FOX

FOX & ASSOCIATES OF NEW MEXICO, INC.

CONSULTING ENGINEERS AND GEOLOGISTS

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HYDROGEOLOGIC INVESTIGATION AND PROPOSED SOIL AND GROUNDWATER RESTORATION PROGRAM BELL STATION #213 ALBUQUERQUE, NEW MEXICO

Prepared for:
Atex Gas, Inc.

August 14, 1985

COVER LETTER

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August 14, 1985

Atex Gas, Inc.
7324 Fourth Street, NW
Albuquerque, New Mexico 87107

Attention: Mr. Glenn Salsman

Subject: Hydrogeologic Report and Proposed Groundwater Restoration Program at Bell Station No. 213 in Albuquerque, New Mexico

Reference: "Settlement Agreement" New Mexico Water Quality Control Commission and Environmental Improvement Division of the New Mexico Health and Environment Department and Atex Gas, Inc.

"Proposal to Perform a Hydrogeologic Investigation in the Vicinity of Bell Oil Station No. 213 to Evaluate Hydrocarbon Contamination of the Soil and Groundwater and Design a Remedial Action Program"

Gentlemen:

Fox & Associates of New Mexico, Inc., acting as Atex Gas, Inc.'s consultant, is pleased to submit the attached hydrogeologic report and reclamation proposal pertaining to spilled petroleum product at Bell Station No. 213. As proposed and required in the referenced documents, the soil hydrocarbon vapor concentrations and groundwater contaminant plume have been defined, the appropriate aquifer characteristics determined, and a groundwater reclamation plan developed. The attached report is intended to satisfy the

requirements stipulated in paragraph 5i of the referenced Settlement Agreement.

We are available at your convenience to discuss the attached reclamation plan. Should you have any questions or require additional information, please contact us.

Sincerely,

Fox & Associates of NM, Inc.

Steven Brewer
Project Geologist

Martin D. Vinyard, P. E.
Geotechnical Division Manager

cc: Water Pollution Control Bureau
State of New Mexico EID

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INTRODUCTION

This report presents the results of a hydrogeologic investigation conducted at Bell Station No. 213 in Albuquerque, New Mexico. This investigation was performed to evaluate the subsurface conditions at the site and to provide data for design of a soil and groundwater reclamation system. Four primary tasks were undertaken during this investigation:

- o Evaluate petroleum product vapor concentrations in the vadose zone;
- o Define the petroleum product contaminate plume in the groundwater;
- o Determine local aquifer characteristics; and
- o Design a soil and groundwater restoration system.

The following paragraphs present a brief introduction to each of the above tasks. A detailed description of each phase of the investigation is presented in the remainder of this report.

Petroleum product vapors in the vadose zone were measured in the vicinity of the station and in the subsurface structures near the station. Locations where vapor readings were taken and interpolated contours of vapor concentrations are presented on Figure 2 and Plate

1. Information on petroleum product vapor concentrations in utility manholes monitored in conjunction with this project is presented on Table 1.

The petroleum product contaminant plume was defined by installing a total of nineteen (19) groundwater monitor wells. The well head elevations were surveyed ~~in~~, water levels were measured, and water samples were collected and tested for various chemical compounds. A water table contour map and contaminate plume map are presented on Plates 2 and 3, respectively.

The water table in the vicinity of the station has a general gradient to the south. The contaminant plume is situated within the station area with a surface area of approximately 152,000 square feet. The limits of the plume were plotted based upon New Mexico State Environmental Improvement Division (NMEID) standards for benzene. Benzene was generally found to be the compound most prevalent and of highest concentration at the site.

To evaluate local aquifer characteristics, a pump test well and four observation wells were installed near the southwest corner of the site (Plate 2). A short duration, low discharge pump test was conducted and the pump test data was analyzed. The raw field data from the test is included in Appendix B. The test duration and pumping rate were dictated by arrangements with the City of

Albuquerque for disposal of the contaminated discharge water at the wastewater treatment plant. The pumping rate and duration were not adequate to completely stress the aquifer. However, the test was adequate to develop design parameters for use in design of the proposed recovery system.

Based upon the information obtained in the previous phases of the project, a groundwater restoration system was designed. The proposed restoration system consists of an adjustable barrier type well point system. The system will consist of four wells having relatively small discharges and creating minimal yet effective drawdown. Details of the proposed recovery system are presented in the final section of this report.

PROJECT BACKGROUND

Atex Gas, Inc. owns and operates Bell Station No. 213 which is located at 3501 Isleta Boulevard, SW in Albuquerque, New Mexico. In 1981, inventory records for the station indicated that approximately 43,000 gallons of unleaded fuel was lost over a four month period. In July 1981, a 10,000 gallon capacity underground steel storage tank suspected of leaking was unearthed. A small hole was found in the bottom of the tank, therefore the tank was replaced.

In October of 1981 gasoline vapors were reported in an adjacent

residence to the west of the gasoline station. Subsequent investigation by Atex under the direction of the Bernalillo County Fire Marshall's Office determined that fuel which leaked from the underground steel fuel storage tank was floating on the surface of the shallow aquifer. A trench was excavated between the station and the residence, and a large diameter access well was installed. An undeterminable amount of product and comingle was removed and disposed of. Product was removed by Atex, a contracted pumping service, and by individuals skimming off gasoline for use in personal vehicles.

Fox & Associates was contacted by Atex Gas, Inc. to provide technical consultation in June 1982. To begin evaluating the problem, four groundwater monitoring wells were installed at the station and a limited amount of field work was performed. Work was suspended in January 1983 until the Environmental Improvement Division (NMEID) and Atex Gas, Inc., reached a legal settlement agreement.

While negotiations on the settlement agreement proceeded no further field work was performed until March 1983 when the Bernalillo County Fire Marshall was notified of a potential explosion hazard in several Mountain Bell manholes in the vicinity of the Station. Action was taken for Atex Gas, Inc. by Fox & Associates of New Mexico, Inc., to minimize the potential explosion hazard. This action involved inspection, monitoring, and cleaning of six manholes and installation of a continuous passive ventilation system in the manhole nearest the

Station to reduce the hydrocarbon vapor concentrations. The remaining five manholes were frequently monitored using a MSA Model 62 combustible gas indicator and were externally force ventilated when hydrocarbon vapor levels approached 30 percent of the lower explosive limit. The results of this ongoing monitoring have been tabulated and distributed to all involved parties. The work performed on the project after 1983 is detailed in this report.

SITE DESCRIPTION AND LOCATION

Bell Station No. 213 is located in the southwest valley of Albuquerque at 3501 Isleta Boulevard, SW. General location of the site is indicated on Figure 1. The location is approximately 0.8 miles west of and within the inner valley of the Rio Grande. The site is occupied by a self service gasoline station. Both residential and commercial developments surround the site.

Isleta Boulevard (State Highway 47) is one of the major north-south thoroughfares in the south valley area. Numerous service stations and businesses occupy or have occupied sites along Isleta Boulevard. The residences in the vicinity of the station are generally more than twenty years old. The residences typically have individual wells and septic tanks. Most of the residences have recently been connected to City water and sewer service. The shallow wells are still used by some individuals to provide water for

irrigation.

The station is bounded to the north and east by Sausalito Drive and Isleta Boulevard, respectively. A single family residence lies to the west of the station and a PNM Substation is located to the south.

REGIONAL HYDROGEOLOGY

The Atex site lies in the central portion of the Albuquerque Basin. The Albuquerque Basin is one of a interconnected series of north-south aligned grabens and structural basins which have subsided between mountain uplifts comprising the Rio Grande rift (Reeder, et al, 1967). The Rio Grande only in a minor sense eroded the depression it follows.

In conjunction with subsidence of the rift, a considerable thickness of valley fill shed from the surrounding highlands has accumulated in the basin. The valley fill has been estimated by deep oil well drilling to be as much as 10,000 MORE feet thick. The valley fill is comprised of the Miocene-Pliocene Santa Fe Group with overlying recent alluvium. Therefore, the sediments immediately underlying the site are ?ecent alluvium, primarily deposited by the Rio Grande and its tributaries. These deposits are unconsolidated and commonly consist of erratic lenses and layers of sand, clay, and gravel.

Groundwater within the valley fill is the principal aquifer in the Albuquerque area. The Santa Fe group and recent alluvium are generally hydraulically interconnected with occurances of partially separated shallow "perched water". The valley fill aquifer is generally unconfined with localized reports of artesian pressures (Reeder, 1967). The water table slopes at a low angle down gradient diagonally away from the river. This phenomena and recorded water level fluctuations measured in wells, indicate that the Rio Grande generally loses water and recharges the aquifer.

FIELD INVESTIGATION

General

An extensive field investigation has been performed to provide information on the following:

- The site soil profile;
- The limits of hydrocarbon soil vapors in the vadose zone;
- The lateral and vertical extent of groundwater contamination; and
- The soil and aquifer characteristics controlling contaminate migration.

A detailed description of each phase of the field investigation performed is presented in the following sections.

Soil Profile

During drilling and installation of various groundwater monitoring wells, detailed logs of the subsurface conditions were recorded. As shown on the Logs of Test Holes, Figures 4 through 7, subsurface conditions at the site include variable alluvial deposits. The test holes primarily encountered slightly silty to silty sand, sandy clay, clayey sand, and man-made fill above the water table. Below the water table the aquifer is comprised of medium to fine-grained and some coarse grained sand. The deepest test hole, DW1 (Figure 5), encountered a four foot "perching clay" layer from 37 to 41 feet. This was the only hole which was completed to a depth below 25 feet. Location of this hole is indicated on Plate 2. Following drilling, this hole was filled with bentonite-cement grout. It is not definitely known, but we anticipate that this clay layer at least partially separates the shallow aquifer from a deeper aquifer at the site.

