3R - 23

REPORTS

DATE:

Oct. 1993

REMEDIAL ACTION PLAN

AMOCO PRODUCTION COMPANY
GALLEGOS CANYON UNIT WELL NO. 162
(K) SECTION 36-T29N-R12W-NMPM
SAN JUAN COUNTY, NEW MEXICO

PREPARED FOR
NEW MEXICO OIL CONSERVATION DIVISION

COMMISSIONED BY
AMOCO PRODUCTION COMPANY

PREPARED BY
ENVIROTECH, INC.
Environmental Scientists & Engineers
5796 US Highway 64-3014
Farmington, New Mexico 87401
(505) 632-0615

OCTOBER, 1993

PROJECT 92140/C4495

OCTOBER, 1993 PROJECT 92140/C4495

TABLE OF CONTENTS

REMEDIAL ACTION PLAN
AMOCO PRODUCTION COMPANY
GALLEGOS CANYON UNIT WELL NO. 162
SAN JUAN COUNTY, NEW MEXICO

APPENDICES

OCTOBER, 1993 PROJECT 92140/C4495

REMEDIAL ACTION PLAN
AMOCO PRODUCTION COMPANY
GALLEGOS CANYON UNIT WELL NO. 162
SAN JUAN COUNTY, NEW MEXICO

INTRODUCTION

Amoco Production Company proposes to remediate hydrocarbon contamination at Gallegos Canyon Unit Well No. 162, a Dakota gas well site located in the Northwest ¼ of the Southeast ¼ (Unit K) Section 36, T29N, R12W, NMPM, San Juan County, New Mexico (Figure 1). Hydrocarbon contamination of the shallow fresh water aquifer at this location has resulted from prior production and discharge practices. This document provides information concerning previous site assessment, limits of contamination and proposed remedial action.

Groundwater contamination at the site is suspected to have resulted from discharges of hydrocarbon liquids to unlined pits. The extent of contamination has been primarily restricted to the well site, with limited off-site movement in a down gradient direction. Presently all discharges are to lined pits or tanks.

Remedial action proposed for the site is standard pump-and-treat methodology. The depth to groundwater (≈20 feet below ground surface) and the presence of floating free product limits application of excavation or other reclamation technologies (air sparging, etc.) for initial abatement. However, future abatement may include other remedial actions.

Amoco intends to implement reclamation system installation prior to NMOCD final approval of this Remedial Action Plan in order to expedite site clean-up. However, Amoco will adhere to Plan modifications as may be required by NMOCD.

SCOPE OF SERVICES

The purpose of this Remedial Action Plan is to abate hydrocarbon contamination present in the shallow aquifer at the Amoco GCU 162 well site. The Scope of Services to meet this objective are as follows:

1) Notification of NMOCD and other appropriate regulatory authorities of the intent to remediate the referenced site.

2) Installation and operation of the proposed remedial action system for abatement of hydrocarbon contamination.

3) Assessment of the effectiveness of reclamation by scheduled monitoring and testing.

4) Documentation of abatement and site closure activities.

The following sections to this report present a site description, site assessment summary and proposed reclamation methodology.

SITE DESCRIPTION

The Gallegos Canyon Unit Well No. 162 site is located in the Northwest ¼ of the Southeast ¼, Section 36, Township 29 North, Range 12 West, NMPM, San Juan County, New Mexico. Access to the site is from County Road 5251. The location is approximately 100 yards east of Road 5251 and 1/3 mile south of the San Juan River (Figure 1).

An active Dakota natural gas well is operated at the location (Figure 2). Surface equipment includes an above ground steel production tank (approximately 300 bbl), heated separator, meter run and several below grade liquids tanks. An abandoned, unlined, earthen separator pit is present; the presence of other unlined earthen pits, such as drilling reserve, dehydrator and well blow down pits, is not evident.

Construction of the site pad was reportedly in the mid 1960's when the well was drilled and completed. The site appears to be built by elevating the drilling pad above the surrounding topography by levelling the site and moving in fill material. Surface soils are dense, sandy clays and clayey sands.

The depth to groundwater is approximately 20 feet below ground surface. The local groundwater gradient is towards the north with a slope of approximately 0.01 feet/foot. Boring logs indicate that both the vadose zone soils and aquifer lithology are interfingered sands, silts and clays. The total thickness of the aquifer at the site has not been quantitatively determined, but on-site borings indicate a minimum thickness of 18 feet.

GCU 162 is located in a rural community with single family dwellings immediately adjacent to the site on the south, west and north west. East and north of the location is a tributary to Horn Canyon wash, which flows intermittently depending on local precipitation and irrigation ditch return flow.

SITE ASSESSMENT SUMMARY

Monitor Well Installation

Initial investigation of the shallow subsurface strata and aquifer commenced in March, 1992 with the installation of five groundwater monitor wells. An additional five monitor wells were drilled in September and October, 1992 (See Figure 2, Site Plan).

Monitor wells MW-1 through MW-5 were installed with a hand auger and drive points. Construction for each of these wells was per the following general procedure:

1) Borings were advanced with a hand auger to the top of the water table, found at an approximate depth of 18 feet to 20 feet below the ground surface. If sloughing was not extensive, the boring was advanced up to 5 feet into the aquifer.

2) A steel well drive point was placed in the boring and driven into the aquifer. The well screen was positioned to straddle the water table surface.

Monitor wells MW-6 through MW-10 were installed with a hollow stem auger drill rig. Construction for these wells was as follows:

1) Borings were advanced with a hollow stem auger drill rig to a depth between 10 feet and 15 feet below the top of the water table surface. The auger flights were 3-3/4-inch ID x 7-inch OD.

2) Two inch diameter flush thread PVC screen and casing was run into the boring. Screen comprised of a 10 foot section and was positioned to straddling the water table surface. Casing was placed from the top of the screen and extended to the ground surface.

3) A graded sand filter pack was installed in the casing/boring annulus across the screened interval, and a bentonite seal was placed immediately above the filter pack. Cement/bentonite grout mix was placed in the annulus above the bentonite seal and extended to the ground surface.

Boring logs and well diagrams are included in Appendix B.

Monitor Well Sampling

The groundwater monitor system has been periodically sampled to determine water quality and the presence/absence of floating hydrocarbon. During sample events, the depth to water and hydrocarbon thickness (if present) has been measured. Prior to water sampling, three well volumes of water was removed. Samples were collected into 40 ml VOA vials, preserved with 113 Freon and expressed delivered to the laboratory. Analysis was performed by Amoco GMS Laboratory, Tulsa, Oklahoma, and included USEPA Method 8015 (modified) for Benzene, Toluene, Ethylbenzene and total Xylenes (BTEX) analysis.

All laboratory analytical reports for groundwater and hydrocarbon testing are included in Appendix C. Table 1 on the following page summarizes groundwater monitor well analytical data. Figure 3 presents a contour of the groundwater dissolved phase BTEX total based on July 15, 1993 monitoring results, and Figure 4 indicates the groundwater surface contour on this sample date.

Well monitoring has determined the presence of floating hydrocarbon in wells MW-1, MW-2, MW-6, MW-7 and MW-8 during some sample events, while wells MW-3, MW-4, MW-5, MW-9 and MW-10 have never indicated free product. Table 2 on Page 7, below, summarizes historical product thickness measurements. Static water levels, water conditions and visual descriptions for monitoring events are included in Appendix D.

In addition to groundwater sampling, free floating hydrocarbon samples were collected and submitted to Amoco GMS Laboratory for characterization to determine potential sources. Analytical reports for this testing are included in Appendix C.

Pump Test

A pump test to determine aquifer permeability was performed in December, 1992 by pumping well RW-1 and placing transducers in wells MW-6, MW-7 and MW-8 to monitor piezometric surface changes. Analysis of drawdown effects observed in the monitor wells indicates an aquifer permeability range of 2.45 gpd/ft^2 to 10.47 gpd/ft^2, with a corresponding groundwater velocity range of 2.7 ft/year to 15.0 ft/year. These values are typical of interfingered silty, sandy, clayey aquifers. Plots, calculations and data are included in Appendix D.

TABLE 1

Amoco Production Company
GCU Well No. 162 Summary Groundwater Monitoring Results
USEPA Method 8015 (Amoco Modified) for BTEX

Analytical Results in ug/L, Equivalent to Parts per Billion

Monitor Well	Sample Date	Benzene	Toluene	Ethyl Benzene	Total Xylenes
MW-3	09/04/92	ND	ND	ND	ND
	11/25/92	1	115	112	1,070
	07/15/93	27	2	ND	ND
MW-4	09/04/92	1,710	9	407	3,030
	11/25/92	1,300	288	408	3,010
	07/15/93	548	4	109	1,690
MW-5	09/04/92	ND	ND	ND	ND
	11/25/92	54	1,080	544	4,380
	07/15/93	ND	ND	ND	ND
MW-6	09/04/92	158	196	45	503
	11/25/92	154	1,010	242	1,910
	07/15/93	48	5	27	280
MW-7	09/04/92	346	1,090	96	992
	11/25/92	654	12,600	6,560	33,500
MW-8	09/04/92	119	3	11	64
	11/25/92	3,520	17,000	3,950	24,300
MW-9	11/25/93	3	13	4	30
	07/15/93	ND	ND	ND	ND
MW-10	11/25/93	ND	3	1	7
	07/15/93	ND	ND	ND	ND

ND = Not Detected at reporting limit of 1 ug/L

TABLE 2

Amoco Production Company
GCU Well No. 162 Summary Hydrocarbon Thickness
Floating on Groundwater Surface

Measured Product Thickness, in Feet

Sample Date	MW-1	MW-2	MW-6	MW-7	MW-8
03/03/92	0.62				
09/02/92	1.82	1.89			
09/04/92	1.87	1.83	ND	ND	ND
10/27/92	1.33	1.37	ND	0.05	ND
11/03/92	1.16	1.22	NA	0.08	NA
12/11/92	0.80	0.35	ND	NA	ND
12/21/92	1.07	0.30	ND	0.20	ND
12/29/92	0.92	0.46	ND	0.16	0.11
01/05/93	1.50	1.52	ND	0.11	0.50
01/15/93	1.52	1.70	ND	0.12	0.60
02/03/93	1.14	0.26	0.01	0.23	0.30
02/19/93	1.26	1.16	ND	0.24	0.20
03/05/93	1.03	1.14	0.02	0.24	0.35
03/22/93	1.18	1.16	0.02	0.24	0.20
04/05/93	1.67	2.00	ND	0.17	0.25
07/15/93	1.35	1.52	ND	0.63	0.63
07/29/93	1.50	1.42	ND	0.63	0.96

NA = Not Available
ND = Not Detected when sampled.

RECLAMATION PLAN

Reclamation proposed for the GCU 162 site is standard pump-and-treat methodology. Groundwater and free product recovery wells placed at locations within and down gradient of known contamination will be used for pumping both free phase and dissolved phase hydrocarbon. Fluid will be pumped to a coalescing separator system where contamination will be separated from groundwater. Hydrocarbon will be transferred to an above ground storage tank for refinery sales. Groundwater will be re-introduced to the aquifer via an infiltration gallery.

The following sections provide an extended description of each element of the reclamation system. A system flow chart is included as Figure 5.

Recovery Wells

Six (6) wells have been installed at the site for recovery of floating product and groundwater containing dissolved phase hydrocarbon (See Figure 2, Site Plan). Recovery well RW-1 was installed in October, 1992 and wells RW-2 through RW-6 were drilled in August, 1993. These wells were placed adjacent to existing monitor wells and boring log information was not obtained. Well completion data was maintained and has been included in Appendix B.

Each of the recovery wells was installed with a hollow stem auger drill rig utilizing 6-1/4 inch ID x 10 inch OD auger flights. Borings were advanced 15 feet to 20 feet below the top of the water table surface and completed with four inch diameter PVC screen and casing. Slotted screen was installed to a total depth of 12 feet to 20 feet below the top of the water table, and extended to approximately 5 feet above the top of the water table. Casing was run from the top of the screened interval and extended to the ground surface. Annulus fill included a graded silica sand filter pack across the screened interval, followed by a bentonite seal and cement bentonite grout mix to surface.

Recovery wells RW-2, RW-3, RW-5 and RW-6 were installed immediately down gradient from monitor wells containing measurable free floating hydrocarbons. Electric submersible pumps are to be placed in each of these wells. Pump rates will initially be at a low flow volume (anticipated to be less than 0.5 gpm per well) for recovery of floating product. Low flow rates will be maintained to minimize water table depression which could potentially introduce free product to deeper aquifer horizons. Additionally, low flow rates will minimize water treatment requirements.

Recovery wells RW-1 and RW-4 were placed at the northern boundary of the fenced well pad for recovery of dissolved phase contamination. Both of these wells will initially be pumped at flow rates similar to the free product recovery wells, previously described, to control water table depression until retrieval of all recoverable free product has been achieved. Pump rates of these two wells will then be increased to prohibit down gradient migration of dissolved phase contamination.

The actual radius of influence resulting from pumping recovery wells will be determined by drawdown effects measured in groundwater monitor wells. This drawdown data will be used to confirm dissolved phase capture; pump rates will be adjusted as necessary to effect capture.

Liquids Treatment System

Fluids pumped from recovery wells will be routed to a central separation system. Free product is to be gravity separated from water and transferred to a storage tank for sales. Water containing dissolved phase contamination is to be transferred to a coalescing tray treatment process for hydrocarbon removal.

Following treatment by the coalescing tray system, water will be transferred to an infiltration gallery constructed on the well pad site, where it will be re-introduced to the aquifer.

Monitoring Program

Groundwater treatment system influent and effluent will be sampled for laboratory analysis to determine reclamation efficiency. The system will be sampled daily for the first five days of operation to insure that water standards, as promulgated by the New Mexico Water Quality Control Commission Regulations (NMWQCCR), Section 3-103, have been achieved. Following the first five days of successful reclamation system operation, effluent sampling is to be performed on a monthly basis. Laboratory testing is to include USEPA Method 8020 for BTEX analysis.

Discharge of water to the infiltration gallery will be terminated if NMWQCCR water standards are not achieved, based on laboratory analysis. Effluent will not be placed into the infiltration gallery until repair/revisions to the system are completed and subsequent laboratory analysis determines that NMWQCCR standards have been achieved.

Each of the existing ten (10) groundwater monitor wells will be

sampled immediately prior to start-up of the reclamation system. Monitor well sampling will be on a quarterly schedule after the system is placed into operation. Groundwater laboratory testing is to include USEPA Method 8020 for BTEX analysis.

Free product and fluid level in each groundwater monitor well will be measured on a weekly basis until all known free product has been recovered. Fluid level monitoring will subsequently be included in quarterly sample events.

Reclamation Termination

Reclamation will be terminated when each of the ten (10) groundwater monitor wells at the site indicate NMWQCCR standards have been achieved. If laboratory testing results indicate that it will not be possible to reach NMWQCCR standards with the proposed reclamation system, Amoco will petition NMOCD to approve either, (1) termination of reclamation, or (2) installation of an alternative corrective action system.

CLOSURE AND LIMITATIONS

This Remedial Action Plan has been prepared for the exclusive use of Amoco Production Company as it pertains to the Gallegos Canyon Unit Well No. 162, located in the Northwest ¼ of the Southeast ¼, Section 36, Township 29 North, Range 12 West, NMPM, San Juan County, New Mexico.

The Plan is based on information provided by Amoco concerning subsurface hydrogeology, lithology and groundwater contamination at the site. Due to possible unforeseen subsurface variations between wells, borings and sample points, there is no guarantee that execution of this Plan will result in restoration of contaminated groundwater to desired water quality standards.

All work will be performed in accordance with generally accepted professional practices in geotechnical, environmental and petroleum engineering.

Respectfully submitted,
Envirotech, Inc.

Jeffrey C. Blagg, P.E.
Geological Engineer

Reviewed by:

Michael K. Lane, P.E.
Geological Engineer

JCB/162RAP1.DOC

References:

"New Mexico Water Quality Control Commission Regulations", Parts 1, 3 & 5, as amended through August 18, 1991.

APPENDIX A

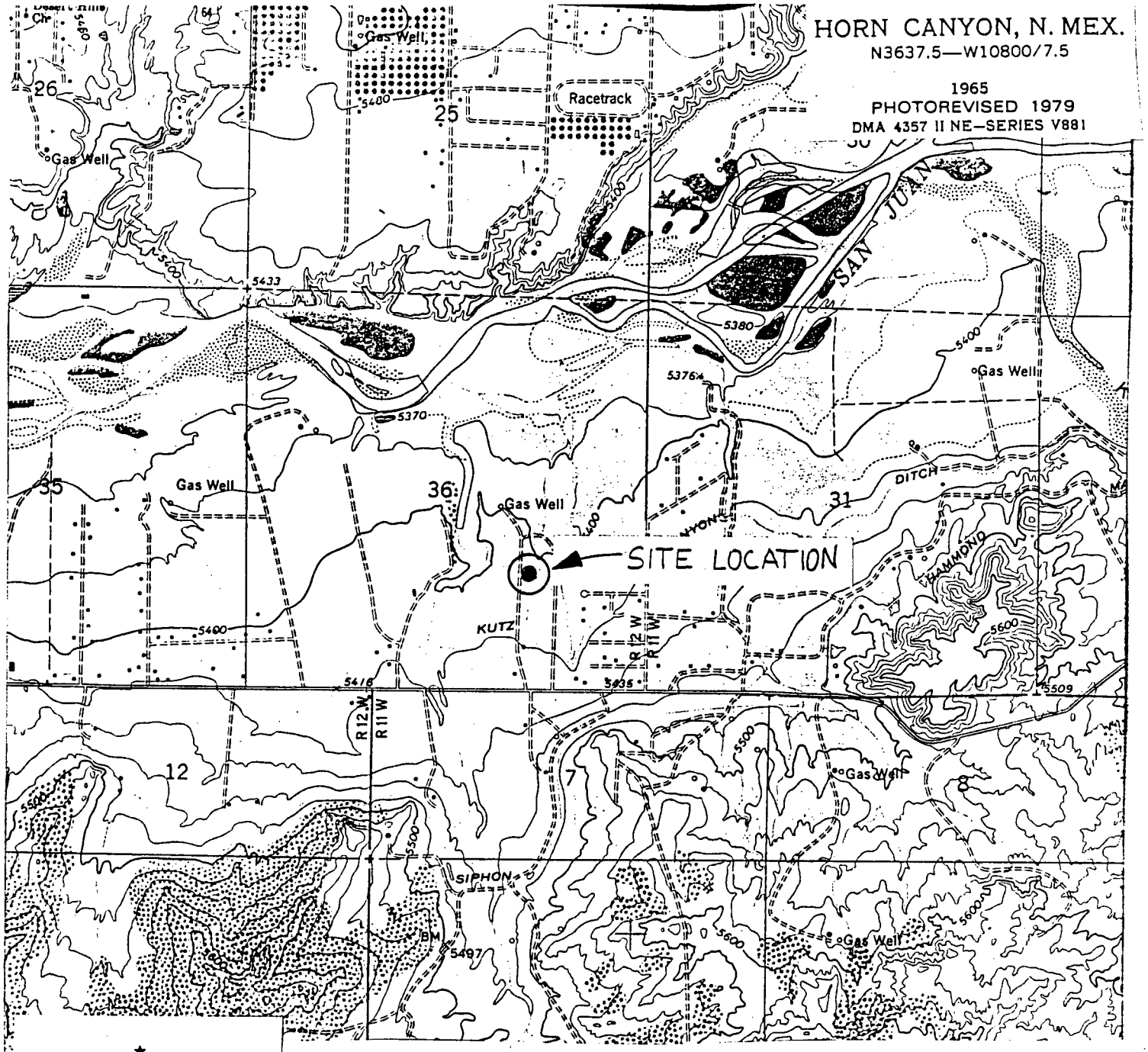
FIGURE 1 - SITE LOCATION MAP

FIGURE 2 - SITE MAP

FIGURE 3 - TOTAL BTEX CONTOUR

FIGURE 4 - GROUNDWATER SURFACE CONTOUR

FIGURE 5 - RECLAMATION SYSTEM FLOW DIAGRAM



AMOCO PRODUCTION CO.
GCU 162 WELL SITE
SAN JUAN CO., NEW MEXICO

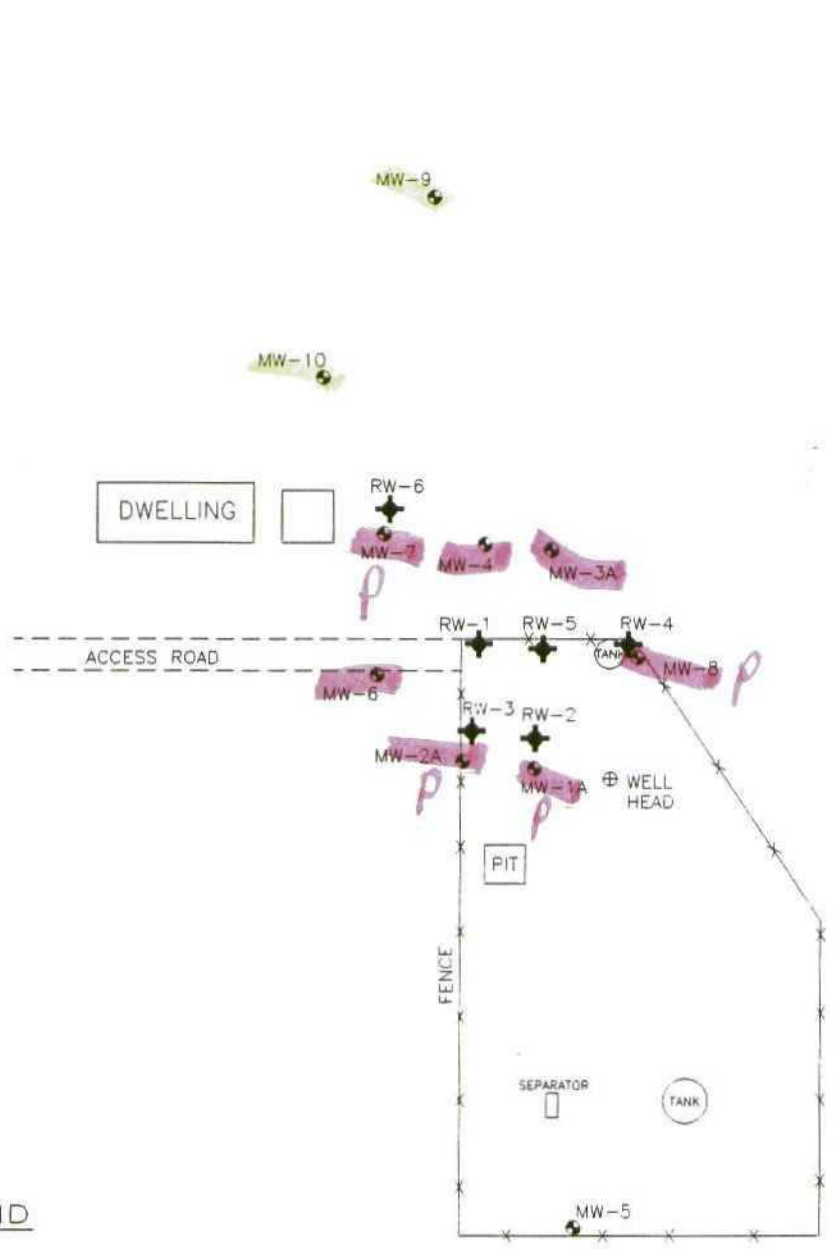
PROJECT NO: 92140 SEPT. 93

ENVIROTECH INC.
ENVIRONMENTAL SCIENTISTS & ENGINEERS
5796 U.S. HIGHWAY 64-3014
FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615

LOCATION MAP

FIGURE 1 | DRWN BY JCB

SITE | PROJ. MANG. JCB



LEGEND

RW-6 RECOVERY WELL

MW-7 GROUNDWATER MONITOR WELL

0 100 200 FEET

AMOCO PRODUCTION CO.
GCU 162 WELL SITE
SAN JUAN CO., NEW MEXICO

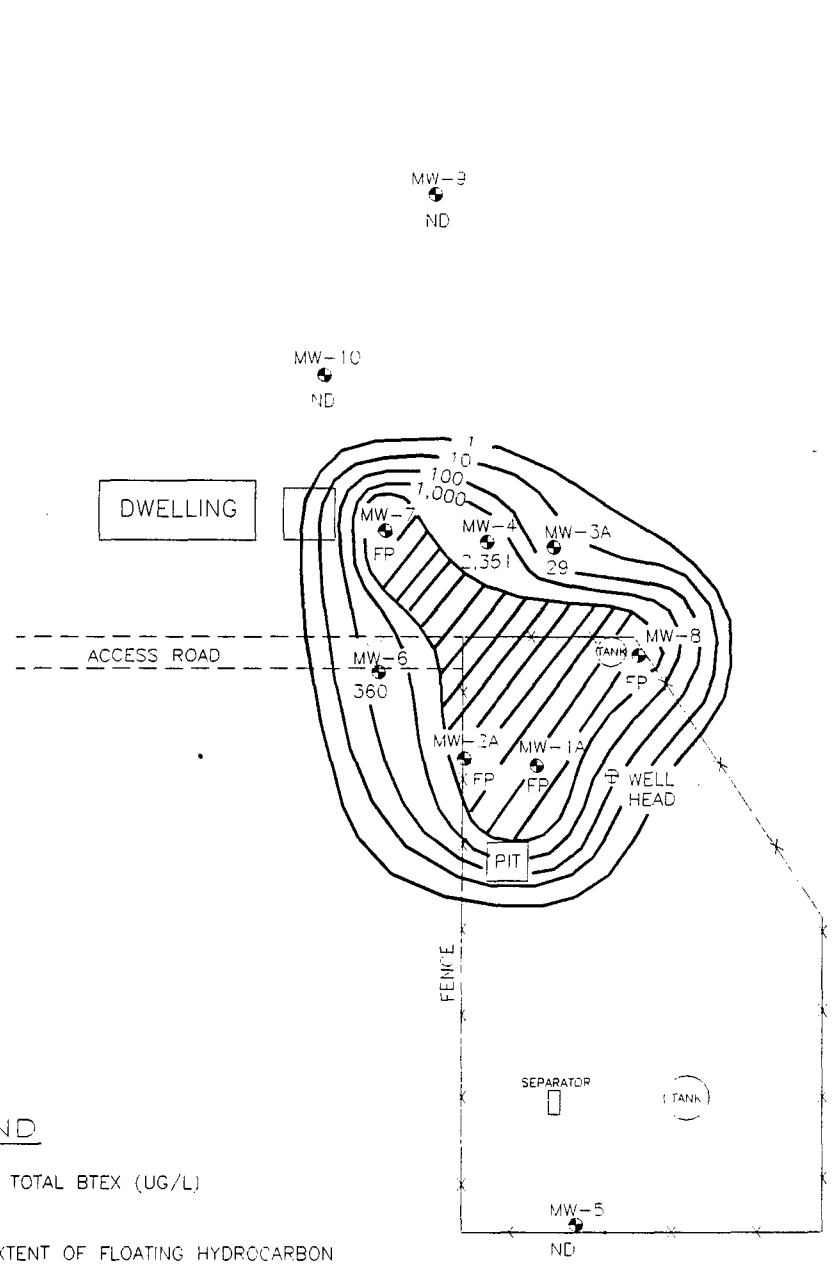
PROJECT NO: 92140 JULY, 1993

ENVIROTECH INC.

