coarse grained, M=0.7 mm, slightly silty, abundant granule gravel, micaceous, very poorly sorted, subangular, moist, (SW). No recovery			
25	SILTY SAND dark yellowish brown (10YR 4/4), fine grained, M=0.1 mm, slightly clayey, occasional rock fragments to 2 cm, very poorly sorted, subangular, micaceous, moist, (SM).		2100	Top of 4" diameter stainless steel blank casing 23.5'; Top of bentonite seal 24.3'
	SAND light yellowish brown (10YR 6/4), coarse grained, M=0.7 mm, slightly silty, abundant granule gravel, micaceous, very poorly sorted, subangular, moist, (SW).			



Water Level - January 1992 ▽ 37.11 (bgs)

RADIAN CORPORATION

Well #: MW-44

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
	No recovery			Top of #0/30 bridge sand 27.8'
	CLAYEY SILTY SAND dark yellowish brown (10YR 4/4), fine grained, M=0.2 mm, some medium to coarse sandy rock fragments to 6 cm, very poorly sorted, subangular to subround, moist, (SC-SM).		2095	
30	CLAYEY SAND dark yellowish brown (10YR 3/6), medium grained, M=0.4 mm, slightly silty, micaceous, very poorly sorted, subangular, pebbles to 5 mm, moist, (SC-SM). No recovery			Top of #3 filter pack sand 29.9'
	SANDY CLAY dark yellowish brown (10YR 4/4), micaceous, (CL).		2090	Top of 0.02" slot, 4" diameter stainless steel well screen 34'
35	SILTY SAND dark yellowish brown (10YR 4/4), medium grained, M=0.4 mm, some clay, micaceous, pebbles to 1 cm, very poorly sorted, subangular to subround, very moist to wet, (SM). No recovery			
	SANDY SILT dark reddish gray (5YR 4/2), micaceous, (ML).		2085	
40	SILTY SAND olive gray (5Y 4/2), fine grained, M=0.2 mm, micaceous, very poorly sorted, subangular, wet, (SM).			
	CLAY dark olive gray (5Y 3/2), slightly silty, micaceous, pebbles to 5 mm, wet, (CL).			
	SILTY SAND dark gray (5Y 4/1), medium grained, M=0.3 mm, poorly sorted, subround, micaceous, wet, (SM). No recovery			
	Color change to gray (5Y 5/1), fine grained, M=0.2 mm. Coarse grained, M=0.7 mm, gravelly, (SW-GM).		2080	
45	CLAYEY SILT dark gray (5Y 4/1), sandy, micaceous, wet, (ML).			
	SILTY SAND gray (5Y 5/1), coarse grained, M=0.7 mm, gravelly, micaceous, very poorly sorted, subangular, wet, (SW-GM). No recovery			
			2075	
50	Color change to black (5Y 2.5/2), fine grained, M=0.2 mm, plant debris. No recovery			
	CLAYEY SILTY SAND dark gray (5Y 4/1), medium grained, M=0.3 mm, micaceous, very poorly sorted, subangular, wet, (SC-SM).		2070	Bottom of well screen 54'
55	SILTY SAND dark gray (5Y 4/1), fine grained, M=0.2 mm, micaceous, moderately sorted, subround, (SM).			
	CLAYEY SILTY SAND, dark gray (5Y 4/1), medium grained, M=0.3 mm, micaceous, very poorly sorted, subangular, wet, (SC-SM).			Formational slough
	SILTY SAND dark gray (5Y 4/1), fine grained, M=0.1 mm, micaceous, moderately sorted, subround, wet, (SM).			Total depth at 59'
	SANDY SILT black (5Y 2.5/1), abundant medium to coarse sand, slightly clayey, wet, (ML). No recovery			

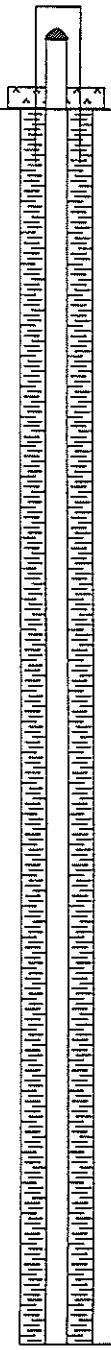
RADIAN CORPORATION

Well #: MW-45

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.
TOTAL DEPTH 55.00 START DATE 12/10/91 WELL COMPLETION DATE 12/10/91
GEOLOGIST J.C. Shulters APPROVED BY W G Hamer CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER D. Marocchi
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME 75
DRILL BIT TYPE AND SIZE 12"
APPROXIMATE WELL LOCATION

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	Monitoring well installed adjacent to MW-43. See log MW-43 for lithologic description.		2063.28	Top of PVC (MSL)= 2068.88 Top of grout interval at surface 4" diameter Schedule 40 PVC blank casing



Water Level - January 1992 ▽ 4.42 above ground surface

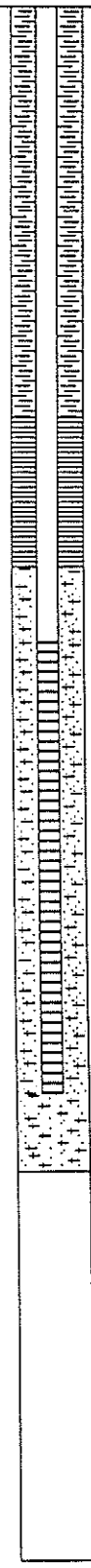
RADIAN CORPORATION

Well #: MW-45

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
				Top of bentonite seal 37.5'
				Top of CA filter pack sand 41.0'
				Top of 0.02" slot dual wall casing prepacked with #3 sand 42.7' P.V.C. PREPACKED SCREEN
				Top of slough sand 46'
				Bottom of well screen 52.7' Bottom end of cap
				Total depth at 55'



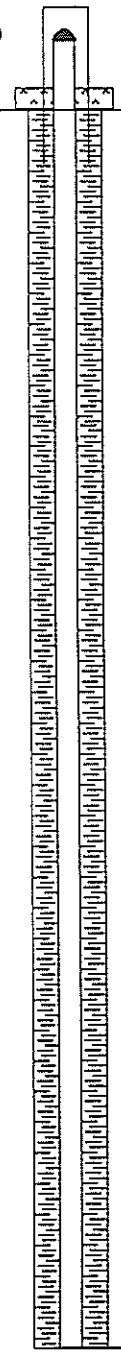
RADIAN CORPORATION

Well #: MW-46

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.
TOTAL DEPTH 89.00 START DATE 12/17/91 0830 WELL COMPLETION DATE 12/17/91 1305
GEOLOGIST M. Boulay APPROVED BY WG Flower CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER D. Marocchi
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME 75
DRILL BIT TYPE AND SIZE 8" for borehole, 10" for well installation
APPROXIMATE WELL LOCATION

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2068.32	Top of PVC (MSL)= 2069.40
0	SILTY SAND dark yellowish brown (10YR 3/4), fine to coarse grained, (SM).			Top of grout interval at surface
	No recovery from 2 to 4'.			4" diameter Schedule 40 blank PVC casing
			2065	
5	No recovery from 6.5 to 9'.			
			2060	
10	SAND yellowish brown (10YR 5/6), coarse grained, pebbly, well sorted, dry, (SP).			
	No recovery from 10.5 to 14'.			
			2055	
15	Becomes very coarse grained and contains cobbles at 15.5', color change to dark yellowish brown (10YR 4/6). No recovery from 16 to 19'.			
			2050	
	Fine to coarse grained, pebbly, moist, (SW).			
20	No recovery from 21 to 24'.			
			2045	
	Minor interbeds of micaceous silt at 24'.			
25	Abundant quartz at 26'. No recovery from 26.5 to 29'.			Top of 4" diameter



First Water Encountered ▽ 48.00 (bgs)

Water Level - January 1992 ▼ 53.64 (bgs)

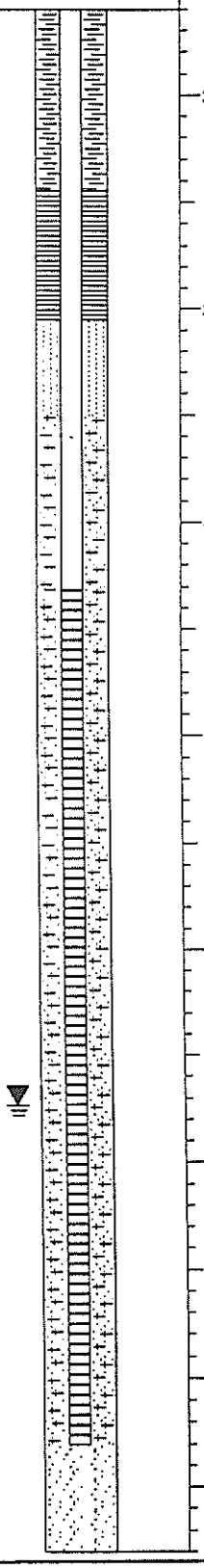
RADIAN CORPORATION

Well #: MW-46

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2040	stainless steel blank casing 27.5'
30	Abundant weathered quartz fragments and some pebbles at 31'. No recovery from 31 to 34'.			
			2035	Top of bentonite seal 32.3'
	Coarse grained sand.			
35				Top of #0/30 bridge sand 35.3'
	SILTY SAND dark yellowish brown (10YR 4/6), very fine grained, contains fragments of weathered quartz, (SM). No recovery from 36.5 to 39'.			
			2030	Top of #3 filter pack sand 37.5'
	SAND dark yellowish brown (10YR 3/6), medium grained, moist to wet, micaceous, (SP).			
40	No recovery from 41.5 to 44'.			Top of 0.02" slot 4" diameter stainless steel well screen 41.5'
			2025	
	Color changes to black (2.5Y 2/0) and coarse grained from 44 to 45'.			
45	No recovery from 46.5 to 49'.			
			2020	
	SILTY SAND dark yellowish brown (10YR 3/4), medium to coarse grained, saturated, micaceous, (SM).			
50	No recovery from 52 to 54'.			
			2015	
	SAND dark yellowish brown (10YR 3/6), coarse grained, saturated, (SP).			
55	No recovery from 55.5 to 59'.			
			2010	
	Color change to dark brown (10YR 3/3), medium to very coarse grained, pebbly, some gravel, (SW).			
60				Bottom of well screen 61.5'
			2005	



RADIAN CORPORATION

Well #: MW-46

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65				Top of bentonite plug 64'
	Becomes micaceous and finer grained at 66'.			
	No recovery from 67 to 69'.			
			2000	
	Color change to dark yellowish brown (10YR 4/6), very coarse grained, (SP).			
70				
	No recovery from 71 to 74'.			
			1995	
	Color change to olive gray (5Y 4/2), medium to coarse grained, (SW).			
75				
	No recovery from 78 to 79'.		1990	
	Color change to light yellowish brown (2.5Y 6/4), medium grained, saturated, (SP).			
80				
	Becomes very coarse grained with pebbles and fine gravel from 81 to 83'.			
	No recovery from 83 to 89'.		1985	
	Color change to dark grayish brown (2.5Y 4/2), medium to very coarse grained, (SW).			
85				
			1980	
	SILT (2.5Y 4/2), clayey, wet, (ML).			Total depth at 89 feet

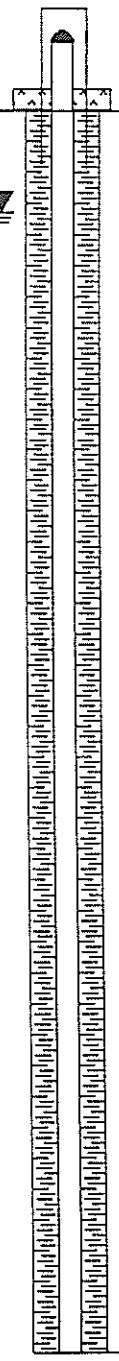
RADIAN CORPORATION

Well #: MW-47

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.
TOTAL DEPTH 54.00 START DATE 12/18/91 0945 WELL COMPLETION DATE 12/18/91 1120
GEOLOGIST M. Boulay APPROVED BY W G Homer CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER D. Marocchi
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME 75
DRILL BIT TYPE AND SIZE 8" for borehole, 12" for well installation
APPROXIMATE WELL LOCATION

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SILT dark yellowish brown (10YR 3/4), sandy, dry, (ML).		2073.00	Top of PVC (MSL)= 2077.12
	No recovery from 1.5 to 4'.			Top of grout interval at surface
			2070	4" diameter Schedule 40 blank PVC casing
5	Becomes very dark grayish brown (2.5Y 3/2) and micaceous.			
	Interbedded sand from 7.5 to 8.5'.		2065	
	No recovery from 8.5 to 9'. Becomes wet with very fine sand at 9'.			
10	Reddish brown staining and very micaceous at 10.5'.			
	No recovery from 12.4 to 14'.		2060	
15	SILTY SAND black (5Y 2.5/1), very fine grained, saturated at 15.5', (SM).			
	No recovery from 17 to 19'.		2055	
20	Becomes very dark gray (5Y 3/1) and coarse grained from 19 to 21'. No recovery from 21 to 24'.			
			2050	
25	Becomes fine to very coarse grained, and color changes to very dark grayish brown (2.5Y 3/2). No recovery from 26 to 29'.		2045	



First Water Encountered ▽ 15.50 (bgs)

Water Level - January 1992 ▼ 2.29 above ground

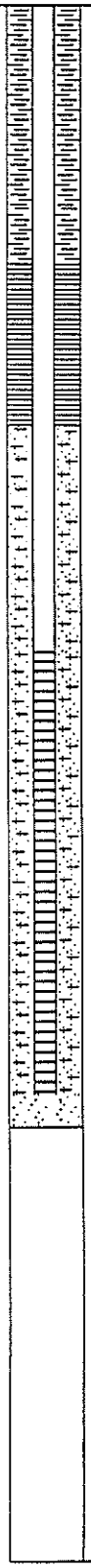
RADIAN CORPORATION

Well #: MW-47

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2045	
	SILT very dark gray (5Y 3/1), very sandy, micaceous, (ML).			
30				
	SAND very dark gray (5Y 3/1), fine to medium grained, saturated, (SW). No recovery from 32.5 to 34'.		2040	
	Becomes medium to very coarse grained at 34'.			Top of bentonite seal 34.0'
35				
	No recovery from 36 to 39'.			
			2035	Top of #3 filter sand 37.8'
40				
	No recovery from 41 to 44'.			Measured static at 41' BGS, let borehole stand 10 minutes and measured static at 31'. Water eventually rose to above ground surface during installation.
			2030	Top of 0.02" slot dual-wall screen, P.V.C. prepacked with #3 sand
45				
	No recovery from 47 to 49'.			Top of slough sand 47'
			2025	
50	SILTY SAND very dark grayish brown (10YR 3/2), very fine to coarse grained, saturated, (SM).			
	SILT dark gray (5Y 3/1), very sandy, wet, (ML).			
			2020	Bottom of well screen 53.3' Total depth at 54 feet



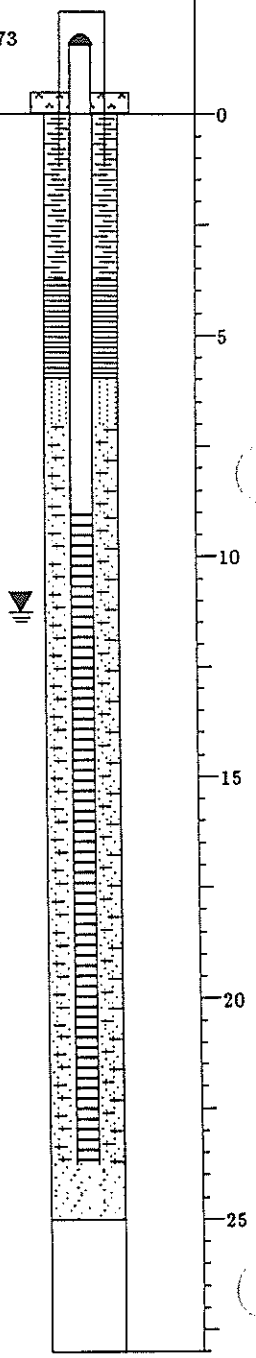
RADIAN CORPORATION

Well #: MW-48

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.
TOTAL DEPTH 54.00 START DATE 12/18/91 0945 WELL COMPLETION DATE 12/18/91 1120
GEOLOGIST M. Boulay APPROVED BY W G Hamm CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER D. Marocchi
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME 75
DRILL BIT TYPE AND SIZE 10" for well installation
APPROXIMATE WELL LOCATION

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2072.29	Top of PVC (MSL)= 2073.73
0	SILT dark yellowish brown (10YR 3/4), sandy, dry, (ML).			Top of grout interval at surface
	No recovery from 1.5 to 4'.		2070	4" diameter Schedule 40 blank PVC casing
				Top of bentonite seal 4.0'
5	Becomes very dark grayish brown (2.5Y 3/2) and micaceous.			Top of #0/30 bridge sand 6.0'
	Interbedded sand from 7.5 to 8.5'.		2065	Top of #3 filter pack sand 7.0'
	No recovery from 8.5 to 9'. Becomes wet with very fine sand at 9'.			Top of 0.02" slot, 4" diameter stainless steel well screen 8.7'
10	Reddish brown staining and very micaceous at 10.5'.			
	No recovery from 12.4 to 14'.		2060	
15	SILTY SAND black (5Y 2.5/1), very fine grained, saturated at 15.5', (SM).			
	No recovery from 17 to 19'.		2055	
20	Becomes very dark gray (5Y 3/1) and coarse grained from 19 to 21'. No recovery from 21 to 24'.			
			2050	Bottom of well screen 23.7'
25	Becomes fine to very coarse grained, and color changes to very dark grayish brown (2.5Y 3/2). No recovery from 26 to 29'.		2045	



First Water Encountered ▽ 15.50 (bgs)

Water Level - January 1992 ▼ 11.25 (bgs)

RADIAN CORPORATION

Well #: MW-48

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
	SILT very dark gray (5Y 3/1), very sandy, micaceous, (ML).			Well MW-48 was drilled adjacent to Well MW-47. Lithologic log is presented from Well MW-47.
30				
	SAND very dark gray (5Y 3/1), fine to medium grained, saturated, (SW). No recovery from 32.5 to 34'.		2040	
	Becomes medium to very coarse grained at 34'.			
35				
	No recovery from 36 to 39'.		2035	
40				
	No recovery from 41 to 44'.		2030	
45				
	No recovery from 47 to 49'.		2025	
50				
	SILTY SAND very dark grayish brown (10YR 3/2), very fine to coarse grained, saturated, (SM).			
	SILT dark gray (5Y 3/1), very sandy, wet, (ML).		2020	
				Total depth at 54 feet

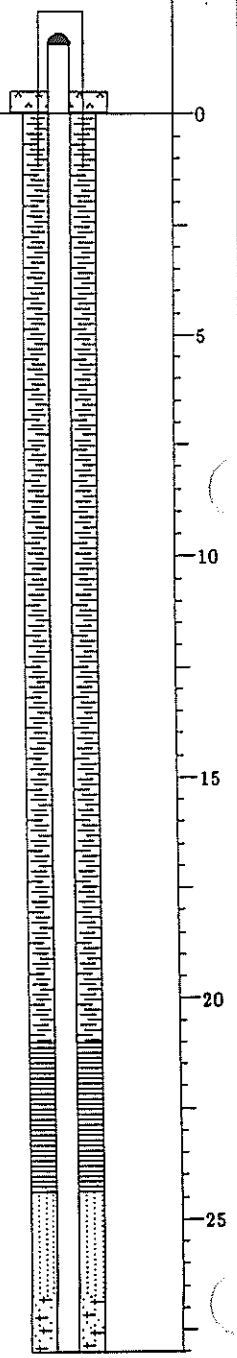
RADIAN CORPORATION

Well #: MW-49

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.
TOTAL DEPTH 113.50 START DATE 12/19/91 1500 WELL COMPLETION DATE 12/20/91 1130
GEOLOGIST M. Boulay APPROVED BY W G Hamer CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER D. Marocchi
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME 75
DRILL BIT TYPE AND SIZE 8" for borehole, 10" for well installation
APPROXIMATE WELL LOCATION

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2127.18	Top of PVC (MSL)= 2128.19
0	SILTY SAND dark brown (10YR 3/3), fine to very coarse grained, dry, (SM).			Top of grout interval at surface
			2125	4" diameter Schedule 40 blank PVC casing
	No recovery from 3.2 to 4'.			
5	No recovery from 6.4 to 9'.		2120	
10			2115	
	Becomes slightly clayey at 13'. No recovery from 13.5 to 14'. Minor pebbles at 14'.			
15	No recovery from 16.5 to 19'.		2110	
20	SILT brown (10YR 4/3), sandy, damp (ML).			Top of 4" diameter stainless steel blank casing 20.5'
	No recovery from 21.5 to 24'.			
	SILTY SAND dark brown to dark yellowish brown (10YR 3/3 to 10YR 4/3), fine to coarse grained, moist, (SM).		2105	Top of bentonite seal 21.0'
25	No recovery from 26.4 to 29'.		2100	Top of #3 filter pack sand 27'



First Water Encountered ▽ 38.00 (bgs)

Water Level - January 1992 ▼ 35.50 (bgs)

RADIAN CORPORATION

Well #: MW-49

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30				Top of 0.02" slot, 4" diameter stainless steel well screen 30.5'
			2095	
	No recovery from 32.5 to 34'.			
	Becomes wet and contains pebbles at 34'.			
35				Measured static water at 34.7' BGS
	No recovery from 36.2 to 39'.			
			2090	
	Saturated at 39'.			
40				
	No recovery from 41.7 to 44'.		2085	
	Becomes micaceous with some pebbles at 44'.			
45				
	No recovery from 45.8 to 49'.			
			2080	
50				
			2075	Bottom of well screen 52.0' Top of grout interval 52.5'
55	SAND brown (10Y 5/3), medium to very coarse grained, minor gravel, saturated, (SW).			Base of borehole backfilled with grout before well installation
			2070	
	Color change to light olive brown (2.5Y 5/4) from 59 to 64'.			
60				
			2065	

RADIAN CORPORATION

Well #: MW-49

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
	Gravel up to 15 mm at 64'.			
65			2060	Began adding water downhole, each time core barrel was tripped out of borehole
70			2055	
75	SILT dark yellowish brown (10YR 4/3), very sandy, saturated, (ML).			Base of borehole backfilled with grout before well installation
	SILTY SAND brown (10YR 5/3), fine to very coarse grained, saturated, (SM). No recovery from 76 to 79'.		2050	
80	No recovery from 81.9 to 84'.		2045	
85	No recovery from 86.5 to 89'.		2040	
90	Interbedded clayey silt from 90 to 91.5'. No recovery from 91.5 to 94'.		2035	
	SAND brown (10YR 5/3), medium to very coarse grained, saturated, (SW).			
95	SILT very dark gray to black (5Y 3/1 to 5Y 2.5/2), very sandy, clayey, very wet, (ML).		2030	
	No recovery from 98.5 to 99'.			
100				

RADIAN CORPORATION

Well #: MW-49

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
100	Sand content increasing at 100.5'.			
	SILTY SAND very dark gray (5Y 3/1), very fine to coarse grained, trace clay, saturated, (SM).			
			2025	
	No recovery from 102.5 to 104'.			
105	CLAY very dark gray (5Y 4/1), silty, wet, (CL).			
	SILTY SAND dark gray (5Y 4/1), very fine to coarse grained, saturated, (SM).			
			2020	
	No recovery from 107.2 to 109'.			
110				Mount Eden contact
	SANDSTONE dark brown to dark reddish brown (7.5YR 4/4 to 5YR 3/4), very fine to coarse grained, silty, wet, highly weathered granitic boulder.		2015	Blow count 67/3", 100/4" Drilling very hard at 112'. Not making hole. Switched to split spoon sampler. Total depth at 113.5'

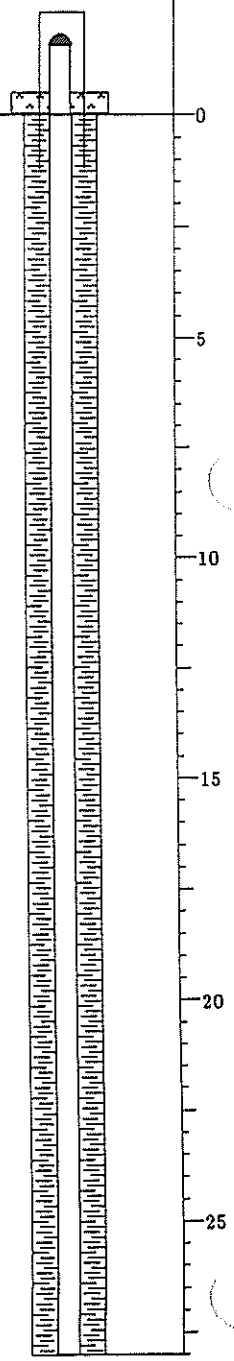
RADIAN CORPORATION

Well #: MW-50

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.
TOTAL DEPTH 74.00 START DATE 12/19/91 0750 WELL COMPLETION DATE 12/19/91 1020
GEOLOGIST M. Boulay APPROVED BY [illegible] CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER D. Marocchi
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME 75
DRILL BIT TYPE AND SIZE 8" for borehole, 10" for well installation
APPROXIMATE WELL LOCATION

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SILTY SAND dark yellowish brown (10YR 4/4), fine to medium grained, some pebbles, dry, (SM).		2148.11	Top of PVC (MSL)= 2148.76
	No recovery from 1.5 to 4'.			Top of grout interval
			2145	4" diameter Schedule 40 blank PVC casing
5	No recovery from 6.5 to 9'.			
			2140	
10	SILT dark yellowish brown (10YR 3/4), very sandy, moist, subangular pebbles of quartz, (ML).			
	No recovery from 11.2 to 14'.			
			2135	
15	SILTY SAND yellowish brown to dark yellowish brown (10YR 5/4 to 10YR 3/4), fine to very coarse grained, subangular pebbles of quartz, dry, (SM). No recovery from 15.5 to 19'.			
			2130	
20	No recovery from 21 to 24'.			
			2125	
25	No recovery from 26.5 to 29'.			



First Water Encountered ▽ 55.00 (bgs)

Water Level - January 1992 ▼ 55.10 (bgs)

RADIAN CORPORATION

Well #: MW-50

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
	Minor gravel, sandstone and quartz at 29'.		2120	
30				
			2115	
35				Very hard drilling
	No recovery from 36.5 to 39'.			
			2110	
	Becomes finer grained at 39'.			
40	SILT dark yellowish brown (10YR 3/6), clayey, sandy, moist, (ML).			
			2105	
				Top of bentonite seal 44.0'
45	SILTY SAND dark yellowish brown (10YR 4/4), fine to coarse grained, moist, (SM).			
	No recovery from 45.4 to 49'.			Top of 4" diameter stainless steel blank casing 46.0'
			2100	Top of #0/30 sand bridge 47.6'
50				Top of #3 filter pack sand 50.0'
	No recovery from 52.3 to 54'.			
			2095	
55	Saturated at 55'.			Top of 0.02" slot, 4" diameter stainless steel well screen
	No recovery from 56.2 to 59'.			
			2090	
	Decreasing silt at 59'.			
60				
	No recovery from 61.5 to 64'.			
			2085	

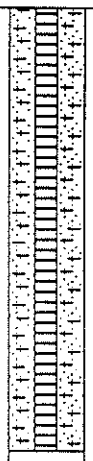
RADIAN CORPORATION

Well #: MW-50

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	SAND light yellowish brown (2.5Y 6/4), medium to very coarse grained, saturated, (SW).			
	No recovery from 67 to 69'.		2080	
70				
	No recovery from 73 to 74'.		2075	Bottom of well screen 74.0' Total depth at 74 feet.



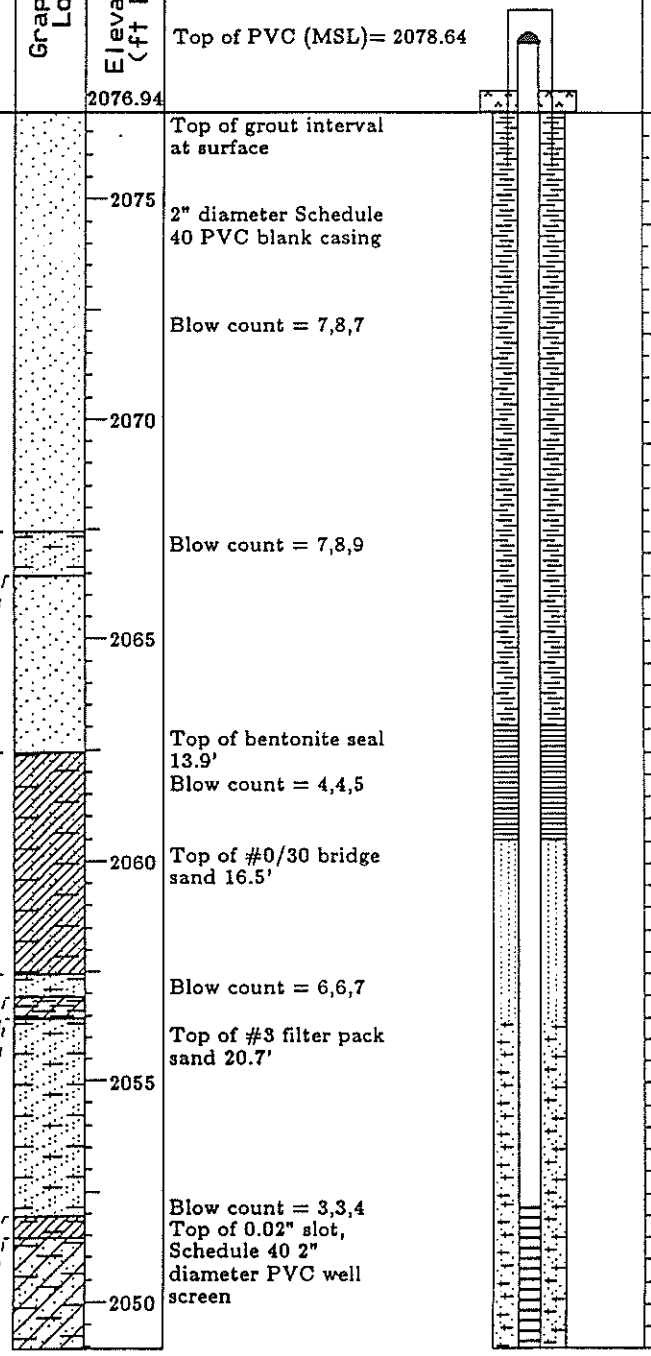
RADIAN CORPORATION

Well #: P-2

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.
TOTAL DEPTH 36.00 START DATE 12/5/91 WELL COMPLETION DATE 12/5/91
GEOLOGIST J.C. Shulters APPROVED BY W.G. Hamer CALIF R.G.# 3678
DRILLING COMPANY West Hazmat DRILLER D. Marocchi
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME 75
DRILL BIT TYPE AND SIZE 8"
APPROXIMATE WELL LOCATION

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0			2076.94	Top of PVC (MSL)= 2078.64
				Top of grout interval at surface
			2075	2" diameter Schedule 40 PVC blank casing
5	SAND very dark grayish brown (10YR 3/2), well graded sand, silt, clay mixture, with plagioclase crystals to 3 mm, slightly moist, (SM-CL).			Blow count = 7,8,7
			2070	
10	SILTY SAND dark yellowish brown (10YR 4/4), fine grained, M=0.1 mm, minor clay, minor medium to coarse sand, occasional pebbles to 8 mm, poorly sorted, subround, moist, (SM).			Blow count = 7,8,9
	SAND very dark grayish brown (10YR 3/2), as above with more clay, micaceous, moist, (SM-SC).		2065	
15	SILTY SANDY CLAY olive gray (5Y 4/2), micaceous, iron oxide staining, moist, (CL).			Top of bentonite seal 13.9' Blow count = 4,4,5
			2060	Top of #0/30 bridge sand 16.5'
20	SILTY SAND olive gray (5Y 4/2), medium grained, M=0.4 mm, some coarse sand, micaceous, poorly sorted, subangular, very moist to wet, (SW).			Blow count = 6,6,7
	CLAYEY SILT very dark gray (5Y 3/1), minor fine sand, micaceous, moist, (ML).			Top of #3 filter pack sand 20.7'
	SILTY SAND very dark gray (5Y 3/2), fine grained, M=0.1 mm, micaceous, poorly sorted, subangular, moist, (SM).		2055	
25	Color change to olive gray (5Y 4/2), moderately sorted, subrounded, very moist to wet.			Blow count = 3,3,4
	SILTY CLAY olive gray (5Y 4/2), with thin sand lamina, micaceous, very moist, (CL).			Top of 0.02" slot, Schedule 40 2" diameter PVC well screen
	SILTY CLAYEY SAND olive gray (5Y 4/2), medium to fine grained, M=0.1 mm, abundant coarse sand, igneous rock fragments to 8 mm, wet, (SM-SC).		2050	



Water Level - January 1992 ▽ 21.23 (bgs)

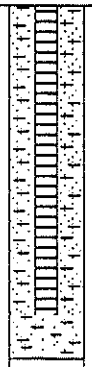
RADIAN CORPORATION

Well #: P-2

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	Same as above			Blow count = 4,4,6
	CLAY dark gray (5YR 4/1), slightly silty, micaceous, wet, (CL).		2045	
35	SILTY SAND olive gray (5Y 4/2), fine grained, M=0.2 mm, wet (SM).			Bottom of screen 34.7' Bottom end of cap Total depth at 36'



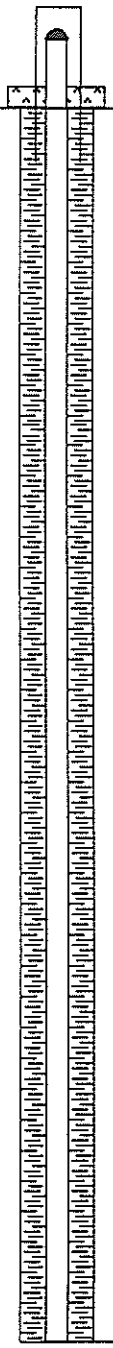
RADIAN CORPORATION

Well #: P-3

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.
TOTAL DEPTH 58.00 START DATE 12/4/91 WELL COMPLETION DATE 12/4/91
GEOLOGIST J.C. Shulters APPROVED BY W.C. Hamer CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER D. Marocchi
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME 75
DRILL BIT TYPE AND SIZE 8"
APPROXIMATE WELL LOCATION

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0			2135.63	Top of PVC (MSL)= 2137.58
	SILTY SAND very pale brown (10YR 8/9), medium sand, M=0.3 mm, cobbles to 5 cm, very poorly sorted, subangular, dry, (SM). Color change to dark yellowish brown (10YR 4/4), fine grained, M=0.1 mm, moderately sorted, moist. No recovery		2135	Top of grout interval at surface 2" diameter Schedule 40 blank PVC casing
	Micaceous, poorly sorted.			
5	No recovery		2130	
	CLAYEY SILT dark brown (10YR 3/3), minor fine sand, micaceous, moist, (ML).			
10	SAND very pale brown (10YR 7/4), fine to medium grained, M=0.25 mm, very poorly sorted, subangular, moist, (SM). No recovery		2125	
15	SILTY SAND light yellowish brown (10YR 6/4), fine grained, M=0.2 mm, micaceous, moderately sorted, subangular, moist, (SM).		2120	
	CLAYEY SAND very dark grayish brown, fine grained, M=0.1 mm, micaceous, poorly sorted, subrounded, moist, (SC). No recovery			
20	SILTY SAND weak red (2.5YR 4/2), fine grained, M=0.1 mm, micaceous, moderately sorted, subangular, very moist, (SM). Well graded slightly silty sand, very pale brown (10YR 7/4) pebbles to 5 mm, poorly sorted, subangular, moist, (SW-SM).		2115	
	CLAYEY SAND very dark gray (10YR 3/1), fine grained, M=0.1 mm, micaceous, very poorly sorted, subangular, subround, moist, (SC). No recovery			
25	SILTY SAND dark brown (10YR 4/3), fine grained, M=0.2 mm, occasional pebble to 5 cm, poorly sorted, subangular, moist, (SM).		2110	
	SAND very pale brown (10YR 8/4), medium grained, M=0.3 mm, very poorly sorted, subangular, moist, (SW). No recovery			



Water Level - January 1992 ▽ 51.54 (bgs)

RADIAN CORPORATION

Well #: P-3

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	SILTY SAND very dark grayish brown (10YR 3/2), fine grained, M=0.2 mm, very poorly sorted, subangular, subround, occasional pebble to 2 cm, moist, (SM).		2105	
	No recovery			
	Well graded slightly silty sand, brownish yellow (10YR 6/6), moist, (SW-SM).			
35	SILTY CLAY gray (5YR 5/1), some coarse sand, root hairs, moist, (CL).		2100	Top of bentonite seal 35.5'
	SAND, well graded (SW-SM).			
	CLAYEY SANDY SILT very dark brown (10YR 2/2), micaceous, moist (ML).			
	SILTY SAND dark gray (5Y 4/1), fine grained, moist (SM). No recovery			
	SAND, as above			Top of #0/30 bridge sand 38.8'
40	Well graded sand (SW-SM)		2095	
	SILTY SAND dark gray (5Y 4/1), fine grained, moist, (SM). No recovery			
45	SILTY CLAY black (7.5YR 2/0), micaceous, fine to coarse sand, moist, (CL).		2090	Top of #3 filter pack sand 44.0'
	SILTY SAND dark gray (10YR 4/1), fine grained, M=0.15 mm, poorly sorted, subangular, (SM).			
	CLAYEY SILT very dark gray (10YR 3/1), micaceous, very moist, (ML).			
	SILTY SAND very dark grayish brown (10YR 3/2), fine grained, M=0.2 mm, moderate to poorly sorted, subangular, subround, wet, (SM). No recovery			Top of 0.02" slot, 2" diameter Schedule 40 PVC well screen 47.7'
50	Well graded slightly silty sand, dark gray (10YR 4/1), wet, (SW-SM).		2085	
	No recovery			
	SAND dark gray (10YR 4/1), well graded, subangular, silty, wet (SW-SM).			
55	SILTY SAND dark grayish brown (10YR 4/2), fine grained, M=0.2 mm, micaceous, poorly sorted, subangular, wet, (SM).		2080	
	Granodiorite basement rock			Bottom of well screen 57.7' Refusal at 58' Bottom of end cap Total depth at 58'

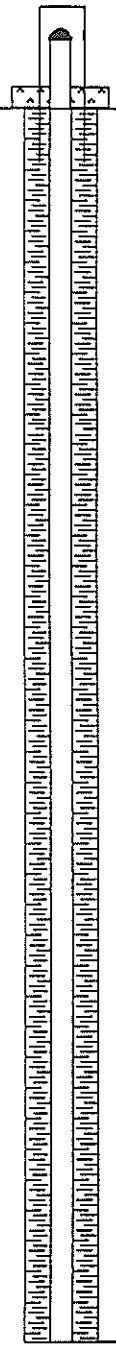
RADIAN CORPORATION

Well #: P-4

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.
TOTAL DEPTH 49.00 START DATE 12/7/91 WELL COMPLETION DATE 12/7/91
GEOLOGIST J.C. Shulters APPROVED BY W G Homan CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER D. Marocchi
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME 75
DRILL BIT TYPE AND SIZE 8"
APPROXIMATE WELL LOCATION

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0			2109.02	Top of PVC (MSL)= 2109.94
				Top of grout interval at surface
				2" diameter Schedule 40 blank PVC casing
			2105	
5	CLAYEY SANDY SILT dark brown (10YR 3/3), micaceous, caliche, slightly moist, (ML).			Blow count = 5,8,10
	SILTY SAND yellowish brown (10YR 5/4), fine grained, M=0.1 mm, subround, moderately sorted, slightly moist, (SM).			
			2100	
10				Blow count = 4,5,6
	SILTY CLAY very dark grayish brown (10YR 3/2), micaceous with iron oxide staining, (CL).			
			2095	
15				Blow count = 3,4,4
	SANDY CLAY very dark grayish brown (10YR 3/2), micaceous, iron oxide staining, fine to medium grained sand, occasional pebble to 5 mm, moist, (CL).			
			2090	
20	SILTY CLAY very dark grayish brown (10YR 3/2), minor sand, occasional pebble to 5 mm, micaceous, iron oxide staining, slightly moist, (CL). Decreasing sand content.			Blow count = 4,6,14
			2085	
25	CLAYEY SAND very dark grayish brown (10YR 3/2), fine grained, M=0.1 mm, minor iron oxide staining, moderately sorted, subround, moist, (SM).			Blow count = 4,5,7
	CLAY very dark grayish brown (10YR 3/2), slightly silty, micaceous, moist, (CL).			



First Water Encountered ▽ 38.00 (bgs)

Water Level - January 1992 ▼ 34.22 (bgs)

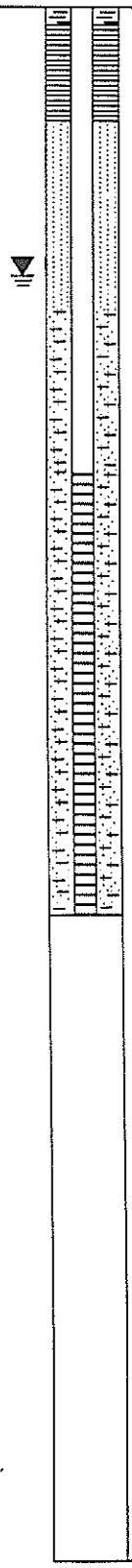
RADIAN CORPORATION

Well #: P-4

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2080	Top of bentonite seal 28.4'
30	SILTY CLAY dark reddish gray (5Y 4/2), with minor sand, iron oxide staining along root hairs, moist, (CL).			Blow count = 4,4,5
	CLAY very dark gray (5Y 3/1), slightly silty, micaceous, moist, (CL).			Top of #0/30 bridge sand 30.7'
			2075	
35	Thin interbeds of fine grained sand at 34.6 feet and 35.2 feet.			Blow count = 3,4,5 Top of #3 filter pack sand 35.0'
	CLAYEY SAND gray (7.5YR 5/0), fine grained, M=0.2 mm, moderately sorted, subround, very moist to wet, (SC).			
	CLAY very dark gray (5Y 3/1), slightly silty, micaceous, moist (CL).			
			2070	Top of 0.02" slot, 2" diameter Schedule 40 PVC well screen 38.7' Blow count = 5,7,7
40	SAND gray (7.5YR 5/0), slightly silty, medium grained, M=0.3 mm, abundant coarse sand, subangular, poorly sorted, wet, (SW).			
	INTERLAYERED SILT AND CLAY gray (7.5YR 5/0), 1-2 cm layers, minor fine to coarse sand, wet, (ML-CL).			
	SILTY SAND dark gray (5Y 4/1), fine grained, M=0.2 mm, subangular, moderately sorted, wet (SM).			
			2065	
	M=0.1 mm, subrounded, with minor plant debris.			Blow count = 5,5,11
45	INTERLAYERED FINE SAND AND SILTY CLAY dark gray (5Y 4/1), micaceous, wet, (SM-CL).			
	SAND gray (5Y 5/1), fine to medium grained, M=0.25 mm, slightly silty, some coarse sand, micaceous, subangular, poorly sorted, wet, (SW).			
				Bottom of screen 48.7' Bottom end of cap Piezometer installed in borehole adjacent to logged borehole. Original location was abandoned with grout after well casing was pulled up during installation Total depth at 49'



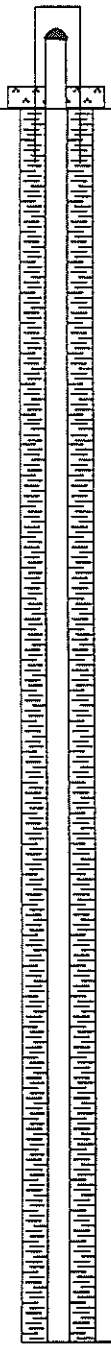
RADIAN CORPORATION

Well #: P-5

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.
TOTAL DEPTH 120.00 START DATE 12/8/91 WELL COMPLETION DATE 12/8/91
GEOLOGIST J.C. Shulters APPROVED BY [illegible] CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER D. Marocchi
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME 75
DRILL BIT TYPE AND SIZE 8 inch Diameter
APPROXIMATE WELL LOCATION

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0			2148.11	Top of PVC (MSL)= 2148.76
				Top of grout interval at surface
			2145	2" diameter Schedule 40 blank PVC casing
5	SILTY SAND reddish brown (10YR 4/4), fine grained, M=0.1 mm, poorly sorted, subangular, micaceous, moist, (SM).			Blow counts = 3,3,4
			2140	
10	Some coarse grained sand, pebbles to 5 mm, occasional carbonized wood fragments.			Blow counts = 4,5,6
			2135	
15	Color change to yellowish brown (10YR 5/6), M=0.2 mm, abundant coarse grained sand, pebbles to 5 mm, very poorly sorted.			Blow counts = 4,4,5
			2130	
20	CLAYEY SANDY SILT dark yellow brown (10YR 3/6), micaceous, with pebbles to 3 cm, moist, (ML).			Blow counts = 6,7,7
			2125	
25	SAND very pale brown (10YR 7/4), coarse grained, M=1 mm, slightly silty, abundant fine to medium sand, pebbles to 5 mm, occasional pebble to 2 cm, very poorly sorted, angular to subangular, slightly moist, (SW).			Blow counts = 10,13,15



Water Level - January 1992 ▽ 65.74 (bgs)

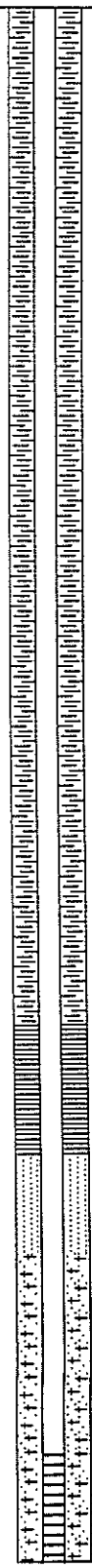
RADIAN CORPORATION

Well #: P-5

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2120	
30	SILTY SAND dark yellow brown (10YR 4/6), fine grained, M=0.2 mm, abundant coarse sand and pebbles to 5 mm, poorly sorted, subangular, moist, (SM).			Blow counts = 11,14,11
	SILTY CLAY very dark grayish brown (10YR 3/2), some sand, micaceous, (CL).		2115	
35	SANDY CLAY dark yellowish brown (10YR 3/4), micaceous, moist, (CL).			Blow counts = 8,8,10
	SILTY SAND dark yellowish brown (10YR 3/4), fine grained, M=0.15 mm, occasional pebble to 5 mm, poorly sorted, subangular, moist, (SM).		2110	
40	Color change to yellowish brown (10YR 5/4), medium grained, M=0.3 mm, abundant fine grained sand.			Blow counts = 13,18,22
			2105	
45	CLAYEY SILTY SAND dark yellowish brown (10YR 3/6), fine grained, M=0.1 mm, poorly sorted, subround, moist.			Blow counts = 8,8,13 Slower drilling
	SAND dark yellowish brown (10YR 3/6), medium grained, M=0.3 mm, slightly silty, pebbles to 1 cm, poorly sorted, subangular to subround, moist, (SW).			
	CLAYEY SILT dark yellowish brown (10YR 3/6), some sand, micaceous, moist, (ML).		2100	
50	SANDY SILTY CLAY dark yellowish brown (10YR 3/4), micaceous, pebbles to 5 mm, very moist, (CL).			
				Top of bentonite seal 51.6'
			2095	
55	SANDY CLAYEY SILT dark yellowish brown (10YR 3/4), micaceous, pebbles to 1 cm, very moist, (ML).			Blow counts = 13,19,22 Top of #0/30 bridge sand 54.7'
	SAND light yellow brown (10YR 6/4), coarse grained, M=0.6 mm, abundant fine to medium sand, pebbles to 1 cm, very poorly sorted, subangular to subround, moist, (SW).			Top of #3 filter pack sand 56.9'
			2090	Hard drilling
60	CLAYEY SANDY SILT, dark yellowish brown (7.5YR, 3/4), micaceous, with fine to coarse grained sand, pebbles to 2 cm, very moist, (ML).			Blow counts = 5,7,9
				Top of 0.02" slot, 2" diameter Schedule 40 PVC well screen 61.4'
			2085	



RADIAN CORPORATION

Well #: P-5

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	SILTY SAND dark yellowish brown (10YR 3/4), fine grained, M=0.2 mm, abundant medium to coarse sand, pebbles to 1 cm, micaceous, very poorly sorted, subangular, wet, (SM).		2080	Water in borehole Blow counts = 17,23,30
70	SILTY CLAY, dark yellowish brown (10YR 3/6), minor sand, micaceous, wet, (CL).		2075	Bottom of well screen 71.4' Bottom of end cap 71.7' Casing installation was in borehole adjacent to logged borehole. Initial borehole grouted to ground surface.
75	SILTY SAND dark yellowish brown (10YR 3/4), coarse grained, M=0.7 mm, abundant fine to medium sand, micaceous, pebbles to 5 mm, poorly sorted, subangular, wet, (SW-SM).		2070	Blow counts = 9,11,13 Getting heaving sands - go to 10-foot sampler
80			2065	
	SAND as above			
85	SILTY SAND yellowish brown (10YR 5/4), fine grained, M=0.15 mm, minor medium to coarse sand, micaceous, moderately sorted, subround, wet, (SM).		2060	Blow counts = 7,13,20
90			2055	
95	Medium grained, M=0.4 mm, micaceous. SILTY CLAY dark yellowish brown (10YR 4/4), some sand, pebbles to 1 cm, micaceous, wet, (CL). SILTY SAND dark yellowish brown (10YR 3/4), fine grained, M=0.1 mm, abundant medium to coarse sand, poorly sorted, subangular, wet, (SM).		2050	Blow counts = 10,17,20
100				

RADIAN CORPORATION

Well #: P-5

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
100			2045	
105	SAND yellowish brown (10YR 5/4), medium grained, M=0.3 mm, slightly silty, some coarse sand, micaceous, moderately sorted, subangular to subround, wet, (SW).			Blow counts = 17,34,35
	SILT dark yellowish brown (10YR 4/4), micaceous, wet, (ML).		2040	
110			2035	
115	SAND light yellowish brown (10YR 6/4), coarse grained, M=0.9 mm, abundant fine to medium sand, micaceous, poorly sorted, subangular, wet, (SW).			Blow counts = 14,30,37
	SILTSTONE reddish gray (5Y 5/2), semi-consolidated with abundant plagioclase crystals.		2030	Mount Eden contact
120	Weathered granodiorite (cobble?)			Blow counts = 100 Total depth at 120'

RADIAN CORPORATION

Boring #: IB-1

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S. LOCATION Beaumont Ca.
TOTAL DEPTH 105.00 START DATE 2/1/91 WELL COMPLETION DATE 2/1/91
GEOLOGIST P. Quandt APPROVED BY W G Hamer CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 8" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION Approximately 200' East of the Burn Pit area.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
0			2185.55	
	SAND medium brown (10 YR 6/4), fine to medium grained sand, some coarse and fine pebbles, (SW).		2185	Entire borehole was grouted.
5			2180	Blow count = 7,7,12
10	SAND medium brown (10 YR 6/4), fine to coarse grained sand, with some fine pebbles, (SW).		2175	Blow count = 7,7,10
15	SAND medium brown (10 YR 6/4), fine to coarse grained sand, slight coarse pebbles with some fine pebbles, (SW).		2170	Blow count = 7,6,10
20	SILTY SAND medium grayish brown (10 YR 5/4), very fine to medium grained sand, some coarse sand and some silt, (SM).		2165	Blow count = 7,7,12
25	SAND medium brown (10 YR 6/4), fine to coarse grained sand, some fine pebbles, (SW).		2160	Blow count = 7,9,12

First Water Encountered ▽ 95.00 (bgs)

RADIAN CORPORATION

Boring #: IB-1

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
30	SAND medium grayish brown (10 YR 5/4), fine to coarse grained sand, some fine pebbles, clayey silt, (SW/SM).		2155	Lithologies are interlayered in 1"-1' thick beds. Blow count = 10,10,10
35	SAND medium grayish brown (10 YR 5/4), fine to coarse grained sand, some clayey silt, some fine pebbles, (SW/SM).		2150	Blow count = 9,10,10
40	SAND medium brown (10 YR 6/4), fine to coarse grained sand, some fine pebbles, (SW).		2145	Blow count = 17,15,12
45			2140	Blow count = 15,15,15
50	SAND medium brown (10 YR 6/4), fine to medium grained sand, some coarse and fine grained pebbles, (SW).		2135	Blow count = 16,16,16
55	SILTY SAND dark yellowish brown (10 YR 4/4), fine to medium grained sand, some fine pebbles, some silt, (SM).		2130	Blow count = 9,8,9
60	SILTY SAND medium grayish brown (10 YR 5/4), fine to medium grained sand, some coarse grained, some fine pebbles, silt, (SM).		2125	Blow count = 10,9,9

RADIAN CORPORATION

Boring #: IB-1

Page 3of 4

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
65			2120	Blow count = 12,12,15
70	SAND fine to medium grained sand, some coarse grained, some fine pebbles, some silt, (SW).		2115	Blow count = 13,12,14
75	SILTY SAND yellowish red (5 Y 4/6), fine to medium grained sand, some coarse grained sand, some fine pebbles, silt, (SW).		2110	Alluvium Mount Eden contact at 75'. Blow count = 12,13,14
80	SAND light yellowish brown (10 YR 5/6), fine to medium grained sand, some coarse grained, some fine pebbles, slight silt, (SW).		2105	Blow count = 50 for 5"
85	SILTY SAND medium grayish brown (10 YR 5/4), fine to medium grained sand, some coarse grained sand and silt, (SM).		2100	Blow count = 50 for 5"
90	SILTY SAND light yellowish brown (10 YR 5/6), slight clay, (SM).		2095	Blow count = 50 for 4.5"
95			2090	Blow count = 50 for 4"

RADIAN CORPORATION

Boring #: IB-1

Page 4of 4

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
100			2085	
105				Total depth 105'

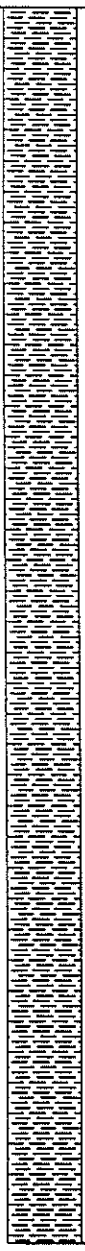
RADIAN CORPORATION

Boring #: IB-2

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S. LOCATION Beaumont Ca.
TOTAL DEPTH 115.00 START DATE 2/4/91 WELL COMPLETION DATE 2/4/91
GEOLOGIST P. Quandt APPROVED BY WG Hamman CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 10" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION Approximately 800' South of the Burn Pit area.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
0	SAND medium grayish brown (10 YR 5/4), fine to medium grained sand, some coarse grained sand, slight silt, some fine pebbles, (SW).		2187.91	Entire borehole was grouted.
			2185	
5				Blow count = 5,5,6
			2180	
10				Blow count = 5,5,6
			2175	
15				Blow count = 22,21,18
			2170	
20	SAND medium grayish brown (10 YR 5/4), fine to medium grained sand, some coarse grained sand, slight fine pebbles, (SW).			Blow count = 7,8,9
			2165	
25	SAND light yellowish brown (10 YR 5/6), fine to coarse grained sand, slight silt, (SW).			Blow count = 11,9,10 Cobble. Cobble at 27'
			2160	



First Water Encountered ▽ 95.00 (bgs)

RADIAN CORPORATION

Boring #: IB-2

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
30	SAND medium brown (10 YR 6/4), fine to coarse grained sand, slight silt, (SW).			Blow count = 12,15,17
			2155	
35				Blow count = 12,12,12
			2150	
40	SAND medium brown (10 YR 6/4), fine to coarse grained sand, slight silt, slight fine pebbles, (SW).			Blow count = 17,13,15
			2145	Cobble - 43'-44'
45	SAND dark yellowish brown (10 YR 4/4), fine grained sand, clayey silt, (SM).			Blow count = 11,9,8
			2140	Lithologies interlayered in 3" to 1' beds.
50	SAND medium brown (10 YR 6/4), fine to medium grained sand, some coarse grained, some silt, (SW).			Blow count = 11,11,11
			2135	
55	CLAYEY SILTY SAND dark yellowish brown (10 YR 4/6), fine grained sand, (SM/SC).			Blow count = 8,8,12
			2130	
60	SILTY SAND yellowish brown (10 YR 5/4), slight fine pebbles, (SM).			Blow count = 12,15,15
			2125	Possible cobble 63'

RADIAN CORPORATION

Boring #: IB-2

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
65	SAND light yellowish brown (10 YR 6/4), fine to medium grained sand, some coarse grained, some fine pebbles, some medium pebbles, (SW).		2120	Blow count = 25,25,25
70	CLAYEY SILTY SAND pale red (2.5 Y 6/2), fine grained sand, slight medium to coarse grained sand, (SM/SC).		2115	Blow count = 13,14,14 Some cobble at 74'
75	SAND white (2.5 Y 8/0), fine to medium grained sand, some coarse grained sand, some pebbles and cobbles, (Mount Eden Formation), (SW).		2110	Alluvium Mount Eden contact at 75'. Blow count = 100 for 4"
80	SAND yellowish brown (10 YR 5/6), fine to medium grained sand, some coarse grained sand, some fine pebbles, (SW).		2105	Blow count = 100 for 4"
85			2100	Blow count = 50 for 1"
90	SAND yellowish brown (10 YR 5/4), fine to medium grained sand, slight silt, some coarse grained sand, fine pebbles, (SW).		2095	Blow count = 50 for 2"
95			2090	▽

RADIAN CORPORATION

Boring #: IB-2

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
100	SAND yellowish brown (10 YR 5/4), fine to medium grained sand, slight silt, some coarse grained sand and fine pebbles, (SW).			
			2085	
105				
			2080	
110				
			2075	
115				Total depth 115'

RADIAN CORPORATION

Boring Well #: **FS-1**

LOG OF DRILLING OPERATIONS

PROJECT	Lockheed Beaumont #1 FS	LOCATION	Beaumont Ca.
TOTAL DEPTH	120.00	START DATE	11/7/90
WELL COMPLETION DATE	11/8/90	GEOLOGIST	J Hensel
APPROVED BY	[illegible]	CALIF R.G.#	3878
DRILLING COMPANY	West Hazmat	DRILLER	Rob Slagle
DRILLING METHOD	Hollow Stem Auger	EQUIPMENT	CME-75
DRILL BIT TYPE AND SIZE	8" Diameter Auger Head Bit		
APPROXIMATE BOREHOLE/WELL LOCATION	Burn Pit Area by BP-8.		

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
0			2184.68	
	SAND very pale brown (10YR 7/4) silt to coarse sand with some very fine to fine pebbles, iron staining, grains are angular to subangular, loose, dry, (SW). Sand = 80%, Pebbles = 10%, Silt = 10%.			Entire borehole grouted. Blow count = 6,5,2 Vapor Probe at 1.6 Blow Count = 12,13,17
	SAND yellowish red (5YR 4/6) fine to coarse sand with some very fine to fine pebbles, iron staining, grains are angular to subangular, loose, dry, (SW). Sand = 90%, Pebbles = 10%.		2180	Blow Count = 12,10,9
5				Blow Count not taken. Blow Count = 11,13,9
	SAND pale brown (10YR 6/3) fine to coarse sand with some very fine to fine sand and pebbles, quartz and feldspar with mica composition, grains are angular to subrounded, loose, dry (SW). Sand = 90%, Pebbles = 10%.			Flux at 7.6 Blow Count = 10,7,7
	SAND dark yellowish brown (10YR 4/4) fine to medium sand with minor fine pebbles, grains are angular to subrounded, minor silt also present, slightly moist, slightly compact, (SW). Sand = 95-96%, Pebbles = 2%, Silt = 2-3%.		2175	
10				

First Water Encountered ▽ **103.70** (bgs)

RADIAN CORPORATION

Boring Well #: FS-1

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 FS LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
10				Blow Count = 6,8,5
				Blow Count = 12,12,12
	SAND pale brown (10YR 6/3) fine to coarse sand with some very fine to fine pebbles, sand and pebbles are quartz and feldspar, mica also present, grains are angular to subangular, dry, slightly compact, poorly sorted, (SW). Sand = 90%, Pebbles = 10%			
				Blow Count = 11,11,12
				Blow Count = 13,10,10
	SAND dark yellowish brown (10YR 4/4) fine to medium sand with minor very fine pebbles and silt, grains are angular to subrounded, slightly moist and slightly compact, (SW). Sand = 95%, Pebbles = 2%, Silt = 3%.		2170	
15				
	SAND pale brown (10YR 6/3) fine to coarse sand with some very fine to fine pebbles, sand and pebbles are quartz and feldspar, mica also present, grains are angular to subangular, dry, slightly compact, poorly sorted, (SW). Sand = 90%, Pebbles = 10%			Blow Count = 10,12,10
				Blow Count = 8,8,14
	SAND dark yellowish brown (10YR 4/4) fine to medium sand with minor very fine pebbles and silt, grains are angular to subrounded, slightly moist and slightly compact, (SW). Sand = 95%, Pebbles = 2%, Silt = 3%			Blow Count = 8,8,9
			2165	
20	SAND dark yellowish brown (10YR 4/4) fine to medium sand with minor very fine pebbles and silt, grains are angular to subrounded, slightly moist and slightly compact, (SW). Sand = 95%, Pebbles = 2%, Silt = 3%.			Blow Count = 17,16,28
				Blow Count = 10,19,21

RADIAN CORPORATION

Boring Well #: FS-1

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 FS LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
	SAND pale brown (10YR 6/3) fine to coarse sand with some very fine to fine pebbles, sand is quartz and iron stained, grains are angular to subrounded, dry, slightly compact, poorly sorted, (SW). Sand = 90%, Pebbles = 10%			Blow Count = 11,13,20
			2160	
25				Blow Count = 15,18,21
				Blow Count = 14,15,20
				Blow Count = 10,22,26
				Blow Count = 16,18,23
			2155	
30				Blow Count = 8,8,19
	SAND dark yellowish brown (10YR 4/4), (SW). Sand = 94%, Pebbles = 3%, Silt = 3%			Blow Count = 15,18,18
	SAND pale brown (10YR 6/3) fine to coarse sand with very fine to fine pebbles, grains are angular to subrounded, loose, poorly sorted, dry (SW). Sand = 94%, Pebbles = 3%, Silt = 3%.			Blow Count not taken.
			2150	
35				Blow Count = 16,19,25

RADIAN CORPORATION

Boring Well #: FS-1

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 FS LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
	SAND dark yellowish brown (10YR 4/4), (SW). Sand = 95%, Pebbles = 3%, Silt = 2%.			Blow Count = 14,15,19
	SAND pale brown sand (10YR 6/3) fine to coarse sand with some very fine to fine pebbles, grains angular to subrounded, loose, poorly sorted, dry, (SW). Sand = 85%, Pebbles = 15%			Blow Count = 17,25,23
			2145	
40				Blow Count = 17,20,21
	SAND yellowish brown (10YR 5/4) fine to coarse sand with fine pebbles to small cobbles, grains are angular to subrounded, loose, poorly sorted, dry, (SW). Sand = 80%, Pebbles = 15%, Cobbles = 5%.			Blow Count = 15,15,22
				Blow Count = 13,13,20
	Same but pale brown (10YR 6/3) and no cobbles.			Blow Count = 10,12,15
			2140	
45	Same but sand finer grained, (less coarse grained sand) and fewer pebbles. Sand = 90%, Pebbles = 10%.			
				Blow Count = 12,12,22
	Same but back to larger percentage of coarse grained sand and pebbles. Sand = 85%, Pebbles = 15%.			Blow Count = 13,18,20

RADIAN CORPORATION

Boring Well #: FS-1

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
	SAND strong brown (7.5YR 5/6) to yellowish red (5YR 4/6) very fine to coarse sand with some very fine to fine pebbles, minor silt also present, grains are angular to subrounded, dry and very stiff but poorly cemented. easily broken apart, (SW). Sand = 93%, Pebbles = 5%, Silt = 2% (Mount Eden Formation).			Blow count = 50 for 8"
			2135	Alluvium Mount Eden contact 49.5'
50				Blow Count = 100 for 6"
				Blow Count = 106 for 6"
				Blow Count = 110 for 6"
				Blow Count = 143 for 6"
				Blow Count = +100 for 6"
				Blow Count = +100
				Blow Count = 115 for 6"
				Blow Count = 180 for 6"
				Blow Count = 140 for 6"
			2130	
55				
				Blow Count = 140 for 6"
			2125	
60				
				Blow Count = 205 for 6"

RADIAN CORPORATION

Boring Well #: FS-1

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
	SAND strong brown (7.5YR 5/6) to yellowish red (5YR 4/6) very fine to coarse sand with some very fine to fine pebbles, minor silt also present, grains are angular to subrounded, dry and very stiff but poorly cemented. easily broken apart, (SW). Sand = 93%, Pebbles = 5%, Silt = 2% (Mount Eden Formation).			Blow Count = 70 for 6"
			2120	
65				Blow Count = +100 for 6"
			2115	
70				Blow Count = 96 for 6"

RADIAN CORPORATION

Boring Well #: FS-1

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
75	SAND strong brown (7.5YR 5/6) to yellowish red (5YR 4/6) very fine to coarse sand with some very fine to fine pebbles, minor silt also present, grains are angular to subrounded, dry and very stiff but poorly cemented. easily broken apart, (SW). Sand= 93%, Pebbles= 5%, Silt= 2%, (Mount Eden Formation).		2110	Blow count= 140 for 6"
80			2105	Blow count= 110 for 6"
85	Same, slight increase in moisture content.		2100	Blow count= 110 for 6"

RADIAN CORPORATION

Boring Well #: FS-1

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
	SAND strong brown (7.5YR 5/6) to yellowish red (5YR 4/6) very fine to coarse sand with some very fine to fine pebbles, minor silt also present, grains are angular to subrounded, dry and very stiff but poorly cemented. easily broken apart, (SW). Sand = 93%, Pebbles = 5%, Silt = 2%, (Mount Eden Formation).		2095	
90				Blow count = 100 for 6"
			2090	
95				Blow count = 116 for 6"
				Blow count = 131 for 6"
			2085	

RADIAN CORPORATION

Boring Well #: FS-1

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
100	SAND strong brown (7.5YR 5/6) to yellowish red (5YR 4/6) very fine to coarse sand with some very fine to fine pebbles, minor silt also present, grains are angular to subrounded, dry and very stiff but poorly cemented. easily broken apart, (SW). Sand = 93%, Pebbles = 5%, Silt = 2%, (Mount Eden Formation).			Drilling slow.
			2080	
105				Blow count = 95 for 6"
			2075	
110				Blow count = 96 for 6"

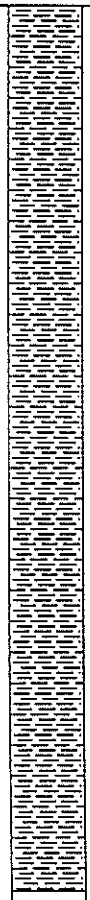
RADIAN CORPORATION

Boring Well #: FS-1

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
	SAND strong brown (7.5YR 5/6) to yellowish red (5YR 4/6) very fine to coarse sand with some very fine to fine pebbles, minor silt also present, grains are angular to subrounded, wet, very stiff but poorly cemented. easily broken apart, (SW). Sand= 93%, Pebbles= 5%, Silt= 2%, (Mount Eden Formation).		2070	
115				Blow count= 115 for 6"
			2065	
120				Total depth 120' (auger refusal).



120.0

RADIAN CORPORATION

Boring Well #: FS-2

LOG OF DRILLING OPERATIONS

PROJECT	Lockheed Beaumont #1 T.S.	LOCATION	Beaumont Ca.
TOTAL DEPTH	53.00	START DATE 11/6/90	WELL COMPLETION DATE 11/7/90
GEOLOGIST	J Hensel	APPROVED BY	CALIF R.G.# 3878
DRILLING COMPANY	West Hazmat	DRILLER	Rob Slagle
DRILLING METHOD	Hollow Stem Auger	EQUIPMENT	CME-75
DRILL BIT TYPE AND SIZE	8" Diameter Auger Head Bit		
APPROXIMATE BOREHOLE/WELL LOCATION	Rocket Motor Assembly Area.		

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0			2143.77	4" Diameter Well Casing & Screen
	SAND grayish brown (2.5Y 5/2) fine to coarse sand with some very fine to fine pebbles, sand is quartz and mica rich, grass roots also present in 0-6", grains are angular to subrounded, dry, loose, poorly sorted, (SW). Sand= 80%, Pebbles= 15%, Grass roots= 5%.			Entire Borehole grouted.
				Blow Count = 9,11,20.
	SAND dark grayish brown (2.5Y 4/2) fine to coarse sand with some very fine to fine pebbles and silt, sand and pebbles are quartz rich, mica also present, grains are angular to subrounded, dry, slightly compact, poorly sorted, (SW). Sand= 80%, Pebbles= 15%, Silt= 5%.			Blow Count = 14,20,17.
				Vapor probe at 3.5'
			2140	
	Same, coarse subrounded pebbles, poorly sorted, (SW). Sand= 90%, Pebbles= 5%, Silt= 5%.			Blow Count = 9,11,14.
5				Blow count= 7,8,10
				Blow Count = 7,8,10.
				Blow Count = 15,10,9.
	SAND light olive brown (2.5Y 5/4) fine to coarse sand with some very fine to fine pebbles and minor silt, grains are angular and subrounded, dry, slightly compact, poorly sorted, (SW). Sand= 75%, Pebbles= 20%, Silt= 5%.			Flux
				Blow count= 6,12,10
	SAND very pale brown (10YR 7/4) fine to coarse sand with some very fine to fine pebbles, biotite, feldspar and quartz present, grains are angular to subrounded, dry, slightly compact to loose, poorly graded, (SW). Sand= 75%, Pebbles= 25%.			Flux
			2135	
10	SAND very pale brown (10YR 7/4) fine to coarse sand with some very fine to fine pebbles, biotite, quartz and feldspar present, grains angular to subrounded, dry, slightly compact to loose, poorly sorted, (SW). Sand= 75%, Pebbles= 25%.			

First Water Encountered ▽ 52.55 (bgs)

Water Stabilized - November 17,1990 ▼ 51.00 (bgs)

RADIAN CORPORATION

Boring Well #: FS-2

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
10				
	SAND light olive brown (7.5Y 5/4) fine to coarse sand with some fine to very coarse pebbles and silt, grains angular to subrounded, slightly moist, slightly compact, poorly sorted, (SW). Sand = 85%, Pebbles = 10%, Silt = 5%.			Vapor probe at 13'.
			2130	
15				Compaction of soil (sand) only filled 3 sleeves with 4 feet of penetration.
			2125	Blow Count = 11,13,21.
20	SAND dark yellowish brown (10YR 4/4) fine to medium sand with some silt and fine pebbles, grains are angular to subrounded, moist, slightly compact, poorly sorted, (SW). Sand = 85%, Pebbles = 5%, Silt = 10%.			Blow Count = 3,9,4,5.
	SAND yellowish brown (10YR 5/6) fine to coarse sand with some very fine to fine pebbles, grains are angular to subrounded, dry and slightly compact, poorly sorted, (SW). Sand = 80%, Pebbles = 20%.			

RADIAN CORPORATION

Boring Well #: FS-2

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
				Blow Count = 4,4,8,11.
			2120	
25				Blow Count = 8,7,9,17.
	CLAYEY SAND dark yellowish brown (10YR 4/4) fine to medium sand and minor very fine pebbles, grains are subangular to subrounded, moist, slightly compact, (SC). Sand = 65%, Pebbles = 5%, Clay = 30%.			
				Blow Count = 3,4,9,12.
	SAND brownish yellow (10YR 6/6) fine to coarse sand with fine pebbles, grains angular to subrounded, dry, slightly compact, poorly sorted, (SW). Sand = 90%, pebbles = 10%.		2115	Blow Count = 7,2,37.
30	CLAYEY SAND same as 25.6' to 28.5', (SC).			Blow Count = 28,20,20.
	SAND same as 28.5' to 31.4' with a slight increase in silt content, (SW). Sand = 85-87%, Pebbles = 10%, Silt = 3-5%.			
				Blow Count = 8,8,8,10.
	CLAYEY SAND same as 25.6' to 28.5', (SC).			Vapor probe at 33'.
	SAND olive brown (2.5Y 4/4) silty fine sand to coarse sand with some very fine to medium pebbles, grains angular to subrounded, slightly moist, slightly compact, (SM to SW). Sand = 80%, Silt = 15%, Pebbles = 5%.		2110	Blow Count = 10,2,50.
35	SAND light yellowish brown (2.5Y 6/4) fine to coarse sand with some very fine to fine pebbles and minor silt, grains angular to subrounded, dry, loose, (SW). Sand = 96%, Pebbles = 2%, Silt =			Blow Count = 42,37,50.

RADIAN CORPORATION

Boring Well #: FS-2

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
	Same but much larger percentage of coarser sand and pebbles. (SW). Sand = 88-89%, Pebbles = 10%, Silt = 1-2%.			
				Blow Count = 17,40,50.
	Same as sand from 35.1' to 36.3', (SW). Sand = 95%, Pebbles = 3%, Silt = 2%.			
			2105	
				Blow Count = 15,30,28.
40				Vapor flux at 39.8'. Blow Count = 25,30,30.
				Blow Count = 17,28,39.
	SAND dark yellowish brown (10YR 4/6) fine to coarse sand with some very fine pebbles and silt, grains angular to subrounded, slightly moist, slightly compact. (SW). Sand = 95%, Pebbles = 2%, Silt = 3%.			
				Blow Count = 17,26,30.
	SAND light yellowish brown (2.5Y 6/4) fine to coarse sand with some very fine to fine pebbles, grains angular to subrounded, slightly moist to dry slightly compact, poorly sorted, (SW). Sand = 95%, Pebbles = 5%.		2100	
45				Blow Count = 20,32,35.
				Blow Count = 17,42,45.
				Blow Count = 15,20,38.

RADIAN CORPORATION

Boring Well #: FS-2

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 T.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2095	Blow Count = 48,35,28.
50	SAND dark yellowish brown (10YR 4/4) silty fine sand to coarse sand with minor very fine pebbles, grains are angular to subrounded, moist, slightly compact, poorly sorted, (SM to SW).			Vapor flux at 49.8'. Blow Count = 20,25,27.
	SAND yellowish brown (10YR 3/4) fine to coarse sand with some very fine to fine pebbles, grains angular to subrounded, moist, slightly compact, poorly sorted, (SW).			
	Same, but saturated.			Blow Count = 8,25,15.
				Total depth at 53'

RADIAN CORPORATION

Boring Well #: FS-18

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.
TOTAL DEPTH 20.00 START DATE 11/21/90 WELL COMPLETION DATE 11/21/90
GEOLOGIST Jeff Hensel APPROVED BY W G Hamer CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 8" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION Between MW-2/MW-3 cluster and MW-24.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
0	SAND pale brown (10 YR 6/3), fine to coarse grained sand, with some very fine pebbles, silt, and grass roots, dry, loose, (SW).		2173.16	Entire Borehole was grouted.
			2170	
5				Blow Count = 8,6,5
			2165	
10	SAND pale brown (10 YR 6/3) to light olive brown (2.5 Y 5/4), fine to coarse grained sand, very fine pebbles, silt, dry, loose, (SW).			Blow Count = 8,8,10
			2160	
15	Same, more yellowish brown.			Blow Count = 8,7,8
	Large Pebble Layer.			
	SAND reddish brown (5 YR 4/4), fine to medium grained sandstone with very fine to fine pebbles, dry, very compact, hard, (Mount Eden Formation), (SW).		2155	Alluvium Mt. Eden contact at 18.5'. Blow count = 37,50 for 12" Total depth 20.0'.
20				

RADIAN CORPORATION

Boring Well #: **FS-19**

LOG OF DRILLING OPERATIONS

PROJECT	Lockheed Beaumont #1 F.S.	LOCATION	Beaumont Ca.
TOTAL DEPTH	45.00	START DATE	11/21/90
WELL COMPLETION DATE	11/21/90	GEOLOGIST	Jeff Hensel
APPROVED BY	W G Hamel	CALIF R.G.#	3878
DRILLING COMPANY	West Hazmat	DRILLER	Rob Slagle
DRILLING METHOD	Hollow Stem Auger	EQUIPMENT	CME-75
DRILL BIT TYPE AND SIZE	8" Diameter Auger Head Bit		
APPROXIMATE BOREHOLE/WELL LOCATION	Between MW-24 and FS-18.		

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
0			2175.69	
	SAND pale brown (10 YR 6/3), fine to coarse grained sand, very fine to fine pebbles, dry, loose, (SW).		2175	Entire Borehole was grouted.
5			2170	
10			2165	Blow Count = 5,5,7
15			2160	
20	SAND dark yellowish brown (10 YR 4/4), fine to medium grained sand, clay and minor pebbles, slightly compact, slightly moist, (SC).		2155	Blow Count = 8,8,10 Clay layer about 1 foot thick
25			2150	

RADIAN CORPORATION

Boring Well #: FS-19

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
30	SAND pale brown (10 YR 6/3), fine to coarse grained sand with pebbles, loose, dry, (SW).		2145	Blow Count = 8,10,11
35			2140	
40	Same, cobbles.		2135	Blow Count = 73 for 6" Cobbles about 3 feet thick.
	SAND reddish brown (5 YR 4/3), (Mount Eden formation), (SW).			Top of Mount Eden 43.0'
45				Total depth 45.0'

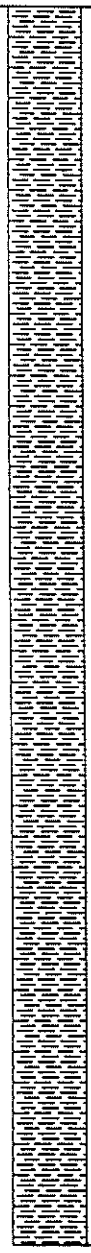
RADIAN CORPORATION

Boring Well #: FS-20

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.
TOTAL DEPTH 60.00 START DATE 11/21/90 WELL COMPLETION DATE 11/21/90
GEOLOGIST Jeff Hensel APPROVED BY W.G. Hamer CALIF R.G.# 5878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 8" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION Between FS-18 and MW-2/MW-3 cluster.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
0	SAND pale brown (10 YR 6/3), fine to coarse grained sand, pebbles, dry, loose, (SW).		2169.37	Entire Borehole was grouted.
5			2165	
10			2160	Blow Count = 9,5,5
15			2155	
20	SAND dark yellowish brown (10 YR 4/6), fine to medium grained sand, clay, pebbles, slightly compact, slightly moist, (SC).		2150	Blow Count = 7,7,7
25			2145	



RADIAN CORPORATION

Boring Well #: FS-20

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
30	SAND pale brown (10 YR 6/3), fine to coarse grained sand, pebbles, loose, dry, (SW).		2140	Blow Count = 10,13,16.
35			2135	
40	Same, yellowish brown (10 YR 6/4).		2130	Blow Count = 13,7,6.
45			2125	
50			2120	Blow Count = 13,13,14.
55	Same, cobbles.		2115	
	SAND reddish brown (5 YR 4/4), (Mount Eden formation), (SW).		2110	Alluvium Mount Eden contact at 58.0'. Blow Count = 50 for 2"
60				Total depth 60.0'

RADIAN CORPORATION

Boring Well #: FS-21

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.
TOTAL DEPTH 80.00 START DATE 11/21/90 WELL COMPLETION DATE 11/21/90
GEOLOGIST Jeff Hensel APPROVED BY W G Farmer CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 8" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION Between FS-20 and MW-2/MW-3 cluster.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
0	SAND pale brown (10 YR 6/3), fine to coarse grained sand, pebbles, dry, loose, (SW).		2092.55	Entire Borehole was grouted.
			2090	
5				
			2085	
10				Blow Count = 6,8,11.
			2080	
15				
	Same, yellowish brown (10 YR 5/4), with minor clay.		2075	
20				Blow Count = 5,5,13.
			2070	
25				
			2065	

RADIAN CORPORATION

Boring Well #: FS-21

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
30	SAND dark yellowish brown (10 YR 3/6), fine to coarse grained sand, pebbles, clay, slightly compact, slightly moist, (SC).		2060	Blow Count = 7,7,7.
35			2055	
40	SAND yellowish brown (10 YR 5/4), fine to coarse grained sand, pebbles, minor clay, slightly compact, slightly moist, (SW).		2050	Blow Count = 8,8,9.
45			2045	
50	Same, 1-2" thick layers of clean clay for every 6" of sand, soil in tip of sampler, moist.		2040	Blow Count = 8,7,7.
55			2035	
60	Same, 1-2" clay with in 6-12" of sand with minor clay and back into a thin clay layer.		2030	Blow Count = 14,15,15.

RADIAN CORPORATION

Boring Well #: FS-21

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
65			2025	Sand above clay is moist.
70	SAND yellowish brown (10 YR 5/4), fine to medium grained sand, minor fine pebbles and clay, slightly compact, slightly moist, (SW).		2020	Blow Count = 18,20,29.
75	SAND reddish brown (5 YR 4/4), fine to medium grained with very fine to fine pebbles, (Mount Eden Formation), (SW).		2015	Blow Count = 30,50 for 4" Alluvium Mount Eden contact at 75'.
	Mount Eden moist and easier to break apart.			Drilling difficult.
				Blow Count = 50 for 3"
80				Total depth 80.0'.

RADIAN CORPORATION

Boring Well #: FS-23

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.
TOTAL DEPTH 53.00 START DATE 11/27/90 WELL COMPLETION DATE 11/27/90
GEOLOGIST J.D. Long APPROVED BY W. Hamel CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 8" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION Approximately 350' along siesmic line #1, Northeast of FS-23.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
0	SAND pale yellow (2.5 Y 7/3), well graded, poorly sorted, medium to coarse sand, subangular quartz grains, mica 25%, large grains, (SW).		2188.04	Entire Borehole was grouted.
			2185	
5				Blow Count = 4,4,4.
			2180	
10	SAND dark grayish brown, (10 YR 3/2), fine to medium clayey quartz sand, slightly moist, slightly cohesive, (SW).			Blow Count = 15,7,7.
			2175	
15	SAND dark yellowish (10 YR 3/4), coarser, medium to coarse grained with some brown quartz, mica, (biotite) flakes, moist, 1 large 15 mm pebble, little clay, granitic lithic fragments, (SW).			Blow Count = 7,6,7.
			2170	
20	SAND similar to above, (10 YR 3/3), little clay, granitic lithic fragments, (SW).			Blow Count = 7,6,7.
			2165	
25	SAND coarsening up, percentage of smaller grains decreasing, coarse to very coarse 1-3 mm grains quartz, some biotite, lithic granite fragments, no clay, (SW).			Blow Count = 7,8,9.

RADIAN CORPORATION

Boring Well #: FS-23

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
			2160	
30	SAND brown (10 YR 5/3), fine grains increasing, medium to coarse quartz, mica sand, somewhat moister, clay increasing, slightly cohesive coarser grains drop out, (SW).			Blow Count = 13,17,16.
	Cobble zone noted by driller.		2155	
35	SAND brown (10 YR 5/3), clay content increasing, almost SC, moist, moderately sorted, (SW).			Blow Count = 8,10,11.
			2150	
40	SAND grayish brown (10 YR 5/2), transition to coarser clay, lean SW, mica rich, (SW).			Blow Count = 10,15,13.
			2145	
45	CLAYEY SAND brown (10 YR 5/3), transition to SC, fine to medium grained, poorly graded mica, fine texture and clay content is greater, moist, (SC).			Blow Count = 13,14,12.
	Cobble zone.		2140	
50	Same except, cohesive cobbles of a fine grained nature sampled, fine grained compared to samples above, ferruginous zones with weathered pieces, (SC).			Blow Count = 24,24,24. Blow Count = 50, for 4"
	SAND dark brown (7.5 YR 5/5), fine to medium grained, quartz, biotite, very little coarse, clayey, moist, (Mount Eden Formation), (SW).			Alluvium Mount Eden contact at 52'. Total depth 53.0'

RADIAN CORPORATION

Boring Well #: FS-25

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.
TOTAL DEPTH 45.00 START DATE 11/28/90 WELL COMPLETION DATE 11/28/90
GEOLOGIST J.D. Long APPROVED BY W G Hamer CALIF R.G.# 3578
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 8" Diamater Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION Approximately 60' of 500N, 100W on siesmic line #2.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
0	SAND light brownish gray (10 YR 6/2), fine to very coarse grained sand, subangular quartz sand with up to 1 mm grains, large 1-2 mm biotite flakes, dry, (SW).		2174.43	Entire borehole was grouted.
5			2170	Blow Count = 2,3,3.
10	SAND dark brown (10 YR 4/3), very fine to coarse grained, subangular, quartz sand, mica rock with less coarse material, slightly moist, (SW).		2165	Blow Count = 7,7,7.
15	Same, texture is fine to coarse grained.		2160	Blow Count = 7,8,9.
20	SAND dark brown (10 YR 4/3), fine to medium grained quartz sand with medium mica grains, (biotite), moist, slightly cohesive, (SP/SW).		2155	Blow Count = 3,3,4.
25	Same, fine to coarse quartz mica sand, some larger 3-4 mm grains.		2150	Blow Count = 4,4,5.

RADIAN CORPORATION

Boring Well #: FS-25

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
			2145	
30	SAND dark brown (10 YR 4/3), fine to coarse grained, quartz mica sand, moist, large feldspar grains 1-2 mm, (SW).			Blow Count = 7,7,11.
			2140	
35	Same, coarse fraction increasing, 5 mm diameter granitic fragments in sample, subangular.			Blow Count = 8,8,11.
			2135	
40	SAND dark grayish brown (10 YR 4/2), fine to coarse grained, quartz mica sand with occasional 1-5 mm granitic and feldspar grains, (SW).			Blow Count = 11,10,8.
			2130	
45	Same, still pebbly.			Total depth 45.0'

RADIAN CORPORATION

Boring Well #: FS-26

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.
TOTAL DEPTH 30.00 START DATE 11/28/90 WELL COMPLETION DATE 11/28/90
GEOLOGIST J.D. Long APPROVED BY LG Hamer CALIF R.G.# 3578
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD 1.5" Split Spoon EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 8" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION Approximately 350' North, 250' West, along siesmic line #2.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
0	SAND light brownish gray (2.5 Y 6/2), fine to coarse grained sand, some quartz and mica, subangular, dry, (SW).		2176.35	Entire Borehole grouted.
			2175	
5			2170	
10				Blow Count = 8,8,6.
			2165	
15			2160	
20	Same, dry.			Blow Count = 5,6,6.
			2155	
25			2150	

RADIAN CORPORATION

Boring Well #: FS-26

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
30	SAND light yellowish brown (2.5 Y 5/3), fine to coarse grained quartz, mica, sand, subangular, dry, (SW).			Blow Count = 8,7,9. Total depth 30.0'

RADIAN CORPORATION

Boring Well #: FS-27

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.
TOTAL DEPTH 60.00 START DATE 3/6/91 WELL COMPLETION DATE 3/6/91
GEOLOGIST G. McKelvey APPROVED BY W G Hamer CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Roger
DRILLING METHOD 2" California Mod Split Spoon EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 8" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION Approximately 40' North of MW-31, 25' East of MW-26.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
			2180.53	
0	SAND light brown (7.5 YR 6/4), poorly sorted, dry, (SW).		2180	Entire Borehole was grouted.
5			2175	Blow Count = 9,9,9
10	SAND brown (7.5 YR 5/4), very fine to medium grained sand, moderately sorted, (SW).		2170	Blow Count = 15,15,16
15	SAND dark brown (7.5 YR 4/4), very fine to coarse grained sand, poorly sorted, slightly moist, (SW).		2165	Blow Count = 14,14,14
20	SAND brown (7.5 YR 5/4), fine to coarse grained sand, poorly sorted, loose, (SW).		2160	
25			2155	

RADIAN CORPORATION

Boring Well #: FS-27

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont #1 F.S. LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Notes/Details
30			2150	
35			2145	
40	SAND dark brown (7.5 YR 4/4), very fine to medium coarse grained sand, moderately sorted, slightly moist, (SW).		2140	Blow Count = 18,23,26
45			2135	
	SAND reddish brown (5 YR 4/4), fine to medium grained sandstone, (Mount Eden Formation), (SW).			Alluvium Mount Eden contact at 48'.
50			2130	
55			2125	
				Blow Count = 100 for 4"
60				Total depth 60.0'

60.0

RADIAN CORPORATION

Well #: FS-28

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.
TOTAL DEPTH 50.00 START DATE 12/4/91 WELL COMPLETION DATE 12/4/91
GEOLOGIST J.C. Shulters APPROVED BY W.G. Hamer CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER D. Marocchi
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME 75
DRILL BIT TYPE AND SIZE 8"
APPROXIMATE WELL LOCATION

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0				Entire borehole was grouted
5	SANDY SILT dark brown (10YR 3/2), poorly sorted, subangular, slightly moist, (ML).			Blow counts = 5,6,6
	SILTY SAND dark brown (10YR 3/2), fine grained, M=0.1 mm, slightly moist, (SM).			
	SANDY SILT, dark brown (10YR 3/2), poorly sorted, subangular, slightly moist, (ML).			
10	SILTY SAND light yellowish brown (10YR 6/4), fine grained, M=0.2 mm, micaceous, subangular to subrounded, iron oxide mottling, slightly moist, (SM).			Blow counts = 4,5,5
15	SAND, as above			Blow counts = 3,4,4
	CLAYEY SILT very dark grayish brown (10YR 3/2), micaceous, occasional igneous rock fragments to 5 mm, moist, (ML).			
20	SILTY CLAY very dark grayish brown (10YR 3/2), micaceous, root hairs, fragments of Mt. Eden Formation, moist, (CL).			Blow counts = 7,5,6
	SAND light brownish gray (10YR 6/2), medium grained, M=0.25 mm, silty, gravelly, pebbles to 2 cm, very poorly sorted, subangular to subrounded, moist, (SW-SM).			
	CLAYEY SAND dark brown (10YR 3/3), fine grained, M=0.2 mm, very poorly sorted, subangular to subrounded, moist, (SC).			
25	SAND light yellowish brown (10YR 6/4), well graded, fine to coarse grained, slightly silty, pebbles to 2.5 cm, very poorly sorted, subangular, moist, (SW-SM).			
	CLAYEY SANDY SILT dark yellowish brown (10YR 4/4), very poorly sorted, subrounded, micaceous, moist, (ML).			