Limits and Concentrations of Hydrocarbon Vapors

The presence of potentially explosive hydrocarbon vapors and their effects is a primary concern due to the potential hazard to property

and public safety. Early in the project, hydrocrabon vapors were monitored in six (6) utility manholes. The locations of the manholes is indicated on Figure 2, and described on Table 1.

Monitoring of the manholes was performed by measuring hydrocarbon vapor concentrations with a MSA Model 62 combustible gas indicator. When hydrocarbon vapor levels nearing 30% of the Lower Explosive Limit (LEL) were measured, the manholes were externally forced air ventilated. Monitoring and ventilation of the manholes was performed to maintain hydrocarbon vapor levels below potentially explosive concentrations.

The utility manhole adjacent to the station (#4), generally indicated high levels of hydrocarbon vapors. To reduce the vapor levels, a continuous, passive ventilation system was installed in May of 1983. Since installation, no potentially explosive hydrocarbon vapor concentrations have been measured at that location.

Manholes #1 and #2 have exhibited the highest hydrocarbon vapor levels and frequently required ventilation. The remaining manholes no longer require ventilation.

To evaluate residual hydrocarbon vapor concentrations in the vadose zone at the site, soil vapor surveys were conducted on two separate dates utilizing two different methods. In October of 1983 a

survey was conducted with a MSA Model 62 combustible gas indicator. To implement this procedure, a probe was driven approximately 2.5 to 3.0 feet below existing grade and soil vapor measurements were collected in percent of the lower explosive limit, (% LEL). The measurements and their locations are presented on Plate 1.

Additional measurements of soil vapors were conducted in October and November of 1984. Tracer Research Corporation was contracted to measure concentrations (in mg/l) of total hydrocarbons and benzene within and surrounding the station. Soil gas measurements were vacuum pumped from a depth of approximately 7.5 to 8.0 feet below grade. The gas samples were analyzed utilizing a gas chromatograph with a flame ionization detector. The measurements collected by Tracer Research are also presented on Plate 1, and Table 2.

The areas of high hydrocarbon vapor concentrations found by the two methods roughly correlated. The field investigations indicate that potentially explosive levels of hydrocarbon vapors are present within the station area and beyond its boundaries to the east and north. Based upon the field data obtained, contours of hydrocarbon vapor levels were determined. Results are presented on Plate 1.

Based upon the limits of the soil vapors presented on Plate 1, the contaminate plume presented on Plate 3 and upon the results of the utility manhole monitoring, we believe that the hydrocarbon vapors in

manholes #1 and #2 are not due to the spilled product at the study site. We therefore, request a release of responsibility for continued monitoring of these manholes.

Evaluation of Contaminant Plume

The field investigation to evaluate the nature and limits of the groundwater contamination began in June of 1982 with the installation of four groundwater monitor wells in the station area. These wells are labelled MW #1 through MW#4. Location of the wells is indicated on the accompanying plates. Monitor well MW#5 was installed by the NMEID. To further define the contaminate plume limits, fifteen (15) additional wells (W-1 through W-15) were installed in October and November of 1984.

The MW wells (MW#1 through MW#4) were installed with a CME 55 truck mounted drill rig. Schedule 40, flush threaded, two inch diameter PVC screen and casing was installed with a steel locking cap on all the wells. All these wells were screened across the air-water interface, the screen extended approximately 10 feet below the water surface.

The remaining fifteen monitor wells (W1 through W15) are constructed of two (2) inch diameter wire wrapped well points and galvanized steel riser pipe. These wells were installed with a

(11)
MW-1-4
Screened across air-water interface to 10' below
W series driven - across wt

pneumatic post driver. The wells are screened across the water table and extend approximately four feet into the groundwater. Monitor Well W-14, was screened at a greater depth interval to allow determination of contaminant concentrations at greater depths. The well is screened from eight to twelve feet below the water surface. Some details of the installed wells are presented on Table 2.

The monitor wells were sampled and tested in the field after installation. The chemical analysis of samples collected from the wells was performed by Tracer Research Corporation. Tracer Research Corporation utilizes a portable laboratory in a mobile van which is set up to analyze samples with a gas chromatograph. The State of New Mexico analytical laboratory also performed chemical analysis on selected samples. The results of the analyses of NMEID samples were utilized for comparison with Tracer Research's results and provided a more complete analysis. NMEID results were weighed heavier and primarily used for determination of the configuration and location of the contaminant plume as identified on Plate 3.

Following well installation, the monitor well elevations were surveyed and depths to groundwater were measured. The resulting well elevations and groundwater contour map is presented on Table 2, and Plate 2.

Pump Test

A pump test was performed to evaluate the aquifer characteristics necessary for design of a groundwater restoration system. This phase of the investigation included:

- o Installation of a pump test well;
- o Installation of four observation wells;
- o Development of the above mentioned wells; and
- o Pump testing the test well.

The pump test well was installed with a CME 55 truck mounted drill rig. Using 10-inch diameter, hollowstem auger, a hole was drilled to a depth of 24.5 feet. Five inch diameter galvanized steel pipe and wire wrapped well screen were then installed through the hollowstem auger. The well was screened from a depth of 9 feet to 19 feet.

Construction details of the pump test well and the observation wells are presented in Appendix B. The locations of these wells are shown on Plate 2.

Following installation of the pump test well and observation wells, the wells were developed. The wells were developed by airlifting until no significant sediment was obtained.

A low yield, short duration pump test was conducted in March of 1985. Arrangements were made with the City of Albuquerque to dispose of a limited quantity of water at the wastewater treatment plant. The plant was open from 8 am to 4 pm only. Therefore, the duration of the pump test was limited to a maximum of eight (8) hours.

The pump test was conducted on the upper shallow aquifer. The well partially penetrated the 27 foot thick aquifer. Seven observation wells were monitored during the test, as well as, the pumping well. Water levels were measured with a well sounder in the pumped well and with a steel tape and chalk in the observation wells. Readings taken with the well sounder in the pumped well are somewhat suspect due to ambiguous readings collected prior to the test and during the recovery period.

Pumped water was subjected to limited treatment in an aeration tank constructed by Fox and Associates of New Mexico, Inc., before being hauled to the City of Albuquerque Wastewater Treatment Plant. Based upon testing performed by the NMEID, the aeration tank removed roughly 50% to 60% of the volatile contaminants. This indicates that air stripping should be an effective treatment for cleanup of the dissolved phases in the groundwater, provided the appropriate air/water ratio is established.

ANALYSIS AND RECOMMENDATIONS

General

The contaminant plume is confined to the immediate vicinity of the station. The spilled product is present at the site in three phases: as free product floating on the surface of the water table; suspended product within the vadose and capillary zones; and dissolved product within the groundwater.

Based upon the results of this investigation, it appears that the soil and groundwater can be restored with a conventional dewatering and soil vapor collection system. The proposed dewatering system will consist of four dewatering wells along the south boundary of the gasoline station. The wells will lower the water table and collect any product floating on the surface of the water table and the contaminated water. To reduce soil hydrocarbon vapors, a network of vacuum lines will be installed in the station area. Specific details regarding our findings and the proposed recovery system are presented in the following sections of the report.

Groundwater Contaminant Plume

Based upon the field and laboratory data, the limits of the groundwater contamination plume have been determined. The product

plume, indicated on Plate 3, is based upon measured concentrations of benzene. Benzene concentrations measured are as high as 23 mg/l (MW#3). The state standard for benzene is .01 mg/l. The results plotted on Plate 3 were collected on October 31 and November 1, 1984. The plume is somewhat elongated due to the groundwater gradient. The plume extends approximately 300 feet upgradient from the initial source. We feel this is due to initial product mounding. The plume covers an area of approximately 152,000 square feet.

no gradient reversal from ditch.

As previously mentioned, the product is present within the identified plume in three phases: as free product floating on the surface of the water table; suspended in the capillary and vadose zone; and dissolved in the groundwater. The monitor wells have consistently indicated approximately 0.10 inch of product floating on the water table. Based upon the surface area of the plume and the thickness of free product, approximately 9474 gallons of fuel are floating on the surface of the water table.

As the water table fluctuates over its 1.2 foot seasonal interval within the 152,000 square foot plume, an undetermined amount of product adheres to the soil in this zone. As an example, if we assume that 1% (by weight) of this 182,400 cubic feet of effected soil is suspended product, a volume of product of approximately 31,833 gallons is derived. Although the 1% figure used above is not an actual measured value, and is for illustrative purposes only, we anticipate

that the bulk of the product remaining at the site is suspended in the vadose and capillary zones. The product suspended in the capillary zone may be released into the groundwater as the water table rises. Also within the vadose zone residual product is present as vapors. The vapors were measured and contoured (Plate 1) and found to roughly correlate with the groundwater plume (Plate 3).

The volume of product dissolved in the groundwater is difficult to determine. However, the laboratory testing indicates that dissolved product extends slightly deeper than 12 feet below the water table (see W-14, Appendix A).

The exact amount of product held in the soil, capillary zone, and dissolved in the groundwater could not be accurately determined. The difficulty arises as a result of the unknown amount of product removed during 1982, the difficulty in evaluating the water table fluctuation and the product mounding characteristics when leaked, and the dissolution of product compounds over the time period involved.