ENVIRONMENTAL SCIENTISTS & ENGINEERS
5796 U.S. HIGHWAY 64-3014
FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615

SITE MAP

FIGURE 2	DRWN BY: JCB
162SITE	PROJ MANG: JCB



LEGEND

10 — CONTOUR OF TOTAL BTEX (UG/L)

ESTIMATED EXTENT OF FLOATING HYDROCARBON

MW-7
360 — GROUNDWATER MONITOR WELL W/ TOTAL BTEX VALUE (UG/L)

ND = NO BTEX DETECTED

FP = FREE FLOATING HYDROCARBON ON WATER SURFACE

0 100 200 FEET

AMOCO PRODUCTION CO.
GCU 162 WELL SITE
SAN JUAN CO., NEW MEXICO

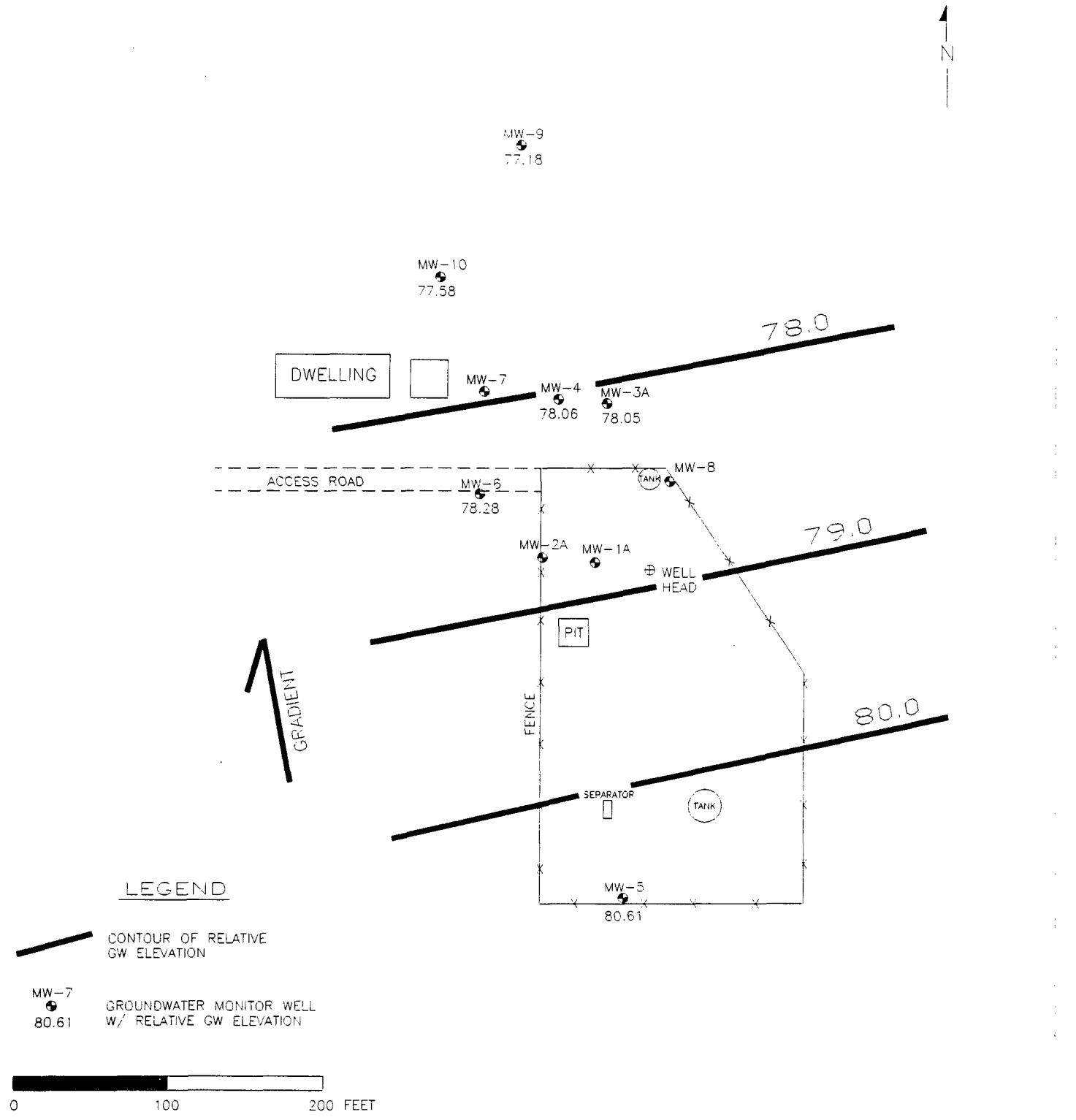
PROJECT NO: 92140 SEPT. 1993

ENVIROTECH INC.

ENVIRONMENTAL SCIENTISTS & ENGINEERS
5796 U.S. HIGHWAY 64-3014
FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615

TOTAL BTEX CONTOUR 7/15/93

FIGURE 3	DRWN BY JCB
162SITE7	PROJ. MGR. JCB



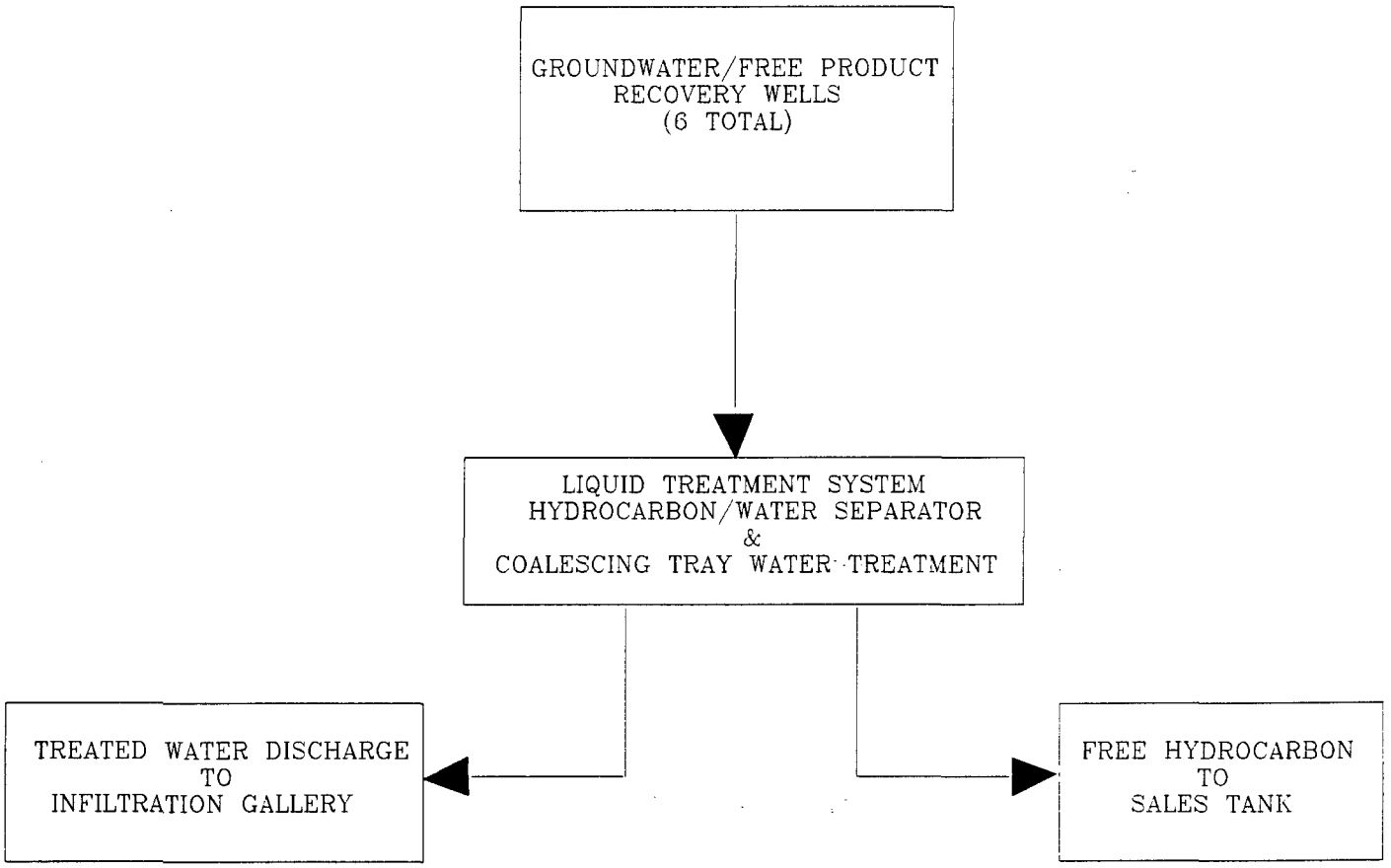
AMOCO PRODUCTION CO.
GCU 162 WELL SITE
SAN JUAN CO. NEW MEXICO

PROJECT NO: 92140 JULY, 1993

ENVIROTECH INC.
ENVIRONMENTAL SCIENTISTS & ENGINEERS
5796 U.S. HIGHWAY 64-3014
FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615

GW SURFACE CONTOUR 7/15/93

FIGURE 4	DRWN BY: JCB
162SITE6	PROJ. MANG: JCB



AMOCO PRODUCTION CO.
GCU 162 WELL SITE
SAN JUAN CO., NEW MEXICO

PROJECT NO: 92140 SEPT. 1993

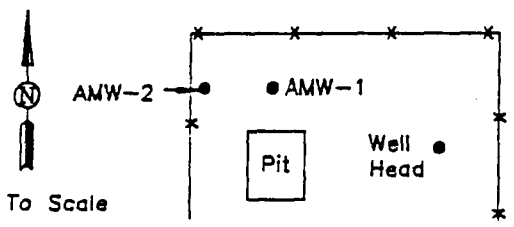
ENVIROTECH INC.
ENVIRONMENTAL SCIENTISTS & ENGINEERS
5796 U.S. HIGHWAY 64-3014
FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615

RECLAMATION SYSTEM
FLOW DIAGRAM

FIGURE 5	DRWN BY: JCB
162SITE8	PROJ MANG: JCB

AMW-1 Lithologic Log

LOCATION MAP:



___1/4 ___1/4 ___1/4 ___1/4 S___ T___ R___

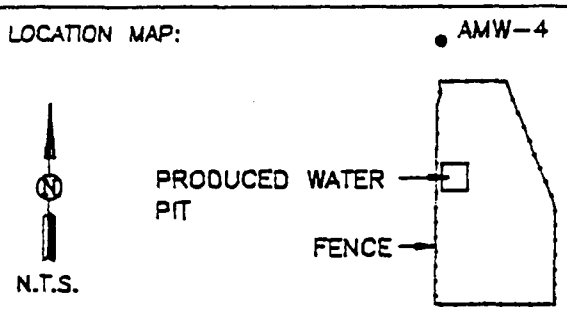
SITE ID: GCU-162 LOCATION ID: AMW-1
SITE COORDINATES (ft.):
N ___ E ___
GROUND ELEVATION (ft. MSL):
STATE: N.M. COUNTY: San Juan
DRILLING METHOD: Power Auger/Hand Auger
DRILLING CONTR.:
DATE STARTED: 3-3-92 DATE COMPLETED: 3-3-92
FIELD REP.: M. Mohorcich
COMMENTS: Old #3 is Our #1, 35' North Of Pit Fencing
Bill Olsen's Old #3

LOCATION DESCRIPTION: North Of Hammond Cty Road 5500

DEPTH (ft.)	LITH.	REC	SAM	RUN #	RUN FROM	RUN TO	SAMPLE I.D.	SAMPLE TYPE	USCS	VISUAL CLASSIFICATION
										0–6' Sand: moderate yellowish brown 10 YR 5/4 to dusky yellow 5 Y 6/4 70% medium to coarse grain with 10% smaller and 305 larger grains, (very coarse) unconsolidated, moderate sorting to poorly sorted.
5										6–8' Clayey Sand: light olive gray 5 Y 5/2 to dusky yellow 5 Y 6/4. Slight to moderate plastic clay with approximately 60% fine grain sands.
										8–13' Sand: light olive gray 5 Y 5/2 to dusky yellow 5 Y 6/4. Fine to medium grained moderate sorting with some hydrocarbon smell from 10–13'.
10										
										13–16' Sandy Clay: greenish black 5 GY 2/1 very fine sand in a slight to moderately plastic clay (60%). Slight rust streaks and black organic laminations, heavy staining and odor.
15										
										16–20' Sand: light olive gray 5 Y 5/2 fine to medium grained approximately 60–70% medium and 30% fine, quartz moist at 16–18', saturated, water at 19', odor.
20										
										22' T.D. at 22' – drove well pt. from 20'.
25										
30										

AMW-4 LITHOLOGIC LOG

LOCATION MAP:



___1/4 ___1/4 ___1/4 ___1/4 S 36 T 29N R 12W

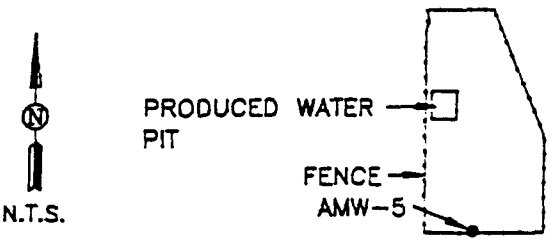
SITE ID: GCU-162 LOCATION ID: AMW-4
SITE COORDINATES (ft.):
N ____ E ____
GROUND ELEVATION (ft. MSL):
STATE: N.M. COUNTY: SAN JUAN
DRILLING METHOD: HAND AUGER
DRILLING CONTR.:
DATE STARTED: 3-27-92 DATE COMPLETED: 3-27-92
FIELD REP.: M. MOHORCICH
COMMENTS:

LOCATION DESCRIPTION:

DEPTH (FT.)	LITH.	REC	SAM	RUN #	RUN FROM	RUN TO	SAMPLE I.D.	SAMPLE TYPE	USCS	VISUAL CLASSIFICATION
										0–1.5' SILTY SAND: DARK YELLOWISH BROWN 10YR 4/2, MOIST, VERY FINE GRAIN, WELL SORTED, UNCONSOLIDATED. COLOR CHANGE AT 1' TO MODERATE YELLOWISH BROWN 10YR 5/4 VERY FINE GRAIN SAND.
5										1.5–7.0' SAND: MODERATE YELLOWISH BROWN 10YR 5/4, FINE TO COARSE GRAINED, ~70% FINE TO MEDIUM, 30% COARSE SAND, POORLY SORTED, DRY, UNCONSOLIDATED, COLOR CHANGE AT 3.2–7.0' TO DUSKY YELLOW 5Y 6/4.
10										7.0–11' CLAYEY SILT: LIGHT OLIVE GRAY 5Y 5/2, ~30% CLAY, MODERATELY PLASTIC, SLIGHTLY MOIST, SEMI CONSOLIDATED.
										11.0–13.0' SILTY SAND: DUSKY YELLOW 5Y 6/4, VERY FINE TO FINE GRAIN (70%), WELL SORTED, SLIGHTLY MOIST, UNCONSOLIDATED.
15										13.0–18.5' SAND: DUSKY YELLOW 5Y 6/4 FINE TO MEDIUM GRAIN, MOIST, UNCONSOLIDATED. HYDROCARBON STAIN AND ODOR AT 17.9', OLIVE GRAY 5Y 4/2, MEDIUM GRAIN, H2O AT 18'.
										18.5–19.0' SILTY SAND: LIGHT OLIVE GRAY 5Y 5/2, SATURATED, SLIGHTLY CONSOLIDATED.
20										19.0–20.0' SAND: LIGHT OLIVE GRAY 5Y 5/2, TO DUSKY YELLOW 5Y 6/4, MEDIUM TO COARSE GRAIN, SUBANGULAR SLOUGHING IN AT 20'.
										T.D. AT 20'.
25										
30										

AMW-5 LITHOLOGIC LOG

LOCATION MAP:



___1/4 ___1/4 ___1/4 ___1/4 S 36 T 29N R 12W

SITE ID: GCU 162 LOCATION ID: AMW-5
SITE COORDINATES (ft.):
N ____ E ____
GROUND ELEVATION (ft. MSL):
STATE: N.M. COUNTY: SAN JUAN
DRILLING METHOD: HAND AUGER
DRILLING CONTR.:
DATE STARTED: 3-27-92 DATE COMPLETED: 3-27-92
FIELD REP.: M. MOHORCICH
COMMENTS: UPGRADIENT WELL INSIDE FENCE AT SOUTH END OF SITE

LOCATION DESCRIPTION:

DEPTH (FT.)	LITH.	REC	SAM	RUN #	RUN FROM	RUN TO	SAMPLE I.D.	SAMPLE TYPE	USCS	VISUAL CLASSIFICATION
										0–1.5' SILTY SAND: DARK YELLOWISH BROWN 10YR 4/2, MOIST, SLIGHTLY PLASTIC, WELL SORTED MEDIUM GRAIN SAND.
										1.5–2.0' SAND: DARK YELLOWISH ORANGE 10YR 6/6, FINE TO MEDIUM GRAIN, SLIGHTLY $CaCo_3$ CEMENTED BUT UNCONSOLIDATED.
5										2.0–9.0' SAND: DUSK YELLOW 5Y 6/4, VERY FINE TO COARSE, MOSTLY FINE TO MEDIUM(~70%), UNCONSOLIDATED, POORLY SORTED.
										9.0–11.0' CLAYEY SILT: LIGHT OLIVE GRAY 5Y 5/2 TO DUSKY YELLOW 5Y 6/4, MOIST, MODERATE PLASTICITY.
10										
										11.0–15.0' CLAYEY SILTY SAND & SAND: STRINGERS OF CLAYEY SILTY SANDS ALTERNATING IN PRIMARILY MEDIUM GRAIN SANDS, LIGHT OLIVE GRAY TO DUSKY YELLOW WITH RUST LAMINATIONS THROUGHOUT, MODERATELY SORTED, UNCONSOLIDATED. * H2O ENCOUNTERED AT 20'
15										
										15.0–25.0' CLAYEY SILT: LIGHT OLIVE GRAY 5Y 5/2, MODERATELY PLASTIC, SEMICONSOLIDATED.
20										
										T.D. AT 25' DUE TO BOREHOLE SLOUGHING
25										
30										

GROUNDWATER MANAGEMENT SECTION
Amoco Corporation - Environmental Affairs and Safety Department

San Juan Co., NM 3 3/4" ID

Well No. MW-6 | Date Drilled 9/2/92 | Driller's Envirotech, Inc.

Project No. Amoco GCU Com "F" #162 | Location s NW/4, SE/4 (J), Sec 36 T29N R12W | Drilling Method ~~3 1/4~~" ID Hollow Stem Auger

Well Type Observation | Hole Diameter s" 7 7/8" OD | Sample Type Split Spoon | Boring Depth 27'

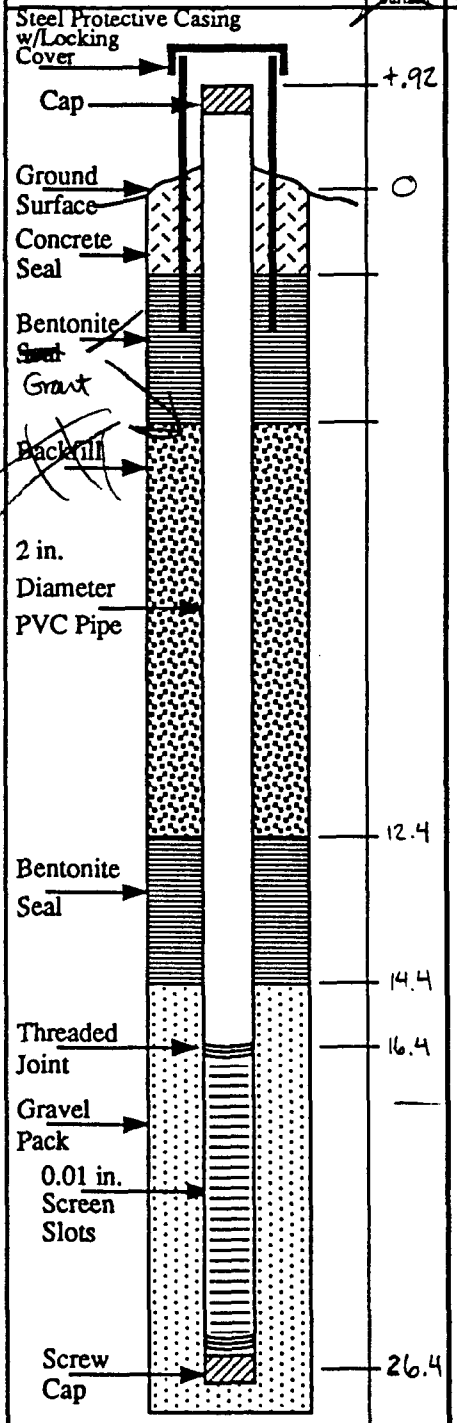
Casing: Material Schedule 40 PVC | Type Schedule 40, screw joints | Diameter 2" | Length 17.3'

Screen: Material Schedule 40 PVC | Depth 16-26 | Slot Size 0.010 | Diameter 2" | Length 10'

Filter Pack Material Colorado Silica Sd #10 | Upper Seal Type Bentonite/Grout

Backfill Material Bentonite/Grout | Lower Seal Type Bentonite Gel

Ground Surface Elevation 97.76 | Top of Casing Elevation 98.68 | Logger ~~K.P. Heaton~~ G.W. Barker



Depth (Soil Type) Feet	Sample Interval	Soil Description	"N" Value	PID Headspace (ppm)
0				
2		SAND: Lt Brown, Med grained, darker w/silt upper 1'. No Odors		NA
4				
6	5-6.5'	SAND: Lt. Brown, Med-Fine Grained No Odors		2.1
8				
10	10-11.5'	Sandy Silt: Some Clay to Abundant Clay, No Odors.		5.1
12				
14				
16	15-16.5'	SAND: Gray-Black, Med-Grained, Some Silt, Moist, HC odor		388
18				
20	20-21.5'	SAND: Tan-Brown, Med-Coarse Grained, wet, No Odors		NA
22				
24				
25				
27		TD 27'		

Att Nelson

pg 1 of 2

9-2-92 (WED) Amoco

Boring #1 to 36.5 TD (auger refusal) — Driller Mike Donohue, helper Earnest Trujillio

Well #1 to 27' set well — 7:00–7:30 — 12.5 hrs

MW #6
- 5' interval sampling (2" spoon)
- 1, 10' screen
- 2, 10' risers
- Sand, 3 bags
- bentonite gel, 1 bag
- ready-mix, 6 bags
- well protector, 1
- 2" pvc end cap, 1
- 2" twist cap, 1
- lock, 1

E-70 Drill rig
E-18 Support vehicle

9-3-92 (Thurs)

Well #2 to 25' set well — 7:30–7:30 — 12.0 hrs

MW #7
- 5' interval split-spoon sampling
- 1, 10' screen
- 2, 10' risers
- Sand, 3 bags
- bentonite gel, 1 bag
- ready-mix, 6 bags
- well protector, 1
- 2" pvc end cap, 1
- 2" twist cap, 1
- lock (2526), 1

9-3-92 (thur)

* well # 3 to 25' set well

- 5' interval split spoon sampling
- 1, 10' screen
- 2, 10' risers
- Sand, 3 bags
- bentonite gel, 1 bag
- ready-mix, 6 bags
- well protector, 1
- 2" pvc and cap, 1
- 2" Twist cap, 1
- lock (2526), 1

MW #8

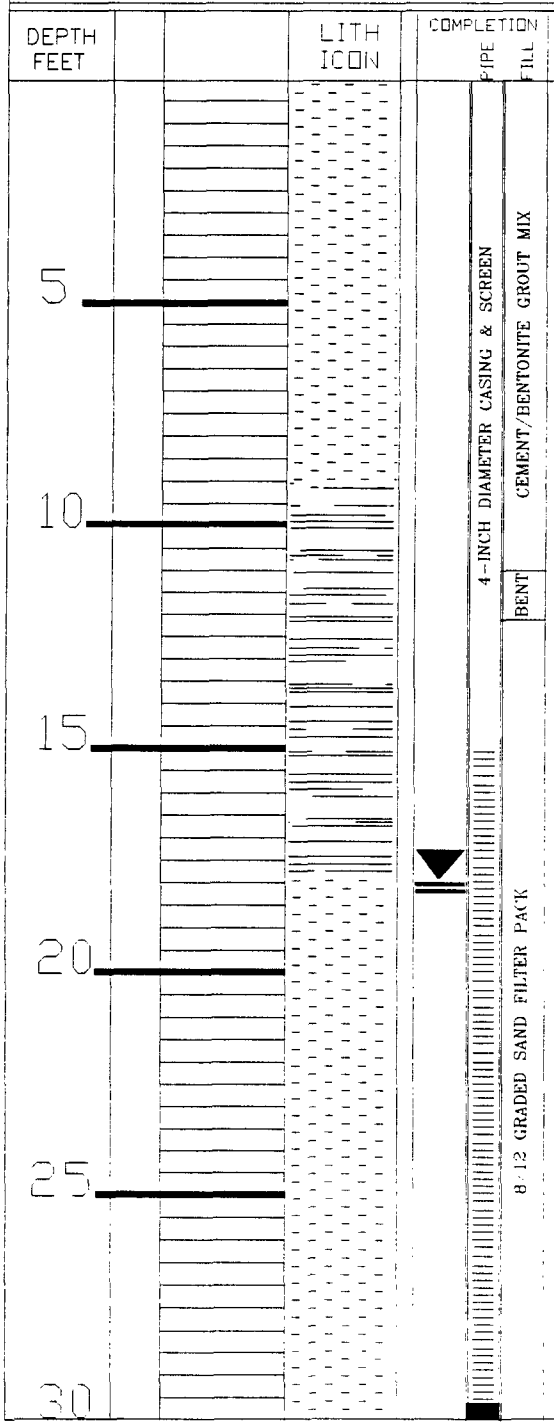
ENVIROTECH Inc.