RADIAN CORPORATION

Well #: FS-28

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	SAND light yellowish brown (10YR 6/4), well graded, gravelly, slightly silty, very poorly sorted, subangular, pebbles to 1 cm, moist, (SW-GW).			Blow counts = 5,6,7 OVA = 20 ppmv
	CLAYEY SANDY SILT dark brown (10YR 4/3), micaceous, moist, (ML).			
35	SILTY SAND dark yellowish brown (10YR 4/4), fine grained, M=0.2 mm, micaceous, poorly sorted, subangular, moist (SM). M=0.1 mm, moderately sorted.			Blow counts = 12,14,14 OVA = 18 ppmv
40	CLAYEY SAND dark yellowish brown (10YR 4/4), fine grained, M=0.1 mm, silty, pebbles to 5 mm, micaceous, poorly sorted, subrounded, very moist to wet, (SC).			Water level stabilized to 39 feet in open borehole during drilling Blow counts = 5,6,13 Mount Eden contact
	SILTY SAND dark red (2.5YR 3/6), consolidated, fine grained, 0.2 mm, moderately sorted, subrounded, wet, (Mt. Eden Formation).			
45	SANDSTONE dark red (2.5YR 3/6), Mt. Eden Formation, wet.			Blow counts = 63
	Color change to red (2.5YR 4/6).			
50				Total depth at 50'

RADIAN CORPORATION

Boring #: FS-33

LOG OF DRILLING OPERATIONS

PROJECT	Lockheed Beaumont	LOCATION	Beaumont Ca.
TOTAL DEPTH	100.00	START DATE	2/5/91
WELL COMPLETION DATE	2/5/91	GEOLOGIST	P.
APPROVED BY	W G Hamer	CALIF R.G.#	3278
DRILLING COMPANY	West Hazmat	DRILLER	Rob Slagle
DRILLING METHOD	Hollow Stem Auger	EQUIPMENT	CME-75
DRILL BIT TYPE AND SIZE	8" Tri-cone bit		
APPROXIMATE BOREHOLE/WELL LOCATION	By OW-02 (Adjacent)		

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SAND pale brown (10 YR 6/3), fine to coarse grain sand, poorly sorted, loose, dry, (SW).		2075.00	Entire borehole was grouted. Well could not be set due to heaving sands.
5	Same as above, wet.		2070	
10	SILTY SAND brown (10 YR 5/3), fine to coarse grain sand, some very fine pebbles, (SM).		2065	
15			2060	
20	SANDY SILTY CLAY dark grayish brown (2.5 YR 4/2), (SC).		2055	Clay not typical elsewhere on site. Appears to be possible lacustrine origin.
25			2050	

A = Approximate Elevation

First Water Encountered ▽ 5.00 (bgs)

RADIAN CORPORATION

Boring #: FS-33

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30			2045	
35	SAND grayish brown (2.5 YR 5/2), medium to coarse grain sand, some clay, silt and fine sand, (SW).		2040	Slight heavy sands up augers.
40			2035	Contact between alluvium and Mount Eden at 50'.
45	SANDSTONE yellowish red (5 YR 3/6), fine to coarse sand, some fine to medium pebbles, poorly sorted, very hard, (SW).		2030	
50	Cobble layer.		2025	Wore teeth of bit.
55			2020	Drilling very slow.
60	Cobble layer.		2015	

RADIAN CORPORATION

Boring #: FS-33

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont Ca.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	SANDSTONE yellowish red (5 YR 5/6), fine to coarse sand, some fine to medium pebbles, poorly sorted, very hard, (SW).		2010	Drilling very slow.
70			2005	Heaving sands unable to get split spoon sample down through augers.
75			2000	
80			1995	
85			1990	
90			1985	
95	SANDSTONE yellowish red (5 YR 5/6), fine to coarse sand, some fine to medium pebbles, poorly sorted, very hard, (SW).		1980	Auger refusal Total depth 100'

RADIAN CORPORATION

Boring #: VRW-1

LOG OF DRILLING OPERATIONS

PROJECT: Lockheed Beaumont — LOCATION: Beaumont, California

TOTAL DEPTH: 80.00 — START DATE: 12/19/90 — WELL COMPLETION DATE: 12/19/90

GEOLOGIST: J. Hensel — APPROVED BY: [illegible] — CALIF R.G.#: 3878

DRILLING COMPANY: West Hazmat — DRILLER: Rob Slagle

DRILLING METHOD: Hollow Stem Auger — EQUIPMENT: CME-75

DRILL BIT TYPE AND SIZE: 10" Diameter Auger Head Bit

APPROXIMATE BOREHOLE/WELL LOCATION: Just West of BP-8 in Burn Pit Area.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SILTY SAND, dark yellowish brown (10YR 3/6), fine sand with some silt and medium sand, slightly moist and slightly compact, (SW/SM).		2183.08	2" Diameter Well Casing & Screen; Top of Grout Interval 0.0'
			2180	
5				
			2175	
10				Blow count = 6,5,4
			2170	4" PVC Well Casing
15				
			2165	
20	Same as above but with minor clay (SW/SM).			Blow count = 4,4,5
			2160	
25				

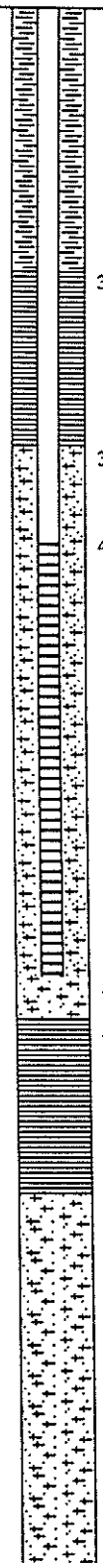
RADIAN CORPORATION

Boring #: VRW-1

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	SAND, yellowish brown (10 YR 5/4), fine to medium, minor coarse sand and pebbles, slightly moist and slightly compact, (SW).		2155	Concrete/Volclay grout Blow count = 6,11,13
			2150	Top of Bentonite Seal 34'
35				
			2145	Top of Sand Pack 38'
40	Same as above but with minor silt (SW/SM).			Top of 0.020" slot PVC screen 40'
				Blow count = 8,8,18
			2140	
45				
			2135	#3 sand 38'- 50'
50	Same as above but light yellowish brown (10 YR 6/4), and no silt and coarser sand, (SW).			Bottom of screen 50'
				Blow count = 9,12,15
			2130	Bentonite chip plug 51'- 55'
55				#3 sand 55'-68'
			2125	
60				Blow count = 20,15,17
	- cobbles at 63'- 64' BGS.		2120	



RADIAN CORPORATION

Boring #: VRW-1

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65				
			2115	Bentonite chip plug 68'- 78'
70	- possible weathered Mt Eden formation (?).			
	SANDSTONE		2110	Blow count = 20,22,25 Mt. Eden formation at 73' Blow count = 24,50 for 12"
75				
				Total depth 78'

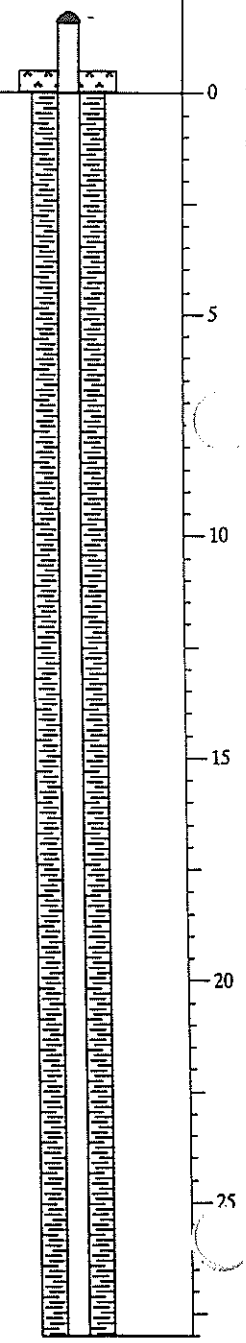
RADIAN CORPORATION

Boring #: VRW-2

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California
TOTAL DEPTH 80.00 START DATE 12/19/90 WELL COMPLETION DATE 12/19/90
GEOLOGIST J. Hensel APPROVED BY W G Thomas CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 10" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION Just West of BP-7/MW-24 in Burn Pit Area.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2179.95	2" Diameter Well Casing & Screen
0	SAND, dark yellowish brown (10 YR 4/4), fine to medium, minor silt and pebbles, slightly moist and loose, (SW).			Top of Grout Interval 0.0'
5			2175	
10			2170	Blow count = 4,5,7
15	Same as above but with dark yellowish brown (10 YR 4/4) to yellowish brown (10 YR 5/4) in color, (SW).		2165	Blow count = 4,6,7
	SAND, pale brown, (SW).			
20	SAND, dark yellowish brown (10 YR 4/4), fine to coarse sand with pebbles and minor silt, slightly moist and loose, (SW).		2160	Blow count = 8,8,8
				PVC Well Casing
25	SAND, yellowish brown (10 YR 5/4), fine to coarse and with pebbles, slightly moist to dry and loose, (SW).		2155	Blow count = 7,7,11



RADIAN CORPORATION

Boring #: VRW-2

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	Same as above but with slight (10 YR 5/4) color, (SW).		2150	Blow count = 5,6,7
35			2145	Blow count = 8,9,9
40	Same as above but larger % of coarser sand, (SW).		2140	Blow count = 9,9,9
45	SAND, yellowish brown (10 YR 5/4) to (10 YR 5/6), medium to very coarse sand with pebbles and fine sand, dry and loose.		2135	Blow count = 12,14,14
50			2130	Blow count = 11,9,10
				Concrete Volclay grout
55	Same as above but with 1-2" clay layers for every 6-8" of SW sand, clay is very moist and sand is slightly moist.		2125	Blow count = 12,14,15
				4" PVC Blank
60	Same as at 50' but with no clay lenses, (SW).		2120	50 ppmv with HNU. Blow count = 8,9,10
				Top of Bentonite Seal 63.0

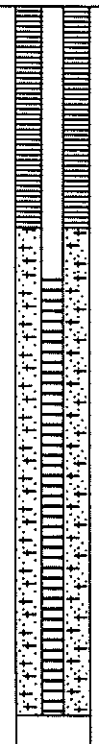
RADIAN CORPORATION

Boring #: VRW-2

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	SAND, yellowish brown (10 YR 5/4), medium to coarse sand with pebbles and one 1-2" clay lense, slightly moist and slightly compact.		2115	Blow count = 12,14,8
				Top of #3 Sand Pack 69'
70	Same as above with increase in thickness of clay lenses to 2-6".		2110	Top of 0.020" slot PVC screen 70'
				Blow count = 15,15,16
75	Same as at 65' (clay back to 1-2" lenses).		2105	Blow count = 10,10,10
				Blow count = 10,20,24
80	SANDSTONE		2100	Mt. Eden formation at 80'
				Bottom of screen 80'
				Total depth 80'



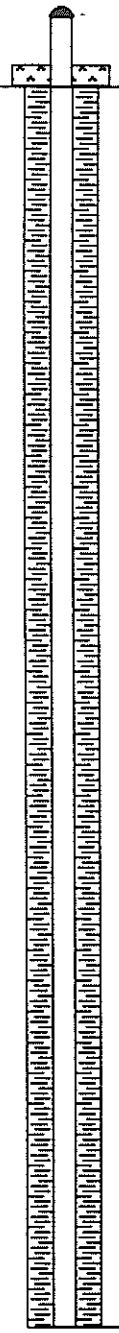
RADIAN CORPORATION

Boring #: VRW-3

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California
TOTAL DEPTH 80.00 START DATE 12/20/90 WELL COMPLETION DATE 12/20/90
GEOLOGIST J. Hensel APPROVED BY W G Hamel CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 10" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION East of VRW-1 in Burn Pit Area.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0			2181.29	2" Diameter Well Casing & Screen
	SAND, yellowish brown (10 YR 5/4), fine to coarse sand with minor pebbles, dry and loose, (SW).			Top of Grout Interval 0.0'
			2180	
5			2175	
10				Blow count = 4,4,7
			2170	
				4" PVC Well Casing
15			2165	
20	Same as above but with more fine sand, (SM/SW).			Blow count = 6,6,10
			2160	
25			2155	
	- cobbles at approximately 28'.			



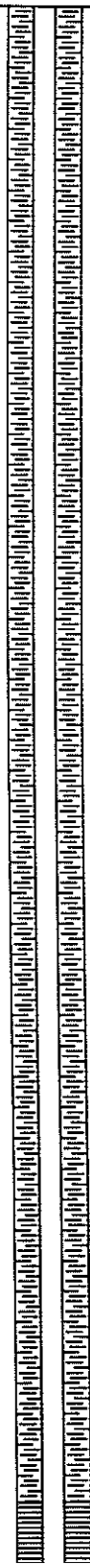
RADIAN CORPORATION

Boring #: VRW-3

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
	SAND, dark yellowish brown (10 YR 4/4), fine to medium sand with minor coarse sand and pebbles with silt, slightly moist and slightly compact (SW).			
30				Blow cont= 7,10,10
			2150	
35				
			2145	
40	SILTY SAND, olive brown (2.5 Y 4/4), fine sand with silt and minor medium sand with pebbles, slightly moist and slightly compact (SM).			Blow count= 15,15,16
			2140	
45				
			2135	
	- cobbles at approximately 47' to 49'.			
50	GRAVELLY SAND, olive brown (2.5 Y 4/4), fine to coarse sand with pebbles, slightly moist and slightly compact (GW).			Blow count= 20,24,26
			2130	
	- cobbles at approximately 50' to 52', BB size well rounded pebbles.			Drilling difficult.
	SANDSTONE, reddish yellow (5 YR 6/6), fine to coarse grained sand, some fine pebbles and silt, slight clay, (SW).			Top of Mount Eden at 53'
55				
			2125	
60				Blow count= 50 for 3"
			2120	
				Top of Bentonite Seal 62'



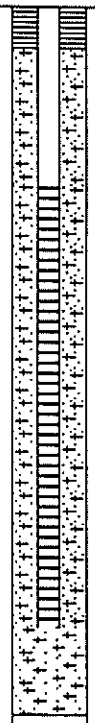
RADIAN CORPORATION

Boring #: VRW-3

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	SANDSTONE reddish yellow (5 YR 6/6), fine to coarse grained sand, some fine pebbles and silt, slight clay, (SW).		2115	Top of Sand Pack 65'
				Top of 0.020" slot PVC screen 68'
70			2110	Blow count = 50 for 3"
75			2105	#3 Sand
				Bottom of screen 78'
80				Total depth 80'.



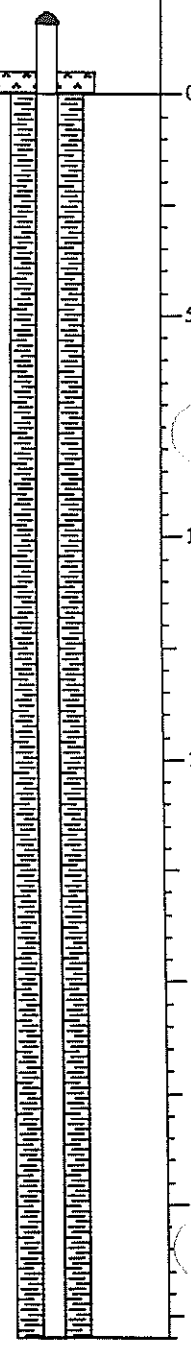
RADIAN CORPORATION

Boring #: VMW-1

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California
TOTAL DEPTH 85.00 START DATE 12/26/90 WELL COMPLETION DATE 12/26/90
GEOLOGIST R. Horwath APPROVED BY W G Kramer CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 8" Diameter Aguer Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION 25' North of VRW-3 in burn pit area.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2180.96	2" Diameter Well Casing & Screen
0	SAND, olive brown (2.5 Y 4/4), fine to medium sand, some coarse sand and fine pebbles, slight silt, dry, (SW).		2180	Top of Grout Interval 0.0'
5			2175	
10			2170	Blow count = 9,8,16
15			2165	2" PVC Well Casing
20			2160	Blow count = 12,15,17
25			2155	



RADIAN CORPORATION

Boring #: VMW-1

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	SAND, light yellowish brown (2.5 Y 6/4), medium to very coarse sand, some fine sand and fine pebbles, dry, (SW).		2150	Blow count = 9,9,9
				Note: these two above lithologies are inter -layered in 6" to 3' layers.
35			2145	
				Blow count = 20,20,20
40			2140	
				Portland cement with Bentonite.
45			2135	
				47', Mount Eden (very red). Mt. Eden/Alluvium Contact at 47'. Blow count = 50 for 4".
	SANDSTONE, yellowish red (5 YR 5/6), fine to coarse sand, slight silt, some fine pebbles, slightly moist, (SW).			
50			2130	
55			2125	
				Note: some Mt. Eden has 10% Clay in dist -tinct layers. Blow count = 100 for 4". Sample sent in for EPA 8010 analysis.
60			2120	

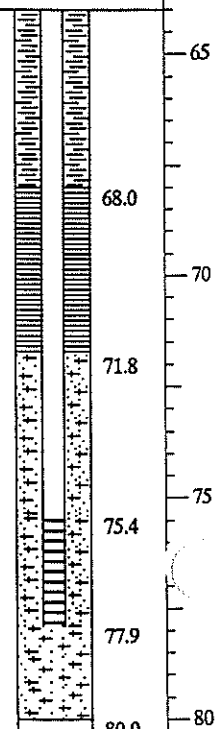
RADIAN CORPORATION

Boring #: VMW-1

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	SANDSTONE yellowish red (5 YR 5/6), fine to coarse sand, slight silt, some fine pebbles, slightly moist, (SW).		2115	
				Top of Bentonite Seal 68'
70			2110	
				Top of Sand Pack 71.8'
75			2105	Top of 0.020" slot ~~PVC~~ St. Steel screen 75.5'
				Bottom of screen 77.9' Sample sent in for EPA 8010 analysis
80				Total Depth 80' - BLS



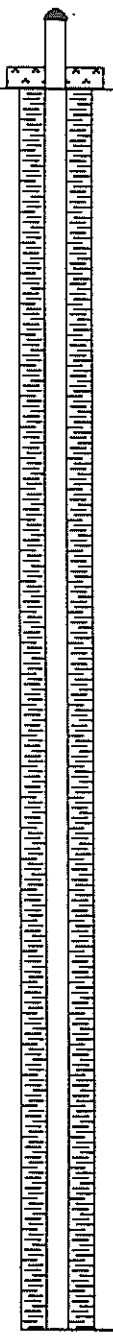
RADIAN CORPORATION

Boring #: VMW-2

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California
TOTAL DEPTH 80.00 START DATE 12/26/90 WELL COMPLETION DATE 12/26/90
GEOLOGIST R. Horwath APPROVED BY W G Hamel CALIF R.G.# 5878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 8" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION 50' Southwest of VRW-3 in burn pit area.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SAND, olive yellow (2.5 Y 6/6), fine to coarse sand, some fine pebble and silt, dry, (SW).		2182.17	2" Diameter Well Casing & Screen Top of Grout Interval 0.0'
			2180	
5			2175	
10			2170	Note: some SM is interlayered with the SW.
15			2165	
20			2160	
25			2155	



RADIAN CORPORATION

Boring #: VMW-2

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
	SAND, light olive brown (2.5 Y 5/4), fine to medium sand, some coarse sand; slight fine pebbles and clay, slightly moist, (SM).			
30				
			2150	
35				
			2145	
40	Same as above but increased clay, (SC).			
			2140	
	Same as above but with cobbles and pebbles, (GC).			Cobbles broke two of the four teeth off drill bit.
45				
			2135	
50	SANDSTONE sand, reddish yellow (5 YR 6/6), fine to coarse sand, some fine pebbles and silt, slight clay.			Mt. Eden/Alluvium contact at 50'.
			2130	
55				
			2125	
60				Very slow drilling.
			2120	

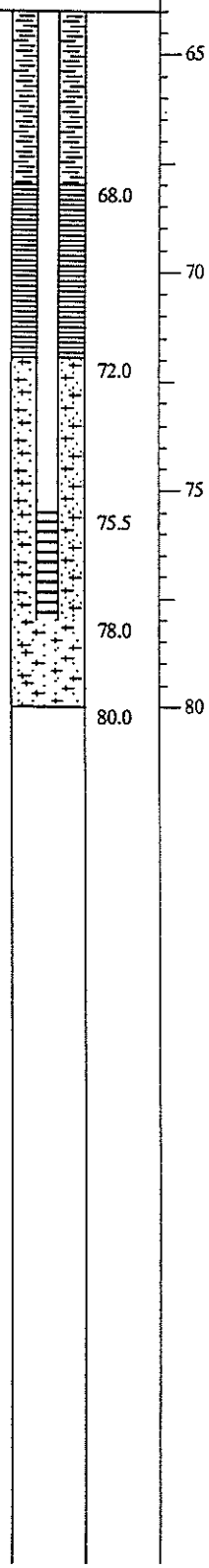
RADIAN CORPORATION

Boring #: VMW-2

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	SANDSTONE sand, reddish yellow (5 YR 6/6), fine to coarse sand, some fine pebbles and silt, slight clay.		2115	
				Top of Bentonite Seal 68'
70			2110	Top of Sand Pack 72'
75			2105	Top of 0.020" slot ~~PVC~~ St. Steel screen 75.5'
				Bottom of screen 80'
80				Total depth 80'.



RADIAN CORPORATION

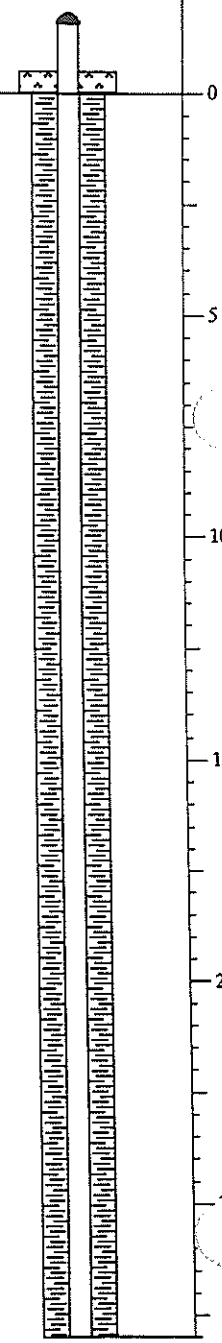
Boring #: VMW-3

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California
TOTAL DEPTH 48.00 START DATE 12/27/90 WELL COMPLETION DATE 12/27/90
GEOLOGIST R. Horwath APPROVED BY W-G Homer CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 8" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION 50' Southwest of VRW-3 in burn pit area.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SAND, light yellowish brown (2.5 Y 6/4), fine to coarse sand with some fine pebbles, slight silt, dry, (SW).		2182.21	Top of Grout Interval 0.0'
			2180	VMW-3 is 2' from VMW-2, thus was only logged by cut -tings drilling speed and weight needed to drive bit.
5			2175	
10			2170	
15			2165	
20	Same as above but with slightly moist, more fine to medium sand than coarse sand, still an SW.			
	SAND, light olive brown (2.5 Y 5/4), otherwise the same as above.		2160	
25			2155	

2" Diameter Well Casing & Screen



RADIAN CORPORATION

Boring #: VMW-3

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	GRAVELLY SAND, light olive brown (2.5 Y 5/4), fine to medium sand, some coarse and fine pebbles and silt, slight clay, moist, (GW).		2150	
35			2145	Top of Bentonite Seal 37'
40	SANDY GRAVELLY CLAY increased clay, (GC).			Top of Sand Pack 40'
	SANDY CLAY less coarse sand and gravel, (SC).		2140	
				Top of 0.020" slot ~~PVC~~ St. Steel screen 43.3'
45	- COBBLES.			Bottom of screen 45.8'
	SANDSTONE reddish yellow (5 YR 6/6), fine to coarse sand, some fine pebbles and silt, slight clay.		2135	Mt. Eden/Alluvium contact at 47'. Blow Counts at 48': 34-6", 50 - 4". Total depth 48' - BLS

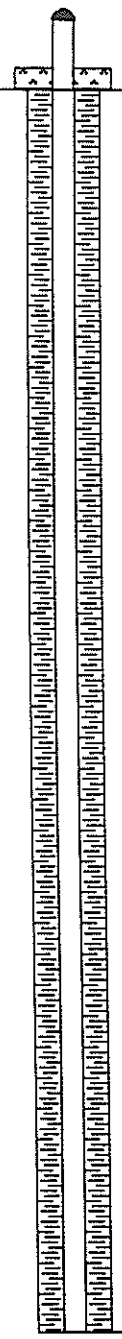
RADIAN CORPORATION

Boring #: VMW-4

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California
TOTAL DEPTH 80.00 START DATE 12/27/90 WELL COMPLETION DATE 12/27/90
GEOLOGIST R. Horwath APPROVED BY [illegible] CALIF R.G.# 5878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 8" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION 75' Southwest of VRW-3.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SAND, yellowish brown (10 YR 5/4), fine to coarse sand, some fine pebbles and silt, dry, (SW).		2182.59	2" Diameter Well Casing & Screen
			2180	
5				
			2175	
10				Blow count= 7,7,7 Note: Lithologies are interlayered with a few inches of SM mixed with SW.
			2170	
15				
			2165	
20				Blow count= 9,9,9
			2160	
25	- cobbles at 27', (1 foot).		2155	



RADIAN CORPORATION

Boring #: VMW-4

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	SILTY SAND, light yellowish brown (2.5 Y 6/4), silty sand, slight clay, moist, (SM).			Blow count = 7,14,24
			2150	
35	CLAYEY SILTY SAND, light yellowish brown (2.5 Y 6/4), clayey silty sand, fine to medium grain, (SC).			
			2145	
40				
			2140	
45	Increased cobbles and pebbles, (GC).			Blow count = 24,50 for 4"
	- cobble layer.		2135	
	SANDSTONE red (2.5 YR 4/6), fine to coarse sand, some pebbles and silt, slight clay, moist, (SW).			Mt. Eden/Alluvium contact at 49' Blow count = 33,100 for 4"
50				
			2130	
55				
			2125	Added water in hole at 58' to soften Mt. Eden which is more resistant here than other places.
60				Blow count = 100 for 5"
			2120	

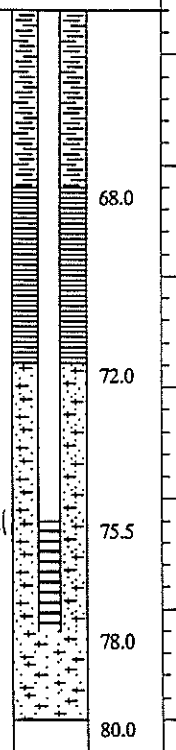
RADIAN CORPORATION

Boring #: VMW-4

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	SANDSTONE red (2.5 YR 4/6), fine to coarse sand, some pebbles and silt, slight clay, moist, (SW).			
			2115	Top of Bentonite Seal 68' Blow count = 100 for 6"
70				Normal - 700-900 lb. Here - 1100-1300 lb. drill pressure.
			2110	Top of Sand Pack 72'
75				Top of 0.020" slot ~~PVC~~ St. Steel screen 75.5'
			2105	Bottom of screen 78' Blow count = 100 for 5"
80				Total depth 80'



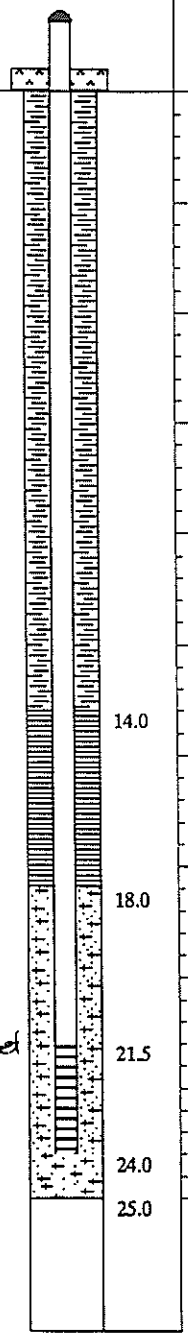
RADIAN CORPORATION

Boring #: VMW-5

LOG OF DRILLING OPERATIONS

PROJECT	Lockheed Beaumont	LOCATION	Beaumont, California
TOTAL DEPTH	25.00	START DATE	12/27/90
WELL COMPLETION DATE	12/27/90		
GEOLOGIST	R. Horwath	APPROVED BY	W G Hamer
CALIF R.G.#	5878		
DRILLING COMPANY	West Hazmat	DRILLER	Rob Slagle
DRILLING METHOD	Hollow Stem Auger	EQUIPMENT	CME-75
DRILL BIT TYPE AND SIZE	8" Diameter Auger Head Bit		
APPROXIMATE BOREHOLE/WELL LOCATION	75' Southwest of VRW-3 in burn pit area.		

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SAND, yellowish brown (10 YR 5/4), fine to coarse sand, some fine pebbles and silt, slight clay, dry, (SW).		2182.59	2" Diameter Well Casing & Screen Top of Grout Interval 0.0'
			2180	
5				
			2175	Only log hole from cuttings and from drilling characteristics and knowledge of lithology from VMW-4, located 2' from VMW-5.
10				
			2170	
				Top of Bentonite Seal 14'
15				
			2165	Top of Sand Pack 18'
20				
			2160	Top of 0.020" slot ~~PVC~~ ST. Steel screen 21.5'
				Bottom of screen 24'
25				Total depth 25'



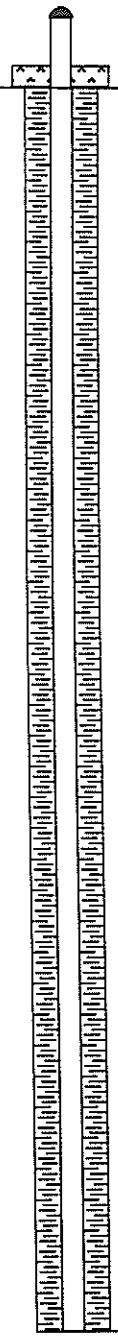
RADIAN CORPORATION

Boring #: VMW-6

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California
TOTAL DEPTH 50.00 START DATE 12/28/90 WELL COMPLETION DATE 12/28/90
GEOLOGIST R. Horwath APPROVED BY W Graham CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 8" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION 75' Southwest of VRW-3 in burn pit area.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SAND, yellowish brown (10 YR 5/4), fine to coarse sand, some fine pebbles and silt, dry, (SW).		2182.59	2" Diameter Well Casing & Screen Top of Grout Interval 0.0' Logged hole from cuttings and drilling characteristics and knowledge of lithology from VMW-4, located 2' from VMW-6.
5			2180	
10			2175	
15			2170	
20			2165	
25			2160	
			2155	



RADIAN CORPORATION

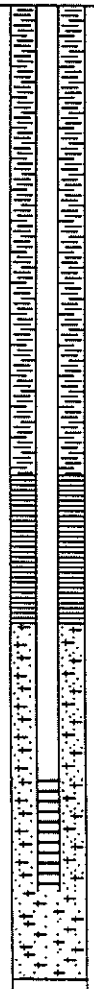
Boring #: VMW-6

Page 2 of 2

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	CLAYEY SILTY SAND, light yellowish brown (2.5 Y 6/4), fine to medium sand, moist, (SC)			
			2150	
35				
			2145	Top of Bentonite Seal 38.6'
40				
	Slight and pebbles mixed in.		2140	Top of Sand Pack 42'
45				Top of 0.020" slot ~~PVC~~ St. Steel screen 45.5'
	GRAVELLY SANDY CLAY (GC).		2135	
				Bottom of screen 48'
	- boulder 4" in diameter, (GC).			Mt. Eden/Alluvium contact at 50'.
50	SANDSTONE red (2.5 YR 4/6), fine to coarse sand, some pebbles and silt, slight clay, moist, (SW).			Total depth 50' - BLS



RADIAN CORPORATION

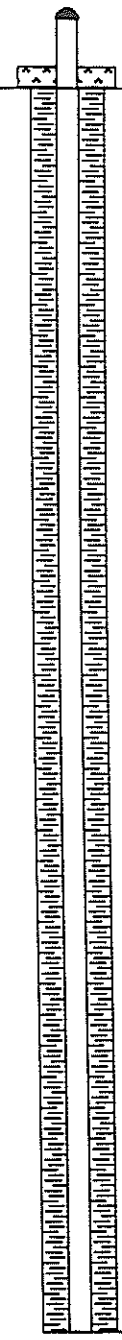
Boring #: VMW-7

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California
TOTAL DEPTH 51.50 START DATE 12/28/90 WELL COMPLETION DATE 12/28/90
GEOLOGIST R. Horwath APPROVED BY WG Hamer CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 8" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION 25' North of VRW-1 in burn pit area.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SAND, yellowish brown (10 YR 5/4), fine to coarse sand with some fine pebbles and silt, dry, poorly sorted, (SW to SM).		2183.13	Top of Grout Interval 0.0'
			2180	
5				Blow count = 10,6,6
			2175	
10	Same as above with some coarser sands (SW) interlayered with the fine to coarse sands (SW/SM).			Blow count = 9,6,8
			2170	
15	Same as above but slightly moist.			Blow count = 3,3,3
			2165	
20	Same as above but less SM, moist.			Blow count = 6,6,6
			2160	
25	Same as above with some gravelly layers, (SW).			Blow count = 6,6,6

2" Diameter Well Casing & Screen



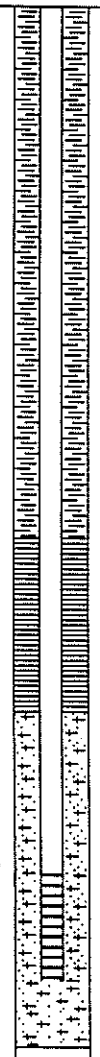
RADIAN CORPORATION

Boring #: VMW-7

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2155	
30	SAND, light yellowish brown (10 YR 6/4), coarse sand and fine pebbles, well sorted, (SW).			Blow count = 8,8,9 Note lighter color due to increase of coarser quartz grains.
			2150	
35	Same as above but with some clay in a 2" layer.			Blow count = 8,9,10 In general still interlayered SM and SW, slight SC and GW.
			2145	
40	Same as above with SW predominant.			Blow count = 8,8,5 Top of Bentonite Seal 40'
			2140	
				Top of Sand Pack 44'
45	Same as above with SW predominant.			Blow count = 10,10,12
			2135	Top of 0.020" slot ~~PVC~~ 51.5 steel screen 47.5'
				Blow count = 12,12,13
50	Same as above with SW.			Bottom of screen 50'
				Total depth 51.5'



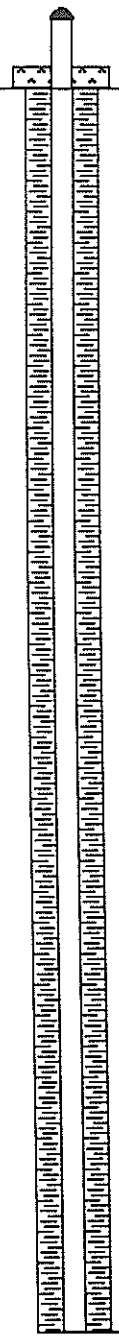
RADIAN CORPORATION

Boring #: VMW-8

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California
TOTAL DEPTH 51.50 START DATE 12/28/90 WELL COMPLETION DATE 12/28/90
GEOLOGIST R. Horwath APPROVED BY WG Hamel CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 8" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION 50' North of VRW-1 in burn pit area.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SAND, yellowish brown (10 YR 5/4), fine to coarse sand with fine pebbles and silt, dry, poorly sorted, dry, (SM to SW).		2182.74	2" Diameter Well Casing & Screen Top of Grout Interval 0.0'
			2180	
5				Blow count = 5,6,6 In general, both the fine to medium sands and coarser sands are interlayered in 6" to 3' beds.
			2175	
10	Same as above but mainly fine to medium sand, (SM).			Blow count = 7,6,5
			2170	
15	SM/SW and SW interlayered, SW is light yellowish brown (10 YR 6/4).			2" SW layer is S.S. surrounded by SM/SW. Blow count = 4,4,4
			2165	
20	Same as above, moist, less SM/SW and more SW.			Blow count = 5,5,6
			2160	2" PVC Well Casing
25	Same as above but both SM/SW and SW in split spoon.			Blow count = 8,5,5
			2155	



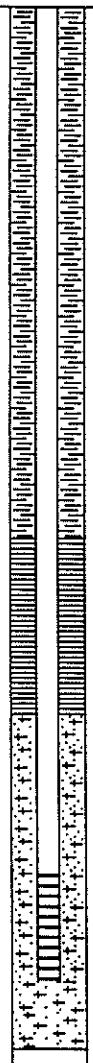
RADIAN CORPORATION

Boring #: VMW-8

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30			2150	
35	Same as above but more SM/SW.		2145	Blow count = 8,8,7
40	Same as above but with slight clay in a 2" SM layer.		2140	Blow count = 9,8,7 Top of Bentonite Seal 40'
45	Same as above, predominantly SW.		2135	Top of Sand Pack 44' Top of 0.020" slot ~~PVC~~ St. Steel screen 47.5'
50				Bottom of screen 50' Total depth 51.5'



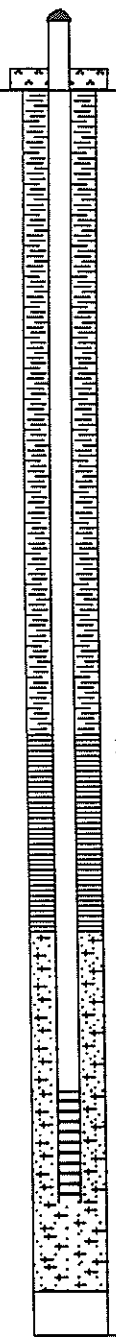
RADIAN CORPORATION

Boring #: VMW-9

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California
TOTAL DEPTH 27.00 START DATE 12/28/90 WELL COMPLETION DATE 12/28/90
GEOLOGIST R. Horwath APPROVED BY W G Hamilton CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 8" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION 50' North of VRW-1 in burn pit area.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SAND, yellowish brown (10 YR 5/4), fine to coarse sands with fine pebbles and silt, poorly sorted, dry, (SM/SW) & (SW).		2182.74	Top of Grout Interval 0.0'
			2180	Logged boring from cuttings and drilling characteristics and boring log from VMW-8 VMW-8 located 2' from VMW-9.
5			2175	
10				Interlayered lithologies to 20' when coarse sands become dominant.
			2170	
15				Top of Bentonite Seal 14.5'
			2165	
				Top of Sand Pack 19'
20	Same as above but increase coarse sands and less fine to medium sands, (SW).			
			2160	Top of 0.020" slot PVC screen 22.5'
25				Bottom of screen 25'
				Total depth 27'



RADIAN CORPORATION

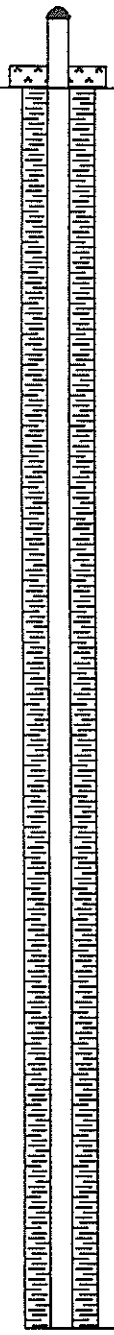
Boring #: VMW-10

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California
TOTAL DEPTH 52.00 START DATE 1/3/91 WELL COMPLETION DATE 1/3/91
GEOLOGIST R. Horwath APPROVED BY [illegible] CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 8" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION 100' North of VRW-1 in burn pit area.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SAND, yellow brown (10 YR 5/4), fine to coarse sand, some fine pebbles and silt, dry, (SM/SW).		2181.43	Top of Grout Interval 0.0'
			2180	
5			2175	Interlayered lithologies of fine to medium sands and coarse sands.
10			2170	
15			2165	
20	SAND, light yellow brown (10 YR 6/4), medium to coarse sand, some fine pebbles, (SW).		2160	
25			2155	

2" Diameter Well Casing & Screen



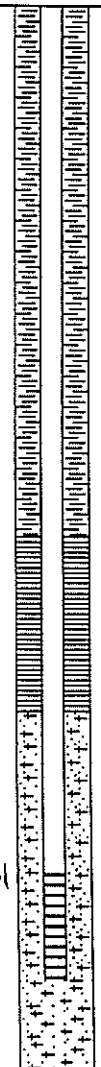
RADIAN CORPORATION

Boring #: VMW-10

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
	SAND, light yellowish brown (10 YR 6/4), medium to coarse sand, some fine pebble, (SW).			The two lithologies were interbedded evenly down to approx. 30' then the ratio became 80% SW to 20% SW.
30			2150	
35			2145	
40			2140	Top of Bentonite Sea 40'
45			2135	Top of Sand Pack 44'
				Top of 0.020" slot ~~PVC~~ St. Steel screen 47.5'
50			2130	Bottom of screen 50'
				Total depth 52'



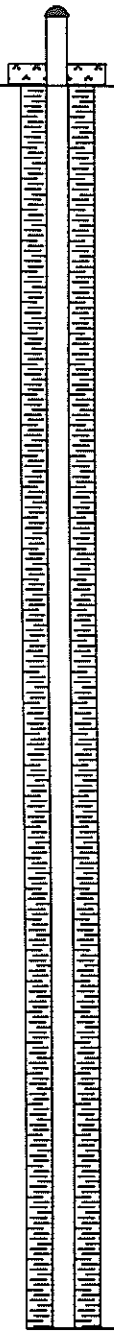
RADIAN CORPORATION

Boring #: VMW-11

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California
TOTAL DEPTH 85.00 START DATE 1/3/91 WELL COMPLETION DATE 1/3/91
GEOLOGIST R. Horwath APPROVED BY W G Hamer CALIF R.G.# 3878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 8" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION 50' South of VRW-2 in burn pit area.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2180.59	2" Diameter Well Casing & Screen
0	SAND, yellow brown (10 YR 5/4), fine to coarse sand, some fine pebbles, dry, (SM/SW).		2180	Top of Grout Interval 0.0'
5			2175	Blow count = 13,9,10 These two lithologies are interbedded.
10	SAND, light yellow brown (10 YR 6/4), medium to coarse sand and fine pebbles (SW).		2170	Blow count = 10,11,8
15			2165	Blow count 9,7,8
20	Slight clay in a SM layer but still predominantly a medium to coarse sand, (SW).		2160	Blow count = 9,8,7
25			2155	Blow count = 7,7,7



RADIAN CORPORATION

Boring #: VMW-11

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	SAND light yellowish brown (10 YR 6/4), medium to coarse sand and some fine pebbles, (SW). Slight cobbles.		2150	Blow count= 15,15,20
	SW, some SM in layers.			
35			2145	Blow count= 7,7,7
40	Same as above with no fine to medium sand layers.		2140	Blow count= 9,11,14
45			2135	Blow count= 10,7,20
50			2130	Cobble in Split Spoon. Blow count= 20,12,10
55			2125	Blow count= 16,15,25
60	- Quartzite cobble.		2120	Blow count= 30,50,for 3"

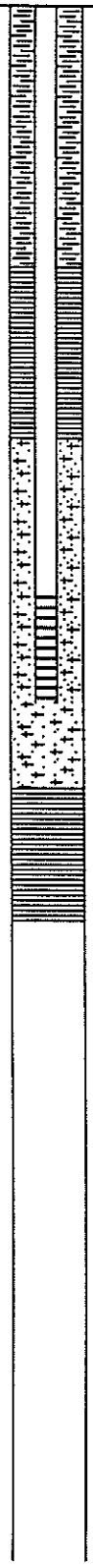
RADIAN CORPORATION

Boring #: VMW-11

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	- SM - much clay in a 6" layer, rest SM/SW mix.		2115	Blow count = 11,7,7
70	- SM and SW interlayered.		2110	Top of Bentonite Seal 70.0' Blow count = 9,11,11
75	- Same as above with SM/SW and SM.		2105	Top of Sand Pack 74' Blow count = 12,12,13
				Top of 0.020" slot ~~PVC~~ St. Steel screen 77.5'
80	- Weathered Mount Eden.		2100	Bottom of screen 80' Blow count = 15,15,20
				3" Bentonite plug
				Mt. Eden/Alluvium contact at 84' Blow count = 16,16,16
	SANDSTONE			
85				Total depth 85'



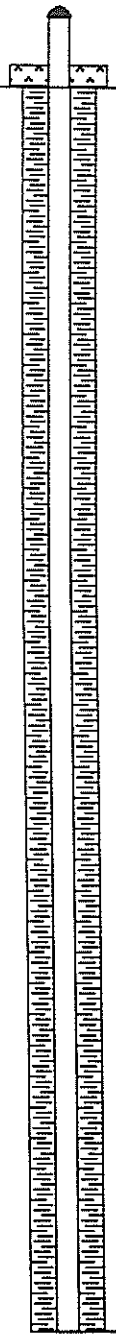
RADIAN CORPORATION

Boring #: VMW-12

LOG OF DRILLING OPERATIONS

PROJECT	Lockheed Beaumont	LOCATION	Beaumont, California
TOTAL DEPTH	52.00	START DATE	1/2/91
WELL COMPLETION DATE	1/2/91		
GEOLOGIST	R. Horwath	APPROVED BY	WG Hamer
CALIF R.G.#	5878		
DRILLING COMPANY	West Hazmat	DRILLER	Rob Slagle
DRILLING METHOD	Hollow Stem Auger	EQUIPMENT	CME-75
DRILL BIT TYPE AND SIZE	8" Diameter Auger Head Bit		
APPROXIMATE BOREHOLE/WELL LOCATION	50' South of VRW-2 in burn pit area.		

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SAND, yellow brown (10 YR 5/4), fine to coarse sand, some fine pebbles, dry, (SM/SW).		2180.59	2" Diameter Well Casing & Screen
			2180	Top of Grout Interval 0.0'
5			2175	Logged boring from cuttings and drilling characteristics and knowledge from VMW-11 located 2' from VMW-12.
10			2170	These two lithologies are interbedded to 25' where SW becomes dominant.
15			2165	
20			2160	2" PVC Well Casing
25	SAND light yellowish brown (10 YR 6/4), medium to coarse sand, some fine pebbles, (SW).		2155	



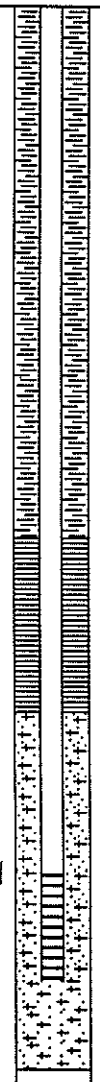
RADIAN CORPORATION

Boring #: VMW-12

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
	SAND light yellowish brown (10 YR 6/4), medium to coarse sand, some fine pebbles, (SW).			
30			2150	
35			2145	
40			2140	Top of Bentonite Seal 40'
				Top of Sand Pack 44'
45			2135	
				Top of 0.020" slot ~~PVC~~ St. Steel screen 47.5'
50			2130	Bottom of screen 50'
				Total depth 52'



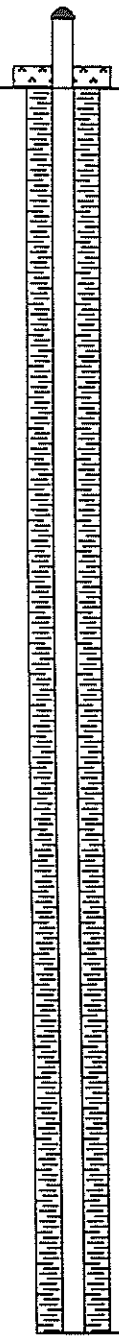
RADIAN CORPORATION

Boring #: VMW-13

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California
TOTAL DEPTH 52.00 START DATE 1/2/91 WELL COMPLETION DATE 1/2/91
GEOLOGIST R. Horwath APPROVED BY [illegible] CALIF R.G.# 3978
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 8" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION 25' South of VRW-2.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
0	SAND, yellow brown (10 YR 5/4), fine to coarse sand with fine pebbles and silt, dry, (SM/SW).		2180.09 2180	2" Diameter Well Casing & Screen Top of Grout Interval 0.0'
5			2175	
10			2170	These two lithologies evenly interbedded to 20' where coarse sands become dominant.
15			2165	
20	SAND, light yellow brown (10 YR 6/4), medium to coarse sand and fine pebbles, (SW).		2160	
25			2155	



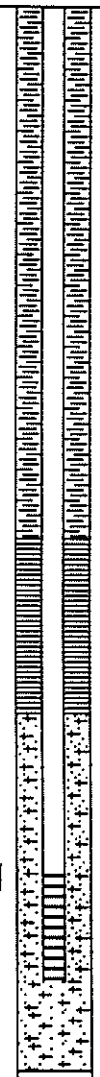
RADIAN CORPORATION

Boring #: VMW-13

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
	SAND, light yellow brown (10 YR 6/4), medium to coarse sand and fine pebbles, (SW).			
30			2150	
35			2145	
40			2140	Top of Bentonite Seal 40'
				Top of Sand Pack 44'
45			2135	
				Top of 0.020" slot ~~PVC~~ St. Steel screen 47.5'
50			2130	Bottom of screen 50'
				Total depth 52'



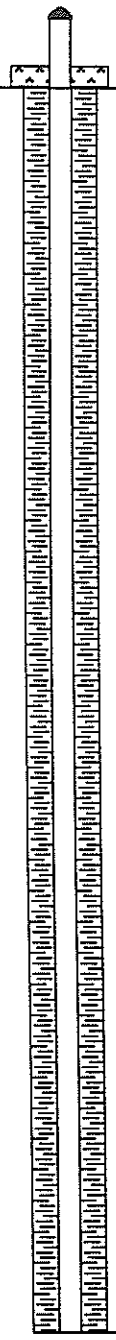
RADIAN CORPORATION

Boring #: VMW-14

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California
TOTAL DEPTH 82.00 START DATE 1/2/91 WELL COMPLETION DATE 1/2/91
GEOLOGIST R. Horwath APPROVED BY [illegible] CALIF R.G.# 5878
DRILLING COMPANY West Hazmat DRILLER Rob Slagle
DRILLING METHOD Hollow Stem Auger EQUIPMENT CME-75
DRILL BIT TYPE AND SIZE 8" Diameter Auger Head Bit
APPROXIMATE BOREHOLE/WELL LOCATION 25' South of VRW-2.

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
			2180.09	2" Diameter Well Casing & Screen
0	SAND, yellowish brown (10 YR 5/4), fine to coarse sand, some fine pebbles, some silt, dry, (SM/SW).		2180	Top of Grout Interval 0.0'
5			2175	These two lithologies are interlayered. Blow count= 4,6,5
10			2170	Blow count= 5,6,7
15	SAND, light yellowish brown (10 YR 6/4), medium to coarse sand,some fine pebbles, (SW).		2165	Blow count= 9,7,7
20	Same as above but interlayered with some SM, moist.		2160	Blow count= 9,9,12
25	Same as above.		2155	Blow count= 13,12,13



RADIAN CORPORATION

Boring #: VMW-14

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
30	Same as above but increased silt and fine sand, (SM).		2150	Blow count= 11,9,12
35	Same as above but mainly SW.		2145	Almost all SW. Blow count= 10,11,12
40	Same as above, (SW).		2140	Blow count 11,12,12
45	Same as above, (SW).		2135	Blow count= 15,15,15
50	SM/SW mix - moist.		2130	Blow count 9,9,15
55	- SW.		2125	Blow count= 12,12,15
60	- SW, slight SM.		2120	Small cobble in split spoon. Blow count= 12,23,18 Slight cobble.

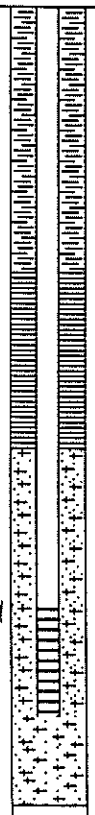
RADIAN CORPORATION

Boring #: VMW-14

LOG OF DRILLING OPERATIONS

PROJECT Lockheed Beaumont LOCATION Beaumont, California

Depth Below Surface (ft)	Lithologic Description	Graphic Log	Elevation (ft MSL)	Drilling Notes/Construction Details
65	- All SW to GW.		2115	Blow count = 13,21,16
				Blow count = 15,23,23
70	- SW.		2110	Top of Bentonite Seal 70.0'
				Top of Sand Pack 74'
75	- SW.		2105	Blow count = 12,13,13
				Top of 0.020" slot ~~PVC~~ St. Steel screen 77.5'
80	SANDSTONE yellowish red, (5 YR 4/4), fine to coarse sand, some fine pebbles, silt and slight clay, moist, (SM).		2100	Mount Eden more weathered here. Mt. Eden/Alluvium contact at 80'. Bottom of screen 80' Note some SW (2") below 2" of Mt. Eden. Total depth 82'



Marvin B. Kuhn & Associates, Inc.
22737 Barton Road, Suite 9
Grand Terrace, CA 92324
(714 783-2273)

April 29, 1991
Updated January 9, 1992

LOCKHEED TEST FACILITY, BEAUMONT #1, BEAUMONT, CALIFORNIA
MONITORING WELLS ELEVATION DATA LIST

POINT	ELEVATION/DESCRIPTION		GROUND ELEVATION	
Monitoring Wells:				
MW-1	2174.30	Top of PVC pipe	2173.22	
MW-2	2167.46	Top of PVC pipe	2166.27	
MW-3	2166.44	Top of PVC pipe	2165.61	
MW-4	2157.39	Top of PVC pipe	2156.67	
MW-5	2118.71	Top of PVC pipe	2117.50	
MW-6	2119.11	Top of PVC pipe	2117.73	
MW-7	2173.84	Top of PVC pipe	2172.63	
MW-8	2087.79	Top of PVC pipe	2086.54	
MW-9	2086.32	Top of PVC pipe	2085.28	
MW-10	2176.72	Top of PVC pipe	2176.11	
MW-11	2119.90	Top of PVC pipe	2118.59	
MW-12	2095.79	Top of PVC pipe	2094.38	
MW-13	2055.19	Top of PVC pipe	2053.92	
MW-14	2026.97	Top of PVC pipe	2025.89	
MW-15	2007.06	Top of PVC pipe	2006.24	
MW-17	2137.72	Top of PVC pipe	2136.18	
MW-18	2006.00	Top of PVC pipe	2004.85	
MW-19	2115.79	Top of PVC pipe	2114.72	
MW-20	2156.86	Top of 4" PVC pipe	2157.20	- (Ground elevation is at chiseled "X" on concrete slab)
MW-21	2158.13	Top of 5" PVC pipe	2158.86	
MW-22	2168.22	Top of 1" sounding tube	2168.37	
MW-23	2159.56	Top of 1" sounding tube	2159.71	
MW-24	2180.62	Top of 2" PVC pipe	2179.83	
MW-25	2180.66	Top of 4" PVC pipe	2179.97	
MW-26	2179.78	Top of 5" PVC pipe	2180.06	
MW-27	2177.99	Top of 1" sounding tube	2178.27	
MW-28	2158.25	Top of 4" PVC pipe	2157.29	
MW-29	2112.37	Top of 4" PVC pipe	2109.54	
MW-30	2159.04	Top of 1" sounding tube	2159.31	
MW-31	2183.32	Top of 4" PVC pipe	2181.80	
MW-32	2173.38	Top of 4" PVC pipe	2171.86	
MW-34	2151.18	Top of 4" PVC pipe	2150.39	
MW-35	2168.34	Top of 4" PVC pipe	2166.05	
MW-36	2202.53	Top of 2" PVC pipe	2200.82	
MW-37	2038.25	Top of 4" PVC pipe	2036.45	
MW-38	2027.58	Top of 4" PVC pipe	2026.22	
MW-39	2141.54	Top of 4" PVC pipe	2139.34	
MW-40	2123.69	Top of 4" PVC pipe	2122.18	
MW-41	2131.29	Top of 4" PVC pipe	2129.74	
MW-42	2089.86	Top of 4" PVC pipe	2088.68	
MW-43	2065.81	Top of 4" PVC pipe	2064.38	
MW-44	2124.42	Top of 4" PVC pipe	2126.04	
MW-45	2068.88	Top of 4" PVC pipe	2063.28	
MW-46	2069.40	Top of 4" PVC pipe	2068.32	
MW-47	2077.12	Top of steel sleeve*	2073.00	*chiseled mark at top of 8½" steel sleeve; unable to remove plastic cap.
MW-48	2073.73	Top of 4" PVC pipe	2072.29	
MW-49	2128.19	Top of 4" PVC pipe	2127.18	
MW-50	2148.76	Top of 4" pvc pipe	2148.11	- -
Vapor Monitoring Wells:				
VMW-1	2180.96	(Ground elevation is at chiseled "X" on concrete slab)		
VMW-2	2182.17			
VMW-3	2182.21			
VMW-4,5,6	2182.59			
VMW-7	2183.13			
VMW-8&9	2182.74			
VMW-10	2181.43			
VMW-11&12	2180.59			
VMW-13&14	2180.09			
Vapor Recovery Wells:				
VRW-1	2183.08	(Ground elevation is at chiseled "X" on concrete slab)		
VRW-2	2179.95			
VRW-3	2181.29			

(continued)

Marvin B. Kuhn & Associates, Inc.
22737 Barton Road, Suite 9
Grand Terrace, CA 92324
(714 783-2273)

April 29, 1991
Updated January 9, 1992

LOCKHEED TEST FACILITY, BEAUMONT #1, BEAUMONT, CALIFORNIA
MONITORING WELLS ELEVATION DATA LIST

(continued)

POINT	ELEVATION/DESCRIPTION		GROUND ELEVATION	
Observation Wells:				
OW-1	2202.31	Top of well casing	2200.47	
OW-2	2076.60	Top of well casing	2074.84	
OW-3	2141.01	Top of well casing	2139.40	
OW-8	2033.66	Top of well casing	2032.00	
Production Wells:				
W-1	1972.02	X on top of galv. elbow on top of well	1970.11	
W-2	2028.88	Top of well casing	2028.73	
W-3	2124.42	Top of well casing	2124.42	
W-5	2201.51	Top of well casing	2200.38	
Injection Bore Holes:				
IB-1	2185.55	1 x 2 hub		
IB-2	2187.91	1 x 2 hub		
Mt. Eden Surface Alluvium Contact:				
ME-1	2203.29	1 x 2 hub		
ME-2	2198.94	1 x 2 hub		
ME-3	2193.83	1 x 2 hub		
ME-4	2148.85	1 x 2 hub		
ME-5	2144.92	1 x 2 hub		
ME-6	2137.53	1 x 2 hub		
ME-7	2135.68	1 x 2 hub		
Feasibility Study Bore Holes:				
FS-1	2184.68	1 x 2 hub		
FS-2	2143.77	1 x 2 hub		
FS-18	2173.16	1 x 2 hub		
FS-19	2175.69	1 x 2 hub		
FS-20	2169.37	1 x 2 hub		
FS-21	2167.55	1 x 2 hub		
FS-23	2188.04	1 x 2 hub		
FS-25	2174.43	1 x 2 hub		
FS-26	2176.35	1 x 2 hub		
FS-27	2180.53	1 x 2 hub		
FLOWLINE:				
FL 1	2156.6			
FL 2	2164.9			
FL 3	2171.8			
FL 4	2176.8			
FL 5	2180.8			
FL 6	2187.2			
PIEZOMETER:				
P-2	2078.64	Top of 2" PVC pipe	2076.94	(Ground elevation is at chiseled "X" on concrete slab)
P-3	2137.58	Top of 2" PVC pipe	2135.63	
P-4	2109.02	Top of 2" PVC pipe	2109.94	
P-5	2159.51	Top of 2" PVC pipe	2157.85	

Marvin B. Kuhn & Associates, Inc.
22737 Barton Road, Suite 9
Grand Terrace, CA 92324
(714 783-2273)

April 29, 1991
Updated January 9, 1992

LOCKHEED TEST FACILITY, BEAUMONT #1, BEAUMONT, CALIFORNIA
MONITORING WELLS COORDINATE LIST

POINT	NORTH	EAST
Monitoring Wells:		
MW-1	19630.49	30474.56
MW-2	20218.90	30511.20
MW-3	20199.56	30470.75
MW-4	20809.01	30259.43
MW-5	21426.31	28296.33
MW-6	21462.48	28314.08
MW-7	19601.27	30438.04
MW-8	20280.17	26395.07
MW-9	20291.06	26337.01
MW-10	20299.66	31736.78
MW-11	23231.23	27658.70
MW-12	22760.54	26468.02
MW-13	21190.74	25120.90
MW-14	19523.92	24010.77
MW-15	19285.66	22339.50
MW-17	20230.32	28491.84
MW-18	19260.66	22293.90
MW-19	20859.48	27999.86
MW-20	20153.10	29811.84
MW-21	20492.33	30162.03
MW-22	20383.54	30840.67
MW-23	20474.13	30179.74
MW-24	19681.74	31088.93
MW-25	19887.02	31225.29
MW-26	19675.96	31105.22
MW-27	20183.53	31703.43
MW-28	20147.87	29791.51
MW-29	21613.30	27664.61
MW-30	20499.91	30182.83
MW-31	19625.98	31166.72
MW-32	19644.58	30436.25
MW-34	21204.22	30314.73
MW-35	19507.21	30004.89
MW-36	18920.24	32161.94
MW-37	20147.63	24742.57
MW-38	20013.32	22586.35
MW-39	21069.67	29366.24
MW-40	22406.40	27780.62
MW-41	21214.15	28988.85
MW-42	21279.48	27007.74
MW-43	20707.39	25676.74
MW-44	22026.84	28502.84
MW-45	20729.33	25662.98
MW-46	20352.45	25200.48
MW-47	20540.50	25971.21
MW-48	20561.13	25982.09
MW-49	20792.00	28522.63
MW-50	20300.02	29148.78
Vapor Monitoring Wells:		
VMW-1	19730.72	31241.81
VMW-2	19664.99	31234.08
VMW-3	19660.49	31237.88
VMW-4,5,6	19636.95	31225.92
VMW-7	19522.86	31187.52
VMW-8&9	19539.04	31169.62
VMW-10	19574.03	31133.27
VMW-11&12	19608.03	31097.39
VMW-13&14	19624.98	31079.66
Vapor Recovery Wells:		
VRW-1	19504.90	31205.85
VRW-2	19643.10	31060.96
VRW-3	19706.66	31252.22

(continued)

Marvin B. Kuhn & Associates, Inc.
22737 Barton Road, Suite 9
Grand Terrace, CA 92324
(714 783-2273)

April 29, 1991
Updated January 9, 1992

LOCKHEED TEST FACILITY, BEAUMONT #1, BEAUMONT, CALIFORNIA
MONITORING WELLS COORDINATE LIST

(continued)

POINT	NORTH	EAST
Observation Wells:		
OW-1	18340.94	32228.18
OW-2	21111.74	26254.21
OW-3	20775.17	29182.57
OW-8	20168.79	23003.86
Production Wells:		
W-1	18552.92	21321.85
W-2	20336.29	24297.95
W-3	22380.89	27779.39
W-5	18923.52	32118.67
Injection Bore Holes:		
IB-1	19750.69	31563.04
IB-2	18958.20	31343.16
Mt. Eden Surface Alluvium Contact:		
ME-1	19114.23	32353.29
ME-2	19220.16	32093.16
ME-3	19308.73	32386.98
ME-4	22233.56	30578.76
ME-5	21673.45	30030.88
ME-6	21274.45	29347.56
ME-7	21050.28	29047.54
Feasibility Study Bore Holes:		
FS-1	19515.72	31288.87
FS-2	20670.00	29436.29
FS-18	19939.86	30802.40
FS-19	19815.93	30939.70
FS-20	20061.33	30645.75
FS-21	20132.85	30565.80
FS-23	19513.76	31484.52
FS-25	20333.80	31556.38
FS-26	20180.89	31444.14
FS-27	19672.80	31140.06
FLOWLINE:		
FL 1	19201.02	29888.97
FL 2	19169.42	30357.08
FL 3	19100.12	30734.51
FL 4	18984.87	31035.38
FL 5	18878.06	31266.06
FL 6	18750.44	31731.12
PIEZOMETER:		
P-2	21833.19	26189.62
P-3	22725.24	28632.13
P-4	23394.54	26753.70
P-5	19129.79	28779.01

RADIAN CORPORATION

APPENDIX D

AQUIFER TEST ANALYSES

This appendix presents a summary table for the aquifer tests performed at the site. Additionally, it presents data plots for tests where the hydraulic conductivity of the aquifer was calculated.

Test data were collected in the field by hand measurement or by electronic data logger. Data were plotted using the AQTESOLV™ computer program. The program utilizes several types of aquifer analysis methods including those by Theis (1935), Neuman (1975), Bouwer and Rice (1976), Cooper and Jacob (1946), Hantush (1960 and 1961), Hantush and Jacob (1955). Each analysis method includes consideration of various aquifer and well conditions. The program plots the data and a type curve or straight line is matched to the data (by computer or by hand) to calculate aquifer parameters.

As shown on the data plots, the computer program calculates a transmissivity value for the aquifer (T). The transmissivity value was converted to a hydraulic conductivity value using the following equations:

$$K = \frac{T \quad 0.5125}{b}$$

where:

T = Transmissivity in ft^2/min.
b = saturated thickness of the aquifer in ft.
K = hydraulic conductivity in cm/sec.
0.5125 = conversion factor

REFERENCES

Bouwer, H. and R. C. Rice, 1976. A slug test method for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells, Water Resources Research, vol. 12, no. 3, pp. 423-428.

Cooper, H. H. and C. E. Jacob, 1946. A generalized graphical method for evaluating formation constants and summarizing well field history, Am. Geophys. Union, vol. 27, pp. 526-534.

Hantush, M.S., 1960. Modification of the theory of leaky aquifers, Jour. of Geophysics, vol. 65, no. 11, pp. 3713-3725.

Hantush, M.S., 1961a. Drawdown around a partially penetrating well, Jour. of the Div., Proc. of the Am. Soc. of Civil Eng., vol. 87, no. HY 4, pp. 83-98.

Hantush, M.S., 1961b. Aquifer tests on partially penetrating wells, Jour. of the Hydrology Proc. of the Am. Soc. of Civil Eng., vol. 87, no. HY 5, pp. 171-194.

Hantush, M.S. and C.E. Jacob, 1955. Non-steady radial flow in an infinite leaky aquifer Am. Geophys. Union Trans., vol. 36, p.p. 95-100.

Neuman, S.P., 1975. Analysis of pumping test data from anisotropic unconfined aquifer considering delayed yield, Water Resources Research, vol. 11, no. 2, pp. 320.

Theis, C.V., 1935. The relation between the lowering of the piezometric surface and recharge rate and duration of discharge of a well using groundwater storage, Am. Geophysical Union Trans., vol. 16, pp. 519-524.

Table D-1

Aquifer Test Summary

Well No.	Aquifer Unit	Test Type	Observation Well Used	Test Duration (hours)	Flowrate (gpm)	Remarks	Anal.* Type	Hydraulic Conditions (cm/sec)
MW-2	ALV	Pump	MW-3	11.5	6.9	No response observed in deeper adj. well MW-3	N	1.6×10^{-2}
MW-2	ALV	Recovery	MW-3	14.0	NA	No response observed in deeper adj. well MW-3	R	6.1×10^{-2}
MW-20	ALV	Pump		4.0	1.0	—	N	5.1×10^{-4}
			MW-28	4.0	NA	Quantitative analysis not possible for data from this deeper well. Water level in well did respond to pumping of MW-20.	—	—
MW-20	ALV	Recovery			NA		R	5.8×10^{-4}
			MW-28	4.0	NA	Quantitative analysis not possible for data from this deeper well.	—	—
MW-22	ALV	Pump	None	20.0	1.3 - 1.8	Field data too poor for quantitative analysis. Test results questionable. Pump rate varied greatly.	J	—
MW-22	ALV	Recovery	None	1.0	2.0 - 4.3	Relatively poor fit for type curve.	R	3.2×10^{-4}
MW-23	ALV	Pump		4.0		Relatively poor fit for type curve.	N T J	8.9×10^{-4} 1.6×10^{-3} 1.7×10^{-3}
			MW-30	4.0		No response observed in nearby well MW-30.		
MW-23	ALV	Recovery		4.0	NA	No response observed in nearby well MW-30.	R	1.5×10^{-3}
			MW-30	12.0	NA			
MW-25	ME	Slug	None	48	NA		B	3.0×10^{-4}
MW-26	ME	Pump		3.5	0.85 - 1.0	Field data too poor for qualitative analysis.	—	—
			MW-24	3.5			T J	1.04×10^{-3} 5.8×10^{-4}

RADIAN CORPORATION

Table D-1

(Continued)

Well No.	Aquifer Unit	Test Type	Observation Well Used	Test Duration (hours)	Flowrate (gpm)	Remarks	Anal.* Type	Hydraulic Conditions (cm/sec)
MW-26	ME	Recovery		5.0		Test data poor; no analyses performed.		
						Test data poor; no analyses performed.		
			MW-24	5.0	NA			
MW-30	ALV	Pump		43.5	23.6		J	1.3×10^{-1}
							N	3.9×10^{-2}
			MW-23	43.5	NA		J	5.1×10^{-1}
			MW-2	43.5	NA	No response to pumping observed in well MW-2.	—	—
						No response to pumping observed in well MW-21.		
			MW-21	43.5	NA		—	—
MW-30	ALV	Recovery		50.0	NA	—	R	1.1×10^{-1}
			MW-23	50.0	NA	—	R	5.2×10^{-1}
			MW-2	NA		No response to pumping observed in well MW-2.	—	—
						No response to pumping observed in well MW-21.		
			MW-21	NA			—	—
MW-31	ME	Pump	None	2.0	.5 - 2.0	Field data poor. No quantitative analysis.	—	—
						Data suspect.		
MW-31	ME	Recovery	None	12.5	NA		R	7.1×10^{-5}
MW-34	ALV	Pump	None	4.0	3.0		N	1.8×10^{-3}
MW-34	ALV	Recovery	None	11.5			R	4.1×10^{-3}
MW-35	ALV	Slug	None	4.0			B	2.4×10^{-4}
MW-37	ME	Slug	None	2.0			B	3.0×10^{-5}
MW-38	ME	Slug	None	13.0			B	6.2×10^{-5}
MW-39	ALV	Slug	None	4.0			B	1.2×10^{-3}
MW-39	ALV	Pump	None	4.0	1.0		N	5.6×10^{-4}
MW-39	ALV	Recovery	None	4.0			R	5.5×10^{-4}
MW-40	ALV	Pump		4.0			N	1.2×10^{-3}
			W-3			No response to pumping observed in well MW-3.	—	—
MW-40	ALV	Recovery	None	12.5			R	5.4×10^{-4}

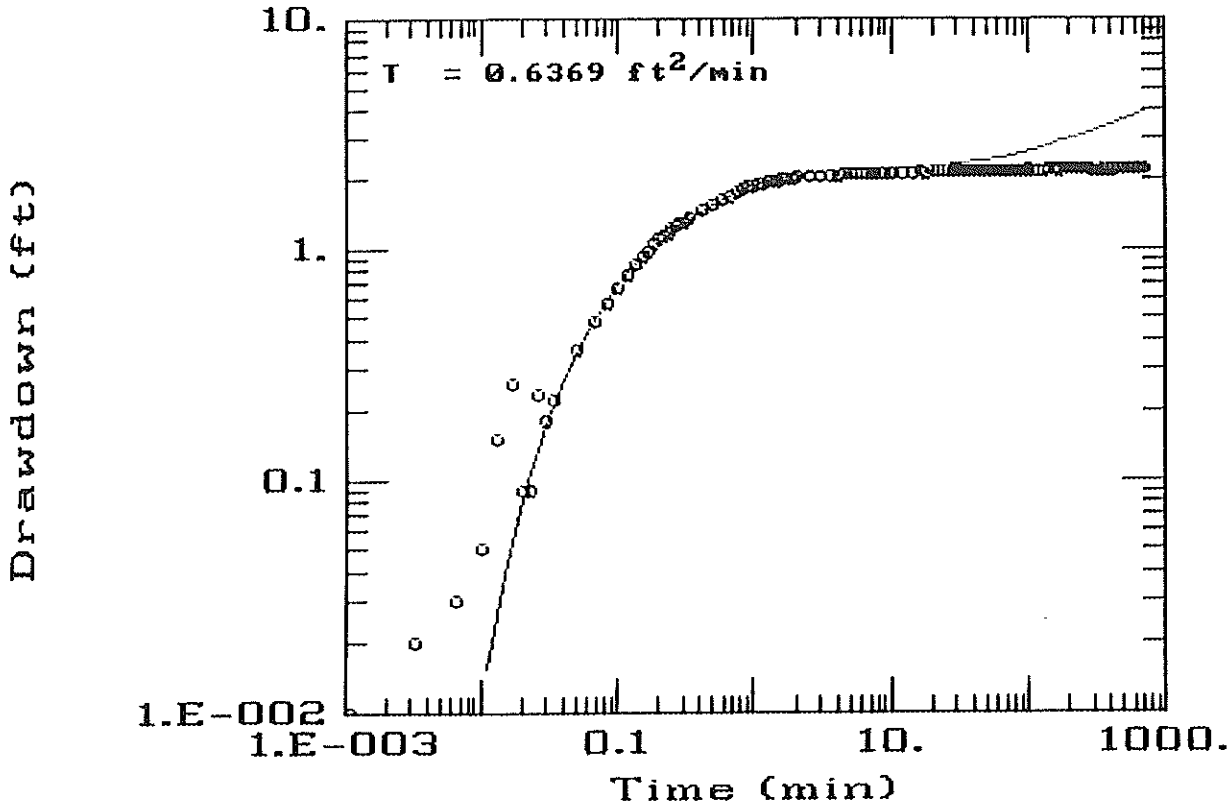
ALV = Alluvium
ME = Mt. Eden Formation
*N = Newman
J = Jacob

T = Theis (log/log)
B = Bouwer & Rice method
R = Theis/Recovery

RADIAN CORPORATION

RADIAN CORPORATION

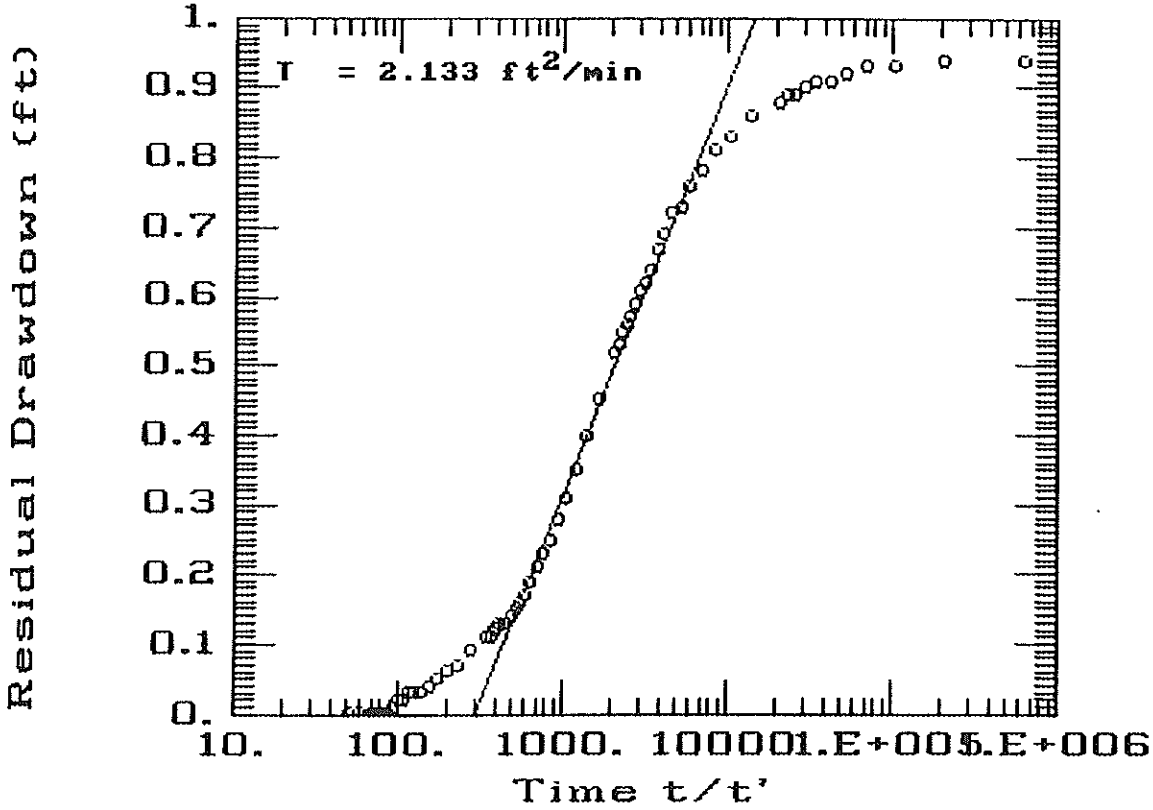
MW-2 DRAWDOWN CURVE; PUMPING MW-2



T = 0.64 ft^2/min
b = 20 ft
k = 1.6 x 10^{-2} cm/sec
Neuman Method

RADIAN CORPORATION

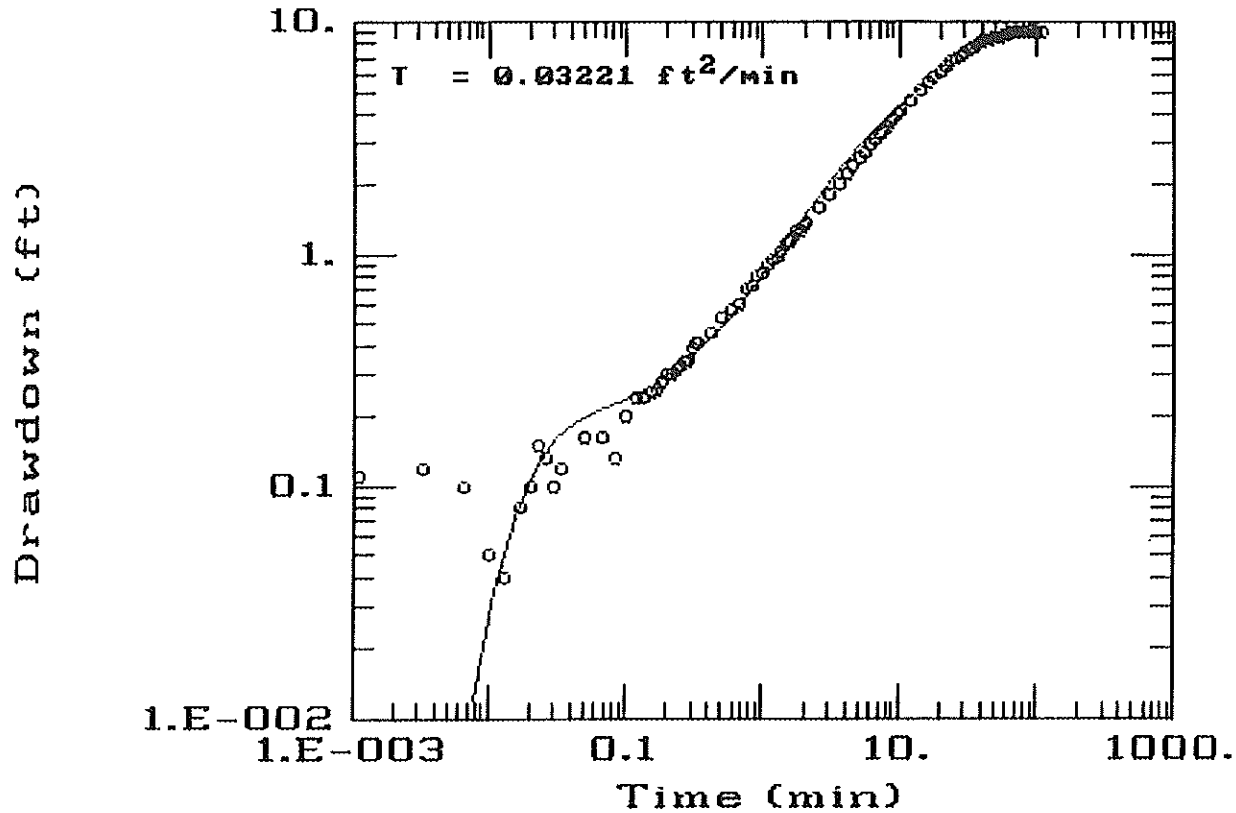
MW-2 RECOVERY CURVE; PUMPED MW-2



T = 2.1 ft^2/min
b = 17.7 ft
k = 6.1 x 10^{-2} cm/sec
Theis Recovery Method

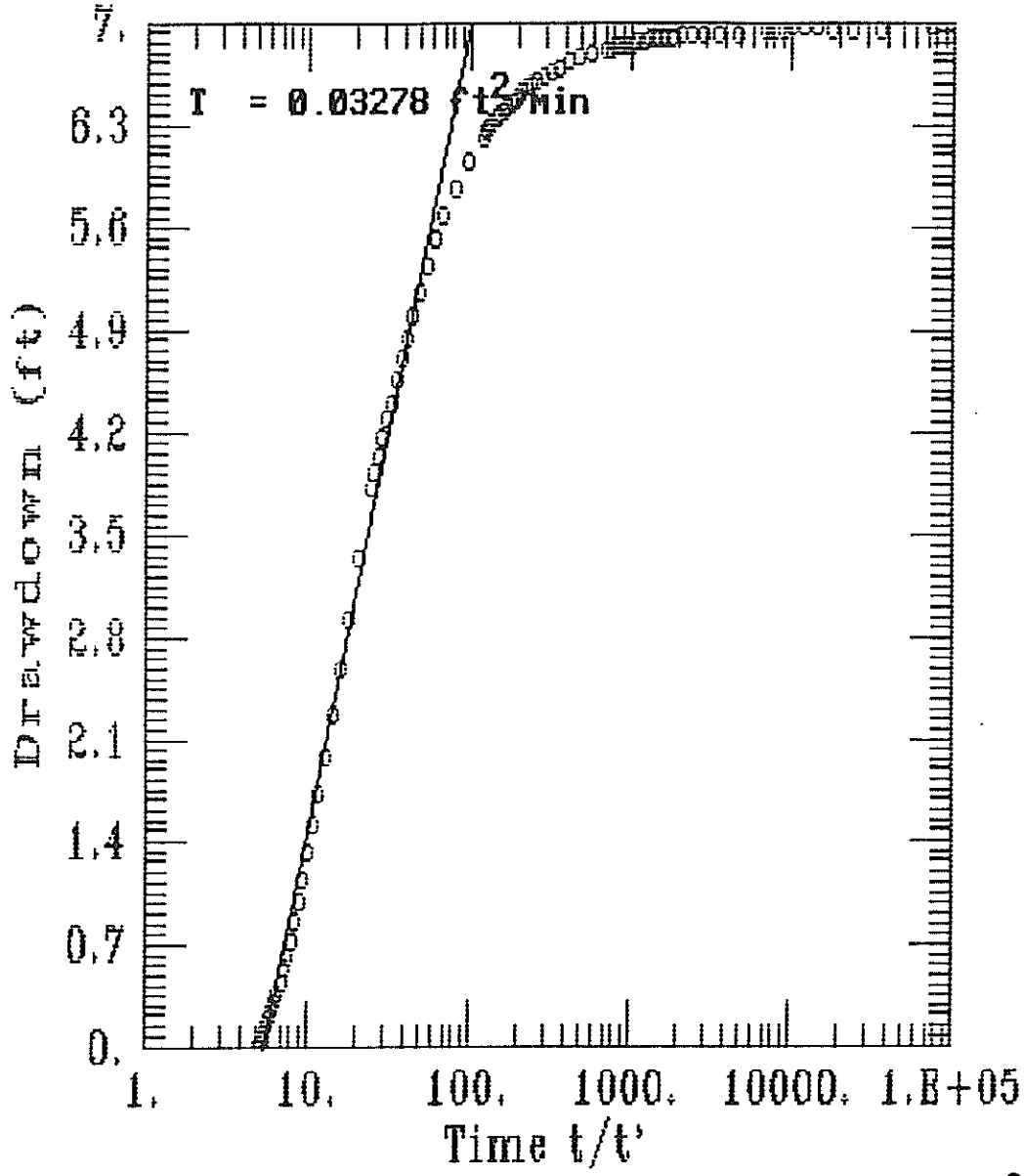
RADIAN CORPORATION

MW-20 DRAWDOWN CURVE; PUMPING MW-20



T = 0.032 ft^2/min
b = 32 ft
k = 5.1 x 10^{-4} cm/sec
Neuman Method

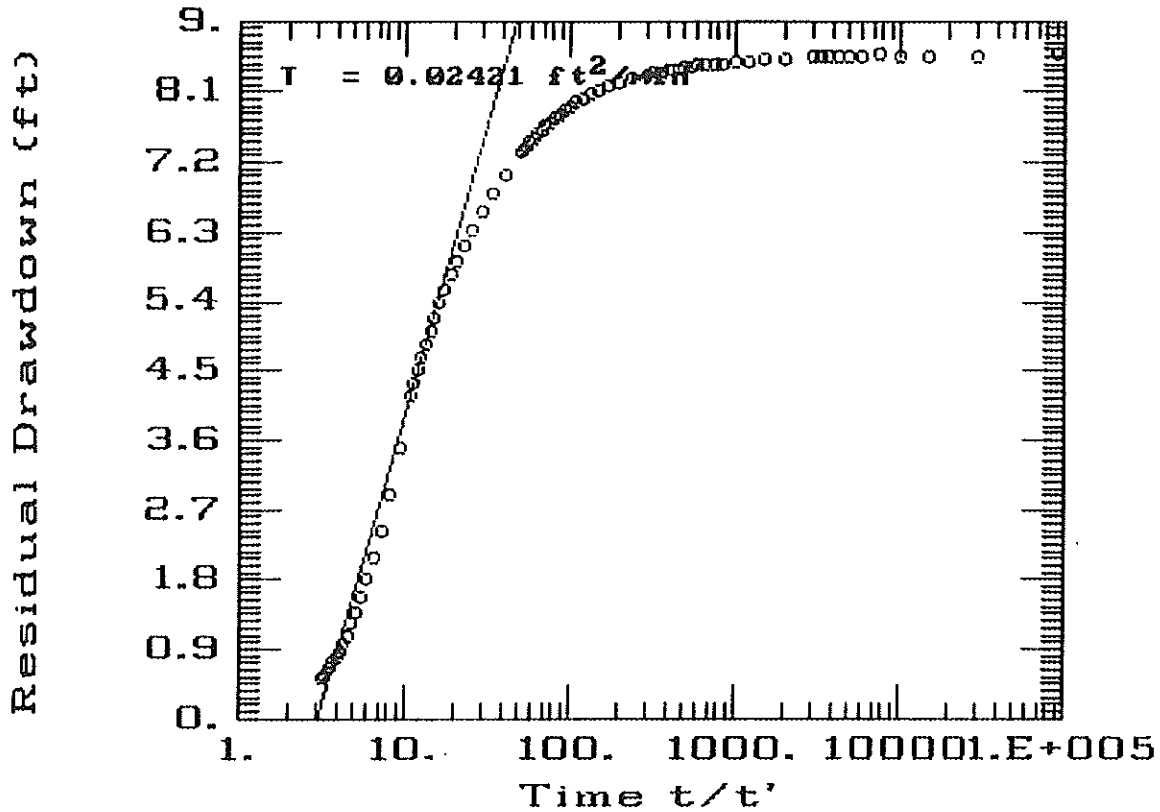
MW-20 RECOVERY CURVE



T = 0.033 ft^2/min
b = 28.6 ft
k = 5.8 x 10^{-4} cm/sec
Theis Recovery Method

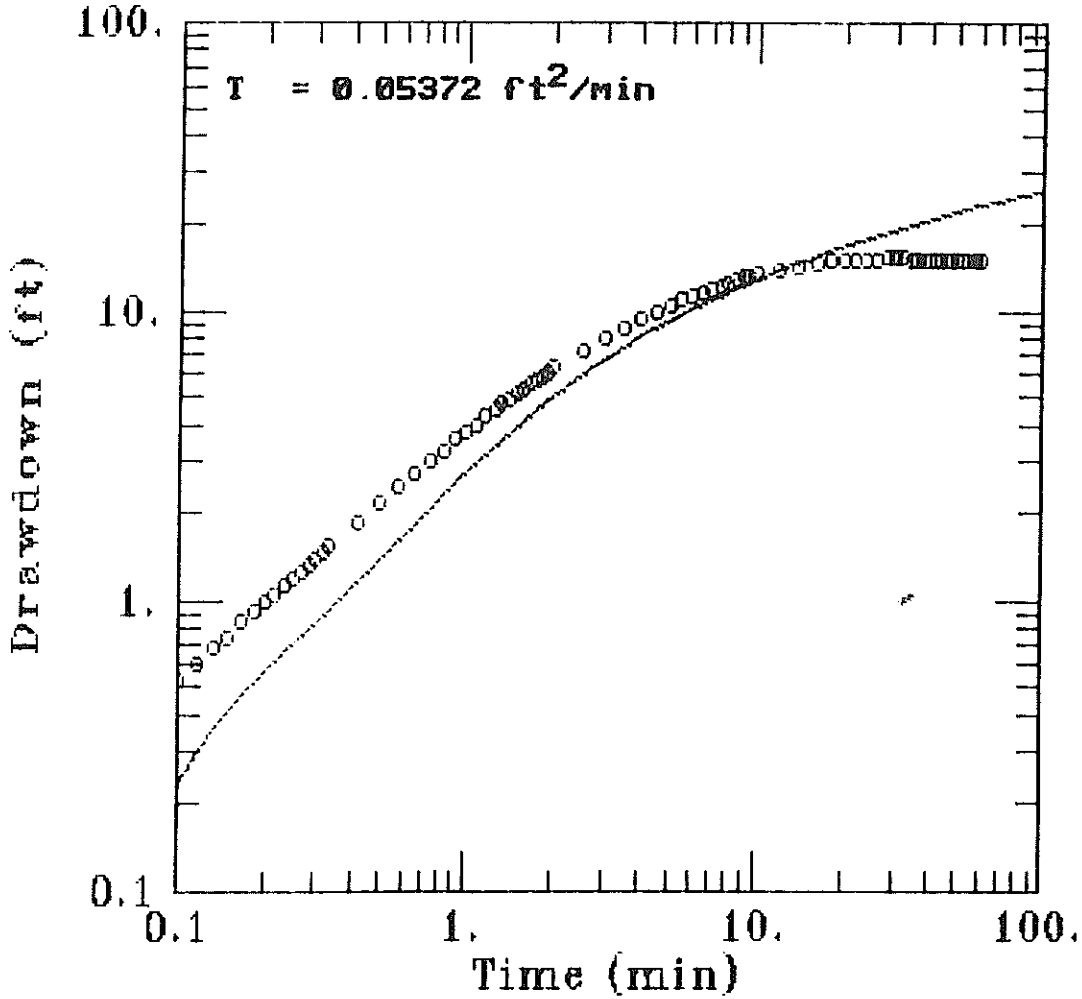
RADIAN CORPORATION

MW-22 RECOVERY CURVE; PUMPED MW-22



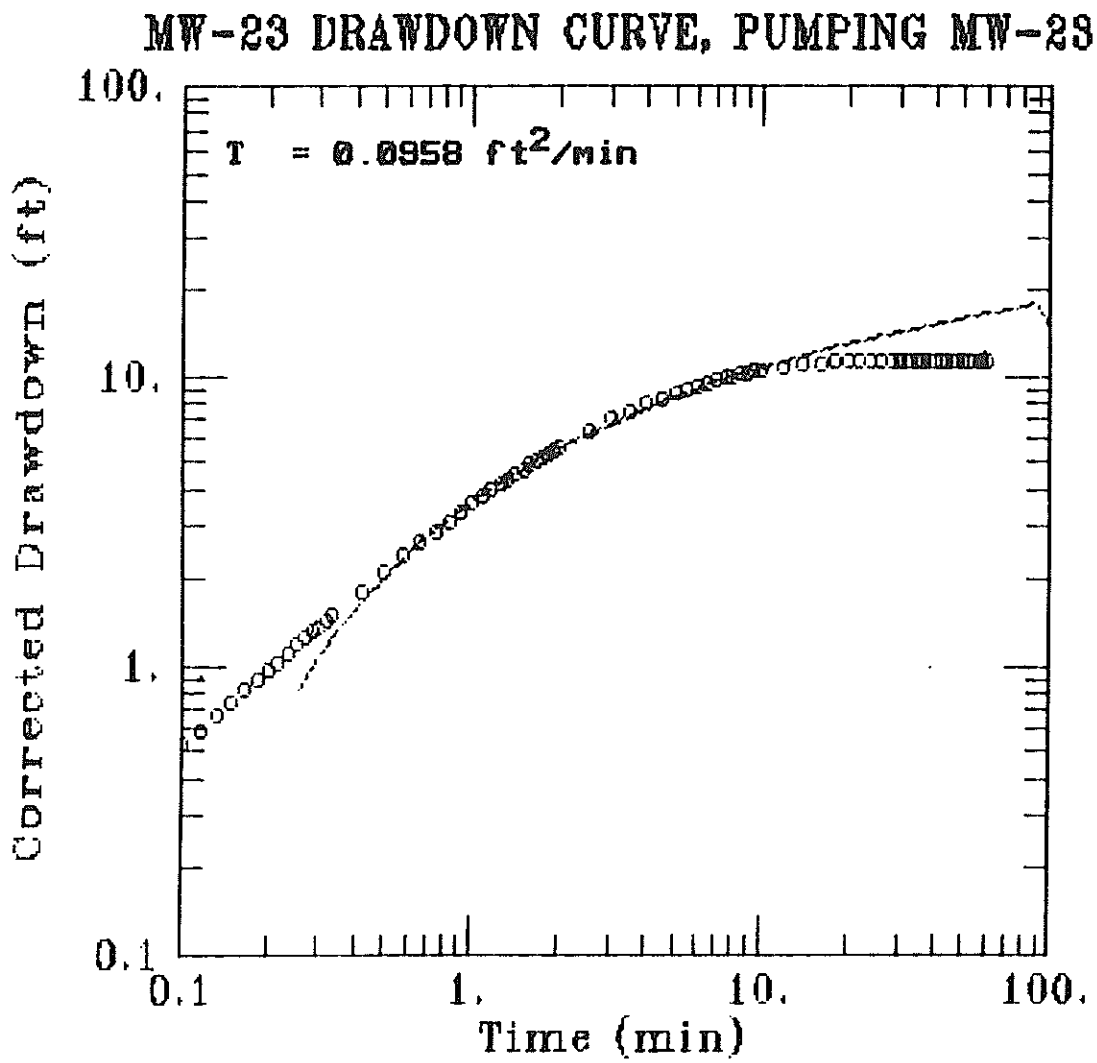
T = 0.024 ft^2/min
b = 38.4 ft
k = 3.2 x 10^{-4} cm/sec
Theis Recovery Method

MW-23 DRAWDOWN CURVE, PUMPING MW-23

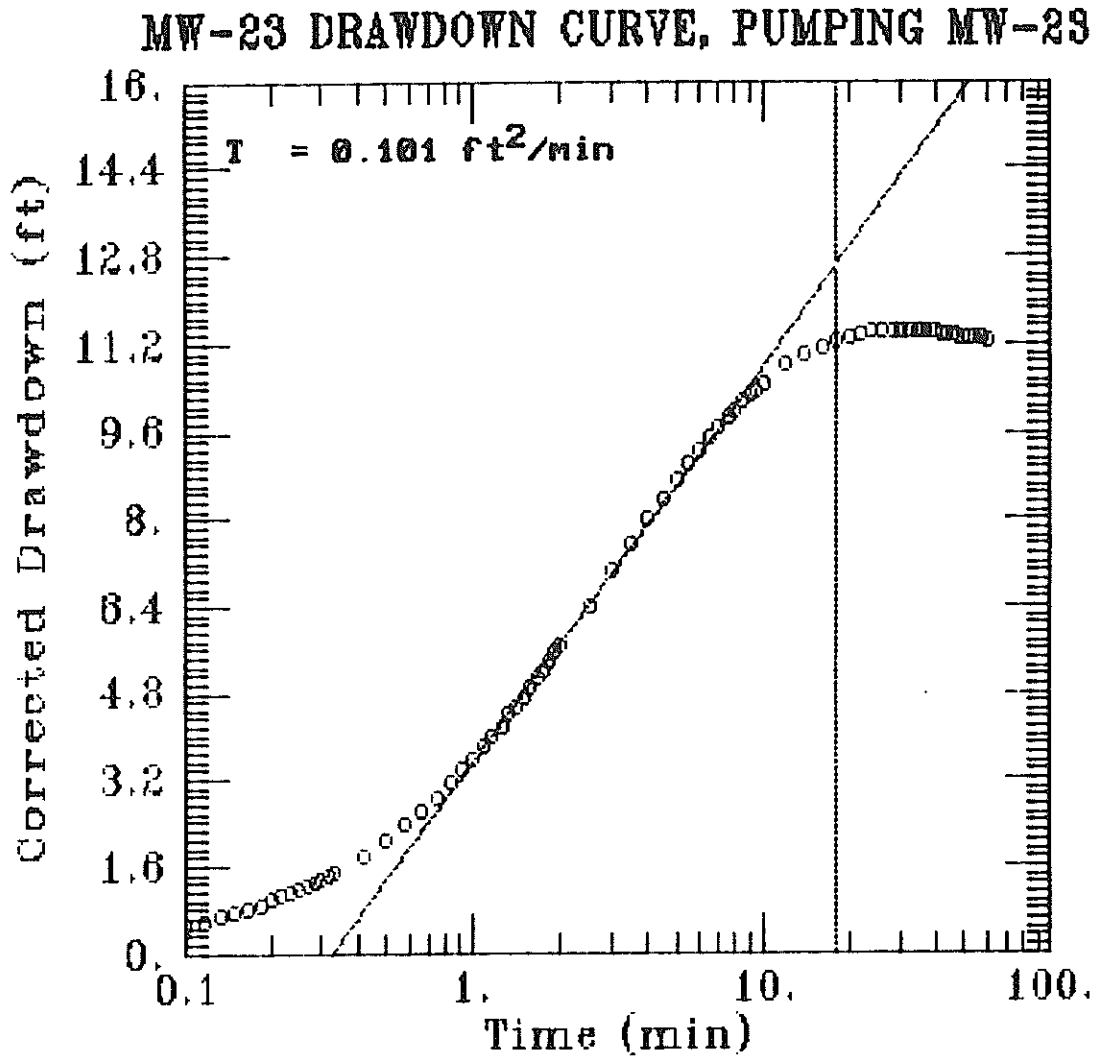


T = 0.054 ft ^{2}/min
b = 30.6 ft
k = 8.9 x 10^{-4} cm/sec
Neuman Method

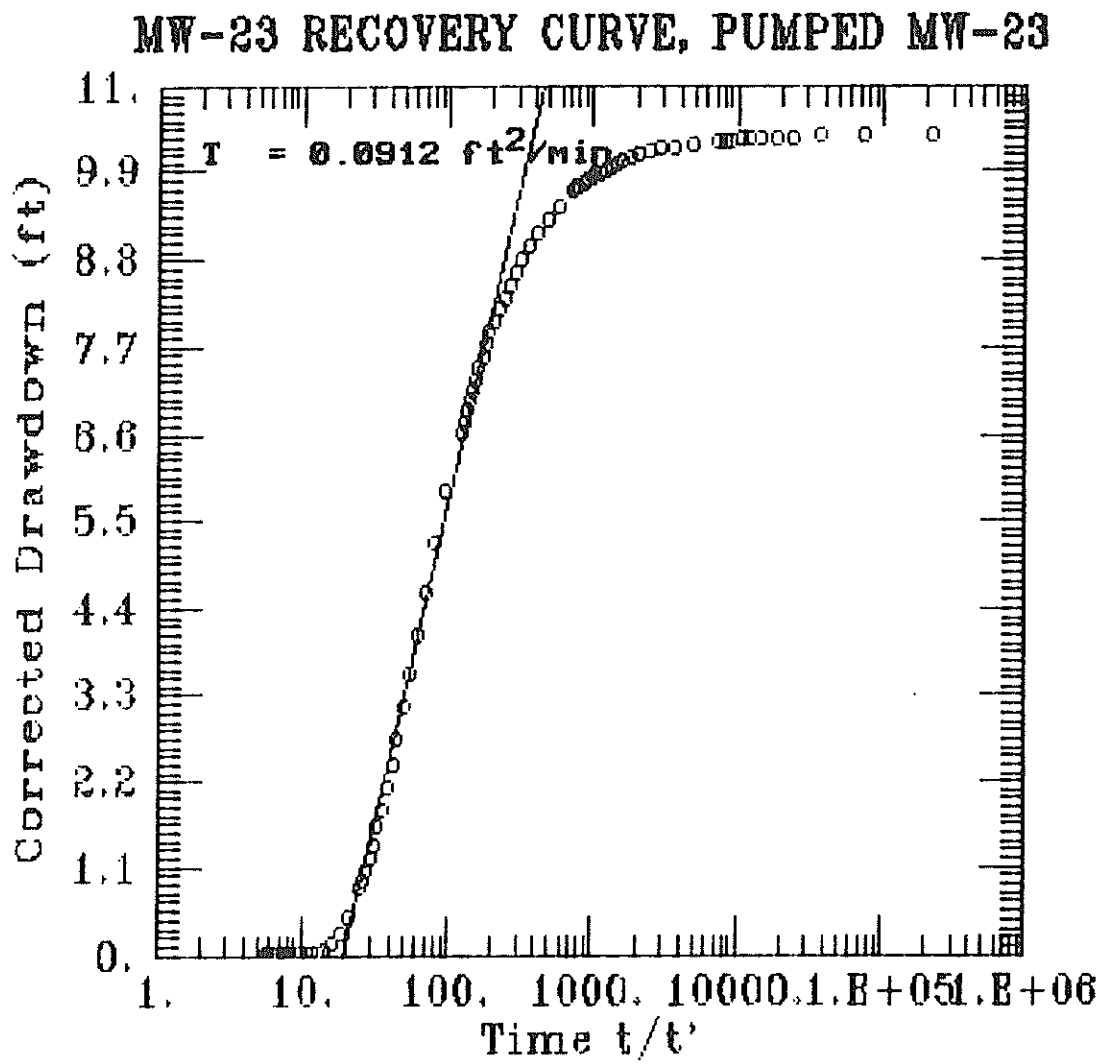
Note: Pumping rate varies considerably during test