Local Hydrology

Based upon records of water levels measured in monitor wells MW#1 through MW#4 (see accompanying Plates) since 1982, the water table has a yearly fluctuation of approximtely 1.2 feet (Figure 3.) This fluctuation appears to be in direct response to the base level in the

Rio Grande, and indicates that the river generally loses water or recharges the shallow aquifer.

As indicated on Plate 2, the flow beneath the site is toward the south-southeast with a gradient of 0.0012. This flow direction and water table contour configuration represents conditions measured on November 5, 1984. Alteration of conditions at the site are expected to occur from March to November when the Pajarito Lateral, south of the site, is active and is expected to create a hydraulic barrier which locally effects and recharges the aquifer. This condition has probably aided in preventing the plume from migrating further down gradient.

The groundwater flow velocity at the site is estimated to be approximately 234 ft/yr. This velocity and gradient are, however, altered by the Pajarito Lateral south of the site and area wells which have affected down gradient movement and caused the plume to spread out laterally.

Pump Test Analysis

Determination of aquifer characteristics from pumping test data was performed to design a recovery well(s) at the site. The test results indicated as expected, that the test was not of sufficient length and the pumping rate was not of a capacity required for the

effects of delayed gravity yield to dissipate and to completely stress and test the aquifer. Difficulty deriving the aquifer characteristics was encountered due to several conditions:

- o Steady State conditions were not reached (time restraints);
- o The discharge rate was not sufficent to adequately stress the aquifer; and
- o The pump test well efficiency could not be determined.

Due to the above uncertainties, a range of aquifer parameters were calculated. The pump test data (Appendix B) was analyzed utilizing methods developed by Theis and further modified by Jacob, Boulton, and Prickett. Graphic methods of N.S. Boulton (1963) and C. E. Jacob (1940) are presented in Figures 8 through 16. The pump test well and observation wells obs 1 through obs 4 test data were evaluated.

The procedure developed by Boulton allows for delayed yield from storage. Analysis considering delayed yield was considered based upon the S-shaped curve resulting when drawdowns were plotted versus time on logarithmetic paper. However, the curve is flattened which caused difficulty in interpretation. The transmissivity determined from the log-log plot for the pumped well is 15,901 gpd/ft (Figure 8). The efficiency of the pumped well could not be determined as the actual

drawdown was less than predicted drawdown based upon (Figure 11).

$s' = s - s^2/2b$

Drawdown correction for partial penetration (S /2b) for the pump test data ranges from .0017 feet to .011 feet. Therefore, correction of the drawdowns measured was not considered necessary.

Figure 10 graphically illustrates Boulton's method for observation well #1 (obs 1) which was located five feet from the pumped well. The transmissivity for this curve was calculated to be 25,107 gpd/ft. The storage or specific yield is .298 which is at the high end of values for an unconfined aquifer.

Plotting distance drawdown data (Figure 11) for the four observation wells yields a transmissivity of 25,482 gpd/ft and a similar specific yield of .298. Prickett (1965) stresses that the effects of delayed gravity drainage must dissipate in all observation wells before using distance-drawdown data to compute the hydraulic properties of the aquifer. For the tested period, the effects of delayed gravity drainage have not dissipated in all of the observation wells by the end of the test. This is indicated by the flatted "s" curve of the log-log plots.

The average transmissivity and specific yield values for obs 1 and from the distance drawdown data is 25,295 and .298, respectively. The values from the pump test well are not considered because of the

uncertainties of well efficiency and the extremely low values derived.

The remaining analysis of the pump test data utilizes C.E. Jacob's Modified Nonequilibrium Method. This method is a simplified straight line semilog procedure. The pumped well and the four observation wells were evaluated with this method.

The value derived for the pumped well (13442 gpd/ft), Figure 9, is approximately the same as that using the log-log method, Figure 8. This value was not utilized based upon the previously mentioned criteria.

The analyses with the semilog method for obs 1 through 4, and including the recovery data for obs 1 (Figures 12 through 16), yields a much higher transmissivity than previously presented (average value of 71,399 gpd/ft). A specific yield value could not be determined from these analyses due to the short test duration.

Solution of the pump test data therefore, yielded a range of values. The low and high range of transmissivity was 25,295 gpd/ft and 71,399 gpd/ft, respectively, and a storage value of .298 were utilized for design of a recovery system.

Proposed Recovery System

Several groundwater restoration systems were evaluated. However,

we feel that the most efficient and cost effective system will be a down gradient barrier system designed much like a dewatering system. The system will utilize four small diameter wells, a single centrifugal pump, an above ground holding tank (with optional scavenger pump should product accumulation indicate the efficient use of one), and an air stripping tower for removing the contaminants before discharge. This type of system will create minimal drawdown over a large area and immediately begin to remove the most contaminated water. Permission will initially be sought for release of water into an irrigation canal with future plans for infiltration galleries upgradient. Further details of the system are presented in the following paragraphs.

The proposed well locations and recovery system layout are presented on Plate 4. The four wells will be two inches in diameter and be placed intercepting the air-water interface and extend approximately fifteen feet below the water table. The wells will be spaced approximately 55 feet apart and be pumped (at least initially) at 10 gpm.

To demonstrate the effectiveness of the proposed system at selected distances and pump rates, the following tables are presented:

Low Range Values: T = 25,295 gpd/ft

S = .298

Expected Drawdown at Pumped Wells with Time

Distance	Pump Rate	Drawdown in Feet				
(feet)	(gpm)	1 week	1 month	6 months	1 year	2 years
.08	5	.39	.42	.46	.48	.49
.08	10	.77	.84	.92	.95	.98
.08	20	1.5	1.7	1.8	1.9	2.0

Expected Drawdown Midway Between Wells with Time

Distance	Pump Rate	Drawdown in Feet				
(feet)	(gpm)	1 week	1 month	6 months	1 year	2 years
27.5	5	.12	.16	.20	.21	.23
27.5	10	.25	.31	.39	.43	.46
27.5	20	.49	.63	.79	.85	.92

Expected Interference Drawdown at Each Well

Distance	Pump Rate	Drawdown in Feet				
(feet)	(gpm)	1 week	1 month	6 months	1 year	2 years
55	5	.09	.13	.17	.18	.20
55	10	.19	.25	.33	.36	.40
55	20	.37	.50	.66	.73	.79

High Range Values: T = 71,399 gpd/ft

S = .298

Expected Drawdown at Pumped Wells with Time

Distance	Pump Rate	Drawdown in Feet				
(feet)	(gpm)	1 week	1 month	6 month	1 year	2 years
.08	5	.15	.16	.17	.18	.18
.08	10	.29	.31	.34	.35	.37
.08	20	.58	.63	.69	.71	.73

Expected Drawdown Midway Between Wells with Time

Distance	Pump Rate	Drawdown in Feet				
(feet)	(gpm)	1 week	1 month	6 months	1 year	2 years
27.5	5	.05	.06	.078	.08	.09
27.5	10	.10	.13	.16	.17	.18
27.5	20	.21	.25	.31	.34	.36

Expected Interference Drawdown at Each Well

Distance	Pump Rate	Drawdown in Feet				
(feet)	(gpm)	1 week	1 month	6 months	1 year	2 years
55	5	.04	.05	.07	.07	.08
55	10	.08	.11	.13	.15	.16
55	20	.16	.21	.27	.29	.31

Due to interference drawdown, the actual drawdown at each well and the midway point between wells would be the sum of all the influences. As indicated by the previous tables, a pump rate of 5 gpm per well would produce sufficient drawdown under either set of aquifer values. However, the proposed pump rate for the system is 10 gpm per well. The system has adjustability up to 20 gpm which should provide more than sufficient capacity.

The maximum distance the plume extends from a proposed recovery well is 200 feet (Plate 3). The following table presents calculated drawdowns at that distance, pumping at 10 gpm. As indicated by the table, the system will be able to remove the upgradient portion of the plume using the natural gradient and well drawdown and the furthest down gradient contamination with well drawdown for complete recovery.

Drawdown at 200 Feet From Closest Well

Trans-missivity (gpd/ft)	Distance (feet)	Pump Rate (gpm)	Drawdown in Feet 1 week	1 month	6 months	1 year	2 years
25,295	200	10	.07	.14	.22	.25	.28
71,399	200	10	.04	.06	.09	.10	.12

The proposed recovery system will utilize four (4), small diameter recovery wells connected to a manifold system. Each well head will have a gate valve and flow rate meter to regulate flow and record quantities pumped. The manifold will connect to a single centrifugal pump. The pump will be powered by a 0.75 horsepower motor capable of a total of 110 gpm against the predicted head (allowing 5 to 20 gpm/well). The pump controls will be explosion proof and connected by a licensed electrician. The combined discharge will be pumped into an above ground holding tank where any free product will be allowed to accumulate. Should sufficient quantities of product accumulate, a "skimmer" pump would be installed in the tank. The discharge water will be treated by air stripping. It is believed, based upon results of aeration during the pumping test, that air stripping will adequately restore the contaminated groundwater to required levels. Should chemical concentrations not be reduced to acceptable standards, additional treatment would be performed.

Permission to discharge water, as well as, the appropriate discharge pemits will be sought for release of the treated water initially into the Pajarito Lateral drain with later stages of pumping discharging into infiltration galleries upgradient. Infiltration galleries would not be utilized until the plume has moved down gradient of their proposed locations (Plate 4). These artificial recharge points will aid in raising the water table and assist in flushing the suspended product out of the capillary zone. The annual fluctuation in the water table leaves product suspended in the capillary and vadose zones. We will attempt to adjust the pumping rate to maintain a constant water table.