5796 US HWY. 64, FARMINGTON, NM 87401
(505) 632-0615

BORING & COMPLETION LOG – RW#2

BORING No: RW NO. 2
JOB No: 92140
PAGE No: B1
LOCATION: GCU 162
DATE START: 8-24-93
DATE FINISH: 8-24-93
DRILLER: DONOHUE
PREPARED BY: BLAGG

PROJECT: AMOCO GCU 162 RECLAMATION
CLIENT: AMOCO PRODUCTION COMPANY
CONTRACTOR: ENVIROTECH, INC
EQUIPMENT USED: TRUCK MOUNTED CME-55 HOLLOW STEM AUGER DRILL



FIELD CLASSIFICATION AND REMARKS

YELLOW/GREEN CLAYEY SILTY SAND, DRY TO MOIST, MINOR COHESIVE, FIRM.

SAME AS ABOVE, EXCEPT MOIST

YELLOW/GREEN SILTY SANDY CLAY, PLASTIC, MOIST, WITH STRINGERS OF SILTY CLAYEY SAND.

SAME AS ABOVE, EXCEPT VERY MOIST.

SAME AS ABOVE, EXCEPT BLACK TO GREY COLOR, ODOR OF HYDROCARBON CONTAMINATION.

SILTY, CLAYEY SAND, WATER SATURATED.

SAME AS ABOVE TO 30 FEET

DRAWING: AMOCO/RW2LOG
DATE: 9-93
DWN BY: JOB

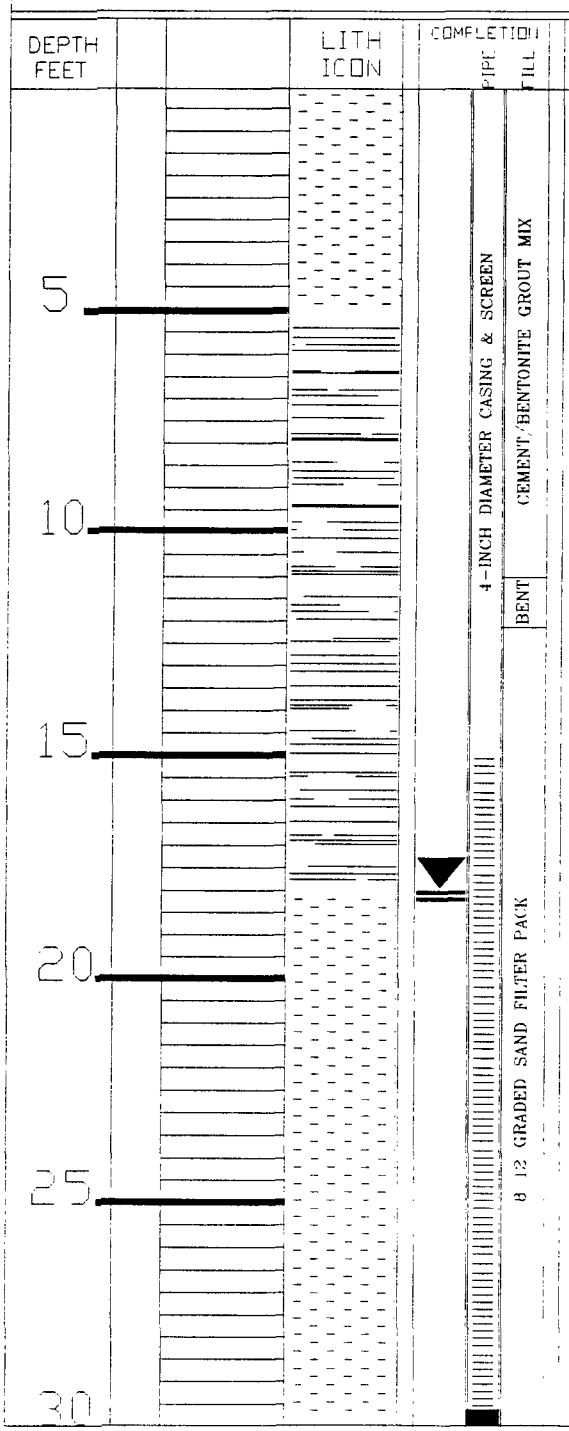
ENVIROTECH Inc.

5796 US HWY. 64, FARMINGTON, NM 87401
(505) 632-0615

BORING & COMPLETION LOG – RW#3

SOPING No: RW NO. 3
JOB No: 92140
PAGE No: B1
LOCATION: GCU 162
DATE START: 8-24-93
DATE FINISH: 8-24-93
DRILLER: DONOHUE
PREPARED BY: BLAGG

PROJECT: AMOCO GCU 162 RECLAMATION
CLIENT: AMOCO PRODUCTION COMPANY
CONTRACTOR: ENVIROTECH, INC.
EQUIPMENT USED: TRUCK MOUNTED CME-55 HOLLOW STEM AUGER DRILL



FIELD CLASSIFICATION AND REMARKS

YELLOW/GREEN COARSE GRAINED SAND, DRY TO MOIST, NON COHESIVE, FIRM.

YELLOW/GREEN SILTY SANDY CLAY, PLASTIC, MOIST, WITH STRINGERS OF SILTY CLAYEY SAND.

SAME AS ABOVE, EXCEPT BLACK TO GREY COLOR, ODOR OF HYDROCARBON CONTAMINATION.

SILTY, CLAYEY SAND, WATER SATURATED.

SAME AS ABOVE, TD 30 FEET.

DRAWING: AMOCO/RW3LOG
DATE: 9/93
DWN BY: JOB

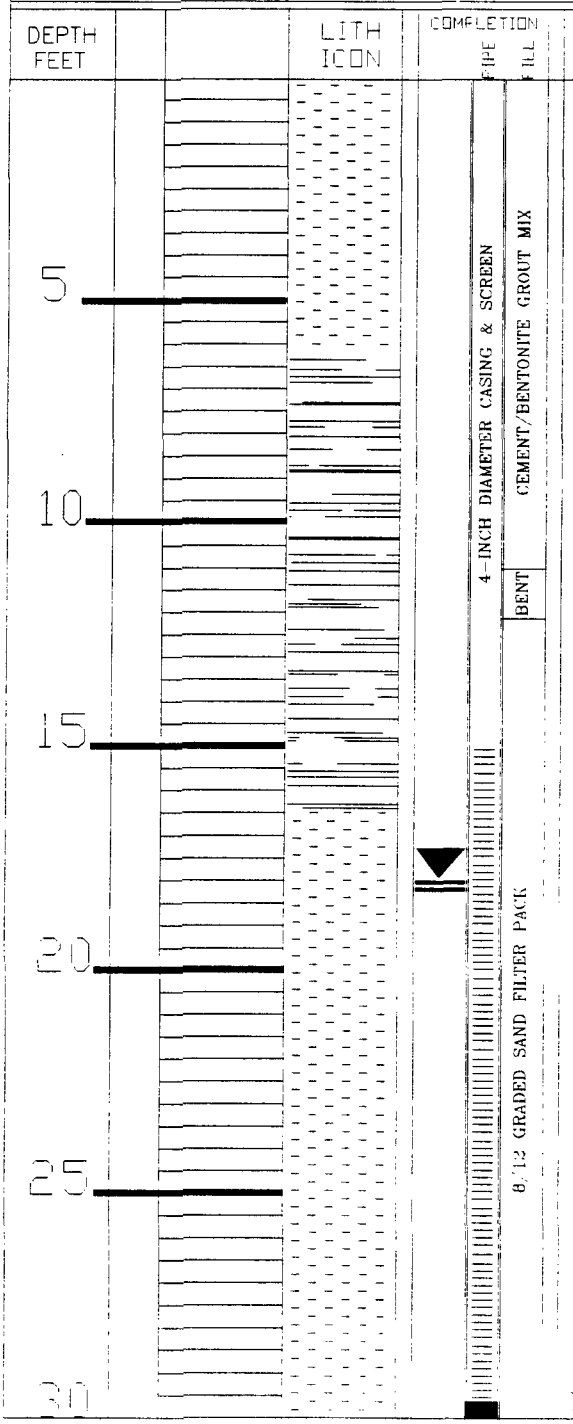
ENVIROTECH Inc.

5796 US HWY. 64, FARMINGTON, NM 87401
(505) 632-0615

BORING & COMPLETION LOG — RW#4

BORING No: RW NO. 4
JOB No: 92140
PAGE No: B1
LOCATION: GCU 162
DATE START: 8-25-93
DATE FINISH: 8-25-93
DRILLER: DONOHUE
PREPARED BY: BLAGG

PROJECT: AMOCO GCU 162 RECLAMATION
CLIENT: AMOCO PRODUCTION COMPANY
CONTRACTOR: ENVIROTECH, INC.
EQUIPMENT USED: TRUCK MOUNTED CME-55 HOLLOW STEM AUGER DRILL



FIELD CLASSIFICATION AND REMARKS

YELLOW/GREEN CLAYEY SILTY SAND, DRY TO MOIST, MINOR COHESIVE, FIRM.

YELLOW GREEN SILTY SANDY CLAY, PLASTIC, MOIST, WITH STRINGERS OF SILTY CLAYEY SAND.

SAME AS ABOVE, EXCEPT MOIST.

SAME AS ABOVE, EXCEPT VERY MOIST.

SAME AS ABOVE, EXCEPT BLACK TO GREY COLOR, ODOR OF HYDROCARBON CONTAMINATION.

SILTY CLAYEY SAND, WATER SATURATED.

SAME AS ABOVE TO 30 FEET

DRAWING: AMOCO.RW4LOG
DATE: 9/93
DWN BY: MCB

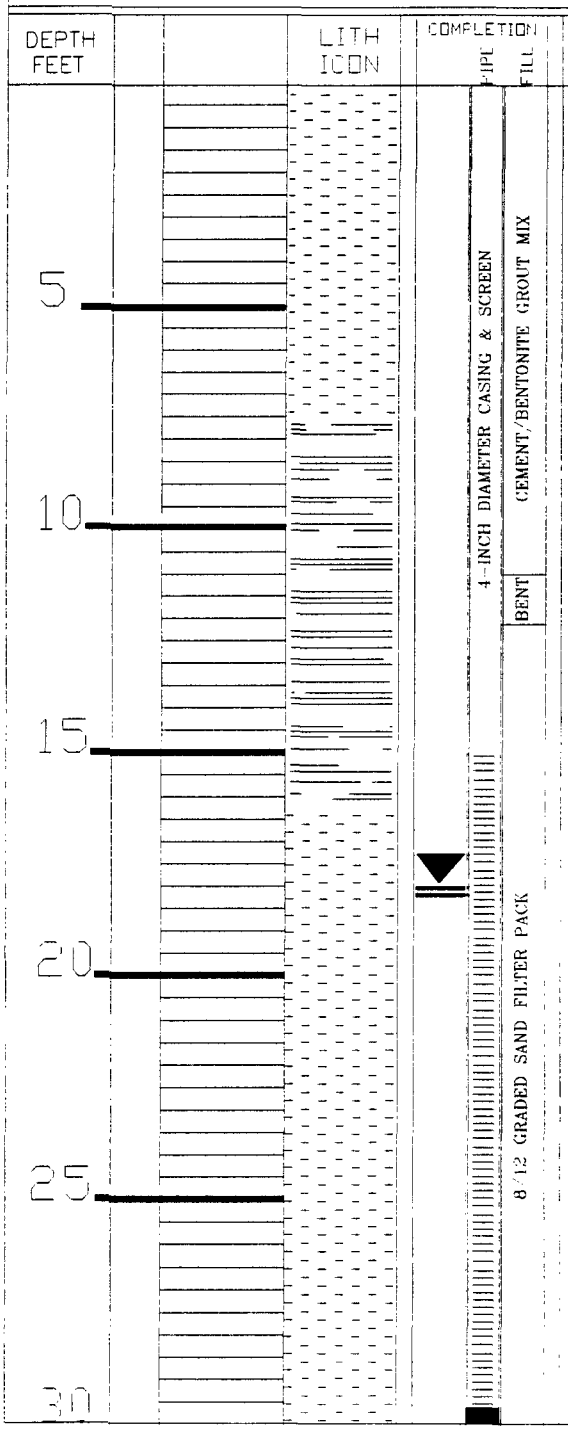
ENVIROTECH Inc.

5796 US HWY. 64, FARMINGTON, NM 87401
(505) 632-0615

BORING & COMPLETION LOG – RW#5

BORING No: RW NO. 5
JOB No: 92140
PAGE No: B1
LOCATION: GCU 168
DATE START: 8-25-93
DATE FINISH: 8-25-93
DRILLER: DONOHUE
PREPARED BY: BLAGG

PROJECT: AMOCO GCU 168 RECLAMATION
CLIENT: AMOCO PRODUCTION COMPANY
CONTRACTOR: ENVIROTECH, INC.
EQUIPMENT USED: TRUCK MOUNTED CME-55 HOLLOW STEM AUGER DRILL



FIELD CLASSIFICATION AND REMARKS

YELLOW/GREEN CLAYEY SILTY SAND, DRY TO MOIST, MINOR COHESIVE, FIRM.

YELLOW/GREEN SILTY SANDY CLAY, PLASTIC, MOIST, WITH STRINGERS OF SILTY CLAYEY SAND.

SAME AS ABOVE, EXCEPT MOIST.

SAME AS ABOVE, EXCEPT VERY MOIST.

SAME AS ABOVE, EXCEPT BLACK TO GREY COLOR, ODOR OF HYDROCARBON CONTAMINATION.

SILTY CLAYEY SAND, WATER SATURATED.

SAME AS ABOVE TO 30 FEET

DRAWING: AMOCO/RW5LOG
DATE: 9/93
DWN BY: JCB

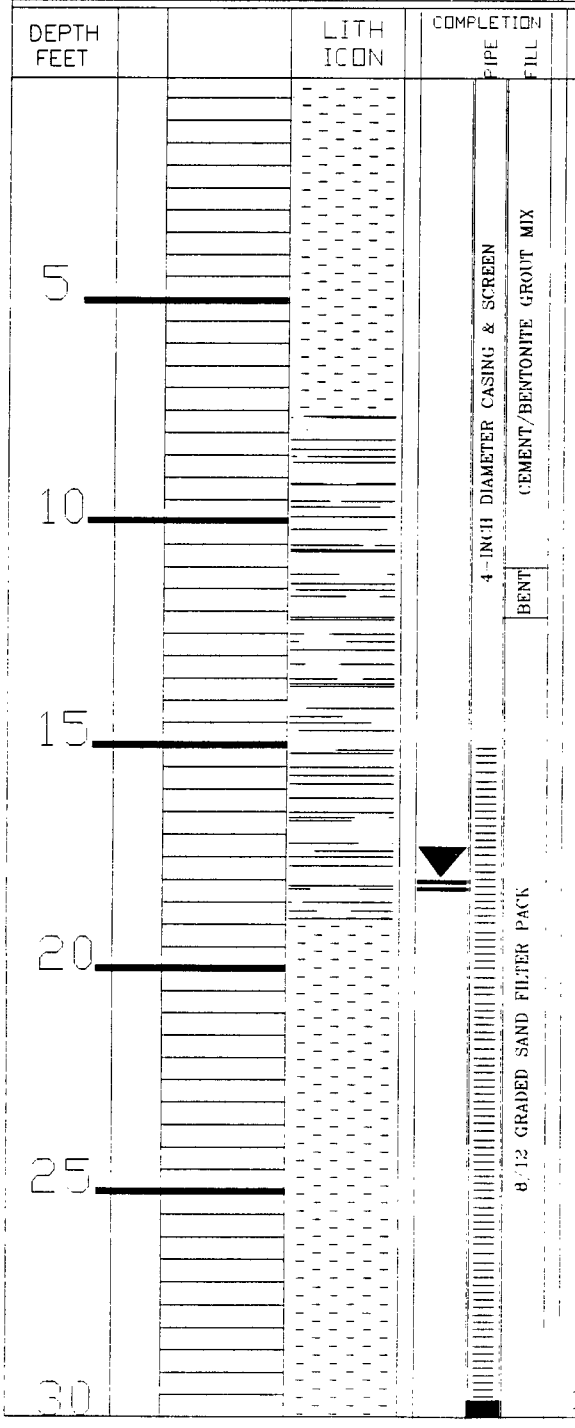
ENVIROTECH Inc.

5796 US HWY. 64, FARMINGTON, NM 87401
(505) 632-0615

BORING & COMPLETION LOG – RW#6

BORING No: FW NO. 6
JOB No: 92140
PAGE No: B1
LOCATION: GCU 162
DATE START: 8-26-93
DATE FINISH: 8-26-93
DRILLER: DONOHUE
PREPARED BY: BLAGG

PROJECT: AMOCO GCU 162 RECLAMATION
CLIENT: AMOCO PRODUCTION COMPANY
CONTRACTOR: ENVIROTECH, INC.
EQUIPMENT USED: TRUCK MOUNTED CME-55 HOLLOW STEM AUGER DRILL



FIELD CLASSIFICATION AND REMARKS

YELLOW/GREEN CLAYEY SILTY SAND, DRY TO MOIST, MINOR COHESIVE, FIRM.

YELLOW/GREEN SILTY SANDY CLAY, PLASTIC, MOIST, WITH STRINGERS OF SILTY CLAYEY SAND.

SAME AS ABOVE, EXCEPT MOIST

SAME AS ABOVE, EXCEPT VERY MOIST

SAME AS ABOVE, EXCEPT BLACK TO GREY COLOR, ODOR OF HYDROCARBON CONTAMINATION.

SILTY CLAYEY SAND, WATER SATURATED

SAME AS ABOVE TO 30 FEET

DRAWING: AMOCO RW6LOG
DATE: 9/93
DWN BY: JCB

APPENDIX C

LABORATORY ANALYTCIAL REPORTS

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR DISSOLVED HYDROCARBONS

Location: GCU Com F 162, Farmington, NM

Lab#: 93W1076 Method: Amoco Modified 8015

Date sampled: 07/15/93 Date received: 07/16/93

Sample ID	Benz	Tolu	EtBz	Xyls	BTEX TOTAL
Trip blank	ND	ND	ND	ND	ND
MW-3	0.027	0.002	ND	ND	0.029
MW-4	0.548	0.004	0.109	1.03	1.69
MW-5	ND	ND	ND	ND	ND
MW-6	0.048	0.005	0.027	0.280	0.360
MW-9	ND	ND	ND	ND	ND
MW-10	ND	ND	ND	ND	ND
MW-10 Dup.	ND	ND	ND	ND	ND

NOTES
1. Unit of data is mg/L.
2. ND = not detected at or above reporting limit.
3. Benz = benzene, Tolu = toluene, EtBz = ethylbenzene, Xyls = xylenes,
4. Reporting limit for benzene, toluene, ethylbenzene, and each xylene is 0.001 mg/L.

Comments:

Sampled by: EnviroTech - Nelson Velez

Date analyzed: 07/24/93 Checked by: T. G. Miller

GROUNDWATER MANAGEMENT SECTION

AMOCO CORPORATION - ENVIRONMENTAL AFFAIRS AND SAFETY

CHAIN OF CUSTODY RECORD

W1076

LOCATION SAMPLED: (Use AMOCO Facility Numbers When Known)

FACILITY NAME GCU com F 162 AMOCO FACILITY # _____

ADDRESS STREET _____ CITY _____ STATE _____

SAMPLER Nelson Velez AFFILIATION Envirotech, Inc.

SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	SAMPLE TYPE (SOIL, WATER, PRODUCT)	PRESERVATION METHOD (FREON, ICE PACKS, NONE)	SAMPLE CONTAINER DESCRIPTION	NUMBER OF VIALS	ANALYSES REQUESTED
mw #3	7/15/93	1155	WATER	FREON	40 mL VOA	1	BTEX MODIFIED 8015
mw #4	7/15/93	1145	WATER	FREON	40 mL VOA	1	" " "
mw #5	7/15/93	1240	WATER	FREON	40 mL VOA	1	" " "
mw #6	7/15/93	1225	WATER	FREON	40 mL VOA	1	" " "
mw #9	7/15/93	1255	WATER	FREON	40 mL VOA	1	" " "
mw #10	7/15/93	1315	WATER	FREON	40 mL VOA	2	" " "
TRIP BLANK	-	-	FREON	NONE	2 mL VOA	1	" " "

REMARKS:

1 RELINQUISHED BY:	1. DATE	1. RECEIVED BY:	3. RELINQUISHED BY:	3. DATE	3. RECEIVED BY:
Nelson Velez	7/15/93 1500			7/16/93	
2 RELINQUISHED BY:	2. DATE	2. RECEIVED BY:	4. RELINQUISHED BY:	4. DATE	4. RECEIVED BY:

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR DISSOLVED HYDROCARBONS

Location: Gallegos Canyon Unit 162, Farmington, NM

Lab#: 93W0182 Method: Amoco Modified 8015

Date sampled: 02/19/93 Date received: 02/22/93

Sample ID	Benz	Tolu	EtBz	Xyls	BTEX TOTAL
Trip blank	ND	0.002	0.001	0.007	0.010
Rcvry Well	ND	0.001	ND	0.002	0.003
Rcvry Well (Duplicate)	ND	ND	ND	ND	ND

NOTES
1. Unit of data is mg/L.
2. ND = not detected at or above reporting limit.
3. Benz = benzene, Tolu = toluene, EtBz = ethylbenzene, Xyls = xylenes,
4. Reporting limit for benzene, toluene, ethylbenzene, and each xylene is 0.001 mg/L.