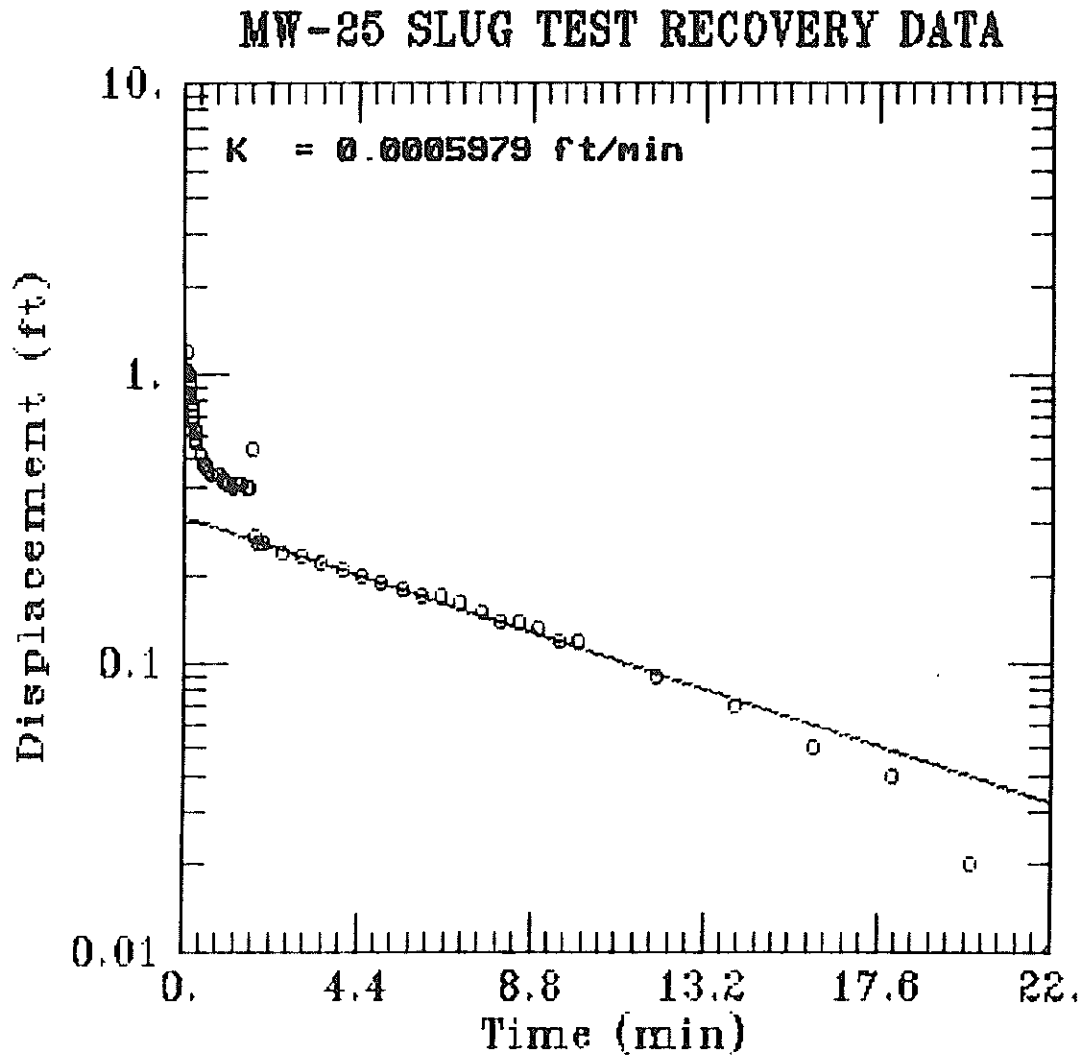
T = 0.096 ft^2/min
b = 30.6 ft
k = 1.6 x 10^{-3} cm/sec
Theis Method



T = 0.10 ft^2/min
b = 30.6 ft
k = 1.7 x 10^{-3} cm/sec
Jacob Method



T = 0.091 ft^2/min
b = 30.6 ft
k = 1.5 x 10^{-3} cm/sec
Theis Recovery Method

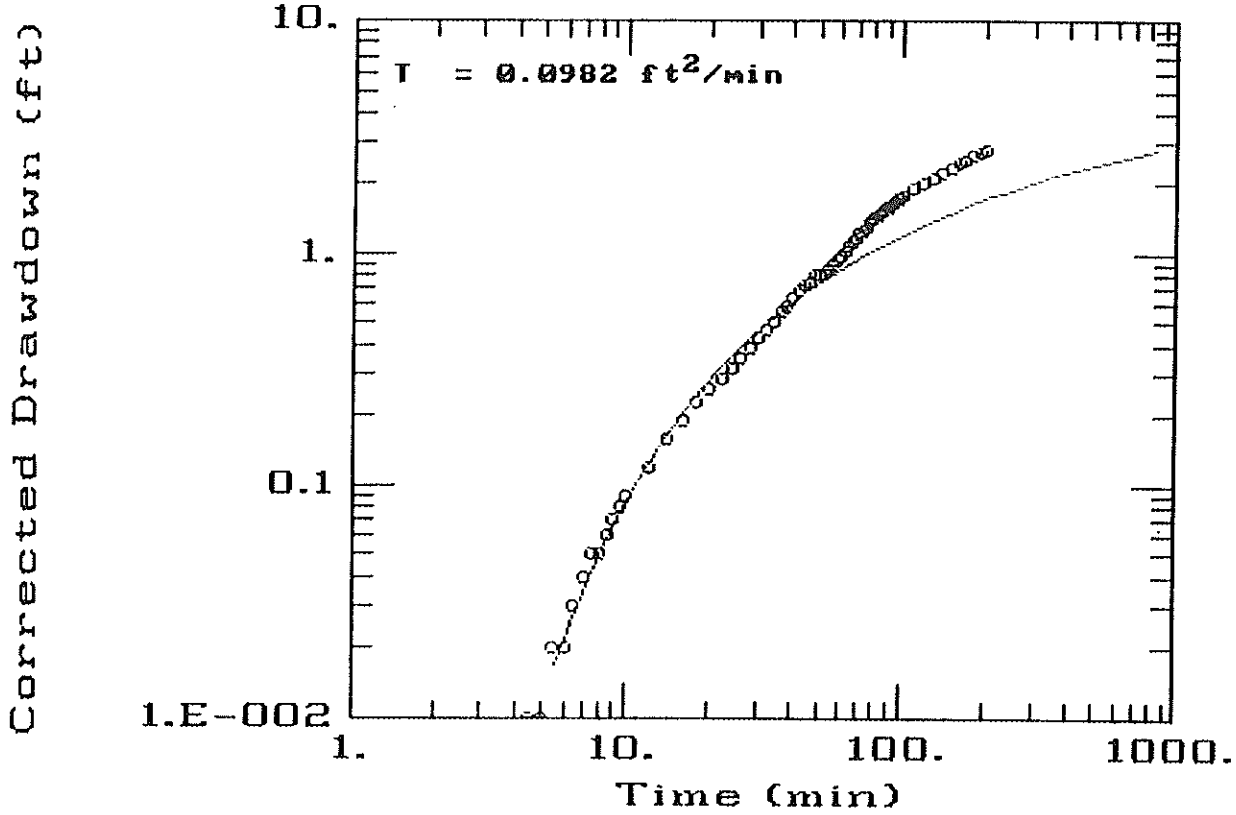


k = 0.00060 ft/min
k = 3.0 x 10^{-4} cm/sec
Bouwer and Rice Method

RADIAN CORPORATION

RADIAN CORPORATION

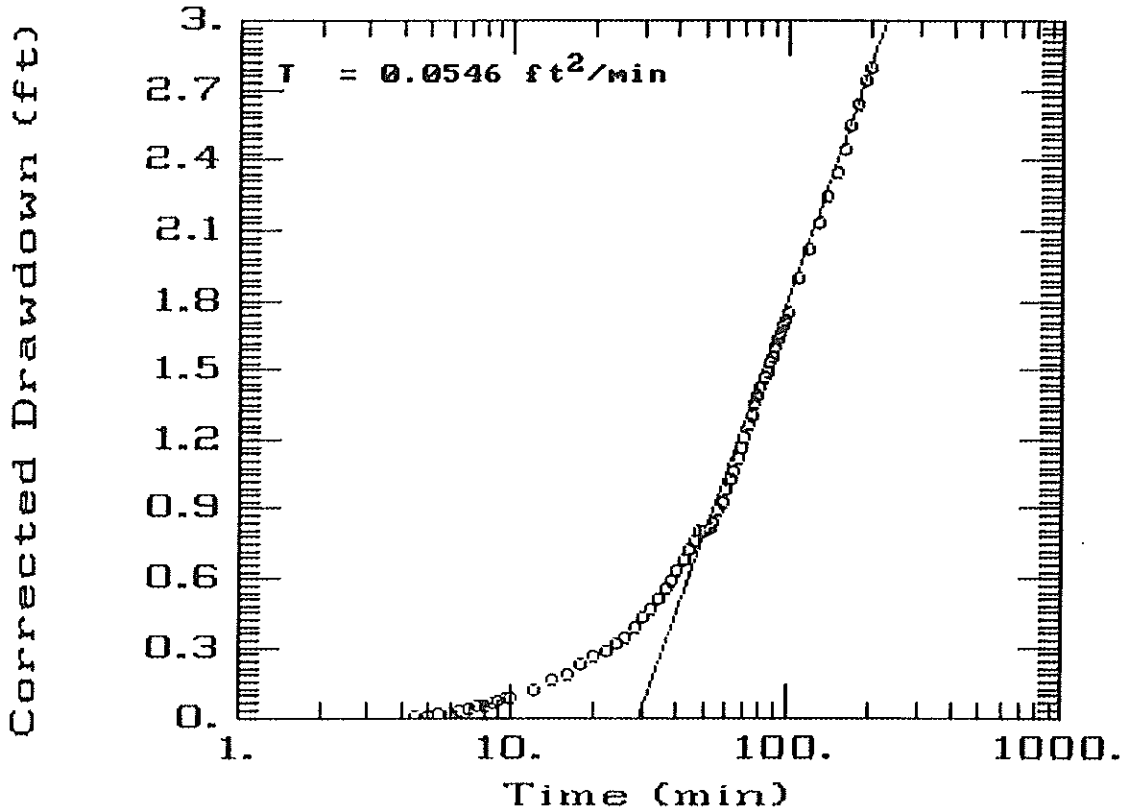
MW-24 OBSERVATION WELL; PUMPING MW-26



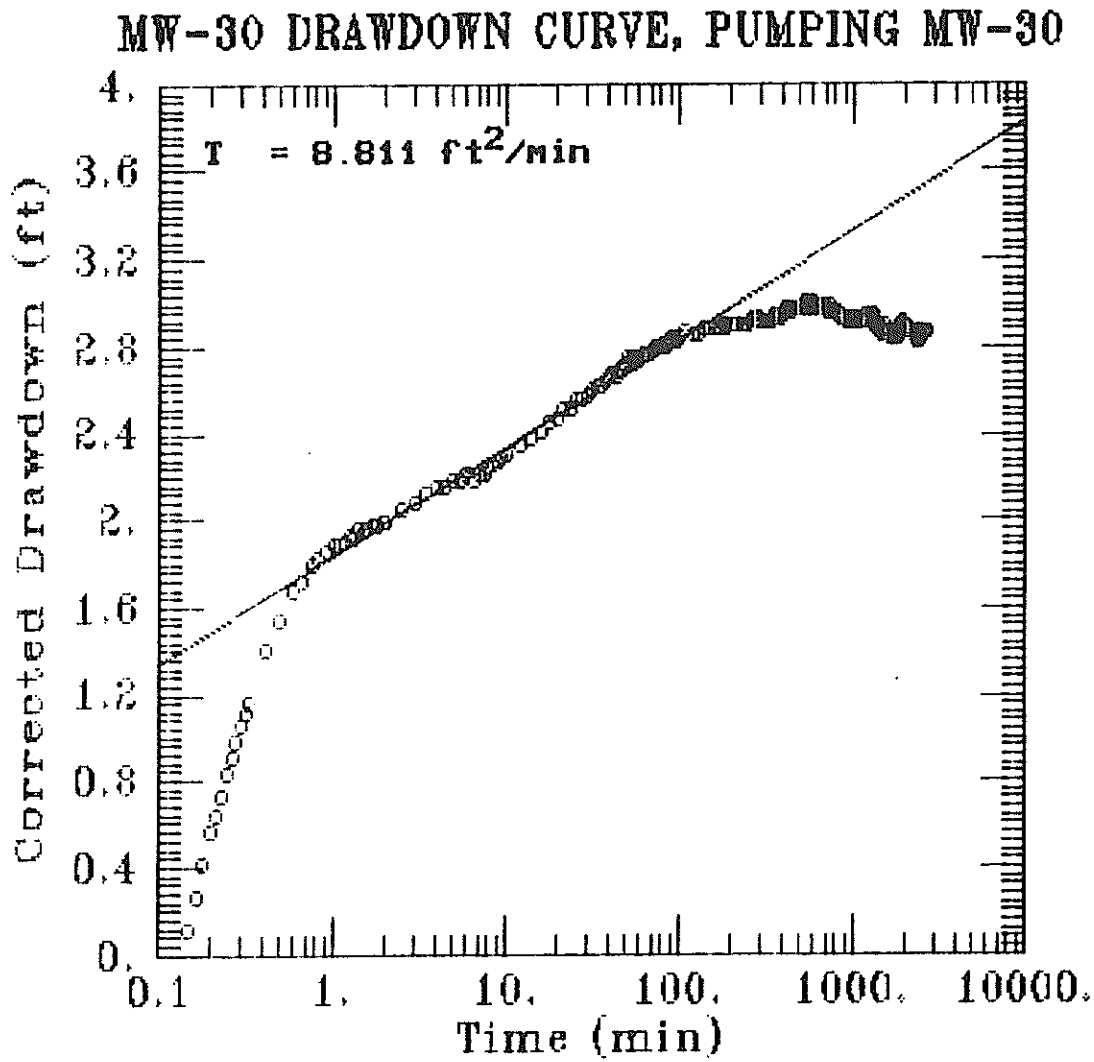
T = 0.098 ft^2/min
b = 48 ft
k = 1.0 x 10^{-3} cm/sec
Theis Method

RADIAN CORPORATION

MW-24 OBSERVATION WELL; PUMPING MW-26

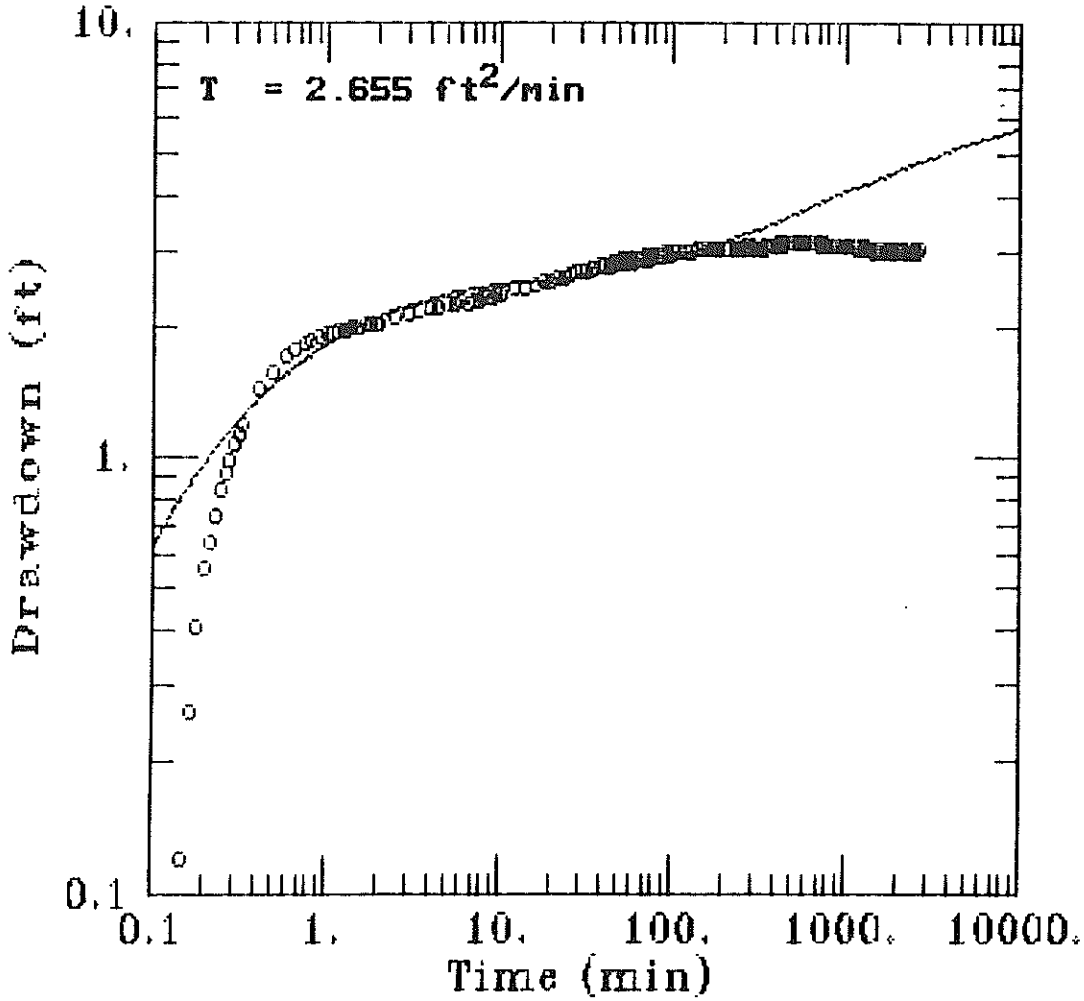


T = 0.055 ft^2/min
b = 48 ft
k = 5.8 x 10^{-4} cm/sec
Jacob Method



T = 8.8 ft^2/min
b = 34.5 ft
k = 1.3 x 10^{-1} cm/sec
Jacob Method

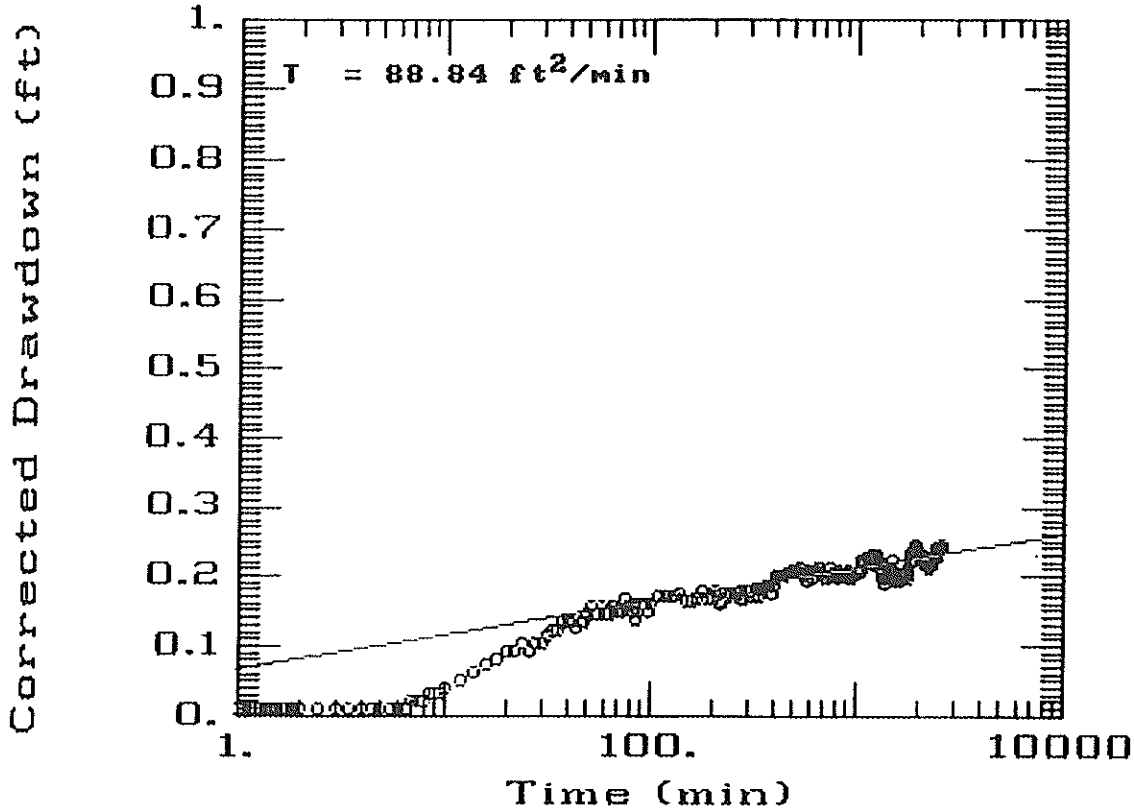
MW-30 DRAWDOWN CURVE, PUMPING MW-30



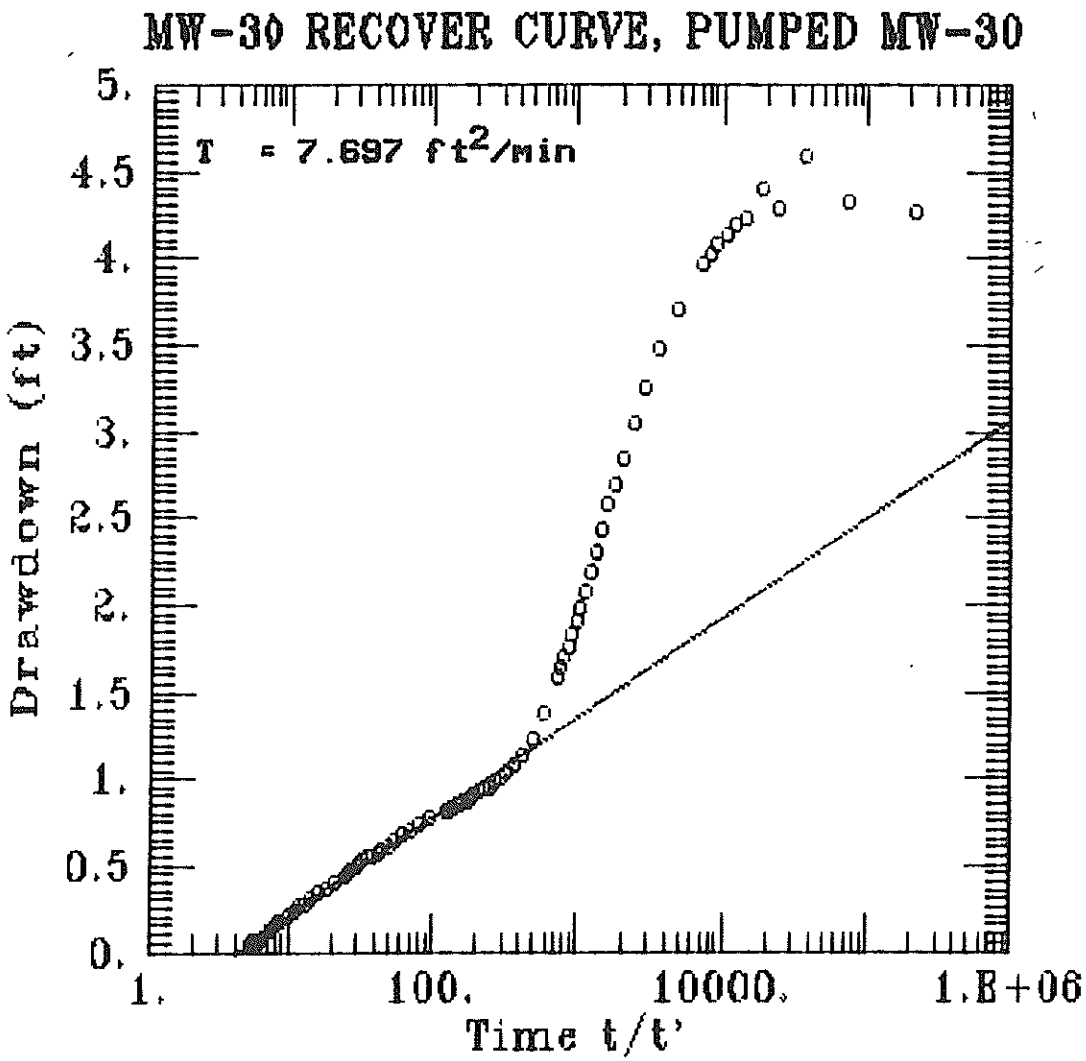
T = 2.7 ft^2/min
b = 34.5 ft
k = 3.9 x 10^{-2} cm/sec
Neuman Method

RADIAN CORPORATION

MW-23 DRAWDOWN CURVE; PUMPING MW-30



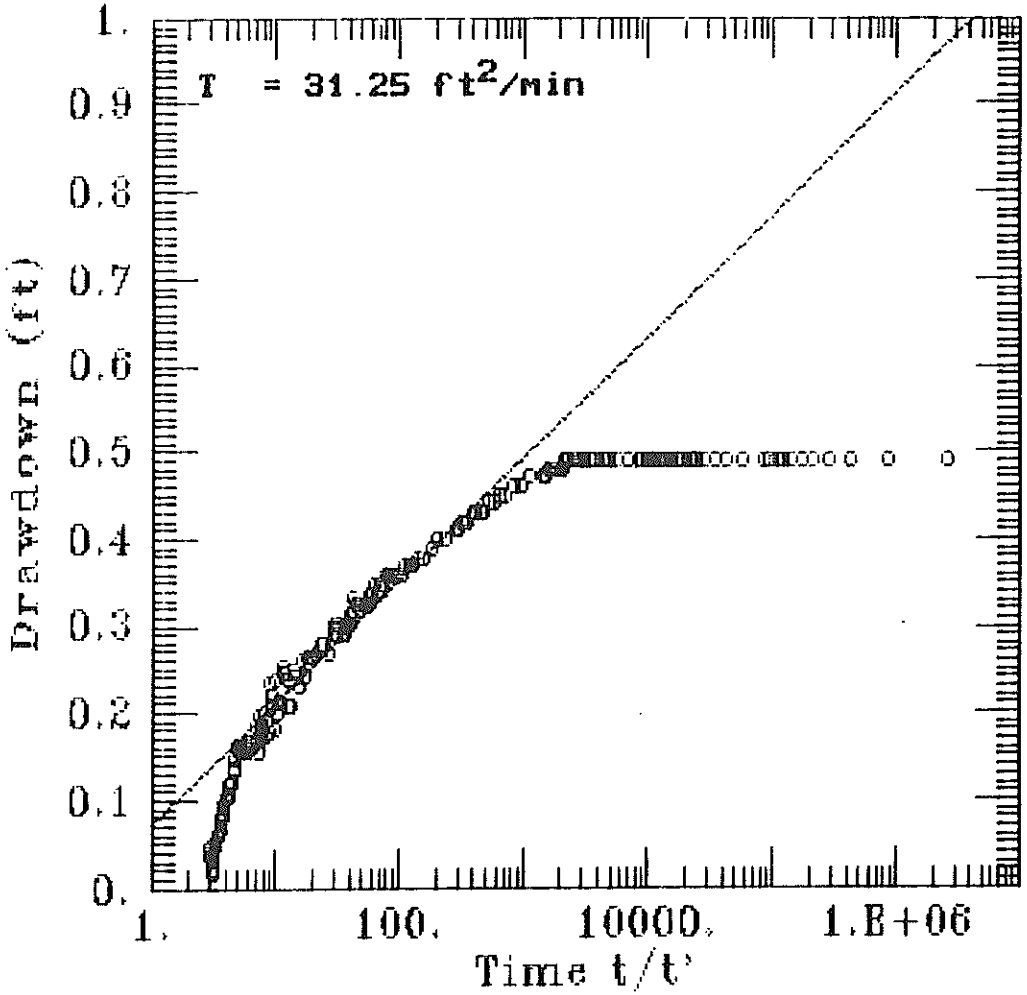
T = 89 ft^2/min
b = 88 ft
k = 5.1 x 10^{-1} cm/sec
Jacob Method, partially penetrating



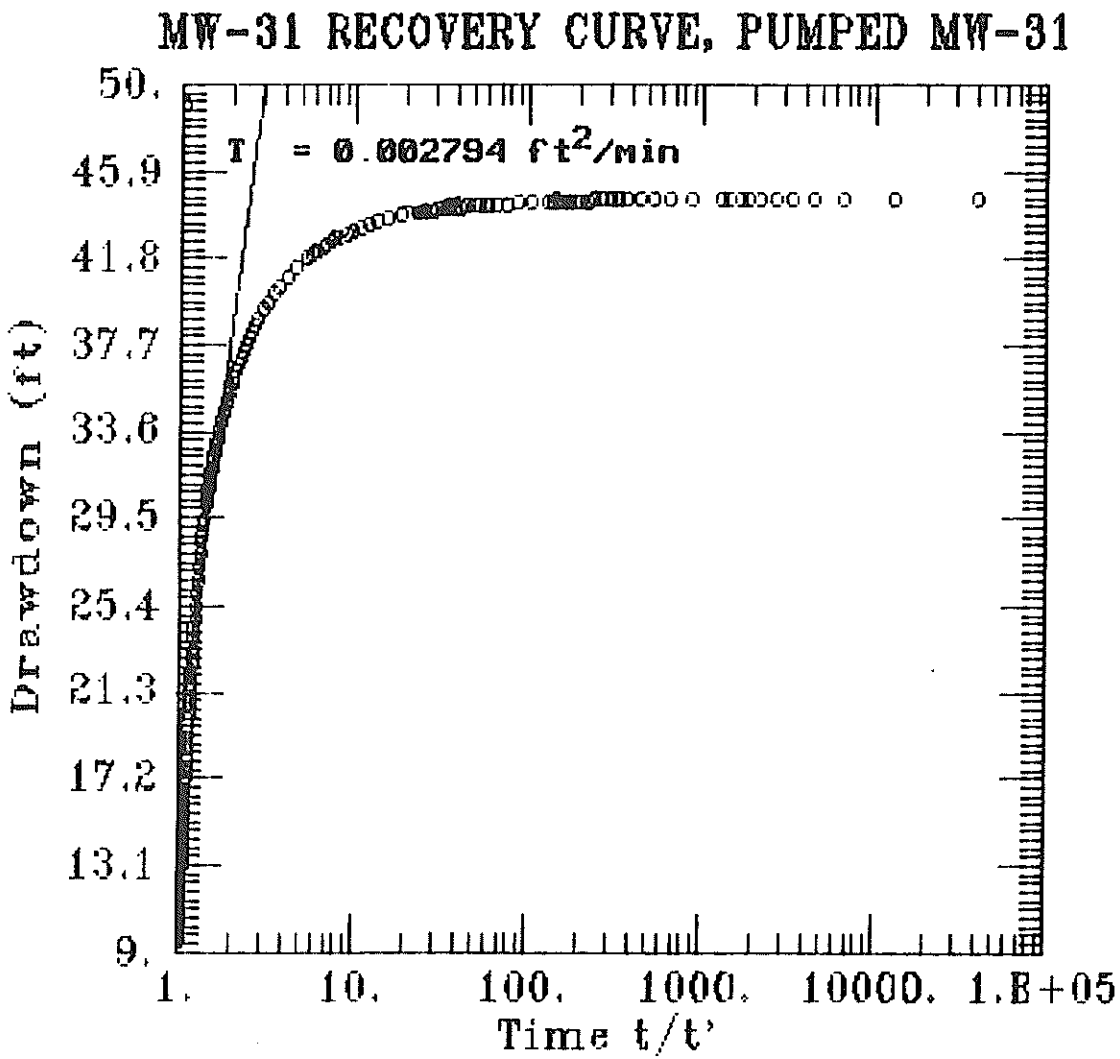
T = 7.7 ft^2/min
b = 34.5 ft
k = 1.1 x 10^{-1} cm/sec
Theis Recovery Method

RADIAN CORPORATION

MW-23 RECOVERY CURVE, PUMPING MW-30

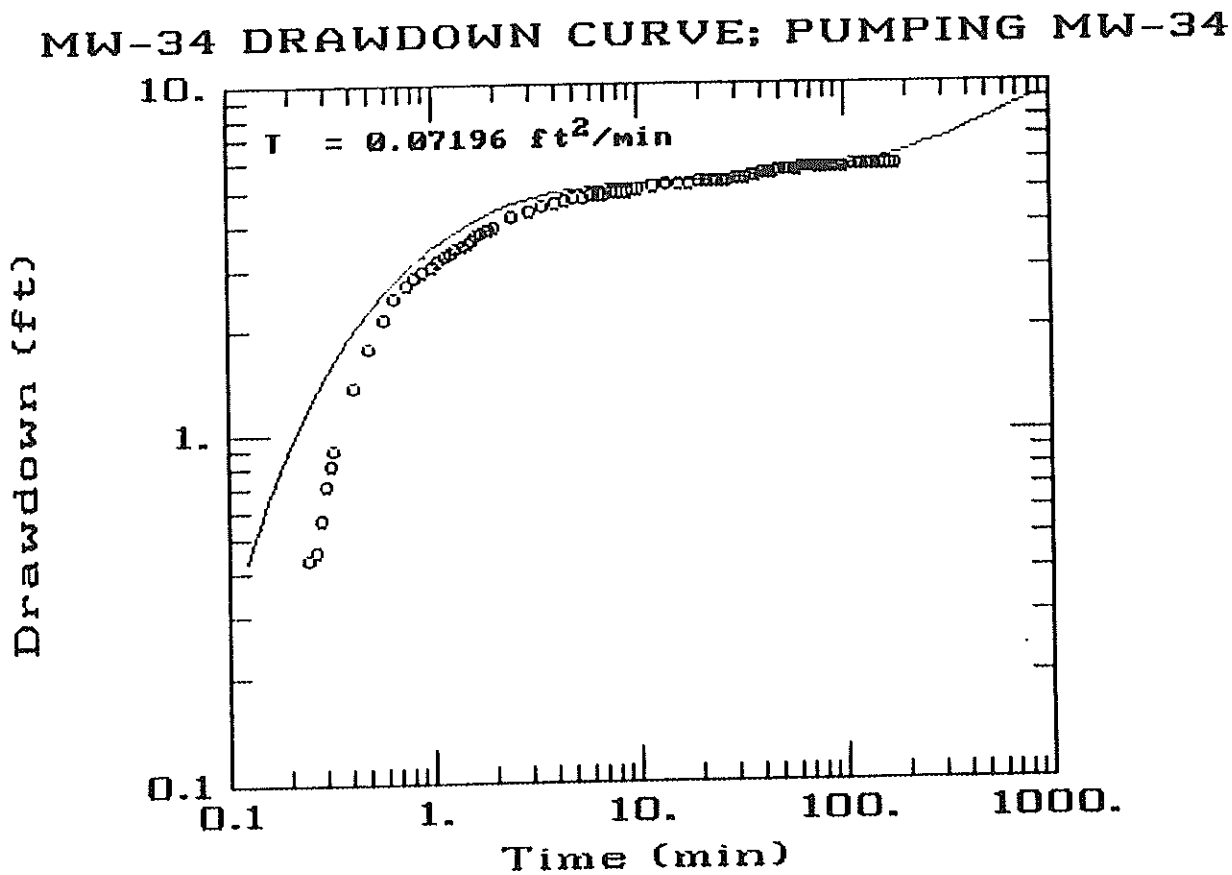


T = 31 ft^2/min
b = 30.6 ft
k = 5.2 x 10^{-1} cm/sec
Theis Recovery Method

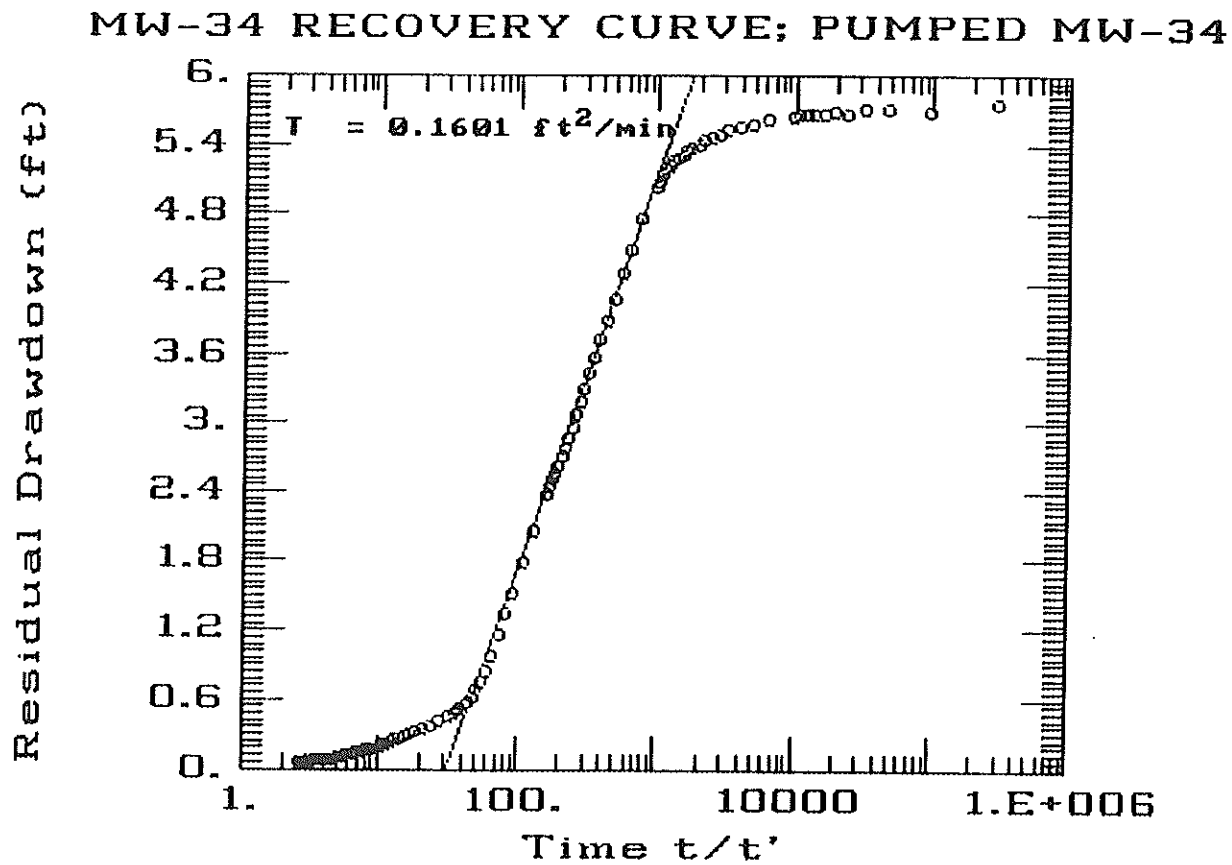


T = 0.0028 ft^2/min
b = 86 ft
k = 7.1 x 10^{-5} cm/sec
Theis Recovery Method

RADIAN CORPORATION

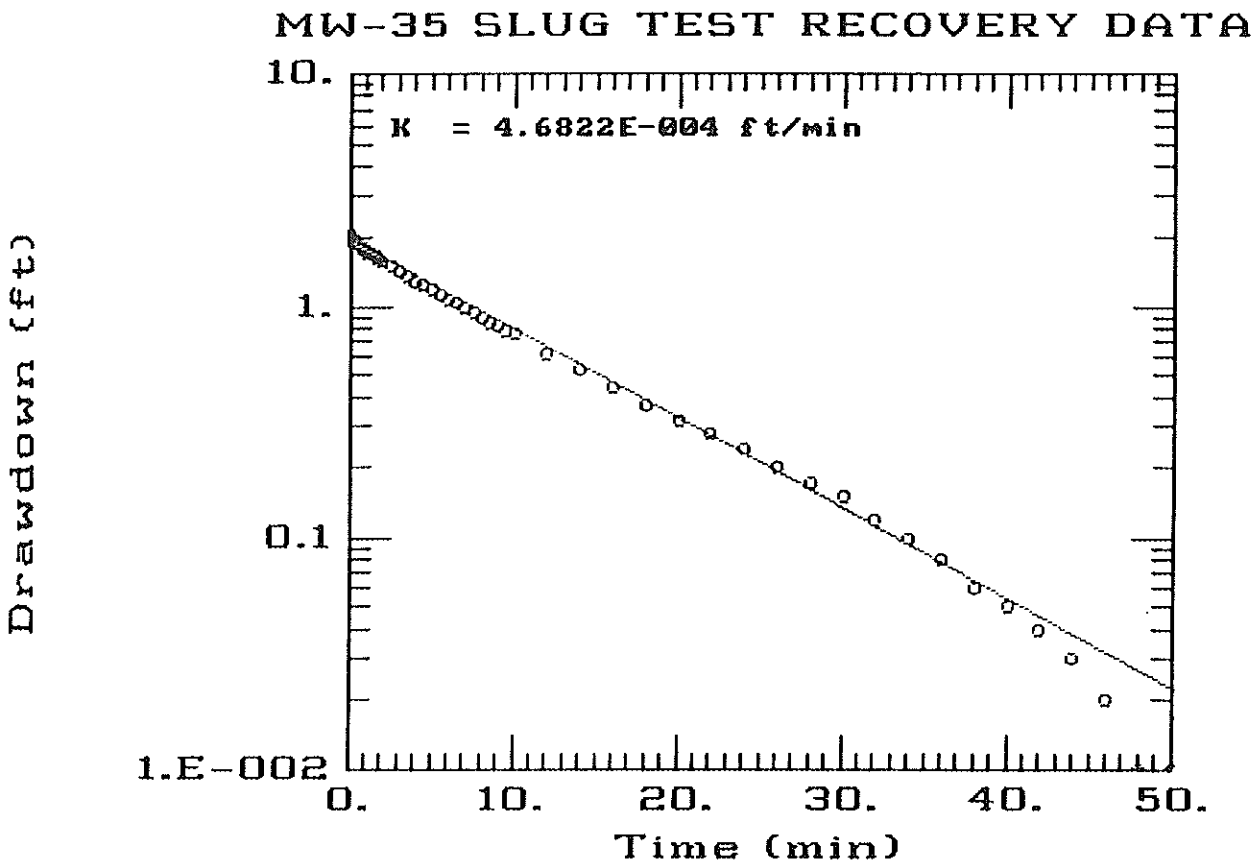


T = 0.072 ft^2/min
b = 20 ft
k = 1.8 x 10^{-3} cm/sec
Neuman Method



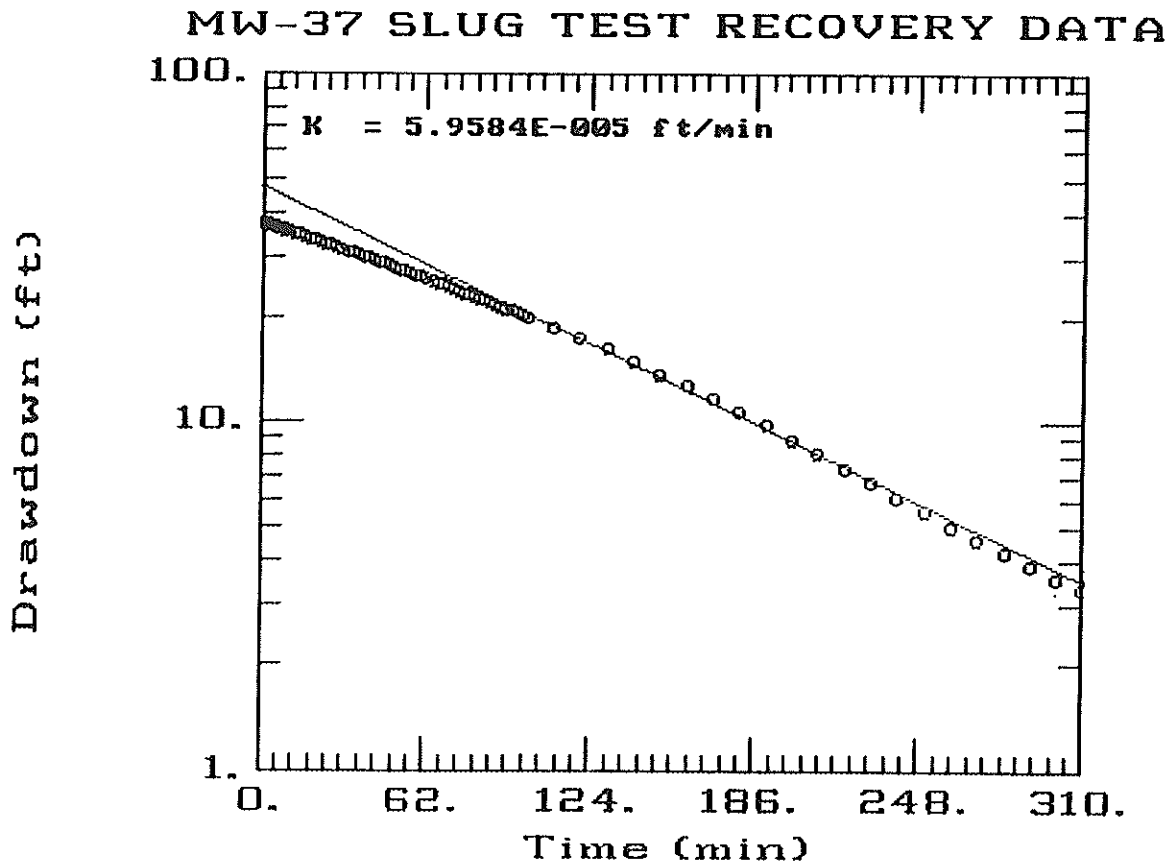
T = 0.16 ft^2/min
b = 20 ft
k = 4.1 x 10^{-3} cm/sec
Theis Recovery Method

RADIAN CORPORATION



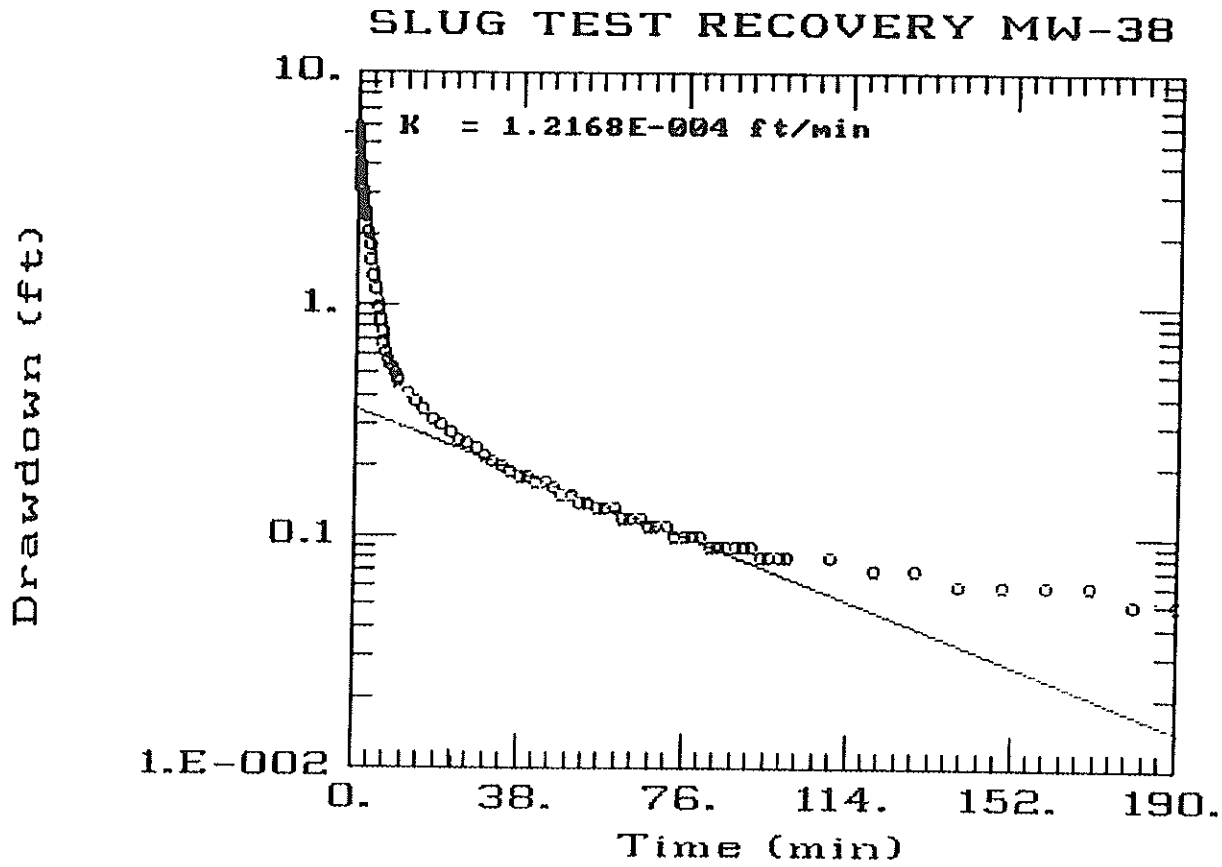
$k = 4.7 \times 10^{-4}$ ft/min
$k = 2.4 \times 10^{-4}$ cm/sec
Bouwer and Rice Method

RADIAN CORPORATION



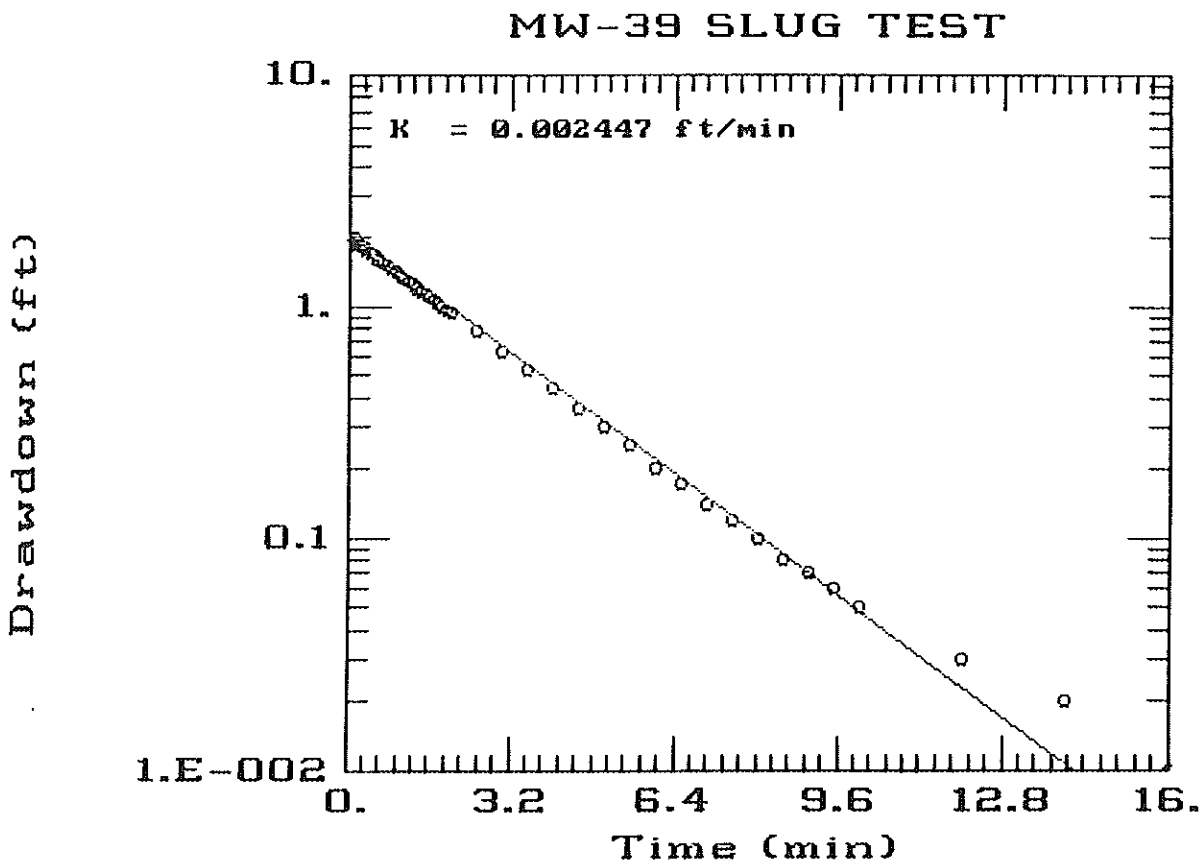
$k = 6.0 \times 10^{-5}$ ft/min
$k = 3.0 \times 10^{-5}$ cm/sec
Bouwer and Rice Method

RADIAN CORPORATION



$k = 1.2 \times 10^{-4}$ ft/min
$k = 6.2 \times 10^{-5}$ cm/sec
Bouwer and Rice Method

RADIAN CORPORATION

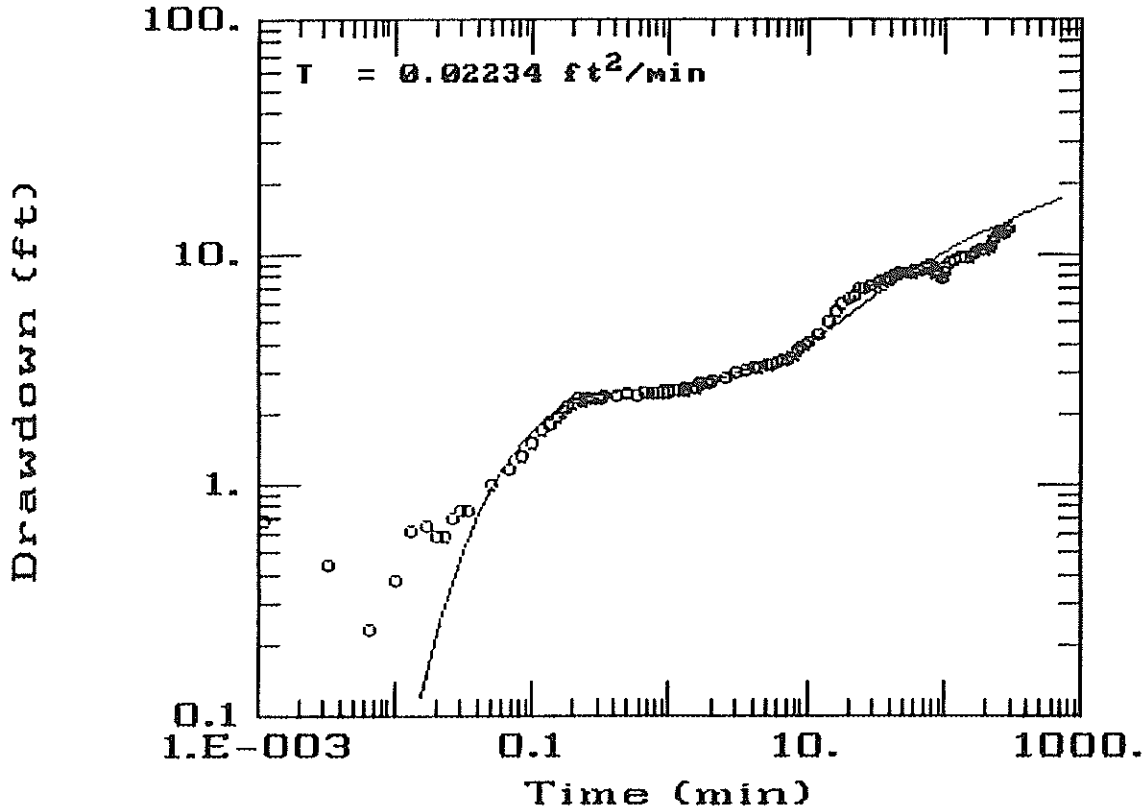


k = 0.0024 ft/min
k = 1.2 x 10^{-3} cm/sec
Bouwer and Rice Method

RADIAN CORPORATION

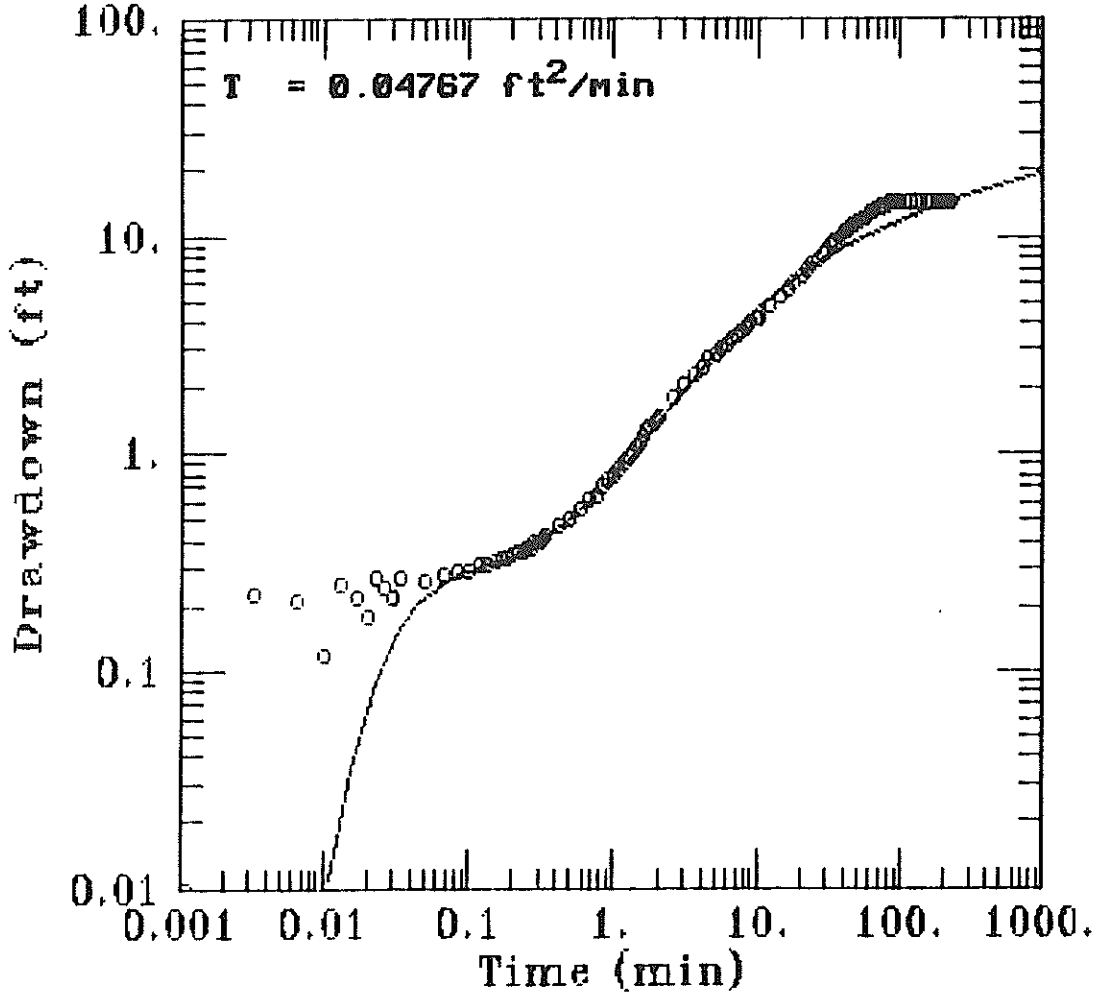
RADIAN CORPORATION

MW-39 DRAWDOWN CURVE; PUMPING MW-39

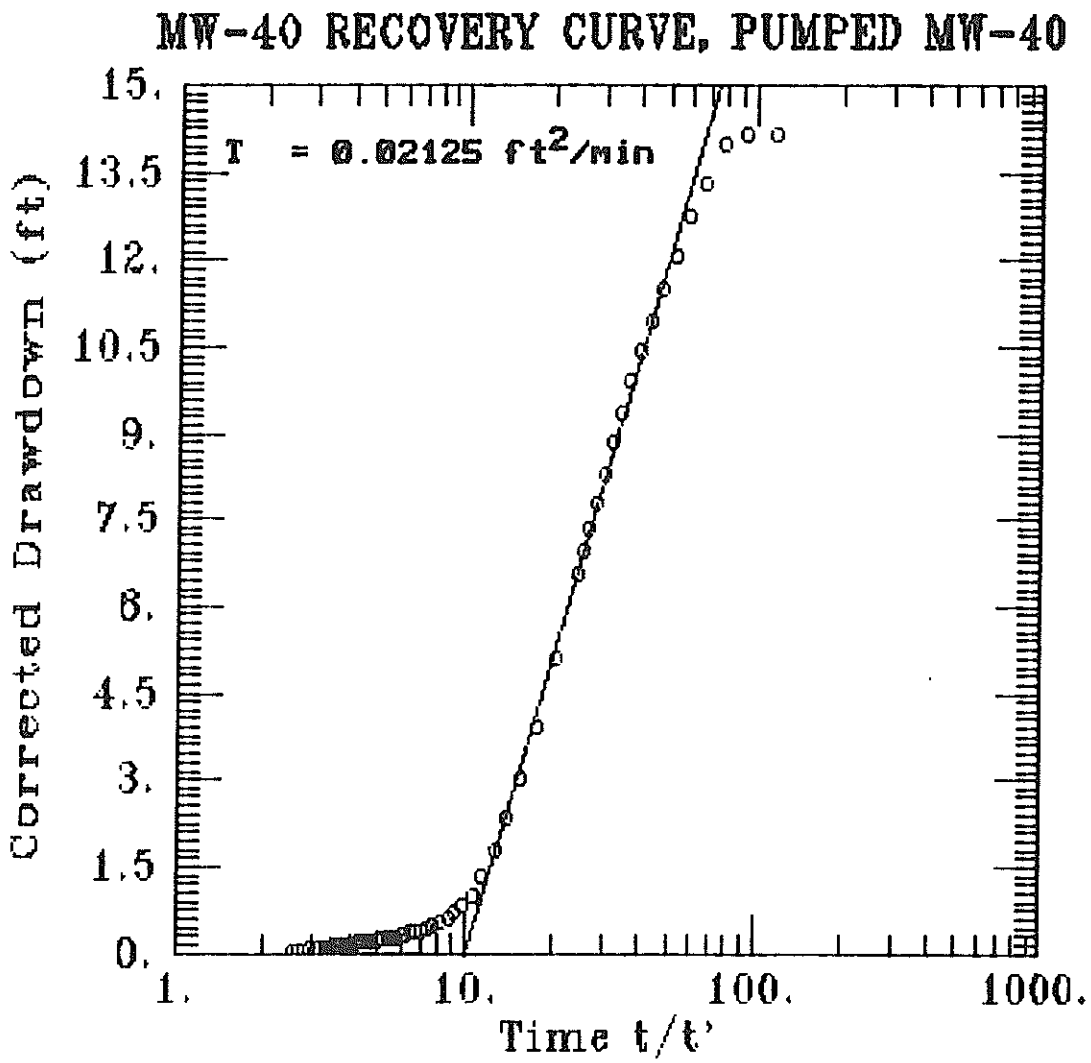


T = 0.022 ft^2/min
b = 20 ft
k = 5.6 x 10^{-4} cm/sec
Neuman Method

MW-40 DRAWDOWN CURVE, PUMPING MW-40



T = 0.48 ft^2/min
b = 20 ft
k = 1.2 x 10^{-3} cm/sec
Neuman Method

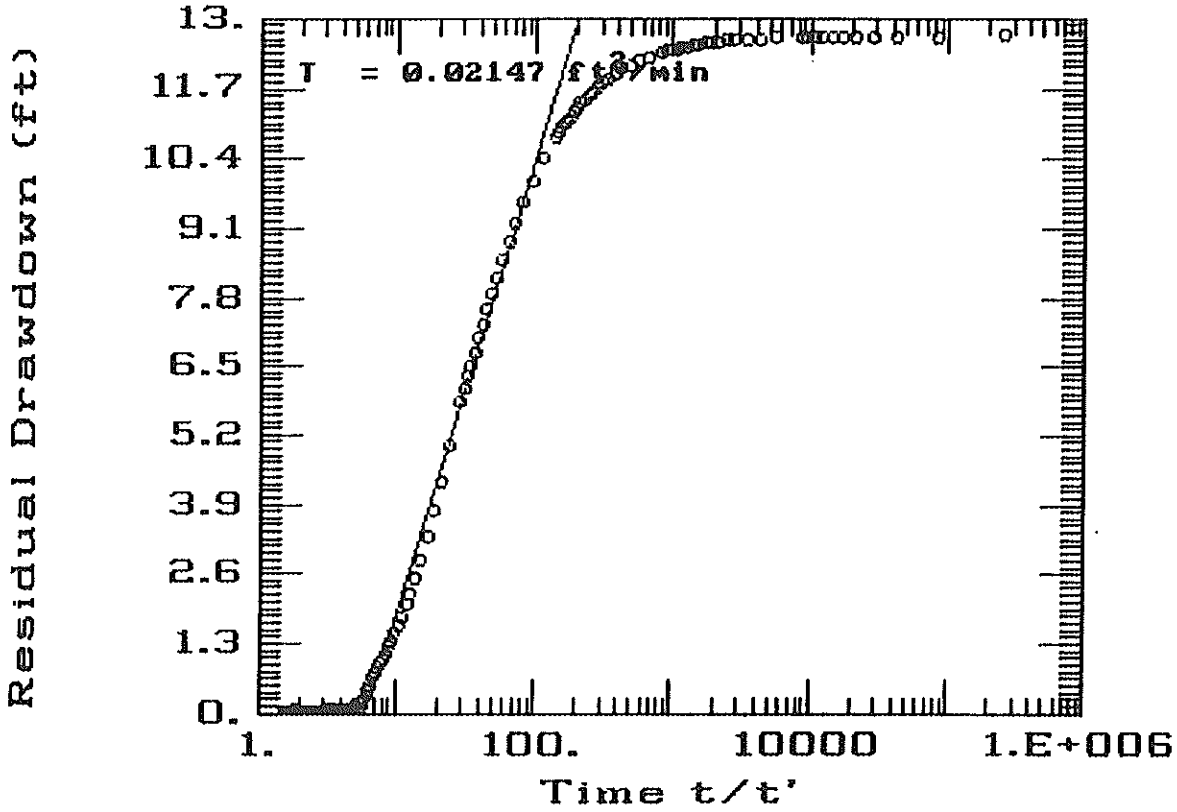


T = 0.021 ft^2/min
b = 20 ft
k = 5.4 x 10^{-4} cm/sec
Theis Recovery Method

RADIAN CORPORATION

RADIAN CORPORATION

MW-39 RECOVERY CURVE; PUMPED MW-39



T = 0.021 ft^2/min
b = 20 ft
k = 5.5 x 10^{-4} cm/sec
Theis Recovery Method

RADIAN CORPORATION

APPENDIX E

WATER LEVEL DATA AND HYDROGRAPHS

Table E-1

Water Level Data, Pre-1989

Well Number	Well Gauging Point Elevation	Date												
		6/2/83	6/15/83	7/8/83	7/22/83	8/5/83	8/19/83	9/3/83	9/16/83	9/30/83	11/9/83	1/4/84	3/2/84	10/15/86
W-1	1972.02	1946.02	1946.11	1946.1	1946.17	1945.72	1946.82	1945.62	1945.72	1945.73	1945.31	1944.98	1944.89	
W-2	2028.88	2022.27	2022.72	2021.46	2020.22	2020.01	2019.62	2018.79	2017.72	2017.11	2016.96	2020.35	2019.66	
W-3	2124.42				2088.52	2090.7	2090.73	2090.62	2090.48	2089.67	2089.92	2089.69	2089.67	
W-5	2201.51	2170.76	2164.96	2155.93	2152.01	2149.3	2147.13	2145.41	2144.23	2143.14	2141.11	2143.07	2140.33	2125.66
OW-1	2202.31	2180.98	2176.95	2171.26	2169.59	2168.76	2167.42	2166.67	2165.78	2165.19	2163.69	2162.02	2158.03	
OW-2	2076.60		2076.6	2076.6	2076.6	2076.6	2076.6	2076.41	2076.6	2076.6	2076.6	2076.6	2076.6	2074.75
OW-3	2141.01	2136.93	2137.15	2136.82	2136.18	2130.78	2135.09	2134.41	2133.96	2133.33	2131.76	2130.2	2126.36	2109.21
OW-8	2033.66	1995.02	1995.28	1995.44	1995.42	1995.16	1994.83	1993.57	1994.53	1994.2	1993.82	1994.13	1994.24	1984.23

Notes: Well W-4 was blocked and never measured. Wells OW-4, OW-5, OW-6, and OW-7 are dry.
Blanks indicate dates when a well was not monitored.

Table E-2

Water Level Data--1989, 1990, 1991 (partial)

Well Number	Well Gauging Point Elevation	Date										
		12/21/89	1/19/90	10/15/90	2/15/91	3/8/91	3/13/91	3/29/91	4/1/91	4/4/91	4/8/91	04/11/91
MW-1	2174.30	2094.25	2093.97	2090.96	2089.84	2089.72				2093.71	2095.97	2096.80
MW-2	2167.46		2094.75	2091.77	2090.60	2090.46				2090.44		
MW-3	2166.44	2030.34	2034.33	2031.54		2030.74					2031.19	
MW-4	2157.39	2094.91	2094.66	2091.62		2090.41				2090.44	2090.73	2090.99
MW-5	2118.71	2091.87	2092.17	2089.78		2088.59						
MW-6	2119.11	2089.51	2089.32	2086.70		2085.69						
MW-7	2173.84	2094.29	2094.04	2090.98		2089.79				2093.73	2095.85	2096.66
MW-8	2087.79	2070.24	2070.29	2069.24		2068.93						
MW-9	2086.32	2079.12	2078.94	2077.05		2077.42						
MW-10	2176.72	2096.62	2096.42	2093.32		2091.92				2092.46	2092.44	2092.71
MW-11	2119.90	2073.00	2072.92	2071.20		2070.33						
MW-12	2095.79	2066.74	2066.59	2065.39		2065.29						
MW-13	2055.19	2035.89	2036.60	2034.45		2041.57						
MW-14	2026.97	1988.02	1987.93	1986.18		1987.15						
MW-15	2007.06		1976.26	1973.24		1976.56						
MW-16	1818.00			1805.14		1818.00						1818.00
MW-17	2137.72	2091.62	2093.19	2090.24		2089.04				2089.74	2090.46	
MW-18	2006.00	1975.10	1975.48	1973.47		1975.80						
MW-19	2115.79	2081.99	2090.76	2088.04		2087.64						
MW-20	2156.86				2089.91		2090.76			2070.56		2091.28
MW-21	2158.13						2088.67			2090.53	2091.09	2091.61

RADIAN CORPORATION

Table E-2

Continued

Well Number	Well Gauging Point Elevation	Date										
		12/21/89	1/19/90	10/15/90	2/15/91	3/8/91	3/13/91	3/29/91	4/1/91	4/4/91	4/8/91	04/11/91
MW-22	2168.22				2091.55		2091.50			2091.88	2092.02	2092.28
MW-23	2159.56				2090.26	2091.56				2090.50		2091.60
MW-24	2180.62				2090.17	2089.97				2092.77		2097.38
MW-25	2180.66				2093.26	2092.96				2092.96	2093.22	2093.34
MW-26	2179.78					2089.78				2092.66		2097.58
MW-27	2177.99				2091.79	2091.83				2097.23	2092.63	
MW-28	2158.25					2089.82				2072.83	2071.46	2092.25
MW-30	2159.04				2090.85	2090.74				2091.39		2092.14
MW-31	2183.32				2078.12	2079.22				2081.25	2082.26	2082.64
MW-32	2173.38				2071.88	2074.84				2076.63	2078.16	2079.64
MW-34	2151.38					2091.93					2092.58	2093.00
MW-35	2168.34					2092.78				2092.71		
MW-36	2202.53								2117.2	2124.77	2137.50	2148.68
MW-37	2038.25					2000.15						
MW-38	2027.58					1977.44						
MW-39	2141.54							2089.70		2089.90	2090.24	
MW-40	2123.69					2075.87						
W-1	1972.02		1941.78									
W-2	2028.88		1993.20			1993.20						
W-3	2124.42		2072.95		2070.15	2070.02						
W-5	2201.51		2112.00		2111.59	2112.21						

Table E-2

Continued

Well Number	Well Gauging Point Elevation	Date										
		12/21/89	1/19/90	10/15/90	2/15/91	3/8/91	3/13/91	3/29/91	4/1/91	4/4/91	4/8/91	04/11/91
OW-1	2202.31	Dry	Dry	Dry	Dry	Dry						
OW-2	2076.60		2072.19	2071.59		2071.78						
OW-3	2141.01		2093.64	2090.60	2089.58	2089.45					2090.04	2090.47
OW-8	2033.66		1979.51	1978.01	1977.70	1978.34						

Table E-3

Water Level Data--1991 (continued)

		Date												
Well Number	Well Gauging Point Elevation	4/15/91	4/16/91	4/19/91	4/23/91	5/3/91	5/6/91	5/12/91	5/29/91	6/27/91	7/30/91	8/28/91	9/29/91	12/12/91
MW-1	2174.30		2097.60	2097.88	2098.06		2098.08	2097.95	2097.75	2097.33	2096.90	2096.50	2096.02	2094.68
MW-2	2167.46	2091.56		2092.09	2092.46	2093.27		2093.91	2094.62	2095.32	2095.62	2095.60	2095.48	2094.73
MW-3	2166.44	2031.40		2031.63				2032.38	2032.66	2033.00	2033.27	2033.38	2033.06	2032.76
MW-4	2157.39		2091.41	2091.71	2092.07				2094.47	2095.23	2095.55	2095.56	2095.43	2094.66
MW-5	2118.71				2089.51				2090.53	2090.91	2091.09	2091.15	2091.19	2090.89
MW-6	2119.11				2087.58				2088.62	2088.87	2088.89	2088.79	2088.74	2088.19
MW-7	2173.84		2097.39	2097.66	2097.82		2097.91	2097.80	2097.64	2097.28	2096.88	2096.40	2096.02	2094.72
MW-8	2087.79				2069.42				2069.58	2069.53	2069.07	2068.76	2068.59	2068.63
MW-9	2086.32				2079.10				2080.58	2080.78	2080.62	2080.32	2079.96	2079.34
MW-10	2176.72		2092.69	2093.05	2093.32			2094.02	2094.58	2095.22	2095.68	2095.88	2095.98	2095.58
MW-11	2119.90				2070.38				2070.40	2070.44	2070.34	2070.28	2070.26	2069.84
MW-12	2095.79					2069.05			2069.12	2068.87	2068.43	2068.09	2067.76	2066.96
MW-13	2055.19				2044.51				2043.15	2041.69	2039.46	2037.84	2036.39	2035.79
MW-14	2026.97				1994.29				1994.65	1994.69	1994.19	1993.47	1992.59	1990.79
MW-15	2007.06				1979.03				1978.66	1978.42	1978.03	1977.71	1977.44	1977.34
MW-16	1818.00				1817.60				1817.10	1815.72	1813.20	1810.45	1807.14	1809.08
MW-17	2137.72		2091.84	2092.25	2092.72				2094.88	2095.18	2095.08	2094.82	2094.52	2093.58
MW-18	2006.00				1978.01				1976.66	1977.43	1977.05	1976.74	1976.46	1976.48
MW-19	2115.79				2089.85				2090.41	2090.43	2090.20	2089.97	2089.57	2089.32
MW-20	2156.86	2092.90		2093.56	2094.06				2095.71	2095.85	2093.92	2095.64	2095.42	2094.52
MW-21	2158.13	2092.19	2092.26	2092.67	2093.08				2095.10	2105.60	2095.73	2095.63	2095.43	2094.55

Table E-3

Continued

		Date												
Well Number	Well Gauging Point Elevation	4/15/91	4/16/91	4/19/91	4/23/91	5/3/91	5/6/91	5/12/91	5/29/91	6/27/91	7/30/91	8/28/91	9/29/91	12/12/91
MW-22	2168.22	2092.38	2092.21	2092.54	2092.78				2094.61	2095.37	2095.80	2095.86	2095.88	2095.30
MW-23	2159.56	2092.19		2092.69	2093.11				2095.58	2095.55	2095.68	2095.56	2095.46	2094.54
MW-24	2180.62		2098.61	2099.05	2099.54			2099.83	2099.24	2098.38	2097.69	2097.14	2096.57	2095.06
MW-25	2180.66		2093.49	2093.60	2093.74			2094.37	2094.82	2095.41	2095.87	2096.06	2096.20	2096.00
MW-26	2179.78		2098.90	2099.36	2099.77				2099.22	2098.32	2097.63	2097.10	2096.52	2094.99
MW-27	2177.99				2106.12			2093.38	2094.05	2094.59	2095.03	2095.23	2095.91	2095.25
MW-28	2158.25	2092.79	2092.35	2093.29	2093.67				2095.25	2095.53	2095.56	2095.41	2095.22	2094.25
MW-29	2112.37													2079.56
MW-30	2159.04	2092.56		2093.10	2093.22				2094.78	2095.34	2095.72	2095.58	2095.52	2094.90
MW-31	2183.32		2085.26	2085.80	2086.20				2086.29	2085.86	2085.48	2085.14	2084.56	2083.44
MW-32	2173.38		2080.74	2081.04	2081.43				2082.82	2082.34	2082.24	2081.93	2081.51	2080.66
MW-34	2151.38		2092.96	2093.56	2093.86				2095.34	2095.82	2096.08	2096.14	2096.10	2093.56
MW-35	2168.34		2095.63	2095.93	2095.84			2096.68	2096.78	2096.66	2096.39	2096.08	2095.70	2094.52
MW-36	2202.53		2148.48	2148.11	2147.45				2142.57	2137.91	2134.58	2131.65	2129.31	2124.11
MW-37	2038.25				2005.82				2005.59	2005.17	2003.9	2002.49	2001.47	1999.63
MW-38	2027.58				1979.14				1980.06	1980.34	1980.38	1980.28	1980.15	1979.74
MW-39	2141.54		2091.13	2091.51	2091.98				2094.32	2094.91	2095.13	2095.08	2094.92	2094.18
MW-40	2123.69				2075.53			2078.15	2078.40	2078.50	2078.25	2077.97	2077.68	2077.00
MW-41	2131.29													2091.01
MW-42	2089.86													2076.20
MW-43	2065.81													2057.81

Table E-3

Continued

Well Number	Well Gauging Point Elevation	Date												
		4/15/91	4/16/91	4/19/91	4/23/91	5/3/91	5/6/91	5/12/91	5/29/91	6/27/91	7/30/91	8/28/91	9/29/91	12/12/91
MW-44	2126.04													2089.42
MW-45	2068.88													
MW-46	2069.40													2069.40
MW-47	2077.12													
MW-48	2073.73													
MW-49	2128.19													
MW-50	2148.76													
P-2	2078.64													2056.16
P-3	2137.58													2086.13
P-4	2109.94													2074.14
P-5	2159.51													2094.23
W-1	1972.02				1946.42				1945.84	1945.04	1943.94	1942.96	1941.88	1942.08
W-2	2028.88					2000.54			2000.93	2001.08	2000.41	1999.44	1998.26	1996.04
W-3	2124.42				2070.94			2071.11	2071.20	2071.24	2071.15	2070.98	2070.85	2070.27
W-5	2201.51					2146.18			2141.91	2138.12	2134.53	2131.79	2128.91	
OW-1	2202.31								2133.31	2146.19	2147.03	2147.27	2147.30	2146.76
OW-2	2076.60				2072.96				2073.10	2074.03	2072.74	2073.50	2073.50	2073.20
OW-3	2141.01		2091.13		2093.06			2093.74	2094.39	2094.92	2095.01	2094.93	2088.88	2093.89
OW-8	2033.66				1981.14				1981.99	1982.33	1982.02	1981.80	1981.26	1980.95

Table E-4

Continued

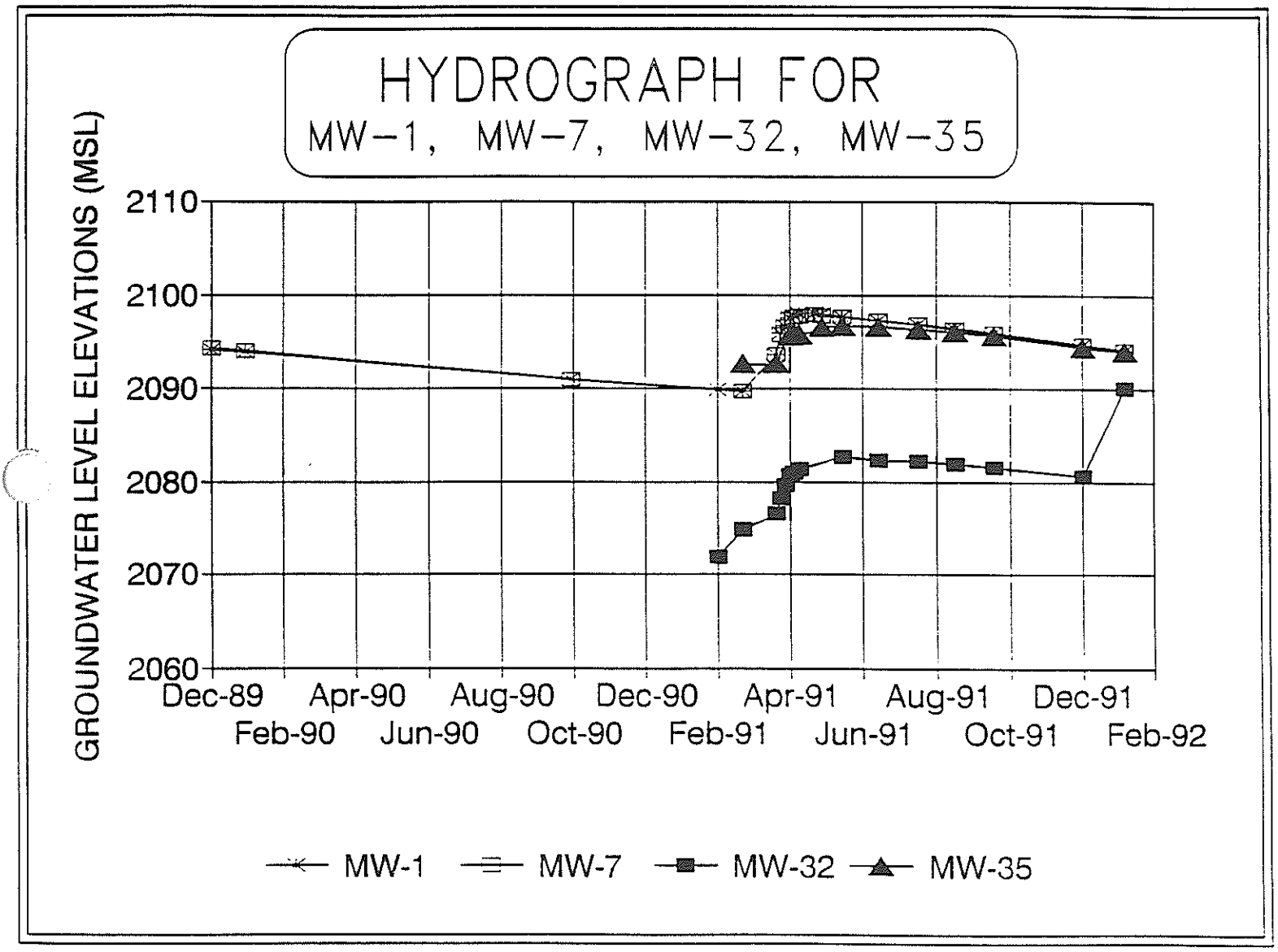
Well Number	Well Gauging Point Elevation	Date						
		1/16/92	2/24/92	3/18/92	4/16/92	5/14/92	6/14/92	7/17/92
MW-22	2168.22	2094.90	2094.54	2094.44	2094.66	2095.30	2096.00	2096.12
MW-23	2159.56	2094.10	2093.68	2093.55	2094.06	2094.92	2095.46	2095.76
MW-24	2180.62	2094.48	2093.82	2093.66	2095.23	2096.89	2097.76	2097.60
MW-25	2180.66	2095.74	2095.42	2095.34	2095.48	2095.92	2096.42	2096.50
MW-26	2179.78	2094.39	2093.71	2093.56	2095.20	2096.86	2097.72	2097.54
MW-27	2177.99			2094.63	2094.94	2095.49	2095.99	2096.09
MW-28	2158.25	2093.87	2093.41	2093.34	2094.13	2095.05	2095.65	2095.75
MW-29	2112.37	2080.30	2079.49	2079.70	2080.17	2080.57	2080.81	2080.77
MW-30	2159.04	2094.49	2094.08	2094.02	2094.50	2095.28	2095.84	2095.94
MW-31	2183.32	2082.99	2082.50	2082.27	2083.44	2084.68	2085.58	2084.52
MW-32	2173.38	-86.15	-86.60	-87.76	-85.67	-84.55	-83.56	-84.55
MW-34	2151.38	2095.27	2094.94	2094.82	2095.15	2095.75	2096.24	2096.32
MW-35	2168.34	2094.02	2093.49	2093.46	2094.80	2095.80	2096.32	2096.28
MW-36	2202.53	2121.97	2121.61	2122.00	2138.50	2142.05	2137.77	2135.53
MW-37	2038.25	1999.65	2002.11	2002.49	2005.55	2005.26	2004.85	2004.01
MW-38	2027.58	1979.72	1980.08	1980.35	1980.82	1981.15	1981.27	1981.12
MW-39	2141.54	2093.70	2093.20	2093.04	2093.40	2094.26	2095.02	2095.14
MW-40	2123.69	2076.52	2076.61	2077.58	2079.41	2080.15	2079.66	2079.11
MW-41	2131.29	2090.82	2090.52	2090.39	2090.57	2091.07	2091.59	2091.65
MW-42	2089.86	2076.30	2078.06	2077.86	2079.54	2079.25	2078.65	2078.22
MW-43	2065.81	2058.21	2058.76	2058.61	2059.18	2059.27	2059.05	2058.83

Table E-4

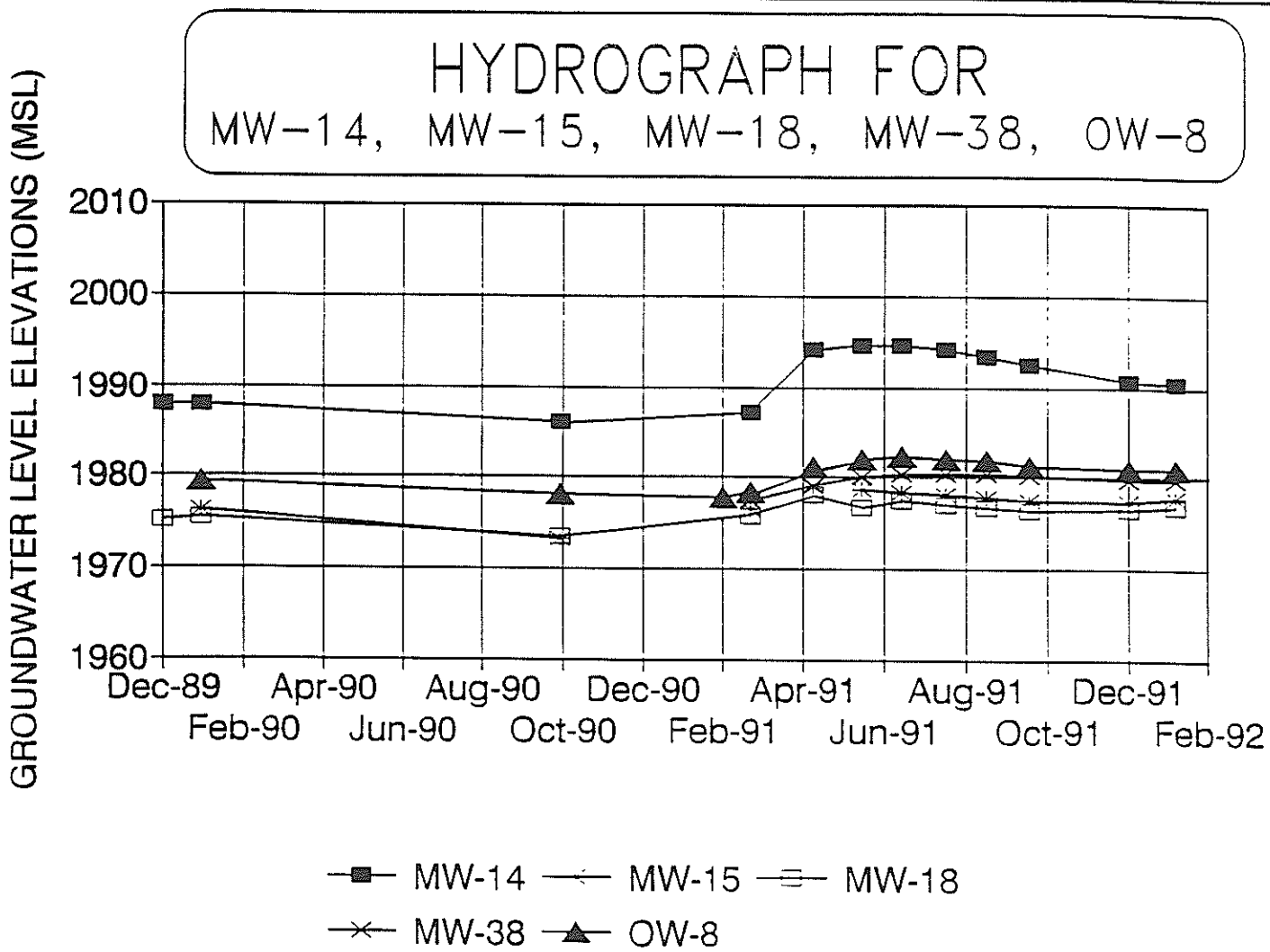
Continued

Well Number	Well Gauging Point Elevation	Date						
		1/16/92	2/24/92	3/18/92	4/16/92	5/14/92	6/14/92	7/17/92
MW-44	2126.04	2088.93	2088.64	2088.54	2088.68	2089.12	2089.54	2089.48
MW-45	2068.88	2067.70	2068.48	2068.48	2068.88	2068.88	2068.88	2068.88
MW-46	2069.40	2015.76	2015.94	2016.26	2016.88	2017.78	2018.46	2018.30
MW-47	2077.12	2074.61	2074.78	2074.84	2075.56	2075.76	2075.76	2075.76
MW-48	2073.73	2062.40	2062.83	2062.95	2063.48	2063.35	2063.15	2062.91
MW-49	2128.19	2092.69	2092.25	2092.19	2092.71	2093.61	2094.21	2094.21
MW-50	2148.76	2093.66	2093.04	2092.95	2093.63	2094.64	2095.29	2095.30
W-1		1944.27	1946.50	1946.74	1947.04	1946.38	1945.55	1944.66
W-2		1996.08	1998.18	1998.66	2001.38	2001.55	2001.58	2000.68
W-3		2070.10	2070.22	2070.44	2071.22	2071.54	2071.62	2070.82
W-5		2121.79	2121.27	2121.59	2137.27	2142.04	2136.81	2135.39
OW-1		2146.49	2146.26	2146.21	2146.21	2146.26	2146.41	2146.41
OW-2		2072.92	2073.31	2073.19	2073.76	2073.78	2073.56	2073.38
OW-3		2093.46	2092.93	2092.81	2093.26	2094.19	2094.91	2094.99
OW-8		1981.00	1981.48	1981.88	1982.54	1982.93	1982.96	1982.76
P-2	2078.64	2057.31	2059.39	2059.58	2061.53	2061.29	2060.37	2059.52
P-3	2137.58	2086.04	2085.96	2086.06	2086.73	2087.16	2087.85	2087.82
P-4	2109.94	2074.80	2076.38	2076.86	2078.65	2078.82	2078.55	2078.12
P-5	2159.51	2093.77	2093.29	2093.43	2094.81	2095.92	2096.47	2096.25