A dedicated up gradient stainless steel monitor well will also be installed and sampled prior to recovery activity. The location of the well is pending permission to locate the well on private property. Once recovery commences, all of the previously installed monitor wells will be measured for response due to pumping and sampled as required. Where appropriate, the existing wells will be equipped with a locking cap or removed.

Soil Vapors

In order to address the elevated soil vapors at the site, a soil vapor ventilation system will be installed. Based upon the readings contoured on Plate 1, a series of gravel filled trenches fitted with

perforated PVC will be constructed. These will probably partially coincide with infiltration gallery locations. The PVC will connect to manifolds and vacuum pump(s) which will safely exhaust the vapors to the atmosphere. A schematic of the proposed vapor system is presented on Plate 4. Additional lateral manifolds not shown on Plate 4 will be installed during construction of the system extending into areas of high vapor concentrations.

At this time bioreclamation is not being considered, however, would be, as a final phase should vapor levels remain high after the majority of the product is removed.

RECOVERY OPERATIONS

The proposed system will be continuously monitored during operation. Pumping levels in the production wells and surrounding monitor wells will be closely monitored. Water sampling, chemical analysis, and well monitoring will be as stipulated in the Settlement Agreement. Records will be kept of quantities of water and any product pumped or scavenged.

Due to uncertainties involved with the interaction and heterogeneity of site subsurface conditions, the aquifer chemistry and parameters, and the quantity and composition of the product spilled; the recovery well efficiencies and the recovery time required for

clean up cannot accurately be determined. We feel that the system proposed utilizes the best available technology with all variables considered. Additionally, the adjustbility of the system will bring a satisfactory and cost effective project end.

Correspondence will be maintained both verbally and by progress reports to Atex Gas, Inc., and NMEID as required.

Fox & Associates of NM, Inc.

Steven Brewer

Project Geologist

Reviewed by:

Martin D. Vinyard, P. E.

Geotechnical Section Head

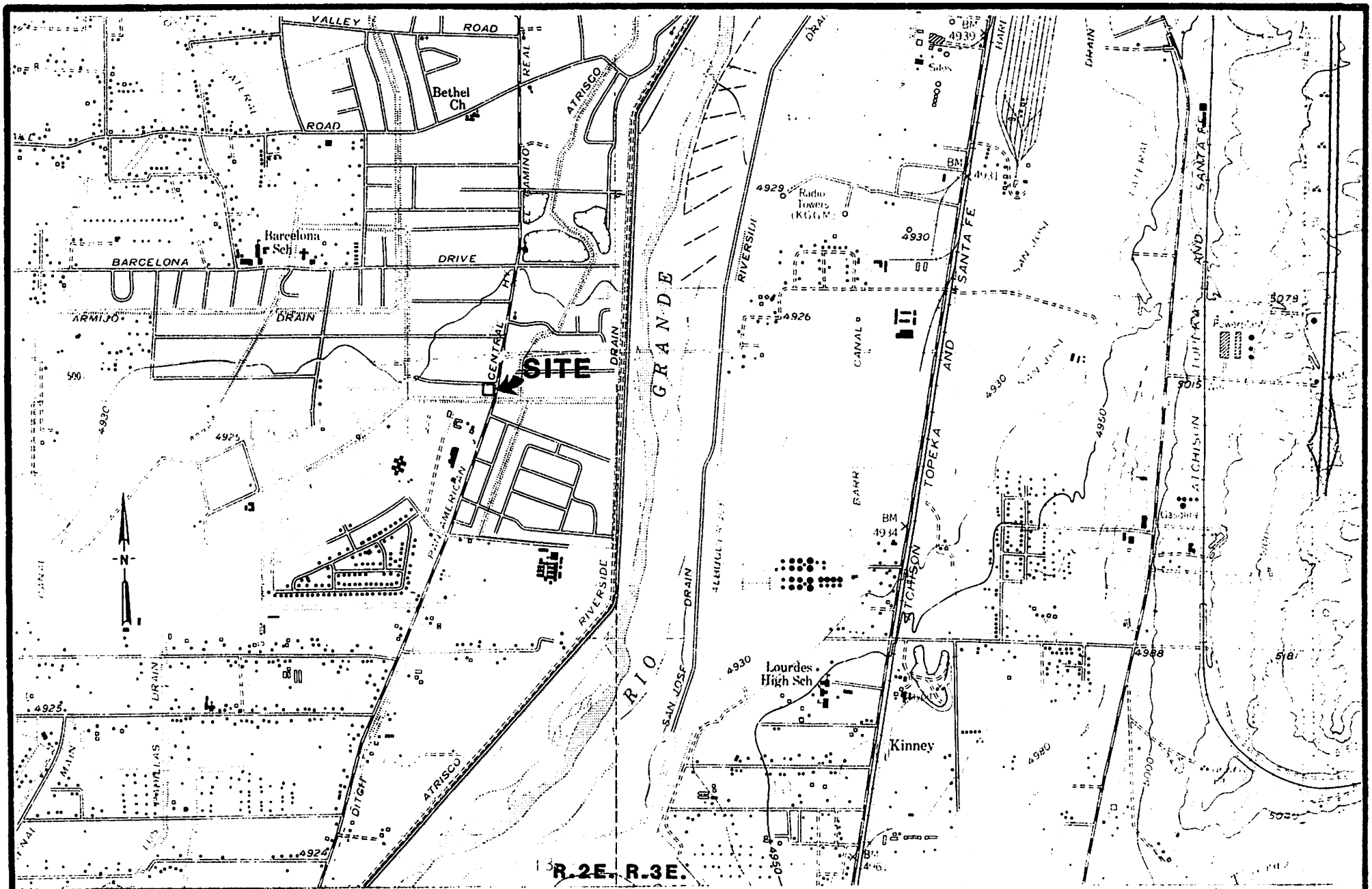
REFERENCES

Boulton, N.S., 1963, Analysis of Data From non-equilibrium Pumping Tests Allowing for Delayed Yield From Storage: Proceedings Institution of Civil Engineers Vol. 26, Nov. 1963, pp. 469-482

Jacob, C. E., 1940, On the Flow of Water in an Elastic Artesian Aquifer: American Geophysical Union Transcript, pt. 2, pp. 574-586

Prickett, T. A., 1965, Type-curve Solution of Aquifer Tests Under Water-table Conditions: Ground Water, Vol. 3, No. 2, pp. 5 - 14

Reeder, H. O., Bjorklund, L. J., and Dinwiddlie, G. A., 1967, Quantitative Analysis of Water Resources in the Albuquerque Area, New Mexico: New Mexico State Engineer Technical Report 33



from: 7.5 minute U.S.G.S. Albuquerque West Quadrangle

scale: 1"=2000'