Comments: Freon in trip blank is more than three months old.
Freon in trip blank has been contaminated with septum material.

Sampled by: Envirotech - Jim Weahkee

Date analyzed: 02/22/93 Checked by: T. G. Miller

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR PETROLEUM HYDROCARBONS IN WATER

Location: Gallegos Canyon Unit 162, Farmington, NM

Lab#: 93W0182 Method: Amoco Modified 8015

Date sampled: 02/19/93 Date received: 02/22/93

Sample ID	Volatiles	Semi-Volatiles
Trip blank	ND	ND
Recovery well	ND	ND
Recovery well Dup.	ND	ND

NOTES
1. Unit of data is mg/L.
2. ND = Not Detected at or above reporting limit.
3. The reporting limit for TPH by GC is 1 mg/L for volatiles and 1 mg/L for semi-volatiles.

Comments:

Date analyzed: 02/22/93 Checked by: T. G. Miller

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR DISSOLVED HYDROCARBONS

Location: Amoco GCU "Com F" #162, Farmington, NM

Lab#: 92W1641 Method: Amoco Modified 8015

Date sampled: 12/16/92 Date received: 12/18/92

Sample ID	Benz	Tolu	EtBz	Xyls	BTEX TOTAL
MW-5	ND	0.002	0.002	0.013	0.017

NOTES
1. Unit of data is mg/L.
2. ND = not detected at or above reporting limit.
3. Benz = benzene, Tolu = toluene, EtBz = ethylbenzene, Xyls = xylenes,
4. Reporting limit for benzene, toluene, ethylbenzene, and each xylene is 0.001 mg/L.

Comments: No trip blank returned with samples.

Sampled by: APC GMS - K. P. H.

Date analyzed: 12/22/92 Checked by: T. G. Miller

List Run Sequence File

ANALYST NAME..... ZBAR
LIMS ANALYSIS ID..... 12/16/92
Amoco GCU "Com F" #162, Farmington, NM

ANALYSIS INFORMATION

Analysis name..... 92W1641
Method name..... MBTEX
Calibration name..... MBTEX
Calibration sequence..... Sequential Standard
User parameter 1 name..... Dilution

SAMPLE SUMMARY

SAMPLE NUMBER	LIMS ID	SAMPLE NAME
1	MW-5	92W1641A Amoco GCU, Farmington, NM.

No.	Sample name	Bo	LIMS Id	User
1	92W1641A Amoco GCU,	20	MW-5	1.0

USER PARAMETER VALUES

SAMPLE	DILUTION
1	1.00000

INTERNAL/DILUTION STANDARDS

SAMPLE NUMBER	ISTD1 AMOUNT	ISTD2 AMOUNT	ISTD3 AMOUNT	DIL1 AMOUNT	DIL2 AMOUNT
1	1.00000	1.00000	1.00000	1.00000	1.00000

PROCESSING ORDER

SAMPLE NUMBER	TYPE
1	Sample

GROUNDWATER MANAGEMENT SECTION
AMOCO CORPORATION - ENVIRONMENTAL AFFAIRS AND SAFETY
FLUID AND SOIL SAMPLE TRANSMITTAL FORM

SEND SAMPLES TO:

GROUNDWATER MANAGEMENT LABORATORY
7201 E. 38th ST., SPACE 7253
TULSA, OK 74145

PHONE: (918) 660-4420 FAX: (918) 660-4443

FROM: (Please Print)

Amoco Production Co.
AMOCO OPERATING COMPANY

SRBU
AMOCO MARKETING DISTRICT OFFICE (IF APPLICABLE)

K.P. Heaton
AMOCO REPRESENTATIVE AUTHORIZING WORK

CONSULTING FIRM GMS ( )
CONSULTING FIRM - PROJECT MANAGER TEL #

STREET ADDRESS / MAILING ADDRESS

CITY STATE ZIP

RESULTS TO:

☒ AMOCO
☐ CONSULTANT
☐ OTHER (PROVIDE INFO BELOW)

NAME Kevin Heaton
ADDRESS GMS

CITY STATE ZIP

LOCATION SAMPLED: (Use AMOCO Facility Numbers When Known)

FACILITY NAME Amoco GCU "Com F" #162 AMOCO FACILITY #

ADDRESS STREET Farmington, NM
CITY STATE

RESULTS REQUESTED:

GROUNDWATER:	SOIL:	PRODUCT:
X BTEX	____ BTEX	PRODUCT
____ MTBE	____ MTBE	____ CHARACTERIZATION
____ TPH	____ TPH	____ LEAD CONTENT
____ OTHER		

DATE RESULTS REQUIRED:

☐ INDICATE HERE IF ***DRINKING WATER SAMPLES***

NUMBER OF SAMPLES SHIPPED: 1

COLLECTED FROM:

X OBSERVATION WELL	____ DISCHARGE POINT	DATE COLLECTED 12/16/92
____ RECOVERY WELL	____ WATER TAP	BY KPH
____ WATER WELL	____ STREAM	
____ TEST BORING	____ TANK	DATE SHIPPED 12/17/92
____ SEPARATOR	____ PIT	BY KPH
____ OTHER		VIA Commercial Air

REASON FOR SAMPLING OR ADDITIONAL INFORMATION & REMARKS:

SHIPPED BY: K.P. Heat (SIGNATURE) 12/17/92 (DATE)

RECEIVED BY: (SIGNATURE) (DATE)

PLEASE ATTACH COMPLETED ORIGINAL 'CHAIN OF CUSTODY' FORM
OR
COMPLETE FORM ON REVERSE SIDE

(FORM 3672 Jul-91)

GROUNDWATER MANAGEMENT SECTION
AMOCO CORPORATION - ENVIRONMENTAL AFFAIRS AND SAFETY

CHAIN OF CUSTODY RECORD

PAGE _____ OF _____

W1641

LOCATION SAMPLED: (Use AMOCO Facility Numbers When Known)

FACILITY NAME Amoco GCU "Com F" #162 AMOCO FACILITY # _____

ADDRESS STREET _____ CITY Farmington STATE NM

SAMPLER K.P. Heaton AFFILIATION Amoco GMS

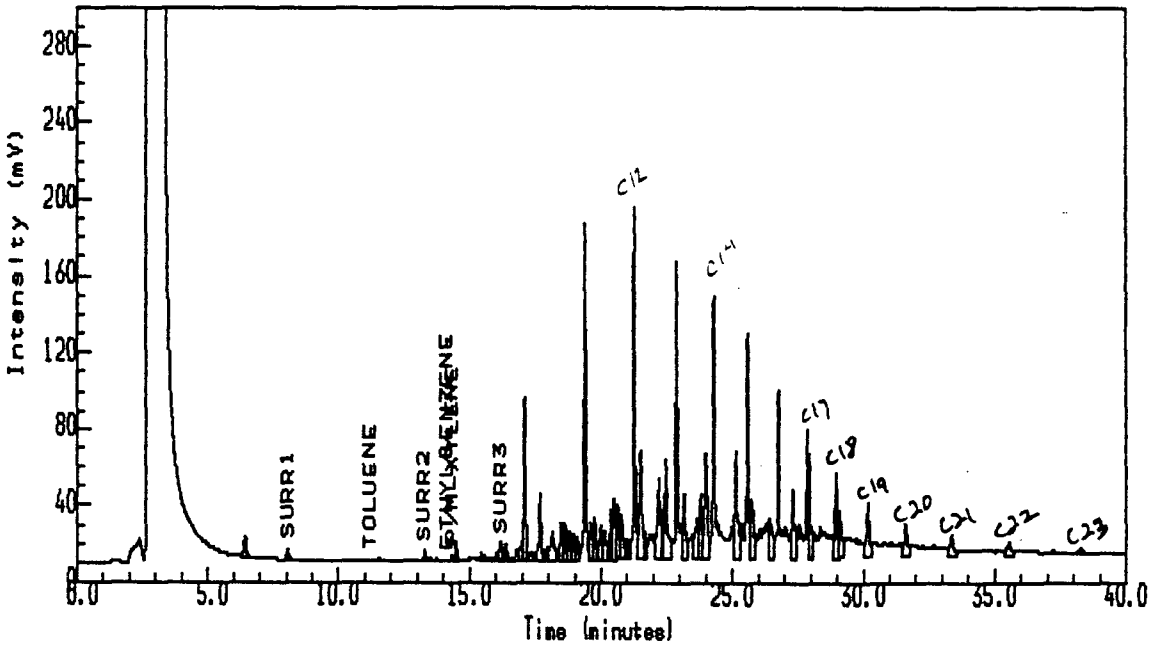
SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	SAMPLE TYPE (SOIL, WATER, PRODUCT)	PRESERVATION METHOD (FREON, ICE PACKS, NONE)	SAMPLE CONTAINER DESCRIPTION	NUMBER OF VIALS	ANALYSES REQUESTED
MW-5	12/16/92	2:47 pm	Water	Freon	40 ml VOA	1	BTEX
No Trip Blank Available							

REMARKS:

1. RELINQUISHED BY:	1. DATE	1. RECEIVED BY:	3. RELINQUISHED BY:	3. DATE	3. RECEIVED BY:
K.P. Heaton	12/18/92			12/18/92	
2. RELINQUISHED BY:	2. DATE	2. RECEIVED BY:	4. RELINQUISHED BY:	4. DATE	4. RECEIVED BY:

Injection Report

Acquired on 22-DEC-1992 at 06:03



AMOCO, Groundwater Management Section

Sample Name : 92W1641A Amoco GCU, Farmington, NM.
Sample Id : MW-5
Sample Type : Sample Amount=1.00000
Bottle No : 20

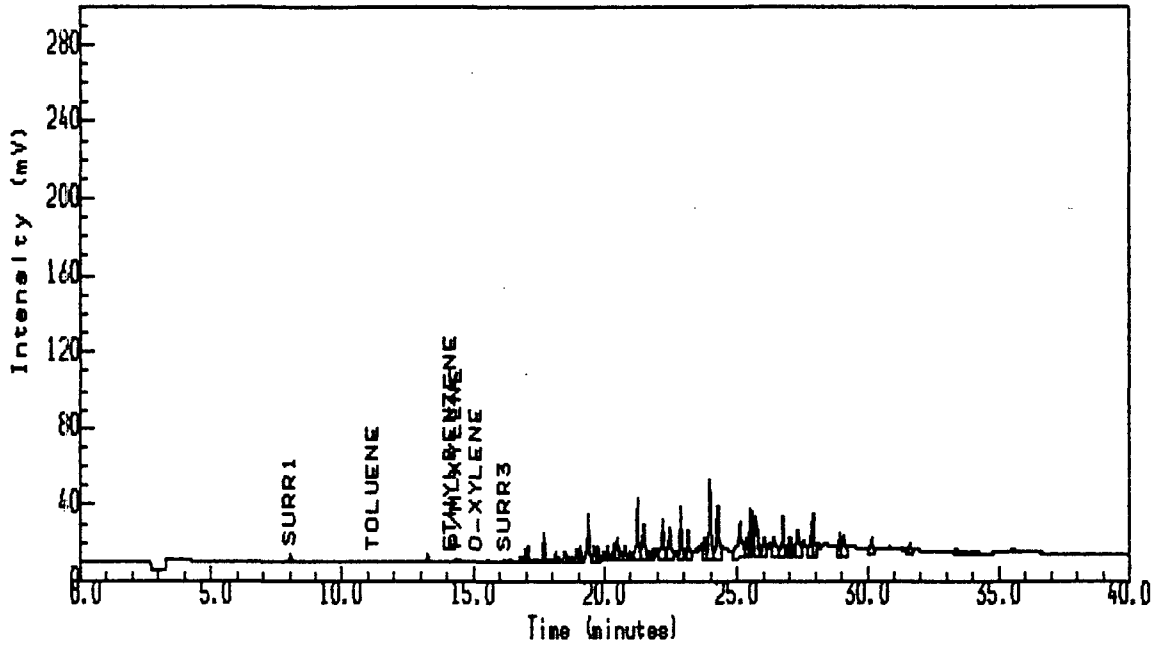
PEAK INFORMATION

RT mins	RT Exp	Area uVs	mg/L	Peak name	Width
8.044	8.050	33237	0.914	SURR1	5.3
11.213	11.200	4121	0.003	TOLUENE	6.1
13.280	13.350	26419	0.924	SURR2	4.8
14.129	14.100	4029	0.003	ETHYLBENZENE	6.7
14.342	14.350	17202	0.011	P/M-XYLENE	5.3
16.196	16.100	77032	3.868	SURR3	8.0

Totals		
Unknowns	7691363	N/A
Quantified	162041	5.722
Grand Total	7853404	5.722

Injection Report

Acquired on 22-DEC-1992 at 06:03



AMOCO, Groundwater Management Section

Sample Name : 92W1641A Amoco GCU, Farmington, NM.
Sample Id : MW-5
Sample Type : Sample Amount=1.00000
Bottle No : 20

PEAK INFORMATION

RT mins	RT Exp	Area uVs	mg/L	Peak name	Width
8.040	8.050	17939	0.787	SURR1	5.3
11.222	11.200	1622	0.002	TOLUENE	4.8
14.129	14.100	2374	0.002	ETHYLBENZENE	6.7
14.338	14.350	12082	0.010	P/M-XYLENE	5.1
15.089	15.100	2986	0.003	O-XYLENE	4.5
16.169	16.050	9836	0.328	SURR3	7.5

Totals

Unknowns	3879092	N/A
Quantified	46840	1.131
Grand Total	3925932	1.131

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR DISSOLVED HYDROCARBONS

Location: Gallegos Canyon Unit#162, Farmington, NM

Lab#: 92W1549 Method: Amoco Modified 8015

Date sampled: 11/25/92 Date received: 11/30/92

Sample ID	Benz	Tolu	EtBz	Xyls	BTEX TOTAL
Trip blank	ND	0.004	0.001	0.007	0.012
MW-3A	0.001	0.115	0.112	1.07	1.30
MW-4	1.30	0.288	0.408	3.01	5.01
MW-5	0.054	1.08	0.544	4.38	6.06
MW-6	0.154	1.01	0.242	1.91	3.32
MW-7	0.654	12.6	6.56	33.5	53.3
MW-8	3.52	17.0	3.95	24.3	48.8
MW-9	0.003	0.013	0.004	0.030	0.050
MW-10	ND	0.003	0.001	0.007	0.011
MW-10 Dup.	ND	0.002	0.001	0.004	0.007

NOTES
1. Unit of data is mg/L.
2. ND = not detected at or above reporting limit.
3. Benz = benzene, Tolu = toluene, EtBz = ethylbenzene, Xyls = xylenes,
4. Reporting limit for benzene, toluene, ethylbenzene, and each xylene is 0.001 mg/L.

Comments: Product samples shipped in same container as water samples.

Sampled by: Envirotech - Jim Weahkee

Date analyzed: 12/01/92 Checked by: T. G. Miller

GROUNDWATER MANAGEMENT SECTION
AMOCO CORPORATION - ENVIRONMENTAL AFFAIRS AND SAFETY
CHAIN OF CUSTODY RECORD

W1549

LOCATION SAMPLED: (Use AMOCO Facility Numbers When Known)

FACILITY NAME Gallegos Canyon Unit No. 162 AMOCO FACILITY # Southern Rockies Business Unit

ADDRESS STREET CITY Farmington STATE N. Mex.

SAMPLER Jim Weakee AFFILIATION Envirotech Inc.

SAMPLE IDENTIFICATION		DATE SAMPLED	TIME SAMPLED	SAMPLE TYPE (SOIL, WATER, PRODUCT)	PRESERVATION METHOD (FREON, ICE PACKS, NONE)	SAMPLE CONTAINER DESCRIPTION	NUMBER OF VIALS	ANALYSES REQUESTED
P0263								
MW # 1A	A	11-25-92	1451	Product	None	40 ml vial	1	BTEX 8015
MW # 2A	B	11-25-92	1453	Product	None	40 ml vial	1	BTEX 8015
MW # 3A	B	11-25-92	1448	WATER	FREON	40 ml vial	1	BTEX 8015
MW # 4	C	11-25-92	1445	WATER	FREON	40 ml vial	1	BTEX 8015
MW # 5	D	11-25-92	1500	WATER	FREON	40 ml Vial	1	BTEX 8015
MW # 6	E	11-25-92	1439	WATER	FREON	40 ml VIAL	1	BTEX 8015
MW # 7	F	11-25-92	1438	WATER	FREON	40 ml VIAL	1	BTEX 8015
MW # 8	G	11-25-92	1455	WATER	FREON	40 ml VIAL	1	BTEX 8015
MW # 9	H	11-25-92	1436	WATER	FREON	40 ml VIAL	1	BTEX 8015
MW # 10	I J	11-25-92	1432	WATER	FREON	40 ml VIAL	2	BTEX 8015
TRIP BLANK	A				FREON	2 ml VIAL		

REMARKS: Product Samples were shipped in the same box as water samples.

MW's No 1A & 2A No FREON STANDING Product

1. RELINQUISHED BY:	1. DATE	1. RECEIVED BY:	3. RELINQUISHED BY:	3. DATE	3. RECEIVED BY:
Jim Weakee	Nov. 25 1992				
2. RELINQUISHED BY:	2. DATE	2. RECEIVED BY:	4. RELINQUISHED BY:	4. DATE	4. RECEIVED BY:
				11-30-92	Sharon Hines

GROUNDWATER MANAGEMENT SECTION
AMOCO CORPORATION - ENVIRONMENTAL AFFAIRS AND SAFETY
FLUID AND SOIL SAMPLE TRANSMITTAL FORM

SEND SAMPLES TO:

GROUNDWATER MANAGEMENT LABORATORY
7201 E. 38th ST., SPACE 7253
TULSA, OK 74145

PHONE: (918) 660-4420 FAX: (918) 660-4443

RESULTS TO: ☒ AMOCO ☐ CONSULTANT ☐ OTHER (PROVIDE INFO BELOW)

NAME _____

ADDRESS _____

_____
CITY STATE ZIP

FROM:

(Please Print) _____
AMOCO OPERATING COMPANY

_____
AMOCO MARKETING DISTRICT OFFICE (IF APPLICABLE)

Buddy Shaw
AMOCO REPRESENTATIVE AUTHORIZING WORK

Envirotech INC.
CONSULTING FIRM

Jim Weakee (505) 632-0615
CONSULTING FIRM - PROJECT MANAGER TEL #

5796 U.S Highway 64-3014
STREET ADDRESS / MAILING ADDRESS

/

Farmington New Mexico 87401
CITY STATE ZIP

LOCATION SAMPLED: (Use AMOCO Facility Numbers When Know

FACILITY NAME Gallegos Canyon Unit No 162 AMOCO FACILITY # Southern Rockies Bus. Unit

ADDRESS STREET _____ CITY Farmington STATE N Me

RESULTS REQUESTED:

GROUNDWATER:	SOIL:	PRODUCT:
X BTEX	_____ BTEX	PRODUCT
_____ MTBE	_____ MTBE	_____ CHARACTERIZATION
_____ TPH	_____ TPH	_____ LEAD CONTENT
8015 OTHER		
_____		

DATE RESULTS REQUIRED:

_____

☐ INDICATE HERE IF ***DRINKING WATER SAMPLES***

NUMBER OF SAMPLES SHIPPED: _____

COLLECTED FROM:

_____ OBSERVATION WELL	_____ DISCHARGE POINT	DATE COLLECTED 11-25-92
_____ RECOVERY WELL	_____ WATER TAP	BY Jim Weakee
_____ WATER WELL	_____ STREAM	
_____ TEST BORING	_____ TANK	DATE SHIPPED _____
_____ SEPARATOR	_____ PIT	BY _____
_____ OTHER Monitor Wells		VIA _____

REASON FOR SAMPLING OR ADDITIONAL INFORMATION & REMARKS: _____

SHIPPED BY: Jim Weakee 11-25-92
SIGNATURE DATE

RECEIVED BY: _____ _____
SIGNATURE DATE

PLEASE ATTACH COMPLETED ORIGINAL 'CHAIN OF CUSTODY' FORM
OR
COMPLETE FORM ON REVERSE SIDE

(FORM 3672 Jul-91)

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR DISSOLVED HYDROCARBONS

Location: Gallegos Canyon Unit#162, Sec.36-T29N-R12W, San Juan Basin, NM

Lab#: 92W1132 Method: Amoco Modified 8015

Date sampled: 09/04/92 Date received: 09/08/92

Sample ID	Benz	Tolu	EtBz	Xyls	BTEX TOTAL	
Trip blank	ND	ND	ND	ND	ND	
Eqpmnt blank	ND	ND	ND	ND	ND	
MW-3	ND	ND	ND	ND	ND	1.30
MW-4	1.71	0.009	0.407	3.03	5.15	5.01
MW-5	ND	ND	ND	ND	ND	6.06
MW-6	0.158	0.196	0.045	0.503	0.902	3.32
MW-7	0.346	1.09	0.096	0.992	2.53	53.3
MW-8	0.119	0.003	0.011	0.064	0.197	48.8

NOTES
1. Unit of data is mg/L.
2. ND = not detected at or above reporting limit.
3. Benz = benzene, Tolu = toluene, EtBz = ethylbenzene, Xyls = xylenes,
4. Reporting limit for benzene, toluene, ethylbenzene, and each xylene is 0.001 mg/L.

Comments:

Sampled by: Amoco GMS - K. P. Heaton

Date analyzed: 09/09/92 Checked by: T. G. Miller

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR TOTAL PETROLEUM HYDROCARBONS

Location: Gallegos Canyon Unit#162, Sec.36-T29N-R12W, San Juan Basin, NM

Lab#: 92W1132 Method: Amoco Modified 8015

Date sampled: 09/04/92 Date received: 09/08/92

Sample ID	Volatiles	Semi-Volatiles
Trip blank	ND	ND
Eqpmnt blank	ND	ND
MW-3	ND	ND
MW-4	6	ND
MW-5	ND	ND
MW-6	1	ND
MW-7	3	ND
MW-8	ND	ND

NOTES
1. ND = Not Detected at or above reporting limit.
2. The reporting limit for TPH by GC is 1 mg/L for volatiles and 5 mg/L for semi-volatiles.

Comments:

Date analyzed: 09/09/92 Checked by: T. G. Miller

GROUNDWATER MANAGEMENT SECTION
AMOCO CORPORATION - ENVIRONMENTAL AFFAIRS AND SAFETY

CHAIN OF CUSTODY RECORD

PAGE _____ OF _____

LOCATION SAMPLED: (Use AMOCO Facility Numbers When Known)

FACILITY NAME GCU #162 AMOCO FACILITY # _____

ADDRESS STREET open CITY _____ STATE _____

SAMPLER K. Heath AFFILIATION GMS

SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	SAMPLE TYPE (SOIL, WATER, PRODUCT)	PRESERVATION METHOD (FREON, ICE PACKS, NONE)	SAMPLE CONTAINER DESCRIPTION	NUMBER OF VIALS	ANALYSES REQUESTED
Trip Blank	9/4/92	–	Freon	Freon	~~40 ml VOA~~	1	BTEX + TPH
MW-3		10:30 am	Water		40 ml VOA	1	
MW-4						1	
MW-5						1	
MW-6						1	
MW-7						1	
MW-8						1	
Equip. Blank						1	

REMARKS: Note: Smpls shipped w/ GCU #181 Smpls. Use same Trip Blank.
Smpls Returned to GMS 9/4/92, Stored in my office.