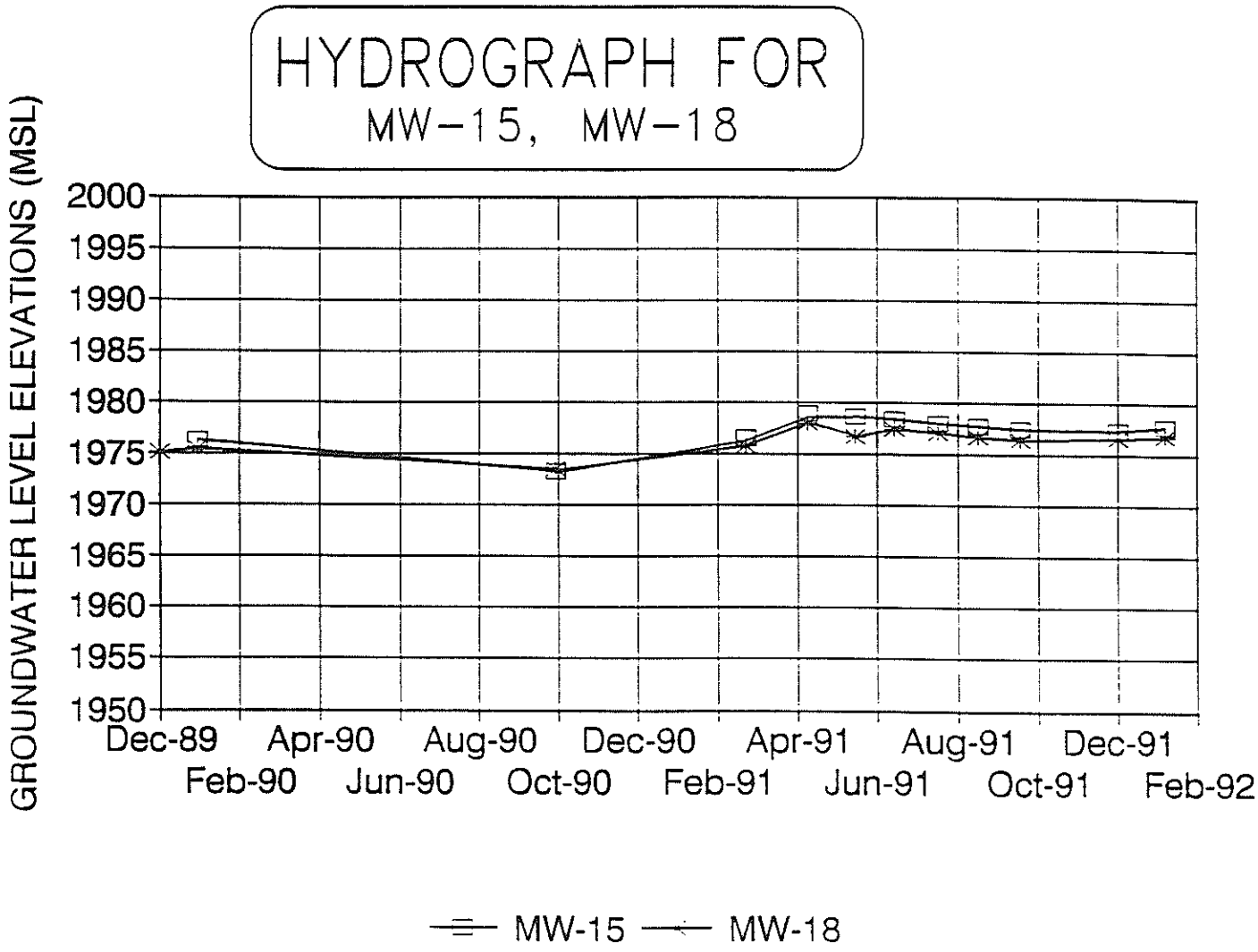
RADIAN CORPORATION



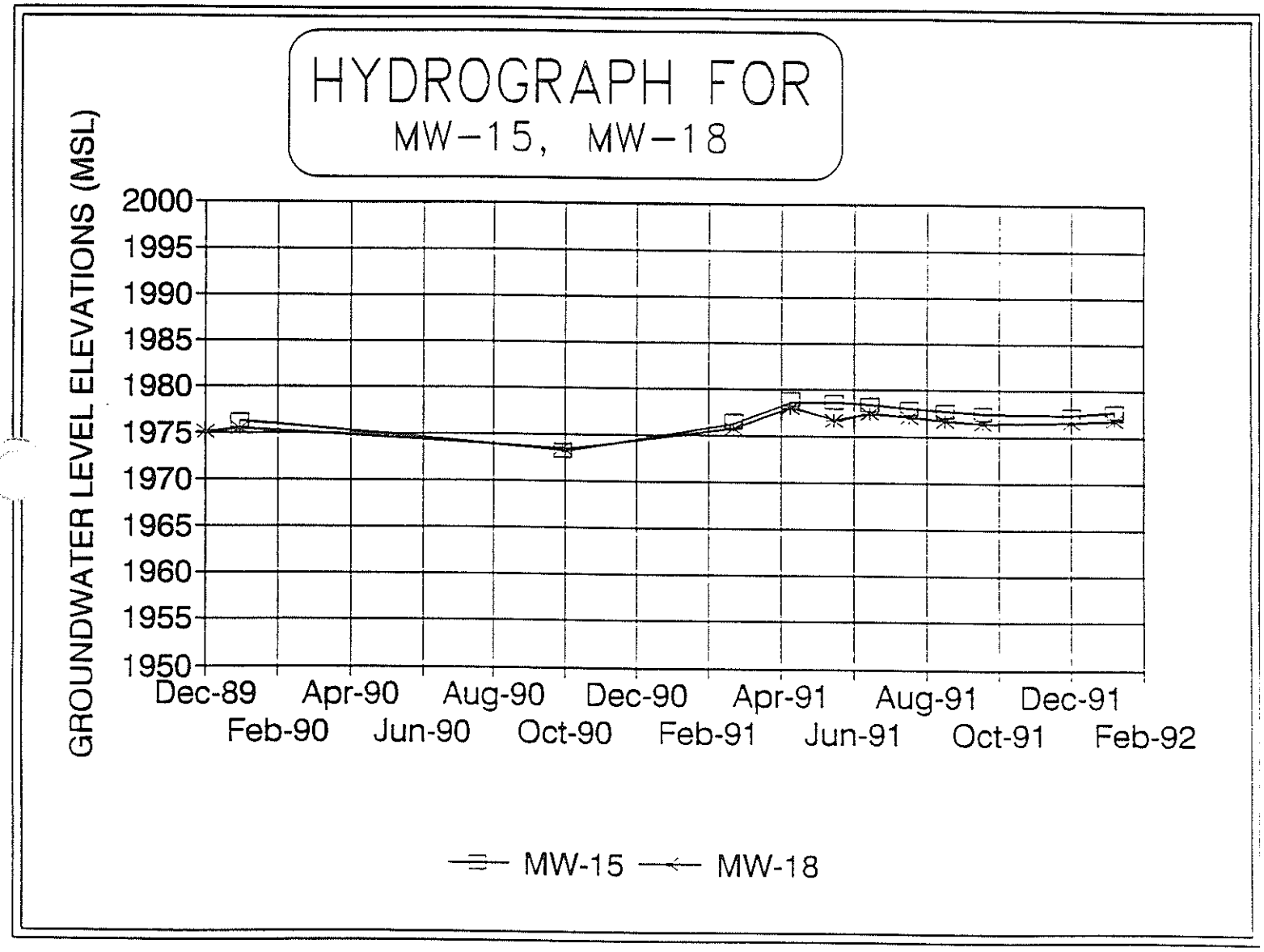
RADIAN CORPORATION



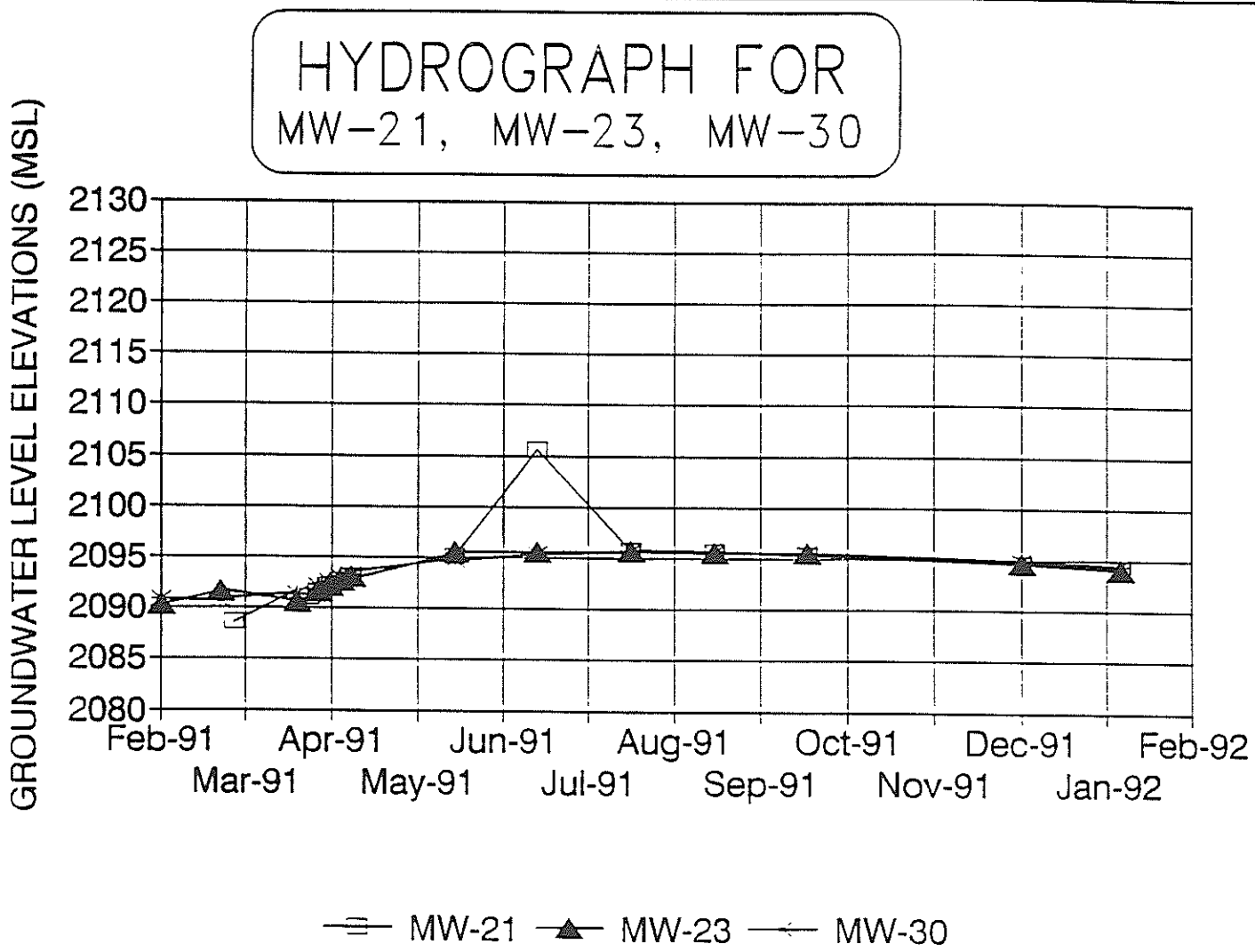
RADIAN CORPORATION



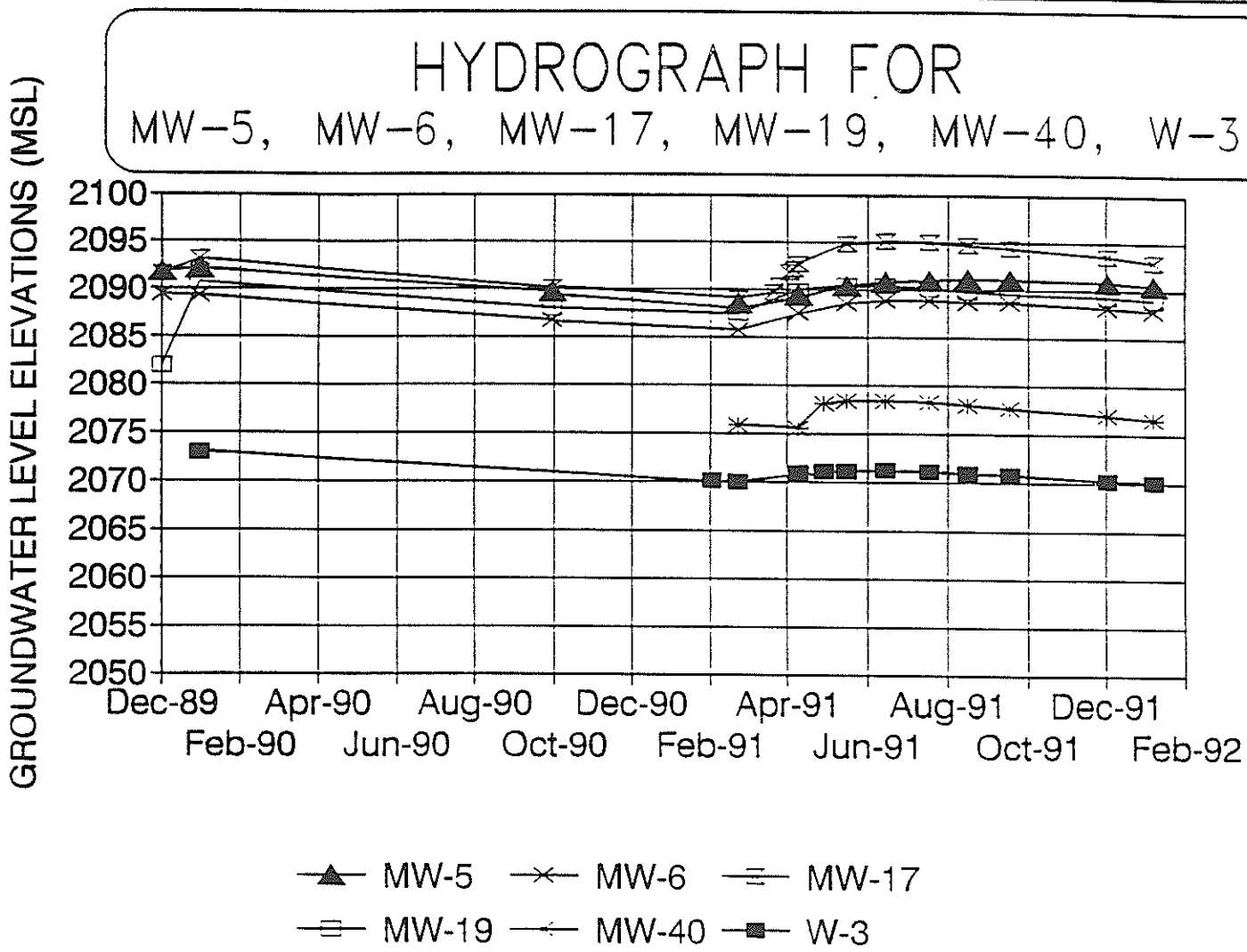
RADIAN CORPORATION



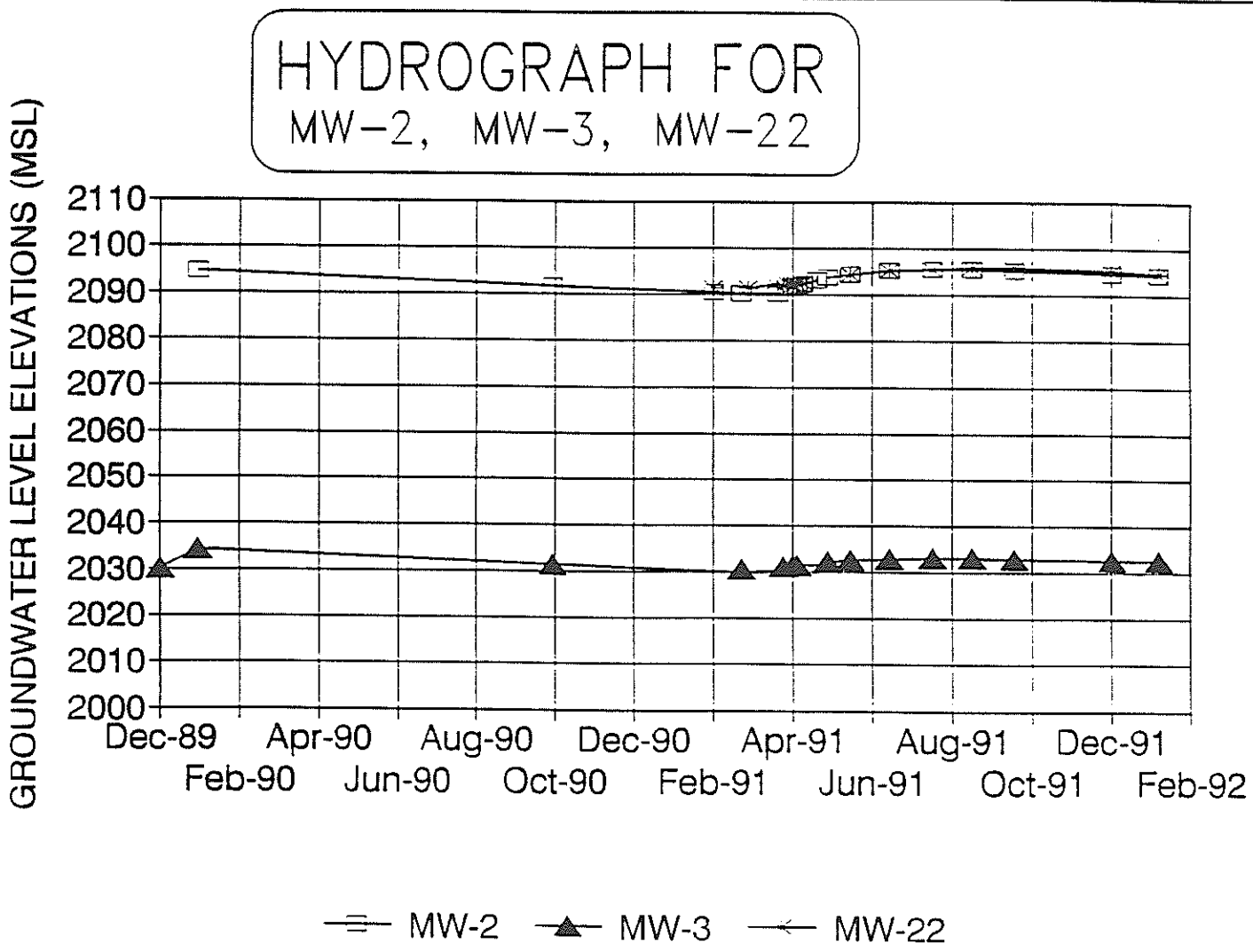
RADIAN CORPORATION



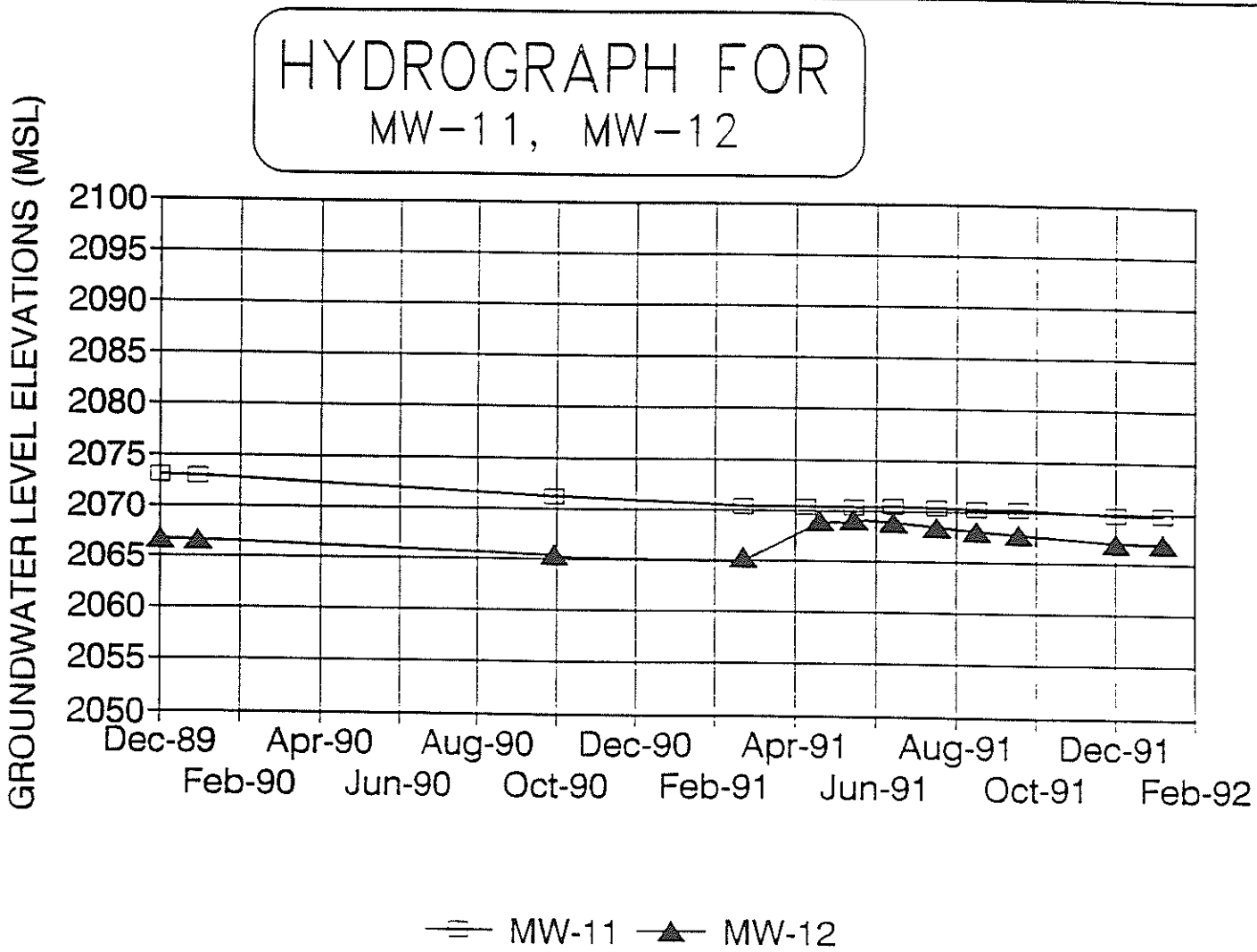
RADIAN CORPORATION



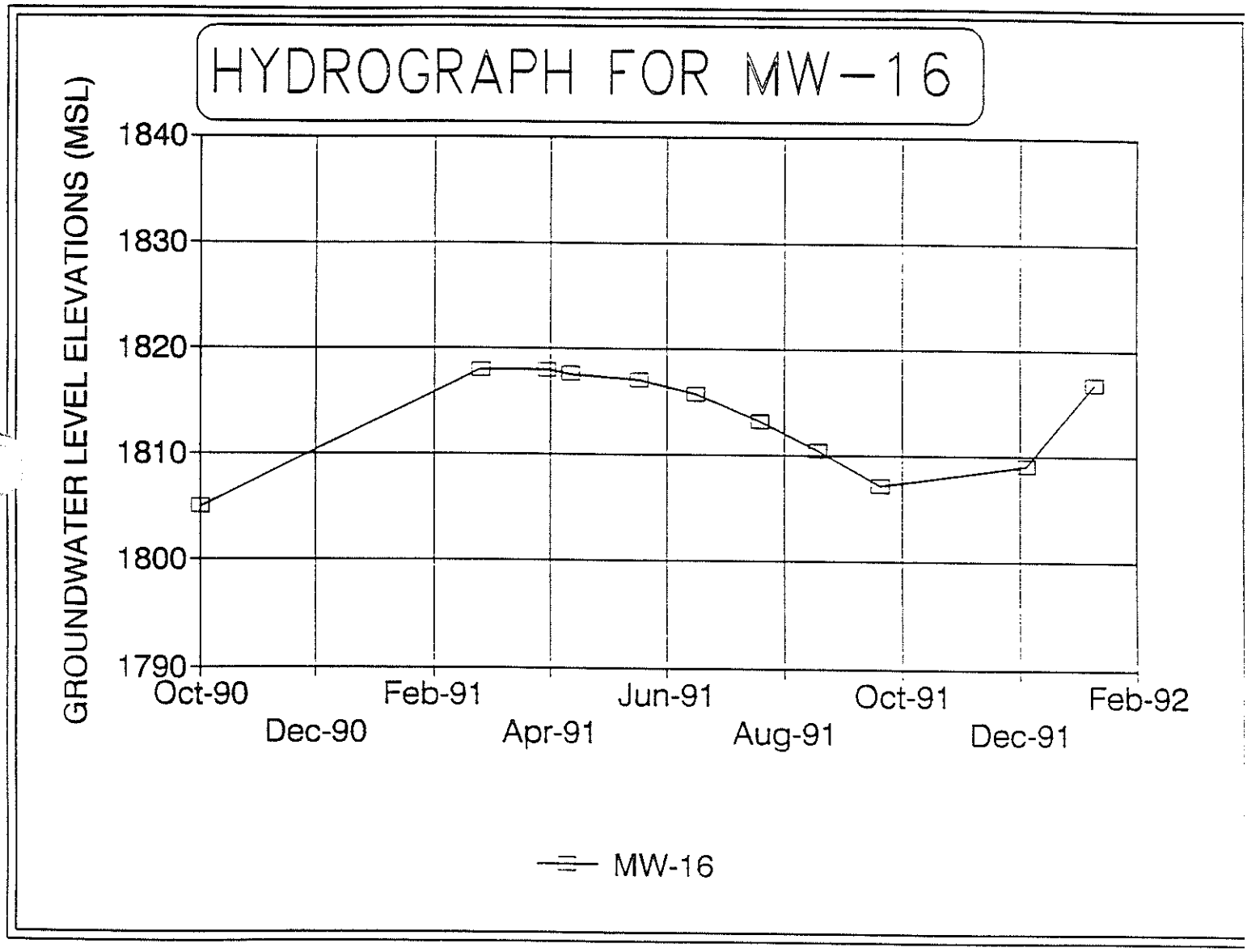
RADIAN CORPORATION



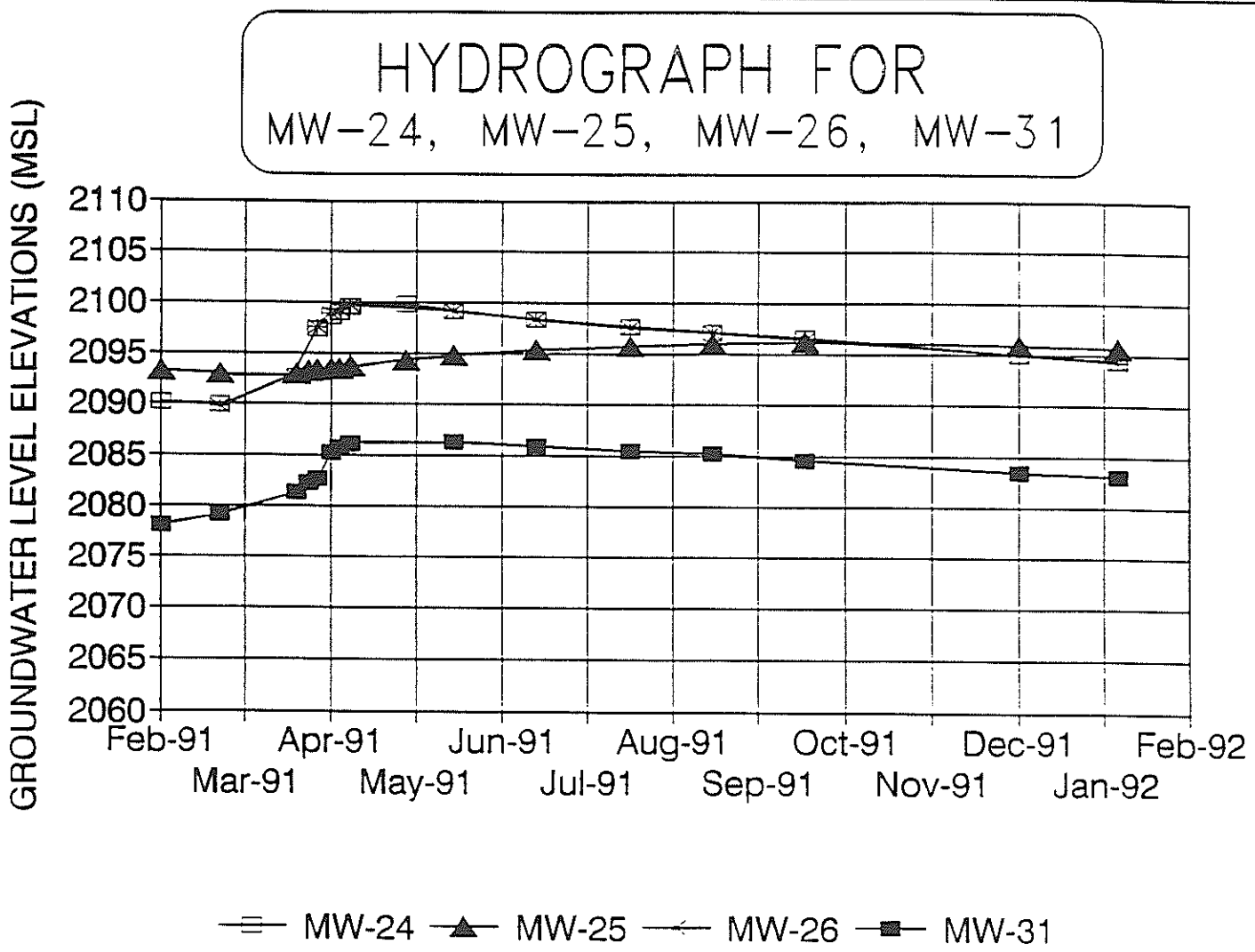
RADIAN CORPORATION



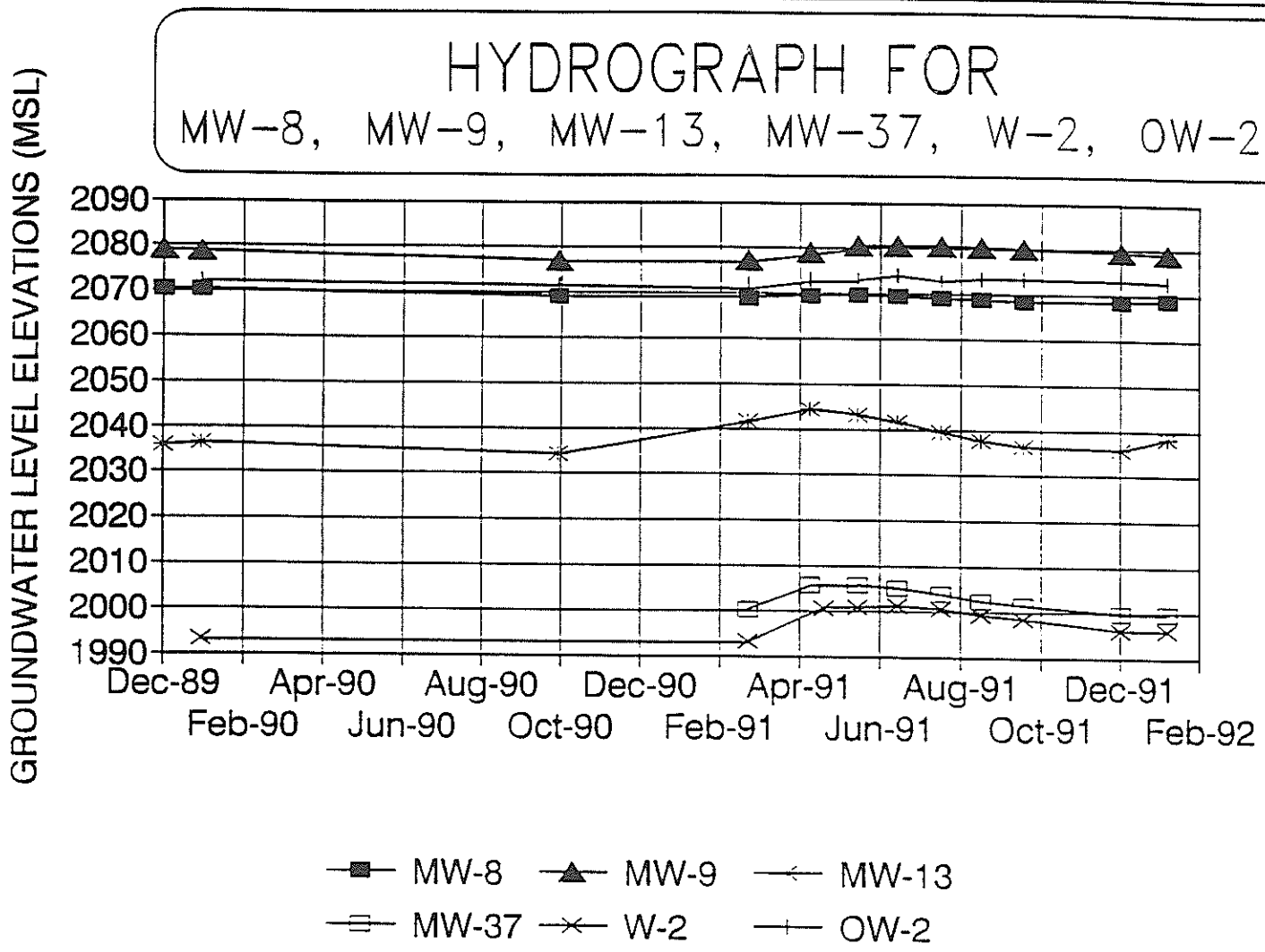
RADIAN CORPORATION



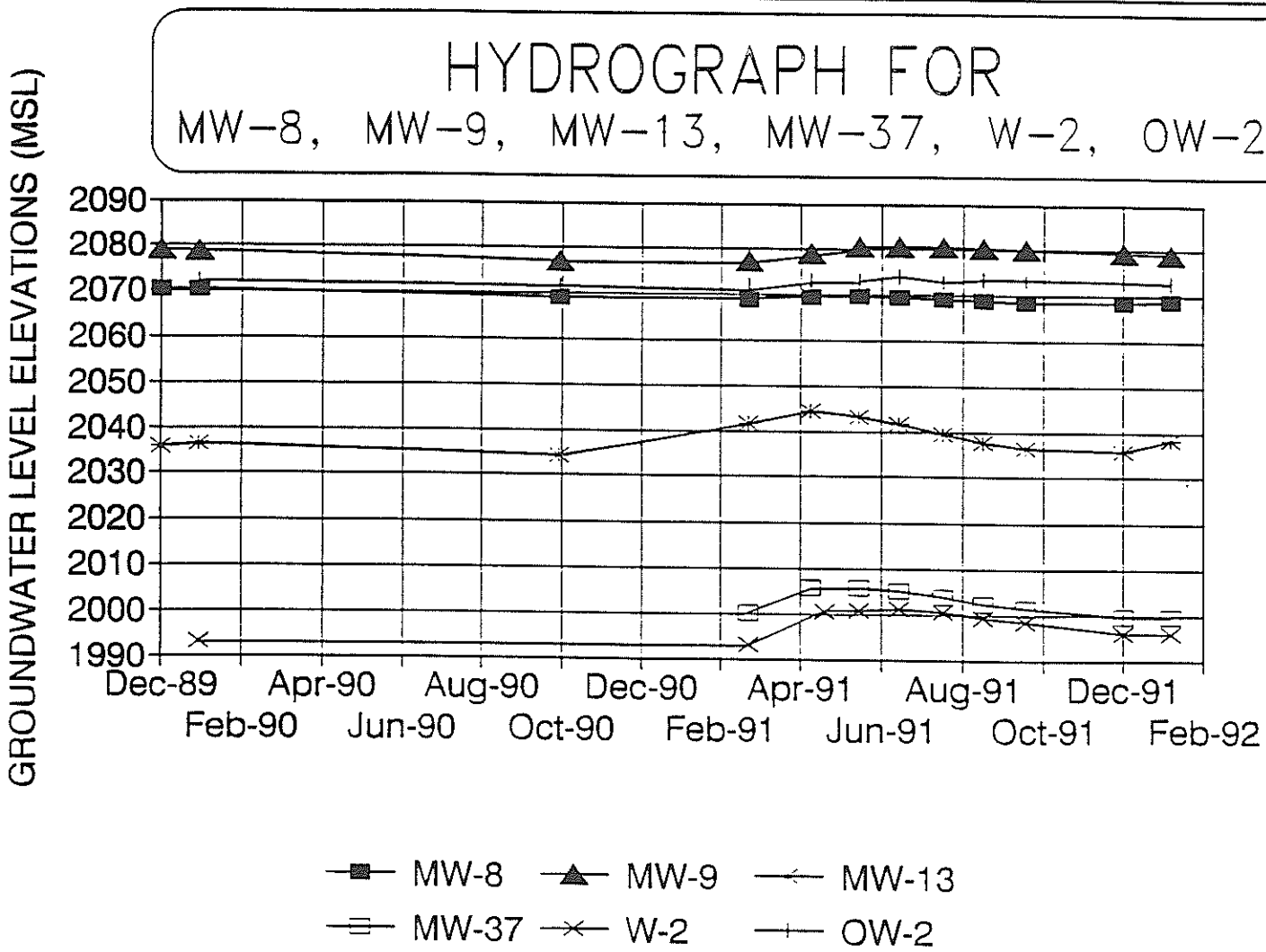
RADIAN CORPORATION



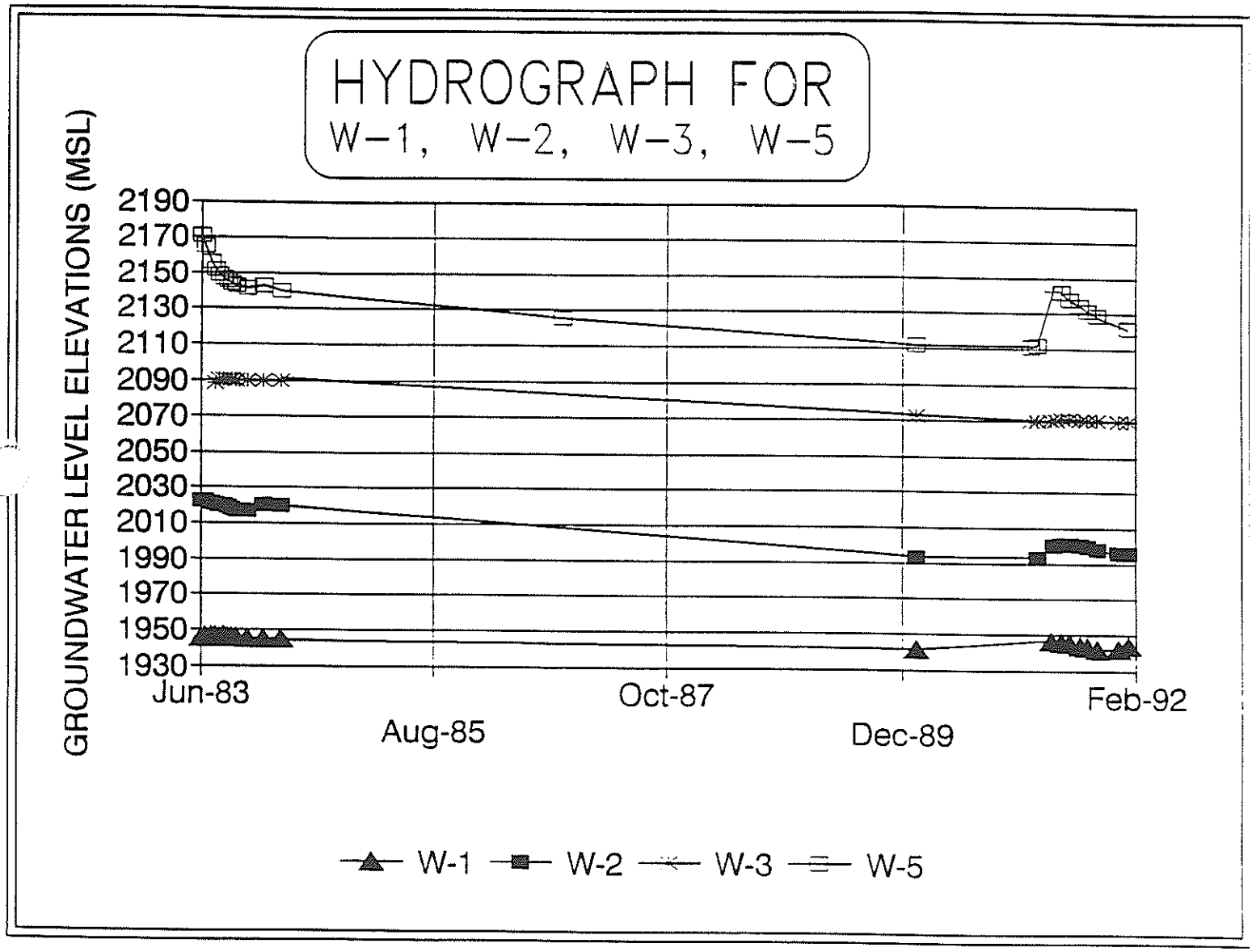
RADIAN CORPORATION



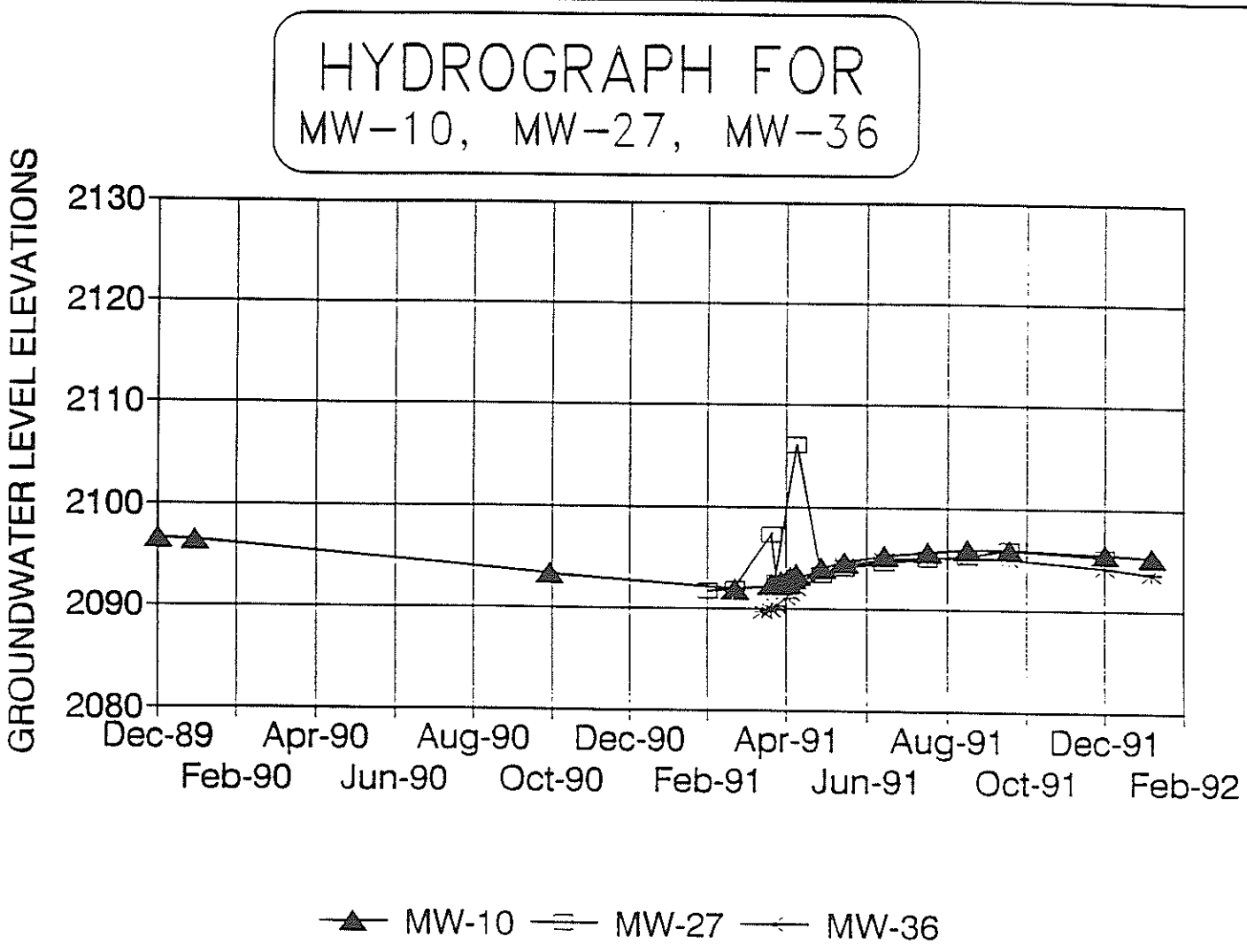
RADIAN CORPORATION



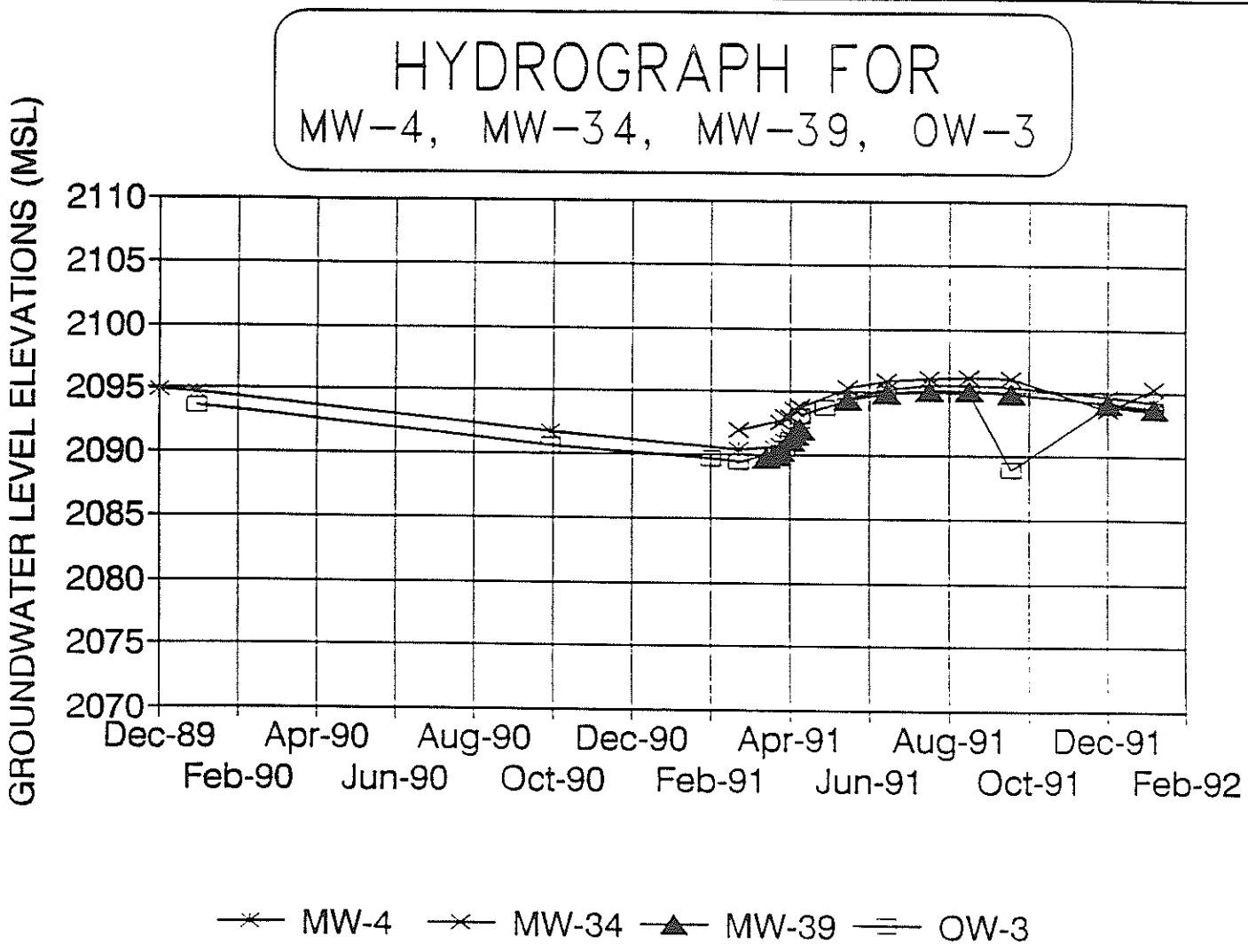
RADIAN CORPORATION



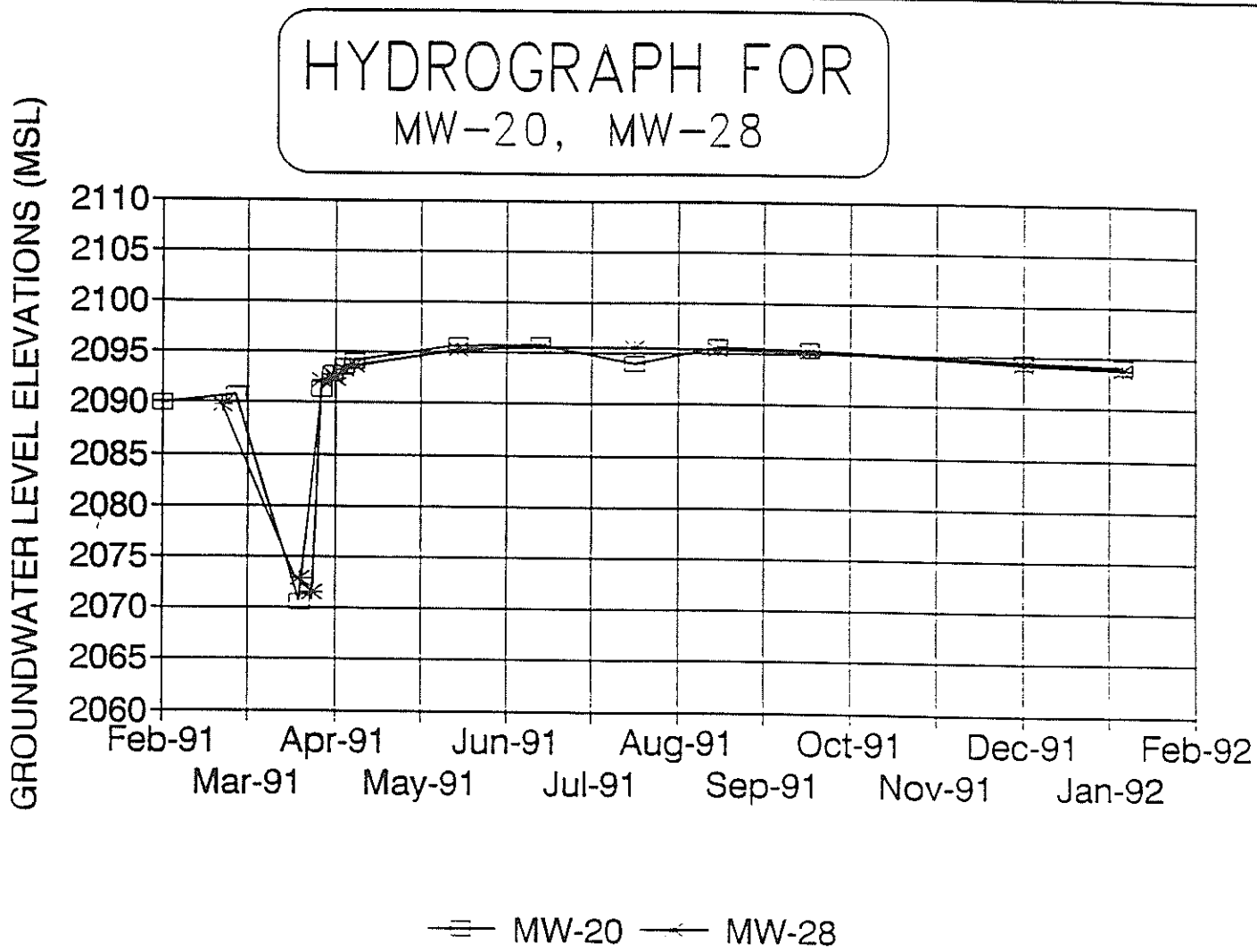
RADIAN CORPORATION



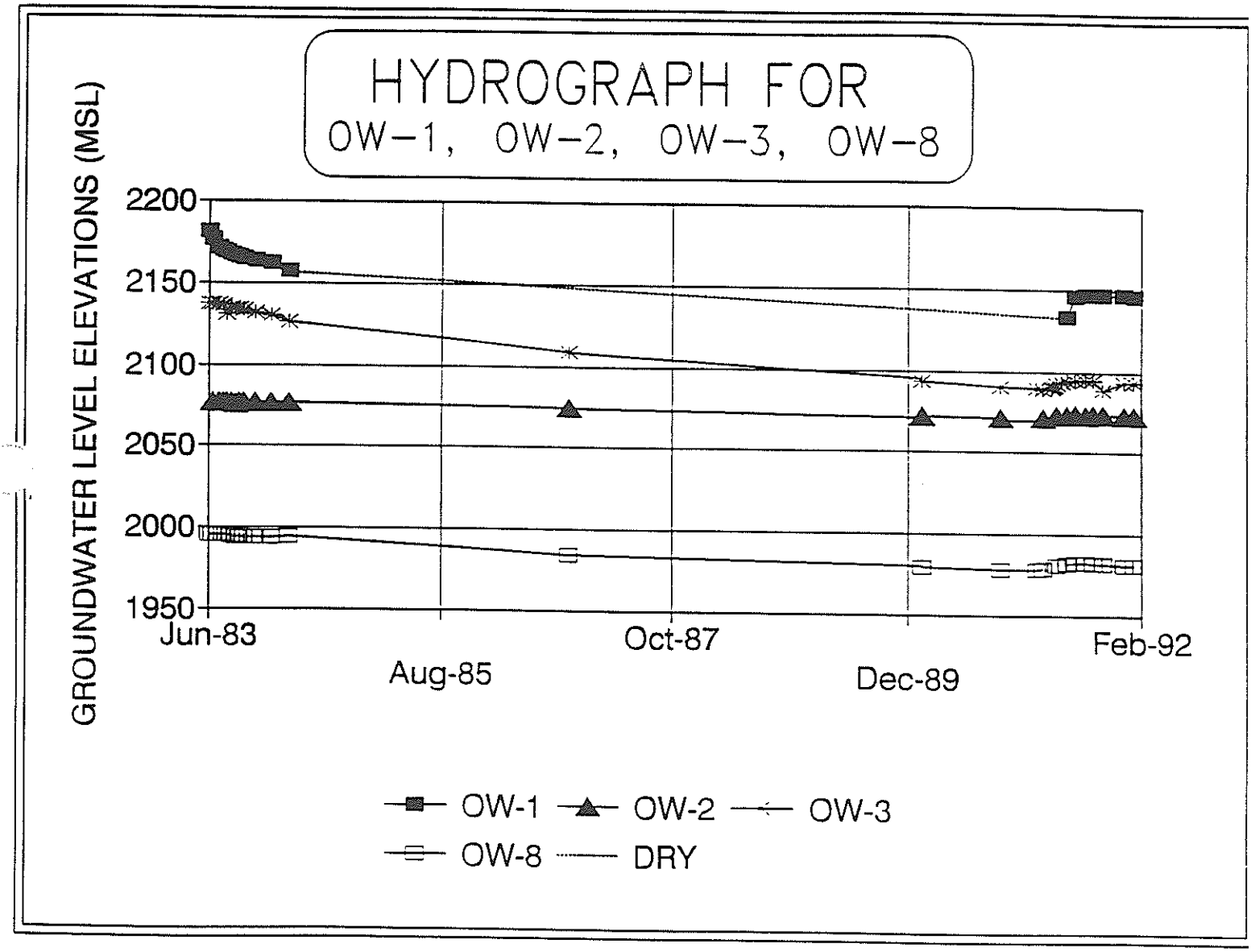
RADIAN CORPORATION



RADIAN CORPORATION



RADIAN CORPORATION



RADIAN CORPORATION

APPENDIX F

LABORATORY RESULTS FOR SOIL VAPOR, SOIL, AND GROUNDWATER

Table F-1

Lockheed Beaumont Soil Vapor Samples from 1990 and 1991

DATE	11/06/90	11/06/90	11/06/90	11/06/90	11/06/90	11/06/90	11/06/90	11/06/90	11/07/90	11/07/90	11/07/90	11/07/90	11/07/90	11/07/90
LOCATION	FS-2	FS-2	FS-2	FS-2		FS-2	FS-2	FS-2	FS-2	FS-2	FS-1	FS-1	FS-1	FS-1
CONTROL #	L2100	L2101	L2102	L2103	L2104	L2105	L2106	L2107	L2108	L2109	L2110	L2111	L2112	L2113
SAMPLING METHOD	SVP	DHF	DHF	SVP		DHF	SVP	SVP	DHF	DHF	SVP	DHF	SVP	SVP
DEPTH (IN FEET)	3.5	7	9	15		18	36	36	39.3	50	4	7	VOID	14.5
QA/QC					FIELD BLANK		FIELD DUPLICATE	FIELD DUPLICATE						
LAB RUN #														
1,1-DCA	0.32	1.39	0.65											
1,1-DCE			INT			INT	INT	INT			4.07	0.78	VOID	21.9
T,1,2-DCE													VOID	0.21
1,1,1-TCA	92.7	0.79	6.41	160.3		19.48	0.84	0.15			152	11.5	VOID	374
1,2-DCA	89.9	1.16	10.5	2.28		36.15	0.93	0.14			56.3	19.9	VOID	252
PCE	1.04										2.41	0.6	VOID	15.6
1,1,2-TCA													VOID	
TCE													VOID	
1,1,2,2-PCA													VOID	
BENZENE													VOID	
TOLUENE													VOID	
P-XYLENE													VOID	
O-XYLENE													VOID	
TOTAL VOC'S	183.96	3.34	17.56	162.58	0.00	55.63	1.77	0.29	0.00	0.00	214.78	32.78	0.00	663.71
STEADY FLUX														
MAX OVA														

LEGEND
DHF - DOWN HOLE FLUX - SWEEP AIR VARIED
MDHF - MODIFIED DOWN HOLE FLUX - NO SWEEP AIR INTRODUCED INTO CHAMBER,PULLED CA. 1 MINUTE
SVP - SOIL VAPOR PROBE
SF - SURFACE FLUX
DSF - DISTURBED SURFACE FLUX

Table F-1

(Continued)

IE	11/07/90	11/07/90	11/08/90	11/08/90	11/08/90	11/08/90	11/08/90	11/08/90	11/08/90	11/08/90	11/09/90	11/09/90	11/09/90	11/09/90	11/09/90
CATION	FS-1	FS-1	FS-1	FS-1	FS-1	FS-1	FS-1	FS-1	FS-1	FS-1	FS-3	FS-3	FS-3	FS-3	FS-3
NTROL #	L2114	L2115	L2116	L2117	L2118	L2119	L2120	L2121	L2122	L2123	L2176	L2177	L2178	L2179	L2180
MPLING METHOD	DHF	DHF	SVP	SVP	DHF	SVP	DHF	DHF	DHF	DHF	SVP	DHF	SVP	SVP	SVP
PTH (IN FEET)	19.5	19.5	37	37	49.5	62.5	62.5	62.5	89.5		7	7.5	15	35	50
/QC										EQUIPMENT BLANK					
B RUN #															
1-DCA			0.85										1.27	1.6	7.04
1-DCE	1.25	??????	126	VOID	94.3	VOID	36.4	61.1			126	0.64	505	602	
1,2-DCE				VOID		VOID		3.26				0.42			
1,1-TCA	29.5		1582	VOID	1320	VOID	160	288	3.09	0.41	1280	2.02	3450	3470	8803
2-DCA	26.9		1271	VOID	1628	VOID	602								
E	0.58		81.1	VOID	48.5	VOID	5.87	623	419	0.36	6.99	0.89	71.6	70.4	430
1,2-TCA				VOID		VOID		0.1							2.43
E				VOID		VOID		410	114	16.6	448	14.6	2170	2380	6899
1,2,2-PCA				VOID		VOID					1.58	5.37	6.43	4.03	4.03
NZENE				VOID		VOID									
LUENE				VOID		VOID									
XYLENE				VOID		VOID									
XYLENE				VOID		VOID									
TAL VOC'S	58.23	0.00	3060.95	0.00	3090.80	0.00	804.27	1385.46	536.09	17.37	1862.57	23.94	6204.30	6528.03	16145.50
EADY FLUX															
X OVA															

GEND
F - DOWN HOLE
HF - MODIFIED
P - SOIL VAPOR
- SURFACE FL
F - DISTURBED

Table F-1

(Continued)

ATE	11/12/90	11/12/90	11/12/90	11/12/90	11/12/90	11/12/90	11/12/90	11/12/90	11/12/90	11/12/90	11/12/90	11/13/90	11/13/90	11/13/90	11/13/90
OCATION	FS-4			FS-5	FS-6	FS-7	FS-8	FS-9	FS-10	FS-11	FS-12	FS-13	FS-14	FS-15	FS-16
ONTROL #	L2181	L2182	L2183	L2184	L2185	L2186	L2187	L2188	L2189	L2190	L2191	L2192	L2193	L2194	L2195
AMPLING METHOD	SVP	SVP	SVP	SVP	SVP	SVP	SVP	SVP	SVP	SVP	SVP	SVP	SVP	SVP	SVP
EPTH (IN FEET)	7			7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
A/QC		AMBIENT BLANK	EQUIPMENT BLANK												
AB RUN #															
1,1-DCA			ND	ND	ND	ND	ND			1.12					
1,1-DCE	96.2		4.9	58.5	261	71.6	95.8	2.94	1.63	35.8	15.8	1.4	1.3	1.6	1.1
1,2-DCE			ND	ND	ND	ND	ND								
1,1,1-TCA	386		7.89	128	1510	378	370	8.86	4.75	631	131	17.4	11.1	11.8	8.3
1,2-DCA			ND	ND	0.5	ND	ND								
CE	5.96		1.67	3.25	48.3	76.6	15.6		0.99	51.3	4.22	1.9	1.9	3	1.62
1,1,2-TCA			ND	ND	ND	ND	ND								
TCE	398	0.38	77.5	229	1140	318	587	35.6	27.7	781	134	32.5	43.2	65.9	34.2
1,1,2,2-PCA	2.3		1.16	0.84	11	2.69	2.32			1.27	1.93		6.8	0.35	1.25
BENZENE			ND	ND	ND	ND									
TOLUENE			ND	ND	ND	ND									
P-XYLENE			ND	ND	ND	ND									
O-XYLENE			ND	ND	ND	ND									
TOTAL VOC'S	888.46	0.38	93.12	419.59	3390.39	3817.69	1070.72	47.40	35.07	1501.49	286.95	53.20	64.30	82.65	46.47
STEADY FLUX															
MAX OVA															

LEGEND
DHF - DOWN HOLE
MDHF - MODIFIED
SVP - SOIL VAPOR
SF - SURFACE FL
DSF - DISTURBED

Table F-1

(Continued)

E	11/13/90	11/13/90	11/13/90	11/19/90	11/19/90	11/19/90	11/19/90	11/19/90	11/19/90	11/19/90	11/19/90	11/19/90	11/19/90	11/19/90	11/19/90
ATION	FS-17	BETA	BETA	VRW-2			VRW-2	VRW-2	VRW-1			VRW-1	VRW-1	VRW-1	VRW-1
TROL #	L2196	L2202	L2203	L2211	L2212	L2213	L2214	L2215	L2216	L2217	L2218	L2219	L2220	L2221	L2222
PLING METHOD	SVP			MDHF	MDHF	MDHF	MDHF	MDHF	MDHF	MDHF	MDHF	MDHF	MDHF	MDHF	MDHF
TH (IN FEET)	7.0			60			70	80	10			20	30	40	50
QC		AMBIENT BLANK	EQUIPMENT BLANK		FIELD BLANK	AMBIENT BLANK				FIELD BLANK	AMBIENT BLANK				
RUN #															
-DCA				306											
-DCE	8.53			45900	156	129		55500	922	2214	37.9	662	250	4890	9089
,2-DCE															
,1-TCA	28.4			11800	17.4	22.1	6660	8230	176	618	8.55	364	106	2016	2784
-DCA				664			576	561		321					114
	4.5			233	1.33		96	458	14.5	16.9		741	3.36	40.8	200
,2-TCA															
	112	0.62	0.69	23600	214	35.3	14400	18700	1990	3010	22.5	964	655	3800	6530
,2,2-PCA	2.1														
ZENE															
UENE															
YLENE															
YLENE															
AL VOC'S	155.53	0.62	0.69	82503.00	388.73	186.40	21732.00	83449.00	3102.50	6179.90	68.95	2731.00	1014.36	10746.80	18717.00
ADY FLUX															
OVA															

GEND
F - DOWN HOLE
HF - MODIFIED
P - SOIL VAPOR
- SURFACE FL
F - DISTURBED

Table F-1

(Continued)

ATE	11/19/90	11/19/90	12/20/90	12/20/90	12/20/90	12/20/90	12/20/90	12/20/90	12/20/90	12/20/90	12/20/90	12/20/90	12/20/90	12/20/90	12/20/90
OCATION	VRW-1	VRW-1		VRW-3	VRW-3			VRW-3	VRW-3	VRW-3	VRW-3	VRW-3	VRW-3	VRW-3	VRW-3
ONTROL #	L2223	L2224	L2225	L2226	L2227	L2228	L2229	L2230	L2231	L2232	L2233	L2234	L2235	L2236	L2237
AMPLING METHOD	MDHF	MDHF	MDHF	MDHF	MDHF	MDHF	MDHF	MDHF	MDHF	MDHF	MDHF	MDHF	MDHF	MDHF	MDHF
EPTH (IN FEET)	60	70		10	20			30	40	50	60	70	70	80	
A/QC			UHP AIR BLANK			FIELD BLANK	AMBIENT BLANK								FIELD BLANK
AB RUN #															
,1-DCA	49							107	551			1260	2380	7620	
,1-DCE	12400	31209		1100	3080	370	469	8530	50400	11574	14201	282000	381000	764000	771
,1,2-DCE															
,1,1-TCA	3160	8550		4390	11700	51.3	66	15800	69232	15816	9389	55100	68700	84800	61.9
,2-DCA	45.8	2240									355	2680	3980	5440	
CE	165	326		18.6	14.6	2.22		395	1700	117	71.5	500	918	2560	6.4
,1,2-TCA															
CE	7410	21600	12.6	783	2100	99.2	10.3	5222	36600	4917	5186	61400	75000	138000	576
,1,2,2-PCA															
ENZENE															
OLUENE															
-XYLENE															
-XYLENE															
OTAL VOC'S	23229.80	63925.00	12.60	6291.60	16894.60	522.72	545.30	30054.00	158483.00	32424.00	29202.50	402940.00	531978.00	1002420.00	1415.30
TEADY FLUX															
AX OVA															

LEGEND
DHF - DOWN HOLE
MDHF - MODIFIED
SVP - SOIL VAPOR
SF - SURFACE FL
DSF - DISTURBED

Table F-1

(Continued)

E	12/20/90	08/21/91	08/21/91	08/21/91	08/21/91	08/21/91	08/21/91	08/21/91	08/21/91	08/21/91	08/21/90	08/21/91	08/22/91	08/22/91
ATION		SF-1	SF-1	SF-1	SF-1	SF-1	SF-1	SF-2	SF-2	SF-2	SF-2	SB-1	BETA	BETA
TROL #	L2238	L4001	L4002	L4003	L4004	L4005	L4006	L4007	L4008	L4009	L4009	SB-1	L4010	L4011
IPLING METHOD	MDHF		SF	SF	DSF	SVP	SVP	SF	DSF	SVP	SVP			SF
TH (IN FEET)					0.4		4.0		0.4	4.0	4.0			
QC	AMBIENT BLANK	AMBIENT BLANK	EQUIPMENT BLANK			EQUIPMENT BLANK					LAB DUPLICATE	SYRINGE BLANK	AMBIENT BLANK	EQUIPMENT BLANK
RUN #										RUN 1	RUN 2			
-DCA														
-DCE	6	0.30	12.70	5.00	8.70	ND	108.00	1.80	1.80	288.00	283.00	0.80	0.40	0.40
,2-DCE														
,1-TCA	2.3	0.40	0.10	0.90	1.90	0.30	599.00	0.80	1.50	1650.00	1590.00	0.10	0.50	0.40
-DCA														
		0.10	0.03	0.10	0.03	0.10	4.60	ND	0.08	8.30	8.50	0.02	0.10	0.01
,2-TCA														
	17.8	ND	0.10	0.40	1.50	ND	212.00	0.20	0.60	354.00	354.00	0.20	0.10	0.10
,2,2-PCA														
ZENE														
UENE														
YLENE														
YLENE														
AL VOC'S	26.10	0.80	12.93	6.40	12.13	0.40	923.60	2.80	3.98	2300.30	2235.50	1.12	1.10	0.91
ADY FLUX		N/A	0	1.8	0	3	3	1.9	1.6	5	5	N/A	6	6
OVA		N/A	4	3.5	2.9	3	6	2.8	2.2	15	15	N/A	6	6

END
- DOWN HOLE
F - MODIFIED
- SOIL VAPOR
- SURFACE FL
F - DISTURBED

Table F-1

(Continued)

DATE	08/22/91	08/22/91	08/22/91	08/22/91	08/22/91	08/22/91	08/22/91	08/22/91	08/22/91	08/22/91	08/22/91	08/22/91	08/22/91	08/22/91
LOCATION	SF-3	SF-3	SF-3	SF-3	SF-4	SF-4	SF-4	SF-4	SF-4	SF-5	SF-5	SF-5	SF-6	SF-6
CONTROL #	L4012	L4013	L4014	L4015	L4016	L4017	L4018	L4019	L4020	L4021	L4022	L4023	L4024	L4025
SAMPLING METHOD	SF	DSF	SVP	SVP	SF	DSF	DSF	SVP	SVP	SF	DSF	SVP	SF	DSF
DEPTH (IN FEET)				4.5		0.4	0.4	4.5	4.5		0.4	4.0		0.4
QA/QC			EQUIPMENT BLANK				FIELD DUPLICATE		FIELD DUPLICATE					
LAB RUN #														
1,1-DCA														
1,1-DCE	1.20	2.10	0.40	584.00	1.40	5.30	6.20	377.00	341.00	0.60	1.90	377.00	0.40	1.00
T,1,2-DCE														
1,1,1-TCA	0.80	1.40	0.70	442.00	2.40	13.10	12.80	846.00	800.00	1.30	3.70	798.00	0.70	1.00
1,2-DCA														
PCE	0.02	0.08	0.10	3.40	0.06	0.10	0.10	2.90	2.80	0.06	0.04	2.80	0.01	0.01
1,1,2-TCA														
TCE	0.50	1.40	0.30	299.00	0.60	3.50	3.50	131.00	129.00	0.40	1.60	126.00	0.20	1.00
1,1,2,2-PCA														
BENZENE														
TOLUENE														
P-XYLENE														
O-XYLENE														
TOTAL VOC'S	2.52	4.98	1.50	1328.40	4.46	22.00	22.60	1356.90	1272.80	2.36	7.24	1303.80	1.31	3.01
STEADY FLUX	0	0	4	4	1.9	0	2.8	0	0	2.8	1.8	3.5	4	2
MAX OVA	5	4.5	4	13	4.5	3.8	3.5	7	7	3.5	3.5	20	4.5	3.5

LEGEND
DHF - DOWN HOLE
MDHF - MODIFIED
SVP - SOIL VAPOR
SF - SURFACE FL
DSF - DISTURBED

Table F-1

(Continued)

E	08/22/91	08/22/91	08/22/91	08/22/91	08/23/91	08/23/91	08/23/91	08/23/91	08/23/91	08/23/91	08/23/91	08/23/91	08/23/91	08/23/91	08/23/91
ATION	SF-6	SF-7	SF-7	SF-7	BETA	SF-8	SF-8	SF-8	SF-8	SF-8	SF-9	SF-9	SF-9	SF-10	SF-11
TROL #	L4026	L4027	L4028	L4029	L4030	L4031	L4032	L4033	L4034	L4035	L4036	L4037	L4038	L4039	L4040
PLING METHOD	SVP	SF	DSF	SVP	SF	SF	DSF		SVP	SVP	SF	DSF	SVP	SVP	SVP
TH (IN FEET)	4.5		0.4	4.5			0.4			4.5		0.4	4.5	4.5	4.5
QC					EQUIPMENT BLANK			AMBIENT BLANK	EQUIPMENT BLANK						
RUN #															RUN 2
-DCA															
-DCE	430.00	0.70	0.90	245.00	0.40	1.10	0.60	0.40	ND	190.00	0.40	0.40	109.00	50.60	407.00
,2-DCE															
,1-TCA	307.00	0.60	0.80	82.30	0.50	0.20	0.60	0.50	1.00	152.00	0.20	0.20	46.20	22.20	208.00
-DCA	2.80	0.08	0.03	1.20	0.02	ND	0.01	0.03	0.20	3.50	0.03	ND	0.70	0.10	408.00
,2-TCA	234.00	0.50	1.00	154.00	0.30	0.20	0.30	0.10	0.10	395.00	0.10	0.20	59.10	38.20	324.00
,2,2-PCA															
IZENE															
UENE															
YLENE															
YLENE															
AL VOC'S	973.80	1.88	2.73	482.50	1.22	1.50	1.51	1.03	1.30	740.50	0.73	0.80	215.00	111.10	1347.00
ADY FLUX	4	2.8	2.2	0	1.5	0	1.4	N/A	2.5	2.5	1.7	1	2	2.5	2.5
OVA	10	4	3.5	10	3.5	3	2.5	N/A	2.5	7	3.5	1.5	3.5	5	5

END
F - DOWN HOLE
HF - MODIFIED
P - SOIL VAPOR
- SURFACE FL
F - DISTURBED

Table F-1

(Continued)

DATE	08/23/91	08/23/91	08/23/91
LOCATION	SF-12	SF-13	SB-2
CONTROL #	L4141	L4142	SB-2
SAMPLING METHOD	SVP	SVP	
DEPTH (IN FEET)	4.5	4.5	
QA/QC			
LAB RUN #		NOT RUN	SYRINGE BLANK
1,1-DCA			
1,1-DCE	637.00	VOID	13.80
T,1,2-DCE		VOID	
1,1,1-TCA	5557.00	VOID	0.20
1,2-DCA		VOID	
PCE	3.10	VOID	0.04
1,1,2-TCA		VOID	
TCE	227.00	VOID	0.10
1,1,2,2-PCA		VOID	
BENZENE		VOID	
TOLUENE		VOID	
P-XYLENE		VOID	
O-XYLENE		VOID	
TOTAL VOC'S	6424.10	0.00	14.14
STEADY FLUX	2.5	VOID	N/A
MAX OVA	6	VOID	N/A

LEGEND
DHF - DOWN HOLE
MDHF - MODIFIED
SVP - SOIL VAPOR
SF - SURFACE FL
DSF - DISTURBED

SOIL ANALYSES FOR VOLATILES AND SEMI-VOLATILES AT LOCKHEED/BEAUMONT SITE I

as of 2/1/91

Boring/Well/Pit Location	Depth (Feet)	Sample No.	Analyses Performed	Anything Detected(Y/N)	Remarks
Trench H	5	LO-FS10-1	8240.8270	N	
Trench(MNP)	3	LO-FS10-2	8240.8270	N	
Trench C	4	LO-FS10-3	8240.8270	Y	2-butanone @ 34000
Boring FS1	4	L2126	8240	N	
Boring FS1	14.5	L2128	8010	N	
Boring FS1	15	L2135	8010	N	
Boring FS1	33.5	L2130	8010	N	
Boring FS1	51	L2132	8010	N	
Boring FS1	74.5	L2136	8010	N	
Boring FS1	99.5	L2137	8010	N	Below The W.Table
Boring FS2	4	L2127	8240	N	Rock. Mot. Washout Area
Boring FS2	4.5	L2134	8240	N	Rock. Mot. Washout Area
Boring FS2	14.5	L2129	8010	N	Rock. Mot. Washout Area
Boring FS2	34	L2131	8010	N	Rock. Mot. Washout Area
Boring FS2	51	L2133	8010	N	Rock. Mot. Washout Area
VM-1	60	L2240	8010	N	
VM-1	80	L2241	8010	Y	1.2-DCA @20000. TCE @12000 1.1.1-TCA @3000
MW26	75	L2246	8010	Y	1.2-DCA @10000. 1.1-DCE @13000. Meth.Cl. @7000. TCE @19000
MW26	85	L2247	8010	N	

NOTES:

With the exception of the data for FS-2 boring, all locations are in the Burn Pit area.

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	IB-1		IB-2		LOWER POND		LOWER POND	
Sample Control # :	L2248		L2249		L2031		LOWER POND	
Date Sampled :	2/01/91		2/05/91		10/23/90		12/21/90	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	3.9	(1.0)	ND	(1.0)	32 C	(0.20)	ND	(0.20)
1,1,2,2-Tetrachloroethane	ND	(1.0)	ND	(1.0)	ND	(0.15)	ND	(0.15)
1,1,2-Trichloroethane	ND	(1.0)	ND	(1.0)	ND	(0.20)	ND	(0.20)
1,1-Dichloroethane	ND	(1.0)	ND	(1.0)	7.2 C	(0.50)	ND	(0.50)
1,1-Dichloroethene	7.8	(1.0)	ND	(1.0)	93 DC	(0.40)	ND	(0.20)
1,2-Dichloroethane	ND	(1.0)	ND	(1.0)	1.2 C	(0.10)	ND	(0.10)
Chloroform	ND	(1.0)	ND	(1.0)	ND	(0.10)	ND	(0.10)
Cis-1,2-Dichloroethylene	NA		NA		NA		ND	(0.20)
Methylene Chloride	2.4	(1.0)	ND	(1.0)	ND	(0.40)	0.55 *C	(0.40)
Tetrachloroethene	ND	(1.0)	ND	(1.0)	0.15 C@	(0.10)	ND	(0.10)
Trans-1,2-Dichloroethylene	ND	(1.0)	ND	(1.0)	6.9 X	(0.20)	ND	(0.20)
Trichloroethene	15	(1.0)	ND	(1.0)	53 DC	(0.40)	ND	(0.20)
Trichlorofluoromethane	ND	(10)	ND	(10)	ND	(0.20)	ND	(0.20)
VOC Total	29	N/A	ND	N/A	190	N/A	0.55	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	LOWERPOND		MW-01		MW-01		MW-01	
Sample Control # :	L5005		MW-1		L2001		L2037	
Date Sampled :	9/16/91		12/08/89		10/24/90		1/02/91	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(0.27)	52 C	(2.0)	120 C	(5.0)	140	(2.0)
1,1,2,2-Tetrachloroethane	ND	(0.30)	ND	(1.5)	ND	(3.8)	ND	(2.0)
1,1,2-Trichloroethane	ND	(0.20)	ND	(2.0)	ND	(5.0)	ND	(2.0)
1,1-Dichloroethane	ND	(0.50)	55 C	(5.0)	14 Q@	(12)	17	(2.0)
1,1-Dichloroethene	ND	(0.70)	97 C	(2.0)	320 C	(5.0)	310Y	(2.0)
1,2-Dichloroethane	ND	(0.15)	3.0 *C	(1.0)	6.9 Q@	(2.5)	ND	(2.0)
Chloroform	ND	(0.15)	ND	(1.0)	ND	(2.5)	ND	(2.0)
Cis-1,2-Dichloroethylene	NA		ND	(2.0)	NA		NA	
Methylene Chloride	ND	(0.40)	ND	(4.0)	ND	(10)	ND	(2.0)
Tetrachloroethene	ND	(0.10)	ND	(1.0)	ND	(2.5)	ND	(2.0)
Trans-1,2-Dichloroethylene	NA		ND	(2.0)	ND	(5.0)	ND	(2.0)
Trichloroethene	ND	(0.20)	180 C	(2.0)	450 C	(5.0)	450Y	(2.0)
Trichlorofluoromethane	ND	(0.27)	ND	(2.0)	ND	(5.0)	ND	(20)
VOC Total	ND	N/A	390	N/A	910	N/A	920	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-01		MW-02		MW-02		MW-02	
Sample Control # :	L5041		MW-2		L2002		L2003	
Date Sampled :	9/27/91		12/07/89		10/24/90		10/24/90	
QC Type :					FDA		FDB	
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	200 C	(14)	450 C	(20)	310 C	(5.0)	310 C	(20)
1,1,2,2-Tetrachloroethane	ND	(15)	ND	(15)	ND	(3.8)	ND	(15)
1,1,2-Trichloroethane	ND	(10)	ND	(20)	ND	(5.0)	ND	(20)
1,1-Dichloroethane	ND	(25)	ND	(50)	30 Q@	(12)	ND	(50)
1,1-Dichloroethene	220 C	(35)	1100 C	(20)	1500 DC	(50)	1200 C	(20)
1,2-Dichloroethane	ND	(7.5)	ND	(10)	27 C	(2.5)	ND	(10)
Chloroform	ND	(7.5)	ND	(10)	ND	(2.5)	ND	(10)
Cis-1,2-Dichloroethylene	NA		ND	(20)	NA		NA	
Methylene Chloride	ND	(20)	ND	(40)	ND	(10)	ND	(40)
Tetrachloroethene	ND	(5.0)	ND	(10)	ND	(2.5)	ND	(10)
Trans-1,2-Dichloroethylene	NA		ND	(20)	ND	(5.0)	ND	(20)
Trichloroethene	500 C	(10)	530 C	(20)	530 C	(5.0)	590 C	(20)
Trichlorofluoromethane	ND	(14)	ND	(20)	ND	(5.0)	ND	(20)
VOC Total	920	N/A	2100	N/A	2400	N/A	2100	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-02		MW-02		MW-03		MW-03	
Sample Control # :	L5055		L5056		MW-3		MW-3A	
Date Sampled :	10/03/91		10/03/91		12/21/89		12/21/89	
QC Type :	FDA		FDB		FDA		FDB	
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	190 C	(6.8)	170 C	(6.8)	ND	(0.20)	ND	(0.20)
1,1,2,2-Tetrachloroethane	ND	(7.5)	ND	(7.5)	ND	(0.15)	ND	(0.15)
1,1,2-Trichloroethane	ND	(5.0)	ND	(5.0)	ND	(0.20)	ND	(0.20)
1,1-Dichloroethane	ND	(12)	ND	(12)	ND	(0.50)	ND	(0.50)
1,1-Dichloroethene	550 C	(18)	570 C	(18)	ND	(0.20)	ND	(0.20)
1,2-Dichloroethane	24 C	(3.8)	22 C	(3.8)	ND	(0.10)	ND	(0.10)
Chloroform	ND	(3.8)	ND	(3.8)	ND	(0.10)	ND	(0.10)
Cis-1,2-Dichloroethylene	NA		NA		ND	(0.20)	ND	(0.20)
Methylene Chloride	11 M	(10)	15 M	(10)	ND	(0.40)	ND	(0.40)
Tetrachloroethene	ND	(2.5)	ND	(2.5)	ND	(0.10)	ND	(0.10)
Trans-1,2-Dichloroethylene	NA		NA		ND	(0.20)	ND	(0.20)
Trichloroethene	330 C	(5.0)	340 C	(5.0)	ND	(0.20)	ND	(0.20)
Trichlorofluoromethane	ND	(6.8)	ND	(6.8)	ND	(0.20)	ND	(0.20)
VOC Total	1100	N/A	1100	N/A	ND	N/A	ND	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-03		MW-03		MW-03		MW-04	
Sample Control # :	L2004		L5012		L5013		MW-4	
Date Sampled :	10/16/90		9/18/91		9/18/91		12/20/89	
QC Type :			FDA		FDB			
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(0.20)	ND	(0.27)	ND	(0.27)	50 C	(2.0)
1,1,2,2-Tetrachloroethane	ND	(0.15)	ND	(0.30)	ND	(0.30)	ND	(1.5)
1,1,2-Trichloroethane	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(2.0)
1,1-Dichloroethane	ND	(0.50)	ND	(0.50)	ND	(0.50)	5.1 *C	(5.0)
1,1-Dichloroethene	0.45 Q@	(0.20)	ND	(0.70)	ND	(0.70)	200 C	(2.0)
1,2-Dichloroethane	ND	(0.10)	ND	(0.15)	ND	(0.15)	ND	(1.0)
Chloroform	ND	(0.10)	ND	(0.15)	ND	(0.15)	5.9 C	(1.0)
Cis-1,2-Dichloroethylene	NA		NA		NA		ND	(2.0)
Methylene Chloride	ND	(0.40)	ND	(0.40)	ND	(0.40)	ND	(4.0)
Tetrachloroethene	ND	(0.10)	ND	(0.10)	ND	(0.10)	ND	(1.0)
Trans-1,2-Dichloroethylene	ND	(0.20)	NA		NA		ND	(2.0)
Trichloroethene	0.20X@T	(0.20)	0.73 C	(0.20)	0.41 C	(0.20)	240 C	(2.0)
Trichlorofluoromethane	ND	(0.20)	ND	(0.27)	ND	(0.27)	ND	(2.0)
VOC Total	0.65	N/A	0.73	N/A	0.41	N/A	500	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-04		MW-04		MW-05		MW-05	
Sample Control # :	L2005		L5038		MW-5		L2006	
Date Sampled :	10/24/90		9/26/91		12/20/89		10/23/90	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	43 C@	(10)	34 C	(2.7)	ND	(1.0)	27 C	(1.0)
1,1,2,2-Tetrachloroethane	ND	(7.5)	ND	(3.0)	ND	(0.75)	ND	(0.75)
1,1,2-Trichloroethane	ND	(10)	ND	(2.0)	ND	(1.0)	ND	(1.0)
1,1-Dichloroethane	ND	(25)	ND	(5.0)	6.2 *C	(2.5)	ND	(2.5)
1,1-Dichloroethene	290 C	(10)	120 C	(7.0)	160 CQ	(1.0)	110 C	(1.0)
1,2-Dichloroethane	ND	(5.0)	ND	(1.5)	ND	(0.50)	ND	(0.50)
Chloroform	ND	(5.0)	9.8 C	(1.5)	3.3 C	(0.50)	2.9 X	(0.50)
Cis-1,2-Dichloroethylene	NA		NA		ND	(1.0)	NA	
Methylene Chloride	ND	(20)	ND	(4.0)	ND	(2.0)	ND	(2.0)
Tetrachloroethene	ND	(5.0)	ND	(1.0)	ND	(0.50)	ND	(0.50)
Trans-1,2-Dichloroethylene	ND	(10)	NA		ND	(1.0)	ND	(1.0)
Trichloroethene	280 C	(10)	170 C	(2.0)	160 CQ	(1.0)	63 C	(1.0)
Trichlorofluoromethane	ND	(10)	ND	(2.7)	ND	(1.0)	ND	(1.0)
VOC Total	610	N/A	330	N/A	330	N/A	200	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calibration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-05		MW-06		MW-06		MW-06	
Sample Control # :	L5033		MW-6		L2007		L5036	
Date Sampled :	9/25/91		12/13/89		10/19/90		9/26/91	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	45 C	(6.8)	ND	(0.20)	ND	(0.20)	15 C	(1.4)
1,1,2,2-Tetrachloroethane	ND	(7.5)	ND	(0.15)	ND	(0.15)	ND	(1.5)
1,1,2-Trichloroethane	ND	(5.0)	ND	(0.20)	ND	(0.20)	ND	(1.0)
1,1-Dichloroethane	ND	(12)	0.53 *C	(0.50)	ND	(0.50)	ND	(2.5)
1,1-Dichloroethene	180 C	(18)	14 C	(0.20)	1.7 C	(0.20)	28 C	(3.5)
1,2-Dichloroethane	ND	(3.8)	ND	(0.10)	ND	(0.10)	ND	(0.75)
Chloroform	ND	(3.8)	0.19 *C	(0.10)	ND	(0.10)	ND	(0.75)
Cis-1,2-Dichloroethylene	NA		ND	(0.20)	NA		NA	
Methylene Chloride	ND	(10)	ND	(0.40)	ND	(0.40)	3.0 M	(2.0)
Tetrachloroethene	ND	(2.5)	ND	(0.10)	ND	(0.10)	ND	(0.50)
Trans-1,2-Dichloroethylene	NA		ND	(0.20)	ND	(0.20)	NA	
Trichloroethene	200 C	(5.0)	13 C	(0.20)	1.3 C	(0.20)	42 C	(1.0)
Trichlorofluoromethane	ND	(6.8)	ND	(0.20)	ND	(0.20)	ND	(1.4)
VOC Total	430	N/A	28	N/A	3.0	N/A	88	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-07		MW-07		MW-07		MW-08	
Sample Control # :	MW-7 1		L2008		L5040		MW-8	
Date Sampled :	12/18/89		10/23/90		9/27/91		12/06/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	12 C	(0.20)	30 C	(0.20)	87 C	(6.8)	ND	(0.20)
1,1,2,2-Tetrachloroethane	ND	(0.15)	ND	(0.15)	ND	(7.5)	ND	(0.15)
1,1,2-Trichloroethane	ND	(0.20)	ND	(0.20)	ND	(5.0)	ND	(0.20)
1,1-Dichloroethane	1.6 *C	(0.50)	3.1 C	(0.50)	ND	(12)	ND	(0.50)
1,1-Dichloroethene	16 C	(0.20)	36 DC	(2.0)	100 C	(18)	ND	(0.20)
1,2-Dichloroethane	ND	(0.10)	7.0 C	(0.10)	ND	(3.8)	ND	(0.10)
Chloroform	0.21 *C	(0.10)	0.71 X	(0.10)	ND	(3.8)	ND	(0.10)
Cis-1,2-Dichloroethylene	0.41 *C	(0.20)	NA		NA		ND	(0.20)
Methylene Chloride	ND	(0.40)	ND	(0.40)	ND	(10)	ND	(0.40)
Tetrachloroethene	ND	(0.10)	0.33 C@	(0.10)	ND	(2.5)	ND	(0.10)
Trans-1,2-Dichloroethylene	ND	(0.20)	1.4 X	(0.20)	NA		ND	(0.20)
Trichloroethene	31 C	(0.20)	46 DC	(2.0)	280 C	(5.0)	0.22 *C	(0.20)
Trichlorofluoromethane	ND	(0.20)	ND	(0.20)	ND	(6.8)	ND	(0.20)
VOC Total	61	N/A	120	N/A	470	N/A	0.22	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second colum or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second colum

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calibration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-08		MW-08		MW-09		MW-09	
Sample Control # :	L2009		L5002		MW-9		L2010	
Date Sampled :	10/18/90		9/16/91		12/05/89		10/22/90	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(0.20)	ND	(0.27)	0.23 *C	(0.20)	ND	(0.20)
1,1,2,2-Tetrachloroethane	ND	(0.15)	ND	(0.30)	ND	(0.15)	ND	(0.15)
1,1,2-Trichloroethane	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
1,1-Dichloroethane	ND	(0.50)	ND	(0.50)	ND	(0.50)	ND	(0.50)
1,1-Dichloroethene	ND	(0.20)	ND	(0.70)	ND	(0.20)	ND	(0.20)
1,2-Dichloroethane	ND	(0.10)	ND	(0.15)	ND	(0.10)	ND	(0.10)
Chloroform	ND	(0.10)	ND	(0.15)	ND	(0.10)	ND	(0.10)
Cis-1,2-Dichloroethylene	NA		NA		ND	(0.20)	NA	
Methylene Chloride	ND	(0.40)	ND	(0.40)	ND	(0.40)	ND	(0.40)
Tetrachloroethene	ND	(0.10)	ND	(0.10)	ND	(0.10)	ND	(0.10)
Trans-1,2-Dichloroethylene	ND	(0.20)	NA		ND	(0.20)	ND	(0.20)
Trichloroethene	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Trichlorofluoromethane	ND	(0.20)	ND	(0.27)	ND	(0.20)	ND	(0.20)
VOC Total	ND	N/A	ND	N/A	0.23	N/A	ND	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-09		MW-10		MW-10		MW-10	
Sample Control # :	L5003		MW-10		L2011		L5029	
Date Sampled :	9/16/91		12/12/89		10/17/90		9/24/91	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(0.27)	ND	(0.20)	ND	(0.20)	ND	(0.27)
1,1,2,2-Tetrachloroethane	ND	(0.30)	ND	(0.15)	ND	(0.15)	ND	(0.30)
1,1,2-Trichloroethane	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
1,1-Dichloroethane	ND	(0.50)	ND	(0.50)	ND	(0.50)	ND	(0.50)
1,1-Dichloroethene	ND	(0.70)	ND	(0.20)	ND	(0.20)	ND	(0.70)
1,2-Dichloroethane	ND	(0.15)	ND	(0.10)	0.12 X@T	(0.10)	ND	(0.15)
Chloroform	ND	(0.15)	ND	(0.10)	ND	(0.10)	5.5 C	(0.15)
Cis-1,2-Dichloroethylene	NA		ND	(0.20)	NA		NA	
Methylene Chloride	ND	(0.40)	ND	(0.40)	ND	(0.40)	ND	(0.40)
Tetrachloroethene	ND	(0.10)	ND	(0.10)	ND	(0.10)	ND	(0.10)
Trans-1,2-Dichloroethylene	NA		ND	(0.20)	ND	(0.20)	NA	
Trichloroethene	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Trichlorofluoromethane	ND	(0.27)	ND	(0.20)	ND	(0.20)	ND	(0.27)
VOC Total	ND	N/A	ND	N/A	0.12	N/A	5.5	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-11		MW-11		MW-11		MW-12	
Sample Control # :	MW-11		L2012		L5004		MW-12	
Date Sampled :	12/08/89		10/17/90		9/16/91		12/12/89	
QC Type :							FDA	
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(0.20)	ND	(0.20)	ND	(0.27)	0.61 *C	(0.20)
1,1,2,2-Tetrachloroethane	ND	(0.15)	ND	(0.15)	ND	(0.30)	ND	(0.15)
1,1,2-Trichloroethane	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
1,1-Dichloroethane	ND	(0.50)	ND	(0.50)	ND	(0.50)	ND	(0.50)
1,1-Dichloroethene	ND	(0.20)	ND	(0.20)	ND	(0.70)	ND	(0.20)
1,2-Dichloroethane	ND	(0.10)	ND	(0.10)	ND	(0.15)	ND	(0.10)
Chloroform	ND	(0.10)	ND	(0.10)	ND	(0.15)	ND	(0.10)
Cis-1,2-Dichloroethylene	ND	(0.20)	NA		NA		ND	(0.20)
Methylene Chloride	ND	(0.40)	ND	(0.40)	ND	(0.40)	ND	(0.40)
Tetrachloroethene	ND	(0.10)	ND	(0.10)	ND	(0.10)	ND	(0.10)
Trans-1,2-Dichloroethylene	ND	(0.20)	ND	(0.20)	NA		ND	(0.20)
Trichloroethene	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Trichlorofluoromethane	ND	(0.20)	ND	(0.20)	ND	(0.27)	ND	(0.20)
VOC Total	ND	N/A	ND	N/A	ND	N/A	0.61	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second colum or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second colum