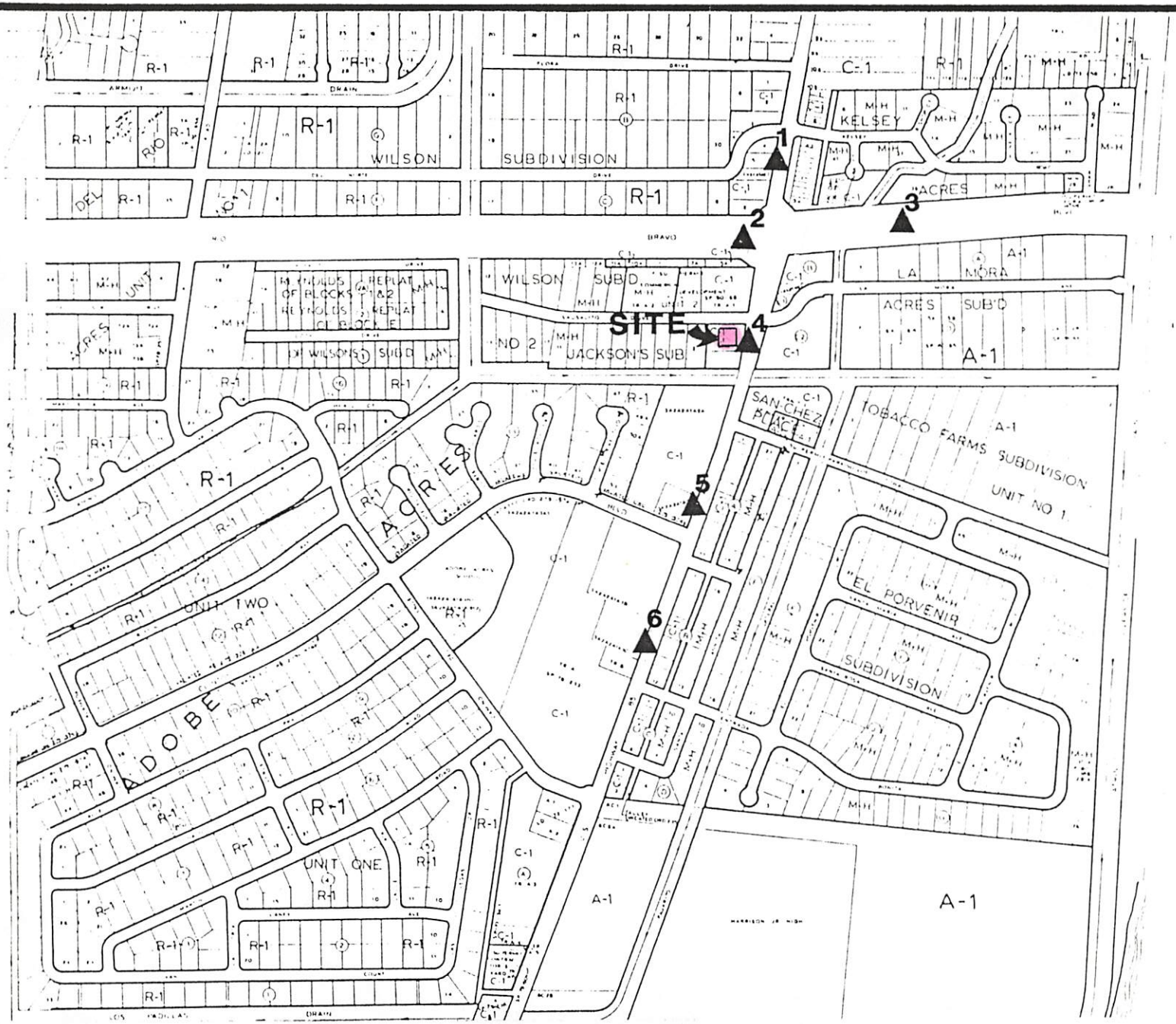
SITE VICINITY MAP

FOX Consulting Engineers and Geologists

Job No: 0109990

Date: 8/14/85

Figure 1



1 indicates the location of a utility manhole monitored for explosive vapor concentrations (see table 1)

MONITORED UTILITY MANHOLES PLAN

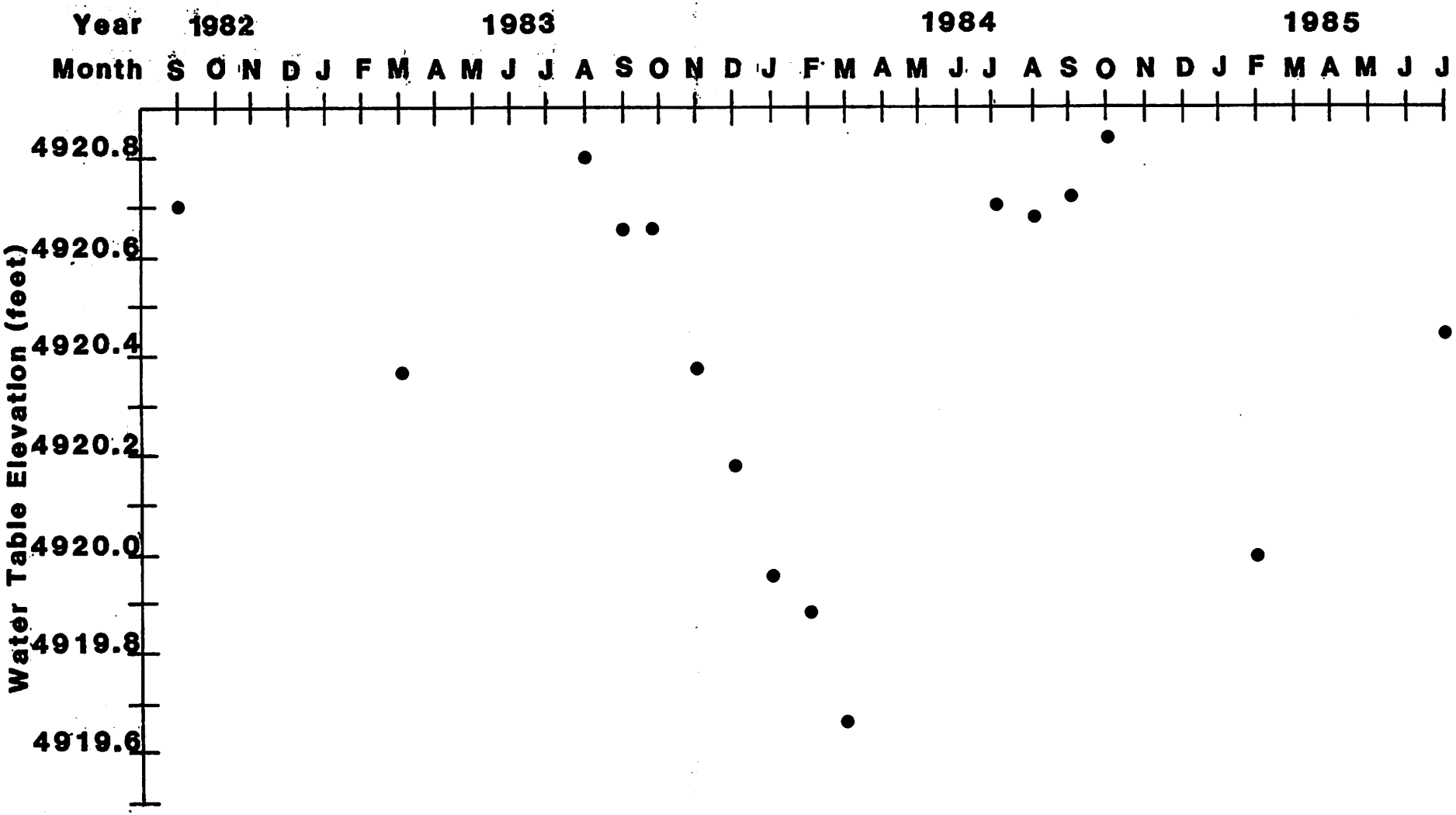
FOX Consulting Engineers and Geologists

Job No: **0109990**

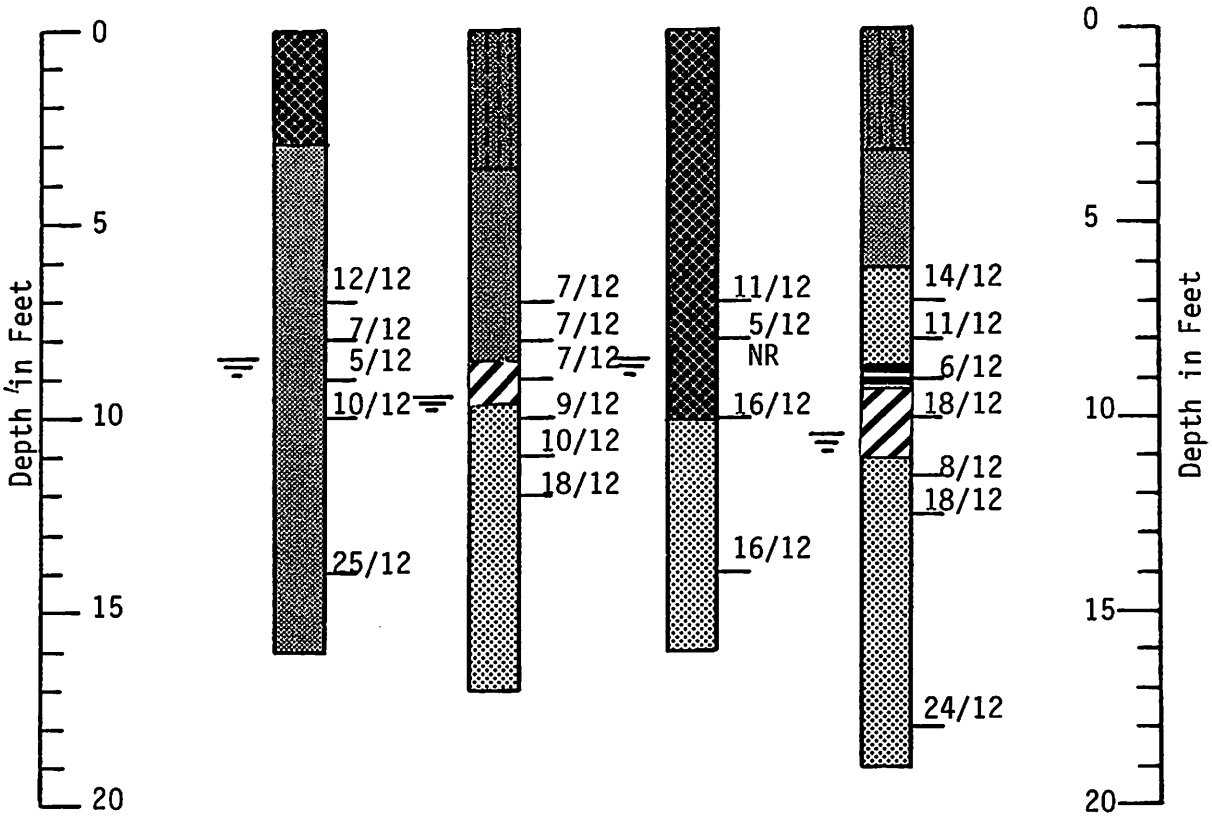
Date: **8/14/85**

Figure **2**

WATER TABLE ELEVATIONS



WATER TABLE ELEVATIONS	Job No: 0109990
FOX Consulting Engineers and Geologists	Date: 8/14/85
	Figure 3