1. RELINQUISHED BY:	1. DATE	1. RECEIVED BY:	3. RELINQUISHED BY:	3. DATE	3. RECEIVED BY:
K.P. Heath	9/4/92				
2. RELINQUISHED BY:	2. DATE	2. RECEIVED BY:	4. RELINQUISHED BY:	4. DATE	4. RECEIVED BY:
	9-8-92	Robert Taylor			

GROUNDWATER MANAGEMENT SECTION
AMOCO CORPORATION - ENVIRONMENTAL AFFAIRS AND SAFETY
FLUID AND SOIL SAMPLE TRANSMITTAL FORM

SEND SAMPLES TO:

GROUNDWATER MANAGEMENT LABORATORY
7201 E. 38th ST., SPACE 7253
TULSA, OK 74145

PHONE: (918) 660-4420 FAX: (918) 660-4443

FROM:
(Please Print) APC
AMOCO OPERATING COMPANY
San Juan OC, Farmington, NM
AMOCO MARKETING DISTRICT OFFICE (IF APPLICABLE)
Buddy Shaw
AMOCO REPRESENTATIVE AUTHORIZING WORK

CONSULTING FIRM
K.P. Heaton ( )
CONSULTING FIRM - PROJECT MANAGER TEL #
BMS
STREET ADDRESS / MAILING ADDRESS

CITY STATE ZIP

RESULTS TO: ☒ AMOCO
☐ CONSULTANT
☐ OTHER (PROVIDE INFO BELOW)

NAME Buddy Shaw
ADDRESS APC
San Juan OC
Farmington, NM
CITY STATE ZIP

LOCATION SAMPLED: (Use AMOCO Facility Numbers When Know)
FACILITY NAME GCU #162 AMOCO FACILITY #
ADDRESS STREET Sec 36, T29N, R12W CITY San Juan Basin STATE NM

RESULTS REQUESTED:

GROUNDWATER:
✓ BTEX
MTBE
✓ TPH
OTHER

SOIL:
BTEX
MTBE
TPH

PRODUCT:
PRODUCT
CHARACTERIZATION
LEAD CONTENT

DATE RESULTS REQUIRED:

☐ INDICATE HERE IF ***DRINKING WATER SAMPLES***

NUMBER OF SAMPLES SHIPPED: 7

COLLECTED FROM:
✓ OBSERVATION WELL
RECOVERY WELL
WATER WELL
TEST BORING
SEPARATOR
OTHER
DISCHARGE POINT
WATER TAP
STREAM
TANK
PIT

DATE COLLECTED 9/4/92
BY K.P. Heaton

DATE SHIPPED 9/4/92
BY K.P. Heaton
VIA Comm Air / Hand Carry

REASON FOR SAMPLING OR ADDITIONAL INFORMATION & REMARKS:

SHIPPED BY: Ken P. Heaton (SIGNATURE) 9/4/92 (DATE)

RECEIVED BY: (SIGNATURE) (DATE)

PLEASE ATTACH COMPLETED ORIGINAL 'CHAIN OF CUSTODY' FORM
OR
COMPLETE FORM ON REVERSE SIDE

(FORM 3672 Jul-91)

GROUNDWATER MANAGEMENT SECTION
AMOCO CORPORATION - ENVIRONMENTAL AFFAIRS AND SAFETY

CHAIN OF CUSTODY RECORD

PAGE _____ OF _____

P0277

LOCATION SAMPLED: (Use AMOCO Facility Numbers When Known)

FACILITY NAME Amoco GCU "F" Com #162 AMOCO FACILITY # _____

ADDRESS STREET _____ CITY Farmington STATE NM

SAMPLER _____ AFFILIATION _____

SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	SAMPLE TYPE (SOIL, WATER, PRODUCT)	PRESERVATION METHOD (FREON, ICE PACKS, NONE)	SAMPLE CONTAINER DESCRIPTION	NUMBER OF VIALS	ANALYSES REQUESTED
A MW-8	12/16/92	2:45	Product	None	20 dram Vial	1	PRODUCT CHAR

REMARKS:

1. RELINQUISHED BY:	1. DATE	1. RECEIVED BY:	3. RELINQUISHED BY:	3. DATE	3. RECEIVED BY:
K. P. Hoota	12/17/92			12/18/92	
2. RELINQUISHED BY:	2. DATE	2. RECEIVED BY:	4. RELINQUISHED BY:	4. DATE	4. RECEIVED BY:

GROUNDWATER MANAGEMENT SECTION
AMOCO CORPORATION - ENVIRONMENTAL AFFAIRS AND SAFETY
FLUID AND SOIL SAMPLE TRANSMITTAL FORM

SEND SAMPLES TO:

GROUNDWATER MANAGEMENT LABORATORY
7201 E. 38th ST., SPACE 7253
TULSA, OK 74145

PHONE: (918) 660-4420 FAX: (918) 660-4443

FROM:
(Please Print)

Amoco Production Co.
AMOCO OPERATING COMPANY

SRBU
AMOCO MARKETING DISTRICT OFFICE (IF APPLICABLE)

K.P. Heaton
AMOCO REPRESENTATIVE AUTHORIZING WORK

GMS
CONSULTING FIRM

( )
CONSULTING FIRM - PROJECT MANAGER TEL #

STREET ADDRESS / MAILING ADDRESS

CITY STATE ZIP

RESULTS TO:

- [X] AMOCO
- [ ] CONSULTANT
- [ ] OTHER (PROVIDE INFO BELOW)

NAME K.P. Heaton

ADDRESS

GMS
CITY STATE ZIP

LOCATION SAMPLED: (Use AMOCO Facility Numbers When Known)

FACILITY NAME Amoco GCU "F" Com #162 AMOCO FACILITY #

ADDRESS STREET CITY Farmington STATE NM

RESULTS REQUESTED:

GROUNDWATER:	SOIL:	PRODUCT:
_____ BTEX	_____ BTEX	✓ PRODUCT CHARACTERIZATION
_____ MTBE	_____ MTBE	_____ LEAD CONTENT
_____ TPH	_____ TPH	
_____ OTHER		

DATE RESULTS REQUIRED:

_____

☐ INDICATE HERE IF ***DRINKING WATER SAMPLES***

NUMBER OF SAMPLES SHIPPED: 1

COLLECTED FROM:

✓ OBSERVATION WELL	_____ DISCHARGE POINT	DATE COLLECTED 12/16/92
_____ RECOVERY WELL	_____ WATER TAP	BY KPH
_____ WATER WELL	_____ STREAM	
_____ TEST BORING	_____ TANK	DATE SHIPPED 12/17/92
_____ SEPARATOR	_____ PIT	BY K. Heaton
_____ OTHER		VIA FEDX

REASON FOR SAMPLING OR ADDITIONAL INFORMATION & REMARKS:

SHIPPED BY: Kei P. Heat (SIGNATURE) 12/17/92 (DATE)

RECEIVED BY: _____ (SIGNATURE) _____ (DATE)

PLEASE ATTACH COMPLETED ORIGINAL 'CHAIN OF CUSTODY' FORM
OR
COMPLETE FORM ON REVERSE SIDE

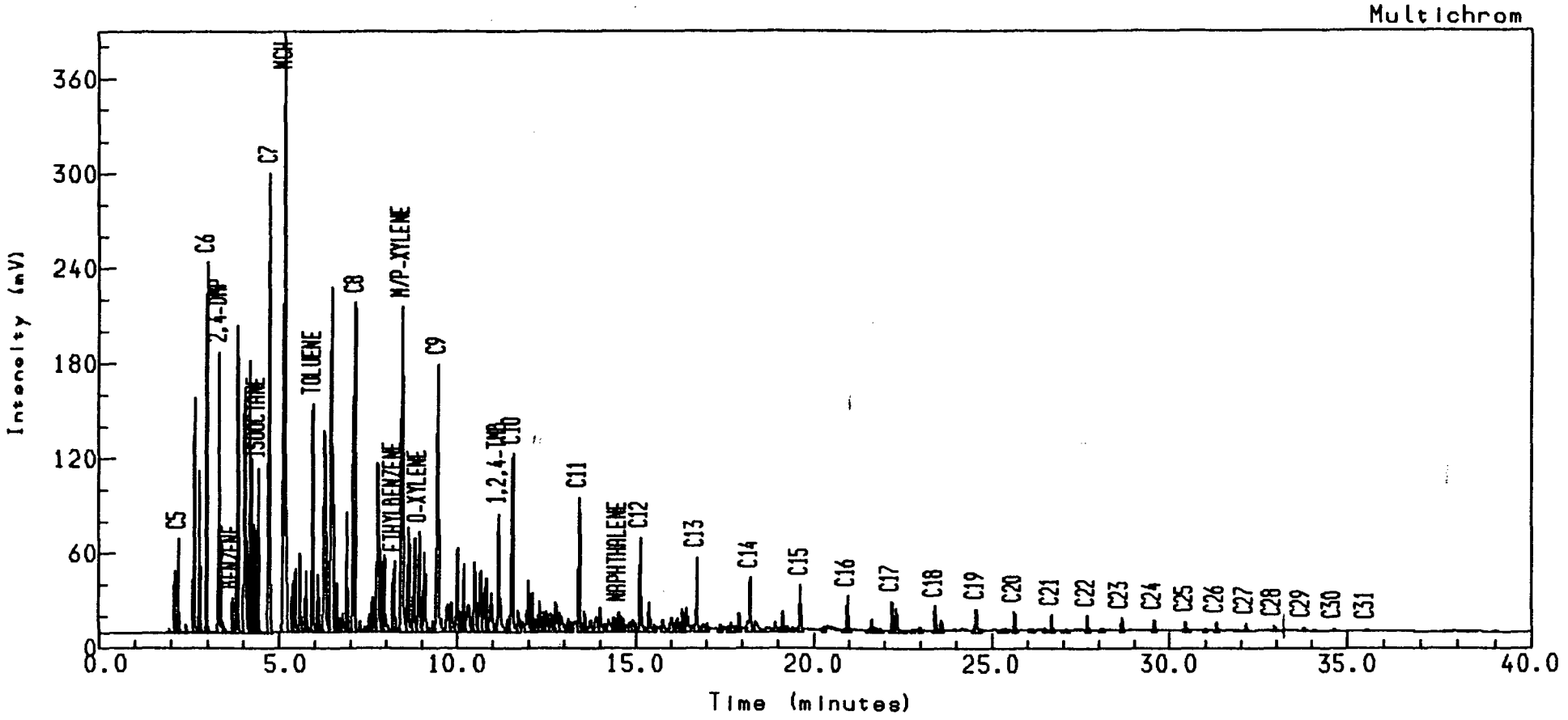
(FORM 3672 Jul-91)

mw-8

VAX MULTICHROM

Analysis Name : [GMS] 15 92PRDT1228,5,1.

Amoco GCU "F" Com #162, Farmington, NM Amount : 1.000



Instrument :
Channel Title : Channel #15
Lims ID : 92P0277A
Acquired on 28-DEC-1992 at 16:37
Reported on 28-DEC-1992 at 17:22

Method : PRODUCT
Calibration : PRODUCT
Run Sequence : PRDT1228

Reported on 28-DEC-1992 at 17:21

Injection Report

Acquired on 28-DEC-1992 at 16:37

VAX MULTICHROM

Analyst Name : ZACKOA
Lims Id : 12/28/92
Comment : Product characterization for hydrocarbons
Method Title : Method for Product Characterization
Sample Name : Amoco GCU "F" Com #162, Farmington, NM
Sample Id : 92P0277A
Sample Type : Sample Amount=1.00000
Bottle No : 5

PEAK INFORMATION

RT mins	Area uVs	Per cent	Peak name	Width
2.222	66663	0.4	C5	2.1A
2.996	352545	2.1	C6	2.1A
3.347	347323	2.1	2,4-DMP	2.1
3.729	40121	0.2	BENZENE	2.1
4.444	208644	1.3	ISOOCTANE	2.1
4.769	838484	5.1	C7	3.5
5.196	1510633	9.2	MCH	4.0
5.973	331543	2.0	TOLUENE	2.7
7.151	774491	4.7	C8	4.5
8.258	168239	1.0	ETHYLBENZENE	4.3
8.476	734763	4.5	M/P-XYLENE	3.7
8.956	177501	1.1	O-XYLENE	2.7
9.476	554436	3.4	C9	3.5
11.169	247819	1.5	1,2,4-TMB	2.7
11.556	335924	2.0	C10	3.2
13.427	214798	1.3	C11	2.7
14.529	31048	0.2	NAPHTHALENE	2.7
15.147	161923	1.0	C12	2.7
16.738	135123	0.8	C13	2.7
18.236	111660	0.7	C14	2.7
19.640	80718	0.5	C15	2.7
20.969	60348	0.4	C16	2.7
22.231	55313	0.3	C17	2.7
23.427	47852	0.3	C18	2.7
24.569	59220	0.4	C19	2.9
25.658	37127	0.2	C20	2.7
26.698	31207	0.2	C21	2.9
27.698	28485	0.2	C22	2.9
28.653	25486	0.2	C23	2.9
29.569	21644	0.1	C24	2.9
30.458	27611	0.2	C25	2.9
31.307	18553	0.1	C26	2.9
32.129	17752	0.1	C27	2.9
32.938	16454	0.1	C28	3.2

RT mins	Area uVs	Per cent	Peak name	Width
33.760	13145	8.0E-2	C29	3.2
34.622	7454	4.5E-2	C30	3.5
35.538	5034	3.1E-2	C31	4.0

Totals

Unknowns	8522829	N/A
	7897088	48.1
	16419917	48.1

GROUNDWATER MANAGEMENT SECTION
AMOCO CORPORATION - ENVIRONMENTAL AFFAIRS AND SAFETY

CHAIN OF CUSTODY RECORD

PAGE _____ OF _____

LOCATION SAMPLED: (Use AMOCO Facility Numbers When Known)

FACILITY NAME GCU #162 AMOCO FACILITY # _____

ADDRESS STREET San Juan Basin CITY _____ STATE NM

SAMPLER _____ AFFILIATION _____

SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	SAMPLE TYPE (SOIL, WATER, PRODUCT)	PRESERVATION METHOD (FREON, ICE PACKS, NONE)	SAMPLE CONTAINER DESCRIPTION	NUMBER OF VIALS	ANALYSES REQUESTED
MW-1	9/2/92	12:05 pm	Product	Ice	Product Vial / Alum Cap	1	GC Charact.
MW-2	9/2/92	12:00 pm	"	"	"	1	"

REMARKS:

1. RELINQUISHED BY:	1. DATE	1. RECEIVED BY:	3. RELINQUISHED BY:	3. DATE	3. RECEIVED BY:
K.P. Heath	9/4/92				
2. RELINQUISHED BY:	2. DATE	2. RECEIVED BY:	4. RELINQUISHED BY:	4. DATE	4. RECEIVED BY:
	9-8-92	Robert Taylor			

GROUNDWATER MANAGEMENT SECTION
AMOCO CORPORATION - ENVIRONMENTAL AFFAIRS AND SAFETY
FLUID AND SOIL SAMPLE TRANSMITTAL FORM

SEND SAMPLES TO:

GROUNDWATER MANAGEMENT LABORATORY
7201 E. 38th ST., SPACE 7253
TULSA, OK 74145

PHONE: (918) 660-4420 FAX: (918) 660-4443

RESULTS TO:
- [X] AMOCO
- [ ] CONSULTANT
- [ ] OTHER (PROVIDE INFO BELOW)

NAME Buddy Shaw
ADDRESS APC
CITY Farmington STATE NM ZIP

FROM:
(Please Print)

APC
AMOCO OPERATING COMPANY
San Juan OC, Farmington, NM
AMOCO MARKETING DISTRICT OFFICE (IF APPLICABLE)
Buddy Shaw
AMOCO REPRESENTATIVE AUTHORIZING WORK

CONSULTING FIRM
K.P. Heaton ( )
CONSULTING FIRM - PROJECT MANAGER TEL #
GMS
STREET ADDRESS / MAILING ADDRESS
CITY STATE ZIP

LOCATION SAMPLED: (Use AMOCO Facility Numbers When Known)

FACILITY NAME GCU #162 AMOCO FACILITY #
ADDRESS STREET Sec 36, T29N, R12W CITY San Juan Basin STATE NM

RESULTS REQUESTED:

GROUNDWATER:	SOIL:	PRODUCT:
____ BTEX	____ BTEX	✓ PRODUCT
____ MTBE	____ MTBE	____ CHARACTERIZATION
____ TPH	____ TPH	____ LEAD CONTENT
____ OTHER		

DATE RESULTS REQUIRED:

[ ] INDICATE HERE IF ***DRINKING WATER SAMPLES***

NUMBER OF SAMPLES SHIPPED: 2

COLLECTED FROM:

✓ OBSERVATION WELL	____ DISCHARGE POINT	DATE COLLECTED 9/2/92
____ RECOVERY WELL	____ WATER TAP	BY K.P. Heaton
____ WATER WELL	____ STREAM	
____ TEST BORING	____ TANK	DATE SHIPPED 9/4/92
____ SEPARATOR	____ PIT	BY K.P. Heaton
____ OTHER		VIA Comm. Air / Hand Carry

REASON FOR SAMPLING OR ADDITIONAL INFORMATION & REMARKS:

SHIPPED BY: Kim P. Heaton (SIGNATURE) 9/4/94 (DATE)

RECEIVED BY: (SIGNATURE) (DATE)

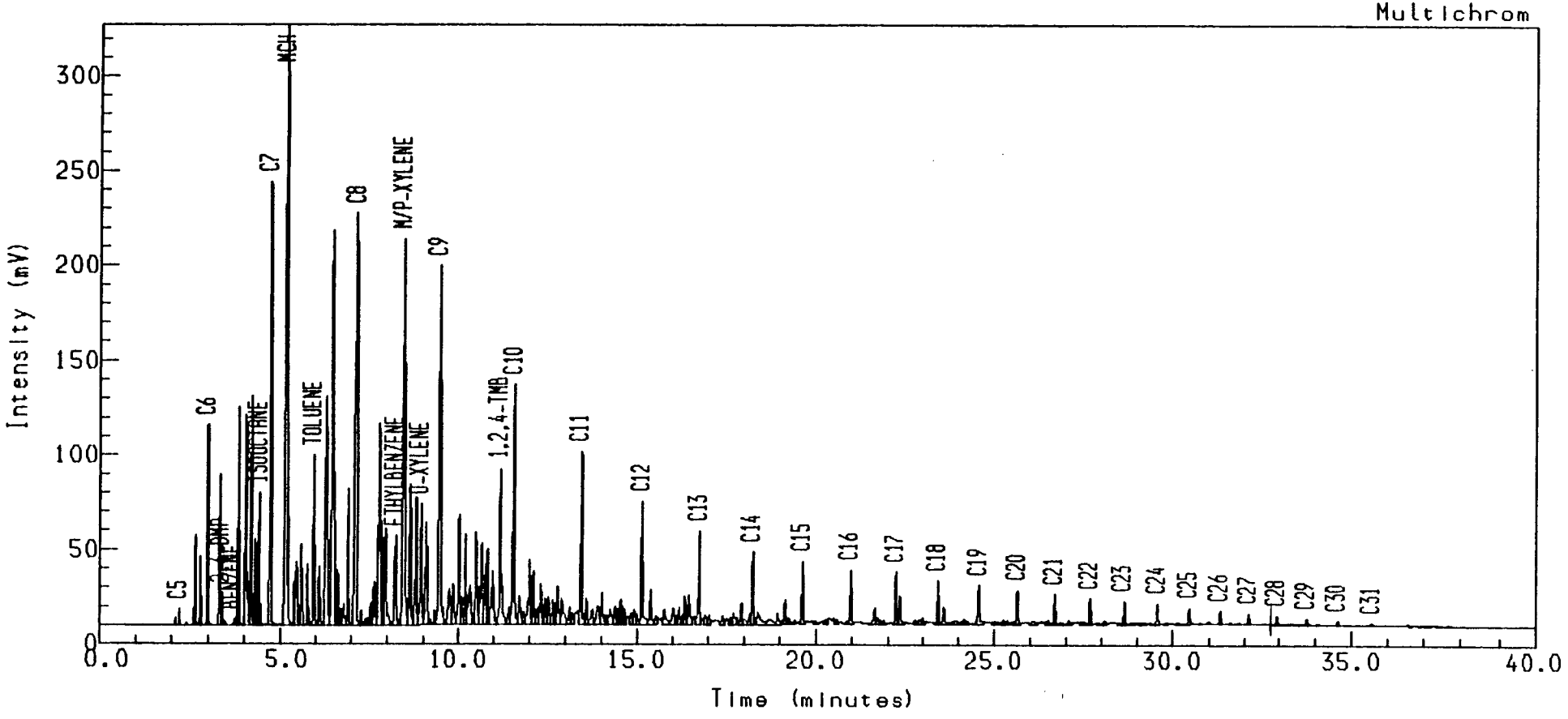
PLEASE ATTACH COMPLETED ORIGINAL 'CHAIN OF CUSTODY' FORM
OR
COMPLETE FORM ON REVERSE SIDE

(FORM 3672 Jul-91)

AMOCO, Groundwater Management Section

Analysis Name : [GMS] 15 92PRDT1104,6,1.

GCU"Com F"#162, San Juan Cnty, NM MW-7 Amount : 1.000



Instrument : HP5790GC
Channel Title : Channel #15
Lims ID : 92P0248A
Acquired on 4-NOV-1992 at 21:16
Reported on 4-NOV-1992 at 21:57

Method : PRODUCT
Calibration : PRODUCT
Run Sequence : PRDT1104

Injection Report

Acquired on 4-NOV-1992 at 21:16

AMOCO, Groundwater Management Section

Analyst Name : ZSTN01
Lims Id : 11/04/92
Comment :
Method Title : Method for Product Characterization
Sample Name : GCU"Com F"#162, San Juan Cnty, NM MW-7
Sample Id : 92P0248A
Sample Type : Sample Amount=1.00000
Bottle No : 6

PEAK INFORMATION

RT mins	Area uVs	Per cent	Peak name	Width
2.227	10163	6.8E-2	C5	1.6A
2.996	158905	1.1	C6	1.6A
3.396	29312	0.2	2,4-DMP	1.9
3.733	6361	4.2E-2	BENZENE	2.1
4.436	144160	1.0	ISOOCTANE	2.1
4.751	607443	4.0	C7	2.9
5.178	1117420	7.4	MCH	3.5
5.956	197768	1.3	TOLUENE	2.4
7.151	787972	5.2	C8	4.5
8.258	175067	1.2	ETHYLBENZENE	4.0
8.471	713713	4.7	M/P-XYLENE	3.5
8.956	174815	1.2	O-XYLENE	2.7
9.480	635564	4.2	C9	3.5
11.169	274259	1.8	1,2,4-TMB	2.7
11.560	391421	2.6	C10	3.2
13.431	266951	1.8	C11	2.9
15.147	193453	1.3	C12	2.7
16.742	145289	1.0	C13	2.7
18.236	99228	0.7	C14	2.7
19.644	89656	0.6	C15	2.7
20.978	74229	0.5	C16	2.7
22.240	70850	0.5	C17	2.7
23.440	60633	0.4	C18	2.7
24.578	69594	0.5	C19	2.7
25.667	48151	0.3	C20	2.7
26.707	39686	0.3	C21	2.7
27.702	36016	0.2	C22	2.7
28.658	31056	0.2	C23	2.7
29.578	26269	0.2	C24	2.7
30.467	27553	0.2	C25	2.7
31.311	20739	0.1	C26	2.9
32.138	15216	0.1	C27	2.9
32.942	12403	8.2E-2	C28	2.7
33.773	10440	6.9E-2	C29	2.9

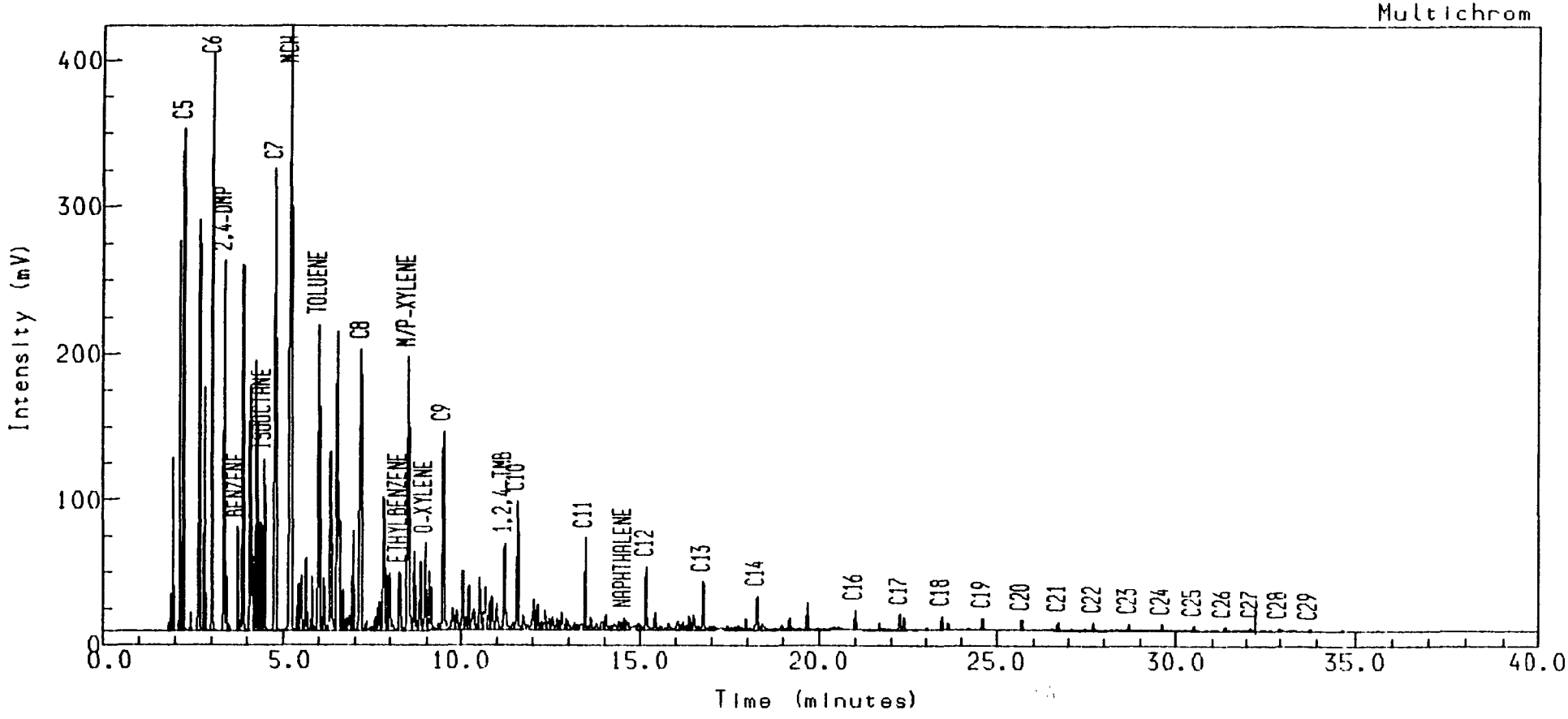
RT mins	Area uVs	Per cent	Peak name	Width
34.631	7560	5.0E-2	C30	3.2
35.556	5374	3.6E-2	C31	3.7

Totals		
Unknowns	8267347	N/A
	6774690	45.0
	15042037	45.0

AMOCO, Groundwater Management Section

Analysis Name : [GMS] 15 92PRDT0910,8,1.