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-12		MW-12		MW-12		MW-13	
Sample Control # :	MW-12A		L2013		L5007		MW-13	
Date Sampled :	12/12/89		10/18/90		9/17/91		12/09/89	
QC Type :	FDB							
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(0.20)	ND	(0.20)	ND	(0.27)	ND	(0.20)
1,1,2,2-Tetrachloroethane	ND	(0.15)	ND	(0.15)	ND	(0.30)	ND	(0.15)
1,1,2-Trichloroethane	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
1,1-Dichloroethane	ND	(0.50)	ND	(0.50)	ND	(0.50)	ND	(0.50)
1,1-Dichloroethene	ND	(0.20)	ND	(0.20)	ND	(0.70)	ND	(0.20)
1,2-Dichloroethane	ND	(0.10)	ND	(0.10)	ND	(0.15)	ND	(0.10)
Chloroform	ND	(0.10)	ND	(0.10)	ND	(0.15)	ND	(0.10)
Cis-1,2-Dichloroethylene	ND	(0.20)	NA		NA		ND	(0.20)
Methylene Chloride	ND	(0.40)	ND	(0.40)	ND	(0.40)	ND	(0.40)
Tetrachloroethene	ND	(0.10)	ND	(0.10)	ND	(0.10)	ND	(0.10)
Trans-1,2-Dichloroethylene	ND	(0.20)	ND	(0.20)	NA		ND	(0.20)
Trichloroethene	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Trichlorofluoromethane	ND	(0.20)	ND	(0.20)	ND	(0.27)	ND	(0.20)
VOC Total	ND	N/A	ND	N/A	ND	N/A	ND	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-13		MW-13		MW-14		MW-14	
Sample Control # :	L2014		L5008		MW-14		L2015	
Date Sampled :	10/22/90		9/17/91		12/10/89		10/23/90	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(0.20)	ND	(0.27)	0.92 *C	(0.20)	ND	(0.20)
1,1,2,2-Tetrachloroethane	ND	(0.15)	ND	(0.30)	ND	(0.15)	ND	(0.15)
1,1,2-Trichloroethane	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
1,1-Dichloroethane	ND	(0.50)	ND	(0.50)	ND	(0.50)	ND	(0.50)
1,1-Dichloroethene	ND	(0.20)	ND	(0.70)	1.4 C	(0.20)	1.3 C	(0.20)
1,2-Dichloroethane	ND	(0.10)	ND	(0.15)	ND	(0.10)	ND	(0.10)
Chloroform	ND	(0.10)	ND	(0.15)	ND	(0.10)	ND	(0.10)
Cis-1,2-Dichloroethylene	NA		NA		ND	(0.20)	NA	
Methylene Chloride	ND	(0.40)	ND	(0.40)	ND	(0.40)	ND	(0.40)
Tetrachloroethene	ND	(0.10)	ND	(0.10)	ND	(0.10)	ND	(0.10)
Trans-1,2-Dichloroethylene	ND	(0.20)	NA		ND	(0.20)	ND	(0.20)
Trichloroethene	ND	(0.20)	ND	(0.20)	1.4 C	(0.20)	0.67 Q@	(0.20)
Trichlorofluoromethane	ND	(0.20)	ND	(0.27)	ND	(0.20)	ND	(0.20)
VOC Total	ND	N/A	ND	N/A	3.7	N/A	2.0	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-14		MW-15		MW-15		MW-15	
Sample Control # :	L5024		MW-15		L2016		L2017	
Date Sampled :	9/23/91		1/04/90		10/22/90		10/22/90	
QC Type :					FDA		FDB	
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(0.27)	ND	(0.20)	ND	(0.20)	ND	(0.20)
1,1,2,2-Tetrachloroethane	ND	(0.30)	ND	(0.15)	ND	(0.15)	ND	(0.15)
1,1,2-Trichloroethane	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
1,1-Dichloroethane	ND	(0.50)	ND	(0.50)	ND	(0.50)	ND	(0.50)
1,1-Dichloroethene	ND	(0.70)	ND	(0.20)	0.49 X@T	(0.20)	ND	(0.20)
1,2-Dichloroethane	ND	(0.15)	ND	(0.10)	ND	(0.10)	ND	(0.10)
Chloroform	ND	(0.15)	ND	(0.10)	ND	(0.10)	ND	(0.10)
Cis-1,2-Dichloroethylene	NA		ND	(0.20)	NA		NA	
Methylene Chloride	ND	(0.40)	ND	(0.40)	ND	(0.40)	ND	(0.40)
Tetrachloroethene	ND	(0.10)	ND	(0.10)	ND	(0.10)	ND	(0.10)
Trans-1,2-Dichloroethylene	NA		ND	(0.20)	ND	(0.20)	ND	(0.20)
Trichloroethene	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Trichlorofluoromethane	ND	(0.27)	ND	(0.20)	ND	(0.20)	ND	(0.20)
VOC Total	ND	N/A	ND	N/A	0.49	N/A	ND	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-17		MW-17		MW-17		MW-18	
Sample Control # :	MW-17		L2019		L5032		MW-18	
Date Sampled :	12/20/89		10/23/90		9/25/91		12/20/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	3.5 C	(0.20)	5.4 C	(0.20)	8.6 C	(0.27)	0.61 *C	(0.20)
1,1,2,2-Tetrachloroethane	ND	(0.15)	ND	(0.15)	ND	(0.30)	ND	(0.15)
1,1,2-Trichloroethane	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
1,1-Dichloroethane	ND	(0.50)	ND	(0.50)	0.85 C	(0.50)	3.0 C	(0.50)
1,1-Dichloroethene	2.4 C	(0.20)	1.6 C	(0.20)	4.1 C	(0.70)	5.1 C	(0.20)
1,2-Dichloroethane	ND	(0.10)	ND	(0.10)	ND	(0.15)	ND	(0.10)
Chloroform	ND	(0.10)	ND	(0.10)	ND	(0.15)	ND	(0.10)
Cis-1,2-Dichloroethylene	ND	(0.20)	NA		NA		ND	(0.20)
Methylene Chloride	ND	(0.40)	ND	(0.40)	ND	(0.40)	3.6 CB	(0.40)
Tetrachloroethene	ND	(0.10)	ND	(0.10)	ND	(0.10)	ND	(0.10)
Trans-1,2-Dichloroethylene	ND	(0.20)	ND	(0.20)	NA		ND	(0.20)
Trichloroethene	ND	(0.20)	2.1 C	(0.20)	2.3 C	(0.20)	3.8 C	(0.20)
Trichlorofluoromethane	ND	(0.20)	ND	(0.20)	ND	(0.27)	ND	(0.20)
VOC Total	5.9	N/A	9.1	N/A	16	N/A	16	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second colum or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second colum

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-15		MW-16		MW-16		MW-16	
Sample Control # :	L5022		MW-16		L2018		L5009	
Date Sampled :	9/23/91		1/04/90		10/22/90		9/17/91	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(0.27)	ND	(0.20)	ND	(0.20)	ND	(0.27)
1,1,2,2-Tetrachloroethane	ND	(0.30)	ND	(0.15)	ND	(0.15)	ND	(0.30)
1,1,2-Trichloroethane	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
1,1-Dichloroethane	ND	(0.50)	ND	(0.50)	ND	(0.50)	ND	(0.50)
1,1-Dichloroethene	ND	(0.70)	ND	(0.20)	ND	(0.20)	ND	(0.70)
1,2-Dichloroethane	ND	(0.15)	ND	(0.10)	ND	(0.10)	ND	(0.15)
Chloroform	ND	(0.15)	ND	(0.10)	ND	(0.10)	ND	(0.15)
Cis-1,2-Dichloroethylene	NA		ND	(0.20)	NA		NA	
Methylene Chloride	ND	(0.40)	0.53 *C	(0.40)	ND	(0.40)	ND	(0.40)
Tetrachloroethene	ND	(0.10)	ND	(0.10)	ND	(0.10)	ND	(0.10)
Trans-1,2-Dichloroethylene	NA		ND	(0.20)	ND	(0.20)	NA	
Trichloroethene	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Trichlorofluoromethane	ND	(0.27)	ND	(0.20)	ND	(0.20)	ND	(0.27)
VOC Total	ND	N/A	0.53	N/A	ND	N/A	ND	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second colum or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second colum

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-19		MW-20		MW-20		MW-21	
Sample Control # :	L5031		L2242		L5054		L2243	
Date Sampled :	9/25/91		1/18/91		10/03/91		1/21/91	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(0.27)	46	(1.0)	79 C	(6.8)	190Y	(1.0)
1,1,2,2-Tetrachloroethane	ND	(0.30)	ND	(1.0)	ND	(7.5)	ND	(1.0)
1,1,2-Trichloroethane	ND	(0.20)	ND	(1.0)	ND	(5.0)	ND	(1.0)
1,1-Dichloroethane	2.0 C	(0.50)	5.0	(1.0)	ND	(12)	12	(1.0)
1,1-Dichloroethene	3.0 C	(0.70)	200Y	(1.0)	260 C	(18)	360Y	(1.0)
1,2-Dichloroethane	ND	(0.15)	ND	(1.0)	ND	(3.8)	ND	(1.0)
Chloroform	ND	(0.15)	ND	(1.0)	ND	(3.8)	10	(1.0)
Cis-1,2-Dichloroethylene	NA		NA		NA		NA	
Methylene Chloride	0.45 M	(0.40)	5.0B	(1.0)	10 M	(10)	ND	(1.0)
Tetrachloroethene	ND	(0.10)	ND	(1.0)	ND	(2.5)	ND	(1.0)
Trans-1,2-Dichloroethylene	NA		ND	(1.0)	NA		ND	(1.0)
Trichloroethene	1.3 C	(0.20)	130Y	(1.0)	240 C	(5.0)	130Y	(1.0)
Trichlorofluoromethane	ND	(0.27)	ND	(10)	ND	(6.8)	ND	(10)
VOC Total	6.8	N/A	390	N/A	590	N/A	700	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-18		MW-18		MW-19		MW-19	
Sample Control # :	L2020		L5023		MW-19		L2021	
Date Sampled :	10/19/90		9/23/91		12/20/89		10/18/90	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(0.20)	2.2 G	(0.27)	0.37 *C	(0.20)	ND	(0.20)
1,1,2,2-Tetrachloroethane	ND	(0.15)	ND	(0.30)	ND	(0.15)	ND	(0.15)
1,1,2-Trichloroethane	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
1,1-Dichloroethane	0.92 Q@	(0.50)	2.5 C	(0.50)	1.0 *C	(0.50)	1.3 Q@	(0.50)
1,1-Dichloroethene	2.1 C	(0.20)	7.6 C	(0.70)	0.86 *C	(0.20)	1.9 C	(0.20)
1,2-Dichloroethane	0.14 X@T	(0.10)	ND	(0.15)	ND	(0.10)	ND	(0.10)
Chloroform	ND	(0.10)	ND	(0.15)	ND	(0.10)	ND	(0.10)
Cis-1,2-Dichloroethylene	NA		NA		ND	(0.20)	NA	
Methylene Chloride	ND	(0.40)	ND	(0.40)	1.3 *C	(0.40)	ND	(0.40)
Tetrachloroethene	ND	(0.10)	ND	(0.10)	ND	(0.10)	ND	(0.10)
Trans-1,2-Dichloroethylene	ND	(0.20)	NA		ND	(0.20)	ND	(0.20)
Trichloroethene	1.2 C	(0.20)	6.4 C	(0.20)	0.66 *C	(0.20)	1.2 C	(0.20)
Trichlorofluoromethane	ND	(0.20)	ND	(0.27)	ND	(0.20)	ND	(0.20)
VOC Total	4.4	N/A	19	N/A	4.2	N/A	4.4	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second colum

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calibration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-24		MW-25		MW-25		MW-25	
Sample Control # :	L5049		L2034		L2034-2		L5043	
Date Sampled :	10/01/91		12/01/90		12/07/90		9/27/91	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	970 C	(68)	ND	(1.0)	56	(1.0)	1700 C	(68)
1,1,2,2-Tetrachloroethane	ND	(75)	ND	(1.0)	ND	(1.0)	ND	(75)
1,1,2-Trichloroethane	ND	(50)	ND	(1.0)	2.0	(1.0)	ND	(50)
1,1-Dichloroethane	ND	(120)	ND	(1.0)	12	(1.0)	ND	(120)
1,1-Dichloroethene	3800 C	(180)	ND	(1.0)	160Y	(1.0)	4500 C	(180)
1,2-Dichloroethane	150 C	(38)	ND	(1.0)	11	(1.0)	510 C	(38)
Chloroform	ND	(38)	ND	(1.0)	ND	(1.0)	ND	(38)
Cis-1,2-Dichloroethylene	NA		NA		NA		NA	
Methylene Chloride	ND	(100)	ND	(1.0)	ND	(1.0)	ND	(100)
Tetrachloroethene	ND	(25)	ND	(1.0)	ND	(1.0)	ND	(25)
Trans-1,2-Dichloroethylene	NA		ND	(1.0)	ND	(1.0)	NA	
Trichloroethene	2700 C	(50)	ND	(1.0)	79	(1.0)	1800 C	(50)
Trichlorofluoromethane	ND	(68)	ND	(10)	ND	(10)	ND	(68)
VOC Total	7600	N/A	ND	N/A	320	N/A	8500	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second colum or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second colum

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-22		MW-22		MW-23		MW-24	
Sample Control # :	L2244		L5042		L5053		L2033	
Date Sampled :	1/25/91		9/27/91		10/03/91		11/20/90	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	50	(1.0)	19 C	(1.4)	31 C	(6.8)	NDF	(25)
1,1,2,2-Tetrachloroethane	ND	(1.0)	ND	(1.5)	ND	(7.5)	NDF	(25)
1,1,2-Trichloroethane	ND	(1.0)	ND	(1.0)	ND	(5.0)	NDF	(25)
1,1-Dichloroethane	ND	(1.0)	ND	(2.5)	ND	(12)	25F	(25)
1,1-Dichloroethene	170Y	(1.0)	60 C	(3.5)	74 C	(18)	740YF	(25)
1,2-Dichloroethane	ND	(1.0)	ND	(0.75)	ND	(3.8)	50F	(25)
Chloroform	ND	(1.0)	ND	(0.75)	ND	(3.8)	NDF	(25)
Cis-1,2-Dichloroethylene	NA		NA		NA		NA	
Methylene Chloride	5.0B	(1.0)	ND	(2.0)	ND	(10)	NDF	(25)
Tetrachloroethene	ND	(1.0)	ND	(0.50)	ND	(2.5)	NDF	(25)
Trans-1,2-Dichloroethylene	ND	(1.0)	NA		NA		NDF	(25)
Trichloroethene	110Y	(1.0)	22 C	(1.0)	70 C	(5.0)	740YF	(25)
Trichlorofluoromethane	ND	(10)	ND	(1.4)	ND	(6.8)	NDF	(250)
VOC Total	340	N/A	100	N/A	180	N/A	1600	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-28		MW-28		MW-29		MW-30	
Sample Control # :	L2264		L5030		L5063		L5052	
Date Sampled :	3/08/91		9/24/91		12/05/91		10/03/91	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(1.0)	12 C	(0.27)	ND	(1.8)	1.3 C	(0.27)
1,1,2,2-Tetrachloroethane	ND	(1.0)	ND	(0.30)	ND	(2.4)	ND	(0.30)
1,1,2-Trichloroethane	ND	(1.0)	ND	(0.20)	ND	(2.4)	ND	(0.20)
1,1-Dichloroethane	ND	(1.0)	1.2 C	(0.50)	8.0	(3.9)	ND	(0.50)
1,1-Dichloroethene	1.2	(1.0)	33 C	(0.70)	8.3	(4.4)	7.0 C	(0.70)
1,2-Dichloroethane	ND	(1.0)	1.1 C	(0.15)	ND	(2.2)	ND	(0.15)
Chloroform	ND	(1.0)	ND	(0.15)	ND	(1.8)	ND	(0.15)
Cis-1,2-Dichloroethylene	NA		NA		NA		NA	
Methylene Chloride	ND	(1.0)	ND	(0.40)	ND	(3.6)	ND	(0.40)
Tetrachloroethene	ND	(1.0)	ND	(0.10)	ND	(3.5)	ND	(0.10)
Trans-1,2-Dichloroethylene	ND	(1.0)	NA		NA		NA	
Trichloroethene	1.0	(1.0)	34 C	(0.20)	12	(2.8)	5.8 C	(0.20)
Trichlorofluoromethane	ND	(10)	ND	(0.27)	ND	(4.0)	ND	(0.27)
VOC Total	2.2	N/A	81	N/A	28	N/A	14	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second colum or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second colum

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-26		MW-26		MW-26		MW-27	
Sample Control # :	L2245		L5044		L5045		L2250	
Date Sampled :	1/29/91		9/30/91		9/30/91		2/07/91	
QC Type :			FDA		FDB			
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	140Y	(1.0)	1300 C	(140)	1300 CT	(68)	ND	(1.0)
1,1,2,2-Tetrachloroethane	ND	(1.0)	ND	(150)	ND	(75)	ND	(1.0)
1,1,2-Trichloroethane	2.0	(1.0)	ND	(100)	ND	(50)	ND	(1.0)
1,1-Dichloroethane	26	(1.0)	ND	(250)	ND	(120)	ND	(1.0)
1,1-Dichloroethene	400Y	(1.0)	5000 C	(350)	6200 CT	(180)	ND	(1.0)
1,2-Dichloroethane	11	(1.0)	ND	(75)	170 CT	(38)	ND	(1.0)
Chloroform	ND	(1.0)	ND	(75)	ND	(38)	ND	(1.0)
Cis-1,2-Dichloroethylene	NA		NA		NA		NA	
Methylene Chloride	9.0B	(1.0)	ND	(200)	ND	(100)	ND	(1.0)
Tetrachloroethene	3.0	(1.0)	ND	(50)	ND	(25)	ND	(1.0)
Trans-1,2-Dichloroethylene	ND	(1.0)	NA		NA		ND	(1.0)
Trichloroethene	180Y	(1.0)	3500 C	(100)	4400 CT	(50)	ND	(1.0)
Trichlorofluoromethane	ND	(10)	ND	(140)	ND	(68)	ND	(10)
VOC Total	770	N/A	9800	N/A	12000	N/A	ND	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second colum

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-32		MW-32		MW-34		MW-34	
Sample Control # :	L2265		L5047		L2252		L5015	
Date Sampled :	3/08/91		10/01/91		2/18/91		9/19/91	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(1.0)	ND	(0.27)	ND	(1.0)	ND	(0.27)
1,1,2,2-Tetrachloroethane	ND	(1.0)	ND	(0.30)	ND	(1.0)	ND	(0.30)
1,1,2-Trichloroethane	ND	(1.0)	ND	(0.20)	ND	(1.0)	ND	(0.20)
1,1-Dichloroethane	ND	(1.0)	ND	(0.50)	ND	(1.0)	ND	(0.50)
1,1-Dichloroethene	ND	(1.0)	ND	(0.70)	ND	(1.0)	ND	(0.70)
1,2-Dichloroethane	ND	(1.0)	ND	(0.15)	ND	(1.0)	ND	(0.15)
Chloroform	ND	(1.0)	ND	(0.15)	ND	(1.0)	ND	(0.15)
Cis-1,2-Dichloroethylene	NA		NA		NA		NA	
Methylene Chloride	ND	(1.0)	ND	(0.40)	ND	(1.0)	ND	(0.40)
Tetrachloroethene	ND	(1.0)	ND	(0.10)	ND	(1.0)	ND	(0.10)
Trans-1,2-Dichloroethylene	ND	(1.0)	NA		ND	(1.0)	NA	
Trichloroethene	ND	(1.0)	ND	(0.20)	ND	(1.0)	ND	(0.20)
Trichlorofluoromethane	ND	(10)	ND	(0.27)	ND	(10)	ND	(0.27)
VOC Total	ND	N/A	ND	N/A	ND	N/A	ND	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calibration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-31		MW-31		MW-31		MW-31	
Sample Control # :	L2251		L5010		L5011		L5060	
Date Sampled :	2/15/91		9/18/91		9/18/91		11/08/91	
QC Type :			FDA		FDB			
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(1.0)	12 C	(0.27)	14 C	(0.27)	ND	(0.20)
1,1,2,2-Tetrachloroethane	ND	(1.0)	ND	(0.30)	ND	(0.30)	ND	(0.20)
1,1,2-Trichloroethane	ND	(1.0)	ND	(0.20)	ND	(0.20)	ND	(0.20)
1,1-Dichloroethane	ND	(1.0)	ND	(0.50)	ND	(0.50)	ND	(0.20)
1,1-Dichloroethene	ND	(1.0)	19 C	(0.70)	20 C	(0.70)	ND	(0.20)
1,2-Dichloroethane	ND	(1.0)	ND	(0.15)	ND	(0.15)	ND	(0.20)
Chloroform	ND	(1.0)	ND	(0.15)	ND	(0.15)	ND	(0.20)
Cis-1,2-Dichloroethylene	NA		NA		NA		NA	
Methylene Chloride	ND	(1.0)	ND	(0.40)	ND	(0.40)	10B	(0.20)
Tetrachloroethene	ND	(1.0)	ND	(0.10)	ND	(0.10)	ND	(0.20)
Trans-1,2-Dichloroethylene	ND	(1.0)	NA		NA		NA	
Trichloroethene	ND	(1.0)	6.2 C	(0.20)	6.5 C	(0.20)	ND	(0.20)
Trichlorofluoromethane	ND	(10)	ND	(0.27)	ND	(0.27)	ND	(1.0)
VOC Total	ND	N/A	37	N/A	41	N/A	10	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calibration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-37		MW-37		MW-37		MW-38	
Sample Control # :	L2275		L2276		L5025		L2256	
Date Sampled :	4/03/91		4/03/91		9/23/91		2/22/91	
QC Type :	FDA		FDB					
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(1.0)	ND	(1.0)	ND	(0.27)	ND	(1.0)
1,1,2,2-Tetrachloroethane	ND	(1.0)	ND	(1.0)	ND	(0.30)	ND	(1.0)
1,1,2-Trichloroethane	ND	(1.0)	ND	(1.0)	ND	(0.20)	ND	(1.0)
1,1-Dichloroethane	ND	(1.0)	ND	(1.0)	ND	(0.50)	ND	(1.0)
1,1-Dichloroethene	ND	(1.0)	ND	(1.0)	ND	(0.70)	ND	(1.0)
1,2-Dichloroethane	ND	(1.0)	ND	(1.0)	ND	(0.15)	ND	(1.0)
Chloroform	ND	(1.0)	ND	(1.0)	ND	(0.15)	ND	(1.0)
Cis-1,2-Dichloroethylene	NA		NA		NA		NA	
Methylene Chloride	ND	(1.0)	ND	(1.0)	ND	(0.40)	ND	(1.0)
Tetrachloroethene	ND	(1.0)	ND	(1.0)	ND	(0.10)	ND	(1.0)
Trans-1,2-Dichloroethylene	ND	(1.0)	ND	(1.0)	NA		ND	(1.0)
Trichloroethene	1.1	(1.0)	1.0	(1.0)	0.93 C	(0.20)	ND	(1.0)
Trichlorofluoromethane	ND	(10)	ND	(10)	ND	(0.27)	ND	(10)
VOC Total	1.1	N/A	1.0	N/A	0.93	N/A	ND	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second colum

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-35		MW-35		MW-36		MW-36	
Sample Control # :	L2280		L5018		L2278		L5016	
Date Sampled :	4/09/91		9/20/91		4/08/91		9/19/91	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	1.7F	(1.0)	1.3 C	(0.27)	NDF	(1.0)	ND	(0.27)
1,1,2,2-Tetrachloroethane	NDF	(1.0)	ND	(0.30)	NDF	(1.0)	ND	(0.30)
1,1,2-Trichloroethane	NDF	(1.0)	ND	(0.20)	NDF	(1.0)	ND	(0.20)
1,1-Dichloroethane	NDF	(1.0)	ND	(0.50)	NDF	(1.0)	ND	(0.50)
1,1-Dichloroethene	NDF	(1.0)	1.4 C	(0.70)	NDF	(1.0)	ND	(0.70)
1,2-Dichloroethane	NDF	(1.0)	ND	(0.15)	NDF	(1.0)	ND	(0.15)
Chloroform	NDF	(1.0)	ND	(0.15)	NDF	(1.0)	ND	(0.15)
Cis-1,2-Dichloroethylene	NA		NA		NA		NA	
Methylene Chloride	NDF	(1.0)	ND	(0.40)	NDF	(1.0)	ND	(0.40)
Tetrachloroethene	NDF	(1.0)	ND	(0.10)	NDF	(1.0)	ND	(0.10)
Trans-1,2-Dichloroethylene	NDF	(1.0)	NA		NDF	(1.0)	NA	
Trichloroethene	NDF	(1.0)	2.7 C	(0.20)	NDF	(1.0)	ND	(0.20)
Trichlorofluoromethane	NDF	(10)	ND	(0.27)	NDF	(10)	ND	(0.27)
VOC Total	1.7	N/A	5.4	N/A	ND	N/A	ND	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-40		MW-40		MW-41		MW-42	
Sample Control # :	L2253		L5034		L5072		L5065	
Date Sampled :	2/19/91		9/25/91		12/10/91		12/05/91	
QC Type :							FDA	
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	5.2	(1.0)	18 G	(2.7)	21	(4.0)	ND	(1.8)
1,1,2,2-Tetrachloroethane	ND	(1.0)	ND	(3.0)	ND	(7.9)	ND	(2.4)
1,1,2-Trichloroethane	ND	(1.0)	ND	(2.0)	ND	(9.0)	ND	(2.4)
1,1-Dichloroethane	2.4	(1.0)	ND	(5.0)	ND	(2.1)	5.9	(3.9)
1,1-Dichloroethene	31	(1.0)	38 C	(7.0)	160	(2.2)	100	(4.4)
1,2-Dichloroethane	ND	(1.0)	ND	(1.5)	ND	(1.1)	ND	(2.2)
Chloroform	1.8	(1.0)	ND	(1.5)	ND	(2.2)	ND	(1.8)
Cis-1,2-Dichloroethylene	NA		NA		NA		NA	
Methylene Chloride	ND	(1.0)	ND	(4.0)	11B	(7.2)	ND	(3.6)
Tetrachloroethene	ND	(1.0)	ND	(1.0)	ND	(7.9)	ND	(3.5)
Trans-1,2-Dichloroethylene	ND	(1.0)	NA		NA		NA	
Trichloroethene	48	(1.0)	66 C	(2.0)	200	(3.0)	140	(2.8)
Trichlorofluoromethane	ND	(10)	ND	(2.7)	ND	(3.4)	ND	(4.0)
VOC Total	88	N/A	120	N/A	390	N/A	250	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second colum or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second colum

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-38		MW-38		MW-39		MW-39	
Sample Control # :	L2270		L5020		L2267		L5019	
Date Sampled :	4/01/91		9/20/91		3/29/91		9/20/91	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(1.0)	ND	(0.27)	8.0	(1.0)	15 G	(2.7)
1,1,2,2-Tetrachloroethane	ND	(1.0)	ND	(0.30)	ND	(1.0)	ND	(3.0)
1,1,2-Trichloroethane	ND	(1.0)	ND	(0.20)	ND	(1.0)	ND	(2.0)
1,1-Dichloroethane	ND	(1.0)	ND	(0.50)	ND	(1.0)	ND	(5.0)
1,1-Dichloroethene	ND	(1.0)	ND	(0.70)	52	(1.0)	49 C	(7.0)
1,2-Dichloroethane	ND	(1.0)	ND	(0.15)	ND	(1.0)	ND	(1.5)
Chloroform	ND	(1.0)	ND	(0.15)	6.0	(1.0)	ND	(1.5)
Cis-1,2-Dichloroethylene	NA		NA		NA		NA	
Methylene Chloride	ND	(1.0)	ND	(0.40)	ND	(1.0)	ND	(4.0)
Tetrachloroethene	ND	(1.0)	ND	(0.10)	ND	(1.0)	ND	(1.0)
Trans-1,2-Dichloroethylene	ND	(1.0)	NA		ND	(1.0)	NA	
Trichloroethene	ND	(1.0)	ND	(0.20)	47	(1.0)	50 C	(2.0)
Trichlorofluoromethane	ND	(10)	ND	(0.27)	ND	(10)	ND	(2.7)
VOC Total	ND	N/A	ND	N/A	110	N/A	110	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second colum or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second colum

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-45		MW-46		MW-47		MW-48	
Sample Control # :	L5078		L5080		L5082		L5084	
Date Sampled :	12/11/91		12/19/91		12/19/91		12/19/91	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	22	(0.74)	ND	(0.40)	ND	(0.40)	ND	(0.40)
1,1,2,2-Tetrachloroethane	ND	(0.94)	ND	(0.79)	ND	(0.79)	ND	(0.79)
1,1,2-Trichloroethane	ND	(0.96)	ND	(0.90)	ND	(0.90)	ND	(0.90)
1,1-Dichloroethane	ND	(1.6)	0.57J	(0.21)	ND	(0.21)	ND	(0.21)
1,1-Dichloroethene	54	(1.8)	1.3	(0.22)	ND	(0.22)	ND	(0.22)
1,2-Dichloroethane	ND	(0.87)	ND	(0.11)	ND	(0.11)	ND	(0.11)
Chloroform	ND	(0.72)	ND	(0.22)	ND	(0.22)	ND	(0.22)
Cis-1,2-Dichloroethylene	NA		NA		NA		NA	
Methylene Chloride	ND	(1.4)	ND	(0.72)	ND	(0.72)	ND	(0.72)
Tetrachloroethene	ND	(1.4)	ND	(0.79)	ND	(0.79)	ND	(0.79)
Trans-1,2-Dichloroethylene	NA		NA		NA		NA	
Trichloroethene	110	(1.1)	ND	(0.30)	ND	(0.30)	ND	(0.30)
Trichlorofluoromethane	ND	(1.6)	ND	(0.34)	ND	(0.34)	ND	(0.34)
VOC Total	190	N/A	1.9	N/A	ND	N/A	ND	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-42		MW-43		MW-44		MW-45	
Sample Control # :	L5066		L5068		L5070		L5075	
Date Sampled :	12/05/91		12/06/91		12/12/91		12/06/91	
QC Type :	FDB							
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(1.8)	5.9	(0.40)	9.5	(1.8)	12	(0.40)
1,1,2,2-Tetrachloroethane	ND	(2.4)	ND	(0.79)	ND	(2.4)	ND	(0.79)
1,1,2-Trichloroethane	ND	(2.4)	ND	(0.90)	ND	(2.4)	ND	(0.90)
1,1-Dichloroethane	ND	(3.9)	1.3	(0.21)	6.3	(3.9)	1.1	(0.21)
1,1-Dichloroethene	130	(4.4)	17	(0.22)	120	(4.4)	29	(0.22)
1,2-Dichloroethane	ND	(2.2)	ND	(0.11)	ND	(2.2)	ND	(0.11)
Chloroform	ND	(1.8)	ND	(0.22)	ND	(1.8)	ND	(0.22)
Cis-1,2-Dichloroethylene	NA		NA		NA		NA	
Methylene Chloride	ND	(3.6)	ND	(0.72)	9.5	(3.6)	ND	(0.72)
Tetrachloroethene	ND	(3.5)	ND	(0.79)	ND	(3.5)	ND	(0.79)
Trans-1,2-Dichloroethylene	NA		NA		NA		NA	
Trichloroethene	130	(2.8)	21	(0.30)	150	(2.8)	35	(0.30)
Trichlorofluoromethane	ND	(4.0)	ND	(0.34)	ND	(4.0)	ND	(0.34)
VOC Total	260	N/A	45	N/A	300	N/A	77	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second colum

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	OW-02		OW-02		OW-02		OW-02	
Sample Control # :	86-OW-02		86-OW-02		L2022		L5037	
Date Sampled :	10/17/86		10/17/86		10/23/90		9/26/91	
QC Type :	LDA		LDB					
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	110C	(1.0)	90C	(1.0)	110 C	(5.0)	78 C	(2.7)
1,1,2,2-Tetrachloroethane	ND	(1.0)	ND	(1.0)	ND	(3.8)	ND	(3.0)
1,1,2-Trichloroethane	ND	(1.0)	ND	(1.0)	ND	(5.0)	ND	(2.0)
1,1-Dichloroethane	4.0C	(0.50)	3.8C	(0.50)	ND	(12)	6.5 C	(5.0)
1,1-Dichloroethene	140C	(0.50)	120C	(0.50)	270 C	(5.0)	180 C	(7.0)
1,2-Dichloroethane	2.5C	(0.50)	2.5C	(0.50)	ND	(2.5)	ND	(1.5)
Chloroform	ND	(0.50)	ND	(0.50)	ND	(2.5)	ND	(1.5)
Cis-1,2-Dichloroethylene	NA		NA		NA		NA	
Methylene Chloride	ND	(2.0)	ND	(2.0)	ND	(10)	ND	(4.0)
Tetrachloroethene	ND	(0.50)	ND	(0.50)	ND	(2.5)	ND	(1.0)
Trans-1,2-Dichloroethylene	ND	(0.50)	ND	(0.50)	ND	(5.0)	NA	
Trichloroethene	180C	(1.0)	150C	(1.0)	240 C	(5.0)	210 C	(2.0)
Trichlorofluoromethane	ND	(0.50)	ND	(0.50)	ND	(5.0)	ND	(2.7)
VOC Total	440	N/A	370	N/A	620	N/A	470	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second colum or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second colum

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	MW-49		MW-50		OW-01		OW-01	
Sample Control # :	L5087		L5086		86-OW-01		L5017	
Date Sampled :	12/26/91		12/20/91		10/17/86		9/19/91	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	32	(1.8)	69	(2.0)	ND	(0.20)	ND	(0.27)
1,1,2,2-Tetrachloroethane	ND	(2.4)	ND	(4.0)	ND	(0.20)	ND	(0.30)
1,1,2-Trichloroethane	ND	(2.4)	ND	(4.5)	ND	(0.20)	ND	(0.20)
1,1-Dicliloroethane	ND	(3.9)	2.8	(1.0)	ND	(0.10)	ND	(0.50)
1,1-Dichloroethene	84	(4.4)	200	(1.1)	ND	(0.10)	ND	(0.70)
1,2-Dichloroethane	ND	(2.2)	1.2	(0.56)	ND	(0.10)	ND	(0.15)
Chloroform	ND	(1.8)	ND	(1.1)	ND	(0.10)	ND	(0.15)
Cis-1,2-Dichloroethylene	NA		NA		NA		NA	
Methylene Chloride	ND	(3.6)	5.0B	(3.6)	1.6CH	(0.40)	ND	(0.40)
Tetrachloroethene	ND	(3.5)	ND	(4.0)	ND	(0.10)	ND	(0.10)
Trans-1,2-Dichloroethylene	NA		NA		ND	(0.10)	NA	
Trichloroethene	110	(2.8)	140	(1.5)	ND	(0.20)	ND	(0.20)
Trichlorofluoromethane	ND	(4.0)	ND	(1.7)	0.36C	(0.10)	ND	(0.27)
VOC Total	230	N/A	420	N/A	2.0	N/A	ND	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	OW-08		OW-08		OW-08		OW-2	
Sample Control # :	86-OW-08		L2024		L5021		OW-2 2	
Date Sampled :	10/17/86		10/22/90		9/20/91		1/18/90	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(0.20)	ND	(0.20)	ND	(0.27)	85 C	(2.0)
1,1,2,2-Tetrachloroethane	ND	(0.20)	ND	(0.15)	ND	(0.30)	ND	(1.5)
1,1,2-Trichloroethane	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(2.0)
1,1-Dichloroethane	ND	(0.10)	ND	(0.50)	ND	(0.50)	5.4 C	(5.0)
1,1-Dichloroethene	ND	(0.10)	ND	(0.20)	ND	(0.70)	160 C	(2.0)
1,2-Dichloroethane	ND	(0.10)	ND	(0.10)	ND	(0.15)	ND	(1.0)
Chloroform	ND	(0.10)	ND	(0.10)	ND	(0.15)	1.1 C	(1.0)
Cis-1,2-Dichloroethylene	NA		NA		NA		ND	(2.0)
Methylene Chloride	1.3CH	(0.40)	ND	(0.40)	ND	(0.40)	ND	(4.0)
Tetrachloroethene	ND	(0.10)	ND	(0.10)	ND	(0.10)	ND	(1.0)
Trans-1,2-Dichloroethylene	ND	(0.10)	ND	(0.20)	NA		ND	(2.0)
Trichloroethene	ND	(0.20)	ND	(0.20)	ND	(0.20)	170 C	(2.0)
Trichlorofluoromethane	0.3CC	(0.10)	ND	(0.20)	ND	(0.27)	ND	(2.0)
VOC Total	1.6	N/A	ND	N/A	ND	N/A	420	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calibration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	OW-03		OW-03		OW-03		OW-03	
Sample Control # :	86-OW-03A		86-OW-03B		L2023		L5046	
Date Sampled :	10/16/86		10/16/86		10/25/90		10/01/91	
QC Type :	FDA		FDB					
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	190C	(0.20)	190C	(0.20)	140 C	(10)	200 C	(14)
1,1,2,2-Tetrachloroethane	3.0C	(0.20)	ND	(0.20)	ND	(7.5)	ND	(15)
1,1,2-Trichloroethane	ND	(0.20)	ND	(0.20)	ND	(10)	ND	(10)
1,1-Dichloroethane	10C	(0.10)	8.2C	(0.10)	29 Q@	(25)	ND	(25)
1,1-Dichloroethene	270C	(0.10)	240C	(0.10)	660 C	(10)	410 C	(35)
1,2-Dichloroethane	ND	(0.10)	ND	(0.10)	ND	(5.0)	ND	(7.5)
Chloroform	ND	(0.10)	ND	(0.10)	ND	(5.0)	ND	(7.5)
Cis-1,2-Dichloroethylene	NA		NA		NA		NA	
Methylene Chloride	2.8C	(0.40)	ND	(0.40)	ND	(20)	ND	(20)
Tetrachloroethene	ND	(0.10)	ND	(0.10)	ND	(5.0)	ND	(5.0)
Trans-1,2-Dichloroethylene	ND	(0.10)	ND	(0.10)	82 X	(10)	NA	
Trichloroethene	280C	(0.20)	280C	(0.20)	460 C	(10)	460 C	(10)
Trichlorofluoromethane	ND	(0.10)	ND	(0.10)	ND	(10)	ND	(14)
VOC Total	760	N/A	720	N/A	1400	N/A	1100	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	TANK		UPPER POND		UPPERPOND		W-01	
Sample Control # :	L5057		UPPER POND		L5039		86-W-01	
Date Sampled :	10/03/91		12/21/90		9/26/91		10/17/86	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	58 C	(6.8)	44 C	(2.0)	60 C	(2.7)	ND	(0.20)
1,1,2,2-Tetrachloroethane	ND	(7.5)	ND	(1.5)	ND	(3.0)	ND	(0.20)
1,1,2-Trichloroethane	ND	(5.0)	ND	(2.0)	ND	(2.0)	ND	(0.20)
1,1-Dichloroethane	ND	(12)	ND	(5.0)	6.7 G	(5.0)	ND	(0.10)
1,1-Dichloroethene	220 C	(18)	64 C	(2.0)	99 C	(7.0)	ND	(0.10)
1,2-Dichloroethane	12 C	(3.8)	ND	(1.0)	ND	(1.5)	ND	(0.10)
Chloroform	ND	(3.8)	ND	(1.0)	ND	(1.5)	ND	(0.10)
Cis-1,2-Dichloroethylene	NA		3.8 *C	(2.0)	NA		NA	
Methylene Chloride	ND	(10)	ND	(4.0)	ND	(4.0)	1.1CH	(0.40)
Tetrachloroethene	ND	(2.5)	ND	(1.0)	ND	(1.0)	ND	(0.10)
Trans-1,2-Dichloroethylene	NA		ND	(2.0)	NA		ND	(0.10)
Trichloroethene	160 C	(5.0)	72 C	(2.0)	100 C	(2.0)	ND	(0.20)
Trichlorofluoromethane	ND	(6.8)	ND	(2.0)	ND	(2.7)	0.38C	(0.10)
VOC Total	450	N/A	180	N/A	270	N/A	1.5	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calibration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	OW-3		OW-8		P-02		TANK	
Sample Control # :	OW-3		OW-8		L5076		L2032	
Date Sampled :	1/18/90		11/02/89		12/10/91		10/25/90	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	130 C	(4.0)	ND	(0.20)	ND	(0.37)	13 C	(0.40)
1,1,2,2-Tetrachloroethane	ND	(3.0)	ND	(0.15)	ND	(0.47)	ND	(0.30)
1,1,2-Trichloroethane	ND	(4.0)	ND	(0.20)	ND	(0.48)	ND	(0.40)
1,1-Dichloroethane	20 C	(10)	ND	(0.50)	ND	(0.78)	1.6 C@	(1.0)
1,1-Dichloroethene	360 C	(4.0)	ND	(0.20)	ND	(0.88)	5.7 C	(0.40)
1,2-Dichloroethane	9.6 C	(2.0)	ND	(0.10)	ND	(0.43)	1.1 C	(0.20)
Chloroform	8.1 C	(2.0)	ND	(0.10)	ND	(0.36)	ND	(0.20)
Cis-1,2-Dichloroethylene	21 C	(4.0)	ND	(0.20)	NA		NA	
Methylene Chloride	ND	(8.0)	ND	(0.40)	1.3B	(0.71)	ND	(0.80)
Tetrachloroethene	ND	(2.0)	ND	(0.10)	ND	(0.69)	ND	(0.20)
Trans-1,2-Dichloroethylene	ND	(4.0)	ND	(0.20)	NA		ND	(0.40)
Trichloroethene	400 C	(4.0)	ND	(0.20)	ND	(0.55)	32 C	(0.40)
Trichlorofluoromethane	ND	(4.0)	ND	(0.20)	ND	(0.81)	ND	(0.40)
VOC Total	950	N/A	ND	N/A	1.3	N/A	53	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	W-03		W-03		W-05		W-05	
Sample Control # :	86-W-03		L2036		86-W-05		L2026	
Date Sampled :	10/16/86		12/07/90		10/15/86		1/22/91	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	6.0K	(0.20)	2.2K	(1.0)	ND	(0.20)	ND	(1.0)
1,1,2,2-Tetrachloroethane	ND	(0.20)	ND	(1.0)	ND	(0.20)	ND	(1.0)
1,1,2-Trichloroethane	ND	(0.20)	ND	(1.0)	ND	(0.20)	ND	(1.0)
1,1-Dichloroethane	0.68K	(0.10)	ND	(1.0)	ND	(0.10)	ND	(1.0)
1,1-Dichloroethene	19K	(0.10)	6.8K	(1.0)	ND	(0.10)	ND	(1.0)
1,2-Dichloroethane	ND	(0.10)	ND	(1.0)	ND	(0.10)	ND	(1.0)
Chloroform	0.32K	(0.10)	ND	(1.0)	ND	(0.10)	ND	(1.0)
Cis-1,2-Dichloroethylene	NA		NA		NA		NA	
Methylene Chloride	4.3K	(0.40)	ND	(1.0)	ND	(0.40)	ND	(1.0)
Tetrachloroethene	0.29K	(0.10)	ND	(1.0)	ND	(0.10)	ND	(1.0)
Trans-1,2-Dichloroethylene	ND	(0.10)	ND	(1.0)	ND	(0.10)	ND	(1.0)
Trichloroethene	18K	(0.20)	13K	(1.0)	ND	(0.20)	ND	(1.0)
Trichlorofluoromethane	0.37K	(0.10)	ND	(10)	ND	(0.10)	ND	(10)
VOC Total	49	N/A	22	N/A	ND	N/A	ND	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second colum

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	W-01		W-01		W-02		W-02	
Sample Control # :	L2025		L5014		86-W-02		L2035	
Date Sampled :	10/24/90		9/19/91		10/16/86		12/06/90	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(0.20)	ND	(0.27)	ND	(0.20)	ND	(1.0)
1,1,2,2-Tetrachloroethane	ND	(0.15)	ND	(0.30)	ND	(0.20)	ND	(1.0)
1,1,2-Trichloroethane	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(1.0)
1,1-Dichloroethane	ND	(0.50)	ND	(0.50)	1.3C	(0.10)	ND	(1.0)
1,1-Dichloroethene	0.49 C@	(0.20)	ND	(0.70)	25C	(0.10)	ND	(1.0)
1,2-Dichloroethane	ND	(0.10)	ND	(0.15)	ND	(0.10)	ND	(1.0)
Chloroform	ND	(0.10)	ND	(0.15)	ND	(0.10)	ND	(1.0)
Cis-1,2-Dichloroethylene	NA		NA		NA		NA	
Methylene Chloride	ND	(0.40)	ND	(0.40)	0.80C	(0.40)	ND	(1.0)
Tetrachloroethene	ND	(0.10)	ND	(0.10)	ND	(0.10)	ND	(1.0)
Trans-1,2-Dichloroethylene	ND	(0.20)	NA		ND	(0.10)	ND	(1.0)
Trichloroethene	0.33 C@	(0.20)	0.52 C	(0.20)	0.27C	(0.20)	ND	(1.0)
Trichlorofluoromethane	ND	(0.20)	ND	(0.27)	ND	(0.10)	ND	(10)
VOC Total	0.82	N/A	0.52	N/A	27	N/A	ND	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second column or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second column

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calibration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	W-5							
Sample Control # :	W-5							
Date Sampled :	11/03/89							
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(0.20)						
1,1,2,2-Tetrachloroethane	ND	(0.15)						
1,1,2-Trichloroethane	ND	(0.20)						
1,1-Dichloroethane	ND	(0.50)						
1,1-Dichloroethene	ND	(0.20)						
1,2-Dichloroethane	ND	(0.10)						
Chloroform	ND	(0.10)						
Cis-1,2-Dichloroethylene	ND	(0.20)						
Methylene Chloride	ND	(0.40)						
Tetrachloroethene	ND	(0.10)						
Trans-1,2-Dichloroethylene	ND	(0.20)						
Trichloroethene	ND	(0.20)						
Trichlorofluoromethane	ND	(0.20)						
VOC Total	ND	N/A						

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second colum or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second colum

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-3 LOCKHEED BEAUMONT 8010 HITLIST INCLUDING HISTORIC DATA

Location ID :	W-06		W-1		W-2		W-3	
Sample Control # :	86-W-06		W-1		W-2		W-3	
Date Sampled :	10/17/86		11/03/89		11/02/89		11/02/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
1,1,2,2-Tetrachloroethane	ND	(0.20)	ND	(0.15)	ND	(0.15)	ND	(0.15)
1,1,2-Trichloroethane	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
1,1-Dichloroethane	ND	(0.10)	ND	(0.50)	ND	(0.50)	ND	(0.50)
1,1-Dichloroethene	ND	(0.10)	ND	(0.20)	ND	(0.20)	10 C	(0.20)
1,2-Dichloroethane	ND	(0.10)	ND	(0.10)	ND	(0.10)	ND	(0.10)
Chloroform	ND	(0.10)	ND	(0.10)	ND	(0.10)	0.10 *C	(0.10)
Cis-1,2-Dichloroethylene	NA		ND	(0.20)	ND	(0.20)	ND	(0.20)
Methylene Chloride	1.9CH	(0.40)	ND	(0.40)	ND	(0.40)	ND	(0.40)
Tetrachloroethene	ND	(0.10)	ND	(0.10)	ND	(0.10)	ND	(0.10)
Trans-1,2-Dichloroethylene	ND	(0.10)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Trichloroethene	ND	(0.20)	ND	(0.20)	ND	(0.20)	11 C	(0.20)
Trichlorofluoromethane	0.31C	(0.10)	ND	(0.20)	ND	(0.20)	ND	(0.20)
VOC Total	2.2	N/A	ND	N/A	ND	N/A	21	N/A

QC Type = Lab and or field QC flags
* or @ = Est. result less than 5 times detection limit (not used by all labs)
C = Confirmed on second colum or by GC/MS
F = Analyzed by GC/MS instead of GC
FDB = Field duplicate B
J = Value between method detection limit and practical quantitation limit
LDA = Lab duplicate A
M = Presence of analyte not confirmed due to coelution
NA = Not Analyzed
Q = Outside control limit
X = Presence not confirmed by second colum

Data from 1986 analyzed using equivalent EPA method 601
B or H = Org-detected in blank
D = Sample diluted for this analyte
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
K = No confirmation analysis due to lab error
LDB = Lab duplicate B
N/A = Not Available or Applicable
ND = Not Detected
T = Confirmation analyzed out of hold time
Y = Exceeds calbration range

1/30/92 17:18:16 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	W-05		W-05					
Sample Control # :	W-5		L2026					
Date Sampled :	11/03/89		1/22/91					
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 6010 (UNITS ARE mg/L)								
Aluminum	0.25	(0.045)	ND	(0.10)				
Antimony	ND	(0.034)	ND	(0.10)				
Barium	0.070	(0.0020)	ND	(0.10)				
Boron	0.32	(0.0060)	NA					
Cadmium	ND	(0.0040)	ND	(0.050)				
Calcium	32	(0.010)	28	(1.0)				
Chromium	ND	(0.0070)	ND	(0.050)				
Cobalt	ND	(0.0070)	ND	(0.10)				
Copper	ND	(0.0060)	ND	(0.10)				
Iron	0.22	(0.0070)	3.0	(0.10)				
Magnesium	5.1	(0.030)	4.4	(1.0)				
Manganese	0.22	(0.0020)	ND	(0.10)				
Molybdenum	ND	(0.0080)	NA					
Nickel	ND	(0.015)	ND	(0.10)				
Potassium	ND	(3.0)	1.7	(1.0)				
Silicon	16	(0.058)	NA					
Sodium	23	(0.029)	14	(1.0)				
Vanadium	ND	(0.0080)	ND	(0.10)				
Zinc	0.15	(0.0020)	ND	(0.10)				
EPA METHOD 300.0 (UNITS ARE mg/L)								
Nitrate as N	NA		5.3	(4.0)				
EPA METHOD 353.2 (UNITS ARE mg/L)								
Nitrate as N	NA		NA					

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	W-05		W-05					
Sample Control # :	W-5		L2026					
Date Sampled :	11/03/89		1/22/91					
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 415.1 (UNITS ARE mg/L)								
Total Organic Carbon	NA		ND	(0.50)				

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	W-05		W-05					
Sample Control # :	W-5		L2026					
Date Sampled :	11/03/89		1/22/91					
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 130.2 (UNITS ARE mg/L)								
Hardness	NA		95	(10)				
EPA METHOD 160.1 (UNITS ARE mg/L)								
Total Dissolved Solids	NA		200 H	(50)				
EPA METHOD 160.2 (UNITS ARE mg/L)								
Total Suspended Solids	NA		ND H	(10)				
EPA METHOD 180.1 (UNITS ARE NTU)								
Turbidity	NA		24 H	(0.10)				
EPA METHOD 310.1 (UNITS ARE mg/L)								
Bicarbonate	NA		NA					
Carbonate	NA		NA					
Total Alkalinity	NA		70 H	(10)				
EPA METHOD IC (UNITS ARE mg/L)								
Perchlorate	NA		NA					
EPA METHOD MOISTURE(UNITS ARE %moist)								
% Moisture	NA		NA					

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	W-05		W-05					
Sample Control # :	W-5		L2026					
Date Sampled :	11/03/89		1/22/91					
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8020 (UNITS ARE ug/L)								
Benzene	NA		NA					
Toluene	NA		NA					
EPA METHOD 8040 (UNITS ARE ug/L)								
2,4-Dichlorophenol	ND	(0.50)	NA					
Phenol	ND	(0.20)	NA					
EPA METHOD 8240 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	NA		NA					
1,1-Dichloroethene	NA		NA					
1,2-Dichloroethane	NA		NA					
Acetone	NA		NA					
Methylene Chloride	NA		NA					
Trans-1,2-Dichloroethylene	NA		NA					
Trichloroethene	NA		NA					
EPA METHOD 8270 (UNITS ARE ug/L)								
Benzoic Acid	NA		NA					
Bis(2-Ethylhexyl)Phthalate	NA		NA					
Di-N-Butyl Phthalate	NA		NA					
Phenol	NA		NA					
p-Cresol	NA		NA					

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	W-03		W-03		W-05		W-05	
Sample Control # :	L2036		L2036		86-W-05		86-W-05	
Date Sampled :	12/07/90		12/07/90		10/15/86		10/15/86	
QC Type :	LDA		LDB		LDA		LDB	
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 6010 (UNITS ARE mg/L)								
Aluminum	ND	(0.10)	NA		ND	(0.045)	NA	
Antimony	ND	(0.10)	NA		ND	(0.034)	NA	
Barium	ND	(0.10)	NA		0.055	(0.0020)	NA	
Boron	NA		NA		0.034	(0.0060)	NA	
Cadmium	ND	(0.050)	NA		ND	(0.0040)	NA	
Calcium	1.0	(1.0)	NA		17	(0.010)	NA	
Chromium	ND	(0.050)	NA		ND	(0.0070)	NA	
Cobalt	ND	(0.10)	NA		ND	(0.0070)	NA	
Copper	ND	(0.10)	NA		0.018	(0.0060)	NA	
Iron	ND	(0.10)	NA		0.15	(0.0070)	NA	
Magnesium	ND	(1.0)	NA		3.0	(0.030)	NA	
Manganese	ND	(0.10)	NA		0.035	(0.0020)	NA	
Molybdenum	NA		NA		ND	(0.0080)	NA	
Nickel	ND	(0.10)	NA		ND	(0.015)	NA	
Potassium	1.4	(1.0)	NA		1.6	N/A	NA	
Silicon	NA		NA		18	(0.058)	NA	
Sodium	51	(1.0)	NA		13	(0.029)	NA	
Vanadium	ND	(0.10)	NA		ND	(0.0080)	NA	
Zinc	ND	(0.10)	NA		0.19	(0.0020)	NA	
EPA METHOD 300.0 (UNITS ARE mg/L)								
Nitrate as N	NA		NA		NA		NA	
EPA METHOD 353.2 (UNITS ARE mg/L)								
Nitrate as N	16 HN	(1.0)	16 HN	(1.0)	NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	W-03		W-03		W-05		W-05	
Sample Control # :	L2036		L2036		86-W-05		86-W-05	
Date Sampled :	12/07/90		12/07/90		10/15/86		10/15/86	
QC Type :	LDA		LDB		LDA		LDB	
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 415.1 (UNITS ARE mg/L)								
Total Organic Carbon	3.5	(1.0)	NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	W-03		W-03		W-05		W-05	
Sample Control # :	L2036		L2036		86-W-05		86-W-05	
Date Sampled :	12/07/90		12/07/90		10/15/86		10/15/86	
QC Type :	LDA		LDB		LDA		LDB	
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 130.2 (UNITS ARE mg/L)								
Hardness	40	(1.0)	NA		NA		NA	
EPA METHOD 160.1 (UNITS ARE mg/L)								
Total Dissolved Solids	200	(5.0)	NA		NA		NA	
EPA METHOD 160.2 (UNITS ARE mg/L)								
Total Suspended Solids	ND	(5.0)	NA		NA		NA	
EPA METHOD 180.1 (UNITS ARE NTU)								
Turbidity	3.3 H	(0.10)	NA		NA		NA	
EPA METHOD 310.1 (UNITS ARE mg/L)								
Bicarbonate	NA		NA		NA		NA	
Carbonate	NA		NA		NA		NA	
Total Alkalinity	120	(1.0)	NA		NA		NA	
EPA METHOD IC (UNITS ARE mg/L)								
Perchlorate	ND	(0.20)	NA		NA		NA	
EPA METHOD MOISTURE(UNITS ARE %moist)								
% Moisture	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	W-03		W-03		W-05		W-05	
Sample Control # :	L2036		L2036		86-W-05		86-W-05	
Date Sampled :	12/07/90		12/07/90		10/15/86		10/15/86	
QC Type :	LDA		LDB		LDA		LDB	
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8020 (UNITS ARE ug/L)								
Benzene	NA		NA		NA		NA	
Toluene	NA		NA		NA		NA	
EPA METHOD 8040 (UNITS ARE ug/L)								
2,4-Dichlorophenol	NA		NA		NA		NA	
Phenol	NA		NA		NA		NA	
EPA METHOD 8240 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	NA		NA		ND	(3.8)	ND	(3.8)
1,1-Dichloroethene	NA		NA		ND	(4.7)	ND	(4.7)
1,2-Dichloroethane	NA		NA		ND	(2.8)	ND	(2.8)
Acetone	NA		NA		ND	(7.5)	ND	(7.5)
Methylene Chloride	NA		NA		ND	(2.8)	4.1 B	(2.8)
Trans-1,2-Dichloroethylene	NA		NA		ND	(1.6)	ND	(1.6)
Trichloroethene	NA		NA		ND	(1.9)	ND	(1.9)
EPA METHOD 8270 (UNITS ARE ug/L)								
Benzoic Acid	NA		NA		ND	(50)	NA	
Bis(2-Ethylhexyl)Phthalate	NA		NA		5.6 B	(2.5)	NA	
Di-N-Butyl Phthalate	NA		NA		31 B	(2.5)	NA	
Phenol	NA		NA		2.9	(1.5)	NA	
p-Cresol	NA		NA		ND	(10)	NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	W-02		W-03		W-03		W-03	
Sample Control # :	L2035		86-W-03		86-W-03		W-3	
Date Sampled :	12/06/90		10/16/86		10/16/86		11/02/89	
QC Type :			LDA		LDB			
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 6010 (UNITS ARE mg/L)								
Aluminum	4.0	(0.10)	ND	(0.045)	NA		0.15 *	(0.045)
Antimony	0.10	(0.10)	ND	(0.034)	NA		ND	(0.034)
Barium	0.10	(0.10)	0.016	(0.0020)	NA		0.016	(0.0020)
Boron	NA		0.040	(0.0060)	NA		0.27	(0.0060)
Cadmium	ND	(0.050)	ND	(0.0040)	NA		ND	(0.0040)
Calcium	1.1	(1.0)	15	(0.010)	NA		14	(0.010)
Chromium	ND	(0.050)	ND	(0.0070)	NA		ND	(0.0070)
Cobalt	ND	(0.10)	ND	(0.0070)	NA		ND	(0.0070)
Copper	ND	(0.10)	0.025	(0.0060)	NA		0.032	(0.0060)
Iron	1.8	(0.10)	0.016	(0.0070)	NA		0.056	(0.0070)
Magnesium	ND	(1.0)	0.58	(0.030)	NA		0.46	(0.030)
Manganese	ND	(0.10)	0.0090	(0.0020)	NA		0.0050 *	(0.0020)
Molybdenum	NA		ND	(0.0080)	NA		ND	(0.0080)
Nickel	ND	(0.10)	ND	(0.015)	NA		ND	(0.015)
Potassium	2.9	(1.0)	1.5	N/A	NA		ND	(3.0)
Silicon	NA		12	(0.058)	NA		11	(0.058)
Sodium	120	(1.0)	57	(0.029)	NA		62	(0.029)
Vanadium	ND	(0.10)	ND	(0.0080)	NA		ND	(0.0080)
Zinc	0.40	(0.10)	0.013	(0.0020)	NA		0.016	(0.0020)
EPA METHOD 300.0 (UNITS ARE mg/L)								
Nitrate as N	NA		NA		NA		NA	
EPA METHOD 353.2 (UNITS ARE mg/L)								
Nitrate as N	0.82 HN	(0.40)	NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	W-02		W-03		W-03		W-03	
Sample Control # :	L2035		86-W-03		86-W-03		W-3	
Date Sampled :	12/06/90		10/16/86		10/16/86		11/02/89	
QC Type :			LDA		LDB			
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 415.1 (UNITS ARE mg/L)								
Total Organic Carbon	10	(1.0)	NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	W-02		W-03		W-03		W-03	
Sample Control # :	L2035		86-W-03		86-W-03		W-3	
Date Sampled :	12/06/90		10/16/86		10/16/86		11/02/89	
QC Type :			LDA		LDB			
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 130.2 (UNITS ARE mg/L)								
Hardness	20	(10)	NA		NA		NA	
EPA METHOD 160.1 (UNITS ARE mg/L)								
Total Dissolved Solids	360	(50)	NA		NA		NA	
EPA METHOD 160.2 (UNITS ARE mg/L)								
Total Suspended Solids	98	(10)	NA		NA		NA	
EPA METHOD 180.1 (UNITS ARE NTU)								
Turbidity	96 H	(0.10)	NA		NA		NA	
EPA METHOD 310.1 (UNITS ARE mg/L)								
Bicarbonate	NA		NA		NA		NA	
Carbonate	NA		NA		NA		NA	
Total Alkalinity	140	(10)	NA		NA		NA	
EPA METHOD IC (UNITS ARE mg/L)								
Perchlorate	ND	(0.20)	NA		NA		NA	
EPA METHOD MOISTURE(UNITS ARE %moist)								
% Moisture	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	W-02		W-03		W-03		W-03	
Sample Control # :	L2035		86-W-03		86-W-03		W-3	
Date Sampled :	12/06/90		10/16/86		10/16/86		11/02/89	
QC Type :			LDA		LDB			
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8020 (UNITS ARE ug/L)								
Benzene	NA		NA		NA		NA	
Toluene	NA		NA		NA		NA	
EPA METHOD 8040 (UNITS ARE ug/L)								
2,4-Dichlorophenol	NA		NA		NA		ND	(0.50)
Phenol	NA		NA		NA		0.20 *C	(0.20)
EPA METHOD 8240 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	NA		7.6	(3.8)	NA		NA	
1,1-Dichloroethene	NA		13	(4.7)	NA		NA	
1,2-Dichloroethane	NA		ND	(2.8)	NA		NA	
Acetone	NA		6.0 JB	(7.5)	NA		NA	
Methylene Chloride	NA		ND	(2.8)	NA		NA	
Trans-1,2-Dichloroethylene	NA		ND	(1.6)	NA		NA	
Trichloroethene	NA		13	(1.9)	NA		NA	
EPA METHOD 8270 (UNITS ARE ug/L)								
Benzoic Acid	NA		ND	(50)	ND	(50)	NA	
Bis(2-Ethylhexyl)Phthalate	NA		5.9 B	(2.5)	2.6 B	(2.5)	NA	
Di-N-Butyl Phthalate	NA		27 B	(2.5)	8.3 B	(2.5)	NA	
Phenol	NA		1.4 J	(1.5)	2.2	(1.5)	NA	
p-Cresol	NA		ND	(10)	ND	(10)	NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	TANK		W-01		W-01		W-02	
Sample Control # :	L2032		W-1		L2025		W-2	
Date Sampled :	10/25/90		11/03/89		10/24/90		11/02/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 6010 (UNITS ARE mg/L)								
Aluminum	ND	(0.20)	0.25	(0.045)	ND	(0.20)	0.16 *	(0.045)
Antimony	ND	(0.20)	ND	(0.034)	ND	(0.20)	ND	(0.034)
Barium	0.021 @	(0.010)	0.018	(0.0020)	0.010 @	(0.010)	ND	(0.0020)
Boron	ND	(0.60)	0.63	(0.0060)	ND	(0.60)	0.50	(0.0060)
Cadmium	ND	(0.0050)	ND	(0.0040)	ND	(0.0050)	ND	(0.0040)
Calcium	36	(1.0)	14	(0.010)	4.3 @	(1.0)	2.6	(0.010)
Chromium	ND	(0.010)	ND	(0.0070)	ND	(0.010)	ND	(0.0070)
Cobalt	ND	(0.010)	ND	(0.0070)	ND	(0.010)	ND	(0.0070)
Copper	0.045 @	(0.020)	0.0060 *	(0.0060)	0.17	(0.020)	0.022 *	(0.0060)
Iron	0.072 @	(0.040)	0.035	(0.0070)	0.10 @	(0.040)	0.035	(0.0070)
Magnesium	4.4 @	(1.0)	2.0	(0.030)	ND	(1.0)	0.13 *	(0.030)
Manganese	0.010 @	(0.010)	0.0020 *	(0.0020)	ND	(0.010)	ND	(0.0020)
Molybdenum	ND	(0.050)	ND	(0.0080)	ND	(0.050)	0.012 *	(0.0080)
Nickel	ND	(0.020)	ND	(0.015)	ND	(0.020)	ND	(0.015)
Potassium	ND	(3.0)	ND	(3.0)	ND	(3.0)	ND	(3.0)
Silicon	12	(1.0)	11	(0.058)	7.8	(1.0)	11	(0.058)
Sodium	75	(1.0)	120	(0.029)	110	(1.0)	76	(0.029)
Vanadium	ND	(0.020)	ND	(0.0080)	ND	(0.020)	ND	(0.0080)
Zinc	0.023 @	(0.020)	ND	(0.0020)	0.047 @	(0.020)	0.0030 *	(0.0020)
EPA METHOD 300.0 (UNITS ARE mg/L)								
Nitrate as N	NA		NA		NA		NA	
EPA METHOD 353.2 (UNITS ARE mg/L)								
Nitrate as N	NA		NA		ND	(0.020)	NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	TANK		W-01		W-01		W-02	
Sample Control # :	L2032		W-1		L2025		W-2	
Date Sampled :	10/25/90		11/03/89		10/24/90		11/02/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 415.1 (UNITS ARE mg/L)								
Total Organic Carbon	NA		NA		3.1	(1.0)	NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	TANK		W-01		W-01		W-02	
Sample Control # :	L2032		W-1		L2025		W-2	
Date Sampled :	10/25/90		11/03/89		10/24/90		11/02/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 130.2 (UNITS ARE mg/L)								
Hardness	NA		NA		25 @	(10)	NA	
EPA METHOD 160.1 (UNITS ARE mg/L)								
Total Dissolved Solids	NA		NA		340	(10)	NA	
EPA METHOD 160.2 (UNITS ARE mg/L)								
Total Suspended Solids	NA		NA		13 @	(10)	NA	
EPA METHOD 180.1 (UNITS ARE NTU)								
Turbidity	NA		NA		2.4 @	(1.0)	NA	
EPA METHOD 310.1 (UNITS ARE mg/L)								
Bicarbonate	NA		NA		140	(1.0)	NA	
Carbonate	NA		NA		7.6	(1.0)	NA	
Total Alkalinity	NA		NA		NA		NA	
EPA METHOD IC (UNITS ARE mg/L)								
Perchlorate	NA		NA		ND	(0.20)	NA	
EPA METHOD MOISTURE(UNITS ARE %moist)								
% Moisture	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	TANK		W-01		W-01		W-02	
Sample Control # :	L2032		W-1		L2025		W-2	
Date Sampled :	10/25/90		11/03/89		10/24/90		11/02/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8020 (UNITS ARE ug/L)								
Benzene	NA		NA		NA		NA	
Toluene	NA		NA		NA		NA	
EPA METHOD 8040 (UNITS ARE ug/L)								
2,4-Dichlorophenol	NA		ND	(0.50)	ND	(1.0)	ND	(0.50)
Phenol	NA		ND	(0.20)	ND	(1.0)	0.33 *C	(0.20)
EPA METHOD 8240 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	NA		NA		NA		NA	
1,1-Dichloroethene	NA		NA		NA		NA	
1,2-Dichloroethane	NA		NA		NA		NA	
Acetone	NA		NA		NA		NA	
Methylene Chloride	NA		NA		NA		NA	
Trans-1,2-Dichloroethylene	NA		NA		NA		NA	
Trichloroethene	NA		NA		NA		NA	
EPA METHOD 8270 (UNITS ARE ug/L)								
Benzoic Acid	NA		NA		NA		NA	
Bis(2-Ethylhexyl)Phthalate	NA		NA		NA		NA	
Di-N-Butyl Phthalate	NA		NA		NA		NA	
Phenol	NA		NA		NA		NA	
p-Cresol	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	OW-03		OW-03		OW-08		OW-08	
Sample Control # :	OW-3B		L2023		OW-8		L2024	
Date Sampled :	11/03/89		10/25/90		11/02/89		10/22/90	
QC Type :	FDB							
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 6010 (UNITS ARE mg/L)								
Aluminum	0.20 *	(0.045)	ND	(0.20)	1.4	(0.045)	0.26 @	(0.20)
Antimony	ND	(0.034)	ND	(0.20)	ND	(0.034)	ND	(0.20)
Barium	0.10	(0.0020)	0.093	(0.010)	0.031	(0.0020)	0.035 @	(0.010)
Boron	0.32	(0.0060)	ND	(0.60)	0.52	(0.0060)	ND	(0.60)
Cadmium	ND	(0.0040)	ND	(0.0050)	ND	(0.0040)	ND	(0.0050)
Calcium	34	(0.010)	28	(1.0)	32	(0.010)	21	(1.0)
Chromium	ND	(0.0070)	ND	(0.010)	ND	(0.0070)	ND	(0.010)
Cobalt	ND	(0.0070)	ND	(0.010)	ND	(0.0070)	ND	(0.010)
Copper	0.0090 *	(0.0060)	0.13	(0.020)	ND	(0.0060)	0.072 @	(0.020)
Iron	0.15	(0.0070)	0.27	(0.040)	1.3	(0.0070)	0.071 @	(0.040)
Magnesium	6.2	(0.030)	5.1	(1.0)	7.8	(0.030)	3.9 @	(1.0)
Manganese	0.14	(0.0020)	0.54	(0.010)	0.10	(0.0020)	0.027 @	(0.010)
Molybdenum	ND	(0.0080)	ND	(0.050)	0.027 *	(0.0080)	ND	(0.050)
Nickel	ND	(0.015)	ND	(0.020)	ND	(0.015)	ND	(0.020)
Potassium	ND	(3.0)	ND	(3.0)	ND	(3.0)	ND	(3.0)
Silicon	15	(0.058)	15	(1.0)	17	(0.058)	16	(1.0)
Sodium	23	(0.029)	22	(1.0)	130	(0.029)	93	(1.0)
Vanadium	ND	(0.0080)	ND	(0.020)	0.015 *	(0.0080)	ND	(0.020)
Zinc	ND	(0.0020)	0.050 @	(0.020)	0.0060 *	(0.0020)	0.045 @	(0.020)
EPA METHOD 300.0 (UNITS ARE mg/L)								
Nitrate as N	NA		NA		NA		NA	
EPA METHOD 353.2 (UNITS ARE mg/L)								
Nitrate as N	NA		11	(1.0)	NA		4.2	(0.20)

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	OW-03		OW-03		OW-08		OW-08	
Sample Control # :	OW-38		L2023		OW-8		L2024	
Date Sampled :	11/03/89		10/25/90		11/02/89		10/22/90	
QC Type :	FDB							
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 415.1 (UNITS ARE mg/L)								
Total Organic Carbon	NA		4.4	(1.0)	NA		1.5	(1.0)

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	OW-03		OW-03		OW-08		OW-08	
Sample Control # :	OW-3B		L2023		OW-8		L2024	
Date Sampled :	11/03/89		10/25/90		11/02/89		10/22/90	
QC Type :	FDB							
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 130.2 (UNITS ARE mg/L)								
Hardness	NA		84	(10)	NA		74	(10)
EPA METHOD 160.1 (UNITS ARE mg/L)								
Total Dissolved Solids	NA		160	(10)	NA		300	(10)
EPA METHOD 160.2 (UNITS ARE mg/L)								
Total Suspended Solids	NA		1900	(10)	NA		7600	(20)
EPA METHOD 180.1 (UNITS ARE NTU)								
Turbidity	NA		85	(1.0)	NA		58	(1.0)
EPA METHOD 310.1 (UNITS ARE mg/L)								
Bicarbonate	NA		80	(1.0)	NA		330	(1.0)
Carbonate	NA		ND	(1.0)	NA		ND	(1.0)
Total Alkalinity	NA		NA		NA		NA	
EPA METHOD IC (UNITS ARE mg/L)								
Perchlorate	NA		3.8	(0.20)	NA		ND	(0.20)
EPA METHOD MOISTURE(UNITS ARE %moist)								
% Moisture	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	OW-03		OW-03		OW-08		OW-08	
Sample Control # :	OW-38		L2023		OW-8		L2024	
Date Sampled :	11/03/89		10/25/90		11/02/89		10/22/90	
QC Type :	FDB							
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8020 (UNITS ARE ug/L)								
Benzene	NA		NA		NA		NA	
Toluene	NA		NA		NA		NA	
EPA METHOD 8040 (UNITS ARE ug/L)								
2,4-Dichlorophenol	ND	(0.50)	NA		ND	(0.50)	NA	
Phenol	ND	(0.20)	NA		ND	(0.20)	NA	
EPA METHOD 8240 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	NA		NA		NA		NA	
1,1-Dichloroethene	NA		NA		NA		NA	
1,2-Dichloroethane	NA		NA		NA		NA	
Acetone	NA		NA		NA		NA	
Methylene Chloride	NA		NA		NA		NA	
Trans-1,2-Dichloroethylene	NA		NA		NA		NA	
Trichloroethene	NA		NA		NA		NA	
EPA METHOD 8270 (UNITS ARE ug/L)								
Benzoic Acid	NA		NA		NA		NA	
Bis(2-Ethylhexyl)Phthalate	NA		NA		NA		NA	
Di-N-Butyl Phthalate	NA		NA		NA		NA	
Phenol	NA		NA		NA		NA	
p-Cresol	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	OW-02		OW-03		OW-03		OW-03	
Sample Control # :	L2022		86-OW-03A		86-OW-03B		OW-3A	
Date Sampled :	10/23/90		10/16/86		10/16/86		11/03/89	
QC Type :			FDA		FDB		FDA	
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 6010 (UNITS ARE mg/L)								
Aluminum	ND	(0.20)	0.12	(0.045)	0.051	(0.045)	0.73	(0.045)
Antimony	ND	(0.20)	ND	(0.034)	ND	(0.034)	ND	(0.034)
Barium	0.087	(0.010)	0.068	(0.0020)	0.071	(0.0020)	0.11	(0.0020)
Boron	ND	(0.60)	0.038	(0.0060)	0.038	(0.0060)	0.26	(0.0060)
Cadmium	ND	(0.0050)	ND	(0.0040)	ND	(0.0040)	ND	(0.0040)
Calcium	28	(1.0)	47	(0.010)	44	(0.010)	34	(0.010)
Chromium	ND	(0.010)	ND	(0.0070)	ND	(0.0070)	ND	(0.0070)
Cobalt	ND	(0.010)	ND	(0.0070)	ND	(0.0070)	ND	(0.0070)
Copper	0.12	(0.020)	0.016	(0.0060)	0.018	(0.0060)	0.016 *	(0.0060)
Iron	0.12 @	(0.040)	0.66	(0.0070)	0.25	(0.0070)	0.74	(0.0070)
Magnesium	4.3 @	(1.0)	8.0	(0.030)	7.5	(0.030)	6.3	(0.030)
Manganese	ND	(0.010)	1.8	(0.0020)	1.6	(0.0020)	0.15	(0.0020)
Molybdenum	ND	(0.050)	ND	(0.0080)	ND	(0.0080)	ND	(0.0080)
Nickel	ND	(0.020)	ND	(0.015)	ND	(0.015)	ND	(0.015)
Potassium	ND	(3.0)	5.0	N/A	4.3	N/A	ND	(3.0)
Silicon	16	(1.0)	18	(0.058)	17	(0.058)	16	(0.058)
Sodium	18	(1.0)	20	(0.029)	19	(0.029)	23	(0.029)
Vanadium	ND	(0.020)	ND	(0.0080)	ND	(0.0080)	ND	(0.0080)
Zinc	0.034 @	(0.020)	0.0090	(0.0020)	0.010	(0.0020)	0.0030 *	(0.0020)
EPA METHOD 300.0 (UNITS ARE mg/L)								
Nitrate as N	NA		NA		NA		NA	
EPA METHOD 353.2 (UNITS ARE mg/L)								
Nitrate as N	7.1	(0.50)	NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	OW-02		OW-03		OW-03		OW-03	
Sample Control # :	L2022		86-OW-03A		86-OW-03B		OW-3A	
Date Sampled :	10/23/90		10/16/86		10/16/86		11/03/89	
QC Type :			FDA		FDB		FDA	
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 415.1 (UNITS ARE mg/L)								
Total Organic Carbon	1.3	(1.0)	NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	OW-02		OW-03		OW-03		OW-03	
Sample Control # :	L2022		86-OW-03A		86-OW-03B		OW-3A	
Date Sampled :	10/23/90		10/16/86		10/16/86		11/03/89	
QC Type :			FDA		FDB		FDA	
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8020 (UNITS ARE ug/L)								
Benzene	NA		NA		NA		NA	
Toluene	NA		NA		NA		NA	
EPA METHOD 8040 (UNITS ARE ug/L)								
2,4-Dichlorophenol	NA		NA		NA		ND	(0.50)
Phenol	NA		NA		NA		ND	(0.20)
EPA METHOD 8240 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	NA		160	(19)	210	(19)	NA	
1,1-Dichloroethane	NA		160	(24)	260	(24)	NA	
1,2-Dichloroethane	NA		7.4 JB	(14)	11 J	(14)	NA	
Acetone	NA		36 JB	(38)	14 JB	(38)	NA	
Methylene Chloride	NA		ND	(14)	ND	(14)	NA	
Trans-1,2-Dichloroethylene	NA		39	(8.0)	98	(8.0)	NA	
Trichloroethene	NA		180	(9.5)	200	(9.5)	NA	
EPA METHOD 8270 (UNITS ARE ug/L)								
Benzoic Acid	NA		11 J	(50)	32 J	(50)	NA	
Bis(2-Ethylhexyl)Phthalate	NA		6.1 B	(2.5)	7.2 B	(2.5)	NA	
Di-N-Butyl Phthalate	NA		18 B	(2.5)	18 B	(2.5)	NA	
Phenol	NA		6.9	(1.5)	12	(1.5)	NA	
p-Cresol	NA		94	(10)	180	(10)	NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	OW-02		OW-03		OW-03		OW-03	
Sample Control # :	L2022		86-OW-03A		86-OW-03B		OW-3A	
Date Sampled :	10/23/90		10/16/86		10/16/86		11/03/89	
QC Type :			FDA		FDB		FDA	
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 130.2 (UNITS ARE mg/L)								
Hardness	73	(10)	NA		NA		NA	
EPA METHOD 160.1 (UNITS ARE mg/L)								
Total Dissolved Solids	170	(10)	NA		NA		NA	
EPA METHOD 160.2 (UNITS ARE mg/L)								
Total Suspended Solids	44 @	(10)	NA		NA		NA	
EPA METHOD 180.1 (UNITS ARE NTU)								
Turbidity	15 H	(1.0)	NA		NA		NA	
EPA METHOD 310.1 (UNITS ARE mg/L)								
Bicarbonate	66	(1.0)	NA		NA		NA	
Carbonate	ND	(1.0)	NA		NA		NA	
Total Alkalinity	NA		NA		NA		NA	
EPA METHOD IC (UNITS ARE mg/L)								
Perchlorate	2.8	(0.20)	NA		NA		NA	
EPA METHOD MOISTURE(UNITS ARE %moist)								
% Moisture	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-25		MW-25		MW-37		OW-02	
Sample Control # :	L2034-2		L2034-2		L5026		OW-2 1	
Date Sampled :	12/07/90		12/07/90		9/23/91		11/03/89	
QC Type :	LDA		LDB					
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 415.1 (UNITS ARE mg/L)								
Total Organic Carbon	ND	(1.0)	NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-25		MW-25		MW-37		OW-02	
Sample Control # :	L2034-2		L2034-2		L5026		OW-2 1	
Date Sampled :	12/07/90		12/07/90		9/23/91		11/03/89	
QC Type :	LDA		LDB					
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 6010 (UNITS ARE mg/L)								
Aluminum	19	(0.10)	NA		NA		0.18 *	(0.045)
Antimony	ND	(0.10)	NA		NA		ND	(0.034)
Barium	0.20	(0.10)	NA		NA		0.077	(0.0020)
Boron	NA		NA		NA		0.31	(0.0060)
Cadmium	ND	(0.050)	NA		NA		ND	(0.0040)
Calcium	1.5	(1.0)	NA		NA		27	(0.010)
Chromium	ND	(0.050)	NA		NA		ND	(0.0070)
Cobalt	ND	(0.10)	NA		NA		ND	(0.0070)
Copper	ND	(0.10)	NA		NA		0.0070 *	(0.0060)
Iron	2.2	(0.10)	NA		NA		0.019 *	(0.0070)
Magnesium	ND	(1.0)	NA		NA		4.0	(0.030)
Manganese	ND	(0.10)	NA		NA		ND	(0.0020)
Molybdenum	NA		NA		NA		ND	(0.0080)
Nickel	ND	(0.10)	NA		NA		ND	(0.015)
Potassium	10	(1.0)	NA		NA		ND	(3.0)
Silicon	NA		NA		NA		16	(0.058)
Sodium	47	(1.0)	NA		NA		18	(0.029)
Vanadium	ND	(0.10)	NA		NA		ND	(0.0080)
Zinc	0.10	(0.10)	NA		NA		ND	(0.0020)
EPA METHOD 300.0 (UNITS ARE mg/L)								
Nitrate as N	NA		NA		NA		NA	
EPA METHOD 353.2 (UNITS ARE mg/L)								
Nitrate as N	20 HN	(10)	21 HN	(10)	NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-25		MW-25		MW-37		OW-02	
Sample Control # :	L2034-2		L2034-2		L5026		OW-2 1	
Date Sampled :	12/07/90		12/07/90		9/23/91		11/03/89	
QC Type :	LDA		LDB					
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8020 (UNITS ARE ug/L)								
Benzene	NA		NA		ND	(0.20)	NA	
Toluene	NA		NA		ND	(0.20)	NA	
EPA METHOD 8040 (UNITS ARE ug/L)								
2,4-Dichlorophenol	NA		NA		NA		ND	(0.50)
Phenol	NA		NA		NA		ND	(0.20)
EPA METHOD 8240 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	NA		NA		NA		NA	
1,1-Dichloroethene	NA		NA		NA		NA	
1,2-Dichloroethane	NA		NA		NA		NA	
Acetone	NA		NA		NA		NA	
Methylene Chloride	NA		NA		NA		NA	
Trans-1,2-Dichloroethylene	NA		NA		NA		NA	
Trichloroethene	NA		NA		NA		NA	
EPA METHOD 8270 (UNITS ARE ug/L)								
Benzoic Acid	NA		NA		NA		NA	
Bis(2-Ethylhexyl)Phthalate	NA		NA		NA		NA	
Di-N-Butyl Phthalate	NA		NA		NA		NA	
Phenol	NA		NA		NA		NA	
p-Cresol	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-25		MW-25		MW-37		OW-02	
Sample Control # :	L2034-2		L2034-2		L5026		OW-2 1	
Date Sampled :	12/07/90		12/07/90		9/23/91		11/03/89	
QC Type :	LDA		LDB					
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 130.2 (UNITS ARE mg/L)								
Hardness	70	(10)	NA		NA		NA	
EPA METHOD 160.1 (UNITS ARE mg/L)								
Total Dissolved Solids	260	(50)	NA		NA		NA	
EPA METHOD 160.2 (UNITS ARE mg/L)								
Total Suspended Solids	260	(10)	NA		NA		NA	
EPA METHOD 180.1 (UNITS ARE NTU)								
Turbidity	250 H	(0.10)	NA		NA		NA	
EPA METHOD 310.1 (UNITS ARE mg/L)								
Bicarbonate	NA		NA		NA		NA	
Carbonate	NA		NA		NA		NA	
Total Alkalinity	75	(10)	NA		NA		NA	
EPA METHOD IC (UNITS ARE mg/L)								
Perchlorate	6.8	(0.20)	NA		NA		NA	
EPA METHOD MOISTURE(UNITS ARE %moist)								
% Moisture	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-18		MW-19		MW-19		MW-24	
Sample Control # :	L2020		MW-19		L2021		L2033	
Date Sampled :	10/19/90		12/20/89		10/18/90		11/20/90	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 415.1 (UNITS ARE mg/L)								
Total Organic Carbon	3.9	(1.0)	NA		5.5	(1.0)	8.0	(1.0)

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-18		MW-19		MW-19		MW-24	
Sample Control # :	L2020		MW-19		L2021		L2033	
Date Sampled :	10/19/90		12/20/89		10/18/90		11/20/90	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 6010 (UNITS ARE mg/L)								
Aluminum	0.40 @	(0.20)	11	(0.045)	0.29 @	(0.20)	0.20	(0.10)
Antimony	ND	(0.20)	ND	(0.034)	ND	(0.20)	ND	(0.10)
Barium	0.065	(0.010)	0.047	(0.0020)	0.012 @	(0.010)	0.10	(0.10)
Boron	ND	(0.60)	0.58	(0.0060)	ND	(0.60)	NA	
Cadmium	ND	(0.0050)	ND	(0.0040)	ND	(0.0050)	ND	(0.050)
Calcium	69	(1.0)	13	(0.010)	22	(1.0)	180	(0.10)
Chromium	ND	(0.010)	0.0070 *	(0.0070)	ND	(0.010)	ND	(0.050)
Cobalt	ND	(0.010)	0.0080 *	(0.0070)	ND	(0.010)	ND	(0.10)
Copper	0.020 @	(0.020)	0.057	(0.0060)	0.047 @	(0.020)	ND	(0.10)
Iron	0.20	(0.040)	7.0	(0.0070)	0.31	(0.040)	ND	(0.10)
Magnesium	10	(1.0)	6.8	(0.030)	6.3	(1.0)	ND	(0.10)
Manganese	0.15	(0.010)	0.048	(0.0020)	0.089	(0.010)	ND	(0.10)
Molybdenum	ND	(0.050)	0.020 *	(0.0080)	ND	(0.050)	ND	(0.10)
Nickel	ND	(0.020)	ND	(0.015)	ND	(0.020)	ND	(0.10)
Potassium	ND	(3.0)	ND	(3.0)	ND	(3.0)	26	(1.0)
Silicon	15	(1.0)	27	(0.058)	15	(1.0)	NA	
Sodium	46	(1.0)	87	(0.029)	22	(1.0)	180	(1.0)
Vanadium	ND	(0.020)	0.052	(0.0080)	ND	(0.020)	ND	(0.10)
Zinc	0.024 @	(0.020)	0.031	(0.0020)	0.064 @	(0.020)	ND	(0.10)
EPA METHOD 300.0 (UNITS ARE mg/L)								
Nitrate as N	NA		NA		NA		12 N	(10)
EPA METHOD 353.2 (UNITS ARE mg/L)								
Nitrate as N	0.060 @	(0.020)	NA		ND	(0.020)	NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-18		MW-19		MW-19		MW-24	
Sample Control # :	L2020		MW-19		L2021		L2033	
Date Sampled :	10/19/90		12/20/89		10/18/90		11/20/90	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8020 (UNITS ARE ug/L)								
Benzene	NA		NA		NA		5.0	(1.0)
Toluene	NA		NA		NA		ND	(1.0)
EPA METHOD 8040 (UNITS ARE ug/L)								
2,4-Dichlorophenol	NA		ND	(0.50)	NA		NA	
Phenol	NA		ND	(0.20)	NA		NA	
EPA METHOD 8240 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	NA		NA		NA		NA	
1,1-Dichloroethene	NA		NA		NA		NA	
1,2-Dichloroethane	NA		NA		NA		NA	
Acetone	NA		NA		NA		NA	
Methylene Chloride	NA		NA		NA		NA	
Trans-1,2-Dichloroethylene	NA		NA		NA		NA	
Trichloroethene	NA		NA		NA		NA	
EPA METHOD 8270 (UNITS ARE ug/L)								
Benzoic Acid	NA		NA		NA		NA	
Bis(2-Ethylhexyl)Phthalate	NA		NA		NA		NA	
Di-N-Butyl Phthalate	NA		NA		NA		NA	
Phenol	NA		NA		NA		NA	
p-Cresol	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-18		MW-19		MW-19		MW-24	
Sample Control # :	L2020		MW-19		L2021		L2033	
Date Sampled :	10/19/90		12/20/89		10/18/90		11/20/90	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 130.2 (UNITS ARE mg/L)								
Hardness	200	(10)	NA		77	(10)	630	(10)
EPA METHOD 160.1 (UNITS ARE mg/L)								
Total Dissolved Solids	380	(10)	NA		180	(10)	1600 H	(50)
EPA METHOD 160.2 (UNITS ARE mg/L)								
Total Suspended Solids	ND	(10)	NA		10 @	(10)	1700 H	(10)
EPA METHOD 180.1 (UNITS ARE NTU)								
Turbidity	1.4 @H	(1.0)	NA		8.8 H	(1.0)	2000 H	(0.10)
EPA METHOD 310.1 (UNITS ARE mg/L)								
Bicarbonate	220	(1.0)	NA		110	(1.0)	NA	
Carbonate	ND	(1.0)	NA		ND	(1.0)	NA	
Total Alkalinity	NA		NA		NA		720 H	(10)
EPA METHOD IC (UNITS ARE mg/L)								
Perchlorate	ND	(0.20)	NA		ND	(0.20)	5.1	(0.20)
EPA METHOD MOISTURE(UNITS ARE %moist)								
% Moisture	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-16		MW-17		MW-17		MW-18	
Sample Control # :	L2018		MW-17		L2019		MW-18	
Date Sampled :	10/22/90		12/20/89		10/23/90		12/20/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 415.1 (UNITS ARE mg/L)								
Total Organic Carbon	3.6	(1.0)	NA		ND	(1.0)	NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-16		MW-17		MW-17		MW-18	
Sample Control # :	L2018		MW-17		L2019		MW-18	
Date Sampled :	10/22/90		12/20/89		10/23/90		12/20/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 6010 (UNITS ARE mg/L)								
Aluminum	ND	(0.20)	0.59	(0.045)	ND	(0.20)	0.25	(0.045)
Antimony	ND	(0.20)	ND	(0.034)	ND	(0.20)	ND	(0.034)
Barium	0.083	(0.010)	0.030	(0.0020)	0.016 @	(0.010)	0.045	(0.0020)
Boron	ND	(0.60)	0.44	(0.0060)	ND	(0.60)	0.52	(0.0060)
Cadmium	ND	(0.0050)	ND	(0.0040)	ND	(0.0050)	ND	(0.0040)
Calcium	150	(1.0)	34	(0.010)	33	(1.0)	74	(0.010)
Chromium	ND	(0.010)	ND	(0.0070)	ND	(0.010)	ND	(0.0070)
Cobalt	ND	(0.010)	ND	(0.0070)	ND	(0.010)	ND	(0.0070)
Copper	0.083 @	(0.020)	0.037	(0.0060)	0.12	(0.020)	0.015 *	(0.0060)
Iron	0.077 @	(0.040)	0.27	(0.0070)	0.11 @	(0.040)	0.062	(0.0070)
Magnesium	28	(1.0)	3.7	(0.030)	5.7	(1.0)	14	(0.030)
Manganese	0.010 @	(0.010)	0.0090 *	(0.0020)	0.010 @	(0.010)	0.19	(0.0020)
Molybdenum	ND	(0.050)	0.020 *	(0.0080)	ND	(0.050)	0.019 *	(0.0080)
Nickel	ND	(0.020)	ND	(0.015)	0.024 @	(0.020)	ND	(0.015)
Potassium	ND	(3.0)	ND	(3.0)	3.8 @	(3.0)	ND	(3.0)
Silicon	14	(1.0)	13	(0.058)	10	(1.0)	15	(0.058)
Sodium	210	(1.0)	51	(0.029)	24	(1.0)	78	(0.029)
Vanadium	ND	(0.020)	0.012 *	(0.0080)	ND	(0.020)	ND	(0.0080)
Zinc	0.045 @	(0.020)	0.013	(0.0020)	0.046 @	(0.020)	0.014	(0.0020)
EPA METHOD 300.0 (UNITS ARE mg/L)								
Nitrate as N	NA		NA		NA		NA	
EPA METHOD 353.2 (UNITS ARE mg/L)								
Nitrate as N	0.12	(0.020)	NA		2.8	(0.20)	NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-16		MW-17		MW-17		MW-18	
Sample Control # :	L2018		MW-17		L2019		MW-18	
Date Sampled :	10/22/90		12/20/89		10/23/90		12/20/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8020 (UNITS ARE ug/L)								
Benzene	NA		NA		NA		NA	
Toluene	NA		NA		NA		NA	
EPA METHOD 8040 (UNITS ARE ug/L)								
2,4-Dichlorophenol	ND	(1.0)	ND	(0.50)	ND	(1.0)	ND	(0.50)
Phenol	ND	(1.0)	ND	(0.20)	ND	(1.0)	ND	(0.20)
EPA METHOD 8240 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	NA		NA		NA		NA	
1,1-Dichloroethene	NA		NA		NA		NA	
1,2-Dichloroethane	NA		NA		NA		NA	
Acetone	NA		NA		NA		NA	
Methylene Chloride	NA		NA		NA		NA	
Trans-1,2-Dichloroethylene	NA		NA		NA		NA	
Trichloroethene	NA		NA		NA		NA	
EPA METHOD 8270 (UNITS ARE ug/L)								
Benzoic Acid	NA		NA		NA		NA	
Bis(2-Ethylhexyl)Phthalate	NA		NA		NA		NA	
Di-N-Butyl Phthalate	NA		NA		NA		NA	
Phenol	NA		NA		NA		NA	
p-Cresol	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-16		MW-17		MW-17		MW-18	
Sample Control # :	L2018		MW-17		L2019		MW-18	
Date Sampled :	10/22/90		12/20/89		10/23/90		12/20/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 130.2 (UNITS ARE mg/L)								
Hardness	500	(50)	NA		97	(10)	NA	
EPA METHOD 160.1 (UNITS ARE mg/L)								
Total Dissolved Solids	1200	(10)	NA		200	(10)	NA	
EPA METHOD 160.2 (UNITS ARE mg/L)								
Total Suspended Solids	5900	(20)	NA		46 @	(10)	NA	
EPA METHOD 180.1 (UNITS ARE NTU)								
Turbidity	67	(1.0)	NA		30	(1.0)	NA	
EPA METHOD 310.1 (UNITS ARE mg/L)								
Bicarbonate	660	(1.0)	NA		120	(1.0)	NA	
Carbonate	ND	(1.0)	NA		ND	(1.0)	NA	
Total Alkalinity	NA		NA		NA		NA	
EPA METHOD IC (UNITS ARE mg/L)								
Perchlorate	ND	(0.20)	NA		0.34	(0.20)	NA	
EPA METHOD MOISTURE(UNITS ARE %moist)								
% Moisture	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-15		MW-15		MW-15		MW-16	
Sample Control # :	MW-15		L2016		L2017		MW-16	
Date Sampled :	1/04/90		10/22/90		10/22/90		1/04/90	
QC Type :			FDA		FDB			
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 415.1 (UNITS ARE mg/L)								
Total Organic Carbon	NA		1.4	(1.0)	1.2	(1.0)	NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-15		MW-15		MW-15		MW-16	
Sample Control # :	MW-15		L2016		L2017		MW-16	
Date Sampled :	1/04/90		10/22/90		10/22/90		1/04/90	
QC Type :			FDA		FDB			
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 6010 (UNITS ARE mg/L)								
Aluminum	0.25	(0.045)	ND	(0.20)	ND	(0.20)	0.34	(0.045)
Antimony	ND	(0.034)	ND	(0.20)	ND	(0.20)	ND	(0.034)
Barium	0.033	(0.0020)	0.057	(0.010)	0.051	(0.010)	0.093	(0.0020)
Boron	0.54	(0.0060)	ND	(0.60)	ND	(0.60)	0.61	(0.0060)
Cadmium	0.0040 *	(0.0040)	ND	(0.0050)	ND	(0.0050)	ND	(0.0040)
Calcium	35	(0.010)	52	(1.0)	52	(1.0)	150	(0.010)
Chromium	ND	(0.0070)	ND	(0.010)	ND	(0.010)	ND	(0.0070)
Cobalt	ND	(0.0070)	ND	(0.010)	ND	(0.010)	ND	(0.0070)
Copper	0.17	(0.0060)	0.13	(0.020)	ND	(0.020)	0.095	(0.0060)
Iron	0.17	(0.0070)	0.18@	(0.040)	0.060 @	(0.040)	0.14	(0.0070)
Magnesium	8.0	(0.030)	9.3	(1.0)	9.0	(1.0)	29	(0.030)
Manganese	0.074	(0.0020)	0.13	(0.010)	0.13	(0.010)	0.031	(0.0020)
Molybdenum	0.040	(0.0080)	ND	(0.050)	ND	(0.050)	0.015 *	(0.0080)
Nickel	ND	(0.015)	ND	(0.020)	ND	(0.020)	ND	(0.015)
Potassium	ND	(3.0)	ND	(3.0)	3.8 @	(3.0)	ND	(3.0)
Silicon	12	(0.058)	15	(1.0)	4.1 @	(1.0)	14	(0.058)
Sodium	78	(0.029)	64	(1.0)	62	(1.0)	180	(0.029)
Vanadium	ND	(0.0080)	ND	(0.020)	ND	(0.020)	ND	(0.0080)
Zinc	0.076	(0.0020)	0.076 @	(0.020)	ND	(0.020)	0.035	(0.0020)
EPA METHOD 300.0 (UNITS ARE mg/L)								
Nitrate as N	NA		NA		NA		NA	
EPA METHOD 353.2 (UNITS ARE mg/L)								
Nitrate as N	NA		ND	(0.020)	ND	(0.020)	NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-15		MW-15		MW-15		MW-16	
Sample Control # :	MW-15		L2016		L2017		MW-16	
Date Sampled :	1/04/90		10/22/90		10/22/90		1/04/90	
QC Type :			FDA		FDB			
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8020 (UNITS ARE ug/L)								
Benzene	NA		NA		NA		NA	
Toluene	NA		NA		NA		NA	
EPA METHOD 8040 (UNITS ARE ug/L)								
2,4-Dichlorophenol	ND	(0.50)	ND	(1.0)	ND	(1.0)	ND	(0.50)
Phenol	0.66 *C	(0.20)	ND	(1.0)	ND	(1.0)	0.50 *C	(0.20)
EPA METHOD 8240 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	NA		NA		NA		NA	
1,1-Dichloroethene	NA		NA		NA		NA	
1,2-Dichloroethane	NA		NA		NA		NA	
Acetone	NA		NA		NA		NA	
Methylene Chloride	NA		NA		NA		NA	
Trans-1,2-Dichloroethylene	NA		NA		NA		NA	
Trichloroethene	NA		NA		NA		NA	
EPA METHOD 8270 (UNITS ARE ug/L)								
Benzoic Acid	NA		NA		NA		NA	
Bis(2-Ethylhexyl)Phthalate	NA		NA		NA		NA	
Di-N-Butyl Phthalate	NA		NA		NA		NA	
Phenol	NA		NA		NA		NA	
p-Cresol	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-15		MW-15		MW-15		MW-16	
Sample Control # :	MW-15		L2016		L2017		MW-16	
Date Sampled :	1/04/90		10/22/90		10/22/90		1/04/90	
QC Type :			FDA		FDB			
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 130.2 (UNITS ARE mg/L)								
Hardness	NA		150	(10)	150	(10)	NA	
EPA METHOD 160.1 (UNITS ARE mg/L)								
Total Dissolved Solids	NA		350	(20)	360	(10)	NA	
EPA METHOD 160.2 (UNITS ARE mg/L)								
Total Suspended Solids	NA		ND	(10)	ND	(10)	NA	
EPA METHOD 180.1 (UNITS ARE NTU)								
Turbidity	NA		ND	(1.0)	ND	(1.0)	NA	
EPA METHOD 310.1 (UNITS ARE mg/L)								
Bicarbonate	NA		180	(1.0)	180	(1.0)	NA	
Carbonate	NA		ND	(1.0)	ND	(1.0)	NA	
Total Alkalinity	NA		NA		NA		NA	
EPA METHOD IC (UNITS ARE mg/L)								
Perchlorate	NA		ND	(0.20)	ND	(0.20)	NA	
EPA METHOD MOISTURE(UNITS ARE %moist)								
% Moisture	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-13		MW-13		MW-14		MW-14	
Sample Control # :	MW-13		L2014		MW-14		L2015	
Date Sampled :	12/09/89		10/22/90		12/10/89		10/23/90	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 415.1 (UNITS ARE mg/L)								
Total Organic Carbon	NA		1.3	(1.0)	NA		ND	(1.0)