LOGS OF TEST HOLES

FOX Consulting Engineers and Geologists

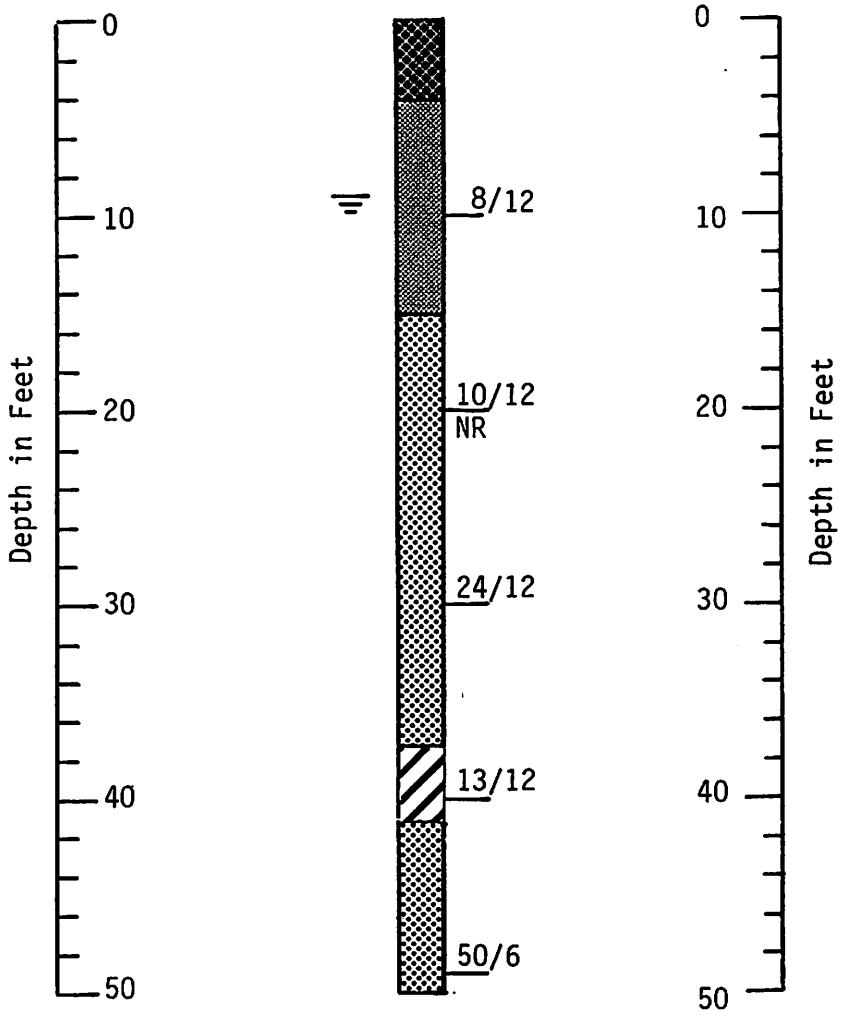
Job No: 0109990

Date: 8/14/85

Figure 4

Well Number: DW 1

Elevation: 4929.35'



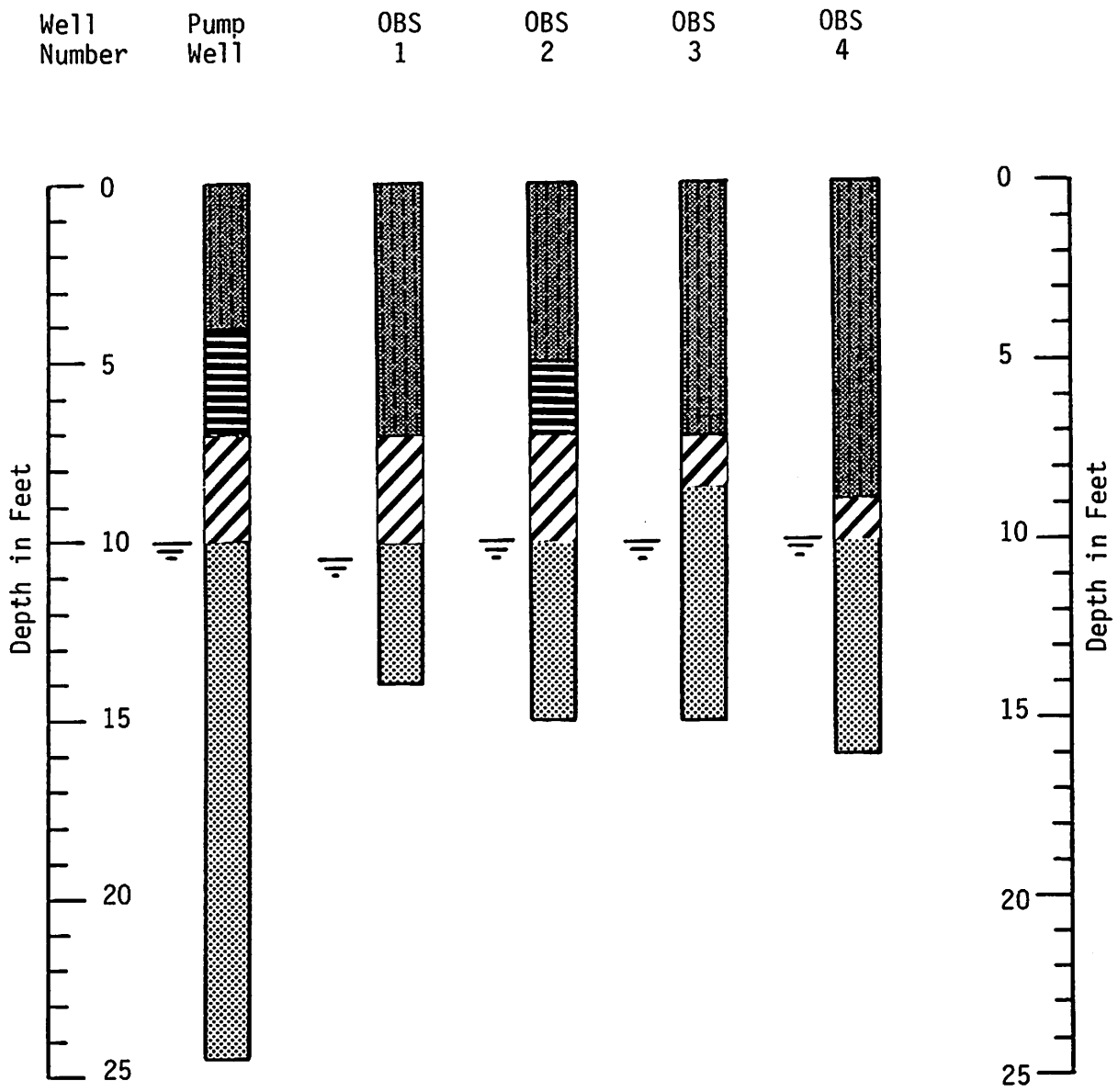
LOGS OF TEST HOLES.

FOX Consulting Engineers and Geologists

Job No: 0109990

Date: 8/14/85

Figure 5



LOGS OF TEST HOLES

FOX Consulting Engineers and Geologists

Job No: 0109990

Date: 8/14/85

Figure 6

LEGEND


MAN-MADE FILL, SAND, fine-grained, slightly silty to silty, occasional clean layers, loose to medium dense, slightly moist, light brown


SAND, fine-grained, slightly silty to silty, medium dense, slightly to medium moist, contained gasoline odor in places, brown (SP-SM)


SAND, mostly fine-grained, occasional medium to coarse grains, slightly silty to clean, medium dense, slightly moist to saturated, strong gasoline odor, brown, gray (SP)


SAND, fine-grained, silty, loose, slightly to medium moist, some gasoline odor, dark brown to brown (SM)


CLAY, silty, trace sand, fine-grained, soft to medium stiff, medium moist, dark brown, gray at depth (CL)


SAND, fine-grained, clayey to very clayey, loose, slightly to medium moist, brown (SC)


SAND, coarse to fine-grained, gravelly, clean, saturated, light brown to gray (SP-SW)