GCU#162, San Juan Basin, NM MW-1 Amount : 1.000



Instrument : HP5790GC

Channel Title : Channel #15

Lims ID : 92P0220A

Acquired on 10-SEP-1992 at 22:04

Reported on 10-SEP-1992 at 22:45

Method : PRODUCT

Calibration : PRODUCT

Run Sequence : PRDT0910

Lead Content ≤ 0.01 grams/gallon

RT mins	Area uVs	Per cent	Peak name	Width
Totals				
Unknowns	8161246	N/A		
	8200210	50.1		
	16361456	50.1		

Injection Report

Acquired on 10-SEP-1992 at 22:04

AMOCO, Groundwater Management Section

Analyst Name : ZSTN01
Lims Id : 09/10/92
Comment :
Method Title : Method for Product Characterization
Sample Name : GCU#162, San Juan Basin, NM MW-1
Sample Id : 92P0220A
Sample Type : Sample Amount=1.00000
Bottle No : 8

PEAK INFORMATION

RT mins	Area uVs	Per cent	Peak name	Width
2.240	383697	2.3	C5	1.6A
3.031	626075	3.8	C6	2.1
3.378	504516	3.1	2,4-DMP	2.1
3.756	129777	0.8	BENZENE	2.1
4.476	228439	1.4	ISOOCTANE	2.4
4.809	966787	5.9	C7	3.5
5.236	1663473	10.2	MCH	4.3
6.027	564893	3.5	TOLUENE	3.2
7.162	686490	4.2	C8	4.3
8.258	151422	0.9	ETHYLBENZENE	4.3
8.502	650186	4.0	M/P-XYLENE	3.5
8.987	159323	1.0	O-XYLENE	2.7
9.498	421926	2.6	C9	2.9
11.191	182970	1.1	1,2,4-TMB	2.4
11.578	237222	1.4	C10	2.7
13.449	145636	0.9	C11	2.4
14.564	20306	0.1	NAPHTHALENE	2.7
15.169	115369	0.7	C12	2.4
16.769	89379	0.5	C13	2.4
18.262	66646	0.4	C14	2.7
21.004	31357	0.2	C15	2.4
22.267	26834	0.2	C17	2.4
23.462	21272	0.1	C18	2.4
24.604	22534	0.1	C19	2.7
25.693	16473	0.1	C20	2.4
26.738	13788	8.4E-2	C21	2.4
27.733	12960	7.9E-2	C22	2.7
28.693	11460	7.0E-2	C23	2.7
29.609	10086	6.2E-2	C24	2.4
30.493	11350	6.9E-2	C25	2.9
31.351	9642	5.9E-2	C26	3.2
32.178	7282	4.5E-2	C27	2.9
32.987	5740	3.5E-2	C28	2.9
33.813	3901	2.4E-2	C29	3.2

Injection Report

Acquired on 10-SEP-1992 at 23:12

AMOCO, Groundwater Management Section

Analyst Name : ZSTN01
Lims Id : 09/10/92
Comment :
Method Title : Method for Product Characterization
Sample Name : GCU#162, San Juan Basin, NM MW-2
Sample Id : 92P0220B
Sample Type : Sample Amount=1.00000
Bottle No : 9

PEAK INFORMATION

RT mins	Area uVs	Per cent	Peak name	Width
2.240	104198	0.6	C5	1.6A
3.027	448445	2.7	C6	1.9
3.373	391474	2.4	2,4-DMP	2.1
3.756	70205	0.4	BENZENE	2.7A
4.476	212402	1.3	ISOOCTANE	2.4
4.804	870460	5.3	C7	3.5
5.231	1497486	9.0	MCH	4.0
5.996	211523	1.3	TOLUENE	2.4
7.191	801392	4.8	C8	4.5
8.262	178765	1.1	ETHYLBENZENE	4.3
8.511	773439	4.7	M/P-XYLENE	4.0
8.996	187226	1.1	O-XYLENE	2.7
9.511	551982	3.3	C9	3.5
11.200	241337	1.5	1,2,4-TMB	2.7
11.591	325208	2.0	C10	2.9
13.462	203840	1.2	C11	2.7
14.569	28408	0.2	NAPHTHALENE	2.4
15.182	162490	1.0	C12	2.7
16.778	135581	0.8	C13	2.7
18.276	103501	0.6	C14	2.7
21.013	56922	0.3	C16	2.4
22.276	50636	0.3	C17	2.7
23.476	43583	0.3	C18	2.7
24.618	53772	0.3	C19	2.7
25.702	32789	0.2	C20	2.7
26.747	26950	0.2	C21	2.9
27.742	25750	0.2	C22	2.9
28.698	21876	0.1	C23	2.7
29.618	18727	0.1	C24	2.7
30.502	23647	0.1	C25	3.2
31.356	19630	0.1	C26	3.2
32.179	14383	8.7E-2	C27	2.9
32.987	11855	7.2E-2	C28	3.2
33.818	7861	4.7E-2	C29	3.2

RT mins	Area uVs	Per cent	Peak name	Width
34.680	4647	2.8E-2	C30	3.2
35.604	4489	2.7E-2	C31	3.5

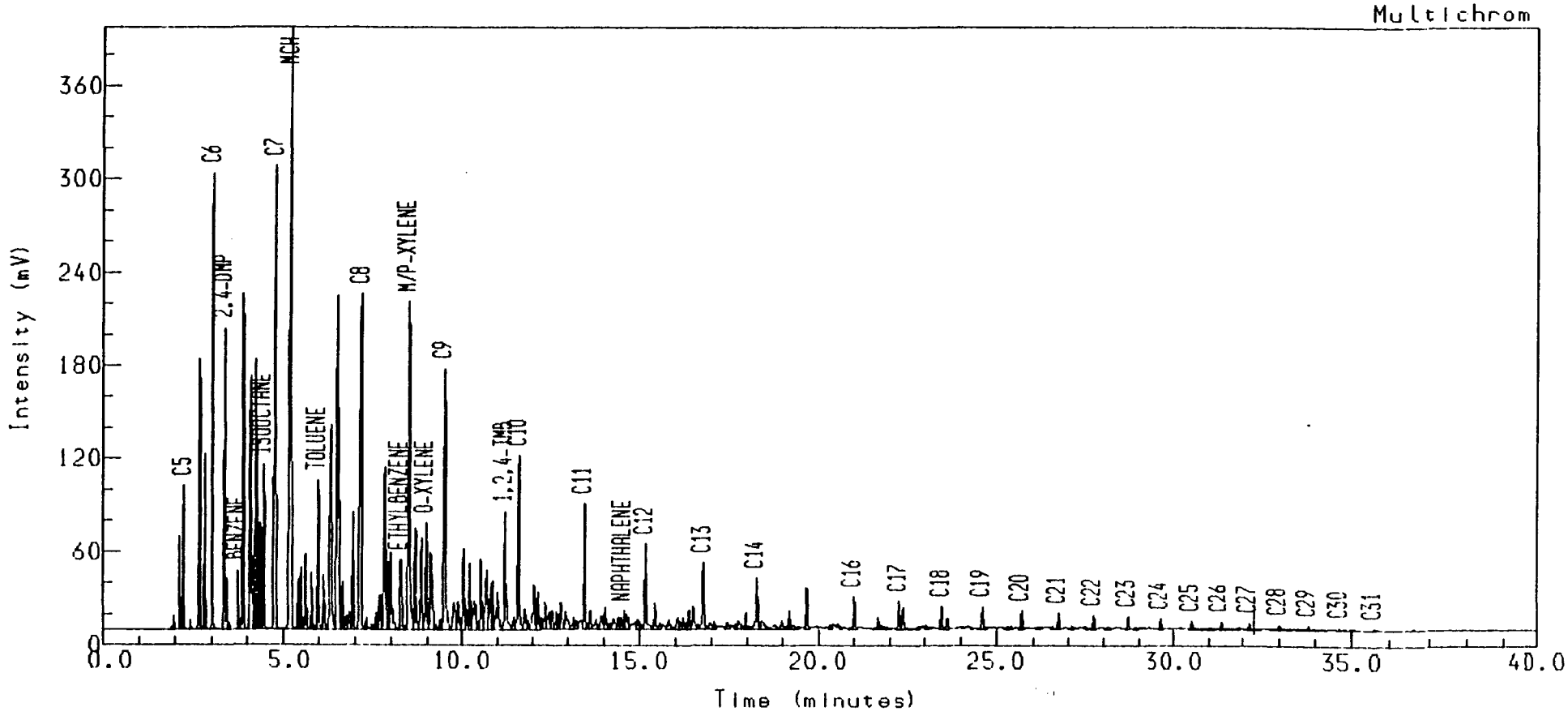
Totals

Unknowns	8647106	N/A
	7906880	47.8
	16553986	47.8

AMOCO, Groundwater Management Section

Analysis Name : [GMS] 15 92PRDT0910,9,1.

GCU#162, San Juan Basin, NM MW-2 Amount : 1.000



Instrument : HP5790GC

Channel Title : Channel #15

Lims ID : 92P0220B

Acquired on 10-SEP-1992 at 23:12

Reported on 10-SEP-1992 at 23:53

Method : PRODUCT

Calibration : PRODUCT

Run Sequence : PRDT0910

Lead Content ≤ 0.01 grams/gallon

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	RW #1 (15-18')	Date Reported:	11-05-92
Laboratory Number:	3623	Date Sampled:	10-27-92
Sample Matrix:	Soil	Date Received:	10-27-92
Preservative:	Cool	Date Extracted:	10-28-92
Condition:	Cool & Intact	Date Analyzed:	11-01-92
		Analysis Requested:	BTEX

Parameter	Concentration (ug/Kg)	Det. Limit (ug/Kg)
Benzene	ND	40.2
Toluene	145	50
Ethylbenzene	ND	40.2
p,m-Xylene	353	70
o-Xylene	ND	30.1

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	119 %
Bromfluorobenzene	108 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986.

ND - Parameter not detected at the stated detection limit.

Comments: GCU Com F 162 Separator Pit C4494

Analyst

Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

MODIFIED EPA METHOD 8015
NONHALOGENATED VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	RW #1 (15'-18')	Date Reported:	10-29-92
Laboratory Number:	3623	Date Sampled:	10-27-92
Sample Matrix:	Soil	Date Received:	10-27-92
Preservative:	Cool	Date Extracted:	10-28-92
Condition:	Cool and Intact	Date Analyzed:	10-29-92
		Analysis Requested:	TPH

Parameter	Concentration (mg/Kg)	Det. Limit (mg/Kg)
Total Petroleum Hydrocarbons	129	0.0032

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986.

ND - Parameter not detected at the stated detection limit.

This analysis was based on a Gasoline calibration.

Comments: GCU Com F #162---Separator Pit---C4494.

Robert M Young
Analyst

David D Young
Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

MODIFIED EPA METHOD 8015
NONHALOGENATED VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	RW #1 (15'-18')	Date Reported:	10-29-92
Laboratory Number:	3623	Date Sampled:	10-27-92
Sample Matrix:	Soil	Date Received:	10-27-92
Preservative:	Cool	Date Analyzed:	10-28-92
Condition:	Cool and Intact	Analysis Requested:	TPH

Parameter	Concentration (mg/Kg)	Det. Limit (mg/Kg)
Total Petroleum Hydrocarbons	750	0.0024

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986.

Method 8015, Nonhalogenated Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

This analysis was based on a Diesel calibration.

Comments: GCU Com 162---Separator Pit---C4494.

Analyst

Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	NA	Project #:	NA
Sample ID:	Laboratory Blank	Date Reported:	11-05-92
Laboratory Number:	BTLB1101 am	Date Sampled:	NA
Sample Matrix:	Water	Date Received:	NA
Preservative:	NA	Date Analyzed:	11-01-92
Condition:	NA	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	ND	0.4
Toluene	ND	0.5
Ethylbenzene	ND	0.4
p,m-Xylene	ND	0.7
o-Xylene	ND	0.3

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	99 %
Bromfluorobenzene	109 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments:

Analyst

Tony Trustano
Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

MODIFIED EPA METHOD 8015
NONHALOGENATED VOLATILE ORGANICS

Client:	NA	Project #:	NA
Sample ID:	Laboratory Blank	Date Reported:	10-29-92
Laboratory Number:	DSLB1028	Date Sampled:	NA
Sample Matrix:	Water	Date Received:	NA
Preservative:	NA	Date Analyzed:	10-28-92
Condition:	NA	Analysis Requested:	TPH

Parameter	Concentration (mg/L)	Det. Limit (mg/L)
Total Petroleum Hydrocarbons	ND	0.12

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986.

Method 8015, Nonhalogenated Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

This analysis was based on a Diesel calibration.

Comments:

Robert M Young
Analyst

Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

MODIFIED EPA METHOD 8015
NONHALOGENATED VOLATILE ORGANICS

Client:	NA	Project #:	NA
Sample ID:	Laboratory Blank	Date Reported:	10-29-92
Laboratory Number:	GSLB1029 am	Date Sampled:	NA
Sample Matrix:	Water	Date Received:	NA
Preservative:	NA	Date Analyzed:	10-29-92
Condition:	NA	Analysis Requested:	TPH

Parameter	Concentration (mg/L)	Det. Limit (mg/L)
Total Petroleum Hydrocarbons	ND	0.16

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986.

Method 8015, Nonhalogenated Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

This sample was based on a Gasoline calibration.

Comments:

Robert M Young
Analyst

Review

2058

CHAIN OF CUSTODY RECORD

C4494

Client/Project Name	Project Location	ANALYSIS/PARAMETERS
AMOCO 92140	SEP. PIT GCU COM 162	

Sampler: (Signature)	Chain of Custody Tape No.
Nelson Velez PER KPH	

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	TPH (418.1)	BTEX (8020)					Remarks
RW #1 - 15-18'	10/27/92	1000	3623	SOIL	1	1	1					

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Nelson Velez	10/27/92	1326	Linda Pender	10-27-92	1326
Relinquished by: (Signature)			Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

ENVIROTECH INC.
5796 U.S. Highway 64-3014
Farmington, New Mexico 87401
(505) 632-0615

san juan repro Form 578 81

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW #9	Date Reported:	11-05-92
Laboratory Number:	3645	Date Sampled:	10-28-92
Sample Matrix:	Soil	Date Received:	10-28-92
Preservative:	Cool	Date Extracted:	10-29-92
Condition:	Cool & Intact	Date Analyzed:	11-01-92
		Analysis Requested:	BTEX

Parameter	Concentration (ug/Kg)	Det. Limit (ug/Kg)
Benzene	ND	39.4
Toluene	520	49.3
Ethylbenzene	ND	39.4
p,m-Xylene	3,020	69
o-Xylene	2,880	29.6

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	105 %
Bromfluorobenzene	118 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986.

ND - Parameter not detected at the stated detection limit.

Comments: GCU Com F 162 Separator Pit C4494

Analyst

Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

MODIFIED EPA METHOD 8015
NONHALOGENATED VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW # 9	Date Reported:	10-29-92
Laboratory Number:	3645	Date Sampled:	10-28-92
Sample Matrix:	Soil	Date Received:	10-28-92
Preservative:	Cool	Date Extracted:	10-28-92
Condition:	Cool and Intact	Date Analyzed:	10-29-92
		Analysis Requested:	TPH

Parameter	Concentration (mg/Kg)	Det. Limit (mg/Kg)
Total Petroleum Hydrocarbons	17.9	0.0032

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986.

ND - Parameter not detected at the stated detection limit.

This analysis was based on a Gasoline calibration.

Comments: GCU Com F #162---Separator Pit---C4494.

Analyst

Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

MODIFIED EPA METHOD 8015
NONHALOGENATED VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW #9	Date Reported:	10-29-92
Laboratory Number:	3645	Date Sampled:	10-28-92
Sample Matrix:	Soil	Date Received:	10-28-92
Preservative:	Cool	Date Analyzed:	10-28-92
Condition:	Cool and Intact	Analysis Requested:	TPH

Parameter	Concentration (mg/Kg)	Det. Limit (mg/Kg)
Total Petroleum Hydrocarbons	224	0.0024

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986.

Method 8015, Nonhalogenated Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

This analysis was based on a Diesel calibration.

Comments: GCU Com F #162---Separator Pit---C4494.

Analyst

Review

2067

CHAIN OF CUSTODY RECORD C4494

Client/Project Name	Project Location	ANALYSIS/PARAMETERS
Amoco Production	Amoco GCU "Com F" #162 - Sep Pit	
Sampler: (Signature) Kelly P. Hunt (Amoco)	Chain of Custody Tape No.	

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	BTEX (8020)	TPH (8015) Volatile & Semi-Volatile					Remarks
MW-9	10/28/92	8:30 am	3645	Soil	1	1	1					

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Kelly P. Hunt	10/28/92	10:25 am	Linda Pender	10-28-92	1025
Relinquished by: (Signature)			Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

ENVIROTECH INC.
5796 U.S. Highway 64-3014
Farmington, New Mexico 87401
(505) 632-0615

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW #10 (12'-14')	Date Reported:	11-05-92
Laboratory Number:	3649	Date Sampled:	10-28-92
Sample Matrix:	Soil	Date Received:	10-28-92
Preservative:	Cool	Date Extracted:	10-29-92
Condition:	Cool & Intact	Date Analyzed:	11-01-92
		Analysis Requested:	BTEX

Parameter	Concentration (ug/Kg)	Det. Limit (ug/Kg)
Benzene	ND	39.9
Toluene	313	49.9
Ethylbenzene	ND	39.9
p,m-Xylene	1,660	70
o-Xylene	1,810	29.9

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	113 %
Bromfluorobenzene	93 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986.

ND - Parameter not detected at the stated detection limit.

Comments: GCU Com F 162 Separator Pit C4494

Analyst

Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

MODIFIED EPA METHOD 8015
NONHALOGENATED VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW # 10	Date Reported:	10-29-92
Laboratory Number:	3649	Date Sampled:	10-28-92
Sample Matrix:	Soil	Date Received:	10-28-92
Preservative:	Cool	Date Extracted:	10-28-92
Condition:	Cool and Intact	Date Analyzed:	10-29-92
		Analysis Requested:	TPH

Parameter	Concentration (mg/Kg)	Det. Limit (mg/Kg)
Total Petroleum Hydrocarbons	20.7	0.0032

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986.

ND - Parameter not detected at the stated detection limit.

This analysis was based on a Gasoline calibration.

Comments: GCU Com F #162---Separator Pit---C4494.

Analyst

Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

MODIFIED EPA METHOD 8015
NONHALOGENATED VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW #10	Date Reported:	10-29-92
Laboratory Number:	3649	Date Sampled:	10-28-92
Sample Matrix:	Soil	Date Received:	10-28-92
Preservative:	Cool	Date Analyzed:	10-29-92
Condition:	Cool and Intact	Analysis Requested:	TPH

Parameter	Concentration (mg/Kg)	Det. Limit (mg/Kg)
Total Petroleum Hydrocarbons	23.2	0.0024

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986.

Method 8015, Nonhalogenated Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

This analysis was based on a Diesel calibration.

Comments: GCU Com F #162---Separator Pit---C4494.

Analyst

Review

2069

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location	C 4494 ANALYSIS/PARAMETERS
Amoco Production Co.	GCU "F Com" #162 Sep P.A	
Sampler: (Signature) K. P. Kent	Chain of Custody Tape No.	

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	BTEX 8020	TPH 418.1 8015 Mod.					Remarks
MW-10 (12-14')	10/28/92	1:15pm	3649	Soil	1	1	1					

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Kei P. Kent	10/28/92	1:45pm	Linda Pender	10-28-92	1:45pm
Relinquished by: (Signature)			Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

ENVIROTECH INC.
5796 U.S. Highway 64-3014
Farmington, New Mexico 87401
(505) 632-0615

APPENDIX D

MONITORING NOTES

PUMP TEST DATA

PLOTS & CALCULATIONS

TABLE 1

SUMMARY OF THE MONITOR WELLS
GROUNDWATER CONDITIONS
AMOCO PRODUCTION COMPANY
GCU COM F 162
(J), SEC. 36, T29N, R12W, NMPM
FARMINGTON, SAN JUAN COUNTY, NEW MEXICO

SAMPLING DATE: JULY 29, 1993

MW #	SAMPLE TIME	TOTAL DEPTH (ft.)	STATIC WATER LEVEL (ft.)	WELL BORE VOLUME (gal)	WATER CONDITIONS TEMP °C	COND µS	pH	DISS O_2 (ppm)	COMMENTS
MW-1	-	22.63	20.74	-	-	-	-	-	1.50' OF PRODUCT, NOT SAMPLED.
MW-2	-	23.25	20.93	-	-	-	-	-	1.42' OF PRODUCT, NOT SAMPLED.
MW-3	0947	25.34	21.08	0.71	15.2	1100	7.5	0.0	MURKY, NO ODOR, DUPLICATE TAKEN.
MW-4	0930	23.48	20.82	0.44	15.0	1200	7.4	0.1	CLEAR TO CLOUDY, SLIGHT ODOR.
MW-5	0900	25.34	21.85	0.58	14.9	2200	7.4	0.2	LOTS OF SEDIMENT, NO ODOR.
MW-6	0918	26.90	20.04	1.14	15.3	1000	7.7	0.1	MURKY, NO ODOR.
MW-7	-	25.24	19.16	-	-	-	-	-	0.63' OF PRODUCT, NOT SAMPLED.
MW-8	-	23.68	20.50	-	-	-	-	-	0.96' OF PRODUCT, NOT SAMPLED.
MW-9	1005	19.50	11.42	1.35	15.9	1500	7.5	0.9	CLOUDY TO MURKY, NO ODOR.
MW-10	1025	20.14	14.02	1.02	14.7	1900	7.4	2.4	CLOUDY TO MURKY, NO ODOR.