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-13		MW-13		MW-14		MW-14	
Sample Control # :	MW-13		L2014		MW-14		L2015	
Date Sampled :	12/09/89		10/22/90		12/10/89		10/23/90	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 6010 (UNITS ARE mg/L)								
Aluminum	0.69 *	(0.045)	ND	(0.20)	0.21 *	(0.045)	ND	(0.20)
Antimony	ND	(0.034)	ND	(0.20)	ND	(0.034)	ND	(0.20)
Barium	0.061	(0.0020)	0.062	(0.010)	ND	(0.0020)	0.014 @	(0.010)
Boron	0.59 *	(0.0060)	ND	(0.60)	ND	(0.0060)	ND	(0.60)
Cadmium	ND	(0.0040)	ND	(0.0050)	ND	(0.0040)	ND	(0.0050)
Calcium	68	(0.010)	58	(1.0)	47	(0.010)	44	(1.0)
Chromium	ND	(0.0070)	ND	(0.010)	ND	(0.0070)	ND	(0.010)
Cobalt	ND	(0.0070)	ND	(0.010)	ND	(0.0070)	ND	(0.010)
Copper	0.16	(0.0060)	0.024 @	(0.020)	0.052 *	(0.0060)	0.19	(0.020)
Iron	0.81	(0.0070)	0.041 @	(0.040)	ND	(0.0070)	0.10 @	(0.040)
Magnesium	8.9	(0.030)	6.7	(1.0)	9.3	(0.030)	7.7	(1.0)
Manganese	0.18	(0.0020)	0.18	(0.010)	0.018 *	(0.0020)	ND	(0.010)
Molybdenum	0.014 *	(0.0080)	ND	(0.050)	ND	(0.0080)	ND	(0.050)
Nickel	ND	(0.015)	ND	(0.020)	ND	(0.015)	ND	(0.020)
Potassium	ND	(3.0)	3.5 @	(3.0)	3.3 *	(3.0)	ND	(3.0)
Silicon	20	(0.058)	7.0	(1.0)	20	(0.058)	18	(1.0)
Sodium	120	(0.029)	110	(1.0)	42	(0.029)	36	(1.0)
Vanadium	ND	(0.0080)	ND	(0.020)	ND	(0.0080)	ND	(0.020)
Zinc	0.056 *	(0.0020)	0.024 @	(0.020)	0.040 *	(0.0020)	0.076 @	(0.020)
EPA METHOD 300.0 (UNITS ARE mg/L)								
Nitrate as N	NA		NA		NA		NA	
EPA METHOD 353.2 (UNITS ARE mg/L)								
Nitrate as N	NA		ND	(0.020)	NA		1.7	(0.10)

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-13		MW-13		MW-14		MW-14	
Sample Control # :	MW-13		L2014		MW-14		L2015	
Date Sampled :	12/09/89		10/22/90		12/10/89		10/23/90	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8020 (UNITS ARE ug/L)								
Benzene	NA		NA		NA		NA	
Toluene	NA		NA		NA		NA	
EPA METHOD 8040 (UNITS ARE ug/L)								
2,4-Dichlorophenol	ND	(0.50)	ND	(1.0)	ND	(0.50)	ND	(1.0)
Phenol	0.26 *C	(0.20)	ND	(1.0)	ND	(0.20)	ND	(1.0)
EPA METHOD 8240 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	NA		NA		NA		NA	
1,1-Dichloroethene	NA		NA		NA		NA	
1,2-Dichloroethane	NA		NA		NA		NA	
Acetone	NA		NA		NA		NA	
Methylene Chloride	NA		NA		NA		NA	
Trans-1,2-Dichloroethylene	NA		NA		NA		NA	
Trichloroethene	NA		NA		NA		NA	
EPA METHOD 8270 (UNITS ARE ug/L)								
Benzoic Acid	NA		NA		NA		NA	
Bis(2-Ethylhexyl)Phthalate	NA		NA		NA		NA	
Di-N-Butyl Phthalate	NA		NA		NA		NA	
Phenol	NA		NA		NA		NA	
p-Cresol	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-13		MW-13		MW-14		MW-14	
Sample Control # :	MW-13		L2014		MW-14		L2015	
Date Sampled :	12/09/89		10/22/90		12/10/89		10/23/90	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 130.2 (UNITS ARE mg/L)								
Hardness	NA		160	(10)	NA		150	(10)
EPA METHOD 160.1 (UNITS ARE mg/L)								
Total Dissolved Solids	NA		510	(10)	NA		290	(10)
EPA METHOD 160.2 (UNITS ARE mg/L)								
Total Suspended Solids	NA		ND	(10)	NA		13 @	(10)
EPA METHOD 180.1 (UNITS ARE NTU)								
Turbidity	NA		2.4 @	(1.0)	NA		9.4	(1.0)
EPA METHOD 310.1 (UNITS ARE mg/L)								
Bicarbonate	NA		200	(1.0)	NA		140	(1.0)
Carbonate	NA		ND	(1.0)	NA		ND	(1.0)
Total Alkalinity	NA		NA		NA		NA	
EPA METHOD IC (UNITS ARE mg/L)								
Perchlorate	NA		ND	(0.20)	NA		ND	(0.20)
EPA METHOD MOISTURE(UNITS ARE %moist)								
% Moisture	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-11		MW-12		MW-12		MW-12	
Sample Control # :	L2012		MW-12		MW-12A		L2013	
Date Sampled :	10/17/90		12/12/89		12/12/89		10/18/90	
QC Type :			FDA		FDB			
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 415.1 (UNITS ARE mg/L)								
Total Organic Carbon	6.2	(1.0)	NA		NA		6.0	(1.0)

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-11		MW-12		MW-12		MW-12	
Sample Control # :	L2012		MW-12		MW-12A		L2013	
Date Sampled :	10/17/90		12/12/89		12/12/89		10/18/90	
QC Type :			FDA		FDB			
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 6010 (UNITS ARE mg/L)								
Aluminum	ND	(0.20)	0.18 *	(0.045)	0.23	(0.045)	0.25 @	(0.20)
Antimony	ND	(0.20)	ND	(0.034)	ND	(0.034)	ND	(0.20)
Barium	0.028 @	(0.010)	0.045	(0.0020)	0.046	(0.0020)	0.054	(0.010)
Boron	ND	(0.60)	0.57	(0.0060)	0.62	(0.0060)	ND	(0.60)
Cadmium	ND	(0.0050)	ND	(0.0040)	ND	(0.0040)	ND	(0.0050)
Calcium	58	(1.0)	130	(0.010)	130	(0.010)	340	(1.0)
Chromium	ND	(0.010)	ND	(0.0070)	ND	(0.0070)	ND	(0.010)
Cobalt	ND	(0.010)	ND	(0.0070)	ND	(0.0070)	ND	(0.010)
Copper	ND	(0.020)	0.058	(0.0060)	0.053	(0.0060)	0.042 @	(0.020)
Iron	0.11 @	(0.040)	0.050	(0.0070)	0.058	(0.0070)	2.7	(0.040)
Magnesium	6.2	(1.0)	25	(0.030)	25	(0.030)	48	(1.0)
Manganese	ND	(0.010)	0.68	(0.0020)	0.69	(0.0020)	7.0	(0.010)
Molybdenum	ND	(0.050)	0.020 *	(0.0080)	0.020 *	(0.0080)	ND	(0.050)
Nickel	ND	(0.020)	ND	(0.015)	ND	(0.015)	ND	(0.020)
Potassium	5.6 @B	(3.0)	4.8 *	(3.0)	4.4 *	(3.0)	ND	(3.0)
Silicon	17	(1.0)	17	(0.058)	17	(0.058)	20	(1.0)
Sodium	130	(1.0)	110	(0.029)	110	(0.029)	160	(1.0)
Vanadium	ND	(0.020)	ND	(0.0080)	ND	(0.0080)	ND	(0.020)
Zinc	ND	(0.020)	0.027	(0.0020)	0.026	(0.0020)	0.031 @	(0.020)
EPA METHOD 300.0 (UNITS ARE mg/L)								
Nitrate as N	NA		NA		NA		NA	
EPA METHOD 353.2 (UNITS ARE mg/L)								
Nitrate as N	16	(2.0)	NA		NA		ND	(0.020)

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-11		MW-12		MW-12		MW-12	
Sample Control # :	L2012		MW-12		MW-12A		L2013	
Date Sampled :	10/17/90		12/12/89		12/12/89		10/18/90	
QC Type :			FDA		FDB			
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8020 (UNITS ARE ug/L)								
Benzene	NA		NA		NA		NA	
Toluene	NA		NA		NA		NA	
EPA METHOD 8040 (UNITS ARE ug/L)								
2,4-Dichlorophenol	NA		ND	(1.0)	ND	(0.50)	NA	
Phenol	NA		ND	(0.40)	ND	(0.20)	NA	
EPA METHOD 8240 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	NA		NA		NA		NA	
1,1-Dichloroethene	NA		NA		NA		NA	
1,2-Dichloroethane	NA		NA		NA		NA	
Acetone	NA		NA		NA		NA	
Methylene Chloride	NA		NA		NA		NA	
Trans-1,2-Dichloroethylene	NA		NA		NA		NA	
Trichloroethene	NA		NA		NA		NA	
EPA METHOD 8270 (UNITS ARE ug/L)								
Benzoic Acid	NA		NA		NA		NA	
Bis(2-Ethylhexyl)Phthalate	NA		NA		NA		NA	
Di-N-Butyl Phthalate	NA		NA		NA		NA	
Phenol	NA		NA		NA		NA	
p-Cresol	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-11		MW-12		MW-12		MW-12	
Sample Control # :	L2012		MW-12		MW-12A		L2013	
Date Sampled :	10/17/90		12/12/89		12/12/89		10/18/90	
QC Type :			FDA		FDB			
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 130.2 (UNITS ARE mg/L)								
Hardness	160	(10)	NA		NA		1000	(50)
EPA METHOD 160.1 (UNITS ARE mg/L)								
Total Dissolved Solids	560	(10)	NA		NA		1800	(10)
EPA METHOD 160.2 (UNITS ARE mg/L)								
Total Suspended Solids	ND	(10)	NA		NA		20 @	(10)
EPA METHOD 180.1 (UNITS ARE NTU)								
Turbidity	2.7 @	(1.0)	NA		NA		22 H	(1.0)
EPA METHOD 310.1 (UNITS ARE mg/L)								
Bicarbonate	210	(1.0)	NA		NA		380	(1.0)
Carbonate	ND	(1.0)	NA		NA		ND	(1.0)
Total Alkalinity	NA		NA		NA		NA	
EPA METHOD IC (UNITS ARE mg/L)								
Perchlorate	ND	(0.20)	NA		NA		ND	(0.20)
EPA METHOD MOISTURE(UNITS ARE %moist)								
% Moisture	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-09		MW-10		MW-10		MW-11	
Sample Control # :	L2010		MW-10		L2011		MW-11	
Date Sampled :	10/22/90		12/12/89		10/17/90		12/08/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 415.1 (UNITS ARE mg/L)								
Total Organic Carbon	1.2	(1.0)	NA		1.3	(1.0)	NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-09		MW-10		MW-10		MW-11	
Sample Control # :	L2010		MW-10		L2011		MW-11	
Date Sampled :	10/22/90		12/12/89		10/17/90		12/08/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 6010 (UNITS ARE mg/L)								
Aluminum	0.29 @	(0.20)	0.19 *	(0.045)	ND	(0.20)	ND	(0.045)
Antimony	ND	(0.20)	ND	(0.034)	ND	(0.20)	ND	(0.034)
Barium	0.066	(0.010)	0.11	(0.0020)	0.057	(0.010)	0.027 *	(0.0020)
Boron	ND	(0.60)	0.37	(0.0060)	ND	(0.60)	ND	(0.0060)
Cadmium	ND	(0.0050)	ND	(0.0040)	ND	(0.0050)	ND	(0.0040)
Calcium	34	(1.0)	44	(0.010)	41	(1.0)	56	(0.010)
Chromium	ND	(0.010)	ND	(0.0070)	ND	(0.010)	ND	(0.0070)
Cobalt	ND	(0.010)	ND	(0.0070)	ND	(0.010)	ND	(0.0070)
Copper	0.032 @	(0.020)	0.022 *	(0.0060)	ND	(0.020)	0.065 *	(0.0060)
Iron	0.094 @	(0.040)	0.022 *	(0.0070)	ND	(0.040)	ND	(0.0070)
Magnesium	2.4 @	(1.0)	9.0	(0.030)	5.2	(1.0)	5.5	(0.030)
Manganese	0.011 @	(0.010)	0.040	(0.0020)	ND	(0.010)	0.094	(0.0020)
Molybdenum	ND	(0.050)	0.017 *	(0.0080)	ND	(0.050)	ND	(0.0080)
Nickel	ND	(0.020)	ND	(0.015)	ND	(0.020)	ND	(0.015)
Potassium	8.0 @	(3.0)	ND	(3.0)	13 @B	(3.0)	3.6 *	(3.0)
Silicon	ND	(1.0)	18	(0.058)	14	(1.0)	18	(0.058)
Sodium	36	(1.0)	34	(0.029)	31	(1.0)	110	(0.029)
Vanadium	ND	(0.020)	ND	(0.0080)	ND	(0.020)	ND	(0.0080)
Zinc	0.023 @	(0.020)	0.033	(0.0020)	ND	(0.020)	0.025 *	(0.0020)
EPA METHOD 300.0 (UNITS ARE mg/L)								
Nitrate as N	NA		NA		NA		NA	
EPA METHOD 353.2 (UNITS ARE mg/L)								
Nitrate as N	0.034 @	(0.020)	NA		22	(2.0)	NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confimed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-09		MW-10		MW-10		MW-11	
Sample Control # :	L2010		MW-10		L2011		MW-11	
Date Sampled :	10/22/90		12/12/89		10/17/90		12/08/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8020 (UNITS ARE ug/L)								
Benzene	NA		NA		NA		NA	
Toluene	NA		NA		NA		NA	
EPA METHOD 8040 (UNITS ARE ug/L)								
2,4-Dichlorophenol	ND	(1.0)	ND	(1.0)	NA		ND	(0.50)
Phenol	ND	(1.0)	ND	(0.40)	NA		ND	(0.20)
EPA METHOD 8240 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	NA		NA		NA		NA	
1,1-Dichloroethene	NA		NA		NA		NA	
1,2-Dichloroethane	NA		NA		NA		NA	
Acetone	NA		NA		NA		NA	
Methylene Chloride	NA		NA		NA		NA	
Trans-1,2-Dichloroethylene	NA		NA		NA		NA	
Trichloroethene	NA		NA		NA		NA	
EPA METHOD 8270 (UNITS ARE ug/L)								
Benzoic Acid	NA		NA		NA		NA	
Bis(2-Ethylhexyl)Phthalate	NA		NA		NA		NA	
Di-N-Butyl Phthalate	NA		NA		NA		NA	
Phenol	NA		NA		NA		NA	
p-Cresol	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-09		MW-10		MW-10		MW-11	
Sample Control # :	L2010		MW-10		L2011		MW-11	
Date Sampled :	10/22/90		12/12/89		10/17/90		12/08/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 130.2 (UNITS ARE mg/L)								
Hardness	38 @	(10)	NA		110	(10)	NA	
EPA METHOD 160.1 (UNITS ARE mg/L)								
Total Dissolved Solids	170	(10)	NA		300	(10)	NA	
EPA METHOD 160.2 (UNITS ARE mg/L)								
Total Suspended Solids	ND	(10)	NA		20 @	(10)	NA	
EPA METHOD 180.1 (UNITS ARE NTU)								
Turbidity	ND	(1.0)	NA		10	(1.0)	NA	
EPA METHOD 310.1 (UNITS ARE mg/L)								
Bicarbonate	94	(1.0)	NA		98	(1.0)	NA	
Carbonate	45	(1.0)	NA		14	(1.0)	NA	
Total Alkalinity	NA		NA		NA		NA	
EPA METHOD IC (UNITS ARE mg/L)								
Perchlorate	ND	(0.20)	NA		ND	(0.20)	NA	
EPA METHOD MOISTURE(UNITS ARE %moist)								
% Moisture	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-07		MW-08		MW-08		MW-09	
Sample Control # :	L2008		MW-8		L2009		MW-9	
Date Sampled :	10/23/90		12/06/89		10/18/90		12/05/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 415.1 (UNITS ARE mg/L)								
Total Organic Carbon	ND	(1.0)	NA		ND	(1.0)	NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-07		MW-08		MW-08		MW-09	
Sample Control # :	L2008		MW-8		L2009		MW-9	
Date Sampled :	10/23/90		12/06/89		10/18/90		12/05/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 6010 (UNITS ARE mg/L)								
Aluminum	ND	(0.20)	1.0	(0.045)	ND	(0.20)	0.29 *	(0.045)
Antimony	ND	(0.20)	ND	(0.034)	ND	(0.20)	ND	(0.034)
Barium	0.032 @	(0.010)	0.042 *	(0.0020)	0.037 @	(0.010)	0.37	(0.0020)
Boron	ND	(0.60)	ND	(0.0060)	ND	(0.60)	ND	(0.0060)
Cadmium	ND	(0.0050)	ND	(0.0040)	ND	(0.0050)	ND	(0.0040)
Calcium	19	(1.0)	29	(0.010)	30	(1.0)	320	(0.010)
Chromium	ND	(0.010)	ND	(0.0070)	ND	(0.010)	0.038 *	(0.0070)
Cobalt	ND	(0.010)	ND	(0.0070)	ND	(0.010)	ND	(0.0070)
Copper	0.067 @	(0.020)	0.031 *	(0.0060)	0.065 @	(0.020)	0.046 *	(0.0060)
Iron	0.051 @	(0.040)	1.3	(0.0070)	0.14 @	(0.040)	ND	(0.0070)
Magnesium	2.9 @	(1.0)	4.9 *	(0.030)	4.0 @	(1.0)	ND	(0.030)
Manganese	ND	(0.010)	0.19	(0.0020)	0.27	(0.010)	ND	(0.0020)
Molybdenum	ND	(0.050)	ND	(0.0080)	ND	(0.050)	0.38	(0.0080)
Nickel	0.022 @	(0.020)	ND	(0.015)	ND	(0.020)	ND	(0.015)
Potassium	3.4 @	(3.0)	ND	(3.0)	ND	(3.0)	47	(3.0)
Silicon	18	(1.0)	18	(0.058)	17	(1.0)	4.2 *	(0.058)
Sodium	16	(1.0)	26	(0.029)	23	(1.0)	110	(0.029)
Vanadium	ND	(0.020)	ND	(0.0080)	ND	(0.020)	ND	(0.0080)
Zinc	0.041 @	(0.020)	ND	(0.0020)	0.032 @	(0.020)	0.041 *	(0.0020)
EPA METHOD 300.0 (UNITS ARE mg/L)								
Nitrate as N	NA		NA		NA		NA	
EPA METHOD 353.2 (UNITS ARE mg/L)								
Nitrate as N	1.7	(0.10)	NA		ND	(0.020)	NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-07		MW-08		MW-08		MW-09	
Sample Control # :	L2008		MW-8		L2009		MW-9	
Date Sampled :	10/23/90		12/06/89		10/18/90		12/05/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8020 (UNITS ARE ug/L)								
Benzene	NA		NA		NA		NA	
Toluene	NA		NA		NA		NA	
EPA METHOD 8040 (UNITS ARE ug/L)								
2,4-Dichlorophenol	NA		ND	(0.50)	NA		6.1 C	(1.0)
Phenol	NA		ND	(0.20)	NA		3.6 C	(0.40)
EPA METHOD 8240 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	NA		NA		NA		NA	
1,1-Dichloroethene	NA		NA		NA		NA	
1,2-Dichloroethane	NA		NA		NA		NA	
Acetone	NA		NA		NA		NA	
Methylene Chloride	NA		NA		NA		NA	
Trans-1,2-Dichloroethylene	NA		NA		NA		NA	
Trichloroethene	NA		NA		NA		NA	
EPA METHOD 8270 (UNITS ARE ug/L)								
Benzoic Acid	NA		NA		NA		NA	
Bis(2-Ethylhexyl)Phthalate	NA		NA		NA		NA	
Di-N-Butyl Phthalate	NA		NA		NA		NA	
Phenol	NA		NA		NA		NA	
p-Cresol	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-07		MW-08		MW-08		MW-09	
Sample Control # :	L2008		MW-8		L2009		MW-9	
Date Sampled :	10/23/90		12/06/89		10/18/90		12/05/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 130.2 (UNITS ARE mg/L)								
Hardness	56	(10)	NA		79	(10)	NA	
EPA METHOD 160.1 (UNITS ARE mg/L)								
Total Dissolved Solids	140	(10)	NA		170	(10)	NA	
EPA METHOD 160.2 (UNITS ARE mg/L)								
Total Suspended Solids	70	(10)	NA		14 @	(10)	NA	
EPA METHOD 180.1 (UNITS ARE NTU)								
Turbidity	34	(1.0)	NA		9.1 H	(1.0)	NA	
EPA METHOD 310.1 (UNITS ARE mg/L)								
Bicarbonate	65	(1.0)	NA		96	(1.0)	NA	
Carbonate	ND	(1.0)	NA		ND	(1.0)	NA	
Total Alkalinity	NA		NA		NA		NA	
EPA METHOD IC (UNITS ARE mg/L)								
Perchlorate	0.62	(0.20)	NA		ND	(0.20)	NA	
EPA METHOD MOISTURE(UNITS ARE %moist)								
% Moisture	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-05		MW-06		MW-06		MW-07	
Sample Control # :	L2006		MW-6		L2007		MW-7 1	
Date Sampled :	10/23/90		12/13/89		10/19/90		12/18/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 415.1 (UNITS ARE mg/L)								
Total Organic Carbon	5.1	(1.0)	NA		2.0	(1.0)	NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-05		MW-06		MW-06		MW-07	
Sample Control # :	L2006		MW-6		L2007		MW-7 1	
Date Sampled :	10/23/90		12/13/89		10/19/90		12/18/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 6010 (UNITS ARE mg/L)								
Aluminum	ND	(0.20)	0.27	(0.045)	ND	(0.20)	0.17 *	(0.045)
Antimony	ND	(0.20)	ND	(0.034)	ND	(0.20)	ND	(0.034)
Barium	0.11	(0.010)	0.063	(0.0020)	0.074	(0.010)	0.021	(0.0020)
Boron	ND	(0.60)	0.49	(0.0060)	ND	(0.60)	0.26	(0.0060)
Cadmium	ND	(0.0050)	ND	(0.0040)	ND	(0.0050)	ND	(0.0040)
Calcium	47	(1.0)	46	(0.010)	22	(1.0)	16	(0.010)
Chromium	ND	(0.010)	0.010 *	(0.0070)	ND	(0.010)	ND	(0.0070)
Cobalt	ND	(0.010)	ND	(0.0070)	ND	(0.010)	ND	(0.0070)
Copper	0.043 @	(0.020)	0.020 *	(0.0060)	0.030 @	(0.020)	0.016 *	(0.0060)
Iron	0.10 @	(0.040)	0.020 *	(0.0070)	0.51	(0.040)	0.038	(0.0070)
Magnesium	7.5	(1.0)	0.039 *	(0.030)	2.4 @	(1.0)	2.8	(0.030)
Manganese	0.051	(0.010)	ND	(0.0020)	0.14	(0.010)	0.029	(0.0020)
Molybdenum	ND	(0.050)	0.039 *	(0.0080)	ND	(0.050)	0.016 *	(0.0080)
Nickel	ND	(0.020)	ND	(0.015)	ND	(0.020)	ND	(0.015)
Potassium	ND	(3.0)	14 *	(3.0)	ND	(3.0)	ND	(3.0)
Silicon	15	(1.0)	14	(0.058)	20	(1.0)	15	(0.058)
Sodium	24	(1.0)	80	(0.029)	26	(1.0)	39	(0.029)
Vanadium	ND	(0.020)	0.022 *	(0.0080)	ND	(0.020)	ND	(0.0080)
Zinc	ND	(0.020)	0.0040 *	(0.0020)	0.020 @	(0.020)	0.0080 *	(0.0020)
EPA METHOD 300.0 (UNITS ARE mg/L)								
Nitrate as N	NA		NA		NA		NA	
EPA METHOD 353.2 (UNITS ARE mg/L)								
Nitrate as N	6.4	(0.50)	NA		0.042 @	(0.020)	NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-05		MW-06		MW-06		MW-07	
Sample Control # :	L2006		MW-6		L2007		MW-7 1	
Date Sampled :	10/23/90		12/13/89		10/19/90		12/18/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8020 (UNITS ARE ug/L)								
Benzene	NA		NA		NA		NA	
Toluene	NA		NA		NA		NA	
EPA METHOD 8040 (UNITS ARE ug/L)								
2,4-Dichlorophenol	NA		27 C	(2.0)	NA		ND	(0.50)
Phenol	NA		ND	(0.80)	NA		ND	(0.20)
EPA METHOD 8240 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	NA		NA		NA		NA	
1,1-Dichloroethene	NA		NA		NA		NA	
1,2-Dichloroethane	NA		NA		NA		NA	
Acetone	NA		NA		NA		NA	
Methylene Chloride	NA		NA		NA		NA	
Trans-1,2-Dichloroethylene	NA		NA		NA		NA	
Trichloroethene	NA		NA		NA		NA	
EPA METHOD 8270 (UNITS ARE ug/L)								
Benzoic Acid	NA		NA		NA		NA	
Bis(2-Ethylhexyl)Phthalate	NA		NA		NA		NA	
Di-N-Butyl Phthalate	NA		NA		NA		NA	
Phenol	NA		NA		NA		NA	
p-Cresol	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-05		MW-06		MW-06		MW-07	
Sample Control # :	L2006		MW-6		L2007		MW-7 1	
Date Sampled :	10/23/90		12/13/89		10/19/90		12/18/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 130.2 (UNITS ARE mg/L)								
Hardness	130	(10)	NA		55	(10)	NA	
EPA METHOD 160.1 (UNITS ARE mg/L)								
Total Dissolved Solids	250	(10)	NA		160	(10)	NA	
EPA METHOD 160.2 (UNITS ARE mg/L)								
Total Suspended Solids	32 @	(10)	NA		ND	(10)	NA	
EPA METHOD 180.1 (UNITS ARE NTU)								
Turbidity	10	(1.0)	NA		1.5 @H	(1.0)	NA	
EPA METHOD 310.1 (UNITS ARE mg/L)								
Bicarbonate	140	(1.0)	NA		110	(1.0)	NA	
Carbonate	ND	(1.0)	NA		ND	(1.0)	NA	
Total Alkalinity	NA		NA		NA		NA	
EPA METHOD IC (UNITS ARE mg/L)								
Perchlorate	7.6	(0.20)	NA		ND	(0.20)	NA	
EPA METHOD MOISTURE(UNITS ARE %moist)								
% Moisture	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-03		MW-04		MW-04		MW-05	
Sample Control # :	L2004		MW-4		L2005		MW-5	
Date Sampled :	10/16/90		12/20/89		10/24/90		12/20/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 415.1 (UNITS ARE mg/L)								
Total Organic Carbon	2.9	(1.0)	NA		3.5	(1.0)	NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-03		MW-04		MW-04		MW-05	
Sample Control # :	L2004		MW-4		L2005		MW-5	
Date Sampled :	10/16/90		12/20/89		10/24/90		12/20/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 6010 (UNITS ARE mg/L)								
Aluminum	ND	(0.20)	0.34	(0.045)	ND	(0.20)	1.3	(0.045)
Antimony	ND	(0.20)	ND	(0.034)	ND	(0.20)	ND	(0.034)
Barium	ND	(0.010)	0.071	(0.0020)	0.097	(0.010)	0.032	(0.0020)
Boron	ND	(0.60)	0.46	(0.0060)	ND	(0.60)	0.47	(0.0060)
Cadmium	ND	(0.0050)	ND	(0.0040)	ND	(0.0050)	ND	(0.0040)
Calcium	1.9 @	(1.0)	58	(0.010)	70	(1.0)	35	(0.010)
Chromium	ND	(0.010)	ND	(0.0070)	ND	(0.010)	ND	(0.0070)
Cobalt	ND	(0.010)	ND	(0.0070)	ND	(0.010)	ND	(0.0070)
Copper	ND	(0.020)	0.055	(0.0060)	0.054 @	(0.020)	0.046	(0.0060)
Iron	0.042 @	(0.040)	0.10	(0.0070)	0.17 @	(0.040)	0.76	(0.0070)
Magnesium	ND	(1.0)	12	(0.030)	11	(1.0)	11	(0.030)
Manganese	ND	(0.010)	0.0080 *	(0.0020)	ND	(0.010)	0.015	(0.0020)
Molybdenum	ND	(0.050)	0.014 *	(0.0080)	ND	(0.050)	ND	(0.0080)
Nickel	ND	(0.020)	ND	(0.015)	ND	(0.020)	ND	(0.015)
Potassium	4.0 @B	(3.0)	ND	(3.0)	ND	(3.0)	ND	(3.0)
Silicon	11	(1.0)	13	(0.058)	14	(1.0)	17	(0.058)
Sodium	67	(1.0)	43	(0.029)	25	(1.0)	34	(0.029)
Vanadium	ND	(0.020)	0.013 *	(0.0080)	ND	(0.020)	ND	(0.0080)
Zinc	ND	(0.020)	0.025	(0.0020)	0.024 @	(0.020)	0.012	(0.0020)
EPA METHOD 300.0 (UNITS ARE mg/L)								
Nitrate as N	NA		NA		NA		NA	
EPA METHOD 353.2 (UNITS ARE mg/L)								
Nitrate as N	ND	(0.020)	NA		31	(2.0)	NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-03		MW-04		MW-04		MW-05	
Sample Control # :	L2004		MW-4		L2005		MW-5	
Date Sampled :	10/16/90		12/20/89		10/24/90		12/20/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8020 (UNITS ARE ug/L)								
Benzene	NA		NA		NA		NA	
Toluene	NA		NA		NA		NA	
EPA METHOD 8040 (UNITS ARE ug/L)								
2,4-Dichlorophenol	NA		ND	(0.50)	NA		ND	(0.50)
Phenol	NA		ND	(0.20)	NA		ND	(0.20)
EPA METHOD 8240 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	NA		NA		NA		NA	
1,1-Dichloroethene	NA		NA		NA		NA	
1,2-Dichloroethane	NA		NA		NA		NA	
Acetone	NA		NA		NA		NA	
Methylene Chloride	NA		NA		NA		NA	
Trans-1,2-Dichloroethylene	NA		NA		NA		NA	
Trichloroethene	NA		NA		NA		NA	
EPA METHOD 8270 (UNITS ARE ug/L)								
Benzoic Acid	NA		NA		NA		NA	
Bis(2-Ethylhexyl)Phthalate	NA		NA		NA		NA	
Di-N-Butyl Phthalate	NA		NA		NA		NA	
Phenol	NA		NA		NA		NA	
p-Cresol	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-03		MW-04		MW-04		MW-05	
Sample Control # :	L2004		MW-4		L2005		MW-5	
Date Sampled :	10/16/90		12/20/89		10/24/90		12/20/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 130.2 (UNITS ARE mg/L)								
Hardness	ND	(10)	NA		210	(10)	NA	
EPA METHOD 160.1 (UNITS ARE mg/L)								
Total Dissolved Solids	180	(10)	NA		340	(10)	NA	
EPA METHOD 160.2 (UNITS ARE mg/L)								
Total Suspended Solids	11 @	(10)	NA		170	(10)	NA	
EPA METHOD 180.1 (UNITS ARE NTU)								
Turbidity	2.9 @H	(1.0)	NA		44	(1.0)	NA	
EPA METHOD 310.1 (UNITS ARE mg/L)								
Bicarbonate	90	(1.0)	NA		150	(1.0)	NA	
Carbonate	19	(1.0)	NA		ND	(1.0)	NA	
Total Alkalinity	NA		NA		NA		NA	
EPA METHOD IC (UNITS ARE mg/L)								
Perchlorate	ND	(0.20)	NA		1.8	(0.20)	NA	
EPA METHOD MOISTURE(UNITS ARE %moist)								
% Moisture	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-02		MW-02		MW-03		MW-03	
Sample Control # :	L2002		L2003		MW-3		MW-3A	
Date Sampled :	10/24/90		10/24/90		12/21/89		12/21/89	
QC Type :	FDA		FDB		FDA		FDB	
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 415.1 (UNITS ARE mg/L)								
Total Organic Carbon	2.0	(1.0)	3.0	(1.0)	NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-02		MW-02		MW-03		MW-03	
Sample Control # :	L2002		L2003		MW-3		MW-3A	
Date Sampled :	10/24/90		10/24/90		12/21/89		12/21/89	
QC Type :	FDA		FDB		FDA		FDB	
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 6010 (UNITS ARE mg/L)								
Aluminum	ND	(0.20)	ND	(0.20)	0.90	(0.045)	1.0	(0.045)
Antimony	ND	(0.20)	ND	(0.20)	ND	(0.034)	ND	(0.034)
Barium	0.084	(0.010)	0.091	(0.010)	0.010	(0.0020)	0.012	(0.0020)
Boron	ND	(0.60)	ND	(0.60)	0.39	(0.0060)	0.51	(0.0060)
Cadmium	ND	(0.0050)	ND	(0.0050)	ND	(0.0040)	ND	(0.0040)
Calcium	29	(1.0)	30	(1.0)	2.7	(0.010)	2.9	(0.010)
Chromium	ND	(0.010)	ND	(0.010)	ND	(0.0070)	ND	(0.0070)
Cobalt	ND	(0.010)	ND	(0.010)	ND	(0.0070)	ND	(0.0070)
Copper	0.072 @	(0.020)	0.060 @	(0.020)	0.13	(0.0060)	0.023 *	(0.0060)
Iron	0.067 @	(0.040)	0.14 @	(0.040)	0.60	(0.0070)	0.72	(0.0070)
Magnesium	5.0	(1.0)	5.2	(1.0)	0.32	(0.030)	0.34	(0.030)
Manganese	ND	(0.010)	ND	(0.010)	0.0090 *	(0.0020)	0.010	(0.0020)
Molybdenum	ND	(0.050)	ND	(0.050)	0.020 *	(0.0080)	0.021 *	(0.0080)
Nickel	ND	(0.020)	ND	(0.020)	ND	(0.015)	ND	(0.015)
Potassium	ND	(3.0)	ND	(3.0)	ND	(3.0)	ND	(3.0)
Silicon	25	(1.0)	27	(1.0)	12	(0.058)	13	(0.058)
Sodium	37	(1.0)	39	(1.0)	64	(0.029)	67	(0.029)
Vanadium	ND	(0.020)	ND	(0.020)	ND	(0.0080)	ND	(0.0080)
Zinc	0.030 @	(0.020)	0.028 @	(0.020)	0.070	(0.0020)	0.068	(0.0020)
EPA METHOD 300.0 (UNITS ARE mg/L)								
Nitrate as N	NA		NA		NA		NA	
EPA METHOD 353.2 (UNITS ARE mg/L)								
Nitrate as N	4.8 @	(2.0)	18	(2.0)	NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-02		MW-02		MW-03		MW-03	
Sample Control # :	L2002		L2003		MW-3		MW-3A	
Date Sampled :	10/24/90		10/24/90		12/21/89		12/21/89	
QC Type :	FDA		FDB		FDA		FDB	
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8020 (UNITS ARE ug/L)								
Benzene	ND	(0.20)	ND	(0.20)	NA		NA	
Toluene	0.38 C@	(0.20)	0.27 X@T	(0.20)	NA		NA	
EPA METHOD 8040 (UNITS ARE ug/L)								
2,4-Dichlorophenol	NA		NA		ND	(0.50)	ND	(0.50)
Phenol	NA		NA		ND	(0.20)	ND	(0.20)
EPA METHOD 8240 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	NA		NA		NA		NA	
1,1-Dichloroethene	NA		NA		NA		NA	
1,2-Dichloroethane	NA		NA		NA		NA	
Acetone	NA		NA		NA		NA	
Methylene Chloride	NA		NA		NA		NA	
Trans-1,2-Dichloroethylene	NA		NA		NA		NA	
Trichloroethene	NA		NA		NA		NA	
EPA METHOD 8270 (UNITS ARE ug/L)								
Benzoic Acid	NA		NA		NA		NA	
Bis(2-Ethylhexyl)Phthalate	NA		NA		NA		NA	
Di-N-Butyl Phthalate	NA		NA		NA		NA	
Phenol	NA		NA		NA		NA	
p-Cresol	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-02		MW-02		MW-03		MW-03	
Sample Control # :	L2002		L2003		MW-3		MW-3A	
Date Sampled :	10/24/90		10/24/90		12/21/89		12/21/89	
QC Type :	FDA		FDB		FDA		FDB	
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 130.2 (UNITS ARE mg/L)								
Hardness	82	(10)	84	(10)	NA		NA	
EPA METHOD 160.1 (UNITS ARE mg/L)								
Total Dissolved Solids	230	(10)	260	(10)	NA		NA	
EPA METHOD 160.2 (UNITS ARE mg/L)								
Total Suspended Solids	ND	(10)	ND	(10)	NA		NA	
EPA METHOD 180.1 (UNITS ARE NTU)								
Turbidity	1.4 @	(1.0)	1.4 @	(1.0)	NA		NA	
EPA METHOD 310.1 (UNITS ARE mg/L)								
Bicarbonate	60	(1.0)	75	(1.0)	NA		NA	
Carbonate	ND	(1.0)	ND	(1.0)	NA		NA	
Total Alkalinity	NA		NA		NA		NA	
EPA METHOD IC (UNITS ARE mg/L)								
Perchlorate	9.1	(0.40)	9.0	(0.20)	NA		NA	
EPA METHOD MOISTURE(UNITS ARE %moist)								
% Moisture	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-01		MW-01		MW-01		MW-02	
Sample Control # :	MW-1		L2001		L2037		MW-2	
Date Sampled :	12/08/89		10/24/90		1/02/91		12/07/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 415.1 (UNITS ARE mg/L)								
Total Organic Carbon	NA		2.6	(1.0)	4.2	(0.50)	NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-01		MW-01		MW-01		MW-02	
Sample Control # :	MW-1		L2001		L2037		MW-2	
Date Sampled :	12/08/89		10/24/90		1/02/91		12/07/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 6010 (UNITS ARE mg/L)								
Aluminum	0.20 *	(0.045)	ND	(0.20)	ND	(0.10)	2.0	(0.045)
Antimony	ND	(0.034)	ND	(0.20)	ND	(0.10)	ND	(0.034)
Barium	0.0080 *	(0.0020)	ND	(0.010)	ND	(0.10)	0.044 *	(0.0020)
Boron	0.46 *	(0.0060)	ND	(0.60)	ND	(1.0)	ND	(0.0060)
Cadmium	ND	(0.0040)	ND	(0.0050)	ND	(0.050)	ND	(0.0040)
Calcium	11	(0.010)	13	(1.0)	10	(1.0)	27	(0.010)
Chromium	ND	(0.0070)	ND	(0.010)	0.050	(0.050)	ND	(0.0070)
Cobalt	ND	(0.0070)	ND	(0.010)	ND	(0.10)	ND	(0.0070)
Copper	0.092 *	(0.0060)	0.071 @	(0.020)	ND	(0.10)	0.033 *	(0.0060)
Iron	0.048 *	(0.0070)	ND	(0.040)	9.9	(0.10)	1.8	(0.0070)
Magnesium	3.2 *	(0.030)	2.0 @	(1.0)	1.7	(1.0)	6.0	(0.030)
Manganese	0.013 *	(0.0020)	ND	(0.010)	ND	(0.10)	0.10	(0.0020)
Molybdenum	ND	(0.0080)	ND	(0.050)	ND	(0.10)	ND	(0.0080)
Nickel	ND	(0.015)	ND	(0.020)	ND	(0.10)	ND	(0.015)
Potassium	3.0 *	(3.0)	ND	(3.0)	1.8	(1.0)	ND	(3.0)
Silicon	14	(0.058)	11	(1.0)	NA		30	(0.058)
Sodium	56	(0.029)	52	(1.0)	48	(1.0)	39	(0.029)
Vanadium	ND	(0.0080)	ND	(0.020)	ND	(0.10)	ND	(0.0080)
Zinc	0.037 *	(0.0020)	ND	(0.020)	ND	(0.10)	0.026 *	(0.0020)
EPA METHOD 300.0 (UNITS ARE mg/L)								
Nitrate as N	NA		NA		120N	(20)	NA	
EPA METHOD 353.2 (UNITS ARE mg/L)								
Nitrate as N	NA		4.2	(0.50)	NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-01		MW-01		MW-01		MW-02	
Sample Control # :	MW-1		L2001		L2037		MW-2	
Date Sampled :	12/08/89		10/24/90		1/02/91		12/07/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8020 (UNITS ARE ug/L)								
Benzene	NA		NA		NA		NA	
Toluene	NA		NA		NA		NA	
EPA METHOD 8040 (UNITS ARE ug/L)								
2,4-Dichlorophenol	ND	(0.50)	ND	(1.0)	NA		ND	(0.50)
Phenol	0.30 *C	(0.20)	ND	(1.0)	NA		ND	(0.20)
EPA METHOD 8240 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	NA		NA		NA		NA	
1,1-Dichloroethene	NA		NA		NA		NA	
1,2-Dichloroethane	NA		NA		NA		NA	
Acetone	NA		NA		NA		NA	
Methylene Chloride	NA		NA		NA		NA	
Trans-1,2-Dichloroethylene	NA		NA		NA		NA	
Trichloroethene	NA		NA		NA		NA	
EPA METHOD 8270 (UNITS ARE ug/L)								
Benzoic Acid	NA		NA		NA		NA	
Bis(2-Ethylhexyl)Phthalate	NA		NA		NA		NA	
Di-N-Butyl Phthalate	NA		NA		NA		NA	
Phenol	NA		NA		NA		NA	
p-Cresol	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	MW-01		MW-01		MW-01		MW-02	
Sample Control # :	MW-1		L2001		L2037		MW-2	
Date Sampled :	12/08/89		10/24/90		1/02/91		12/07/89	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 130.2 (UNITS ARE mg/L)								
Hardness	NA		34 @	(10)	36	(10)	NA	
EPA METHOD 160.1 (UNITS ARE mg/L)								
Total Dissolved Solids	NA		190	(10)	260H	(50)	NA	
EPA METHOD 160.2 (UNITS ARE mg/L)								
Total Suspended Solids	NA		ND	(10)	ND	(10)	NA	
EPA METHOD 180.1 (UNITS ARE NTU)								
Turbidity	NA		1.2 @	(1.0)	1.1H	(0.10)	NA	
EPA METHOD 310.1 (UNITS ARE mg/L)								
Bicarbonate	NA		100	(1.0)	NA		NA	
Carbonate	NA		ND	(1.0)	NA		NA	
Total Alkalinity	NA		NA		100	(10)	NA	
EPA METHOD IC (UNITS ARE mg/L)								
Perchlorate	NA		1.0	(0.20)	NA		NA	
EPA METHOD MOISTURE(UNITS ARE %moist)								
% Moisture	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	FS-27 20'		FS-27 40'		FS-27 60'		LOWER POND	
Sample Control # :	L2260		L2261		L2262		L2031	
Date Sampled :	3/06/91		3/06/91		3/06/91		10/23/90	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 415.1 (UNITS ARE mg/L)								
Total Organic Carbon	NA		NA		NA		1.7	(1.0)

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	FS-27 20'		FS-27 40'		FS-27 60'		LOWER POND	
Sample Control # :	L2260		L2261		L2262		L2031	
Date Sampled :	3/06/91		3/06/91		3/06/91		10/23/90	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 6010 (UNITS ARE mg/L)								
Aluminum	NA		NA		NA		ND	(0.20)
Antimony	NA		NA		NA		ND	(0.20)
Barium	NA		NA		NA		0.065	(0.010)
Boron	NA		NA		NA		ND	(0.60)
Cadmium	NA		NA		NA		ND	(0.0050)
Calcium	NA		NA		NA		24	(1.0)
Chromium	NA		NA		NA		ND	(0.010)
Cobalt	NA		NA		NA		ND	(0.010)
Copper	NA		NA		NA		0.032 @	(0.020)
Iron	NA		NA		NA		0.10 @	(0.040)
Magnesium	NA		NA		NA		3.8 @	(1.0)
Manganese	NA		NA		NA		0.015 @	(0.010)
Molybdenum	NA		NA		NA		ND	(0.050)
Nickel	NA		NA		NA		ND	(0.020)
Potassium	NA		NA		NA		ND	(3.0)
Silicon	NA		NA		NA		15	(1.0)
Sodium	NA		NA		NA		18	(1.0)
Vanadium	NA		NA		NA		ND	(0.020)
Zinc	NA		NA		NA		ND	(0.020)
EPA METHOD 300.0 (UNITS ARE mg/L)								
Nitrate as N	NA		NA		NA		NA	
EPA METHOD 353.2 (UNITS ARE mg/L)								
Nitrate as N	NA		NA		NA		2.9	(0.20)

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	FS-27 20'		FS-27 40'		FS-27 60'		LOWER POND	
Sample Control # :	L2260		L2261		L2262		L2031	
Date Sampled :	3/06/91		3/06/91		3/06/91		10/23/90	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8020 (UNITS ARE ug/L)								
Benzene	NA		NA		NA		NA	
Toluene	NA		NA		NA		NA	
EPA METHOD 8040 (UNITS ARE ug/L)								
2,4-Dichlorophenol	NA		NA		NA		NA	
Phenol	NA		NA		NA		NA	
EPA METHOD 8240 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	NA		NA		NA		NA	
1,1-Dichloroethene	NA		NA		NA		NA	
1,2-Dichloroethane	NA		NA		NA		NA	
Acetone	NA		NA		NA		NA	
Methylene Chloride	NA		NA		NA		NA	
Trans-1,2-Dichloroethylene	NA		NA		NA		NA	
Trichloroethene	NA		NA		NA		NA	
EPA METHOD 8270 (UNITS ARE ug/L)								
Benzoic Acid	NA		NA		NA		NA	
Bis(2-Ethylhexyl)Phthalate	NA		NA		NA		NA	
Di-N-Butyl Phthalate	NA		NA		NA		NA	
Phenol	NA		NA		NA		NA	
p-Cresol	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	FS-27 20'		FS-27 40'		FS-27 60'		LOWER POND	
Sample Control # :	L2260		L2261		L2262		L2031	
Date Sampled :	3/06/91		3/06/91		3/06/91		10/23/90	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 130.2 (UNITS ARE mg/L)								
Hardness	NA		NA		NA		72	(10)
EPA METHOD 160.1 (UNITS ARE mg/L)								
Total Dissolved Solids	NA		NA		NA		160	(10)
EPA METHOD 160.2 (UNITS ARE mg/L)								
Total Suspended Solids	NA		NA		NA		170	(10)
EPA METHOD 180.1 (UNITS ARE NTU)								
Turbidity	NA		NA		NA		17	(1.0)
EPA METHOD 310.1 (UNITS ARE mg/L)								
Bicarbonate	NA		NA		NA		76	(1.0)
Carbonate	NA		NA		NA		ND	(1.0)
Total Alkalinity	NA		NA		NA		NA	
EPA METHOD IC (UNITS ARE mg/L)								
Perchlorate	NA		NA		NA		1.5	(0.20)
EPA METHOD MOISTURE(UNITS ARE %moist)								
% Moisture	7.8	(0.10)	7.6	(0.10)	15	(0.10)	NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	FS-27 02'		FS-27 05'		FS-27 10'		FS-27 15'	
Sample Control # :	L2263		L2257		L2258		L2259	
Date Sampled :	3/06/91		3/06/91		3/06/91		3/06/91	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 415.1 (UNITS ARE mg/L)								
Total Organic Carbon	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	FS-27 02'		FS-27 05'		FS-27 10'		FS-27 15'	
Sample Control # :	L2263		L2257		L2258		L2259	
Date Sampled :	3/06/91		3/06/91		3/06/91		3/06/91	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 6010 (UNITS ARE mg/L)								
Aluminum	NA		NA		NA		NA	
Antimony	NA		NA		NA		NA	
Barium	NA		NA		NA		NA	
Boron	NA		NA		NA		NA	
Cadmium	NA		NA		NA		NA	
Calcium	NA		NA		NA		NA	
Chromium	NA		NA		NA		NA	
Cobalt	NA		NA		NA		NA	
Copper	NA		NA		NA		NA	
Iron	NA		NA		NA		NA	
Magnesium	NA		NA		NA		NA	
Manganese	NA		NA		NA		NA	
Molybdenum	NA		NA		NA		NA	
Nickel	NA		NA		NA		NA	
Potassium	NA		NA		NA		NA	
Silicon	NA		NA		NA		NA	
Sodium	NA		NA		NA		NA	
Vanadium	NA		NA		NA		NA	
Zinc	NA		NA		NA		NA	
EPA METHOD 300.0 (UNITS ARE mg/L)								
Nitrate as N	NA		NA		NA		NA	
EPA METHOD 353.2 (UNITS ARE mg/L)								
Nitrate as N	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	FS-27 02'		FS-27 05'		FS-27 10'		FS-27 15'	
Sample Control # :	L2263		L2257		L2258		L2259	
Date Sampled :	3/06/91		3/06/91		3/06/91		3/06/91	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 8020 (UNITS ARE ug/L)								
Benzene	NA		NA		NA		NA	
Toluene	NA		NA		NA		NA	
EPA METHOD 8040 (UNITS ARE ug/L)								
2,4-Dichlorophenol	NA		NA		NA		NA	
Phenol	NA		NA		NA		NA	
EPA METHOD 8240 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	NA		NA		NA		NA	
1,1-Dichloroethene	NA		NA		NA		NA	
1,2-Dichloroethane	NA		NA		NA		NA	
Acetone	NA		NA		NA		NA	
Methylene Chloride	NA		NA		NA		NA	
Trans-1,2-Dichloroethylene	NA		NA		NA		NA	
Trichloroethene	NA		NA		NA		NA	
EPA METHOD 8270 (UNITS ARE ug/L)								
Benzoic Acid	NA		NA		NA		NA	
Bis(2-Ethylhexyl)Phthalate	NA		NA		NA		NA	
Di-N-Butyl Phthalate	NA		NA		NA		NA	
Phenol	NA		NA		NA		NA	
p-Cresol	NA		NA		NA		NA	

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second column

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

TABLE: F-4 LOCKHEED BEAUMONT HISTORIC HIT LIST (NON 8010)

Location ID :	FS-27 02'		FS-27 05'		FS-27 10'		FS-27 15'	
Sample Control # :	L2263		L2257		L2258		L2259	
Date Sampled :	3/06/91		3/06/91		3/06/91		3/06/91	
QC Type :								
Analyte	Result	Det Lim	Result	Det Lim	Result	Det Lim	Result	Det Lim
EPA METHOD 130.2 (UNITS ARE mg/L)								
Hardness	NA		NA		NA		NA	
EPA METHOD 160.1 (UNITS ARE mg/L)								
Total Dissolved Solids	NA		NA		NA		NA	
EPA METHOD 160.2 (UNITS ARE mg/L)								
Total Suspended Solids	NA		NA		NA		NA	
EPA METHOD 180.1 (UNITS ARE NTU)								
Turbidity	NA		NA		NA		NA	
EPA METHOD 310.1 (UNITS ARE mg/L)								
Bicarbonate	NA		NA		NA		NA	
Carbonate	NA		NA		NA		NA	
Total Alkalinity	NA		NA		NA		NA	
EPA METHOD IC (UNITS ARE mg/L)								
Perchlorate	NA		NA		NA		NA	
EPA METHOD MOISTURE(UNITS ARE %moist)								
% Moisture	1.0	(0.10)	5.0	(0.10)	7.3	(0.10)	2.7	(0.10)

QC Type = Lab and or field QC flags
*/@ = Est. result less than 5 times detection limits (not used by all labs)
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
J = Detected at less than detection limit
LDB = Lab duplicate B
N = The laboratory reported Nitrate as NO3. The result on the analytical report was divided by a factor of 4.4 to make the result comparable to Nitrate reported as N
X = Presence not confirmed by second colum

Data from 1986 using equivalent EPA methods 624, 625, and 200.7
B = Detected in blank, result not corrected
FDA = Field duplicate A
H = Analyzed out of EPA established holding time
LDA = Lab duplicate A
N/A = Not Available or Applicable
NA = Not Analyzed
ND = Not Detected
T = Confirmation analyzed out of holding time

1/31/92 12:24:52 kpd

RADIAN CORPORATION

APPENDIX G

QUALITY ASSURANCE/QUALITY CONTROL SUMMARY FOR SOIL VAPOR, SOIL, AND GROUNDWATER ANALYSES

This appendix includes the quality control (QC) data assessments for the various soil vapor, soil, and groundwater sampling events at the site. The results for the various events are described in the following sections of this appendix:

G.1 Soil vapor sampling from shallow probes and a downhole flux chamber (November and December 1991);

G.2 Surface flux chamber and shallow probe sampling (August 1991);

G.3 Soil samples from borings (November and December 1990);

G.4 Groundwater sampling Round 2 (October 1990) and sampling of Treatability Study wells (November 1990 through March 1991);

G.5 Groundwater sampling Round 3 (September and October 1991); and

G.6 Groundwater sampling from additional wells drilled in December 1991 (December 1991).

The various QC assessments are separated, as each addresses data that were collected during the same time period, and were generally subjected to the same analytical and handling procedures.

G.1 Soil Vapor Sampling (November and December 1990)

The soil vapor sampling for this period was conducted as part of the Treatability Study (Radian, February 1992). Data analyzed for that study include soil probe data and data from Vapor Monitoring Wells (discussed in this report), as well as data from Vapor Recovery Wells and Treatment Systems (discussed in the Treatability Study report). The QC assessment of the data is described in detail in the Treatability Study Report, Appendix B, and is briefly summarized below. All of the soil gas analyses were analyzed in an on-site lab.

Procedures used during sample collection and analysis to control and monitor performance of the analytical systems included weekly three-point calibrations, daily calibration checks, analysis of confirmation samples, meeting the 4-hour specified holding times for soil gas samples, and using quality control (QC) samples to determine sources of contamination and evaluate accuracy and precision. The following QC sample results were assessed to determine the validity of the data collected for this project:

- Blank (reagent or laboratory and field);
- Duplicate samples (field, laboratory, and matrix spike);
- Matrix spikes; and
- Confirmation analyses in an off-site laboratory for selected samples.

Data quality for samples was assessed by evaluating the calibration and calibration check sample results, and the results of the QC samples. The data assessment indicated that most of the data meet the quality assurance objectives of the project in terms of accuracy, precision, representativeness, comparability, and completeness. Several problems were identified during the analytical portion of the project, but do not impact the usability of the data:

- Quantitation for 1,2-dichloroethane (1,2-DCA) in soil gas samples was estimated because of low response on the electron capture detector (ECD) and elution following 1,1,1-trichloroethane (1,1,1-TCA), which was a much larger peak in most samples. The potential for limited quantitation of 1,2-DCA was identified at the start of the project, but was considered to be acceptable for the field analysis objectives because 1,2-DCA was not a primary compound of concern.
- Results for tetrachloroethene (PCE) in soil gas samples were qualified for a two-week period when the correlation coefficient for the GC calibration did not meet the acceptance criterion of 0.990.

- The range of concentrations in reagent blanks was higher than expected due to carryover contamination in sampling syringes during the shallow soil probe and downhole flux chamber sampling (performed during the first week of the Treatability Study). Results for this week are qualified for TCE. Treatment units were not operating at this time and only soil vapor well results are affected. The average blank concentrations were at or below the estimated detection limit for all compounds except TCE. The carryover contamination problem was solved by using two ovens to bake out the syringes over night. Syringes containing high-level vapor well samples were baked over night in an oven reserved for high-level samples before being transferred to a low-level syringe oven for a second night of baking at 160°C. The soil gas GC system was also purged and blanks were analyzed after analysis of high concentration samples to minimize the potential for carryover.

G.2 Surface Flux Chamber and Shallow Probe Sampling (August 1991)

All soil vapor analyses were performed on-site. Sample analysis results met quality requirements. The following sections describe the analysis program.

Soil Vapor Analysis

In order to ensure accurate quantification and identification of the halocarbons in soil vapors at the Lockheed Beaumont site, appropriate quality control and quality assurance techniques were employed.

Glass syringes fitted with mininert valves and ss needles used to collect soil vapors were cleaned by rinsing with MeOH and drying in an oven at ~200° C for $\geq$ 4 hours. This oven was dedicated to the drying of syringes only. Ambient air, as well as Ultra pure® air, was injected into the gas chromatograph/electron capture detector (GC/ECD) from the sampling syringes to ensure no contaminants from the cleaning process were present.

The GC/ECD was calibrated using a standard gas cocktail from Hydrocarbon Technology, Inc. out of Sulphur, Louisiana 70663, containing the following halocarbons with their concentrations:

Tetrachloroethylene	1.00 ppm
Trichloroethylene	1.00 ppm
1,1-Dichloroethylene	0.999 ppm
1,1,1-Trichloroethane	1.00 ppm
1,2-Dichloroethane	0.999 ppm
1,1-Dichloroethane	1.00 ppm
Nitrogen	Balance

Response factors for each analyte were determined by running a three point calibration curve, using concentrations of 50 parts per billion volume (ppbv), 100 ppbv, and 150 ppbv and plotting area units versus concentration. A correlation coefficient of r = 0.99 or better was achieved for each analyte. Daily calibration consisted of injection of a midpoint standard -----> if the % recovery was within $\pm$ 20%, the instrument was considered properly calibrated. If the recovery was greater than $\pm$ 20%, a new calibration curve was determined.

Liquid standards for other halocarbons included methylene chloride, trans-1,2-dichloroethylene, 1,1-dichloroethane, Trans-1,2-dichloroethylene, carbon tetrachloride, 1,1,2-trichloroethane, 1,1,2,2-tetrachloroethane, and chlorobenzene. They were purchased from Supelco, Inc. out of Bellefonte, Pennsylvania. Since these compounds were not on the target list, only their retention times were determined using these liquid standards. Their concentration was determined using an average response factor; hence their concentrations should be considered tentative.

Precision and repeatability were maintained by injecting every tenth sample twice onto the G.C. If variability of response was >50%, the instrument was checked for leaks and faulty septa. Field duplicates were run each day to ensure proper sampling techniques.

Presence of "carry over" and "column bleed" in the analysis was checked by injecting an ambient air sample after every fifth run or after any sample with very large response(s). The appearance of "ghost peaks" was minimized by using a temperature gradient program of 35° for five minutes, then ranging up to 100°C for 0 minutes at a rate of 5°C/min. This made for run times of 18 minutes.

Standards and samples were injected onto the G.C. column in 1 ml aliquots via a 2.0 ml glass gas-tight syringe. Dilutions of standards and samples were made using a 50 ml glass gas-tight syringe and mixing with ambient air.

Gas Chromatograph parameters included a methane/argon carrier gas flow of 10 ml/min + 10 ml/min makeup gas, bringing a total flow of 20 ml/min past the detector. The temperature gradient was described previously. A J&W DB624 30 m x 0.53 mm(2) (a 3.0 μm film thickness) analytical column was used for the analysis.

Equipment for Hydrocarbon Analysis

The primary instrument used for the analysis of hydrocarbons at the Lockheed Beaumont site is a Hewlett Packard 5890 Series II Gas Chromatograph. The GC is equipped with a flame ionization detector (FID) and an electron capture detector (ECD). The FID is used for analysis of hydrocarbons not containing halogens. The ECD is used for analysis of the halocarbons. A Hewlett Packard 3392A Integrator was used to record and integrate the peaks of interest.

The GC is designed for capillary column use, both micro and megabore. The analytical column used was a S&W DB624 30m x 0.53 mm megabore column, with a stationary phase film thickness of 3.0 μm. The column is designed for analysis of those compounds described in EPA Method 624 (or EPA Method 8024).

Support equipment/supplies included gas-tight syringes (2 ml, 50 ml, and 100 ml), gas and liquid standards, gas regulators, and supporting glassware for preparation of liquid standards. A blue dot oven capable of achieving temperatures of 300°C was used for cleanup of syringes, needles, and glassware. Support gases for the GC include N_2, breathing air, hydrogen for the FID, and methane/argon for the ECD.

Solvents used were high pressure liquid chromatography grade methanol and acetone.

G.3 Soil Samples from Borings

The majority of the samples were analyzed by BTC Environmental. The methods included volatile halogenated organics by EPA Method 8010; volatile organics by EPA Method 8240; total organic carbon by EPA Method 415.1; pH by EPA Method 9045; and cation exchange capacity by EPA Method 9081. Quality control samples included one matrix spike sample and one field duplicate sample. Field blank samples were not collected.

Two perchlorate samples were analyzed by EPA Method 300.0 at Radian's Austin laboratory. No field quality control samples were collected for this Method. Data quality for these results was evaluated by reviewing the laboratory control standards, laboratory blanks, and the Beaumont #1 groundwater resampling matrix spike results.

Data reported in this study was reviewed according to EPA guidelines for accuracy, precision, representativeness, detectability, comparability, and completeness. In most cases, the data met these quality assurance objectives; however, individual exceptions or outliers are discussed in the following subsections.

Review of Data for Completeness and Representativeness

Data representativeness was ensured by following standard EPA sampling protocols, including:

- Decontamination of all sampling equipment prior to the collection of field samples;
- Receipt of samples as "blind" by the laboratory, i.e., the identity of a specific sample, duplicate, or blank was unknown to the laboratory;
- Use of proper sample identification and custody as documented on the chain of custody record.

Data completeness was evaluated by comparison of the data analyzed against the chain of custody records. Review of this data indicates the objectives of representativeness and completeness were met.

Data Quality Assessment for BTC Environmental Results

Review of Data for Accuracy

Review of matrix spike and surrogate spike data indicate that the accuracy objectives were met. Matrix spikes and matrix spike duplicates (MS/MSDs) were performed on samples L2126 and L2128 analyzed for volatile organic compounds (EPA Method 8204) and halogenated volatile compounds (EPA Method 8010), respectively. All recoveries were within acceptable limits with the exception of bromoform analyzed

by EPA Method 8240 which displayed low recoveries (18%, 47%). Low recoveries are not unusual for this compound, however; and, since all surrogate spike recoveries were within the acceptance ranges, overall data quality should not be affected.

Review of Data for Precision

Precision is estimated by calculating the relative percent difference (RPD) between duplicate samples. The resulting system level precision is an estimate of the combined laboratory and field variability. By way of comparison, precision calculated with respect to RPD between MS/MSDs results is used to estimate Method level or analytical variability. Analytical variability does not account for factors associated with a particular sampling technique.

Review of the field duplicate and MS/MSD data for samples analyzed by EPA Methods 8010 and 8240 indicates that the quality assurance objective for precision was met. However, a high RPD (45%) was observed for bromoform analyzed by EPA Method 8240. Overall data quality is not affected, however, because this compound was not detected in any of the field samples.

Review of Data for Detectability

Laboratory blank data was reviewed and compared against the Method detection limits specified by EPA in SW-846. The detectability objective for this study was met. Evaluation of system level or sampling induced contamination cannot be accomplished, since field blank samples were not collected; however, since none of the field samples analyzed by EPA Methods 8010 and 8240 contained volatile compounds above the Method detection limits, the integrity of the sampling system was maintained.

Data Quality Assessment for Enseco-CRL Results

Review of Data for Accuracy

Data accuracy for toxicity characteristic leaching procedure (TCLP) samples analyzed by Enseco-CRL was evaluated by review of the laboratory control standard results. These results indicate that the objective for accuracy was met.

Matrix spike recovery data is not available for these samples, therefore, system level bias cannot be estimated.

Review of Data for Precision and Detectability

Since duplicate and blank sample results are not available, the Enseco-CRL TCLP data cannot be evaluated for the precision or detectability objectives.

Data Quality Summary

A matrix spike recovery for bromoform analyzed by EPA Method 87240 was low. Low recoveries are not unusual for this compound. Overall data quality should not be affected. Due to the matrix spike recoveries in this sample (18% and 47%), the precision based on percent RPD is high. This is due to the small number of matrix spike duplicate pairs (1) being compared. Since the other compounds revealed good accuracy and precision, overall data quality is not affected.

Data analyzed for TCLP could not be evaluated for precision and detectability. The effect on data quality is that detected compounds such as 2-butanone, a common laboratory contaminant, cannot be verified by comparison with quality control samples.

G.4 Groundwater Sampling Round 2, (October 1990), and Sampling of Treatability Study Wells (November 1990 through March 1991)

This section presents the results of the QC data assessment for groundwater samples collected from existing wells, monitoring wells, and observation wells for Round 2 groundwater sampling and the sampling of wells drilled for the Treatability Study. Quality assurance and quality control (QA/QC) efforts were conducted to ensure data of known and sufficient quality were collected and reported. Two primary aspects of the overall QA/QC effort are related to achievement of this objective. First, the QA/QC program forms a framework for controlling data quality within pre-established limits during execution of the sampling and analytical efforts. Second, the QA/QC program forms the basis for estimating uncertainty in the measurement data by providing information necessary to determine qualitative and quantitative limitations associated with these data.

Occurrences of out-of-specification QC results and any associated impact to groundwater sample data are discussed in the following subsections.

Analyses were performed by four separate laboratories:

- Radian Analytical Services (RAS), Sacramento, performed 29 analyses each for EPA Methods 6010, 7470, 353.2, 310.1, 180.1, 160.2, 160.1, and 130.2;

- Radian Analytical Service (RAS), Austin, performed 28 analyses for EPA Method 415.1, 32 analyses for perchlorates by ion chromatography (IC), 30 analyses for EPA Method 8010 (purgeable halocarbons) and 2 analyses for EPA Method 8020 (purgeable aromatics);

- BTC Environmental Incorporated (BTC) performed 6 analyses each for EPA Methods 6010, 7740, 7470, 7060, 415.1 (9060), 353.2 (300.0), 310.1, 180.1, 160.2, and 160.1, 26 analyses for EPA Method

8010 (purgeable halocarbons) and one analysis for EPA Method 8020 (purgeable aromatic analysis); and

- Performance Analytical Incorporated (PAI) performed 10 EPA Method 8040 analyses. Table G.4-1 summarizes each analysis type by EPA method number and the types of compounds detected.

The data were checked and reviewed for transcription and reporting errors. Reporting formats varied between three of the four facilities. Computerized data transfer and a standard reporting format was used by the Radian facilities, while analytical results reported by BTC and PAI were hand entered because computerized data transfer was not available. Inconsistencies identified in BTC reports were questioned during the QA/QC review, and corrected reports were issued by the laboratory. PAI, the laboratory that performed all the Method 8040 analyses, issued reports which did not include the date of extraction; This information was later supplied on a separate form.

Part of the QC review and monitoring process is tracking holding times for each sample. EPA analytical methods specify the maximum amount of time a sample may be held before analysis. A summary of samples collected, the sampling date, the extraction date (if applicable), and analysis date is presented in Table G.4-2.

Because of laboratory error, several holding times were exceeded and the results have been qualified. (The chain of custody forms were used to confirm sample collection dates instead of laboratories' final reports.):

- EPA Method 180.1; samples MW-3, MW-5, MW-6, MW-8, MW-12, MW-18, MW-19, OW-2, W-5, Field Blank 1 (IB-1), MW-24, MW-25, W-2, W-3, and MW-1 (date collected 1/2/91). Holding times were exceeded by a range of 1 to 13 days.

- EPA Method 160.1; samples MW-1 (collected 1/2/91), W-5, and MW-24. Holding times were exceeded by a range of 1 to 2 days.

RADIAN CORPORATION

Table G.4-1

Summary of Types of Analyses

EPA Method No.	Analytes	Analytical Technique
130.2	Hardness	Titration
160.1	Total Dissolved Solids	Gravimetric
160.2	Total Suspended Solids	Gravimetric
180.1	Turbidity	Light Scattering
300.0	Nitrate	Ion Chromatography
310.1	Bicarbonate, Carbonate, Total Alkalinity	Titration
353.2	Nitrate/Nitrate	Colorimetric
415.1	Total Organic Carbon	Oxidation
6010	Metals (Al, An, Ba, Ca, Cr, Cu, Fe, Mg, Mn, Ni, K, Si, Na, Zn)	Ind. Coupled Plasma Emission Spectroscopy
7060	Arsenic	Graphite Furnace
7470	Mercury	Cold Vapor Atom. Absorb.
7740	Selenium	Graphite Furnace
8010	Purgeable Halocarbons	Gas Chromatography
8020	Purgeable Aromatics	Gas Chromatography
8040	Phenols	Gas Chromatography

TABLE G.4-2 REPORT OF HOLDING TIMES
LOCKHEED BEAUMONT GROUNDWATER

Location ID	Sample Control #	Date Sampled	QC Type	Lab	Method	Date Analyzed	Date Extracted	Maximum Extraction/Analysis Holding Times (Day)	QC Category Extraction/Analysis
	L2028	10/15/90	TB		130.2	11/05/90	N/A	N/A / 180	c/a
	L2028				160.1	10/20/90	N/A	N/A / 7	c/a
	L2028				160.2	10/20/90	N/A	N/A / 7	c/a
	L2028				180.1	10/19/90	N/A	N/A / 2	c/b
	L2028				310.1	10/25/90	N/A	N/A / 14	c/a
	L2028				353.2	10/19/90	N/A	N/A / 14	c/a
	L2028				415.1	10/23/90	N/A	N/A / 28	c/a
	L2028				6010	11/06/90	NN	N/A / 180	c/a
	L2028				7470	10/30/90	NN	N/A / 28	c/a
	L2028				8010	10/23/90	N/A	N/A / 14	c/a
	L2028				8040	11/12/90	10/23/90	7 / 40	b/a
	L2028				IC	10/31/90	N/A	N/A / N/A	c/d
	L2029	10/25/90	TB		130.2	11/05/90	N/A	N/A / 180	c/a
	L2029				160.1	10/31/90	N/A	N/A / 7	c/a
	L2029				160.2	12/15/90	N/A	N/A / 7	c/b
	L2029				180.1	10/26/90	N/A	N/A / 2	c/a
	L2029				310.1	11/06/90	N/A	N/A / 14	c/a
	L2029				353.2	10/30/90	N/A	N/A / 14	c/a
	L2029				415.1	11/05/90	N/A	N/A / 28	c/a
	L2029				6010	12/07/90	NN	N/A / 180	c/a
	L2029				7470	11/15/90	NN	N/A / 28	c/a
	L2029				8010	11/06/90	N/A	N/A / 14	c/a
	L2029				IC	10/31/90	N/A	N/A / N/A	c/d
	L2272	4/04/91	TB		8010	4/17/91	N/A	N/A / 14	c/a
IB 1	L2248	2/01/91			8010	2/05/91	N/A	N/A / 14	c/a
IB 2	L2249	2/05/91			8010	2/06/91	N/A	N/A / 14	c/a

MW = Monitoring well
FDA = Field duplicate A
LDA = Lab duplicate A
N/A = Not Available or Applicable
a = Holding time was less than the maximum
c = Missing information or does not apply
NN - Not necessary, because analysis date within holding time

OW = Observation well
FDB = Field duplicate B
LDB = Lab duplicate B
TB = Field Blank
b = Holding time was exceeded
d = Not a regulatory method and no specific holding time available

7/29/91 11:41:27 kpd

RADIAN CORPORATION

TABLE G.4-2 REPORT OF HOLDING TIMES
LOCKHEED BEAUMONT GROUNDWATER

Location ID	Sample Control #	Date Sampled	QC Type	Lab	Method	Date Analyzed	Date Extracted	Maximum Extraction/Analysis Holding Times (Day)	QC Category Extraction/Analysis
LOWER POND	L2031	10/23/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2031				160.1	10/27/90	N/A	N/A / 7	c/a
	L2031				160.2	10/27/90	N/A	N/A / 7	c/a
	L2031				180.1	10/24/90	N/A	N/A / 2	c/a
	L2031				310.1	10/25/90	N/A	N/A / 14	c/a
	L2031				353.2	10/24/90	N/A	N/A / 14	c/a
	L2031				415.1	10/31/90	N/A	N/A / 28	c/a
	L2031				6010	12/06/90	NN	N/A / 180	c/a
	L2031				7470	11/15/90	NN	N/A / 28	c/a
	L2031				8010	11/02/90	N/A	N/A / 14	c/a
	L2031				IC	10/30/90	N/A	N/A / N/A	c/d
MW-01	L2001	10/24/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2001				160.1	10/31/90	N/A	N/A / 7	c/a
	L2001				160.2	12/15/90	N/A	N/A / 7	c/b
	L2001				180.1	10/26/90	N/A	N/A / 2	c/a
	L2001				310.1	11/06/90	N/A	N/A / 14	c/a
	L2001				353.2	10/30/90	N/A	N/A / 14	c/a
	L2001				415.1	11/05/90	N/A	N/A / 28	c/a
	L2001				6010	12/07/90	NN	N/A / 180	c/a
	L2001				7470	11/15/90	NN	N/A / 28	c/a
	L2001				8010	11/02/90	N/A	N/A / 14	c/a
	L2001				8040	11/12/90	10/26/90	7 / 40	a/a
	L2001				IC	10/31/90	N/A	N/A / N/A	c/d
	L2037	1/02/91			130.2	1/16/91	N/A	N/A / 180	c/a
	L2037				160.1	1/11/91	N/A	N/A / 7	c/b
	L2037				160.2	1/03/91	N/A	N/A / 7	c/a
	L2037				180.1	1/11/91	N/A	N/A / 2	c/b
	L2037				300.0	1/09/91	N/A	N/A / 28	c/a
	L2037				310.1	1/16/91	N/A	N/A / 14	c/a
	L2037				415.1	1/04/91	N/A	N/A / 28	c/a
	L2037				6010	1/16/91	NN	N/A / 180	c/a
	L2037				7060	1/21/91	NN	N/A / 180	c/a
	L2037				7470	1/21/91	NN	N/A / 28	c/a
	L2037				7740	1/21/91	NN	N/A / 180	c/a
	L2037				8010	1/15/91	N/A	N/A / 14	c/a
MW-02	L2002	10/24/90	FDA		130.2	11/05/90	N/A	N/A / 180	c/a
	L2002				160.1	10/31/90	N/A	N/A / 7	c/a
	L2002				160.2	12/15/90	N/A	N/A / 7	c/b
	L2002				180.1	10/26/90	N/A	N/A / 2	c/a
	L2002				310.1	11/06/90	N/A	N/A / 14	c/a

MW = Monitoring well
FDA = Field duplicate A
LDA = Lab duplicate A
N/A = Not Available or Applicable
a = Holding time was less than the maximum
c = Missing information or does not apply
NN = Not necessary because analysis date within holding time

OW = Observation well
FDB = Field duplicate B
LDB = Lab duplicate B
TB = Field Blank
b = Holding time was exceeded
d = Not a regulatory method and no specific holding time available

7/29/91 11:41:27 kpd

TABLE G.4-2 REPORT OF HOLDING TIMES
LOCKHEED BEAUMONT GROUNDWATER

Location ID	Sample Control #	Date Sampled	QC Type	Lab	Method	Date Analyzed	Date Extracted	Maximum Extraction/Analysis Holding Times (Day)	QC Category Extraction/Analysis
MW 05	L2006	10/23/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2006				160.1	10/31/90	N/A	N/A / 7	c/a*
	L2006				160.2	12/15/90	N/A	N/A / 7	c/b
	L2006				180.1	10/26/90	N/A	N/A / 2	c/b
	L2006				310.1	11/06/90	N/A	N/A / 14	c/a
	L2006				353.2	10/30/90	N/A	N/A / 14	c/a
	L2006				415.1	11/05/90	N/A	N/A / 28	c/a
	L2006				6010	12/07/90	NN	N/A / 180	c/a
	L2006				7470	11/16/90	NN	N/A / 28	c/a
	L2006				8010	11/05/90	N/A	N/A / 14	c/a
	L2006				IC	10/31/90	N/A	N/A / N/A	c/d
MW 06	L2007	10/19/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2007				160.1	10/20/90	N/A	N/A / 7	c/a
	L2007				160.2	10/20/90	N/A	N/A / 7	c/a
	L2007				180.1	10/26/90	N/A	N/A / 2	c/b
	L2007				310.1	10/25/90	N/A	N/A / 14	c/a
	L2007				353.2	10/23/90	N/A	N/A / 14	c/a
	L2007				415.1	10/23/90	N/A	N/A / 28	c/a
	L2007				6010	11/19/90	NN	N/A / 180	c/a
	L2007				7470	11/07/90	NN	N/A / 28	c/a
	L2007				8010	10/24/90	N/A	N/A / 14	c/a
	L2007				IC	10/30/90	N/A	N/A / N/A	c/d
MW-07	L2008	10/23/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2008				160.1	10/27/90	N/A	N/A / 7	c/a
	L2008				160.2	10/27/90	N/A	N/A / 7	c/a
	L2008				180.1	10/24/90	N/A	N/A / 2	c/a
	L2008				310.1	10/25/90	N/A	N/A / 14	c/a
	L2008				353.2	10/24/90	N/A	N/A / 14	c/a
	L2008				415.1	10/31/90	N/A	N/A / 28	c/a
	L2008				6010	12/06/90	NN	N/A / 180	c/a
	L2008				7470	11/15/90	NN	N/A / 28	c/a
	L2008				8010	10/25/90	N/A	N/A / 14	c/a
	L2008				IC	10/30/90	N/A	N/A / N/A	c/d
MW 08	L2009	10/18/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2009				160.1	10/20/90	N/A	N/A / 7	c/a
	L2009				160.2	10/20/90	N/A	N/A / 7	c/a
	L2009				180.1	10/26/90	N/A	N/A / 2	c/b
	L2009				310.1	10/25/90	N/A	N/A / 14	c/a
	L2009				353.2	10/23/90	N/A	N/A / 14	c/a

MW = Monitoring well
FDA = Field duplicate A
LDA = Lab duplicate A
N/A = Not Available or Applicable
a = Holding time was less than the maximum
c = Missing information or does not apply
NN = Not necessary because analysis date within holding time

OW = Observation well
FDB = Field duplicate B
LDB = Lab duplicate B
TB = Field Blank
b = Holding time was exceeded
d = Not a regulatory method and no specific holding time available
*Sample analysis initiated final day of holding time and completed the day after.

7/29/91 11:41:27 kpd

RADIAN CORPORATION

TABLE G.4-2 REPORT OF HOLDING TIMES
LOCKHEED BEAUMONT GROUNDWATER

Location ID	Sample Control #	Date Sampled	QC Type	Lab	Method	Date Analyzed	Date Extracted	Maximum Extraction/Analysis Holding Times (Day)	QC Category Extraction/Analysis
MW 02	L2002	10/24/90	FDA		353.2	10/30/90	N/A	N/A / 14	c/a
	L2002				415.1	11/05/90	N/A	N/A / 28	c/a
	L2002				6010	12/07/90	NN	N/A / 180	c/a
	L2002				7470	11/15/90	NN	N/A / 28	c/a
	L2002				8010	11/02/90	N/A	N/A / 14	c/a
	L2002				8020	11/07/90	N/A	N/A / 14	c/a
	L2002				IC	10/31/90	N/A	N/A / N/A	c/d
	L2003		FDB		130.2	11/05/90	N/A	N/A / 180	c/a
	L2003				160.1	10/31/90	N/A	N/A / 7	c/a
	L2003				160.2	12/15/90	N/A	N/A / 7	c/b
	L2003				180.1	10/26/90	N/A	N/A / 2	c/a
	L2003				310.1	11/06/90	N/A	N/A / 14	c/a
	L2003				353.2	10/30/90	N/A	N/A / 14	c/a
	L2003				415.1	11/05/90	N/A	N/A / 28	c/a
	L2003				6010	12/07/90	NN	N/A / 180	c/a
	L2003				7470	11/15/90	NN	N/A / 28	c/a
	L2003				8010	11/05/90	N/A	N/A / 14	c/a
	L2003				8020	11/07/90	N/A	N/A / 14	c/a
	L2003				IC	10/31/90	N/A	N/A / N/A	c/d
MW 03	L2004	10/16/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2004				160.1	10/20/90	N/A	N/A / 7	c/a
	L2004				160.2	10/20/90	N/A	N/A / 7	c/a
	L2004				180.1	10/19/90	N/A	N/A / 2	c/b
	L2004				310.1	10/25/90	N/A	N/A / 14	c/a
	L2004				353.2	10/19/90	N/A	N/A / 14	c/a
	L2004				415.1	10/23/90	N/A	N/A / 28	c/a
	L2004				6010	11/06/90	NN	N/A / 180	c/a
	L2004				7470	10/30/90	NN	N/A / 28	c/a
	L2004				8010	10/23/90	N/A	N/A / 14	c/a
	L2004				IC	10/31/90	N/A	N/A / N/A	c/d
MW 04	L2005	10/24/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2005				160.1	10/31/90	N/A	N/A / 7	c/a
	L2005				160.2	12/15/90	N/A	N/A / 7	c/b
	L2005				180.1	10/26/90	N/A	N/A / 2	c/a
	L2005				310.1	11/06/90	N/A	N/A / 14	c/a
	L2005				353.2	10/30/90	N/A	N/A / 14	c/a
	L2005				415.1	11/05/90	N/A	N/A / 28	c/a
	L2005				6010	12/07/90	NN	N/A / 180	c/a
	L2005				7470	11/15/90	NN	N/A / 28	c/a
	L2005				8010	11/05/90	N/A	N/A / 14	c/a
	L2005				IC	10/31/90	N/A	N/A / N/A	c/d

MW = Monitoring well
FDA = Field duplicate A
LDA = Lab duplicate A
N/A = Not Available or Applicable
a = Holding time was less than the maximum
c = Missing information or does not apply
NN = Not necessary because analysis date within holding time

OW = Observation well
FDB = Field duplicate B
LDB = Lab duplicate B
TB = Field Blank
b = Holding time was exceeded
d = Not a regulatory method and no specific holding time available

7/29/91 11:41:27 kpd

RADIAN CORPORATION

TABLE G.4-2 REPORT OF HOLDING TIMES
LOCKHEED BEAUMONT GROUNDWATER

Location ID	Sample Control #	Date Sampled	QC Type	Lab	Method	Date Analyzed	Date Extracted	Maximum Extraction/Analysis Holding Times (Day)	QC Category Extraction/Analysis
MW 08	L2009	10/18/90			415.1	10/23/90	N/A	N/A / 28	c/a
	L2009				6010	11/19/90	NN	N/A / 180	c/a
	L2009				7470	11/07/90	NN	N/A / 28	c/a
	L2009				8010	10/24/90	N/A	N/A / 14	c/a
	L2009				IC	10/30/90	N/A	N/A / N/A	c/d
MW 09	L2010	10/22/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2010				160.1	10/27/90	N/A	N/A / 7	c/a
	L2010				160.2	10/27/90	N/A	N/A / 7	c/a
	L2010				180.1	10/24/90	N/A	N/A / 2	c/a
	L2010				310.1	10/25/90	N/A	N/A / 14	c/a
	L2010				353.2	10/24/90	N/A	N/A / 14	c/a
	L2010				415.1	10/31/90	N/A	N/A / 28	c/a
	L2010				6010	12/06/90	NN	N/A / 180	c/a
	L2010				7470	11/15/90	NN	N/A / 28	c/a
	L2010				8010	10/25/90	N/A	N/A / 14	c/a
	L2010				8040	11/12/90	10/26/90	7 / 40	a/a
	L2010				IC	10/30/90	N/A	N/A / N/A	c/d
MW 10	L2011	10/17/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2011				160.1	10/20/90	N/A	N/A / 7	c/a
	L2011				160.2	10/20/90	N/A	N/A / 7	c/a
	L2011				180.1	10/19/90	N/A	N/A / 2	c/a
	L2011				310.1	10/25/90	N/A	N/A / 14	c/a
	L2011				353.2	10/19/90	N/A	N/A / 14	c/a
	L2011				415.1	10/23/90	N/A	N/A / 28	c/a
	L2011				6010	11/06/90	NN	N/A / 180	c/a
	L2011				7470	10/30/90	NN	N/A / 28	c/a
	L2011				8010	10/23/90	N/A	N/A / 14	c/a
	L2011				IC	10/31/90	N/A	N/A / N/A	c/d
MW-11	L2012	10/17/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2012				160.1	10/20/90	N/A	N/A / 7	c/a
	L2012				160.2	10/20/90	N/A	N/A / 7	c/a
	L2012				180.1	10/19/90	N/A	N/A / 2	c/a
	L2012				310.1	10/25/90	N/A	N/A / 14	c/a
	L2012				353.2	10/19/90	N/A	N/A / 14	c/a
	L2012				415.1	10/23/90	N/A	N/A / 28	c/a
	L2012				6010	11/06/90	NN	N/A / 180	c/a
	L2012				7470	10/30/90	NN	N/A / 28	c/a
	L2012				8010	10/23/90	N/A	N/A / 14	c/a
	L2012				IC	10/31/90	N/A	N/A / N/A	c/d

MW = Monitoring well
FDA = Field duplicate A
LDA = Lab duplicate A
N/A = Not Available or Applicable
a = Holding time was less than the maximum
c = Missing information or does not apply
NN - Not necessary because analysis date within holding time

OW = Observation well
FDB = Field duplicate B
LDB = Lab duplicate B
TB = Field Blank
b = Holding time was exceeded
d = Not a regulatory method and no specific holding time available

7/29/91 11:41:27 kpd

RADIAN CORPORATION

TABLE G.4-2 REPORT OF HOLDING TIMES
LOCKHEED BEAUMONT GROUNDWATER

Location ID	Sample Control #	Date Sampled	QC Type	Lab	Method	Date Analyzed	Date Extracted	Maximum Extraction/Analysis Holding Times (Day)	QC Category Extraction/Analysis
MW-12	L2013	10/18/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2013				160.1	10/20/90	N/A	N/A / 7	c/a
	L2013				160.2	10/20/90	N/A	N/A / 7	c/a
	L2013				180.1	10/26/90	N/A	N/A / 2	c/b
	L2013				310.1	10/25/90	N/A	N/A / 14	c/a
	L2013				353.2	10/23/90	N/A	N/A / 14	c/a
	L2013				415.1	10/23/90	N/A	N/A / 28	c/a
	L2013				6010	11/19/90	NN	N/A / 180	c/a
	L2013				7470	11/07/90	NN	N/A / 28	c/a
	L2013				8010	10/24/90	N/A	N/A / 14	c/a
	L2013				IC	10/30/90	N/A	N/A / N/A	c/d
MW 13	L2014	10/22/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2014				160.1	10/27/90	N/A	N/A / 7	c/a
	L2014				160.2	10/27/90	N/A	N/A / 7	c/a
	L2014				180.1	10/24/90	N/A	N/A / 2	c/a
	L2014				310.1	10/25/90	N/A	N/A / 14	c/a
	L2014				353.2	10/24/90	N/A	N/A / 14	c/a
	L2014				415.1	10/31/90	N/A	N/A / 28	c/a
	L2014				6010	12/06/90	NN	N/A / 180	c/a
	L2014				7470	11/15/90	NN	N/A / 28	c/a
	L2014				8010	10/26/90	N/A	N/A / 14	c/a
	L2014				8040	11/12/90	10/26/90	7 / 40	a/a
	L2014				IC	10/30/90	N/A	N/A / N/A	c/d
MW-14	L2015	10/23/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2015				160.1	10/27/90	N/A	N/A / 7	c/a
	L2015				160.2	10/27/90	N/A	N/A / 7	c/a
	L2015				180.1	10/24/90	N/A	N/A / 2	c/a
	L2015				310.1	10/25/90	N/A	N/A / 14	c/a
	L2015				353.2	10/24/90	N/A	N/A / 14	c/a
	L2015				415.1	10/31/90	N/A	N/A / 28	c/a
	L2015				6010	12/06/90	NN	N/A / 180	c/a
	L2015				7470	11/15/90	NN	N/A / 28	c/a
	L2015				8010	10/26/90	N/A	N/A / 14	c/a
	L2015				8040	11/12/90	10/26/90	7 / 40	a/a
	L2015				IC	10/30/90	N/A	N/A / N/A	c/d
MW 15	L2016	10/22/90	FDA		130.2	11/05/90	N/A	N/A / 180	c/a
	L2016				160.1	10/27/90	N/A	N/A / 7	c/a
	L2016				160.2	10/27/90	N/A	N/A / 7	c/a
	L2016				180.1	10/24/90	N/A	N/A / 2	c/a
	L2016				310.1	10/25/90	N/A	N/A / 14	c/a

MW = Monitoring well
FDA = Field duplicate A
LDA = Lab duplicate A
N/A = Not Available or Applicable
a = Holding time was less than the maximum
c = Missing information or does not apply
NN = Not necessary because analysis date within holding time

OW = Observation well
FDB = Field duplicate B
LDB = Lab duplicate B
TB = Field Blank
b = Holding time was exceeded
d = Not a regulatory method and no specific holding time available

7/29/91 11:41:27 kpd

RADIAN CORPORATION

TABLE G.4-2 REPORT OF HOLDING TIMES
LOCKHEED BEAUMONT GROUNDWATER

Location ID	Sample Control #	Date Sampled	QC Type	Lab	Method	Date Analyzed	Date Extracted	Maximum Extraction/Analysis Holding Times (Day)	QC Category Extraction/Analysis
MW 15	L2016	10/22/90	FDA		353.2	10/24/90	N/A	N/A / 14	c/a
	L2016				415.1	10/31/90	N/A	N/A / 28	c/a
	L2016				6010	12/06/90	NN	N/A / 180	c/a
	L2016				7470	11/15/90	NN	N/A / 28	c/a
	L2016				8010	10/29/90	N/A	N/A / 14	c/a
	L2016				8040	11/12/90	10/26/90	7 / 40	a/a
	L2016				IC	10/30/90	N/A	N/A / N/A	c/d
	L2017		FDB		130.2	11/05/90	N/A	N/A / 180	c/a
	L2017				160.1	10/27/90	N/A	N/A / 7	c/a
	L2017				160.2	10/27/90	N/A	N/A / 7	c/a
	L2017				180.1	10/24/90	N/A	N/A / 2	c/a
	L2017				310.1	10/25/90	N/A	N/A / 14	c/a
	L2017				353.2	10/24/90	N/A	N/A / 14	c/a
	L2017				415.1	10/31/90	N/A	N/A / 28	c/a
	L2017				6010	12/06/90	NN	N/A / 180	c/a
	L2017				7470	11/15/90	NN	N/A / 28	c/a
	L2017				8010	11/01/90	N/A	N/A / 14	c/a
	L2017				8040	11/12/90	10/26/90	7 / 40	a/a
	L2017				IC	10/30/90	N/A	N/A / N/A	c/d
MW 16	L2018	10/22/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2018				160.1	10/27/90	N/A	N/A / 7	c/a
	L2018				160.2	10/27/90	N/A	N/A / 7	c/a
	L2018				180.1	10/24/90	N/A	N/A / 2	c/a
	L2018				310.1	10/25/90	N/A	N/A / 14	c/a
	L2018				353.2	10/24/90	N/A	N/A / 14	c/a
	L2018				415.1	10/31/90	N/A	N/A / 28	c/a
	L2018				6010	12/06/90	NN	N/A / 180	c/a
	L2018				7470	11/15/90	NN	N/A / 28	c/a
	L2018				8010	11/01/90	N/A	N/A / 14	c/a
	L2018				8040	11/12/90	10/26/90	7 / 40	a/a
	L2018				IC	10/30/90	N/A	N/A / N/A	c/d
MW 17	L2019	10/23/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2019				160.1	10/27/90	N/A	N/A / 7	c/a
	L2019				160.2	10/27/90	N/A	N/A / 7	c/a
	L2019				180.1	10/24/90	N/A	N/A / 2	c/a
	L2019				310.1	10/25/90	N/A	N/A / 14	c/a
	L2019				353.2	10/24/90	N/A	N/A / 14	c/a
	L2019				415.1	10/31/90	N/A	N/A / 28	c/a
	L2019				6010	12/06/90	NN	N/A / 180	c/a
	L2019				7470	11/15/90	NN	N/A / 28	c/a
	L2019				8010	11/02/90	N/A	N/A / 14	c/a

MW = Monitoring well
FDA = Field duplicate A
LDA = Lab duplicate A
N/A = Not Available or Applicable
a = Holding time was less than the maximum
c = Missing information or does not apply
NN = Not necessary because analysis date within holding time

OW = Observation well
FDB = Field duplicate B
LDB = Lab duplicate B
TB = Field Blank
b = Holding time was exceeded
d = Not a regulatory method and no specific holding time available