indicates water table

NOTES

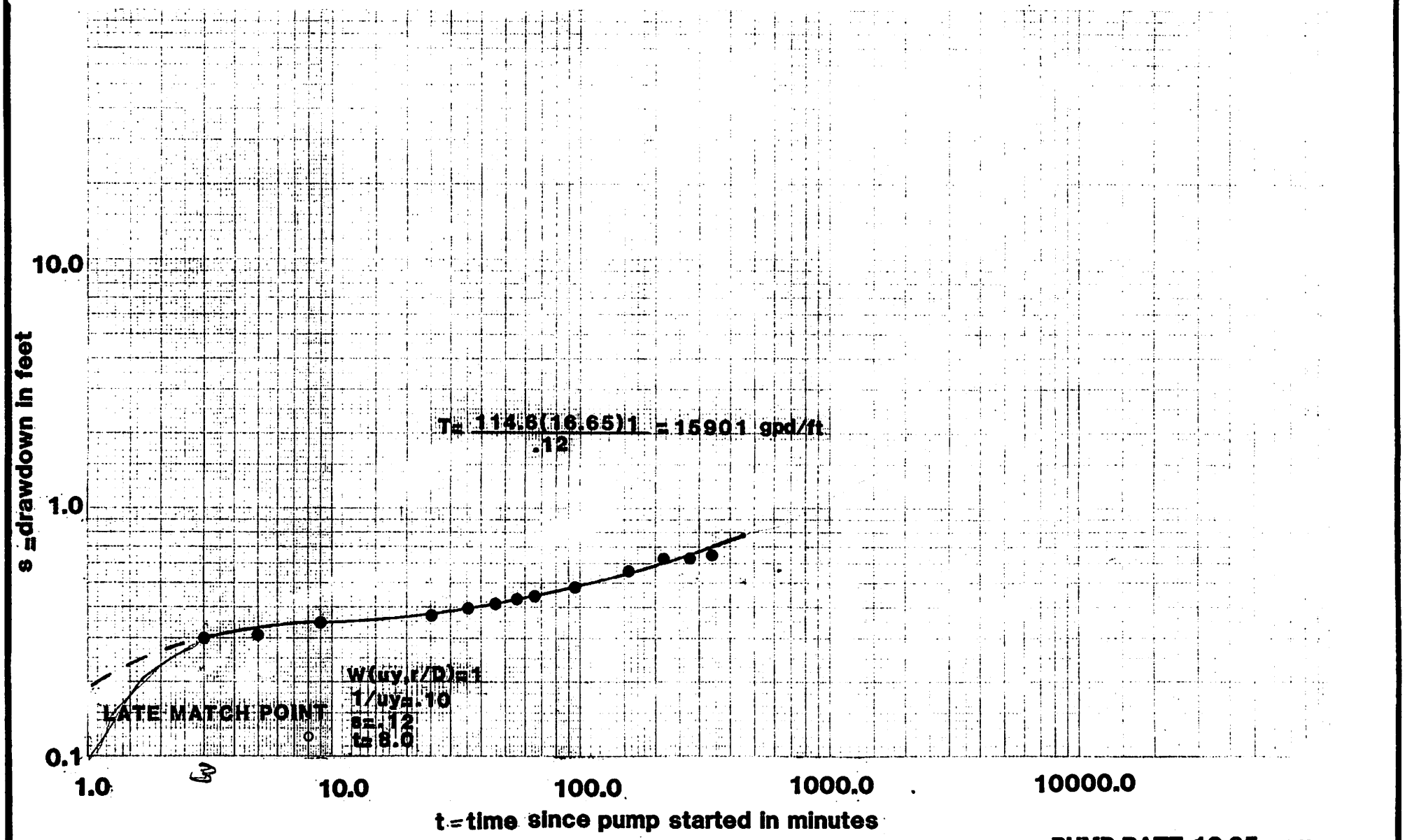
1. Test holes were drilled on August 27, 1982, November 11, 1982, February 13, and February 27, 1985 with a 6 inch diameter hollowstem continuous flight power auger.

2. (12/12) location of Standard Penetration Test; indicates that 12 blows with a 140 pound hammer, falling 30 inches, were required to drive a 2 inch diameter sampler 12 inches.

3. The location of borings were approximately determined by tape and compass measurement from existing structures. Elevations of borings are determined by a level survey. The location and elevation of the borings should be considered accurate only to the degree implied by the method used.

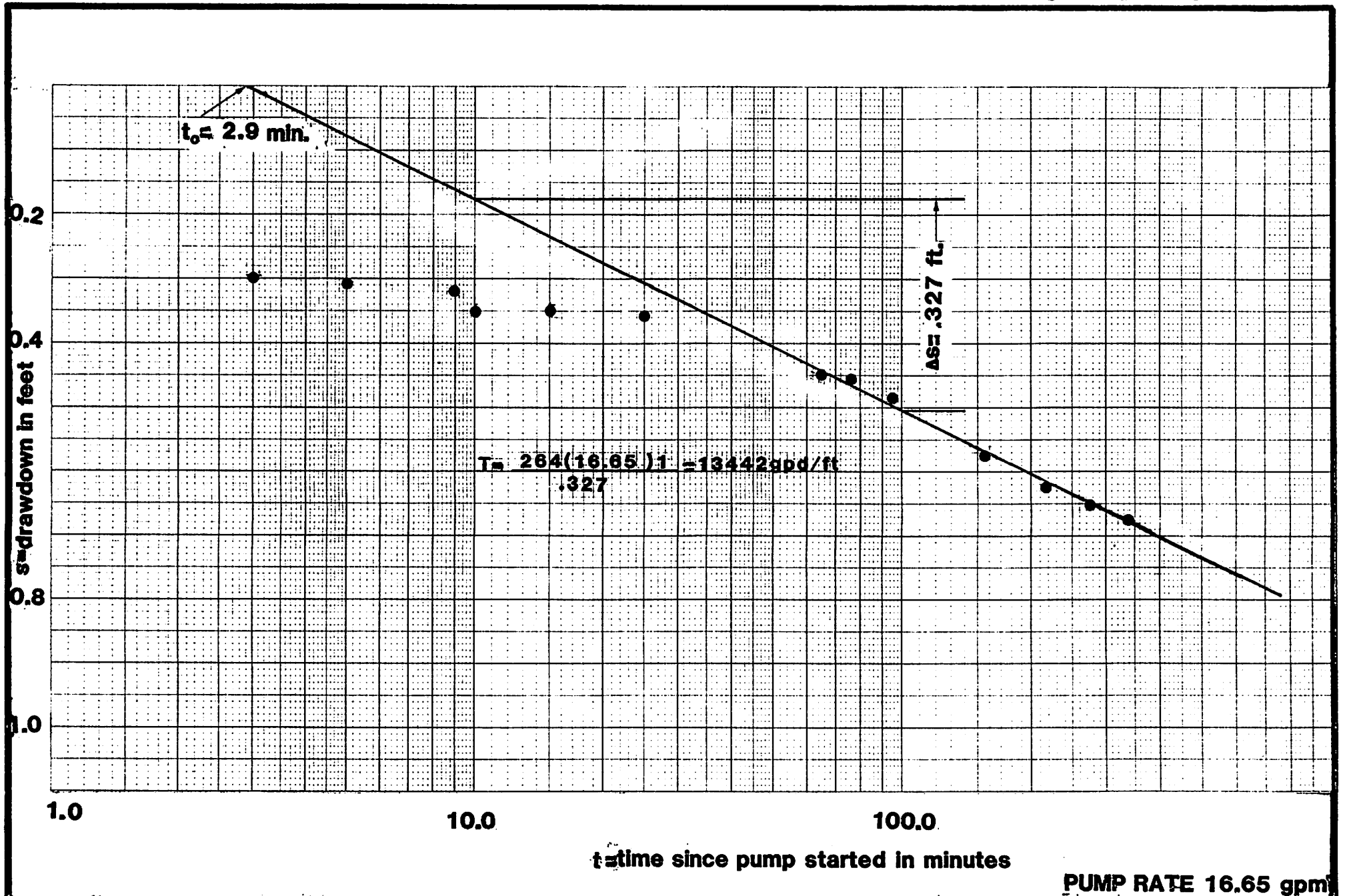
4. The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

LOGS OF TEST HOLES	Job No: 0109990
FOX Consulting Engineers and Geologists	Date: 8/14/85
	Figure 7

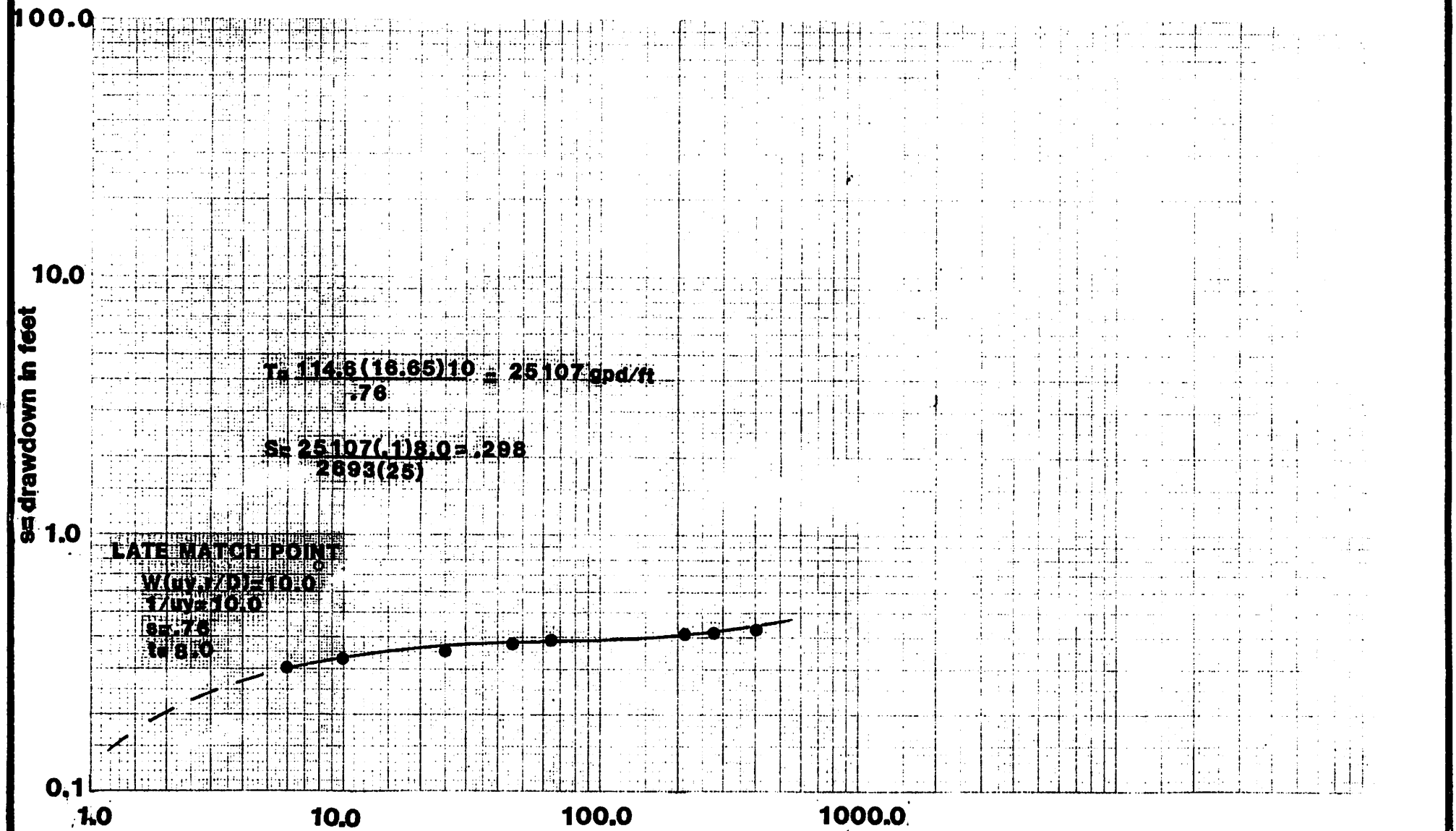


PUMP RATE 16.65 gpm

TIME-DRAWDOWN CURVE FOR PUMP WELL	Job No: 0109990
FOX Consulting Engineers and Geologists	Date: 8/14/85
	Figure 8