TABLE 5

SUMMARY OF THE MONITOR WELLS
GROUNDWATER CONDITIONS
AMOCO PRODUCTION COMPANY
GCU COM F 162
(J), SEC. 36, T29N, R12W, NMPM
FARMINGTON, SAN JUAN COUNTY, NEW MEXICO

7/15/93

MW #	SAMPLE TIME	TOTAL DEPTH (ft.)	STATIC WATER LEVEL (ft.)	WATER CONDITIONS TEMP°C	COND	pH	DISS O_2	COMMENTS
MW-1	-	22.63	20.73	-	-	-	-	1.35' of product, strong odor, not sampled
MW-2	-	23.25	20.87	-	-	-	-	1.52' of product, strong odor, not sampled
MW-3	1155	25.34	21.05	15.2	7.2	900	0.0	murky, very slight odor
MW-4	1145	23.48	20.81	15.0	7.0	1000	0.8	black, strong odor
MW-5	1240	25.34	21.89	15.1	7.0	1500	0.3	lots of sediment, no odor
MW-6	1225	26.90	20.40	15.2	7.5	700	0.0	murky, no odor
MW-7	-	25.24	19.16	-	-	-	-	0.63' of product, strong odor, not sampled
MW-8	-	23.68	20.50	-	-	-	-	0.63' of product, strong odor, not sampled
MW-9	1315	19.50	11.32	15.3	7.3	1400	0.8	murky to cloudy, no odor
MW-10	1255	20.14	14.00	15.3	7.2	1100	2.7	murky to cloudy, not odor

CASING	GW
100.00	
100.16	
99.10	— 78.[illegible]
98.87	— 78.[illegible]
100.[illegible]	— [illegible].01
98.68	— 78.[illegible]
97.39	
99.03	
[illegible]	— 77.[illegible]
91.[illegible]	— 77.[illegible]

SUMMARY OF MONITOR WELL
DEVELOPMENT SCHEDULE & GROUND WATER CONDITIONS
AMOCO PRODUCTION COMPANY
GALLEGOS CANYON UNIT 162
SEC. 36 TWP 29N RNG 12W
SAN JUAN COUNTY, NEW MEXICO
TABLE 1

	Date	Time	Water Level (ft)	Est. Vol. Recovered (gal)	Water Conditions		
					Measured pH	Condtvty. (μS)	Temp. (degree C)
MW-1A	11-3-92	1300	21.37	0.4P	NR	NR	NR
			20.21P	0.4W			
		1630	20.63		NR	NR	NR
			20.03P				
MW-2A	11-3-92	1250	21.66	0.4P	NR	NR	NR
			20.44P	0.4W			
		1630	20.22	NR	NR	NR	NR
			20.16P	NR			
MW-7	11-3-92	1440	19.02	10.0W	8.5	NR	NR
			18.94P	T			
		1610		1.0	8.1	980	NR
		1620		1.0	7.9	1000	NR
MW-9	11-3-92	1435	11.56	3.5	7.7	1780	NR
		1540		2.0	7.9	1780	NR
		1550		1.0	7.9	1790	NR
MW-10	11-3-92	1435	13.86	1.8	NR	NR	NR
		1530		1.0	7.4	3000	NR
		1600		1.0	7.5	2900	NR

C:\FIGS\WP\4456DEV.TBL

SHEET NO. OF

FILE

APPN

DATE

BY

Amoco Production Company

ENGINEERING CHART

SUBJECT GCU 162

	Csg Elev	DTP	DTW	Thick	GW Elev *
MW-1	100.06	20.18	21.51	1.33	79.39
2	100.16	20.39	21.76	1.37	79.33
3	99.10	–	20.65	–	78.45
4	98.87	–	20.47		78.40
5	102.50	–	21.21	–	81.29
6	98.68	–	19.59	–	79.09
		18.95	19.00	0.05	78.47 ①
7	97.39	18.93	18.94	0.01	78.45 ②
8	99.03	–	20.09	–	78.94
9	88.50				
10	91.58				
RW-1	99.67				

10/27/92

* (0.68 Product Correction Factor)

Form 371 2-86

SUMMARY OF MONITOR WELLS
GROUNDWATER CONDITIONS
AMOCO PRODUCTION COMPANY
GALLEGOS CANYON UNIT 162
SEC. 36 T29N, R12W, NMPM
SAN JUAN COUNTY, NEW MEXICO

PROJECT NO. 92140/C4495

	DATE	TOTAL DEPTH (ft.)	STATIC WATER LEVEL (ft.)	WELL BORE VOLUME (gallons)	WATER CONDITIONS Temp.	Cond.	pH	COMMENTS
MW-1	4/5/93	23.54	20.70	5	22.4	NR	7.09	20" prod/6" black oil
MW2	4/5/93	23.10	20.97	3	20.70	NR	6.92	24" prod/4" black oil
MW-3	4/5/93	24.14	21.10	2	22.3	1300	7.34	
MW-4	4/5/93	23.48	19.96	5	22.4	1400	7.06	slight odor
MW-5	4/5/93	25.02	21.96	5	22.8	2100	6.75	
MW-6	4/5/93	26.90	20.17	10	23.6	1000	7.05	strong odor
MW-7	4/5/93	25.24	19.48	8	22.2	1000	6.89	2" yellow product
MW-8	4/5/93	23.64	20.36	12	22.4	1200	7.02	3" yellow product
MW-9	4/5/93	19.50	12.61	8	22.0	1200	7.22	
MW10	4/5/93	20.14	14.36	10	19.5	1400	6.98	
RW-1	4/5/93	36.78	20.84		NR	NR	NR	Pumping 1-1/2 gpm

NOTE:

TABLE 9

SUMMARY OF THE MONITOR WELLS
GROUNDWATER CONDITIONS
AMOCO PRODUCTION COMPANY
GCU COM F 162
(J), SEC. 36, T29N, R12W, NMPM
FARMINGTON, SAN JUAN COUNTY, NEW MEXICO

	DATE	TOTAL DEPTH (ft.)	STATIC WATER LEVEL (ft.)	DEPTH TO PRODUCT (ft.)	COMMENTS
MW-1	03/22/93	22.63	21.92	20.74	1.18' of product, strong odor
MW-2	03/22/93	23.25	22.52	20.92	1.16' of product, strong odor
MW-3	03/22/93	25.34	21.08	-	no odor
MW-4	03/22/93	23.48	20.90	-	slight odor
MW-5	03/22/93	25.34	21.92	-	no odor
MW-6	03/22/93	26.90	20.24	20.22	0.02' of product, strong odor
MW-7	03/22/93	25.24	19.72	19.48	0.24' of product, strong odor
MW-8	03/22/93	23.68	20.56	20.36	0.20' of product, strong odor
MW-9	03/22/93	19.50	-	-	no odor
MW-10	03/22/93	20.14	-	-	no odor

TABLE 8

SUMMARY OF THE MONITOR WELLS
GROUNDWATER CONDITIONS
AMOCO PRODUCTION COMPANY
GCU COM F 162
(J), SEC. 36, T29N, R12W, NMPM
FARMINGTON, SAN JUAN COUNTY, NEW MEXICO

	DATE	TOTAL DEPTH (ft.)	STATIC WATER LEVEL (ft.)	DEPTH TO PRODUCT (ft.)	COMMENTS
MW-1	03/05/93	22.63	21.72	20.69	1.03' of product, strong odor
MW-2	03/05/93	23.25	22.08	20.94	1.14' of product, strong odor
MW-3	03/05/93	25.34	21.01	-	slight odor
MW-4	03/05/93	23.48	20.71	-	slight odor
MW-5	03/05/93	25.34	21.82	-	slight odor
MW-6	03/05/93	26.90	20.22	20.20	0.02' of product, strong odor
MW-7	03/05/93	25.24	19.72	19.48	0.24' of product, strong odor
MW-8	03/05/93	23.68	20.60	20.35	0.35' of product, strong odor
MW-9	03/05/93	19.50	-	-	no odor
MW-10	03/05/93	20.14	-	-	no odor

TABLE 7

SUMMARY OF THE MONITOR WELLS
GROUNDWATER CONDITIONS
AMOCO PRODUCTION COMPANY
GCU COM F 162
(J), SEC. 36, T29N, R12W, NMPM
FARMINGTON, SAN JUAN COUNTY, NEW MEXICO

	DATE	TOTAL DEPTH (ft.)	STATIC WATER LEVEL (ft.)	DEPTH TO PRODUCT (ft.)	COMMENTS
MW-1	02/19/93	22.63	21.80	20.66	1.26' of product, strong odor
MW-2	02/19/93	23.25	22.12	20.96	1.16' of product, strong odor
MW-3	02/19/93	25.34	20.92	-	slight odor
MW-4	02/19/93	23.48	20.76	-	slight odor
MW-5	02/19/93	25.34	21.70	-	slight odor
MW-6	02/19/93	26.90	20.00	-	strong odor
MW-7	02/19/93	25.24	19.76	19.52	0.24' of product, strong odor
MW-8	02/19/93	23.68	20.44	20.24	0.20' of product, strong odor
MW-9	02/19/93	19.50	-	-	no odor
MW-10	02/19/93	20.14	-	-	no odor

TABLE 6

SUMMARY OF THE MONITOR WELLS
GROUNDWATER CONDITIONS
AMOCO PRODUCTION COMPANY
GCU COM F 162
(J), SEC. 36, T29N, R12W, NMPM
FARMINGTON, SAN JUAN COUNTY, NEW MEXICO

	DATE	TOTAL DEPTH (ft.)	STATIC WATER LEVEL (ft.)	DEPTH TO PRODUCT (ft.)	COMMENTS
MW-1	02/03/93	22.63	21.73	20.58	1.14' of product, strong odor
MW-2	02/03/93	23.25	22.08	21.82	0.26' of product, strong odor
MW-3	02/03/93	25.34	20.90	-	slight odor
MW-4	02/03/93	23.48	20.76	-	slight odor
MW-5	02/03/93	25.34	21.65	-	slight odor
MW-6	02/03/93	26.90	20.60	20.59	0.01' of product, strong odor
MW-7	02/03/93	25.24	19.55	19.32	0.23' of product, strong odor
MW-8	02/03/93	23.68	20.50	20.20	0.30' of product, strong odor
MW-9	02/03/93	19.50	-	-	no odor
MW-10	02/03/93	20.14	-	-	no odor

TABLE 5

SUMMARY OF THE MONITOR WELLS
GROUNDWATER CONDITIONS
AMOCO PRODUCTION COMPANY
GCU COM F 162
(J), SEC. 36, T29N, R12W, NMPM
FARMINGTON, SAN JUAN COUNTY, NEW MEXICO

	DATE	TOTAL DEPTH (ft.)	STATIC WATER LEVEL (ft.)	DEPTH TO PRODUCT (ft.)	COMMENTS
MW-1	01/15/93	22.63	22.07	20.55	1.52' of product, strong odor
MW-2	01/15/93	23.25	22.60	20.90	1.70' of product, strong odor
MW-3	01/15/93	25.34	20.89	-	slight odor
MW-4	01/15/93	23.48	20.74	-	slight odor
MW-5	01/15/93	25.34	21.70	-	slight odor
MW-6	01/15/93	26.90	20.03	-	strong odor, trace of product
MW-7	01/15/93	25.24	19.26	19.14	0.12' of product, strong odor
MW-8	01/15/93	23.68	20.24	21.10	0.60' of product, strong odor
MW-9	01/15/93	19.50	-	-	no odor
MW-10	01/15/93	20.14	-	-	no odor

TABLE 4

SUMMARY OF THE MONITOR WELLS
GROUNDWATER CONDITIONS
AMOCO PRODUCTION COMPANY
GCU COM F 162
(J), SEC. 36, T29N, R12W, NMPM
FARMINGTON, SAN JUAN COUNTY, NEW MEXICO

	DATE	TOTAL DEPTH (ft.)	STATIC WATER LEVEL (ft.)	DEPTH TO PRODUCT (ft.)	COMMENTS
MW-1	01/05/93	22.63	22.00	20.50	1.50' of product, strong odor
MW-2	01/05/93	23.25	22.44	20.92	1.52' of product, strong odor
MW-3	01/05/93	25.34	20.92	-	slight odor
MW-4	01/05/93	23.48	20.76	-	slight odor
MW-5	01/05/93	25.34	21.42	-	slight odor
MW-6	01/05/93	26.90	20.01	-	strong odor
MW-7	01/05/93	25.24	19.28	19.17	0.11' of product, strong odor
MW-8	01/05/93	23.68	20.22	20.17	0.50' of product, strong odor
MW-9	01/05/93	19.50	-	-	no odor
MW-10	01/05/93	20.14	-	-	no odor

TABLE 3

SUMMARY OF THE MONITOR WELLS
GROUNDWATER CONDITIONS
AMOCO PRODUCTION COMPANY
GCU COM F 162
(J), SEC. 36, T29N, R12W, NMPM
FARMINGTON, SAN JUAN COUNTY, NEW MEXICO

	DATE	TOTAL DEPTH (ft.)	STATIC WATER LEVEL (ft.)	DEPTH TO PRODUCT (ft.)	COMMENTS
MW-1	12/29/92	22.63	21.24	20.32	0.92' of product, strong odor
MW-2	12/29/92	23.25	21.08	20.62	0.46' of product, strong odor
MW-3	12/29/92	25.34	20.81	-	no odor
MW-4	12/29/92	23.48	20.80	-	slight odor
MW-5	12/29/92	25.34	21.37	-	slight odor
MW-6	12/29/92	26.90	20.07	-	strong odor
MW-7	12/29/92	25.24	19.48	19.36	0.16' of product, strong odor
MW-8	12/29/92	23.68	20.33	20.22	0.11' of product, strong odor
MW-9	12/29/92	19.50	-	-	no odor
MW-10	12/29/92	20.14	-	-	no odor

TABLE 2

SUMMARY OF THE MONITOR WELLS
GROUNDWATER CONDITIONS
AMOCO PRODUCTION COMPANY
GCU COM F 162
(J), SEC. 36, T29N, R12W, NMPM
FARMINGTON, SAN JUAN COUNTY, NEW MEXICO

	DATE	TOTAL DEPTH (ft.)	STATIC WATER LEVEL (ft.)	DEPTH TO PRODUCT (ft.)	COMMENTS
MW-1	12/21/92	22.63	21.40	20.33	1.07' of product, strong odor
MW-2	12/21/92	23.25	21.00	20.15	0.30' of product, strong odor
MW-3	12/21/92	25.34	20.78	-	no odor
MW-4	12/21/92	23.48	20.58	-	slight odor
MW-5	12/21/92	25.34	21.32	-	slight odor
MW-6	12/21/92	26.90	19.75	-	strong odor
MW-7	12/21/92	25.24	19.18	19.16	0.20' of product, strong odor
MW-8	12/21/92	23.68	20.31	-	strong odor
MW-9	12/21/92	19.50	11.90	-	no odor
MW-10	12/21/92	20.14	14.20	-	no odor

TABLE 1

SUMMARY OF THE MONITOR WELLS
GROUNDWATER CONDITIONS
AMOCO PRODUCTION COMPANY
GCU COM F 162
(J), SEC. 36, T29N, R12W, NMPM
FARMINGTON, SAN JUAN COUNTY, NEW MEXICO

	DATE	TOTAL DEPTH (ft.)	STATIC WATER LEVEL (ft.)	WELL BORE VOLUME (gal.)	WATER CONDITIONS TEMP. (°C)	CONDUCT (μS)	pH	COMMENTS
MW-1	12/11/92	22.63	20.30	13	19.0	1010	7.25	0.80' of product
MW-2	12/11/92	23.25	21.00	2	18.7	1011	7.14	0.35' of product
MW-5	12/11/92	25.34	21.31	2	16.1	1014	6.90	no odor
MW-6	12/11/92	26.68	19.76	8	17.5	1009	7.42	slight odor
MW-8	12/11/92	23.68	20.00	10	16.3	1000	6.41	slight odor

SHEET NO. 1 OF

Amoco Production Company

ENGINEERING CHART

FILE

APPN

SUBJECT Pump Test

DATE 12/15/92

RW-1 ~ 2 GPM → 137 HZ - 138 HZ BY LPH

	TIME	DTP	DTW	THICK	TRANSDUCER	
t₀	12:50 pm	-	20.80		8.91	
	5[illegible]:15		20.95 ?		8.11	
	51:50		23.74		7.75	Note:
	52:23		25.00		7.19	1) Orig. well TD @ 39.97'
	52:40		25.50		7.00	2) Cur. TD @ 37.75' (silt/bottom)
	52:59		26.00		6.90	3) Pump set @ 36.75
	53:18		26.50		6.58	- intake @ approx 36'
	53:40		27.00		6.46	
	54:04		27.50		6.24	
	54:31		28.00		6.01	
	55:03		28.50		5.85	
	55:42		29.00		5.64	
	56:43		29.50		5.35	
	58:01		30.00		5.20	
	12:59:45		30.50		4.94	
	1:02:35		31.00		4.74	
	1:07:06		31.50		4.43	
	1:08:30	?? X	32.00 X	Hit Wire	4.34	
	1:13:13		32.00		4.23	
	1:15:52	??	32.50 } ?		3.93	
	1:18:21		32.50 }		4.18	
~	1:21		32.28	GMS Probe		
	1:23:00		32.33		4.06	
	1:24:00		32.37		4.09	
	1:25:00		32.40		4.06	
	1:26:00		32.41 ?			
	1:27:00	—	32.46			
	1:28:00		32.49			
	1:29:00		~~32.55~~ ?	32.52		
	1:30:00		32.55			
	1:32:~~00~~08		32.60			
	1:34:00		32.65			
	1:36:00		32.68		3.93	
	1:38:30		32.74			
	1:40:32		32.78		3.89	

Form 311 2-86

Amoco Production Company

ENGINEERING CHART

FILE

APPN

SUBJECT RW-1

DATE

BY

TIME	DTP	DTW	THICK	TRANSDUCER	FlowChart
1:42:55		32.84			
1:45:00		32.87			
1:47:30		32.92			
1:50:00		32.98			
1:55:00		33.065			
2:00:00		33.18			* 5 Gal/3:00 mt 1.67 GPM
2:12:22		33.33			
2:25:00		33.54			
2:32:00		33.62			
2:40:50		33.74			* Filled GENERATOR at 3:40
~~2:50:00~~ 2:52:00		33.95			
3:05:00		34.12			
3:20:00		34.33			
3:35:00		34.46			
3:50:00		34.60			STARTED SNOWING AT 3:30
4:05:00		34.76			
4:20:00		34.85			
4:35:00		34.95			* Put TARP up at 4:40
4:58:15		35.14			
5:15:00		35.28			
5:36:18		35.50			(1.40GPM) 5 gals/3min 35 sec.
5:50:00		35.64			* Dropped Flow Rate to 125 HZ SL Rising Quickly!
5:54:		→ Returned to 138HZ Set @ 130 HZ			
5:56:15					
5:57:17		32.88			
46:	—	.70			
58 23		.60			
59:11		.50			
6:00:07		.40			
01:18		.30			
02:55		.20			
[illegible]		.10			
6:07:30		32.10			
6:15					

Form 371 2-86

SHEET NO. 3 OF

FILE

APPN

DATE

BY

Amoco Production Company

ENGINEERING CHART

SUBJECT

TIME	DTP	DTW	TRANSDUCER	
6:20:00			FLOW CHK	Chk Flow 5:25 @ 5 Gal
6:30:00		32.09		
6:46:00		32.18		
7:00:00		32.25		
7:20:00		32.28		
7:40:25		32.30		
7:46			FLOW CHK	7:46 → 7:51:20 / 5 GAL
8:00:00		32.28		
8:20:00		32.27	-3.77	
8:40:00		32.24	-3.80	-3.74
9:00:00		32.36	-3.77	-3.80
9:13		FLOW STOPPED !		
9:15		CRANKED UP 187 HZ		BLEW BUBBLE OUT
9:16:21		ReSet to 130 HZ		
9:17:50		33.00		
9:30:06		32.85		
9:35		—		Added Fuel to Generator
10:00:00		32.85		
10:10			FLOW CHK	5:30 / 5 GAL
10:20		32.80	Bubble Forming	
10:40		32.90		
11:03:40		32.~~90~~	32.60	
11:04		BLOW BUBBLE (170 HZ) → 45 sec back to 130 HZ		
11:14		32.61		
11:26:30		32.54		Probe No Buzz / Light Only
12:00:06		32.56		
12:04			FLOW CHK	5.49 / 5 Gal
12:31		FLOW STOPPED (sometime before)		BLOW BUBBLE 318 HZ
12:36		32.75		
1:00:00		32.95		
1:22:00		32.97		
1:49:00		33.03		Fueled Generator @ 2:20
2:10:00		33.07		5:40 / 5 gals
2:30:00		33.11		Blew Bubble 205 HZ

Form 311 2-86

Amoco Production Company

ENGINEERING CHART

FILE

APPN

SUBJECT

DATE

BY

TIME	DTP	DTW	TRANSDUCER	REMARKS
2:50:00		32.98		
3:10:00		32.99		
3:40:00		32.98		
4:10:00		32.99		
4:40:00		33.00		
5:10:00		33.32		Blew Bubble 190 Hz
5:40:00		33.35		6:07/5 gals
6:09:00		33:01		Blew Bubble 188 Hz
6:30:00		32.96		Flow slowed down blew Line with
7:00:00		33.09		higher rate gpm for approx 45 sec.
7:30:00		33.23		Flow rate increased.
~ 8:00:00	→ BLEW BUBBLE			5:32/5 gals
8:03:00		33.99		
8:10				5:34/5 gals
8:32:00		33.22		
8:59:00		33.41		
9:00	→ BLEW BUBBLE @ 201 HZ			(Approx 15 Sec)
~ 9:20	→ FLOW STOPPED / BLEW BUBBLE / LINE PLUGGED @ Tank			
~ 9:40	→ Pulsed Pump 0-400 HZ to Unplug Line / Sucked Air (dry hole)			
9:42-9:50	→ Approx 9:40 Back Up @ 134 HZ / Slow Flow			8 min / 5 Gal
9:54:06		33.12		
10:14		33.17		
~ 10:32	BLEW BUBBLE 180 HZ / 20 Sec / Reset to 130			
10:42 - 10:48:45		~~33.26~~		6:45/5 Gals
10:51		33.26		
11:41	BLEW BUBBLE / 184 HZ / 1 Minute			
11:58		33.33		
12:13 - 12:19:45	FLOW CHK			6:45/5 Gals
12:23		33.26		

Form 371 2-86

SHEET NO. OF

FILE

APPN

DATE

BY

RECOVERY TEST

Amoco Production Company

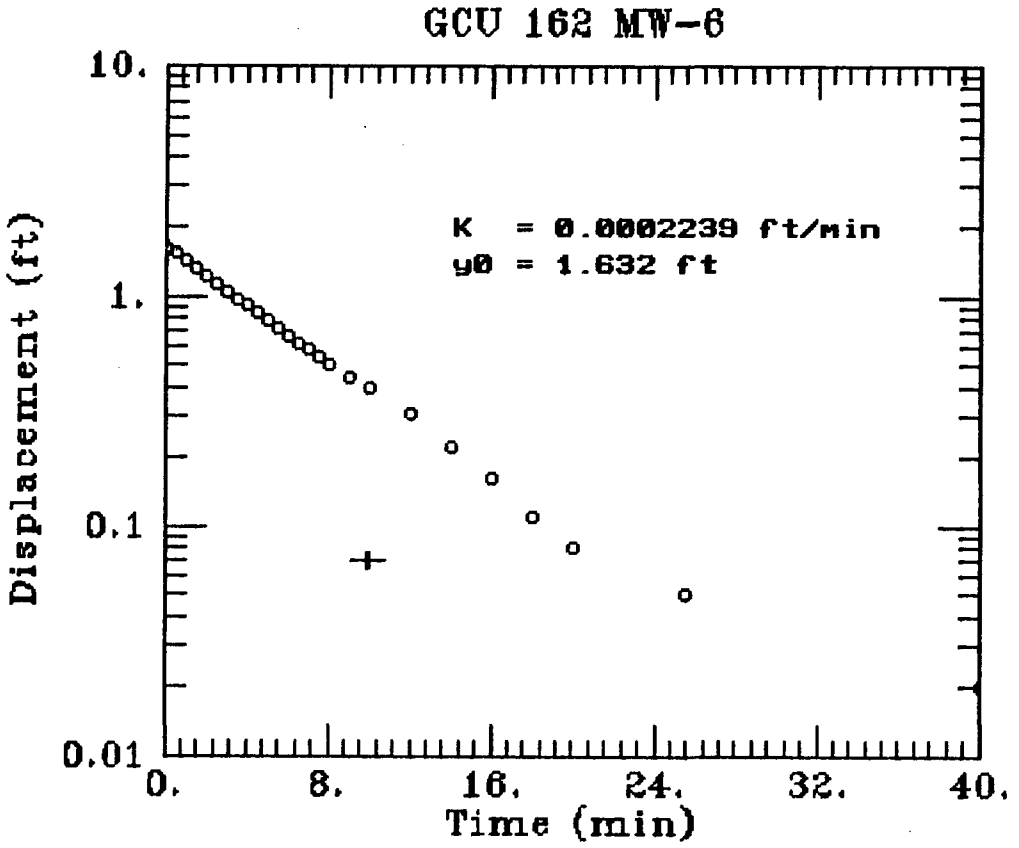
ENGINEERING CHART

SUBJECT ORIG. STATIC WATER LEVEL @ 20.80

TURN OFF PUMP @ 12:50:00

TIME	DTW	DTP TRANSDUCER	
12:48	33.~~42~~	3.85 - 3.99	
12:50:48	32.6		
12:51:46	33.0		
53:06	31.0		
53:48	30.5		
54:28	30.0		* Pinched Off Hose to Prevent Backflow
55:11	29.5		-V. Slow backflow into well, however.
55:55	29.0		
56:46	28.5		? Note: Data Transducer Layer Never Changed? (Car battery was ~~not~~ came disconnected!)
57:38	28.0		
58:33	27.5		
12:59:30	27.0		
1:00:33	26.5		
1:01:42	26.0	3.66	
1:02:54	25.5		
1:04:13	25.0		
05:43	24.5		
07:27	24.0		
1:09:39	~~28~~ 23.5		
1:13:14	23.0		
1:14:51	22.8		
1:16:38	22.6		
1:18:56	22.4		
1:22:01	22.2		
—	~~22.0~~	missed	
1:28:00	~~21.91~~		
28:27	21.89		
28:47	21.87		
29:14	21.85		
29:41	21.83		
1:30:30	21.80		
30:58	21.78		
31:46	21.75	Product?	