7/29/91 11:41:27 kpd

RADIAN CORPORATION

TABLE G.4-2 REPORT OF HOLDING TIMES
LOCKHEED BEAUMONT GROUNDWATER

Location ID	Sample Control #	Date Sampled	QC Type	Lab	Method	Date Analyzed	Date Extracted	Maximum Extraction/Analysis Holding Times (Day)	QC Category Extraction/Analysis
MW-17	L2019	10/23/90			8040	11/12/90	10/26/90	7 / 40	a/a
	L2019				IC	10/30/90	N/A	N/A / N/A	c/d
MW 18	L2020	10/19/90			130 2	11/05/90	N/A	N/A / 180	c/a
	L2020				160.1	10/20/90	N/A	N/A / 7	c/a
	L2020				160.2	10/20/90	N/A	N/A / 7	c/a
	L2020				180.1	10/26/90	N/A	N/A / 2	c/b
	L2020				310.1	10/25/90	N/A	N/A / 14	c/a
	L2020				353.2	10/23/90	N/A	N/A / 14	c/a
	L2020				415.1	10/23/90	N/A	N/A / 28	c/a
	L2020				6010	11/19/90	NN	N/A / 180	c/a
	L2020				7470	11/07/90	NN	N/A / 28	c/a
	L2020				8010	10/24/90	N/A	N/A / 14	c/a
	L2020				IC	10/30/90	N/A	N/A / N/A	c/d
MW-19	L2021	10/18/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2021				160.1	10/20/90	N/A	N/A / 7	c/a
	L2021				160.2	10/20/90	N/A	N/A / 7	c/a
	L2021				180.1	10/26/90	N/A	N/A / 2	c/b
	L2021				310.1	10/25/90	N/A	N/A / 14	c/a
	L2021				353.2	10/23/90	N/A	N/A / 14	c/a
	L2021				415.1	10/23/90	N/A	N/A / 28	c/a
	L2021				6010	11/19/90	NN	N/A / 180	c/a
	L2021				7470	11/07/90	NN	N/A / 28	c/a
	L2021				8010	10/24/90	N/A	N/A / 14	c/a
	L2021				IC	10/30/90	N/A	N/A / N/A	c/d
MW 20	L2242	1/18/91			8010	1/29/91	N/A	N/A / 14	c/a
MW-21	L2243	1/21/91			8010	1/29/91	N/A	N/A / 14	c/a
MW 22	L2244	1/25/91			8010	1/29/91	N/A	N/A / 14	c/a
MW 24	L2033	11/20/90			130.2	12/06/90	N/A	N/A / 180	c/a
	L2033				160.1	11/28/90	N/A	N/A / 7	c/b
	L2033				160.2	11/28/90	N/A	N/A / 7	c/b
	L2033				180.1	12/05/90	N/A	N/A / 2	c/b
	L2033				300.0	12/04/90	N/A	N/A / 28	c/a
	L2033				310.1	12/06/90	N/A	N/A / 14	c/b
	L2033				415.1	12/04/90	N/A	N/A / 28	c/a
	L2033				6010	12/04/90	NN	N/A / 180	c/a
	L2033				7060	11/30/90	NN	N/A / 180	c/a
	L2033				7470	11/30/90	NN	N/A / 28	c/a

MW = Monitoring well
FDA = Field duplicate A
LDA = Lab duplicate A
N/A = Not Available or Applicable
a = Holding time was less than the maximum
c = Missing information or does not apply
NN = Not necessary because analysis date within holding time

OW = Observation well
FDB = Field duplicate B
LDB = Lab duplicate B
TB = Field Blank
b = Holding time was exceeded
d = Not a regulatory method and no specific holding time available

7/29/91 11:41:27 kpd

RADIAN CORPORATION

TABLE G.4-2 REPORT OF HOLDING TIMES
LOCKHEED BEAUMONT GROUNDWATER

Location ID	Sample Control #	Date Sampled	QC Type	Lab	Method	Date Analyzed	Date Extracted	Maximum Extraction/Analysis Holding Times (Day)	QC Category Extraction/Analysis
MW-24	L2033	11/20/90			7740	12/03/90	NN	N/A / 180	c/a
	L2033				8010	11/26/90	N/A	N/A / 14	c/a
	L2033				8020	11/26/90	N/A	N/A / 14	c/a
	L2033				IC	1/09/91	N/A	N/A / N/A	c/d
MW-25	L2034	12/01/90			8010	12/04/90	N/A	N/A / 14	c/a
	L2034-2	12/07/90	LDA		130.2	12/20/90	N/A	N/A / 180	c/a
	L2034-2				160.1	12/10/90	N/A	N/A / 7	c/a
	L2034-2				160.2	12/10/90	N/A	N/A / 7	c/a
	L2034-2				180.1	12/20/90	N/A	N/A / 2	c/b
	L2034-2				310.1	12/17/90	N/A	N/A / 14	c/a
	L2034-2				353.2	12/27/90	N/A	N/A / 14	c/b
	L2034-2				415.1	12/17/90	N/A	N/A / 28	c/a
	L2034-2				6010	12/11/90	NN	N/A / 180	c/a
	L2034-2				7060	12/11/90	NN	N/A / 180	c/a
	L2034-2				7470	12/13/90	NN	N/A / 28	c/a
	L2034-2				7740	12/10/90	NN	N/A / 180	c/a
	L2034-2				8010	12/11/90	N/A	N/A / 14	c/a
	L2034-2				IC	1/10/91	N/A	N/A / N/A	c/d
	L2034-2		LDB		353.2	12/27/90	N/A	N/A / 14	c/b
MW-26	L2245	1/29/91			8010	2/01/91	N/A	N/A / 14	c/a
MW-27	L2250	2/07/91			8010	2/11/91	N/A	N/A / 14	c/a
MW-28	L2264	3/08/91			8010	3/11/91	N/A	N/A / 14	c/a
MW-31	L2251	2/15/91			8010	2/21/91	N/A	N/A / 14	c/a
MW-32	L2265	3/08/91			8010	3/11/91	N/A	N/A / 14	c/a
MW-34	L2252	2/18/91			8010	2/20/91	N/A	N/A / 14	c/a
MW-35	L2280	4/09/91			8010	4/22/91	N/A	N/A / 14	c/a
MW-36	L2278	4/08/91			8010	4/22/91	N/A	N/A / 14	c/a
MW-37	L2275	4/03/91	FDA		8010	4/17/91	N/A	N/A / 14	c/a
	L2276		FDB		8010	4/17/91	N/A	N/A / 14	c/a
MW-38	L2256	2/22/91			8010	2/27/91	N/A	N/A / 14	c/a
	L2270	4/01/91			8010	4/11/91	N/A	N/A / 14	c/a

MW = Monitoring well
FDA = Field duplicate A
LDA = Lab duplicate A
N/A = Not Available or Applicable
a = Holding time was less than the maximum
c = Missing information or does not apply
NN = Not necessary because analysis date within holding time

OW = Observation well
FDB = Field duplicate B
LDB = Lab duplicate B
TB = Field Blank
b = Holding time was exceeded
d = Not a regulatory method and no specific holding time available

7/29/91 11:41:27 kpd

RADIAN CORPORATION

TABLE G.4-2 REPORT OF HOLDING TIMES
LOCKHEED BEAUMONT GROUNDWATER

Location ID	Sample Control #	Date Sampled	QC Type	Lab	Method	Date Analyzed	Date Extracted	Maximum Extraction/Analysis Holding Times (Day)	QC Category Extraction/Analysis
MW-39	L2267	3/29/91			8010	4/01/91	N/A	N/A / 14	c/a
MW 40	L2253	2/19/91			8010	2/20/91	N/A	N/A / 14	c/a
OW 02	L2022	10/23/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2022				160.1	10/31/90	N/A	N/A / 7	c/a*
	L2022				160.2	12/15/90	N/A	N/A / 7	c/b
	L2022				180.1	10/26/90	N/A	N/A / 2	c/b
	L2022				310.1	11/06/90	N/A	N/A / 14	c/a
	L2022				353.2	10/30/90	N/A	N/A / 14	c/a
	L2022				415.1	11/05/90	N/A	N/A / 28	c/a
	L2022				6010	12/07/90	NN	N/A / 180	c/a
	L2022				7470	11/15/90	NN	N/A / 28	c/a
	L2022				8010	11/05/90	N/A	N/A / 14	c/a
	L2022				IC	10/31/90	N/A	N/A / N/A	c/d
OW 03	L2023	10/25/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2023				160.1	10/31/90	N/A	N/A / 7	c/a
	L2023				160.2	12/15/90	N/A	N/A / 7	c/b
	L2023				180.1	10/26/90	N/A	N/A / 2	c/a
	L2023				310.1	11/06/90	N/A	N/A / 14	c/a
	L2023				353.2	10/30/90	N/A	N/A / 14	c/a
	L2023				415.1	11/05/90	N/A	N/A / 28	c/a
	L2023				6010	12/07/90	NN	N/A / 180	c/a
	L2023				7470	11/15/90	NN	N/A / 28	c/a
	L2023				8010	11/05/90	N/A	N/A / 14	c/a
	L2023				IC	10/31/90	N/A	N/A / N/A	c/d
OW 08	L2024	10/22/90			130 2	11/05/90	N/A	N/A / 180	c/a
	L2024				160.1	10/27/90	N/A	N/A / 7	c/a
	L2024				160.2	10/27/90	N/A	N/A / 7	c/a
	L2024				180.1	10/24/90	N/A	N/A / 2	c/a
	L2024				310.1	10/25/90	N/A	N/A / 14	c/a
	L2024				353.2	10/24/90	N/A	N/A / 14	c/a
	L2024				415.1	10/31/90	N/A	N/A / 28	c/a
	L2024				6010	12/06/90	NN	N/A / 180	c/a
	L2024				7470	11/15/90	NN	N/A / 28	c/a
	L2024				8010	11/02/90	N/A	N/A / 14	c/a
	L2024				IC	10/30/90	N/A	N/A / N/A	c/d
TANK	L2032	10/25/90			6010	12/07/90	N/A	N/A / 180	c/a
	L2032				7470	11/15/90	N/A	N/A / 28	c/a
	L2032				8010	11/06/90	N/A	N/A / 14	c/a

MW = Monitoring well
FDA = Field duplicate A
LDA = Lab duplicate A
N/A = Not Available or Applicable
a = Holding time was less than the maximum
c = Missing information or does not apply
NN = Not necessary because analysis date within holding time

OW = Observation well
FDB = Field duplicate B
LDB = Lab duplicate B
TB = Field Blank
b = Holding time was exceeded
d = Not a regulatory method and no specific holding time available
*Sample analysis initiate final day of holding time and completed the day after

7/29/91 11:41:27 kpd

TABLE G.4-2 REPORT OF HOLDING TIMES
LOCKHEED BEAUMONT GROUNDWATER

Location ID	Sample Control #	Date Sampled	QC Type	Lab	Method	Date Analyzed	Date Extracted	Maximum Extraction/Analysis Holding Times (Day)	QC Category Extraction/Analysis
W 01	L2025	10/24/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2025				160.1	10/31/90	N/A	N/A / 7	c/a
	L2025				160.2	12/15/90	N/A	N/A / 7	c/b
	L2025				180.1	10/26/90	N/A	N/A / 2	c/a
	L2025				310.1	11/06/90	N/A	N/A / 14	c/a
	L2025				353.2	10/30/90	N/A	N/A / 14	c/a
	L2025				415.1	11/05/90	N/A	N/A / 28	c/a
	L2025				6010	12/07/90	NN	N/A / 180	c/a
	L2025				7470	11/15/90	NN	N/A / 28	c/a
	L2025				8010	11/06/90	N/A	N/A / 14	c/a
	L2025				8040	11/12/90	10/26/90	7 / 40	a/a
	L2025				IC	10/31/90	N/A	N/A / N/A	c/d
W-02	L2035	12/06/90			130.2	12/20/90	N/A	N/A / 180	c/a
	L2035				160.1	12/10/90	N/A	N/A / 7	c/a
	L2035				160.2	12/10/90	N/A	N/A / 7	c/a
	L2035				180.1	12/20/90	N/A	N/A / 2	c/b
	L2035				310.1	12/17/90	N/A	N/A / 14	c/a
	L2035				353.2	12/27/90	N/A	N/A / 14	c/b
	L2035				415.1	12/17/90	N/A	N/A / 28	c/a
	L2035				6010	12/11/90	NN	N/A / 180	c/a
	L2035				7060	12/11/90	NN	N/A / 180	c/a
	L2035				7470	12/13/90	NN	N/A / 28	c/a
	L2035				7740	12/10/90	NN	N/A / 180	c/a
	L2035				8010	12/20/90	N/A	N/A / 14	c/a
	L2035				IC	1/10/91	N/A	N/A / N/A	c/d
W 03	L2036	12/07/90	LDA		130.2	12/20/90	N/A	N/A / 180	c/a
	L2036				160.1	12/10/90	N/A	N/A / 7	c/a
	L2036				160.2	12/10/90	N/A	N/A / 7	c/a
	L2036				180.1	12/20/90	N/A	N/A / 2	c/b
	L2036				310.1	12/17/90	N/A	N/A / 14	c/a
	L2036				353.2	12/27/90	N/A	N/A / 14	c/b
	L2036				415.1	12/17/90	N/A	N/A / 28	c/a
	L2036				6010	12/11/90	NN	N/A / 180	c/a
	L2036				7060	12/11/90	NN	N/A / 180	c/a
	L2036				7470	12/13/90	NN	N/A / 28	c/a
	L2036				7740	12/10/90	NN	N/A / 180	c/a
	L2036				8010	12/20/90	N/A	N/A / 14	c/a
	L2036				IC	1/10/91	N/A	N/A / N/A	c/d
	L2036		LDB		353.2	12/27/90	N/A	N/A / 14	c/b

MW = Monitoring well
FDA = Field duplicate A
LDA = Lab duplicate A
N/A = Not Available or Applicable
a = Holding time was less than the maximum
c = Missing information or does not apply
NN = Not necessary because analysis date within holding time

OW = Observation well
FDB = Field duplicate B
LDB = Lab duplicate B
TB = Field Blank
b = Holding time was exceeded
d = Not a regulatory method and no specific holding time available

7/29/91 11:41:27 kpd

RADIAN CORPORATION

TABLE G.4-2 REPORT OF HOLDING TIMES
LOCKHEED BEAUMONT GROUNDWATER

Location ID	Sample Control #	Date Sampled	QC Type	Lab	Method	Date Analyzed	Date Extracted	Maximum Extraction/Analysis Holding Times (Day)	QC Category Extraction/Analysis
W-05	L2026	1/22/91			130.2	2/06/91	N/A	N/A / 180	c/a
	L2026				160.1	1/31/91	N/A	N/A / 7	c/b
	L2026				160.2	1/31/91	N/A	N/A / 7	c/b
	L2026				180.1	2/05/91	N/A	N/A / 2	c/b
	L2026				300.0	2/06/91	N/A	N/A / 28	c/a
	L2026				310.1	2/06/91	N/A	N/A / 14	c/b
	L2026				415.1	1/29/91	N/A	N/A / 28	c/a
	L2026				6010	2/04/91	NN	N/A / 180	c/a
	L2026				7060	1/24/91	NN	N/A / 180	c/a
	L2026				7470	1/24/91	NN	N/A / 28	c/a
	L2026				7740	1/23/91	NN	N/A / 180	c/a
	L2026				8010	2/05/91	N/A	N/A / 14	c/a

MW = Monitoring well
FDA = Field duplicate A
LDA = Lab duplicate A
N/A = Not Available or Applicable
a = Holding time was less than the maximum
c = Missing information or does not apply

OW = Observation well
FDB = Field duplicate B
LDB = Lab duplicate B
TB = Field Blank
b = Holding time was exceeded
NN = Not necessary because analysis date within holding time

7/29/91 11:41:27 kpd

RADIAN CORPORATION

- EPA Method 160.2; samples W-5 and MW-24. Holding times were exceeded by a range of 1 to 2 days.
- EPA Method 310.1; samples W-5 and MW-24. Holding times were exceeded by a range of 1 to 2 days.
- EPA Method 353.2; samples MW-25, W-2 and W-3. Holding times were exceeded by a range of 6 to 7 days.
- EPA Method 8040; sample FB-1 was extracted one day out of holding time.

Confirmation analyses for some purgeable halocarbon and aromatic samples were analyzed out of holding time. This could cause analytes detected at low levels on the primary (quantitation) analyses to be undetected on the confirmation analysis, due to loss of volatile compounds over time. Low level results from five well samples are qualified because the confirmation analysis was performed out of holding time: MW-10 and MW-18 for 1,2-dichloroethane, MW-3 for trichloroethene, MW-15 for 1,1-dichloroethene and MW-2 (Field Duplicate B [FDB]) for toluene.

The samples collected from OW-3, IB-2, MW-2(FDA,FDB), MW-5, MW-1, MW-4, OW-2, and W-1, EPA Method 160.2 (Total Suspended Solids) were analyzed twice. They were originally analyzed on 10/30/90 within holding times, but the raw data was misplaced. They were reanalyzed on 12/14/90, approximately a month out of holding time, to verify the original analytical results. Because the results from the original analyses were verified, the results for 12/14/90 were reported and not qualified.

All other analyses met EPA established holding times.

G.4.1 Analytical Issues

Intra-laboratory variations in protocol were noted in the evaluation of analytical results for purgeable halocarbon and aromatic compounds using Methods 8010 and 8020.

- BTC used a 3-point initial calibration (standard concentrations were 20 ppb, 40 ppb, 80 ppb) for purgeable halocarbons (Method 8010) and purgeable aromatics (Method 8020) and performed confirmation analysis using gas chromatograph/mass spectrometer (GC/MS).

- RAS, Austin used a five point initial calibration (standard concentrations were 0.4 ppb to 40 ppb) and performed confirmation analysis on a gas chromatograph instrument (GC).

- Samples collected from MW-24, MW-35 and MW-36 were analyzed for purgeable halocarbons by BTC using a GC/MS, instead of a GC for quantitation. A 25 ml sample was purged for MW-35 and MW-36 to meet the lower detection limits specified for the GC method. The calibration check standards were analyzed using a 5 ml sample. This is not a technically sound procedure, and the data produced are considered to be non-comparable.

Due to differences in protocol between laboratories, all results for purgeable halocarbon and aromatic compounds will be discussed as such, and will not be referenced as EPA Methods 8010 and 8020. Twenty-six of the 55 analyses for purgeable halocarbons, were performed by BTC and the other 30 were performed by RAS, Austin.

A problem occurred during the analysis of the sample from OW-8 for EPA Method 310.1 (Alkalinity). During the analysis, once the pH was brought to 4.5, the pH continued to rise after the titration stopped. Re-analysis did not correct the problem. The results for the first analysis were reported and have been qualified.

Procedures used during sample collection and analysis to control and monitor performance of the analytical systems included weekly three-point calibrations, daily calibration checks, analysis of confirmation samples, meeting the 4-hour specified holding times for soil gas samples, and using quality control (QC) samples to determine sources of contamination and evaluate accuracy and precision. The following QC sample results were assessed to determine the validity of the data collected for this project:

- Blank (reagent or laboratory and field);
- Duplicate samples (field, laboratory, and matrix spike);
- Matrix spikes; and
- Confirmation analyses in an off-site laboratory for selected samples.

Data quality for samples was assessed by evaluating the calibration and calibration check sample results, and the results of the QC samples. The data assessment indicated that most of the data meet the quality assurance objectives of the project in terms of accuracy, precision, representativeness, comparability, and completeness. Several problems were identified during the analytical portion of the project, but do not impact the usability of the data:

- Quantitation for 1,2-dichloroethane (1,2-DCA) in soil gas samples was estimated because of low response on the electron capture detector (ECD) and elution following 1,1,1-trichloroethane (1,1,1-TCA), which was a much larger peak in most samples. The potential for limited quantitation of 1,2-DCA was identified at the start of the project, but was considered to be acceptable for the field analysis objectives because 1,2-DCA was not a primary compound of concern.
- Results for tetrachloroethene (PCE) in soil gas samples were qualified for a two-week period when the correlation coefficient for the GC calibration did not meet the acceptance criterion of 0.990.

The GC/ECD was calibrated using a standard gas cocktail from Hydrocarbon Technology, Inc. out of Sulphur, Louisiana 70663, containing the following halocarbons with their concentrations:

Tetrachloroethylene	1.00 ppm
Trichloroethylene	1.00 ppm
1,1-Dichloroethylene	0.999 ppm
1,1,1-Trichloroethane	1.00 ppm
1,2-Dichloroethane	0.999 ppm
1,1-Dichloroethane	1.00 ppm
Nitrogen	Balance

Response factors for each analyte were determined by running a three point calibration curve, using concentrations of 50 parts per billion volume (ppbv), 100 ppbv, and 150 ppbv and plotting area units versus concentration. A correlation coefficient of r = 0.99 or better was achieved for each analyte. Daily calibration consisted of injection of a midpoint standard -----> if the % recovery was within $\pm$ 20%, the instrument was considered properly calibrated. If the recovery was greater than $\pm$ 20%, a new calibration curve was determined.

Liquid standards for other halocarbons included methylene chloride, trans-1,2-dichloroethylene, 1,1-dichloroethane, Trans-1,2-dichloroethylene, carbon tetrachloride, 1,1,2-trichloroethane, 1,1,2,2-tetrachloroethane, and chlorobenzene. They were purchased from Supelco, Inc. out of Bellefonte, Pennsylvania. Since these compounds were not on the target list, only their retention times were determined using these liquid standards. Their concentration was determined using an average response factor; hence their concentrations should be considered tentative.

The GC is designed for capillary column use, both micro and megabore. The analytical column used was a S&W DB624 30m x 0.53 mm megabore column, with a stationary phase film thickness of 3.0 μm. The column is designed for analysis of those compounds described in EPA Method 624 (or EPA Method 8024).

Support equipment/supplies included gas-tight syringes (2 ml, 50 ml, and 100 ml), gas and liquid standards, gas regulators, and supporting glassware for preparation of liquid standards. A blue dot oven capable of achieving temperatures of 300°C was used for cleanup of syringes, needles, and glassware. Support gases for the GC include N_2, breathing air, hydrogen for the FID, and methane/argon for the ECD.

Solvents used were high pressure liquid chromatography grade methanol and acetone.

G.3 Soil Samples from Borings

The majority of the samples were analyzed by BTC Environmental. The methods included volatile halogenated organics by EPA Method 8010; volatile organics by EPA Method 8240; total organic carbon by EPA Method 415.1; pH by EPA Method 9045; and cation exchange capacity by EPA Method 9081. Quality control samples included one matrix spike sample and one field duplicate sample. Field blank samples were not collected.

Two perchlorate samples were analyzed by EPA Method 300.0 at Radian's Austin laboratory. No field quality control samples were collected for this Method. Data quality for these results was evaluated by reviewing the laboratory control standards, laboratory blanks, and the Beaumont #1 groundwater resampling matrix spike results.

by EPA Method 8240 which displayed low recoveries (18%, 47%). Low recoveries are not unusual for this compound, however; and, since all surrogate spike recoveries were within the acceptance ranges, overall data quality should not be affected.

Review of Data for Precision

Precision is estimated by calculating the relative percent difference (RPD) between duplicate samples. The resulting system level precision is an estimate of the combined laboratory and field variability. By way of comparison, precision calculated with respect to RPD between MS/MSDs results is used to estimate Method level or analytical variability. Analytical variability does not account for factors associated with a particular sampling technique.

Review of the field duplicate and MS/MSD data for samples analyzed by EPA Methods 8010 and 8240 indicates that the quality assurance objective for precision was met. However, a high RPD (45%) was observed for bromoform analyzed by EPA Method 8240. Overall data quality is not affected, however, because this compound was not detected in any of the field samples.

Review of Data for Detectability

Laboratory blank data was reviewed and compared against the Method detection limits specified by EPA in SW-846. The detectability objective for this study was met. Evaluation of system level or sampling induced contamination cannot be accomplished, since field blank samples were not collected; however, since none of the field samples analyzed by EPA Methods 8010 and 8240 contained volatile compounds above the Method detection limits, the integrity of the sampling system was maintained.

G.4 Groundwater Sampling Round 2, (October 1990), and Sampling of Treatability Study Wells (November 1990 through March 1991)

This section presents the results of the QC data assessment for groundwater samples collected from existing wells, monitoring wells, and observation wells for Round 2 groundwater sampling and the sampling of wells drilled for the Treatability Study. Quality assurance and quality control (QA/QC) efforts were conducted to ensure data of known and sufficient quality were collected and reported. Two primary aspects of the overall QA/QC effort are related to achievement of this objective. First, the QA/QC program forms a framework for controlling data quality within pre-established limits during execution of the sampling and analytical efforts. Second, the QA/QC program forms the basis for estimating uncertainty in the measurement data by providing information necessary to determine qualitative and quantitative limitations associated with these data.

Occurrences of out-of-specification QC results and any associated impact to groundwater sample data are discussed in the following subsections.

Analyses were performed by four separate laboratories:

- Radian Analytical Services (RAS), Sacramento, performed 29 analyses each for EPA Methods 6010, 7470, 353.2, 310.1, 180.1, 160.2, 160.1, and 130.2;

- Radian Analytical Service (RAS), Austin, performed 28 analyses for EPA Method 415.1, 32 analyses for perchlorates by ion chromatography (IC), 30 analyses for EPA Method 8010 (purgeable halocarbons) and 2 analyses for EPA Method 8020 (purgeable aromatics);

- BTC Environmental Incorporated (BTC) performed 6 analyses each for EPA Methods 6010, 7740, 7470, 7060, 415.1 (9060), 353.2 (300.0), 310.1, 180.1, 160.2, and 160.1, 26 analyses for EPA Method

RADIAN CORPORATION

Table G.4-1

Summary of Types of Analyses

EPA Method No.	Analytes	Analytical Technique
130.2	Hardness	Titration
160.1	Total Dissolved Solids	Gravimetric
160.2	Total Suspended Solids	Gravimetric
180.1	Turbidity	Light Scattering
300.0	Nitrate	Ion Chromatography
310.1	Bicarbonate, Carbonate, Total Alkalinity	Titration
353.2	Nitrate/Nitrate	Colorimetric
415.1	Total Organic Carbon	Oxidation
6010	Metals (Al, An, Ba, Ca, Cr, Cu, Fe, Mg, Mn, Ni, K, Si, Na, Zn)	Ind. Coupled Plasma Emission Spectroscopy
7060	Arsenic	Graphite Furnace
7470	Mercury	Cold Vapor Atom. Absorb.
7740	Selenium	Graphite Furnace
8010	Purgeable Halocarbons	Gas Chromatography
8020	Purgeable Aromatics	Gas Chromatography
8040	Phenols	Gas Chromatography

TABLE G.4-2 REPORT OF HOLDING TIMES
LOCKHEED BEAUMONT GROUNDWATER

Location ID	Sample Control #	Date Sampled	QC Type	Lab	Method	Date Analyzed	Date Extracted	Maximum Extraction/Analysis Holding Times (Day)	QC Category Extraction/Analysis
LOWER POND	L2031	10/23/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2031				160.1	10/27/90	N/A	N/A / 7	c/a
	L2031				160.2	10/27/90	N/A	N/A / 7	c/a
	L2031				180.1	10/24/90	N/A	N/A / 2	c/a
	L2031				310.1	10/25/90	N/A	N/A / 14	c/a
	L2031				353.2	10/24/90	N/A	N/A / 14	c/a
	L2031				415.1	10/31/90	N/A	N/A / 28	c/a
	L2031				6010	12/06/90	NN	N/A / 180	c/a
	L2031				7470	11/15/90	NN	N/A / 28	c/a
	L2031				8010	11/02/90	N/A	N/A / 14	c/a
	L2031				IC	10/30/90	N/A	N/A / N/A	c/d
MW-01	L2001	10/24/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2001				160.1	10/31/90	N/A	N/A / 7	c/a
	L2001				160.2	12/15/90	N/A	N/A / 7	c/b
	L2001				180.1	10/26/90	N/A	N/A / 2	c/a
	L2001				310.1	11/06/90	N/A	N/A / 14	c/a
	L2001				353.2	10/30/90	N/A	N/A / 14	c/a
	L2001				415.1	11/05/90	N/A	N/A / 28	c/a
	L2001				6010	12/07/90	NN	N/A / 180	c/a
	L2001				7470	11/15/90	NN	N/A / 28	c/a
	L2001				8010	11/02/90	N/A	N/A / 14	c/a
	L2001				8040	11/12/90	10/26/90	7 / 40	a/a
	L2001				IC	10/31/90	N/A	N/A / N/A	c/d
	L2037	1/02/91			130.2	1/16/91	N/A	N/A / 180	c/a
	L2037				160.1	1/11/91	N/A	N/A / 7	c/b
	L2037				160.2	1/03/91	N/A	N/A / 7	c/a
	L2037				180.1	1/11/91	N/A	N/A / 2	c/b
	L2037				300.0	1/09/91	N/A	N/A / 28	c/a
	L2037				310.1	1/16/91	N/A	N/A / 14	c/a
	L2037				415.1	1/04/91	N/A	N/A / 28	c/a
	L2037				6010	1/16/91	NN	N/A / 180	c/a
	L2037				7060	1/21/91	NN	N/A / 180	c/a
	L2037				7470	1/21/91	NN	N/A / 28	c/a
	L2037				7740	1/21/91	NN	N/A / 180	c/a
	L2037				8010	1/15/91	N/A	N/A / 14	c/a
MW-02	L2002	10/24/90	FDA		130.2	11/05/90	N/A	N/A / 180	c/a
	L2002				160.1	10/31/90	N/A	N/A / 7	c/a
	L2002				160.2	12/15/90	N/A	N/A / 7	c/b
	L2002				180.1	10/26/90	N/A	N/A / 2	c/a
	L2002				310.1	11/06/90	N/A	N/A / 14	c/a

MW = Monitoring well
FDA = Field duplicate A
LDA = Lab duplicate A
N/A = Not Available or Applicable
a = Holding time was less than the maximum
c = Missing information or does not apply
NN = Not necessary because analysis date within holding time

OW = Observation well
FDB = Field duplicate B
LDB = Lab duplicate B
TB = Field Blank
b = Holding time was exceeded
d = Not a regulatory method and no specific holding time available

7/29/91 11:41:27 kpd

TABLE G.4-2 REPORT OF HOLDING TIMES
LOCKHEED BEAUMONT GROUNDWATER

Location ID	Sample Control #	Date Sampled	QC Type	Lab	Method	Date Analyzed	Date Extracted	Maximum Extraction/Analysis Holding Times (Day)	QC Category Extraction/Analysis
MW 02	L2002	10/24/90	FDA		353.2	10/30/90	N/A	N/A / 14	c/a
	L2002				415.1	11/05/90	N/A	N/A / 28	c/a
	L2002				6010	12/07/90	NN	N/A / 180	c/a
	L2002				7470	11/15/90	NN	N/A / 28	c/a
	L2002				8010	11/02/90	N/A	N/A / 14	c/a
	L2002				8020	11/07/90	N/A	N/A / 14	c/a
	L2002				IC	10/31/90	N/A	N/A / N/A	c/d
	L2003		FDB		130.2	11/05/90	N/A	N/A / 180	c/a
	L2003				160.1	10/31/90	N/A	N/A / 7	c/a
	L2003				160.2	12/15/90	N/A	N/A / 7	c/b
	L2003				180.1	10/26/90	N/A	N/A / 2	c/a
	L2003				310.1	11/06/90	N/A	N/A / 14	c/a
	L2003				353.2	10/30/90	N/A	N/A / 14	c/a
	L2003				415.1	11/05/90	N/A	N/A / 28	c/a
	L2003				6010	12/07/90	NN	N/A / 180	c/a
	L2003				7470	11/15/90	NN	N/A / 28	c/a
	L2003				8010	11/05/90	N/A	N/A / 14	c/a
	L2003				8020	11/07/90	N/A	N/A / 14	c/a
	L2003				IC	10/31/90	N/A	N/A / N/A	c/d
MW 03	L2004	10/16/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2004				160.1	10/20/90	N/A	N/A / 7	c/a
	L2004				160.2	10/20/90	N/A	N/A / 7	c/a
	L2004				180.1	10/19/90	N/A	N/A / 2	c/b
	L2004				310.1	10/25/90	N/A	N/A / 14	c/a
	L2004				353.2	10/19/90	N/A	N/A / 14	c/a
	L2004				415.1	10/23/90	N/A	N/A / 28	c/a
	L2004				6010	11/06/90	NN	N/A / 180	c/a
	L2004				7470	10/30/90	NN	N/A / 28	c/a
	L2004				8010	10/23/90	N/A	N/A / 14	c/a
	L2004				IC	10/31/90	N/A	N/A / N/A	c/d
MW 04	L2005	10/24/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2005				160.1	10/31/90	N/A	N/A / 7	c/a
	L2005				160.2	12/15/90	N/A	N/A / 7	c/b
	L2005				180.1	10/26/90	N/A	N/A / 2	c/a
	L2005				310.1	11/06/90	N/A	N/A / 14	c/a
	L2005				353.2	10/30/90	N/A	N/A / 14	c/a
	L2005				415.1	11/05/90	N/A	N/A / 28	c/a
	L2005				6010	12/07/90	NN	N/A / 180	c/a
	L2005				7470	11/15/90	NN	N/A / 28	c/a
	L2005				8010	11/05/90	N/A	N/A / 14	c/a
	L2005				IC	10/31/90	N/A	N/A / N/A	c/d

MW = Monitoring well
FDA = Field duplicate A
LDA = Lab duplicate A
N/A = Not Available or Applicable
a = Holding time was less than the maximum
c = Missing information or does not apply
NN = Not necessary because analysis date within holding time

OW = Observation well
FDB = Field duplicate B
LDB = Lab duplicate B
TB = Field Blank
b = Holding time was exceeded
d = Not a regulatory method and no specific holding time available

7/29/91 11:41:27 kpd

RADIAN CORPORATION

TABLE G.4-2 REPORT OF HOLDING TIMES
LOCKHEED BEAUMONT GROUNDWATER

Location ID	Sample Control #	Date Sampled	QC Type	Lab	Method	Date Analyzed	Date Extracted	Maximum Extraction/Analysis Holding Times (Day)	QC Category Extraction/Analysis
MW-12	L2013	10/18/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2013				160.1	10/20/90	N/A	N/A / 7	c/a
	L2013				160.2	10/20/90	N/A	N/A / 7	c/a
	L2013				180.1	10/26/90	N/A	N/A / 2	c/b
	L2013				310.1	10/25/90	N/A	N/A / 14	c/a
	L2013				353.2	10/23/90	N/A	N/A / 14	c/a
	L2013				415.1	10/23/90	N/A	N/A / 28	c/a
	L2013				6010	11/19/90	NN	N/A / 180	c/a
	L2013				7470	11/07/90	NN	N/A / 28	c/a
	L2013				8010	10/24/90	N/A	N/A / 14	c/a
	L2013				IC	10/30/90	N/A	N/A / N/A	c/d
MW 13	L2014	10/22/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2014				160.1	10/27/90	N/A	N/A / 7	c/a
	L2014				160.2	10/27/90	N/A	N/A / 7	c/a
	L2014				180.1	10/24/90	N/A	N/A / 2	c/a
	L2014				310.1	10/25/90	N/A	N/A / 14	c/a
	L2014				353.2	10/24/90	N/A	N/A / 14	c/a
	L2014				415.1	10/31/90	N/A	N/A / 28	c/a
	L2014				6010	12/06/90	NN	N/A / 180	c/a
	L2014				7470	11/15/90	NN	N/A / 28	c/a
	L2014				8010	10/26/90	N/A	N/A / 14	c/a
	L2014				8040	11/12/90	10/26/90	7 / 40	a/a
	L2014				IC	10/30/90	N/A	N/A / N/A	c/d
MW-14	L2015	10/23/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2015				160.1	10/27/90	N/A	N/A / 7	c/a
	L2015				160.2	10/27/90	N/A	N/A / 7	c/a
	L2015				180.1	10/24/90	N/A	N/A / 2	c/a
	L2015				310.1	10/25/90	N/A	N/A / 14	c/a
	L2015				353.2	10/24/90	N/A	N/A / 14	c/a
	L2015				415.1	10/31/90	N/A	N/A / 28	c/a
	L2015				6010	12/06/90	NN	N/A / 180	c/a
	L2015				7470	11/15/90	NN	N/A / 28	c/a
	L2015				8010	10/26/90	N/A	N/A / 14	c/a
	L2015				8040	11/12/90	10/26/90	7 / 40	a/a
	L2015				IC	10/30/90	N/A	N/A / N/A	c/d
MW 15	L2016	10/22/90	FDA		130.2	11/05/90	N/A	N/A / 180	c/a
	L2016				160.1	10/27/90	N/A	N/A / 7	c/a
	L2016				160.2	10/27/90	N/A	N/A / 7	c/a
	L2016				180.1	10/24/90	N/A	N/A / 2	c/a
	L2016				310.1	10/25/90	N/A	N/A / 14	c/a

MW = Monitoring well
FDA = Field duplicate A
LDA = Lab duplicate A
N/A = Not Available or Applicable
a = Holding time was less than the maximum
c = Missing information or does not apply
NN = Not necessary because analysis date within holding time

OW = Observation well
FDB = Field duplicate B
LDB = Lab duplicate B
TB = Field Blank
b = Holding time was exceeded
d = Not a regulatory method and no specific holding time available

7/29/91 11:41:27 kpd

RADIAN CORPORATION

TABLE G.4-2 REPORT OF HOLDING TIMES
LOCKHEED BEAUMONT GROUNDWATER

Location ID	Sample Control #	Date Sampled	QC Type	Lab	Method	Date Analyzed	Date Extracted	Maximum Extraction/Analysis Holding Times (Day)	QC Category Extraction/Analysis
MW-17	L2019	10/23/90			8040	11/12/90	10/26/90	7 / 40	a/a
	L2019				IC	10/30/90	N/A	N/A / N/A	c/d
MW 18	L2020	10/19/90			130 2	11/05/90	N/A	N/A / 180	c/a
	L2020				160.1	10/20/90	N/A	N/A / 7	c/a
	L2020				160.2	10/20/90	N/A	N/A / 7	c/a
	L2020				180.1	10/26/90	N/A	N/A / 2	c/b
	L2020				310.1	10/25/90	N/A	N/A / 14	c/a
	L2020				353.2	10/23/90	N/A	N/A / 14	c/a
	L2020				415.1	10/23/90	N/A	N/A / 28	c/a
	L2020				6010	11/19/90	NN	N/A / 180	c/a
	L2020				7470	11/07/90	NN	N/A / 28	c/a
	L2020				8010	10/24/90	N/A	N/A / 14	c/a
	L2020				IC	10/30/90	N/A	N/A / N/A	c/d
MW-19	L2021	10/18/90			130.2	11/05/90	N/A	N/A / 180	c/a
	L2021				160.1	10/20/90	N/A	N/A / 7	c/a
	L2021				160.2	10/20/90	N/A	N/A / 7	c/a
	L2021				180.1	10/26/90	N/A	N/A / 2	c/b
	L2021				310.1	10/25/90	N/A	N/A / 14	c/a
	L2021				353.2	10/23/90	N/A	N/A / 14	c/a
	L2021				415.1	10/23/90	N/A	N/A / 28	c/a
	L2021				6010	11/19/90	NN	N/A / 180	c/a
	L2021				7470	11/07/90	NN	N/A / 28	c/a
	L2021				8010	10/24/90	N/A	N/A / 14	c/a
	L2021				IC	10/30/90	N/A	N/A / N/A	c/d
MW 20	L2242	1/18/91			8010	1/29/91	N/A	N/A / 14	c/a
MW-21	L2243	1/21/91			8010	1/29/91	N/A	N/A / 14	c/a
MW 22	L2244	1/25/91			8010	1/29/91	N/A	N/A / 14	c/a
MW 24	L2033	11/20/90			130.2	12/06/90	N/A	N/A / 180	c/a
	L2033				160.1	11/28/90	N/A	N/A / 7	c/b
	L2033				160.2	11/28/90	N/A	N/A / 7	c/b
	L2033				180.1	12/05/90	N/A	N/A / 2	c/b
	L2033				300.0	12/04/90	N/A	N/A / 28	c/a
	L2033				310.1	12/06/90	N/A	N/A / 14	c/b
	L2033				415.1	12/04/90	N/A	N/A / 28	c/a
	L2033				6010	12/04/90	NN	N/A / 180	c/a
	L2033				7060	11/30/90	NN	N/A / 180	c/a
	L2033				7470	11/30/90	NN	N/A / 28	c/a

MW = Monitoring well
FDA = Field duplicate A
LDA = Lab duplicate A
N/A = Not Available or Applicable
a = Holding time was less than the maximum
c = Missing information or does not apply
NN = Not necessary because analysis date within holding time

OW = Observation well
FDB = Field duplicate B
LDB = Lab duplicate B
TB = Field Blank
b = Holding time was exceeded
d = Not a regulatory method and no specific holding time available

7/29/91 11:41:27 kpd

RADIAN CORPORATION

G.4.1 Analytical Issues

Intra-laboratory variations in protocol were noted in the evaluation of analytical results for purgeable halocarbon and aromatic compounds using Methods 8010 and 8020.

- BTC used a 3-point initial calibration (standard concentrations were 20 ppb, 40 ppb, 80 ppb) for purgeable halocarbons (Method 8010) and purgeable aromatics (Method 8020) and performed confirmation analysis using gas chromatograph/mass spectrometer (GC/MS).

- RAS, Austin used a five point initial calibration (standard concentrations were 0.4 ppb to 40 ppb) and performed confirmation analysis on a gas chromatograph instrument (GC).

- Samples collected from MW-24, MW-35 and MW-36 were analyzed for purgeable halocarbons by BTC using a GC/MS, instead of a GC for quantitation. A 25 ml sample was purged for MW-35 and MW-36 to meet the lower detection limits specified for the GC method. The calibration check standards were analyzed using a 5 ml sample. This is not a technically sound procedure, and the data produced are considered to be non-comparable.

Due to differences in protocol between laboratories, all results for purgeable halocarbon and aromatic compounds will be discussed as such, and will not be referenced as EPA Methods 8010 and 8020. Twenty-six of the 55 analyses for purgeable halocarbons, were performed by BTC and the other 30 were performed by RAS, Austin.

A problem occurred during the analysis of the sample from OW-8 for EPA Method 310.1 (Alkalinity). During the analysis, once the pH was brought to 4.5, the pH continued to rise after the titration stopped. Re-analysis did not correct the problem. The results for the first analysis were reported and have been qualified.

G.4.2 Groundwater Quality Assurance/Quality Control Results

Blanks

Two types of blanks, reagent blanks and equipments blanks, were analyzed during this sampling program to assess the potential for contamination from various sources in the sampling and analytical process.

Reagent Blanks--Reagent blanks are used to demonstrate that interference or contamination from the analytical system, including glassware and reagents used in the analytical procedure, are under control. They are carried through the same sample preparation (digestion or extraction) procedure as the samples to be analyzed. The required frequency for analyzing reagent blanks generally consists of one per day for each method/instrument and/or one per extraction batch. Table G.4-3 summarizes the results for reagent blanks analyzed with the water samples.

Where the reagent blank was found to be contaminated (i.e., compounds were detected) the following guidelines were applied. If an analyte was detected in a groundwater sample at a concentration greater than five times the blank contamination, the result was not considered to be influenced by any reagent blank contamination. The factor of five is the general Practical Quantitation Limit (PQL) established for groundwater samples analyzed by U.S. EPA SW-846 Methods.

Methylene chloride was detected at concentrations ranging from 1.1 to 11 parts-per-billion (ppb) in four of the 29 reagent blanks that were analyzed for purgeable halocarbons (EPA Method 8010). Methylene chloride is a common laboratory contaminant for the organic compounds detected by this analytical method. Methylene chloride was detected in three well samples, MW-20, MW-22, and MW-26 at approximately four or less times the concentrations detected in the associated reagent

RADIAN CORPORATION

TABLE G.4-3 SUMMARY OF REAGENT BLANK RESULTS
LOCKHEED BEAUMONT GROUNDWATER

Method	Number of Samples	Analyte	Number of Occurrences	Range of Results	Units
130.2	8				
		Hardness	0	ND - ND	mg/L
160.1	7				
		Total Dissolved Solids	0	ND - ND	mg/L
160.2	8				
		Total Suspended Solids	0	ND - ND	mg/L
180.1	7				
		Turbidity	5	ND - 40	NTU
300.0	3				
		Nitrate	0	ND - ND	mg/L
310.1	8				
		Bicarbonate	0	ND - ND	mg/L
		Carbonate	0	ND - ND	mg/L
		Hydroxide	0	ND - ND	mg/L
		Total Alkalinity	0	ND - ND	mg/L
353.2	5				
		Nitrate	0	ND - ND	mg/L
415.1	8				
		Total Organic Carbon	0	ND - ND	mg/L
6010	8				
		Aluminum	0	ND - ND	mg/L
		Antimony	0	ND - ND	mg/L
		Arsenic	0	ND - ND	mg/L
		Barium	0	ND - ND	mg/L
		Beryllium	0	ND - ND	mg/L
		Boron	0	ND - ND	mg/L
		Cadmium	0	ND - ND	mg/L
		Calcium	0	ND - ND	mg/L
		Chromium	0	ND - ND	mg/L
		Cobalt	0	ND - ND	mg/L
		Copper	0	ND - ND	mg/L
		Iron	0	ND - ND	mg/L
		Lead	0	ND - ND	mg/L
		Magnesium	0	ND - ND	mg/L
		Manganese	0	ND - ND	mg/L
		Molybdenum	0	ND - ND	mg/L
		Nickel	0	ND - ND	mg/L

RADIAN CORPORATION

TABLE G.4-3 SUMMARY OF REAGENT BLANK RESULTS
LOCKHEED BEAUMONT GROUNDWATER

Method	Number of Samples	Analyte	Number of Occurrences	Range of Results	Units
6010	8				
		Potassium	1	ND - 4.3	mg/L
		Selenium	0	ND - ND	mg/L
		Silicon	0	ND - ND	mg/L
		Silver	0	ND - ND	mg/L
		Sodium	0	ND - ND	mg/L
		Thallium	0	ND - ND	mg/L
		Vanadium	0	ND - ND	mg/L
		Zinc	0	ND - ND	mg/L
7060	4				
		Arsenic	0	ND - ND	mg/L
7470	9				
		Mercury	0	ND - ND	mg/L
7740	4				
		Selenium	0	ND - ND	mg/L
8010	29				
		1,1,1,2-Tetrachloroethane	0	ND - ND	ug/L
		1,1,1-Trichloroethane	0	ND - ND	ug/L
		1,1,2,2-Tetrachloroethane	0	ND - ND	ug/L
		1,1,2-Trichloroethane	0	ND - ND	ug/L
		1,1-Dichloroethane	0	ND - ND	ug/L
		1,1-Dichloroethene	0	ND - ND	ug/L
		1,2,3-Trichloropropane	0	ND - ND	ug/L
		1,2-Dichlorobenzene	0	ND - ND	ug/L
		1,2-Dichloroethane	0	ND - ND	ug/L
		1,2-Dichloropropane	1	ND - 5.0	ug/L
		1,3-Dichlorobenzene	0	ND - ND	ug/L
		1,4-Dichlorobenzene	0	ND - ND	ug/L
		1-Chloronexane	0	ND - ND	ug/L
		2-Chloroethylvinylether	0	ND - ND	ug/L
		2-Chlorotoluene	0	ND - ND	ug/L
		Benzyl Chloride	0	ND - ND	ug/L
		Bis(2-Chloroethoxy)Methane	0	ND - ND	ug/L
		Bis(2-Chloroisopropyl)Ether	0	ND - ND	ug/L
		Bromobenzene	0	ND - ND	ug/L
		Bromodichloromethane	0	ND - ND	ug/L
		Bromoform	0	ND - ND	ug/L
		Bromomethane	0	ND - ND	ug/L
		C-1,3-Dichloropropylene	0	ND - ND	ug/L
		Carbon Tetrachloride	0	ND - ND	ug/L
		Chloroacetaldehyde	0	ND - ND	ug/L
		Chlorobenzene	0	ND - ND	ug/L

RADIAN CORPORATION

TABLE G.4-3 SUMMARY OF REAGENT BLANK RESULTS
LOCKHEED BEAUMONT GROUNDWATER

Method	Number of Samples	Analyte	Number of Occurrences	Range of Results	Units
8010	29				
		Chloroethane	0	ND - ND	ug/L
		Chloroform	1	ND - 13	ug/L
		Chloromethane	0	ND - ND	ug/L
		Chloromethyl Methyl Ether	0	ND - ND	ug/L
		Dibromochloromethane	0	ND - ND	ug/L
		Dibromomethane	0	ND - ND	ug/L
		Dichlorodifluoromethane	0	ND - ND	ug/L
		Methylene Chloride	3	ND - 11	ug/L
		Propylene Dichloride	0	ND - ND	ug/L
		T-1,3-Dichloropropylene	0	ND - ND	ug/L
		Tetrachloroethene	0	ND - ND	ug/L
		Trans-1,2-Dichloroethylene	0	ND - ND	ug/L
		Trans-1,3-Dichloropropene	0	ND - ND	ug/L
		Trichloroethene	0	ND - ND	ug/L
		Trichlorofluoromethane	0	ND - ND	ug/L
		VOC Total	5	ND - 13	ug/L
		Vinyl Chloride	0	ND - ND	ug/L
8020	2				
		1,2-Dichlorobenzene	0	ND - ND	ug/L
		1,3-Dichlorobenzene	0	ND - ND	ug/L
		1,4-Dichlorobenzene	0	ND - ND	ug/L
		Benzene	0	ND - ND	ug/L
		Chlorobenzene	0	ND - ND	ug/L
		Ethylbenzene	0	ND - ND	ug/L
		Toluene	0	ND - ND	ug/L
		Total Xylenes	0	ND - ND	ug/L
		Xylenes	0	ND - ND	ug/L
8040	1				
		2,4,5-Trichlorophenol	0	ND - ND	ug/L
		2,4,6-Trichlorophenol	0	ND - ND	ug/L
		2,4-Dichlorophenol	0	ND - ND	ug/L
		2,4-Dimethylphenol	0	ND - ND	ug/L
		2,4-Dinitrophenol	0	ND - ND	ug/L
		2-Chlorophenol	0	ND - ND	ug/L
		2-Methylphenol	0	ND - ND	ug/L
		2-Nitrophenol	0	ND - ND	ug/L
		2-sec-Butyl-4,6-Dinitrophenol (DNBP)	0	ND - ND	ug/L
		4,6-Dinitro-2-Methylphenol	0	ND - ND	ug/L
		4-Chloro-3-Methylphenol	0	ND - ND	ug/L
		4-Nitrophenol	0	ND - ND	ug/L
		Pentachlorophenol	0	ND - ND	ug/L
		Phenol	0	ND - ND	ug/L

RADIAN CORPORATION

TABLE G.4-3 SUMMARY OF REAGENT BLANK RESULTS
LOCKHEED BEAUMONT GROUNDWATER

Method	Number of Samples	Analyte	Number of Occurrences	Range of Results	Units
IC	6				
		Perchlorate	0	ND - ND	mg/L

blanks. Therefore, the results for methylene chloride for these samples have been qualified.

The reagent blank analyzed on 11/26/90 was erroneously not spiked with a surrogate. Though this is a deviation from standard laboratory practice, no sample results are considered to have been affected because this was a blank.

Chloroform was reported at a concentration of 13 ppb in one reagent blank, for purgeable halocarbons. This analyte was not detected in the associated well sample and therefore no results were qualified.

Eight reagent blanks were analyzed for metals using Method 6010. Potassium was detected in one blank at 4.3 ppm, less than 2 times the MDL. The following three well samples associated with this reagent blank contained low levels of potassium, and the results are therefore qualified for potassium: MW-3, MW-10 and MW-11.

No target analytes were detected in the reagent blanks analyzed using EPA Methods 130.2, 160.1, 160.2, 180.1, 310.1, 353.2 (300.0), 415.1, 8040, 7470, 7060, 7740, purgeable aromatics, and ion chromatography (IC).

In general, the reagent blank results indicate that laboratory contamination did not significantly affect analysis results.

Field Blanks--The potential for contamination from sampling equipment was monitored using field blanks (equipment blanks). The field blanks consisted of distilled water that was poured through the sampling equipment (bailer for organic analyses and the Bennett Pump for inorganic analyses) and then collected and handled in the same way as other groundwater samples. The field blank results monitor the effectiveness of the decontamination procedure. Three field blanks were collected. Two

of the field blanks were analyzed using EPA Methods 6010, 7470, 310.1, 353.2, 130.2, 160.1, 180.1, 160.2, 415.1, and IC. One blank was also analyzed using Method 8040 and all three blanks were analyzed for purgeable halocarbons. Table G.4-4 summarizes the results for the field blanks.

Tetrachloroethene was detected in two field blanks analyzed for purgeable halocarbons at 6.3 ppb and 0.42 ppb; These samples were collected on 10/15/90 and 10/25/90, respectively. Tetrachloroethene was not detected in any associated well samples collected on 10/25/90 and no samples were collected on 10/15/90, and therefore no results were qualified. However, since organic-free water was not used for the field blanks, it is likely that the source of the tetrachloroethene was not contamination from the sampling equipment, but from the water used to prepare the field blanks. No target compounds for purgeable halocarbons were detected in the field blank collected on 4/3/91.

For Method 6010 analysis, low levels of zinc were detected in the field blank collected on 10/15/90, and zinc, copper and iron were detected in the field blank collected on 10/25/90. Because similar concentrations of zinc, copper, and iron were detected in the samples from OW-3 and Tank (associated with the field blank collected on 10/25/90), these results have been qualified to indicate likely external sources for these metals.

Bicarbonate was detected at approximately five times the MDL in the field blank collected on 10/15/90 for EPA Method 310.1. Samples were not collected for alkalinity analysis on this day and therefore no results have been qualified. In addition, since the source of water used to prepare the field blanks was not deionized, the bicarbonate could be from the water and not contamination from the sampling equipment.

RADIAN CORPORATION

TABLE G.4-4 SUMMARY OF FIELD BLANK RESULTS
LOCKHEED BEAUMONT GROUNDWATER

Method	Number of Samples	Analyte	Number of Occurrences	Range of Results	Units
130.2	2				
		Hardness	0	ND - ND	mg/L
160.1	2				
		Total Dissolved Solids	0	ND - ND	mg/L
160.2	2				
		Total Suspended Solids	0	ND - ND	mg/L
180.1	2				
		Turbidity	0	ND - ND	NTU
310.1	2				
		Bicarbonate	1	ND - 5.4	mg/L
		Carbonate	0	ND - ND	mg/L
		Hydroxide	0	ND - ND	mg/L
353.2	2				
		Nitrate	0	ND - ND	mg/L
415.1	2				
		Total Organic Carbon	0	ND - ND	mg/L
6010	2				
		Aluminum	0	ND - ND	mg/L
		Antimony	0	ND - ND	mg/L
		Arsenic	0	ND - ND	mg/L
		Barium	0	ND - ND	mg/L
		Beryllium	0	ND - ND	mg/L
		Boron	0	ND - ND	mg/L
		Cadmium	0	ND - ND	mg/L
		Calcium	0	ND - ND	mg/L
		Chromium	0	ND - ND	mg/L
		Cobalt	0	ND - ND	mg/L
		Copper	1	ND - 0.10	mg/L
		Iron	1	ND - 0.10	mg/L
		Lead	0	ND - ND	mg/L
		Magnesium	0	ND - ND	mg/L
		Manganese	0	ND - ND	mg/L
		Molybdenum	0	ND - ND	mg/L
		Nickel	0	ND - ND	mg/L
		Potassium	0	ND - ND	mg/L
		Selenium	0	ND - ND	mg/L
		Silicon	0	ND - ND	mg/L
		Silver	0	ND - ND	mg/L

RADIAN CORPORATION

TABLE G.4-4 SUMMARY OF FIELD BLANK RESULTS
LOCKHEED BEAUMONT GROUNDWATER

Method	Number of Samples	Analyte	Number of Occurrences	Range of Results	Units
6010	2				
		Sodium	0	ND - ND	mg/L
		Thallium	0	ND - ND	mg/L
		Vanadium	0	ND - ND	mg/L
		Zinc	2	0.020 - 0.045	mg/L
7470	2				
		Mercury	0	ND - ND	mg/L
8010	3				
		1,1,1,2-Tetrachloroethane	0	ND - ND	ug/L
		1,1,1-Trichloroethane	0	ND - ND	ug/L
		1,1,2,2-Tetrachloroethane	0	ND - ND	ug/L
		1,1,2-Trichloroethane	0	ND - ND	ug/L
		1,1-Dichloroethane	0	ND - ND	ug/L
		1,1-Dichloroethene	0	ND - ND	ug/L
		1,2,3-Trichloropropane	0	ND - ND	ug/L
		1,2-Dichlorobenzene	0	ND - ND	ug/L
		1,2-Dichloroethane	0	ND - ND	ug/L
		1,2-Dichloropropane	0	ND - ND	ug/L
		1,3-Dichlorobenzene	0	ND - ND	ug/L
		1,4-Dichlorobenzene	0	ND - ND	ug/L
		1-Chlorohexane	0	ND - ND	ug/L
		2-Chloroethylvinylether	0	ND - ND	ug/L
		2-Chlorotoluene	0	ND - ND	ug/L
		Benzyl Chloride	0	ND - ND	ug/L
		Bis(2-Chloroethoxy)Methane	0	ND - ND	ug/L
		Bis(2-Chloroisopropyl)Ether	0	ND - ND	ug/L
		Bromobenzene	0	ND - ND	ug/L
		Bromodichloromethane	0	ND - ND	ug/L
		Bromoform	0	ND - ND	ug/L
		Bromomethane	0	ND - ND	ug/L
		C-1,3-Dichloropropylene	0	ND - ND	ug/L
		Carbon Tetrachloride	0	ND - ND	ug/L
		Chloroacetaldehyde	0	ND - ND	ug/L
		Chlorobenzene	0	ND - ND	ug/L
		Chloroethane	0	ND - ND	ug/L
		Chloroform	0	ND - ND	ug/L
		Chloromethane	0	ND - ND	ug/L
		Chloromethyl Methyl Ether	0	ND - ND	ug/L
		Dibromochloromethane	0	ND - ND	ug/L
		Dibromomethane	0	ND - ND	ug/L
		Dichlorodifluoromethane	0	ND - ND	ug/L
		Methylene Chloride	0	ND - ND	ug/L
		Propylene Dichloride	0	ND - ND	ug/L
		T-1,3-Dichloropropylene	0	ND - ND	ug/L

RADIAN CORPORATION

TABLE G.4-4 SUMMARY OF FIELD BLANK RESULTS
LOCKHEED BEAUMONT GROUNDWATER

Method	Number of Samples	Analyte	Number of Occurrences	Range of Results	Units
8010	3				
		Tetrachloroethene	2	ND - 6.3	ug/L
		Trans-1,2-Dichloroethylene	0	ND - ND	ug/L
		Trans-1,3-Dichloropropene	0	ND - ND	ug/L
		Trichloroethene	0	ND - ND	ug/L
		Trichlorofluoromethane	0	ND - ND	ug/L
		VOC Total	2	ND - 6.3	ug/L
		Vinyl Chloride	0	ND - ND	ug/L
8040	1				
		2,4,5-Trichlorophenol	0	ND - ND	ug/L
		2,4,6-Trichlorophenol	0	ND - ND	ug/L
		2,4-Dichlorophenol	0	ND - ND	ug/L
		2,4-Dimethylphenol	0	ND - ND	ug/L
		2,4-Dinitrophenol	0	ND - ND	ug/L
		2-Chlorophenol	0	ND - ND	ug/L
		2-Methylphenol	0	ND - ND	ug/L
		2-Nitrophenol	0	ND - ND	ug/L
		2-sec-Butyl-4,6-Dinitrophenol (DNBP)	0	ND - ND	ug/L
		4,6-Dinitro-2-Methylphenol	0	ND - ND	ug/L
		4-Chloro-3-Methylphenol	0	ND - ND	ug/L
		4-Nitrophenol	0	ND - ND	ug/L
		Pentachlorophenol	0	ND - ND	ug/L
		Phenol	0	ND - ND	ug/L
IC	2				
		Perchlorate	0	ND - ND	mg/L

Duplicates

Duplicate samples were collected and matrix spike/matrix spike duplicates and laboratory duplicate analyses were performed, as described below.

Field Duplicate Samples--Field duplicate samples were collected and analyzed to evaluate the precision, or variability in the entire sampling and analytical process. The quality assurance objective for field duplicate samples was a relative percent difference (RPD) of less than or equal to 50 percent. The results for compounds detected in the duplicate samples are presented in Table G.4-5.

Field duplicate samples of groundwater were collected at monitoring wells MW-02 and MW-15 and analyzed using EPA Methods 130.2, 160.1, 180.1, 310.1, 353.2, 415.1, 6010, 7470, 8040, purgeable halocarbons and aromatics and IC, and duplicate samples were collected from MW-37 for purgeable halocarbon analysis.

No target analytes were detected using EPA Methods 160.2, 7470, and 8040; therefore, no assessment of total precision can be made for these methods.

Methods 130.2, 160.1, 180.1, 310.1, 415.1 and IC: The two pairs of field duplicates yielded two measurable analyte pairs for EPA Methods 130.2, 160.1, and 415.1 with average RPDs of 1.2%, 7.4% and 28%, and one measurable analyte pair for Methods 180.1 and IC had RPDs of 0% and 1.1%, respectively. These results indicate the precision for these methods is within the quality assurance objective.

Method 6010: The two pairs of field duplicate samples yielded 15 measurable analyte pairs with an average RPD of 23%. The results indicate that overall precision is within the quality assurance objectives. The individual analyte results for iron in MW-02 and iron and silicon in MW-15 exceeded the objective; Therefore these results qualified. For three analyte pairs (copper, potassium and zinc), an analyte was

RADIAN CORPORATION

TABLE G.4-5 SUMMARY OF FIELD DUPLICATE SAMPLES
LOCKHEED BEAUMONT GROUNDWATER

Compound	FDA	FDB	RPD(%)	Precision Limit(%)
EPA METHOD 130.2				
SAMPLE CONTROL # : L2002 & L2003				
Hardness	82	84	2.4	50
SAMPLE CONTROL # : L2016 & L2017				
Hardness	150	150	0	50
EPA METHOD 160.1				
SAMPLE CONTROL # : L2002 & L2003				
Total Dissolved Solids	230	260	12	50
SAMPLE CONTROL # : L2016 & L2017				
Total Dissolved Solids	350	360	2.8	50
EPA METHOD 160.2				
SAMPLE CONTROL # : L2002 & L2003				
Total Suspended Solids	ND	ND	NC	50
SAMPLE CONTROL # : L2016 & L2017				
Total Suspended Solids	ND	ND	NC	50
EPA METHOD 180.1				
SAMPLE CONTROL # : L2002 & L2003				
Turbidity	1.4 @	1.4 @	0	50
SAMPLE CONTROL # : L2016 & L2017				
Turbidity	ND	ND	NC	50
EPA METHOD 310.1				
SAMPLE CONTROL # : L2002 & L2003				
Bicarbonate	60	75	22	50
Carbonate	ND	ND	NC	50
Hydroxide	ND	ND	NC	50

RPD = Relative Percent Difference FDA = Field Dup A FDB = Field Dup B 7/29/91 12:56:47 kpd
+ = Above the acceptance criteria
ND = Not Detected

RADIAN CORPORATION

TABLE G.4-5 SUMMARY OF FIELD DUPLICATE SAMPLES
LOCKHEED BEAUMONT GROUNDWATER

Compound	FDA	FDB	RPD(%)	Precision Limit(%)
EPA METHOD 310.1				
SAMPLE CONTROL # : L2016 & L2017				
Bicarbonate	180	180	0	50
Carbonate	ND	ND	NC	50
Hydroxide	ND	ND	NC	50
EPA METHOD 353.2				
SAMPLE CONTROL # : L2002 & L2003				
Nitrate	4.8 @	18	+120	50
SAMPLE CONTROL # : L2016 & L2017				
Nitrate	ND	ND	NC	50
EPA METHOD 415.1				
SAMPLE CONTROL # : L2002 & L2003				
Total Organic Carbon	2	3	40	50
SAMPLE CONTROL # : L2016 & L2017				
Total Organic Carbon	1.4	1.2	15	50
EPA METHOD 6010				
SAMPLE CONTROL # : L2002 & L2003				
Aluminum	ND	ND	NC	50
Antimony	ND	ND	NC	50
Arsenic	ND	ND	NC	50
Barium	.084	.091	8.0	50
Beryllium	ND	ND	NC	50
Boron	ND	ND	NC	50
Cadmium	ND	ND	NC	50
Calcium	29	30	3.4	50
Chromium	ND	ND	NC	50
Cobalt	ND	ND	NC	50
Copper	.072 @	.06 @	18	50
Iron	.067 @	.14 @	+71	50
Lead	ND	ND	NC	50
Magnesium	5	5.2	3.9	50

RPD = Relative Percent Difference FDA = Field Dup A FDB = Field Dup B 7/29/91 12:56:47 kpd
+ = Above the acceptance criteria
ND = Not Detected

RADIAN CORPORATION

TABLE G.4-5 SUMMARY OF FIELD DUPLICATE SAMPLES
LOCKHEED BEAUMONT GROUNDWATER

Compound	FDA	FDB	RPD(%)	Precision Limit(%)
EPA METHOD 6010				
SAMPLE CONTROL # : L2002 & L2003				
Manganese	ND	ND	NC	50
Molybdenum	ND	ND	NC	50
Nickel	ND	ND	NC	50
Potassium	ND	ND	NC	50
Selenium	ND	ND	NC	50
Silicon	25	27	7.7	50
Silver	ND	ND	NC	50
Sodium	37	39	5.3	50
Thallium	ND	ND	NC	50
Vanadium	ND	ND	NC	50
Zinc	.03 @	.028 @	6.9	50
SAMPLE CONTROL # : L2016 & L2017				
Aluminum	ND	ND	NC	50
Antimony	ND	ND	NC	50
Arsenic	ND	ND	NC	50
Barium	.057	.051	11	50
Beryllium	ND	ND	NC	50
Boron	ND	ND	NC	50
Cadmium	ND	ND	NC	50
Calcium	52	52	0	50
Chromium	ND	ND	NC	50
Cobalt	ND	ND	NC	50
Copper	.13	ND	NC	50
Iron	.18 @	.06 @	+100	50
Lead	NDN	ND	NC	50
Magnesium	9.3	9	3.3	50
Manganese	.13	.13	0	50
Molybdenum	ND	ND	NC	50
Nickel	ND	ND	NC	50
Potassium	NDM	3.8 @	NC	50
Selenium	ND	ND	NC	50
Silicon	15	4.1 @	+110	50
Silver	NDN	ND	NC	50
Sodium	64	62	3.2	50
Thallium	ND	ND	NC	50
Vanadium	ND	ND	NC	50
Zinc	.076 @	ND	NC	50

RPD = Relative Percent Difference FDA = Field Dup A FDB = Field Dup B 7/29/91 12:56:47 kpd
+ = Above the acceptance criteria
ND = Not Detected

RADIAN CORPORATION

TABLE G.4-5 SUMMARY OF FIELD DUPLICATE SAMPLES
LOCKHEED BEAUMONT GROUNDWATER

Compound	FDA	FDB	RPD(%)	Precision Limit(%)
EPA METHOD 7470				
SAMPLE CONTROL # : L2002 & L2003				
Mercury	ND	ND	NC	50
SAMPLE CONTROL # : L2016 & L2017				
Mercury	ND	ND	NC	50
EPA METHOD 8010				
SAMPLE CONTROL # : L2002 & L2003				
1,1,1-Trichloroethane	310 C	310 C	0	50
1,1,2,2-Tetrachloroethane	ND	ND	NC	50
1,1,2-Trichloroethane	ND	ND	NC	50
1,1-Dichloroethane	30 C@	ND	NC	50
1,1-Dichloroethene	1500 DC	1200 C	22	50
1,2-Dichlorobenzene	ND	ND	NC	50
1,2-Dichloroethane	27 C	ND	NC	50
1,2-Dichloropropane	ND	ND	NC	50
1,3-Dichlorobenzene	ND	ND	NC	50
1,4-Dichlorobenzene	ND	ND	NC	50
2-Chloroethylvinylether	ND	ND	NC	50
Bromodichloromethane	ND	ND	NC	50
Bromoform	ND	ND	NC	50
Bromomethane	ND	ND	NC	50
Carbon Tetrachloride	ND	ND	NC	50
Chlorobenzene	ND	ND	NC	50
Chloroethane	ND	ND	NC	50
Chloroform	ND	ND	NC	50
Chloromethane	ND	ND	NC	50
Dibromochloromethane	ND	ND	NC	50
Methylene Chloride	ND	ND	NC	50
Propylene Dichloride	ND	ND	NC	50
Tetrachloroethene	ND	ND	NC	50
Trans-1,2-Dichloroethylene	ND	ND	NC	50
Trans-1,3-Dichloropropene	ND	ND	NC	50
Trichloroethene	530 C	590 C	11	50
Trichlorofluoromethane	ND	ND	NC	50
VOC Total	2397	2100	13	50
Vinyl Chloride	ND	ND	NC	50

RPD = Relative Percent Difference FDA = Field Dup A FDB = Field Dup B 7/29/91 12:56:47 kpd
+ = Above the acceptance criteria
ND = Not Detected

RADIAN CORPORATION

TABLE G.4-5· SUMMARY OF FIELD DUPLICATE SAMPLES
LOCKHEED BEAUMONT GROUNDWATER

Compound	FDA	FDB	RPD(%)	Precision Limit(%)
EPA METHOD 8010				
SAMPLE CONTROL # : L2016 & L2017				
1,1,1-Trichloroethane	ND	ND	NC	50
1,1,2,2-Tetrachloroethane	ND	ND	NC	50
1,1,2-Trichloroethane	ND	ND	NC	50
1,1-Dichloroethane	ND	ND	NC	50
1,1-Dichloroethene	.49 X@	ND	NC	50
1,2-Dichlorobenzene	ND	ND	NC	50
1,2-Dichloroethane	ND	ND	NC	50
1,2-Dichloropropane	ND	ND	NC	50
1,3-Dichlorobenzene	ND	ND	NC	50
1,4-Dichlorobenzene	ND	ND	NC	50
2-Chloroethylvinylether	ND	ND	NC	50
Bromodichloromethane	ND	ND	NC	50
Bromoform	ND	ND	NC	50
Bromomethane	ND	ND	NC	50
Carbon Tetrachloride	ND	ND	NC	50
Chlorobenzene	ND	ND	NC	50
Chloroethane	ND	ND	NC	50
Chloroform	ND	ND	NC	50
Chloromethane	ND	ND	NC	50
Dibromochloromethane	ND	ND	NC	50
Methylene Chloride	ND	ND	NC	50
Propylene Dichloride	ND	ND	NC	50
Tetrachloroethene	ND	ND	NC	50
Trans-1,2-Dichloroethylene	ND	ND	NC	50
Trans-1,3-Dichloropropene	ND	ND	NC	50
Trichloroethene	ND	ND	NC	50
Trichlorofluoromethane	ND	ND	NC	50
VOC Total	.49	ND	NC	50
Vinyl Chloride	ND	ND	NC	50
EPA METHOD 8020				
SAMPLE CONTROL # : L2002 & L2003				
1,2-Dichlorobenzene	ND	ND	NC	50
1,3-Dichlorobenzene	ND	ND	NC	50
1,4-Dichlorobenzene	ND	ND	NC	50
Benzene	ND	ND	NC	50
Chlorobenzene	ND	ND	NC	50
Ethylbenzene	ND	ND	NC	50

RPD = Relative Percent Difference FDA = Field Dup A FDB = Field Dup B 7/29/91 12:56:47 kpd
+ = Above the acceptance criteria
ND = Not Detected

RADIAN CORPORATION

TABLE G.4-5 SUMMARY OF FIELD DUPLICATE SAMPLES
LOCKHEED BEAUMONT GROUNDWATER

Compound	FDA	FDB	RPD(%)	Precision Limit(%)
EPA METHOD 8020				
SAMPLE CONTROL # : L2002 & L2003				
Toluene	.38 C0	.27X0	34	50
Total Xylenes	ND	ND	NC	50
EPA METHOD 8040				
SAMPLE CONTROL # : L2016 & L2017				
2,4,5-Trichlorophenol	ND	NDS	NC	50
2,4,6-Trichlorophenol	ND	NDS	NC	50
2,4-Dichlorophenol	ND	NDS	NC	50
2,4-Dimethylphenol	ND	NDS	NC	50
2,4-Dinitrophenol	ND	NDS	NC	50
2-Chlorophenol	ND	NDS	NC	50
2-Methylphenol	ND	NDS	NC	50
2-Nitrophenol	ND	NDS	NC	50
2-sec-Butyl-4,6-Dinitrophenol (DNBP)	ND	NDS	NC	50
4,6-Dinitro-2-Methylphenol	ND	NDS	NC	50
4-Chloro-3-Methylphenol	ND	NDS	NC	50
4-Nitrophenol	ND	NDS	NC	50
Pentachlorophenol	ND	NDS	NC	50
Phenol	ND	NDS	NC	50
EPA METHOD IC				
SAMPLE CONTROL # : L2002 & L2003				
Perchlorate	9.1	9	1.1	50
SAMPLE CONTROL # : L2016 & L2017				
Perchlorate	ND	ND	NC	50

RPD = Relative Percent Difference FDA = Field Dup A FDB = Field Dup B 7/29/91 12:56:47 kpd
+ = Above the acceptance criteria
ND = Not Detected

detected in only one member of the pair, however the concentrations reported for potassium and zinc were near the detection limits, thereby reducing the certainty of the results. Copper was detected at greater than five times the detection limit in one member of the field duplicate pair, but not the other. Therefore, the results for the sample from MW-15 have been qualified for copper to indicate greater than expected variability.

Purgeable Halocarbons: Four analyte pairs had results greater than the detection limit and RPDs could be calculated to assess precision. The RPDs met quality assurance objective, with an average RPD of 11%.

An RPD could not be calculated for three analyte pairs because only 1 sample had a detectable analyte concentration: 1,1-dichloroethene from MW-15, and 1,1-dichloroethane and 1,2-dichloroethane from MW-02. Two of these cases show the detected analyte at a concentration near the detection limit, the analytical variability increases and it is likely that one sample may have a concentration slightly above the detection limit, while the duplicate may have a concentration slightly below the detection limit and the analyte is therefore not reported. While it may appear that there is greater total variability because of these unmatched pairs, this is due mainly to the inherent uncertainty in measurements near the detection limit. Therefore, these low-level data were not qualified. Furthermore, Field Duplicate A (FDA) was analyzed at a 1:25 dilution and FDB was analyzed at a 1:100 dilution for the pair from MW-02. Due to the high dilution, 1,1-dichloroethane and 1,2-dichloroethane were diluted out of FDB, but were detected in FDA. FDA should be used for quantitation of these two analytes. No data were qualified due to the high dilution level used. This indicates the possibility for false negatives at high dilutions.

Purgeable Aromatics: For the field duplicate pair from well sample MW-02, toluene was confirmed in FDA and not confirmed in FDB due to the low levels detected. FDA should be used for the quantitation of toluene.

Method 353.2: One measurable duplicate pair was available from the two field duplicate samples analyzed. The RPD for the sample from MW-02 exceeded the quality assurance objectives. Therefore, for well sample MW-02 results have been qualified for nitrate.

Matrix Spike Duplicate Analyses--Matrix spike duplicates were used to estimate the precision in the analytical portion of the sampling and analytical process. Matrix spike duplicates have an advantage over duplicate analyses in that the analyte does not have to be present in order to obtain useful results. Furthermore, both matrix effects and analytical variability can be assessed with the same sample. Matrix effects are discussed in the next subsection.

The quality assurance objective for matrix spike duplicates is to have an RPD of 30 percent or less for organic analyses and 20 percent or less for inorganic analyses. The matrix spike duplicate results are presented in Table G.4-6.

Matrix spike/matrix spike duplicates were performed on samples collected from MW-02 and MW-15, and analyzed using EPA Methods 160.1, 353.2 (300.0), 415.1, 6010, 7470, IC, and purgeable halocarbons and aromatics.

The precision of EPA Methods 160.1, 353.2 (300.0), 415.1, 7470, IC and purgeable aromatics were all within the control limits.

The results for EPA Method 6010 indicate the analytical precision is within the quality assurance objectives. All RPDs, except two, were less than 19%. The high

RADIAN CORPORATION

TABLE G.4-6 MATRIX SPIKE DUPLICATE REPORT
LOCKHEED BEAUMONT GROUNDWATER

Compound	% Recovery MS	% Recovery MSD	Ave (%) Recovery	Limit(%)	RPD(%)	Precision Limit(%)
EPA METHOD 7470						
SAMPLE CONTROL # : L2016						
EPA METHOD 8010						
SAMPLE CONTROL # : L2002						
1,1,1-Trichloroethane	150	150	150.0	71 -199	0.0	30
Bromodichloromethane	145	150	147.5	44 -197	3.4	30
Bromoform	97	100	98.5	29 -179	3.0	30
1,2-Dichloroethane	140	145	142.5	33 -200	3.5	30
Carbon Tetrachloride	177	185	181.0	67 -187	4.4	30
Chloroform	123	128	125.5	45 -145	4.0	30
Dibromochloromethane	73	73	73.0	26 -214	0.0	30
Tetrachloroethene	125	131	128.0	30 -177	4.7	30
Trichloroethene	141	145	143.0	57 -166	2.8	30
SAMPLE CONTROL # : L2016						
1,1,1-Trichloroethane	114	107	110.5	71 -199	6.3	30
Bromodichloromethane	155	145	150.0	44 -197	6.7	30
Bromoform	117	121	119.0	29 -179	3.4	30
1,2-Dichloroethane	155	150	152.5	33 -200	3.3	30
Carbon Tetrachloride	92	85	88.5	67 -187	7.9	30
Chloroform	82	81	81.5	45 -145	1.2	30
Dibromochloromethane	146	162	154.0	26 -214	10.4	30
Tetrachloroethene	131	131	131.0	30 -177	0.0	30
Trichloroethene	90	93	91.5	57 -166	3.3	30
EPA METHOD 8020						
SAMPLE CONTROL # : L2002						
Benzene	92	97	94.5	42 -135	5.3	30
Ethylbenzene	85	90	87.5	51 -110	5.7	30
Toluene	115	120	117.5	60 -141	4.3	30
Total Xylenes	90	96	93.0	56 -155	6.5	30
EPA METHOD IC						
SAMPLE CONTROL # : L2002						
Perchlorate	100	99	99.5	85 -115	1.0	10
SAMPLE CONTROL # : L2016						
Perchlorate	99	98	98.5	85 -115	1.0	10

RPD = Relative Percent Difference
+ = Above the acceptance criteria
NC = Not Calculated

7/29/91 12:47:14 kpd

RADIAN CORPORATION

TABLE G.4-6 MATRIX SPIKE DUPLICATE REPORT
LOCKHEED BEAUMONT GROUNDWATER

Compound	% Recovery MS	% Recovery MSD	Ave (%) Recovery	Limit(%)	RPD(%)	Precision Limit(%)
EPA METHOD 6010						
SAMPLE CONTROL # : L2002						
Potassium	105	107	106.0	85 -115	1.9	20
Selenium	100	98	99.0	85 -115	2.0	20
Silicon	NC	NC		85 -115		20
Silver	92	94	93.0	85 -115	2.2	20
Sodium	107	108	107.5	85 -115	.9	20
Thallium	95	96	95.5	85 -115	1.0	20
Vanadium	100	101	100.5	85 -115	1.0	20
Zinc	98	99	98.5	85 -115	1.0	20
SAMPLE CONTROL # : L2016						
Aluminum	103	107	105.0	85 -115	3.8	20
Antimony	102	101	101.5	85 -115	1.0	20
Arsenic	101	103	102.0	85 -115	2.0	20
Barium	38 Q	13 Q	25.5	85 -115	+ 98.0	20
Beryllium	94	95	94.5	85 -115	1.1	20
Boron	93	97	95.0	85 -115	4.2	20
Cadmium	132 Q	130 Q	131.0	85 -115	1.5	20
Calcium	101	113	107.0	85 -115	11.2	20
Chromium	98	98	98.0	85 -115	0.0	20
Cobalt	99	99	99.0	85 -115	0.0	20
Copper	45 Q	46 Q	45.5	85 -115	2.2	20
Iron	83 Q	83 Q	83.0	85 -115	0.0	20
Lead	53 Q	47 Q	50.0	85 -115	12.0	20
Magnesium	98	103	100.5	85 -115	5.0	20
Manganese	96	98	97.0	85 -115	2.1	20
Molybdenum	95	100	97.5	85 -115	5.1	20
Nickel	98	98	98.0	85 -115	0.0	20
Potassium	124 Q	124 Q	124.0	85 -115	0.0	20
Selenium	98	95	96.5	85 -115	3.1	20
Silicon	96	62 Q	79.0	85 -115	+ 43.0	20
Silver	45 Q	46 Q	45.5	85 -115	2.2	20
Sodium	80 Q	96	88.0	85 -115	18.2	20
Thallium	99	102	100.5	85 -115	3.0	20
Vanadium	96	97	96.5	85 -115	1.0	20
Zinc	93	93	93.0	85 -115	0.0	20
EPA METHOD 7470						
SAMPLE CONTROL # : L2002						
Mercury	101	100	100.5	85 -115	1.0	20
SAMPLE CONTROL # : L2016						
Mercury	99	101	100.0	85 -115	2.0	20

RPD = Relative Percent Difference
+ = Above the acceptance criteria
NC = Not Calculated

7/29/91 12:47:14 kpd

RADIAN CORPORATION

TABLE G.4-6 MATRIX SPIKE DUPLICATE REPORT
LOCKHEED BEAUMONT GROUNDWATER

Compound	% Recovery MS	MSD	Ave (%) Recovery	Limit(%)	RPD(%)	Precision Limit(%)
EPA METHOD 160.1						
SAMPLE CONTROL # : L2026						
Total Dissolved Solids	103	103	103.0	85 -115	0.0	20
EPA METHOD 300.0						
SAMPLE CONTROL # : L2026						
Nitrate	106	106	106.0	85 -115	0.0	20
EPA METHOD 353.2						
SAMPLE CONTROL # : L2002						
Nitrate	108	108	108.0	85 -115	0.0	20
SAMPLE CONTROL # : L2016						
Nitrate	108	110	109.0	85 -115	1.8	20
EPA METHOD 415.1						
SAMPLE CONTROL # : L2002						
Total Organic Carbon	101	102	101.5	85 -115	1.0	20
SAMPLE CONTROL # : L2016						
Total Organic Carbon	95	96	95.5	85 -115	1.0	20
EPA METHOD 6010						
SAMPLE CONTROL # : L2002						
Aluminum	109	109	109.0	85 -115	0.0	20
Antimony	102	104	103.0	85 -115	1.9	20
Arsenic	98	97	97.5	85 -115	1.0	20
Barium	100	100	100.0	85 -115	0.0	20
Beryllium	105	105	105.0	85 -115	0.0	20
Boron	101	101	101.0	85 -115	0.0	20
Cadmium	118 Q	115	116.5	85 -115	2.6	20
Calcium	107	108	107.5	85 -115	.9	20
Chromium	102	103	102.5	85 -115	1.0	20
Cobalt	101	101	101.0	85 -115	0.0	20
Copper	89	86	87.5	85 -115	3.4	20
Iron	111	111	111.0	85 -115	0.0	20
Lead	100	100	100.0	85 -115	0.0	20
Magnesium	103	104	103.5	85 -115	1.0	20
Manganese	99	100	99.5	85 -115	1.0	20
Molybdenum	98	99	98.5	85 -115	1.0	20
Nickel	100	99	99.5	85 -115	1.0	20

RPD = Relative Percent Difference
+ = Above the acceptance criteria
NC = Not Calculated

7/29/91 12:47:14 kpd

RPD, caused by low recoveries for barium in the sample from MW-15, indicates poor accuracy (possibly due to matrix interferences) rather than high variability and therefore is discussed in the following subsection. The RPD for the silicon pair, from MW-15, exceeded the quality assurance objectives and therefore, results for silicon from this well sample have been qualified to indicate excessive analytical variability.

Laboratory Duplicate Analyses--Laboratory duplicate analyses were performed to measure the variability attributable to the analytical process. Results for laboratory duplicates are summarized in Table G.4-7. These analyses were performed using EPA Method 353.2. The quality assurance objective for a duplicate analysis is an RPD of 30 % or less. Both laboratory duplicate analyses performed were within the quality assurance objective.

Spikes

Matrix spikes, method spikes and surrogate spikes were analyzed as described below.

Matrix Spike Recoveries--A matrix spike is a solution of method analytes (at know concentrations) that is spiked into a field sample before extraction (if applicable). The results of the analysis of the spiked sample are then reported as a percent recovery of each spiked compound, and provide a measure of both the accuracy of the method and the presence of matrix interferences. Specific acceptance criteria for each standard method and parameter measured have been established and are expressed as an acceptable recovery range. Table G.4-8 summarizes the matrix spike recovery results and includes acceptable ranges of recovery.

The recovery of the matrix spikes for EPA Methods 160.1 353.2 (300.0), 415.1, 7470, IC and purgeable halocarbons and aromatics were all within the specified recovery range.

RADIAN CORPORATION

TABLE G.4-7 SUMMARY OF DUPLICATE LAB ANALYSIS
LOCKHEED BEAUMONT GROUNDWATER

Compound	LDA	LDB	RPD(%)	Precision Limit(%)
EPA METHOD 353.2				
SAMPLE CONTROL # : L2034-2				
Nitrate	89	92	3.3	30
SAMPLE CONTROL # : L2036				
Nitrate	72	71	1.4	30

RPD = Relative Percent Difference LDA = Lab Dup A LDB = Lab Dup B 7/29/91 12:52:17 kpd

TABLE G.4-8 SUMMARY OF MATRIX SPIKE RECOVERIES
LOCKHEED BEAUMONT GROUNDWATER

Analyte	Number of Spikes	Mean	Standard Deviation	Range of Results (% Recovery)	Acceptance Criteria (%Recovery)	Results Not Meeting Criteria
Method 160.1						
Total Dissolved Solids	2	103.00	0.00	(103 - 103)	(85 - 115)	0
Method 300.0						
Nitrate	2	106.00	0.00	(106 - 106)	(85 - 115)	0
Method 353.2						
Nitrate	4	108.50	1.00	(108 - 110)	(85 - 115)	0
Method 415.1						
Total Organic Carbon	4	98.50	3.51	(95 - 102)	(85 - 115)	0
Method 6010						
Aluminum	4	107.00	2.83	(103 - 109)	(85 - 115)	0
Antimony	4	102.25	1.26	(101 - 104)	(85 - 115)	0
Arsenic	4	99.75	2.75	(97 - 103)	(85 - 115)	0
Barium	4	62.75	44.21	(13 - 100)	(85 - 115)	2
Beryllium	4	99.75	6.08	(94 - 105)	(85 - 115)	0
Boron	4	98.00	3.83	(93 - 101)	(85 - 115)	0
Cadmium	4	123.75	8.50	(115 - 132)	(85 - 115)	3
Calcium	4	107.25	4.92	(101 - 113)	(85 - 115)	0
Chromium	4	100.25	2.63	(98 - 103)	(85 - 115)	0
Cobalt	4	100.00	1.15	(99 - 101)	(85 - 115)	0
Copper	4	66.50	24.28	(45 - 89)	(85 - 115)	2
Iron	4	97.00	16.17	(83 - 111)	(85 - 115)	2
Lead	4	75.00	28.97	(47 - 100)	(85 - 115)	2
Magnesium	4	102.00	2.71	(98 - 104)	(85 - 115)	0
Manganese	4	98.25	1.71	(96 - 100)	(85 - 115)	0
Molybdenum	4	98.00	2.16	(95 - 100)	(85 - 115)	0
Nickel	4	98.75	.96	(98 - 100)	(85 - 115)	0
Potassium	4	115.00	10.42	(105 - 124)	(85 - 115)	2
Selenium	4	97.75	2.06	(95 - 100)	(85 - 115)	0
Silicon	2	79.00	24.04	(62 - 96)	(85 - 115)	1
Silver	4	69.25	27.44	(45 - 94)	(85 - 115)	2
Sodium	4	97.75	13.02	(80 - 108)	(85 - 115)	1
Thallium	4	98.00	3.16	(95 - 102)	(85 - 115)	0
Vanadium	4	98.50	2.38	(96 - 101)	(85 - 115)	0
Zinc	4	95.75	3.20	(93 - 99)	(85 - 115)	0
Method 7470						
Mercury	4	100.25	.96	(99 - 101)	(85 - 115)	0
Method 8010						
1,1,1-Trichloroethane	4	130.25	22.98	(107 - 150)	(71 - 199)	0
1,2-Dichloroethane	4	147.50	6.45	(140 - 155)	(33 - 200)	0
Bromodichloromethane	4	148.75	4.79	(145 - 155)	(44 - 197)	0
Bromoform	4	108.75	12.01	(97 - 121)	(29 - 179)	0

7/29/91 11:08:49 kpd

TABLE G.4-8 SUMMARY OF MATRIX SPIKE RECOVERIES
LOCKHEED BEAUMONT GROUNDWATER

Analyte	Number of Spikes	Mean	Standard Deviation	Range of Results (% Recovery)	Acceptance Criteria (%Recovery)	Results Not Meeting Criteria
Method 8010						
Carbon Tetrachloride	4	134.75	53.58	(85 - 185)	(67 - 187)	0
Chloroform	4	103.50	25.49	(81 - 128)	(45 - 145)	0
Dibromochloromethane	4	113.50	47.22	(73 - 162)	(26 - 214)	0
Tetrachloroethene	4	129.50	3.00	(125 - 131)	(30 - 177)	0
Trichloroethene	4	117.25	29.80	(90 - 145)	(57 - 166)	0
Method 8020						
Benzene	2	94.50	3.54	(92 - 97)	(42 - 135)	0
Ethylbenzene	2	87.50	3.54	(85 - 90)	(51 - 110)	0
Toluene	2	117.50	3.54	(115 - 120)	(60 - 141)	0
Total Xylenes	2	93.00	4.24	(90 - 96)	(56 - 155)	0
Method IC						
Perchlorate	4	99.00	.82	(98 - 100)	(85 - 115)	0

For Method 6010, four matrix spikes were performed for 25 different metals. Of the 198 measurable spike recoveries, all but 17 were within the quality assurance objectives. The exceptions are discussed below.

The matrix spike and associated matrix spike duplicates for barium, copper, iron, lead and silver were recovered below the quality assurance objectives for well sample MW-15. Since both members of the MS/MSD pairs for these analytes showed low recoveries, a matrix effect is indicated. Therefore, the associated sample results from MW-7, MW-9, MW-13, MW-14, MW-15, MW-16, MW-17, OW-08 and Lower Pond, which are from the same extraction batch, have been qualified for barium, copper, iron, lead and silver to indicate associated uncertainty regarding the quantitation of these analytes that may be caused by matrix interferences.

Recoveries were high for the matrix spike and matrix spike duplicate for potassium, for the sample collected from MW-15. A matrix effect is indicated and potassium has been qualified for well samples MW-7, MW-9, MW-13, MW-15 (FDB) and MW-17, all from the same extraction batch.

Three of the four spike recoveries for cadmium, for the samples from MW-02 and MW-15 exceeded (high) the acceptable recovery limits. However cadmium was not detected in any of the groundwater samples and no results have been qualified.

One spike recovery each for sodium and silicon exceeded the acceptable recovery limits. The spike recovery for the other member of the MS/MSD pair met QA objectives. Therefore, these recoveries are considered to be the result of random error and no results have been qualified.

Surrogate Spikes--Surrogate spikes are a group of compounds, that are not found in nature that have been selected for each organic analysis because of their similarity to the target analytes. Surrogate spikes were added to every sample, blank,

matrix or method spike, and standard to monitor both the performance of the analytical system and the effectiveness of the method in recovering the compounds of interest from each sample matrix. The surrogate spike recoveries were reported for each sample, and the results were compared to the recovery objectives established for the method. Table G.4-9 summarizes the surrogate recovery data.

For purgeable halocarbons and aromatics 6 of 92 surrogate spike recoveries were outside the recovery objectives. The small percentage of out-of-specification surrogate spike recoveries indicates the methods were performing within acceptable limits, and there were no systematic problems in the analytical systems. The surrogate recovery for the purgeable halocarbon analysis of the sample from MW-15 was high, however, no confirmed analytes were reported and therefore, no results have been qualified. Furthermore, the remaining 5 out-of-control surrogate recoveries were from purgeable halocarbon reagent blanks. While this could indicate some degree of bias, this didn't result in any data being qualified, since most analyses had more than one blank analyzed and reported on the same day, with surrogate from the second analysis within the control limits.

Surrogate recovery limits were not available for EPA Method 8040. Surrogate recoveries of 21% and 37% respectively, were low for the samples from MW-15(FDA) and MW-16 indicating possible false negative results, and therefore the results have been qualified for these samples for Method 8040.

Method Spikes--A method spike is a solution of method analytes at known concentrations that is spiked into reagent grade water and analyzed to assess the accuracy of the method. The results are reported as the percent recovery of each spiked compound.

Method spikes were performed for EPA Methods 160.1, 353.2, 415.1, 6010, 7060, 7470, 7740, and purgeable halocarbons and aromatics and IC. These results are

TABLE G.4-9 SUMMARY OF SURROGATE SPIKES
LOCKHEED BEAUMONT GROUNDWATER

Analyte	Number of Spikes	Mean	Standard Deviation	Range of Results (%)	Acceptance Criteria (%)	Results Not Meeting Criteria
Method 8010						
1-Bromo-4-Fluorobenzene	92	110.00	18.39	(63 - 156)	(76 - 140)	6
Method 8020						
1-Bromo-4-Fluorobenzene	8	99.13	3.27	(93 - 103)	(76 - 140)	0
Method 8040						
2,4,6-Tribromophenol	12	88.83	32.74	(21 - 123)	(N/A - N/A)	0

N/A = Not Available

7/29/91 11:35:30 kpd

RADIAN CORPORATION

summarized in Table G.4-10. All results were within acceptable limits, with the exception of one 70% recovery for mercury by EPA Method 7470. This low recovery indicates some potential for false negative results, using EPA Method 7470.

G.4.3 Audit Results

A data quality audit was conducted between June 7-14, 1991. This audit was conducted as part of the Quality Assurance (QA) program for the Lockheed Beaumont Groundwater Assessment. Data reported for purgeable halocarbon analyses performed by BTC, work order 902490, was tracked and reviewed. This work order included three analyses (samples MW-25, W-2 and W-3) conducted on December 11 and 20, 1990 for Method 8010. Documentation provided from the time of sample analysis through reporting of the analytical results was included in this audit.

The audit consisted of reviewing the Chain-of-Custody forms for this work order, as well as the laboratory documentation; the three point calibration, the retention time window study, the detection limit study, the raw data for the samples, blanks and QC samples, the computer printouts for the samples, blanks and QC samples, and the final report.