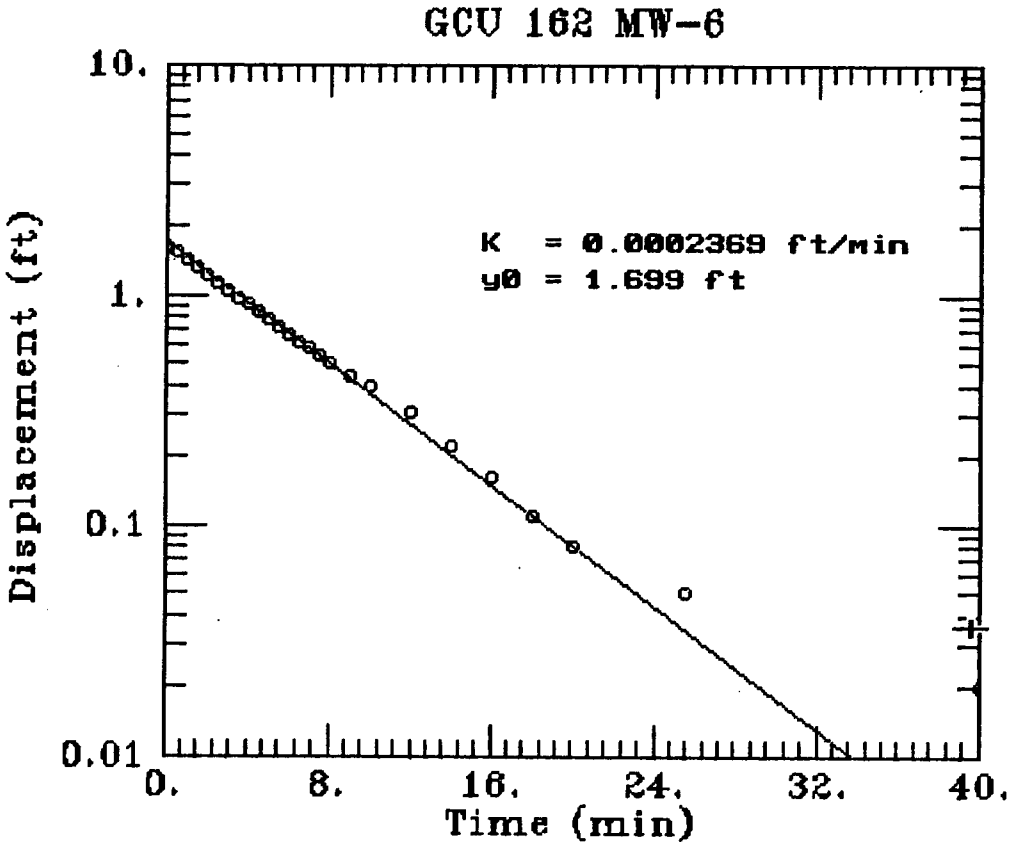
Form 371 2-86



AQTESOLV

GERAGHTY & MILLER, INC.

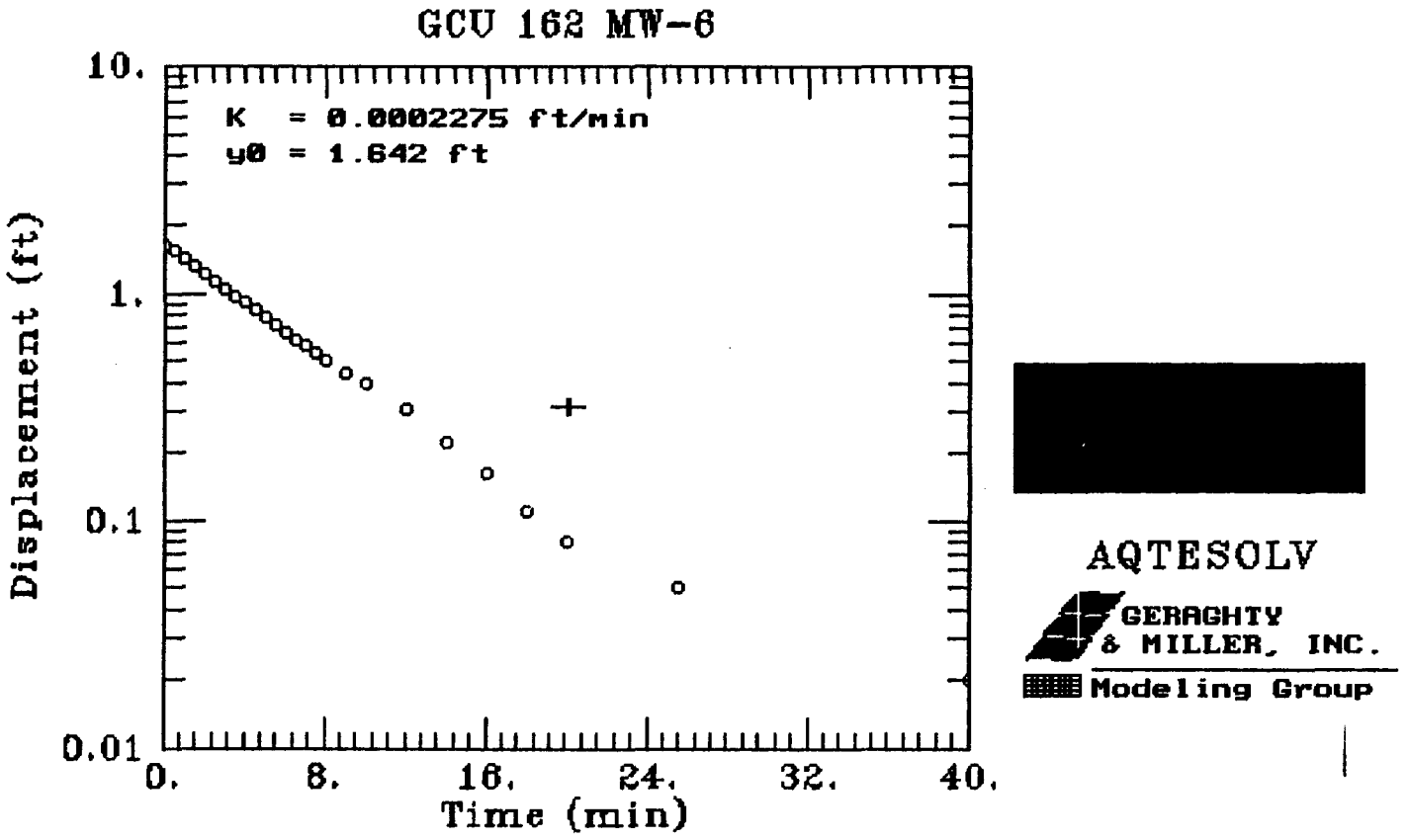
Modeling Group



AQTESOLV

GERAGHTY & MILLER, INC.
Modeling Group

Select a function (F1=help, F2=set anchor pt., F3=drag line, F4=refresh):

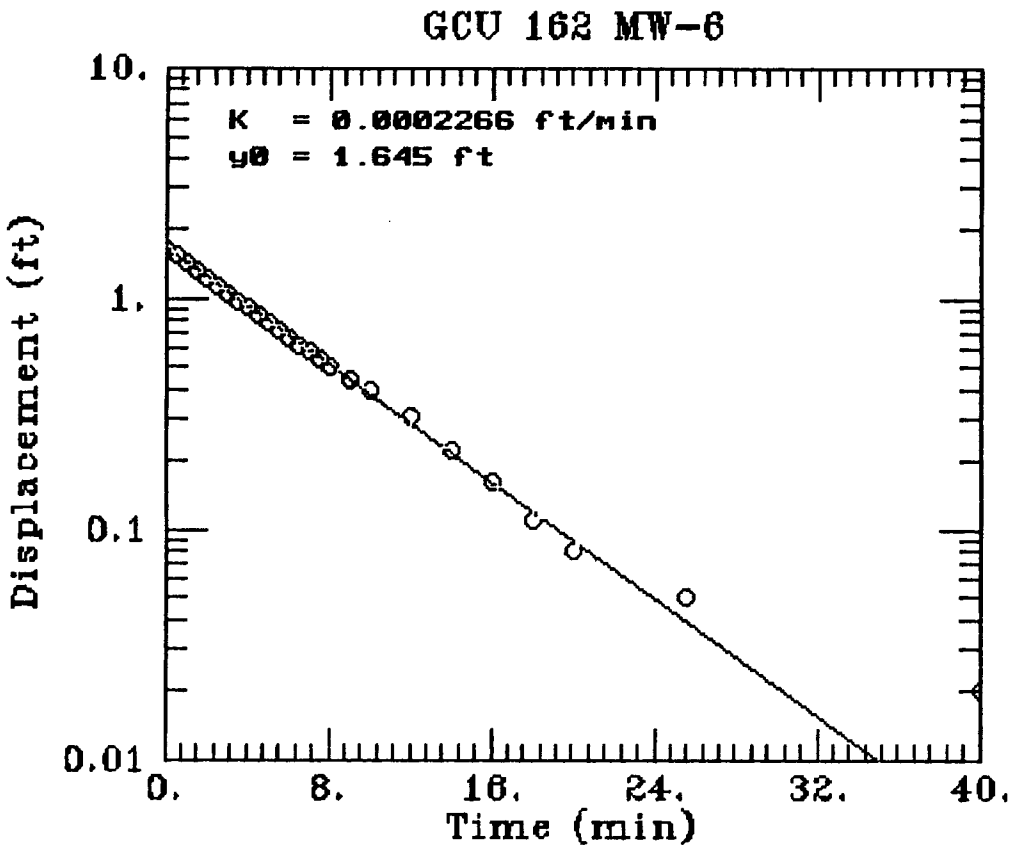

GCU 162 MW-6
K = 0.0002275 ft/min
y0 = 1.642 ft
Displacement (ft)
10.
1.
0.1
0.01
0.
8.
16.
24.
32.
40.
Time (min)
AQTESOLV
GERAGHTY
& MILLER, INC.
Modeling Group

$K = 2.27 \times 10^{-4}$ ft/min

$K = 0.327$ ft/day

$K = 2.45$ gpd/ft^2

$K = 1.15 \times 10^{-4}$ cm/sec

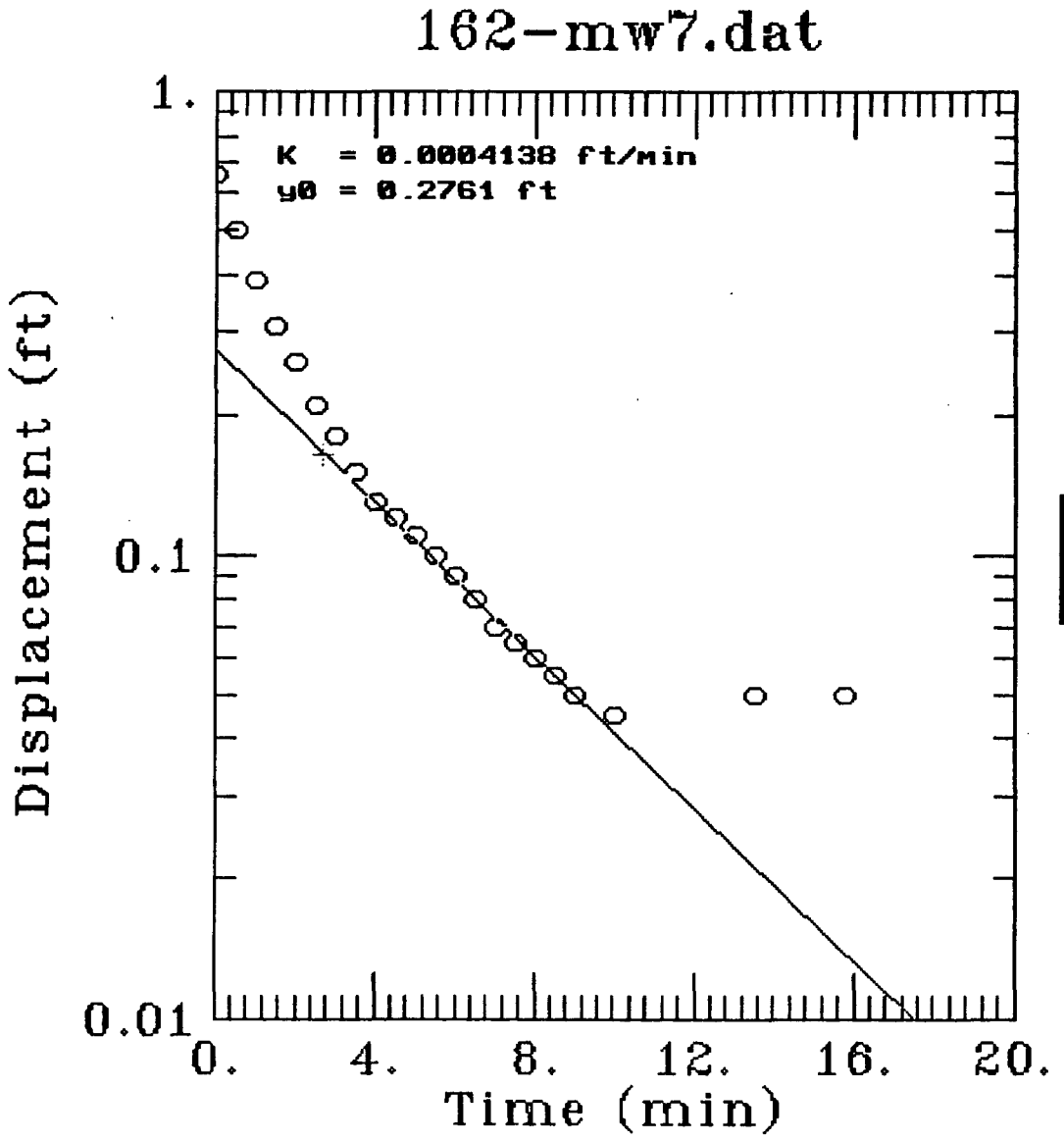


AQTESOLV

GERAGHTY & MILLER, INC.

Modeling Group

Select a function (F1=help, F2=set anchor pt., F3=drag line, F4=refresh):



$K = 4.14 \times 10^{-4}$ ft/min

$K = 0.60$ ft/day

$K = 4.46$ gpd/ft^2

$K = 2.10 \times 10^{-4}$ cm/sec

[redacted]

AQTESOLV

GERAGHTY & MILLER, INC.

Modeling Group

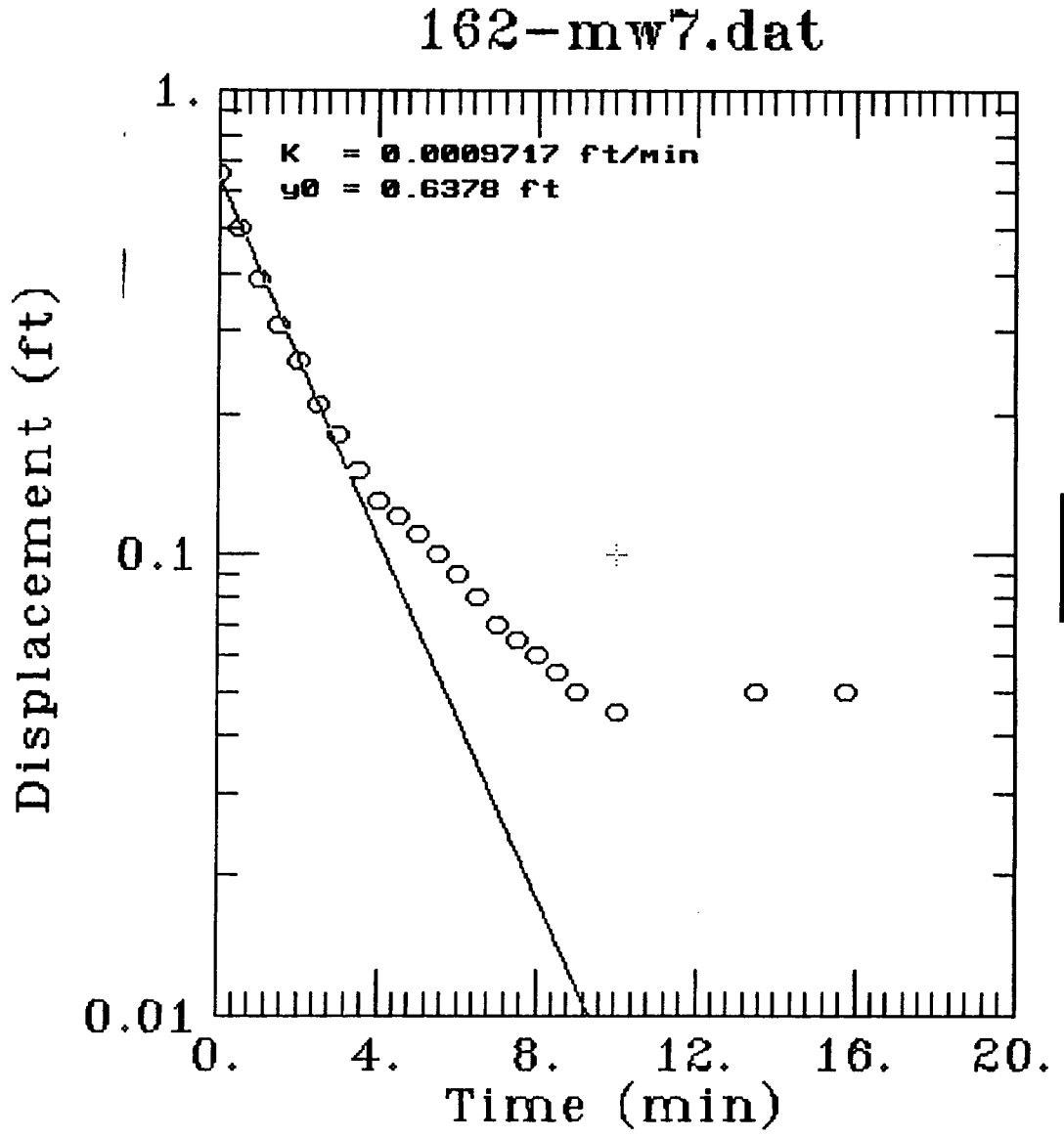
Select a function (F1=help, F2=set anchor pt., F3=drag line, F4=refresh):

K= 9.72 x 10^{-4} ft/min

K= 1.40 ft/day

K= 10.47 gpd/ft^2

K= 4.94 x 10^{-4} cm/sec



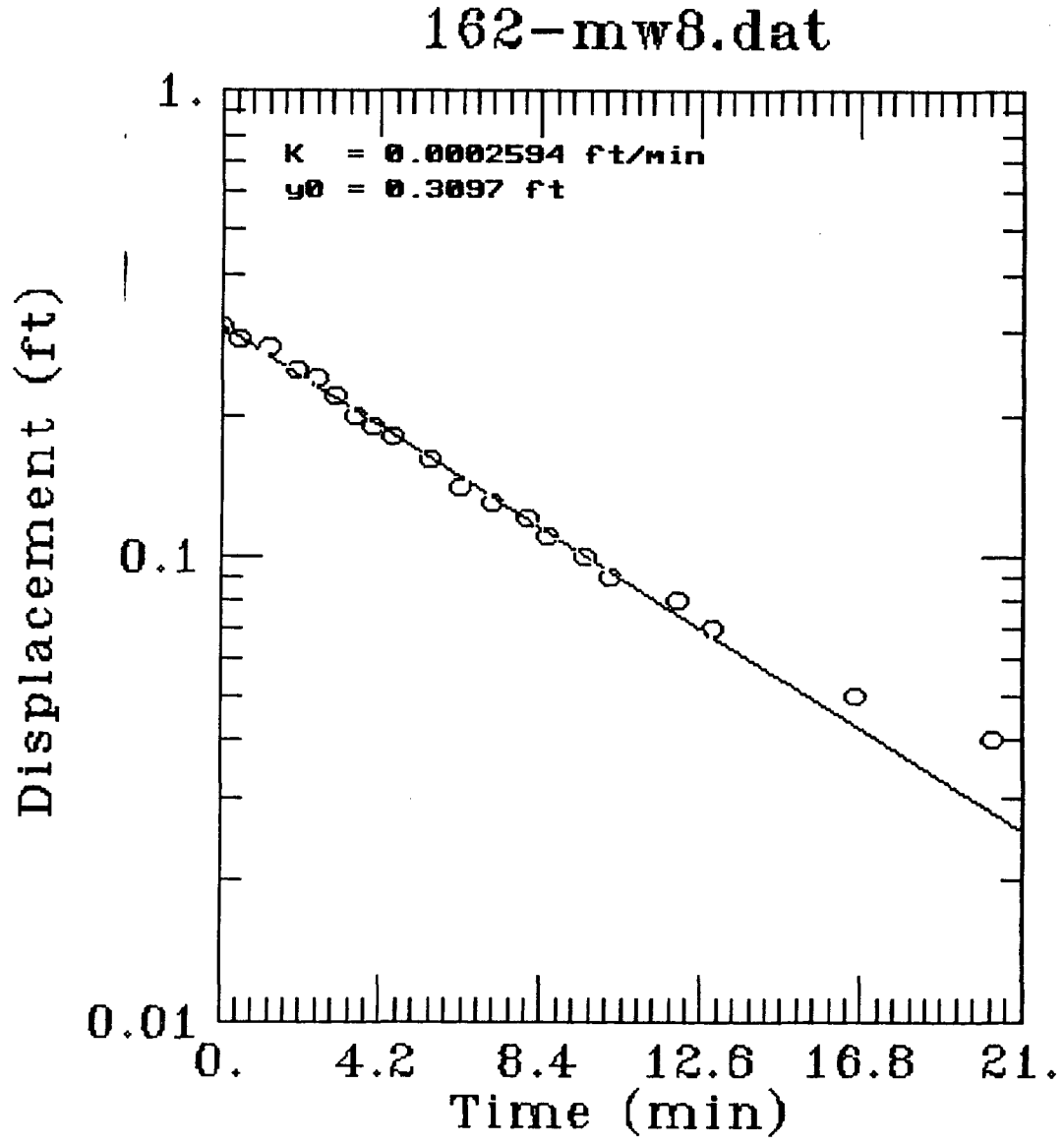
[redacted]

AQTESOLV

GERAGHTY & MILLER, INC.

Modeling Group

Select a function (F1=help, F2=set anchor pt., F3=drag line, F4=refresh):



$K = 2.594 \times 10^{-4}$ ft/min

$\times$ 1440 min/day = 0.3735 ft/day

$\times$ 7.48 gal/day/ft^2

$K = 2.79$ gpd/ft^2

$K = 1.32 \times 10^{-4}$ cm/sec

AQTESOLV

GERAGHTY & MILLER, INC.

Modeling Group

Select a function (F1=help, F2=set anchor pt., F3=drag line, F4=refresh):

Amoco Production Company

ENGINEERING CHART

SHEET NO. OF

FILE

APPN

DATE 11/25/92

BY KPH

SUBJECT Estimated GW Velocity

GCU #162

GW Velocity = $V = \frac{Kdh}{\phi dl}$

Where K = Hydraulic Conductivity (gpd/ft²)

ϕ = Porosity (%)

dh/dl = Hydraulic Gradient (ft/ft)

(MW-6) (MW-7)

Est. K = 2.5 → 10.5 GPD/ft²

ϕ = 0.40

(MW5 - MW4) $dh/dl = \frac{2.79'}{315'} = .00886$

or

(MW6 - MW7) $dh/dl = \frac{.65}{85'} = .00765$

1.48 gal/ft³ Conversion

K=2.5 $V = \frac{2.5\ (2.79)}{315} / 0.40\ (7.5) =$

$= .022 / 3 = .0074$ ft/day

$= 2.69$ ft/year

K=10.5 $V = \frac{10.5\ (2.79)}{315} / 0.40\ (7.5) = 0.031$ ft/day

$= 11.3$ ft/yr @ 40% ϕ

" → $0.30\ (7.5) = 0.041$ ft/day @ 30% ϕ

$= 15$ ft/yr

Form 371 2-86

SHEET NO. OF

FILE

APPN

DATE

BY

Amoco Production Company

ENGINEERING CHART

SUBJECT GW 162

Est Aquifer Parameters

$T = Kb$

$K = 5 - 10$ gpd/ft^2 (slug tests)

est $b = 20 - 40$ ft est.

$T = 100 \rightarrow 400$ gpd/ft

Specific Capacity

$$\frac{Q}{s} = \frac{T}{264 \log \frac{0.3Tt}{r^2 S}} = \frac{400}{264 \log \left(\frac{0.3(400)(1)}{(.0278)(.01)} \right)}$$

Assume: $t = 1$ day

$r^2 = .02777$ ft (2" squared)

$S = .01$ If $S = .10$ then $Q = 0.327$ gal/ft

$$\frac{400}{264 \log (431655)} = \frac{400}{264 (5.635)} = \frac{400}{1488}$$

$\frac{Q}{s} = 0.269$

$Q = 0.269 \times S$

4 GPM @ 15' dd

4.9 GPM @ 15' dd

Form 371 2-86