In conclusion, because GC/MS was used by BTC to confirm detected results (exceptions were noted during the audit), the qualitative (identification) portion of the analysis was valid. However, BTC's method of analyzing purgeable halocarbons, using an initial 3-point calibration with no daily verification of the working calibration range or response factors does not comply with U.S. EPA Methods SW8010 or E601 procedures for verifying the working calibration curve or response factors. Decisions based on this data should be made with the realization that these data are applicable to data interpretation or applications which require identification verification only. The data quality objective of this project was to collect data that are valid in terms of quantitation and identification, and the results of this audit indicate that this objective

TABLE G.4-10 METHOD SPIKE SUMMARY REPORT
LOCKHEED BEAUMONT GROUNDWATER

Analyte	Number of Spikes	Mean	Standard Deviation	Range of Results (%)	Acceptance Criteria (%)	Results Not Meeting Criteria
Method 130.2						
Hardness	6	100.17	.93	(99 - 101)	(80 - 120)	0
Method 160.1						
Total Dissolved Solids	5	103.20	.45	(103 - 104)	(90 - 110)	0
Method 180.1						
Turbidity	1	100.00	0.00	(100 - 100)	(85 - 115)	0
Method 300.0						
Nitrate	4	95.25	3.59	(90 - 98)	(85 - 115)	0
Method 353.2						
Nitrate	1	102.50	0.00	(103 - 103)	(85 - 115)	0
Method 415.1						
Total Organic Carbon	8	97.63	3.02	(92 - 102)	(80 - 120)	0
Method 6010						
Aluminum	4	103.75	4.19	(101 - 110)	(90 - 110)	0
Antimony	5	105.20	3.96	(100 - 110)	(90 - 110)	0
Barium	5	101.52	5.32	(97 - 110)	(90 - 110)	0
Beryllium	5	100.48	2.92	(96 - 103)	(90 - 110)	0
Boron	2	103.50	2.12	(102 - 105)	(90 - 110)	0
Cadmium	5	105.60	.89	(105 - 107)	(90 - 110)	0
Calcium	5	106.40	2.41	(104 - 109)	(90 - 110)	0
Chromium	5	102.60	3.21	(97 - 105)	(90 - 110)	0
Cobalt	5	104.00	4.95	(98 - 110)	(90 - 110)	0
Copper	5	103.00	3.08	(99 - 107)	(90 - 110)	0
Iron	5	104.60	3.21	(100 - 108)	(90 - 110)	0
Lead	5	105.20	2.28	(103 - 109)	(90 - 110)	0
Magnesium	5	99.10	4.67	(95 - 106)	(90 - 110)	0
Manganese	5	101.86	3.29	(96 - 105)	(90 - 110)	0
Molybdenum	2	106.50	4.95	(103 - 110)	(90 - 110)	0
Nickel	5	104.00	2.55	(102 - 108)	(90 - 110)	0
Potassium	4	102.00	2.00	(101 - 105)	(90 - 110)	0
Silver	5	103.60	4.67	(97 - 109)	(90 - 110)	0
Sodium	5	102.60	1.82	(100 - 105)	(90 - 110)	0
Thallium	5	103.20	3.27	(101 - 109)	(90 - 110)	0
Vanadium	5	103.88	3.49	(100 - 108)	(90 - 110)	0
Zinc	5	100.36	7.51	(90 - 109)	(90 - 110)	0
Method 7060						
Arsenic	3	94.43	9.04	(84 - 100)	(85 - 115)	1
Method 7470						
Mercury	4	93.00	15.87	(70 - 106)	(85 - 115)	1

7/29/91 13:02:27 kpd

TABLE G.4-10 METHOD SPIKE SUMMARY REPORT
LOCKHEED BEAUMONT GROUNDWATER

Analyte	Number of Spikes	Mean	Standard Deviation	Range of Results (%)	Acceptance Criteria (%)	Results Not Meeting Criteria
Method 8040						
Method 8040						
2,4,5-Trichlorophenol	1	95.00	0.00	(95 - 95)	(N/A - N/A)	0
2,4,6-Trichlorophenol	1	90.00	0.00	(90 - 90)	(53 - 119)	0
2,4-Dichlorophenol	1	95.00	0.00	(95 - 95)	(44 - 119)	0
2,4-Dimethylphenol	1	100.00	0.00	(100 - 100)	(24 - 118)	0
2,4-Dinitrophenol	1	100.00	0.00	(100 - 100)	(12 - 145)	0
2-Chlorophenol	1	100.00	0.00	(100 - 100)	(38 - 126)	0
2-Methylphenol	1	100.00	0.00	(100 - 100)	(N/A - N/A)	0
2-Nitrophenol	1	90.00	0.00	(90 - 90)	(43 - 117)	0
2-sec-Butyl-4,6-Dinitrophenol (DNBP)	1	115.00	0.00	(115 - 115)	(N/A - N/A)	0
4,6-Dinitro-2-Methylphenol	1	100.00	0.00	(100 - 100)	(30 - 136)	0
4-Chloro-3-Methylphenol	1	90.00	0.00	(90 - 90)	(99 - 122)	1
4-Nitrophenol	1	100.00	0.00	(100 - 100)	(13 - 110)	0
Pentachlorophenol	1	110.00	0.00	(110 - 110)	(36 - 134)	0
Phenol	1	100.00	0.00	(100 - 100)	(23 - 108)	0
Method IC						
Perchlorate	6	94.83	.98	(94 - 96)	(90 - 110)	0

7/29/91 13:02:27 kpd

TABLE G.4-10 METHOD SPIKE SUMMARY REPORT
LOCKHEED BEAUMONT GROUNDWATER

Analyte	Number of Spikes	Mean	Standard Deviation	Range of Results (%)	Acceptance Criteria (%)	Results Not Meeting Criteria
Method 7470						
Method 7740						
Selenium	3	95.43	7.31	(87 - 100)	(85 - 115)	0
Method 8010						
1,1,1-Trichloroethane	3	100.00	17.09	(84 - 118)	(41 - 138)	0
1,1-Dichloroethane	3	94.67	22.30	(78 - 120)	(47 - 132)	0
1,1-Dichloroethene	3	106.00	26.00	(90 - 136)	(28 - 167)	0
1,2-Dichlorobenzene	3	106.67	5.77	(100 - 110)	(D - 208)	0
1,2-Dichloroethane	3	103.33	14.74	(92 - 120)	(51 - 147)	0
1,2-Dichloropropane	3	80.67	23.86	(64 - 108)	(44 - 156)	0
1,3-Dichlorobenzene	3	112.67	12.86	(98 - 122)	(7 - 187)	0
1,4-Dichlorobenzene	3	103.33	6.43	(96 - 108)	(42 - 143)	0
2-Chloroethylvinylether	3	134.67	32.15	(98 - 158)	(14 - 186)	0
Bromodichloromethane	3	122.00	5.29	(116 - 126)	(42 - 172)	0
Bromoform	3	113.33	13.61	(98 - 124)	(13 - 159)	0
Bromomethane	3	56.67	18.48	(46 - 78)	(D - 144)	0
Carbon Tetrachloride	3	100.00	35.16	(74 - 140)	(43 - 143)	0
Chlorobenzene	3	95.33	8.33	(86 - 102)	(38 - 150)	0
Chloroethane	3	74.67	42.77	(48 - 124)	(46 - 137)	0
Chloroform	3	103.00	6.56	(97 - 110)	(49 - 133)	0
Chloromethane	3	58.67	53.15	(26 - 120)	(D - 193)	0
Dibromochloromethane	3	125.33	33.23	(87 - 146)	(24 - 191)	0
Methylene Chloride	3	91.33	3.06	(88 - 94)	(25 - 162)	0
Propylene Dichloride	3	104.00	8.72	(94 - 110)	(22 - 178)	0
Tetrachloroethene	3	93.33	9.61	(83 - 102)	(26 - 162)	0
Trans-1,2-Dichloroethylene	3	78.33	16.44	(66 - 97)	(38 - 155)	0
Trichloroethene	3	118.67	22.30	(102 - 144)	(35 - 146)	0
Trichlorofluoromethane	3	76.00	8.72	(70 - 86)	(21 - 156)	0
Vinyl Chloride	3	85.33	12.86	(76 - 100)	(28 - 163)	0
Method 8020						
1,2-Dichlorobenzene	1	79.00	0.00	(79 - 79)	(57 - 139)	0
1,3-Dichlorobenzene	1	83.00	0.00	(83 - 83)	(46 - 141)	0
1,4-Dichlorobenzene	1	80.00	0.00	(80 - 80)	(38 - 138)	0
Benzene	1	98.00	0.00	(98 - 98)	(60 - 139)	0
Chlorobenzene	1	87.00	0.00	(87 - 87)	(66 - 135)	0
Ethylbenzene	1	88.00	0.00	(88 - 88)	(62 - 144)	0
Toluene	1	91.00	0.00	(91 - 91)	(64 - 138)	0
Total Xylenes	1	65.00	0.00	(65 - 65)	(61 - 129)	0

was not met. Therefore, the results obtained from BTC's method of analyzing purgeable halocarbons should be considered semi-qualitative to qualitative and not quantitative, and are not valid or defensible because required protocols were not followed, documentation was inadequate, and the analytical systems were not operating within required specifications. There is a complete audit report available upon request.

G.4.4 Additional QA/QC Problems

Several additional problems were identified during the review of the purgeable halocarbon analyses performed by BTC. These problems included analytes quantitated out of the calibration range and daily calibration verifications exceeding SW-846 QC requirements. These will be discussed further in the text below.

BTC's analyses of several analytes were quantitated outside of the calibration range and are listed below.

- 1,1-Dichloroethene for samples from MW-1 (collected 1/2/91), MW-20, MW-21, MW-22, MW-24, MW-25, and MW-26.
- Trichloroethene for samples from MW-1 (collected 1/2/91), MW-20, MW-21, MW-22, MW-24, and MW-26.
- 1,1,1-Trichloroethane for samples from MW-21 and MW-26.

The highest level standard for the 3-point initial calibration performed by this lab is 80 ppb. The range of results for these samples is 110 ppb to 400 ppb. Quantitation is uncertain at levels above 80 ppb since linearity of the GC response could not be confirmed. All out-of-range results have been qualified and should be considered estimates for the following samples: MW-20, MW-21, MW-22, MW-24, MW-25 and MW-26. Furthermore, for the sample from MW-1, the initial sample collected on 10/24/90 should be used for quantitation purposes instead of the sample collected from the same location on 1/2/91.

A review was conducted on all the daily calibration verification performed by BTC. Data from several days and most of the data for certain analytes have been qualified because the daily calibration verification exceeded the SW-846 control limit of +/-15%. According to SW-846, if the daily calibration check varies from the predicted response by more than +/- 15%, a new multipoint calibration curve should be generated for that analyte. This criterion is used to determine if the calibration curve is still valid. All results for the samples from MW-27, FB-3, MW-37 have been qualified due to a chance of low recoveries or false negative results. The 1,1-dichloroethene results have been qualified for the samples from MW-26, IB-1, IB-2, MW-34, MW-31, MW-38, MW-39 and MW-40, also due to a chance of low recoveries or false negative results.

G.5 Groundwater Sampling Round 3 (September - October 1991)

This section presents the results of the QC data assessment for 50 groundwater samples collected from existing wells during September and October of 1991 for Lockheed Beaumont No. 1 Groundwater Assessment Round 3. The samples were analyzed primarily using EPA Method 8010, in addition to one sample which was analyzed using EPA Method 8020. Quality assurance and quality control (QA/QC) efforts were conducted to ensure data of known and sufficient quality were collected and reported. Two primary aspects of the overall QA/QC effort are related to achievement of this objective. First, the QA/QC program forms a framework for controlling data quality within pre-established limits during execution of the sampling and analytical efforts. Second, the QA/QC program forms the basis for estimating uncertainty in the measurement data by providing information necessary to determine qualitative and quantitative limitations associated with these data.

The initial set of Method 8010/8020 analyses for these wells was performed by Radian Analytical Services (RAS), Austin. One well was resampled and analyzed using Method 8010 by National Environmental Testing, Inc. (NET).

The results of this assessment indicate the data are valid and the quality, as measured by the analytical accuracy and precision, is within the acceptance criteria for the analytical method used.

Part of the QC review and monitoring process is tracking holding times for each sample. EPA analytical methods specify the maximum amount of time a sample may be held before analysis. For Methods 8010 and 8020, the holding time is 14 days. The method-specified holding requirements were met for all the Method 8010 and 8020 analyses. A summary of samples collected and the sampling date and analysis date is present in Table G.5-1.

G.5.1 Groundwater Quality Assurance/Quality Control Results

Blanks

Three types of blanks, reagent blanks, equipments blanks, and trip blanks were analyzed during this sampling program to assess the potential for contamination from various sources in the sampling and analytical process.

Groundwater sample results are qualified if the concentration of an analyte detected in the associated well sample is within five times the concentration detected in the blank. This qualification indicates that at least a portion of the analyte is attributed to an introduced source and is not representative of groundwater conditions. If a method analyte is detected in a groundwater sample at a concentration greater than this, the sample results are not considered to be influenced by blank contamination and are

Table G.5-1. REPORT OF HOLDING TIMES
LOCKHEED BEAUMONT ROUND 3 GROUND WATER/SURFACE WATER

Location ID	Sample Control #	Date Sampled	QC Type	Lab	Method	Date Analyzed	Date Extracted	Maximum Extraction/Analysis Holding Times (Day)	QC Category Extraction/Analysis
	L5001	9/16/91	EB	AUSTIN	8010	9/19/91	N/A	N/A / 14	c/a
	L5006	9/17/91	TB	AUSTIN	8010	9/19/91	N/A	N/A / 14	c/a
	L5035	9/25/91	EB	AUSTIN	8010	10/08/91	N/A	N/A / 14	c/a
	L5048	10/01/91	EB	AUSTIN	8010	10/14/91	N/A	N/A / 14	c/a
	L5050	10/01/91	EB	AUSTIN	8010	10/15/91	N/A	N/A / 14	c/a
	L5051	10/03/91	TB	AUSTIN	8010	10/16/91	N/A	N/A / 14	c/a
	L5058	11/08/91	EB	NET	8010	11/11/91	N/A	N/A / 14	c/a
	L5059	11/08/91	TB	NET	8010	11/11/91	N/A	N/A / 14	c/a
LOWERPOND	L5005	9/16/91		AUSTIN	8010	9/19/91	N/A	N/A / 14	c/a
MW-01	L5041	9/27/91		AUSTIN	8010	10/11/91	N/A	N/A / 14	c/a
MW-02	L5055	10/03/91	FDA	AUSTIN	8010	10/17/91	N/A	N/A / 14	c/a
MW-02	L5056	10/03/91	FDB	AUSTIN	8010	10/17/91	N/A	N/A / 14	c/a
MW-03	L5012	9/18/91	FDA	AUSTIN	8010	9/20/91	N/A	N/A / 14	c/a
MW-03	L5013	9/18/91	FDB	AUSTIN	8010	9/24/91	N/A	N/A / 14	c/a
MW-04	L5038	9/26/91		AUSTIN	8010	10/08/91	N/A	N/A / 14	c/a
MW-05	L5033	9/25/91		AUSTIN	8010	10/03/91	N/A	N/A / 14	c/a
MW-06	L5036	9/26/91		AUSTIN	8010	10/08/91	N/A	N/A / 14	c/a
MW-07	L5040	9/27/91		AUSTIN	8010	10/10/91	N/A	N/A / 14	c/a
MW-08	L5002	9/16/91		AUSTIN	8010	9/19/91	N/A	N/A / 14	c/a
MW-09	L5003	9/16/91		AUSTIN	8010	9/19/91	N/A	N/A / 14	c/a
MW-10	L5029	9/24/91		AUSTIN	8010	10/03/91	N/A	N/A / 14	c/a
MW-11	L5004	9/16/91		AUSTIN	8010	9/19/91	N/A	N/A / 14	c/a
MW-12	L5007	9/17/91		AUSTIN	8010	9/19/91	N/A	N/A / 14	c/a
MW-13	L5008	9/17/91		AUSTIN	8010	9/19/91	N/A	N/A / 14	c/a
MW-14	L5024	9/23/91		AUSTIN	8010	10/03/91	N/A	N/A / 14	c/a
MW-15	L5022	9/23/91		AUSTIN	8010	10/03/91	N/A	N/A / 14	c/a

MW = Monitoring well
EB = Equipment Blank
FDB = Field duplicate B
TB = Field Blank
c = Missing information or does not apply

OW = Observation well
FDA = Field duplicate A
N/A = Not Available or Applicable
a = Holding time was less than the maximum

1/29/92 10:31:16 PBS

Table G.5-1. REPORT OF HOLDING TIMES
LOCKHEED BEAUMONT ROUND 3 GROUND WATER/SURFACE WATER

Location ID	Sample Control #	Date Sampled	QC Type	Lab	Method	Date Analyzed	Date Extracted	Maximum Extraction/Analysis Holding Times (Day)	QC Category Extraction/Analysis
MW-16	L5009	9/17/91		AUSTIN	8010	9/19/91	N/A	N/A / 14	c/a
MW-17	L5032	9/25/91		AUSTIN	8010	10/03/91	N/A	N/A / 14	c/a
MW-18	L5023	9/23/91		AUSTIN	8010	10/03/91	N/A	N/A / 14	c/a
MW-19	L5031	9/25/91		AUSTIN	8010	10/03/91	N/A	N/A / 14	c/a
MW-20	L5054	10/03/91		AUSTIN	8010	10/17/91	N/A	N/A / 14	c/a
MW-22	L5042	9/27/91		AUSTIN	8010	10/11/91	N/A	N/A / 14	c/a
MW-23	L5053	10/03/91		AUSTIN	8010	10/16/91	N/A	N/A / 14	c/a
MW-24	L5049	10/01/91		AUSTIN	8010	10/15/91	N/A	N/A / 14	c/a
MW-25	L5043	9/27/91		AUSTIN	8010	10/11/91	N/A	N/A / 14	c/a
MW-26	L5044	9/30/91	FDA	AUSTIN	8010	10/12/91	N/A	N/A / 14	c/a
MW-26	L5045	9/30/91	FDB	AUSTIN	8010	10/12/91	N/A	N/A / 14	c/a
MW-28	L5030	9/24/91		AUSTIN	8010	10/03/91	N/A	N/A / 14	c/a
MW-30	L5052	10/03/91		AUSTIN	8010	10/16/91	N/A	N/A / 14	c/a
MW-31	L5010	9/18/91	FDA	AUSTIN	8010	9/20/91	N/A	N/A / 14	c/a
MW-31	L5011	9/18/91	FDB	AUSTIN	8010	9/20/91	N/A	N/A / 14	c/a
MW-31	L5060	11/08/91		NET	8010	11/11/91	N/A	N/A / 14	c/a
MW-32	L5047	10/01/91		AUSTIN	8010	10/14/91	N/A	N/A / 14	c/a
MW-34	L5015	9/19/91		AUSTIN	8010	10/02/91	N/A	N/A / 14	c/a
MW-35	L5018	9/20/91		AUSTIN	8010	10/02/91	N/A	N/A / 14	c/a
MW-36	L5016	9/19/91		AUSTIN	8010	10/02/91	N/A	N/A / 14	c/a
MW-37	L5025	9/23/91		AUSTIN	8010	10/03/91	N/A	N/A / 14	c/a
MW-37	L5026	9/23/91		AUSTIN	8020	10/03/91	N/A	N/A / 14	c/a
MW-38	L5020	9/20/91		AUSTIN	8010	10/03/91	N/A	N/A / 14	c/a
MW-39	L5019	9/20/91		AUSTIN	8010	10/03/91	N/A	N/A / 14	c/a

MW = Monitoring well
EB = Equipment Blank
FDB = Field duplicate B
TB = Field Blank
c = Missing information or does not apply

OW = Observation well
FDA = Field duplicate A
N/A = Not Available or Applicable
a = Holding time was less than the maximum

1/29/92 10:31:16 PBS

Table G.5-1. REPORT OF HOLDING TIMES
LOCKHEED BEAUMONT ROUND 3 GROUND WATER/SURFACE WATER

Location ID	Sample Control #	Date Sampled	QC Type	Lab	Method	Date Analyzed	Date Extracted	Maximum Extraction/Analysis Holding Times (Day)	QC Category Extraction/Analysis
MW-40	L5034	9/25/91		AUSTIN	8010	10/05/91	N/A	N/A / 14	c/a
OW-01	L5017	9/19/91		AUSTIN	8010	10/02/91	N/A	N/A / 14	c/a
OW-02	L5037	9/26/91		AUSTIN	8010	10/08/91	N/A	N/A / 14	c/a
OW 03	L5046	10/01/91		AUSTIN	8010	10/14/91	N/A	N/A / 14	c/a
OW-08	L5021	9/20/91		AUSTIN	8010	10/03/91	N/A	N/A / 14	c/a
TANK	L5057	10/03/91		AUSTIN	8010	10/17/91	N/A	N/A / 14	c/a
UPPERPOND	L5039	9/26/91		AUSTIN	8010	10/08/91	N/A	N/A / 14	c/a
W-01	L5014	9/19/91		AUSTIN	8010	10/02/91	N/A	N/A / 14	c/a

MW = Monitoring well
EB = Equipment Blank
FDB = Field duplicate B
TB = Field Blank
c = Missing information or does not apply

OW = Observation well
FDA = Field duplicate A
N/A = Not Available or Applicable
a = Holding time was less than the maximum

1/29/92 10:31:16 PBS

RADIAN CORPORATION

not qualified. The factor of five is a general practical quantitation limit (PQL) established for groundwater samples by U.S. EPA SW846 Methods.

Reagent Blanks--Reagent blanks are used to demonstrate that interference or contamination from the analytical system, including glassware and reagents used in the analytical procedure, are under control. Each reagent blank is subjected to all laboratory procedures, from sample preparation to quantitation. The required frequency for analyzing reagent blanks generally consists of one per day for each method/instrument. Table G.5-2 summarizes the results for reagent blanks analyzed with the water samples.

Methylene chloride was detected at a concentration of 2.6 ppb in the reagent blank analyzed using Method 8010 at NET on 11/11/91. Methylene chloride is a common laboratory contaminant detected by this analytical method, and was detected in the associated well sample, MW-31, as well as the associated equipment blank and trip blank at four or less times the concentration detected in the reagent blank. Since methylene chloride was detected in the reagent blank and all associated samples, a systematic methylene chloride contamination problem exists. Therefore, the results for methylene chloride for all these samples have been qualified.

Equipment Blanks--The potential for contamination from sampling equipment was monitored using equipment blanks. The equipment blank consisted of distilled water that was poured through the sampling equipment and then collected and handled in the same way as other groundwater samples. The equipment blank results monitor the effectiveness of the decontamination procedure. Five equipment blanks were collected and analyzed. Table G.5-3 summarizes the results for the equipment blanks.

The equipment blank collected on 11/8/91 and analyzed by Method 8010 at NET contained 6.6 ppb of methylene chloride and 0.71 ppb of chlorobenzene. Since there was no chlorobenzene detected in any of the associated samples, no data will be

RADIAN CORPORATION

Table G.5-2. SUMMARY OF REAGENT BLANK RESULTS
LOCKHEED BEAUMONT ROUND 3 GROUND WATER/SURFACE WATER

Method	Number of Samples	Analyte	Number of Occurrences	Range of Results	Units
8010	21				
		1,1,1-Trichloroethane	0	ND - ND	ug/L
		1,1,2,2-Tetrachloroethane	0	ND - ND	ug/L
		1,1,2-Trichloroethane	0	ND - ND	ug/L
		1,1-Dichloroethane	0	ND - ND	ug/L
		1,1-Dichloroethene	0	ND - ND	ug/L
		1,2-Dichlorobenzene	0	ND - ND	ug/L
		1,2-Dichloroethane	0	ND - ND	ug/L
		1,2-Dichloroethene (Total)	0	ND - ND	ug/L
		1,2-Dichloropropane	0	ND - ND	ug/L
		1,3-Dichlorobenzene	0	ND - ND	ug/L
		1,4-Dichlorobenzene	0	ND - ND	ug/L
		2-Chloroethylvinylether	0	ND - ND	ug/L
		Bromodichloromethane	0	ND - ND	ug/L
		Bromoform	0	ND - ND	ug/L
		Bromomethane	0	ND - ND	ug/L
		Carbon Tetrachloride	0	ND - ND	ug/L
		Chlorobenzene	0	ND - ND	ug/L
		Chloroethane	0	ND - ND	ug/L
		Chloroform	0	ND - ND	ug/L
		Chloromethane	0	ND - ND	ug/L
		Cis-1,3-Dichloropropene	0	ND - ND	ug/L
		Dibromochloromethane	0	ND - ND	ug/L
		Dichlorodifluoromethane	0	ND - ND	ug/L
		Methylene Chloride	1	ND - 2.6	ug/L
		Tetrachloroethene	0	ND - ND	ug/L
		Trans-1,3-Dichloropropene	0	ND - ND	ug/L
		Trichloroethene	0	ND - ND	ug/L
		Trichlorofluoromethane	0	ND - ND	ug/L
		Vinyl Chloride	0	ND - ND	ug/L
8020	1				
		1,2-Dichlorobenzene	0	ND - ND	ug/L
		1,3-Dichlorobenzene	0	ND - ND	ug/L
		1,4-Dichlorobenzene	0	ND - ND	ug/L
		Benzene	0	ND - ND	ug/L
		Chlorobenzene	0	ND - ND	ug/L
		Ethylbenzene	0	ND - ND	ug/L
		Toluene	0	ND - ND	ug/L
		Total Xylenes	0	ND - ND	ug/L

RADIAN CORPORATION

Table G.5-3. SUMMARY OF EQUIPMENT BLANK RESULTS
LOCKHEED BEAUMONT ROUND 3 GROUND WATER/SURFACE WATER

Method	Number of Samples	Analyte	Number of Occurrences	Range of Results	Units
8010	5				
		1,1,1-Trichloroethane	0	ND - ND	ug/L
		1,1,2,2-Tetrachloroethane	0	ND - ND	ug/L
		1,1,2-Trichloroethane	0	ND - ND	ug/L
		1,1-Dichloroethane	0	ND - ND	ug/L
		1,1-Dichloroethene	0	ND - ND	ug/L
		1,2-Dichlorobenzene	0	ND - ND	ug/L
		1,2-Dichloroethane	0	ND - ND	ug/L
		1,2-Dichloroethene (Total)	0	ND - ND	ug/L
		1,2-Dichloropropane	0	ND - ND	ug/L
		1,3-Dichlorobenzene	0	ND - ND	ug/L
		1,4-Dichlorobenzene	0	ND - ND	ug/L
		2-Chloroethylvinylether	0	ND - ND	ug/L
		Bromodichloromethane	0	ND - ND	ug/L
		Bromoform	0	ND - ND	ug/L
		Bromomethane	0	ND - ND	ug/L
		Carbon Tetrachloride	0	ND - ND	ug/L
		Chlorobenzene	1	ND - 0.71	ug/L
		Chloroethane	0	ND - ND	ug/L
		Chloroform	0	ND - ND	ug/L
		Chloromethane	0	ND - ND	ug/L
		Cis-1,3-Dichloropropene	0	ND - ND	ug/L
		Dibromochloromethane	0	ND - ND	ug/L
		Dichlorodifluoromethane	0	ND - ND	ug/L
		Methylene Chloride	1	ND - 6.6	ug/L
		Tetrachloroethene	0	ND - ND	ug/L
		Trans-1,3-Dichloropropene	0	ND - ND	ug/L
		Trichloroethene	0	ND - ND	ug/L
		Trichlorofluoromethane	0	ND - ND	ug/L
		Vinyl Chloride	0	ND - ND	ug/L

qualified. The methylene chloride data for the associated samples is already qualified based on the reagent blank data. No target compounds were detected in the remaining four equipment blanks.

Trip Blanks--Trip blanks are used to identify volatile contaminants introduced during sample transport, handling, or from sample containers. Trip blanks are prepared with volatile free water, filled in a contaminant-free environment, sealed, carried to the field, and returned unopened, along with all other field samples to the laboratory. Three trip blanks were collected and analyzed. Table G.5-4 summarizes the trip blank results.

Two of the trip blanks contained methylene chloride at concentrations of 4.4 ppb and 11 ppb. The trip blank containing 11 ppb of methylene chloride was analyzed by NET and the associated data is already qualified based on a contaminated reagent blank. Methylene chloride was detected in three samples associated with the trip blank containing 4.4 ppb of methylene chloride: MW-20 and the field duplicates of MW-2. The methylene chloride results for these samples are less than five times the level of contamination in the trip blank so the results have been qualified.

Duplicates

Duplicate samples were collected and matrix spike/matrix spike duplicate analyses were performed, as described below.

Field Duplicate Samples--Field duplicate samples were collected and analyzed to evaluate the precision or variability in the entire sampling and analytical process. The quality assurance objective for field duplicate samples was a relative percent difference (RPD) of less than or equal to 50 percent. The results for compounds detected in the duplicate samples are presented in Table G.5-5.

RADIAN CORPORATION

Table G.5-4. SUMMARY OF TRIP BLANK RESULTS
LOCKHEED BEAUMONT ROUND 3 GROUND WATER/SURFACE WATER

Method	Number of Samples	Analyte	Number of Occurrences	Range of Results	Units
8010	3				
		1,1,1-Trichloroethane	0	ND - ND	ug/L
		1,1,2,2-Tetrachloroethane	0	ND - ND	ug/L
		1,1,2-Trichloroethane	0	ND - ND	ug/L
		1,1-Dichloroethane	0	ND - ND	ug/L
		1,1-Dichloroethene	0	ND - ND	ug/L
		1,2-Dichlorobenzene	0	ND - ND	ug/L
		1,2-Dichloroethane	0	ND - ND	ug/L
		1,2-Dichloroethene (Total)	0	ND - ND	ug/L
		1,2-Dichloropropane	0	ND - ND	ug/L
		1,3-Dichlorobenzene	0	ND - ND	ug/L
		1,4-Dichlorobenzene	0	ND - ND	ug/L
		2-Chloroethylvinylether	0	ND - ND	ug/L
		Bromodichloromethane	0	ND - ND	ug/L
		Bromoform	0	ND - ND	ug/L
		Bromomethane	0	ND - ND	ug/L
		Carbon Tetrachloride	0	ND - ND	ug/L
		Chlorobenzene	0	ND - ND	ug/L
		Chloroethane	0	ND - ND	ug/L
		Chloroform	0	ND - ND	ug/L
		Chloromethane	0	ND - ND	ug/L
		Cis-1,3-Dichloropropene	0	ND - ND	ug/L
		Dibromochloromethane	0	ND - ND	ug/L
		Dichlorodifluoromethane	0	ND - ND	ug/L
		Methylene Chloride	2	ND - 11	ug/L
		Tetrachloroethene	0	ND - ND	ug/L
		Trans-1,3-Dichloropropene	0	ND - ND	ug/L
		Trichloroethene	0	ND - ND	ug/L
		Trichlorofluoromethane	0	ND - ND	ug/L
		Vinyl Chloride	0	ND - ND	ug/L

RADIAN CORPORATION

Table G.5-5. SUMMARY OF FIELD DUPLICATE SAMPLES
LOCKHEED BEAUMONT ROUND 3 GROUND WATER/SURFACE WATER

Compound	FDA	FDB	RPD(%)	Precision Limit(%)
EPA METHOD 8010				
SAMPLE CONTROL # : L5010 & L5011				
1,1,1-Trichloroethane	12 C	14 C	15	50
1,1,2,2-Tetrachloroethane	ND	ND	NC	50
1,1,2-Trichloroethane	ND	ND	NC	50
1,1-Dichloroethane	ND	ND	NC	50
1,1-Dichloroethene	19 C	20 C	5.1	50
1,2-Dichlorobenzene	ND	ND	NC	50
1,2-Dichloroethane	ND	ND	NC	50
1,2-Dichloroethene (Total)	ND	ND	NC	50
1,2-Dichloropropane	ND	ND	NC	50
1,3-Dichlorobenzene	ND	ND	NC	50
1,4-Dichlorobenzene	ND	ND	NC	50
2-Chloroethylvinylether	ND	ND	NC	50
Bromodichloromethane	ND	ND	NC	50
Bromoform	ND	ND	NC	50
Bromomethane	ND	ND	NC	50
Carbon Tetrachloride	ND	ND	NC	50
Chlorobenzene	ND	ND	NC	50
Chloroethane	ND	ND	NC	50
Chloroform	ND	ND	NC	50
Chloromethane	ND	ND	NC	50
Cis-1,3-Dichloropropene	ND	ND	NC	50
Dibromochloromethane	ND	ND	NC	50
Methylene Chloride	ND	ND	NC	50
Tetrachloroethene	ND	ND	NC	50
Trans-1,3-Dichloropropene	ND	ND	NC	50
Trichloroethene	6.2 C	6.5 C	4.7	50
Trichlorofluoromethane	ND	ND	NC	50
Vinyl Chloride	ND	ND	NC	50
SAMPLE CONTROL # : L5012 & L5013				
1,1,1-Trichloroethane	ND	ND	NC	50
1,1,2,2-Tetrachloroethane	ND	ND	NC	50
1,1,2-Trichloroethane	ND	ND	NC	50
1,1-Dichloroethane	ND	ND	NC	50
1,1-Dichloroethene	ND	ND	NC	50
1,2-Dichlorobenzene	ND	ND	NC	50
1,2-Dichloroethane	ND	ND	NC	50
1,2-Dichloroethene (Total)	ND	ND	NC	50
1,2-Dichloropropane	ND	ND	NC	50

RPD = Relative Percent Difference FDA = Field Dup A FDB = Field Dup B 1/29/92 11:19:51 PBS
+ = Above the acceptance criteria
C = Confirmed on second column or by GC/MS
ND = Not Detected
X = Second column confirmation was run one hour out of hold time. The second column supports the presence of these analytes.
Y = This result not confirmed due to coelution

RADIAN CORPORATION

Table G.5-5. SUMMARY OF FIELD DUPLICATE SAMPLES
LOCKHEED BEAUMONT ROUND 3 GROUND WATER/SURFACE WATER

Compound	FDA	FDB	RPD(%)	Precision Limit(%)
EPA METHOD 8010				
SAMPLE CONTROL # : L5012 & L5013				
1,3-Dichlorobenzene	ND	ND	NC	50
1,4-Dichlorobenzene	ND	ND	NC	50
2-Chloroethylvinylether	ND	ND	NC	50
Bromodichloromethane	ND	ND	NC	50
Bromoform	ND	ND	NC	50
Bromomethane	ND	ND	NC	50
Carbon Tetrachloride	ND	ND	NC	50
Chlorobenzene	ND	ND	NC	50
Chloroethane	ND	ND	NC	50
Chloroform	ND	ND	NC	50
Chloromethane	ND	ND	NC	50
Cis-1,3-Dichloropropene	ND	ND	NC	50
Dibromochloromethane	ND	ND	NC	50
Methylene Chloride	ND	ND	NC	50
Tetrachloroethene	ND	ND	NC	50
Trans-1,3-Dichloropropene	ND	ND	NC	50
Trichloroethene	.73 C	.41 C	+56	50
Trichlorofluoromethane	ND	ND	NC	50
Vinyl Chloride	ND	ND	NC	50
SAMPLE CONTROL # : L5044 & L5045				
1,1,1-Trichloroethane	1300 C	1300 X	0	50
1,1,2,2-Tetrachloroethane	ND	ND	NC	50
1,1,2-Trichloroethane	ND	ND	NC	50
1,1-Dichloroethane	ND	ND	NC	50
1,1-Dichloroethene	5000 C	6200 X	21	50
1,2-Dichlorobenzene	ND	ND	NC	50
1,2-Dichloroethane	ND	170 X	NC	50
1,2-Dichloroethene (Total)	ND	ND	NC	50
1,2-Dichloropropane	ND	ND	NC	50
1,3-Dichlorobenzene	ND	ND	NC	50
1,4-Dichlorobenzene	ND	ND	NC	50
2-Chloroethylvinylether	ND	ND	NC	50
Bromodichloromethane	ND	ND	NC	50
Bromoform	ND	ND	NC	50
Bromomethane	ND	ND	NC	50
Carbon Tetrachloride	ND	ND	NC	50
Chlorobenzene	ND	ND	NC	50
Chloroethane	ND	ND	NC	50

RPD = Relative Percent Difference FDA = Field Dup A FDB = Field Dup B 1/29/92 11:19:51 PBS

+ = Above the acceptance criteria

C = Confirmed on second column or by GC/MS

ND = Not Detected

X = Second column confirmation was run one hour out of hold time. The second column supports the presence of these analytes.

Y = This result not confirmed due to coelution

RADIAN CORPORATION

Table G.5-5. SUMMARY OF FIELD DUPLICATE SAMPLES
LOCKHEED BEAUMONT ROUND 3 GROUND WATER/SURFACE WATER

Compound	FDA	FDB	RPD(%)	Precision Limit(%)
EPA METHOD 8010				
SAMPLE CONTROL # : L5044 & L5045				
Chloroform	ND	ND	NC	50
Chloromethane	ND	ND	NC	50
Cis-1,3-Dichloropropene	ND	ND	NC	50
Dibromochloromethane	ND	ND	NC	50
Methylene Chloride	ND	ND	NC	50
Tetrachloroethene	ND	ND	NC	50
Trans-1,3-Dichloropropene	ND	ND	NC	50
Trichloroethene	3500 C	4400 X	23	50
Trichlorofluoromethane	ND	ND	NC	50
Vinyl Chloride	ND	ND	NC	50
SAMPLE CONTROL # : L5055 & L5056				
1,1,1-Trichloroethane	190 C	170 C	11	50
1,1,2,2-Tetrachloroethane	ND	ND	NC	50
1,1,2-Trichloroethane	ND	ND	NC	50
1,1-Dichloroethane	ND	ND	NC	50
1,1-Dichloroethene	550 C	570 C	3.6	50
1,2-Dichlorobenzene	ND	ND	NC	50
1,2-Dichloroethane	24 C	22 C	8.7	50
1,2-Dichloroethene (Total)	ND	ND	NC	50
1,2-Dichloropropane	ND	ND	NC	50
1,3-Dichlorobenzene	ND	ND	NC	50
1,4-Dichlorobenzene	ND	ND	NC	50
2-Chloroethylvinylether	ND	ND	NC	50
Bromodichloromethane	ND	ND	NC	50
Bromoform	ND	ND	NC	50
Bromomethane	ND	ND	NC	50
Carbon Tetrachloride	ND	ND	NC	50
Chlorobenzene	ND	ND	NC	50
Chloroethane	ND	ND	NC	50
Chloroform	ND	ND	NC	50
Chloromethane	ND	ND	NC	50
Cis-1,3-Dichloropropene	ND	ND	NC	50
Dibromochloromethane	ND	ND	NC	50
Methylene Chloride	11Y	15 Y	31	50
Tetrachloroethene	ND	ND	NC	50
Trans-1,3-Dichloropropene	ND	ND	NC	50
Trichloroethene	330 C	340 C	3.0	50
Trichlorofluoromethane	ND	ND	NC	50

RPD = Relative Percent Difference FDA = Field Dup A FDB = Field Dup B 1/29/92 11:19:51 PBS

* = Above the acceptance criteria

C = Confirmed on second column or by GC/MS

ND = Not Detected

X = Second column confirmation was run one hour out of hold time. The second column supports the presence of these analytes.

Y = This result not confirmed due to coelution

RADIAN CORPORATION

Table G.5-5. SUMMARY OF FIELD DUPLICATE SAMPLES
LOCKHEED BEAUMONT ROUND 3 GROUND WATER/SURFACE WATER

Compound	FDA	FDB	RPD(%)	Precision Limit(%)
EPA METHOD 8010				
SAMPLE CONTROL # : L5055 & L5056				
Vinyl Chloride	ND	ND	NC	50

RPD = Relative Percent Difference FDA = Field Dup A FDB = Field Dup B 1/29/92 11:19:51 PBS
+ = Above the acceptance criteria
C = Confirmed on second column or by GC/MS
ND = Not Detected
X = Second column confirmation was run one hour out of hold time. The second column supports the presence of these analytes.
Y = This result not confirmed due to coelution.

Field duplicate samples of groundwater were collected at monitoring wells MW-02, MW-03, MW-26, and MW-31, and analyzed using Method 8010. Twelve analyte pairs had results greater than the detection limit and RPDs were calculated to assess precision. Eleven of the twelve RPDs met the quality assurance objective. The RPD for the duplicates of MW-03 was 56 percent for trichloroethene, but no data will be qualified as the reported results are near the detection limit.

An RPD could not be calculated for one analyte pair because the analyte was detected in only one member of the pair: 1,2-dichloroethane in MW-26. Field Duplicate A (FDA) was analyzed at a 1:500 dilution and FDB was analyzed at a 1:250 dilution. Due to the dilution difference, 1,2-dichloroethane may have been diluted out of FDA, but was detected in FDB. No data were qualified due to the high dilution level used. The results indicate the precision for this method is within the Quality Assurance Objective.

Matrix Spike Duplicate Analyses--Matrix spike duplicates were used to estimate the precision in the analytical portion of the sampling and analytical process. Matrix spike duplicates have an advantage over field duplicates in that the analyte does not have to be present in order to obtain useful results.

The quality assurance objective for matrix spike duplicates is to have an RPD of 30 percent or less. The matrix spike duplicate results are presented in Table G.5-6. Three method spike duplicates analyses were performed, yielding 30 analyte pairs (10 analytes were included in the spike solution). All of the RPDs met the quality assurance objective, except the 1,1-dichloroethene RPD of 39 percent for MW-02. Four of the samples associated with this MS/MSD contain 1,1-dichloroethene, two of which are field duplicates. Since the RPD calculated for the 1,1-dichloroethene results for the field duplicates is within the acceptable range, no data has been qualified.

RADIAN CORPORATION

Table G.5-6. LOCKHEED BEAUMONT ROUND 3 GROUND WATER/SURFACE WATER MATRIX SPIKE DUPLICATE REPORT

Compound	% Recovery MS	MSD	Ave (%) Recovery	Limit(%)	RPD(%)	Precision Limit(%)
EPA METHOD 8010						
SAMPLE CONTROL # : L5012						
1,2-Dichloroethane	69	89	79.0	50 -131	25.3	30
Carbon Tetrachloride	63	75	69.0	22 -151	17.4	30
Chlorobenzene	82	86	84.0	33 -176	4.8	30
1,2-Dichloropropane	71	75	73.0	71 -162	5.5	30
Dibromochloromethane	79	83	81.0	47 -139	4.9	30
1,1,2,2-Tetrachloroethane	73	74	73.5	71 -198	1.4	30
Methylene Chloride	79	84	81.5	43 -149	6.1	30
Trichloroethene	77	81	79.0	38 -170	5.1	30
1,2-Dichloroethene (Total)	73	86	79.5	32 -164	16.4	30
1,1-Dichloroethene	51	54	52.5	43 -155	5.7	30
SAMPLE CONTROL # : L5055						
1,2-Dichloroethane	108	102	105.0	50 -131	5.7	30
Carbon Tetrachloride	104	101	102.5	22 -151	2.9	30
Chlorobenzene	94	96	95.0	33 -176	2.1	30
1,2-Dichloropropane	93	91	92.0	71 -162	2.2	30
Dibromochloromethane	91	94	92.5	47 -139	3.2	30
1,1,2,2-Tetrachloroethane	81	82	81.5	71 -198	1.2	30
Methylene Chloride	115	113	114.0	43 -149	1.8	30
Trichloroethene	92	103	97.5	38 -170	11.3	30
1,2-Dichloroethene (Total)	129	125	127.0	32 -164	3.1	30
1,1-Dichloroethene	70	104	87.0	43 -155	+ 39.1	30
SAMPLE CONTROL # : L5059						
1,2-Dichloroethane	100	97	98.5	50 -131	3.0	30
Carbon Tetrachloride	92	92	92.0	22 -151	0.0	30
Chlorobenzene	95	95	95.0	33 -176	0.0	30
1,2-Dichloropropane	100	100	100.0	71 -162	0.0	30
Dibromochloromethane	96	92	94.0	47 -139	4.3	30
1,1,2,2-Tetrachloroethane	90	97	93.5	71 -198	7.5	30
Methylene Chloride	130	160	145.0	43 -149	20.7	30
Trichloroethene	97	96	96.5	38 -170	1.0	30
1,2-Dichloroethene (Total)	100	100	100.0	32 -164	0.0	30
1,1-Dichloroethene	95	95	95.0	43 -155	0.0	30

RPD = Relative Percent Difference

+ = Above the acceptance criteria

1/29/92 11:32:05 PBS

Spikes

Surrogate, matrix, and method spikes were analyzed as described below.

Surrogate Spikes--Surrogate spikes are a group of compounds that are not found in nature that have been selected for each organic analysis because of their similarity to the target analytes. Surrogate spikes were added to every sample, blank and standard to monitor both the performance of the analytical system and the effectiveness of the method in recovering the compounds of interest from each sample matrix. The surrogate spike recoveries were reported for each sample and blank, and the results were compared to the recovery objectives established for the method. All surrogate recoveries were within the established objectives. Table G.5-7 summarizes the surrogate recovery data.

Matrix Spikes--A matrix spike is a solution of method analytes at known concentrations that is spiked into a field sample before extraction (if applicable). The results of the analysis of the spiked sample are then reported as a percent recovery of each spiked compound, and provide a measure of both the accuracy of the method and the presence of matrix interferences. Specific acceptance criteria for each standard method and parameter measured have been established and are expressed as an acceptable recovery range. Table G.5-8 summarizes the matrix spike recovery results and includes acceptable ranges of recovery.

All matrix spike recoveries are within the acceptable recovery ranges so no results were qualified.

Method Spikes--A method spike is a solution of method analytes at known concentrations that is spiked into reagent grade water and analyzed to assess the accuracy of the method. The results are reported as the percent of each spiked compound.

Table G.6-10

TABLE OF QUALIFIED DATA
LOCKHEED BEAUMONT ADDITIONAL WELLS

Sample Number	U.S. EPA Method	Analyte	Type of Qualification	Reason
MW-41	8010	Methylene chloride	R	Detected in reagent blank
MW-44	8010	Methylene chloride	R	Detected in reagent blank
MW-50	8010	Methylene chloride	R	Detected in reagent blank
P-2	8010	Methylene chloride	R	Detected in reagent blank

R = Detected in reagent blank

Table G.5-7. SUMMARY OF SURROGATE SPIKES
LOCKHEED BEAUMONT ROUND 3 GROUND WATER/SURFACE WATER

Analyte	Number of Spikes	Mean	Standard Deviation	Range of Results (%)	Acceptance Criteria (%)	Results Not Meeting Criteria
Method 8010						
1-Bromo-4-Fluorobenzene	98	91.97	11.61	(67 - 117)	(59 - 143)	0
1-Chloro-2-Fluorobenzene	6	94.45	7.71	(80 - 100)	(50 - 125)	0
Method 8020						
1-Bromo-4-Fluorobenzene	3	90.00	1.00	(89 - 91)	(59 - 142)	0
Trifluorotoluene	3	117.00	3.61	(114 - 121)	(50 - 150)	0

Table G.5-8. SUMMARY OF MATRIX SPIKE RECOVERIES
LOCKHEED BEAUMONT ROUND 3

Analyte	Number of Spikes	Mean	Standard Deviation	Range of Results (% Recovery)	Acceptance Criteria (%Recovery)	Results Not Meeting Criteria
Method 8010						
1,1,2,2-Tetrachloroethane	6	82.83	9.28	(73 - 97)	(71 - 198)	0
1,1-Dichloroethene	6	78.17	22.90	(51 - 104)	(43 - 155)	0
1,2-Dichloroethane	6	94.17	13.82	(69 - 108)	(50 - 131)	0
1,2-Dichloroethene (Total)	6	102.17	21.74	(73 - 129)	(32 - 164)	0
1,2-Dichloropropane	6	88.33	12.48	(71 - 100)	(71 - 162)	0
Carbon Tetrachloride	6	87.83	15.82	(63 - 104)	(22 - 151)	0
Chlorobenzene	6	91.33	5.85	(82 - 96)	(33 - 176)	0
Dibromochloromethane	6	89.17	6.68	(79 - 96)	(47 - 139)	0
Methylene Chloride	6	113.50	29.99	(79 - 160)	(25 - 162)	0
Trichloroethene	6	91.00	10.02	(77 - 103)	(38 - 170)	0

RADIAN CORPORATION

The method spikes were analyzed at a frequency of 1 for each analytical batch. Twenty method spike analyses were performed using 28 analytes, giving a total of 560 method spike results. All recoveries were within the quality assurance objective. Table G.5-9 summarizes the method spike recovery data.

G.5.2 Data Summary

A summary of hits in all samples analyzed by Methods 8010 and 8020 for Lockheed Beaumont No. 1 Groundwater Sampling Round 3 is found in Table G.5-10.

A summary of all qualified data is shown in Table G.5-11.

G.6 Groundwater Sampling from Additional Wells (December 1991)

This section presents the results of the QC data assessment for 13 groundwater samples collected from new (additional) wells for Lockheed Beaumont No. 1 Groundwater Assessment, during December 1991, which were analyzed using Method 8010. Quality assurance and quality control (QA/QC) efforts were conducted to ensure data of known and sufficient quality were collected and reported. Two primary aspects of the overall QA/QC effort are related to achievement of this objective. First, the QA/QC program forms a framework for controlling data quality within pre-established limits during execution of the sampling and analytical efforts. Second, the QA/QC program forms the basis for estimating uncertainty in the measurement data by providing information necessary to determine qualitative and quantitative limitations associated with these data.

The Method 8010 analyses for these wells were performed by Enseco-CRL.

The results of this assessment indicate the data are valid and the quality, as measured by the analytical accuracy and precision, is within the acceptance criteria for

Table G.5-9. METHOD SPIKE SUMMARY REPORT
LOCKHEED BEAUMONT ROUND 3 GROUND WATER/SURFACE WATER

Analyte	Number of Spikes	Mean	Standard Deviation	Range of Results (%)	Acceptance Criteria (%)	Results Not Meeting Criteria
Method 8010						
1,1,1-Trichloroethane	20	118.95	7.73	(96 - 130)	(25 - 205)	0
1,1,2,2-Tetrachloroethane	20	89.10	8.84	(72 - 108)	(0 - 286)	0
1,1,2-Trichloroethane	20	96.25	15.76	(74 - 127)	(3 - 168)	0
1,1-Dichloroethane	20	120.90	8.98	(99 - 132)	(31 - 162)	0
1,1-Dichloroethene	20	111.40	12.01	(100 - 144)	(39 - 171)	0
1,2-Dichlorobenzene	20	105.50	10.71	(78 - 120)	(14 - 165)	0
1,2-Dichloroethane	20	112.45	10.25	(78 - 124)	(39 - 138)	0
1,2-Dichloroethene (Total)	20	107.05	7.91	(83 - 116)	(31 - 132)	0
1,2-Dichloropropane	20	88.10	6.17	(76 - 97)	(28 - 172)	0
1,3-Dichlorobenzene	20	105.35	9.71	(82 - 118)	(27 - 166)	0
1,4-Dichlorobenzene	20	104.55	10.65	(77 - 120)	(20 - 162)	0
2-Chloroethylvinylether	20	68.90	7.22	(57 - 89)	(4 - 170)	0
Bromodichloromethane	20	109.55	10.35	(81 - 124)	(52 - 164)	0
Bromoform	20	95.30	8.24	(78 - 109)	(31 - 161)	0
Bromomethane	20	68.75	5.70	(54 - 77)	(16 - 132)	0
Carbon Tetrachloride	20	116.40	6.41	(105 - 126)	(25 - 205)	0
Chlorobenzene	20	102.90	11.06	(69 - 115)	(38 - 167)	0
Chloroethane	20	43.20	16.24	(29 - 70)	(8 - 136)	0
Chloroform	20	113.90	8.32	(97 - 127)	(20 - 184)	0
Chloromethane	20	68.90	7.64	(52 - 80)	(0 - 196)	0
Cis-1,3-Dichloropropene	20	110.35	10.00	(83 - 125)	(39 - 150)	0
Dibromochloromethane	20	110.05	11.07	(83 - 126)	(24 - 164)	0
Methylene Chloride	20	109.95	9.50	(80 - 122)	(44 - 134)	0
Tetrachloroethene	20	96.40	15.73	(74 - 127)	(54 - 162)	0
Trans-1,3-Dichloropropene	20	105.75	10.25	(81 - 120)	(44 - 161)	0
Trichloroethene	20	105.95	7.62	(91 - 118)	(25 - 200)	0
Trichlorpfluoromethane	20	95.70	7.08	(84 - 106)	(20 - 160)	0
Vinyl Chloride	20	63.60	6.65	(50 - 72)	(39 - 159)	0
Method 8020						
1,2-Dichlorobenzene	1	85.00	0.00	(85 - 85)	(57 - 139)	0
1,3-Dichlorobenzene	1	85.00	0.00	(85 - 85)	(46 - 141)	0
1,4-Dichlorobenzene	1	86.00	0.00	(86 - 86)	(38 - 138)	0
Benzene	1	86.00	0.00	(86 - 86)	(60 - 139)	0
Chlorobenzene	1	88.00	0.00	(88 - 88)	(66 - 135)	0
Ethylbenzene	1	91.00	0.00	(91 - 91)	(62 - 144)	0
Toluene	1	85.00	0.00	(85 - 85)	(60 - 138)	0
Total Xylenes	1	86.00	0.00	(86 - 86)	(61 - 129)	0

RADIAN CORPORATION

Table G.5-10. LOCKHEED BEAUMONT ROUND 3 GW/SW HIT LIST

Location ID :	LOWERTOND		MW-01		MW-02		MW-02	
Sample Control # :	L5005		L5041		L5055		L5056	
Date Sampled :	9/16/91		9/27/91		10/03/91		10/03/91	
QC Type :					FDA		FDB	
Analyte	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(0.27)	200 C	(14)	190 C	(6.8)	170 C	(6.8)
1,1-Dichloroethane	ND	(0.50)	ND	(25)	ND	(12)	ND	(12)
1,1-Dichloroethene	ND	(0.70)	220 C	(35)	550 C	(18)	570 C	(18)
1,2-Dichloroethane	ND	(0.15)	ND	(7.5)	24 C	(3.8)	22 C	(3.8)
Chloroform	ND	(0.15)	ND	(7.5)	ND	(3.8)	ND	(3.8)
Methylene Chloride	ND	(0.40)	ND	(20)	11 X	(10)	15 X	(10)
Trichloroethene	ND	(0.20)	500 C	(10)	330 C	(5.0)	340 C	(5.0)

QC Type = Lab and or field QC flags
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
NA = Not Analyzed
X = Presence of this compound was not confirmed by second colum
Y = Second colum confirmation was run one hour out of hold time. The second colum supports the presence of these analytes
Z = Organic - Detected in blank, result not corrected

DL/PQL = Detection Limit or Practical Quantitation Limit
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
ND = Not Detected

1/29/92 12:10:48 pbs

Table G.5-10. LOCKHEED BEAUMONT ROUND 3 GW/SW HIT LIST

Location ID :	MW-03		MW-03		MW-04		MW-05	
Sample Control # :	L5012		L5013		L5038		L5033	
Date Sampled :	9/18/91		9/18/91		9/26/91		9/25/91	
QC Type :	FDA		FDB					
Analyte	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(0.27)	ND	(0.27)	34 C	(2.7)	45 C	(6.8)
1,1-Dichloroethane	ND	(0.50)	ND	(0.50)	ND	(5.0)	ND	(12)
1,1-Dichloroethene	ND	(0.70)	ND	(0.70)	120 C	(7.0)	180 C	(18)
1,2-Dichloroethane	ND	(0.15)	ND	(0.15)	ND	(1.5)	ND	(3.8)
Chloroform	ND	(0.15)	ND	(0.15)	9.8 C	(1.5)	ND	(3.8)
Methylene Chloride	ND	(0.40)	ND	(0.40)	ND	(4.0)	ND	(10)
Trichloroethene	0.73 C	(0.20)	0.41 C	(0.20)	170 C	(2.0)	200 C	(5.0)

QC Type = Lab and or field QC flags
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
NA = Not Analyzed
X = Presence of this compound was not confirmed by second column
Y = Second column confirmation was run one hour out of hold time. The second column supports the presence of these analytes
Z = Organic - Detected in blank, result not corrected

DL/PQL = Detection Limit or Practical Quantitation Limit
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
ND = Not Detected

1/29/92 12:10:48 pbs

TAble G.5-10. LOCKHEED BEAUMONT ROUND 3 GW/SW HIT LIST

Location ID :	MW-06		MW-07		MW-08		MW-09	
Sample Control # :	L5036		L5040		L5002		L5003	
Date Sampled :	9/26/91		9/27/91		9/16/91		9/16/91	
QC Type :								
Analyte	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	15 C	(1.4)	87 C	(6.8)	ND	(0.27)	ND	(0.27)
1,1-Dichloroethane	ND	(2.5)	ND	(12)	ND	(0.50)	ND	(0.50)
1,1-Dichloroethene	28 C	(3.5)	100 C	(18)	ND	(0.70)	ND	(0.70)
1,2-Dichloroethane	ND	(0.75)	ND	(3.8)	ND	(0.15)	ND	(0.15)
Chloroform	ND	(0.75)	ND	(3.8)	ND	(0.15)	ND	(0.15)
Methylene Chloride	3.0 X	(2.0)	ND	(10)	ND	(0.40)	ND	(0.40)
Trichloroethene	42 C	(1.0)	280 C	(5.0)	ND	(0.20)	ND	(0.20)

QC Type = Lab and or field QC flags
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
NA = Not Analyzed
X = Presence of this compound was not confirmed by second colum
Y = Second colum confirmation was run one hour out of hold time. The second colum supports the presence of these analytes
Z = Organic - Detected in blank, result not corrected

DL/PQL = Detection Limit or Practical Quantitation Limit
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
ND = Not Detected

1/29/92 12:10:48 pbs

RADIAN CORPORATION

Table G.5-10. LOCKHEED BEAUMONT ROUND 3 GW/SW HIT LIST

Location ID :	MW-10		MW-11		MW-12		MW-13	
Sample Control # :	L5029		L5004		L5007		L5008	
Date Sampled :	9/24/91		9/16/91		9/17/91		9/17/91	
QC Type :								
Analyte	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(0.27)	ND	(0.27)	ND	(0.27)	ND	(0.27)
1,1-Dichloroethane	ND	(0.50)	ND	(0.50)	ND	(0.50)	ND	(0.50)
1,1-Dichloroethene	ND	(0.70)	ND	(0.70)	ND	(0.70)	ND	(0.70)
1,2-Dichloroethane	ND	(0.15)	ND	(0.15)	ND	(0.15)	ND	(0.15)
Chloroform	5.5 C	(0.15)	ND	(0.15)	ND	(0.15)	ND	(0.15)
Methylene Chloride	ND	(0.40)	ND	(0.40)	ND	(0.40)	ND	(0.40)
Trichloroethene	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)

QC Type = Lab and or field QC flags
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
NA = Not Analyzed
X = Presence of this compound was not confirmed by second column
Y = Second column confirmation was run one hour out of hold time. The second column supports the presence of these analytes
Z = Organic - Detected in blank, result not corrected

DL/PQL = Detection Limit or Practical Quantitation Limit
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
ND = Not Detected

1/29/92 12:10:48 pbs

Table G.5-10. LOCKHEED BEAUMONT ROUND 3 GW/SW HIT LIST

Location ID :	MW-14		MW-15		MW-16		MW-17	
Sample Control # :	L5024		L5022		L5009		L5032	
Date Sampled :	9/23/91		9/23/91		9/17/91		9/25/91	
QC Type :								
Analyte	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(0.27)	ND	(0.27)	ND	(0.27)	8.6 C	(0.27)
1,1-Dichloroethane	ND	(0.50)	ND	(0.50)	ND	(0.50)	0.85 C	(0.50)
1,1-Dichloroethene	ND	(0.70)	ND	(0.70)	ND	(0.70)	4.1 C	(0.70)
1,2-Dichloroethane	ND	(0.15)	ND	(0.15)	ND	(0.15)	ND	(0.15)
Chloroform	ND	(0.15)	ND	(0.15)	ND	(0.15)	ND	(0.15)
Methylene Chloride	ND	(0.40)	ND	(0.40)	ND	(0.40)	ND	(0.40)
Trichloroethene	ND	(0.20)	ND	(0.20)	ND	(0.20)	2.3 C	(0.20)

QC Type = Lab and or field QC flags
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
NA = Not Analyzed
X = Presence of this compound was not confirmed by second column
Y = Second column confirmation was run one hour out of hold time. The second column supports the presence of these analytes
Z = Organic - Detected in blank, result not corrected

DL/PQL = Detection Limit or Practical Quantitation Limit
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
ND = Not Detected

1/29/92 12:10:48 pbs

RADIAN CORPORATION

Table G.5-10. LOCKHEED BEAUMONT ROUND 3 GW/SW HIT LIST

Location ID :	MW-18		MW-19		MW-20		MW-22	
Sample Control # :	L5023		L5031		L5054		L5042	
Date Sampled :	9/23/91		9/25/91		10/03/91		9/27/91	
QC Type :								
Analyte	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	2.2 G	(0.27)	ND	(0.27)	79 C	(6.8)	19 C	(1.4)
1,1-Dichloroethane	2.5 C	(0.50)	2.0 C	(0.50)	ND	(12)	ND	(2.5)
1,1-Dichloroethene	7.6 C	(0.70)	3.0 C	(0.70)	260 C	(18)	60 C	(3.5)
1,2-Dichloroethane	ND	(0.15)	ND	(0.15)	ND	(3.8)	ND	(0.75)
Chloroform	ND	(0.15)	ND	(0.15)	ND	(3.8)	ND	(0.75)
Methylene Chloride	ND	(0.40)	0.45 X	(0.40)	10 X	(10)	ND	(2.0)
Trichloroethene	6.4 C	(0.20)	1.3 C	(0.20)	240 C	(5.0)	22 C	(1.0)

QC Type = Lab and or field QC flags
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
NA = Not Analyzed
X = Presence of this compound was not confirmed by second column
Y = Second column confirmation was run one hour out of hold time. The second column supports the presence of these analytes
Z = Organic - Detected in blank, result not corrected

DL/PQL = Detection Limit or Practical Quantitation Limit
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
ND = Not Detected

1/29/92 12:10:48 pbs

Table G.5-10. LOCKHEED BEAUMONT ROUND 3 GW/SW HIT LIST

Location ID :	MW-23		MW-24		MW-25		MW-26	
Sample Control # :	L5053		L5049		L5043		L5044	
Date Sampled :	10/03/91		10/01/91		9/27/91		9/30/91	
QC Type :							FDA	
Analyte	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	31 C	(6.8)	970 C	(68)	1700 C	(68)	1300 C	(140)
1,1-Dichloroethane	ND	(12)	ND	(120)	ND	(120)	ND	(250)
1,1-Dichloroethene	74 C	(18)	3800 C	(180)	4500 C	(180)	5000 C	(350)
1,2-Dichloroethane	ND	(3.8)	150 C	(38)	510 C	(38)	ND	(75)
Chloroform	ND	(3.8)	ND	(38)	ND	(38)	ND	(75)
Methylene Chloride	ND	(10)	ND	(100)	ND	(100)	ND	(200)
Trichloroethene	70 C	(5.0)	2700 C	(50)	1800 C	(50)	3500 C	(100)

QC Type = Lab and or field QC flags
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
NA = Not Analyzed
X = Presence of this compound was not confirmed by second column
Y = Second column confirmation was run one hour out of hold time. The second column supports the presence of these analytes
Z = Organic - Detected in blank, result not corrected

DL/PQL = Detection Limit or Practical Quantitation Limit
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
ND = Not Detected

1/29/92 12:10:48 pbs

Table G.5-10. LOCKHEED BEAUMONT ROUND 3 GW/SW HIT LIST

Location ID :	MW-26		MW-28		MW-30		MW-31	
Sample Control # :	L5045		L5030		L5052		L5060	
Date Sampled :	9/30/91		9/24/91		10/03/91		11/08/91	
QC Type :	FDB							
Analyte	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	1300 Y	(68)	12 C	(0.27)	1.3 C	(0.27)	ND	(0.20)
1,1-Dichloroethane	ND	(120)	1.2 C	(0.50)	ND	(0.50)	ND	(0.20)
1,1-Dichloroethene	6200 Y	(180)	33 C	(0.70)	7.0 C	(0.70)	ND	(0.20)
1,2-Dichloroethane	170 Y	(38)	1.1 C	(0.15)	ND	(0.15)	ND	(0.20)
Chloroform	ND	(38)	ND	(0.15)	ND	(0.15)	ND	(0.20)
Methylene Chloride	ND	(100)	ND	(0.40)	ND	(0.40)	10Z	(0.20)
Trichloroethene	4400 Y	(50)	34 C	(0.20)	5.8 C	(0.20)	ND	(0.20)

QC Type = Lab and or field QC flags
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
NA = Not Analyzed
X = Presence of this compound was not confirmed by second column
Y = Second column confirmation was run one hour out of hold time. The second column supports the presence of these analytes
Z = Organic - Detected in blank, result not corrected

DL/PQL = Detection Limit or Practical Quantitation Limit
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
ND = Not Detected

1/29/92 12:10:48 pbs

RADIAN CORPORATION

RADIAN CORPORATION

Table G.5-10. LOCKHEED BEAUMONT ROUND 3 GW/SW HIT LIST

Location ID :	MW-31		MW-31		MW-32		MW-34	
Sample Control # :	L5010		L5011		L5047		L5015	
Date Sampled :	9/18/91		9/18/91		10/01/91		9/19/91	
QC Type :	FDA		FDB					
Analyte	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	12 C	(0.27)	14 C	(0.27)	ND	(0.27)	ND	(0.27)
1,1-Dichloroethane	ND	(0.50)	ND	(0.50)	ND	(0.50)	ND	(0.50)
1,1-Dichloroethene	19 C	(0.70)	20 C	(0.70)	ND	(0.70)	ND	(0.70)
1,2-Dichloroethane	ND	(0.15)	ND	(0.15)	ND	(0.15)	ND	(0.15)
Chloroform	ND	(0.15)	ND	(0.15)	ND	(0.15)	ND	(0.15)
Methylene Chloride	ND	(0.40)	ND	(0.40)	ND	(0.40)	ND	(0.40)
Trichloroethene	6.2 C	(0.20)	6.5 C	(0.20)	ND	(0.20)	ND	(0.20)

QC Type = Lab and or field QC flags
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
NA = Not Analyzed
X = Presence of this compound was not confirmed by second colum
Y = Second colum confirmation was run one hour out of hold time. The second colum supports the presence of these analytes
Z = Organic - Detected in blank, result not corrected

DL/PQL = Detection Limit or Practical Quantitation Limit
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
ND = Not Detected

1/29/92 12:10:48 pbs

RADIAN CORPORATION

Table G.5-10. LOCKHEED BEAUMONT ROUND 3 GW/SW HIT LIST

Location ID :	MW-35		MW-36		MW-37		MW-37	
Sample Control # :	L5018		L5016		L5025		L5026	
Date Sampled :	9/20/91		9/19/91		9/23/91		9/23/91	
QC Type :								
Analyte	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	1.3 C	(0.27)	ND	(0.27)	ND	(0.27)	NA	
1,1-Dichloroethane	ND	(0.50)	ND	(0.50)	ND	(0.50)	NA	
1,1-Dichloroethene	1.4 C	(0.70)	ND	(0.70)	ND	(0.70)	NA	
1,2-Dichloroethane	ND	(0.15)	ND	(0.15)	ND	(0.15)	NA	
Chloroform	ND	(0.15)	ND	(0.15)	ND	(0.15)	NA	
Methylene Chloride	ND	(0.40)	ND	(0.40)	ND	(0.40)	NA	
Trichloroethene	2.7 C	(0.20)	ND	(0.20)	0.93 C	(0.20)	NA	

QC Type = Lab and or field QC flags
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
NA = Not Analyzed
X = Presence of this compound was not confirmed by second colum
Y = Second colum confirmation was run one hour out of hold time. The second colum supports the presence of these analytes
Z = Organic - Detected in blank, result not corrected

DL/PQL = Detection Limit or Practical Quantitation Limit
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
ND = Not Detected

1/29/92 12:10:48 pbs

Table G.5-10. LOCKHEED BEAUMONT ROUND 3 GW/SW HIT LIST

Location ID :	MW-38		MW-39		MW-40		OW-01	
Sample Control # :	L5020		L5019		L5034		L5017	
Date Sampled :	9/20/91		9/20/91		9/25/91		9/19/91	
QC Type :								
Analyte	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(0.27)	15 G	(2.7)	18 G	(2.7)	ND	(0.27)
1,1-Dichloroethane	ND	(0.50)	ND	(5.0)	ND	(5.0)	ND	(0.50)
1,1-Dichloroethene	ND	(0.70)	49 C	(7.0)	38 C	(7.0)	ND	(0.70)
1,2-Dichloroethane	ND	(0.15)	ND	(1.5)	ND	(1.5)	ND	(0.15)
Chloroform	ND	(0.15)	ND	(1.5)	ND	(1.5)	ND	(0.15)
Methylene Chloride	ND	(0.40)	ND	(4.0)	ND	(4.0)	ND	(0.40)
Trichloroethene	ND	(0.20)	50 C	(2.0)	66 C	(2.0)	ND	(0.20)

QC Type = Lab and or field QC flags
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
NA = Not Analyzed
X = Presence of this compound was not confirmed by second column
Y = Second column confirmation was run one hour out of hold time. The second column supports the presence of these analytes
Z = Organic - Detected in blank, result not corrected

DL/PQL = Detection Limit or Practical Quantitation Limit
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
ND = Not Detected

1/29/92 12:10:48 pbs

Table G.5-10. LOCKHEED BEAUMONT ROUND 3 GW/SW HIT LIST

Location ID :	OW-02		OW-03		OW-08		TANK	
Sample Control # :	L5037		L5046		L5021		L5057	
Date Sampled :	9/26/91		10/01/91		9/20/91		10/03/91	
QC Type :								
Analyte	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	78 C	(2.7)	200 C	(14)	ND	(0.27)	58 C	(6.8)
1,1-Dichloroethane	6.5 C	(5.0)	ND	(25)	ND	(0.50)	ND	(12)
1,1-Dichloroethene	180 C	(7.0)	410 C	(35)	ND	(0.70)	220 C	(18)
1,2-Dichloroethane	ND	(1.5)	ND	(7.5)	ND	(0.15)	12 C	(3.8)
Chloroform	ND	(1.5)	ND	(7.5)	ND	(0.15)	ND	(3.8)
Methylene Chloride	ND	(4.0)	ND	(20)	ND	(0.40)	ND	(10)
Trichloroethene	210 C	(2.0)	460 C	(10)	ND	(0.20)	160 C	(5.0)

QC Type = Lab and or field QC flags
C = Confirmed on second column or by GC/MS
FDB = Field duplicate B
NA = Not Analyzed
X = Presence of this compound was not confirmed by second column
Y = Second column confirmation was run one hour out of hold time. The second column supports the presence of these analytes
Z = Organic - Detected in blank, result not corrected

DL/PQL = Detection Limit or Practical Quantitation Limit
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
ND = Not Detected

1/29/92 12:10:48 pbs

Table G.5-10. LOCKHEED BEAUMONT ROUND 3 GW/SW HIT LIST

Location ID :	UPPERPOND		W-01					
Sample Control # :	L5039		L5014					
Date Sampled :	9/26/91		9/19/91					
QC Type :								
Analyte	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	60 C	(2.7)	ND	(0.27)				
1,1-Dichloroethane	6.7 G	(5.0)	ND	(0.50)				
1,1-Dichloroethene	99 C	(7.0)	ND	(0.70)				
1,2-Dichloroethane	ND	(1.5)	ND	(0.15)				
Chloroform	ND	(1.5)	ND	(0.15)				
Methylene Chloride	ND	(4.0)	ND	(0.40)				
Trichloroethane	100 C	(2.0)	0.52 C	(0.20)				

QC Type = Lab and or field QC flags
C = Confirmed on second colum or by GC/MS
FDB = Field duplicate B
NA = Not Analyzed
X = Presence of this compound was not confirmed by second colum
Y = Second colum confirmation was run one hour out of hold time. The second colum supports the presence of these analytes
Z = Organic - Detected in blank, result not corrected

DL/PQL = Detection Limit or Practical Quantitation Limit
FDA = Field duplicate A
G = Indicates an estimated value due to GC interference
ND = Not Detected

1/29/92 12:10:48 pbsQC Type = Lab a
C = Confirmed o
FDB = Field dup
NA = Not Analyz
X = Presence of

RADIAN CORPORATION

Table G.5-11

TABLE OF QUALIFIED DATA
LOCKHEED BEAUMONT ROUND 3

Sample Number	U.S. EPA Method	Analyte	Type of Qualification	Reason
MW-20	8010	Methylene chloride	O	Detected in trip blank
MW-2	8010	Methylene chloride	O	Detected in trip blank
MW-31	8010	Methylene chloride	R	Detected in reagent blank

O = Detected in blank other than reagent blank
R = Detected in reagent blank

the analytical method used. With the exception of some low-level reagent blank contamination, no systematic problems were detected.

Part of the QC review and monitoring process is tracking holding times for each sample. EPA analytical methods specify the maximum amount of time a sample may be held before analysis. For Method 8010, the holding time is 14 days. The method-specified holding requirements were met for all the Method 8010 analyses. A summary of samples collected and the sampling date and analysis date is presented in Table G.6-1.

G.6.1 Groundwater Quality Assurance/Quality Control Results

Blanks

Three types of blanks, reagent blanks, equipments blanks and trip blanks were analyzed during this sampling program to assess the potential for contamination from various sources in the sampling and analytical process. Groundwater sample results are qualified if the concentration of an analyte detected in the associated well sample is within five times the concentration detected in the blank. This qualification indicates that at least a portion of the analyte is attributed to an introduced source and is not representative of groundwater conditions. If a method analyte is detected in a groundwater sample at a concentration greater than this, the sample results are not considered to be influenced by blank contamination and are not qualified. The factor of five is a general practical quantitation limit (PQL) established for groundwater samples by U.S. EPA SW846 Methods.

Reagent Blanks--Reagent blanks are used to demonstrate that interference or contamination from the analytical system, including glassware and reagents used in the analytical procedure, are under control. Each reagent blank is subjected to all laboratory procedures, from sample preparation to quantitation. The required frequency for

Table G.6-1 REPORT OF HOLDING TIMES
LOCKHEED BEAUMONT ADDITIONAL WELLS

Location ID	Sample Control #	Date Sampled	QC Type	Lab	Method	Date Analyzed	Date Extracted	Maximum Extraction/Analysis Holding Times (Day)	QC Category Extraction/Analysis
	L5062	12/05/91	EB	ENSECO CRL	8010	12/07/91	N/A	N/A / 14	c/a
	L5061	12/05/91	TB	ENSECO CRL	8010	12/07/91	N/A	N/A / 14	c/a
MW-29	L5063	12/05/91		ENSECO CRL	8010	12/07/91	N/A	N/A / 14	c/a
MW-41	L5072	12/10/91		ENSECO CRL	8010	12/12/91	N/A	N/A / 14	c/a
MW-42	L5065	12/05/91	FDA	ENSECO CRL	8010	12/07/91	N/A	N/A / 14	c/a
MW-42	L5066	12/05/91	FDB	ENSECO CRL	8010	12/07/91	N/A	N/A / 14	c/a
MW-43	L5068	12/06/91		ENSECO CRL	8010	12/09/91	N/A	N/A / 14	c/a
MW-44	L5070	12/12/91		ENSECO CRL	8010	12/13/91	N/A	N/A / 14	c/a
MW-45	L5075	12/06/91		ENSECO CRL	8010	12/09/91	N/A	N/A / 14	c/a
MW-45	L5078	12/11/91		ENSECO CRL	8010	12/16/91	N/A	N/A / 14	c/a
MW-46	L5080	12/19/91		ENSECO CRL	8010	12/27/91	N/A	N/A / 14	c/a
MW-47	L5082	12/19/91		ENSECO CRL	8010	12/27/91	N/A	N/A / 14	c/a
MW-48	L5084	12/19/91		ENSECO CRL	8010	12/27/91	N/A	N/A / 14	c/a
MW-49	L5087	12/26/91		ENSECO CRL	8010	12/27/91	N/A	N/A / 14	c/a
MW-50	L5086	12/20/91		ENSECO CRL	8010	12/27/91	N/A	N/A / 14	c/a
P-02	L5076	12/10/91		ENSECO CRL	8010	12/12/91	N/A	N/A / 14	c/a

MW = Monitoring well
EB = Equipment Blank
FDB = Field duplicate B
TB = Trip Blank
c = Missing information or does not apply

FDA = Field duplicate A
N/A = Not Available or Applicable
a = Holding time was less than the maximum

1/27/92 10:11:18 pbs

RADIAN CORPORATION

analyzing reagent blanks generally consists of one per day for each method/instrument. Table G.6-2 summarizes the results for reagent blanks analyzed with the water samples.

Methylene chloride was detected at concentrations ranging from 1.2 to 1.9 ppb in three of the eight reagent blanks that were analyzed for Method 8010. Methylene chloride is a common laboratory contaminant detected by this analytical method, and was detected in three well samples, P-2, MW-41, and MW-50 at approximately three or less times the concentrations detected in the associated reagent blanks. Methylene chloride was also detected in well sample MW-44, but not in the associated reagent blank. Since, methylene chloride was detected in three of the eight reagent blanks, a systematic methylene chloride contamination problem exists. Therefore, the results for methylene chloride for all these samples have been qualified.

Equipment Blanks--The potential for contamination from sampling equipment was monitored using equipment blanks. The equipment blank consisted of distilled water that was poured through the sampling equipment and then collected and handled in the same way as other groundwater samples. The equipment blank results monitor the effectiveness of the decontamination procedure. One equipment blank was collected and analyzed. No target analytes were detected. Table G.6-3 summarizes the results for the equipment blank.

Trip Blanks--Trip blanks are used to identify volatile contaminants introduced during sample transport, handling, or from sample containers. Trip blanks are prepared with volatile free water, filled in a contaminant-free environment, sealed, carried to the field, and returned unopened, along with all other field samples to the laboratory. No method analytes were detected in the one trip blank collected and analyzed by Method SW8010. Table G.6-4 summarizes the trip blank results.

RADIAN CORPORATION

Table G.6-2 SUMMARY OF REAGENT BLANK RESULTS
LOCKHEED BEAUMONT ADDITIONAL WELLS

Method	Number of Samples	Analyte	Number of Occurrences	Range of Results	Units
8010	8				
		1,1,1-Trichloroethane	0	ND - ND	ug/L
		1,1,2,2-Tetrachloroethane	0	ND - ND	ug/L
		1,1,2-Trichloroethane	0	ND - ND	ug/L
		1,1-Dichloroethane	0	ND - ND	ug/L
		1,1-Dichloroethene	0	ND - ND	ug/L
		1,2-Dichlorobenzene	0	ND - ND	ug/L
		1,2-Dichloroethane	0	ND - ND	ug/L
		1,2-Dichloropropane	0	ND - ND	ug/L
		1,3-Dichlorobenzene	0	ND - ND	ug/L
		1,4-Dichlorobenzene	0	ND - ND	ug/L
		2-Chloroethylvinylether	0	ND - ND	ug/L
		Bromodichloromethane	0	ND - ND	ug/L
		Bromoform	0	ND - ND	ug/L
		Bromomethane	0	ND - ND	ug/L
		Carbon Tetrachloride	0	ND - ND	ug/L
		Chlorobenzene	0	ND - ND	ug/L
		Chloroethane	0	ND - ND	ug/L
		Chloroform	0	ND - ND	ug/L
		Chloromethane	0	ND - ND	ug/L
		Cis-1,3-Dichloropropene	0	ND - ND	ug/L
		Dibromochloromethane	0	ND - ND	ug/L
		Methylene Chloride	3	ND - 1.9	ug/L
		Tetrachloroethene	0	ND - ND	ug/L
		Trans-1,3-Dichloropropene	0	ND - ND	ug/L
		Trichloroethene	0	ND - ND	ug/L
		Trichlorofluoromethane	0	ND - ND	ug/L
		Vinyl Chloride	0	ND - ND	ug/L
		trans-1,2-Dichloroethene	0	ND - ND	ug/L

RADIAN CORPORATION

Table G.6-3 SUMMARY OF EQUIPMENT BLANK RESULTS
LOCKHEED BEAUMONT ADDITIONAL WELLS

Method	Number of Samples	Analyte	Number of Occurrences	Range of Results	Units
8010	1				
		1,1,1-Trichloroethane	0	ND - ND	ug/L
		1,1,2,2-Tetrachloroethane	0	ND - ND	ug/L
		1,1,2-Trichloroethane	0	ND - ND	ug/L
		1,1-Dichloroethane	0	ND - ND	ug/L
		1,1-Dichloroethene	0	ND - ND	ug/L
		1,2-Dichlorobenzene	0	ND - ND	ug/L
		1,2-Dichloroethane	0	ND - ND	ug/L
		1,2-Dichloropropane	0	ND - ND	ug/L
		1,3-Dichlorobenzene	0	ND - ND	ug/L
		1,4-Dichlorobenzene	0	ND - ND	ug/L
		2-Chloroethylvinylether	0	ND - ND	ug/L
		Bromodichloromethane	0	ND - ND	ug/L
		Bromoform	0	ND - ND	ug/L
		Bromomethane	0	ND - ND	ug/L
		Carbon Tetrachloride	0	ND - ND	ug/L
		Chlorobenzene	0	ND - ND	ug/L
		Chloroethane	0	ND - ND	ug/L
		Chloroform	0	ND - ND	ug/L
		Chloromethane	0	ND - ND	ug/L
		Cis-1,3-Dichloropropene	0	ND - ND	ug/L
		Dibromochloromethane	0	ND - ND	ug/L
		Methylene Chloride	0	ND - ND	ug/L
		Tetrachloroethene	0	ND - ND	ug/L
		Trans-1,3-Dichloropropene	0	ND - ND	ug/L
		Trichloroethene	0	ND - ND	ug/L
		Trichlorofluoromethane	0	ND - ND	ug/L
		Vinyl Chloride	0	ND - ND	ug/L
		trans-1,2-Dichloroethene	0	ND - ND	ug/L

RADIAN CORPORATION

Table G.6-4 SUMMARY OF TRIP BLANK RESULTS
LOCKHEED BEAUMONT ADDITIONAL WELLS

Method	Number of Samples	Analyte	Number of Occurrences	Range of Results	Units
8010	1				
		1,1,1-Trichloroethane	0	ND - ND	ug/L
		1,1,2,2-Tetrachloroethane	0	ND - ND	ug/L
		1,1,2-Trichloroethane	0	ND - ND	ug/L
		1,1-Dichloroethane	0	ND - ND	ug/L
		1,1-Dichloroethene	0	ND - ND	ug/L
		1,2-Dichlorobenzene	0	ND - ND	ug/L
		1,2-Dichloroethane	0	ND - ND	ug/L
		1,2-Dichloropropane	0	ND - ND	ug/L
		1,3-Dichlorobenzene	0	ND - ND	ug/L
		1,4-Dichlorobenzene	0	ND - ND	ug/L
		2-Chloroethylvinylether	0	ND - ND	ug/L
		Bromodichloromethane	0	ND - ND	ug/L
		Bromoform	0	ND - ND	ug/L
		Bromomethane	0	ND - ND	ug/L
		Carbon Tetrachloride	0	ND - ND	ug/L
		Chlorobenzene	0	ND - ND	ug/L
		Chloroethane	0	ND - ND	ug/L
		Chloroform	0	ND - ND	ug/L
		Chloromethane	0	ND - ND	ug/L
		Cis-1,3-Dichloropropene	0	ND - ND	ug/L
		Dibromochloromethane	0	ND - ND	ug/L
		Methylene Chloride	0	ND - ND	ug/L
		Tetrachloroethene	0	ND - ND	ug/L
		Trans-1,3-Dichloropropene	0	ND - ND	ug/L
		Trichloroethene	0	ND - ND	ug/L
		Trichlorofluoromethane	0	ND - ND	ug/L
		Vinyl Chloride	0	ND - ND	ug/L
		trans-1,2-Dichloroethene	0	ND - ND	ug/L

Duplicates

Duplicate samples were collected and method spike/method spike duplicate analyses were performed, as described below.

Field Duplicate Samples--Field duplicate samples were collected and analyzed to evaluate the precision, or variability in the entire sampling and analytical process. The quality assurance objective for field duplicate samples was a relative percent difference (RPD) of less than or equal to 50 percent. The results for compounds detected in the duplicate samples are presented in Table G.6-5.

A field duplicate of groundwater sample from MW-42 was collected analyzed using Method 8010.

Two analyte pairs had results greater than the detection limit and RPDs could be calculated to assess precision. The RPDs met the quality assurance objective, with RPDs of 7.4 percent and 26 percent. Furthermore, for one analyte pair (1,1-dichloroethane), the analyte was detected in only one member of the pair, however the concentration reported was near the detection limit, thereby reducing the certainty of the result. The results indicate the precision for this method is within the Quality Assurance Objective.

Method Spike Duplicate Analyses--Method spike duplicates (duplicate control samples - DCS) were used to estimate the precision in the analytical portion of the sampling and analytical process. Method spike duplicates have an advantage over field duplicates in that the analyte does not have to be present in order to obtain useful results.

RADIAN CORPORATION

SUMMARY OF FIELD DUPLICATE SAMPLES

Table G.6-5 LOCKHEED BEAUMONT ADDITIONAL WELLS

Compound	FDA	FDB	RPD(%)	Precision Limit(%)
EPA METHOD 8010				
SAMPLE CONTROL # : L5065 & L5066				
1,1,1-Trichloroethane	ND	ND	NC	50
1,1,2,2-Tetrachloroethane	ND	ND	NC	50
1,1,2-Trichloroethane	ND	ND	NC	50
1,1-Dichloroethane	5.9	ND	NC	50
1,1-Dichloroethene	100	130	26	50
1,2-Dichlorobenzene	ND	ND	NC	50
1,2-Dichloroethane	ND	ND	NC	50
1,2-Dichloropropane	ND	ND	NC	50
1,3-Dichlorobenzene	ND	ND	NC	50
1,4-Dichlorobenzene	ND	ND	NC	50
2-Chloroethylvinylether	ND	ND	NC	50
Bromodichloromethane	ND	ND	NC	50
Bromoform	ND	ND	NC	50
Bromomethane	ND	ND	NC	50
Carbon Tetrachloride	ND	ND	NC	50
Chlorobenzene	ND	ND	NC	50
Chloroethane	ND	ND	NC	50
Chloroform	ND	ND	NC	50
Chloromethane	ND	ND	NC	50
Cis-1,3-Dichloropropene	ND	ND	NC	50
Dibromochloromethane	ND	ND	NC	50
Methylene Chloride	ND	ND	NC	50
Tetrachloroethene	ND	ND	NC	50
Trans-1,3-Dichloropropene	ND	ND	NC	50
Trichloroethene	140	130	7.4	50
Trichlorofluoromethane	ND	ND	NC	50
Vinyl Chloride	ND	ND	NC	50
trans-1,2-Dichloroethene	ND	ND	NC	50

RPD = Relative Percent Difference FDA = Field Dup A FDB = Field Dup B 1/27/92 10:21:52 pbs

ND = Not Detected

The quality assurance objective for method spike duplicates is to have an RPD of 30 percent or less. The method spike duplicate results are presented in Table G.6-6. Five method spike duplicates analyses were performed, yielding 25 analyte pairs (5 analytes were included in the spike solution). All of the RPDs met the quality assurance objective, except one in batch; QC lot number 23 Dec 91-A. An RPD of 35 percent was calculated for one chlorobenzene pair in this batch. Chlorobenzene was not reported in any samples associated with the out-of-control pair, therefore no sample results have been qualified.

Spikes

Surrogate and method spikes were analyzed as described below.

Surrogate Spikes--Surrogate spikes are a group of compounds, that are not found in nature that have been selected for each organic analysis because of their similarity to the target analytes. Surrogate spikes were added to every sample, blank and standard to monitor both the performance of the analytical system and the effectiveness of the method in recovering the compounds of interest from each sample matrix. The surrogate spike recoveries were reported for each sample and blank, and the results were compared to the recovery objectives established for the method. All surrogate recoveries were within the established objectives. Table G.6-7 summarizes the surrogate recovery data.

Method Spikes--A method spike is a solution of method analytes at known concentrations that is spiked into reagent grade water and analyzed to assess the accuracy of the method. The results are reported as the percent of each spiked compound.

The method spikes were analyzed at a frequency of 1 for every 20 field samples and not by analytical batch. Ten method spike analyses were performed using 5

Table G.6-9 LOCKHEED BEAUMONT ADDITIONAL WELLS HIT LIST

Location ID :	MW-46		MW-47		MW-48		MW-49	
Sample Control # :	L5080		L5082		L5084		L5087	
Date Sampled :	12/19/91		12/19/91		12/19/91		12/26/91	
QC Type :								
Analyte	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(0.40)	ND	(0.40)	ND	(0.40)	32	(1.8)
1,1-Dichloroethane	0.57J	(0.21)	ND	(0.21)	ND	(0.21)	ND	(3.9)
1,1-Dichloroethene	1.3	(0.22)	ND	(0.22)	ND	(0.22)	84	(4.4)
1,2-Dichloroethane	ND	(0.11)	ND	(0.11)	ND	(0.11)	ND	(2.2)
Methylene Chloride	ND	(0.72)	ND	(0.72)	ND	(0.72)	ND	(3.6)
Trichloroethene	ND	(0.30)	ND	(0.30)	ND	(0.30)	110	(2.8)

QC Type = Lab and or field QC flags
B = Inorg CLP-Result < CRDL but > IDL / Org-detected in blank
FDB = Field duplicate B
ND = Not Detected

DL/PQL = Detection Limit or Practical Quantitation Limit
FDA = Field duplicate A
J = Val between method detection & practical quantitation limit

1/27/92 13:39:06 pbs

Table G.6-9 LOCKHEED BEAUMONT ADDITIONAL WELLS HIT LIST

Location ID :	MW-50		P-02					
Sample Control # :	L5086		L5076					
Date Sampled :	12/20/91		12/10/91					
QC Type :								
Analyte	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	69	(2.0)	ND	(0.37)				
1,1-Dichloroethane	2.8	(1.0)	ND	(0.78)				
1,1-Dichloroethene	200	(1.1)	ND	(0.88)				
1,2-Dichloroethane	1.2	(0.56)	ND	(0.43)				
Methylene Chloride	5.0B	(3.6)	1.3B	(0.71)				
Trichloroethene	140	(1.5)	ND	(0.55)				

QC Type = Lab and or field QC flags
B = Inorg CLP-Result < CRDL but > IDL / Org-detected in blank
FDB = Field duplicate B
ND = Not Detected

DL/PQL = Detection Limit or Practical Quantitation Limit
FDA = Field duplicate A
J = Val between method detection & practical quantitation limit

1/27/92 13:39:06 pbs

analytes, giving a total of 50 method spike results. All recoveries were within the quality assurance objective. Table G.6-8 summarizes the method spike recovery data.

G.6.2 Data Summary

A summary of hits in all samples analyzed by Method 8010 for the additional wells for Lockheed Beaumont is found in Table G.6-9. A summary of all qualified data is in Table G.6-10.

Table G.6-8 SUMMARY OF METHOD SPIKE RECOVERIES
LOCKHEED BEAUMONT ADDITIONAL WELLS

Analyte	Number of Spikes	Mean	Standard Deviation	Range of Results (% Recovery)	Acceptance Criteria (%Recovery)	Results Not Meeting Criteria
Method 8010						
1,1-Dichloroethane	10	79.60	12.00	(64 - 102)	(46 - 110)	0
Bromodichloromethane	10	81.52	14.82	(64 - 107)	(38 - 114)	0
Chlorobenzene	10	83.52	9.18	(67 - 95)	(47 - 109)	0
Chloroform	10	90.04	10.08	(77 - 109)	(69 - 125)	0
Trichloroethene	10	91.66	18.24	(56 - 114)	(56 - 128)	0

RADIAN CORPORATION

RADIAN CORPORATION

Table G.6-6 LOCKHEED BEAUMONT ADDITIONAL WELLS
METHOD SPIKE DUPLICATE REPORT

Compound	% Recovery MS	MSD	Ave (%) Recovery	Limit(%)	RPD(%)	Precision Limit(%)
EPA METHOD 8010						
SAMPLE CONTROL # :						
Bromodichloromethane	67	71	69.0	38 -114	5.8	30
Chlorobenzene	87	83	85.0	47 -109	4.7	30
Chloroform	77	80	78.5	69 -125	3.8	30
Trichloroethene	93	95	94.0	56 -128	2.1	30
1,1-Dichloroethane	74	78	76.0	46 -110	5.3	30
SAMPLE CONTROL # :						
Bromodichloromethane	83	64	73.5	38 -114	25.9	30
Chlorobenzene	78	77	77.5	47 -109	1.3	30
Chloroform	89	87	88.0	69 -125	2.3	30
Trichloroethene	94	91	92.5	56 -128	3.2	30
1,1-Dichloroethane	74	78	76.0	46 -110	5.3	30
SAMPLE CONTROL # :						
Bromodichloromethane	107	102	104.5	38 -114	4.8	30
Chlorobenzene	95	93	94.0	47 -109	2.1	30
Chloroform	109	105	107.0	69 -125	3.7	30
Trichloroethene	114	113	113.5	56 -128	.9	30
1,1-Dichloroethane	83	78	80.0	46 -110	5.0	30
SAMPLE CONTROL # :						
Bromodichloromethane	69	76	72.5	38 -114	9.7	30
Chlorobenzene	67	95	81.0	47 -109	+ 34.6	30
Chloroform	84	90	87.0	69 -125	6.9	30
Trichloroethene	56	66	61.0	56 -128	16.4	30
1,1-Dichloroethane	98	102	100.0	46 -110	4.0	30
SAMPLE CONTROL # :						
Bromodichloromethane	86	90	88.0	38 -114	4.5	30
Chlorobenzene	77	83	80.0	47 -109	7.5	30
Chloroform	88	92	90.0	69 -125	4.4	30
Trichloroethene	97	98	97.5	56 -128	1.0	30
1,1-Dichloroethane	64	68	66.0	46 -110	6.1	30

RPD = Relative Percent Difference
+ = Above the acceptance criteria

1/27/92 13:46:21 pbs

Table G.6-7 SUMMARY OF SURROGATE SPIKES
LOCKHEED BEAUMONT ADDITIONAL WELLS

Analyte	Number of Spikes	Mean	Standard Deviation	Range of Results (%)	Acceptance Criteria (%)	Results Not Meeting Criteria
Method 8010						
4-Bromofluorobenzene	24	90.00	22.85	(60 - 130)	(30 - 138)	0

Table G.6-9 LOCKHEED BEAUMONT ADDITIONAL WELLS HIT LIST

Location ID :	MW-29		MW-41		MW-42		MW-42	
Sample Control # :	L5063		L5072		L5065		L5066	
Date Sampled :	12/05/91		12/10/91		12/05/91		12/05/91	
QC Type :					FDA		FDB	
Analyte	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	ND	(1.8)	21	(4.0)	ND	(1.8)	ND	(1.8)
1,1-Dichloroethane	8.0	(3.9)	ND	(2.1)	5.9	(3.9)	ND	(3.9)
1,1-Dichloroethene	8.3	(4.4)	160	(2.2)	100	(4.4)	130	(4.4)
1,2-Dichloroethane	ND	(2.2)	ND	(1.1)	ND	(2.2)	ND	(2.2)
Methylene Chloride	ND	(3.6)	11B	(7.2)	ND	(3.6)	ND	(3.6)
Trichloroethene	12	(2.8)	200	(3.0)	140	(2.8)	130	(2.8)

QC Type = Lab and or field QC flags
B = Inorg CLP-Result < CRDL but > IDL / Org-detected in blank
FDB = Field duplicate B
ND = Not Detected

DL/PQL = Detection Limit or Practical Quantitation Limit
FDA = Field duplicate A
J = Val between method detection & practical quantitation limit

1/27/92 13:39:06 pbs

RADIAN CORPORATION

Table G.6-9 LOCKHEED BEAUMONT ADDITIONAL WELLS HIT LIST

Location ID :	MW-43		MW-44		MW-45		MW-45	
Sample Control # :	L5068		L5070		L5075		L5078	
Date Sampled :	12/06/91		12/12/91		12/06/91		12/11/91	
QC Type :								
Analyte	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL	Result	DL/PQL
EPA METHOD 8010 (UNITS ARE ug/L)								
1,1,1-Trichloroethane	5.9	(0.40)	9.5	(1.8)	12	(0.40)	22	(0.74)
1,1-Dichloroethane	1.3	(0.21)	6.3	(3.9)	1.1	(0.21)	ND	(1.6)
1,1-Dichloroethene	17	(0.22)	120	(4.4)	29	(0.22)	54	(1.8)
1,2-Dichloroethane	ND	(0.11)	ND	(2.2)	ND	(0.11)	ND	(0.87)
Methylene Chloride	ND	(0.72)	9.5	(3.6)	ND	(0.72)	ND	(1.4)
Trichloroethene	21	(0.30)	150	(2.8)	35	(0.30)	110	(1.1)

QC Type = Lab and or field QC flags
B = Inorg CLP-Result < CRDL but > IDL / Org-detected in blank
FDB = Field duplicate B
ND = Not Detected

DL/PQL = Detection Limit or Practical Quantitation Limit
FDA = Field duplicate A
J = Val between method detection & practical quantitation limit

1/27/92 13:39:06 pbs

RADIAN CORPORATION