TIME-DRAWDOWN CURVE FOR PUMP WELL	Job No: 0109990
FOX Consulting Engineers and Geologists	Date: 8/14/85
	Figure 9



PUMP RATE 16.65 gpm

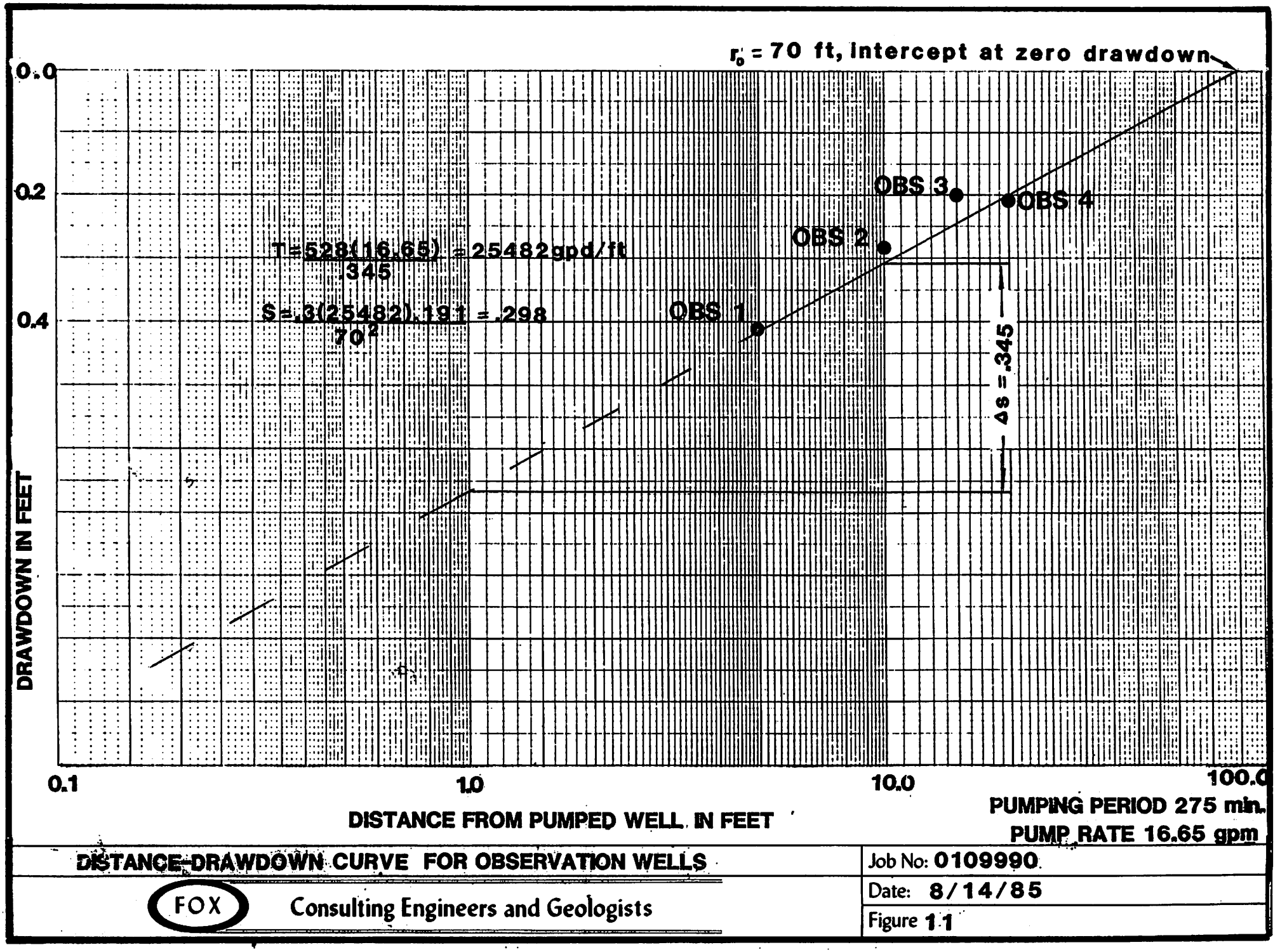
TIME-DRAWDOWN CURVE FOR OBS#1

FOX Consulting Engineers and Geologists

Job No: **0109990**

Date: **8/14/85**

Figure **10**



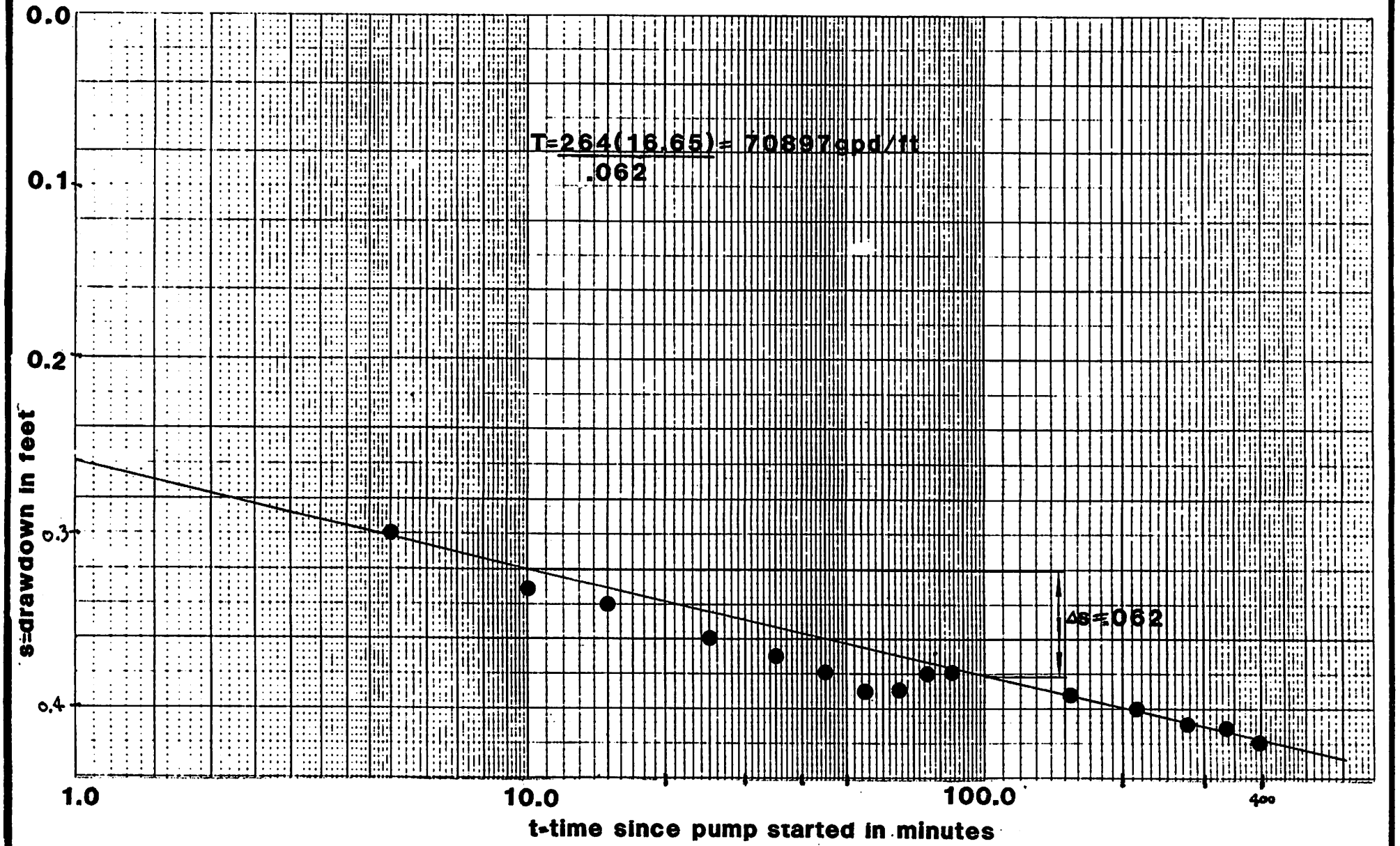
DISTANCE-DRAWDOWN CURVE FOR OBSERVATION WELLS

FOX Consulting Engineers and Geologists

Job No: 0109990

Date: 8/14/85

Figure 1.1



PUMP RATE 16.65 gpm

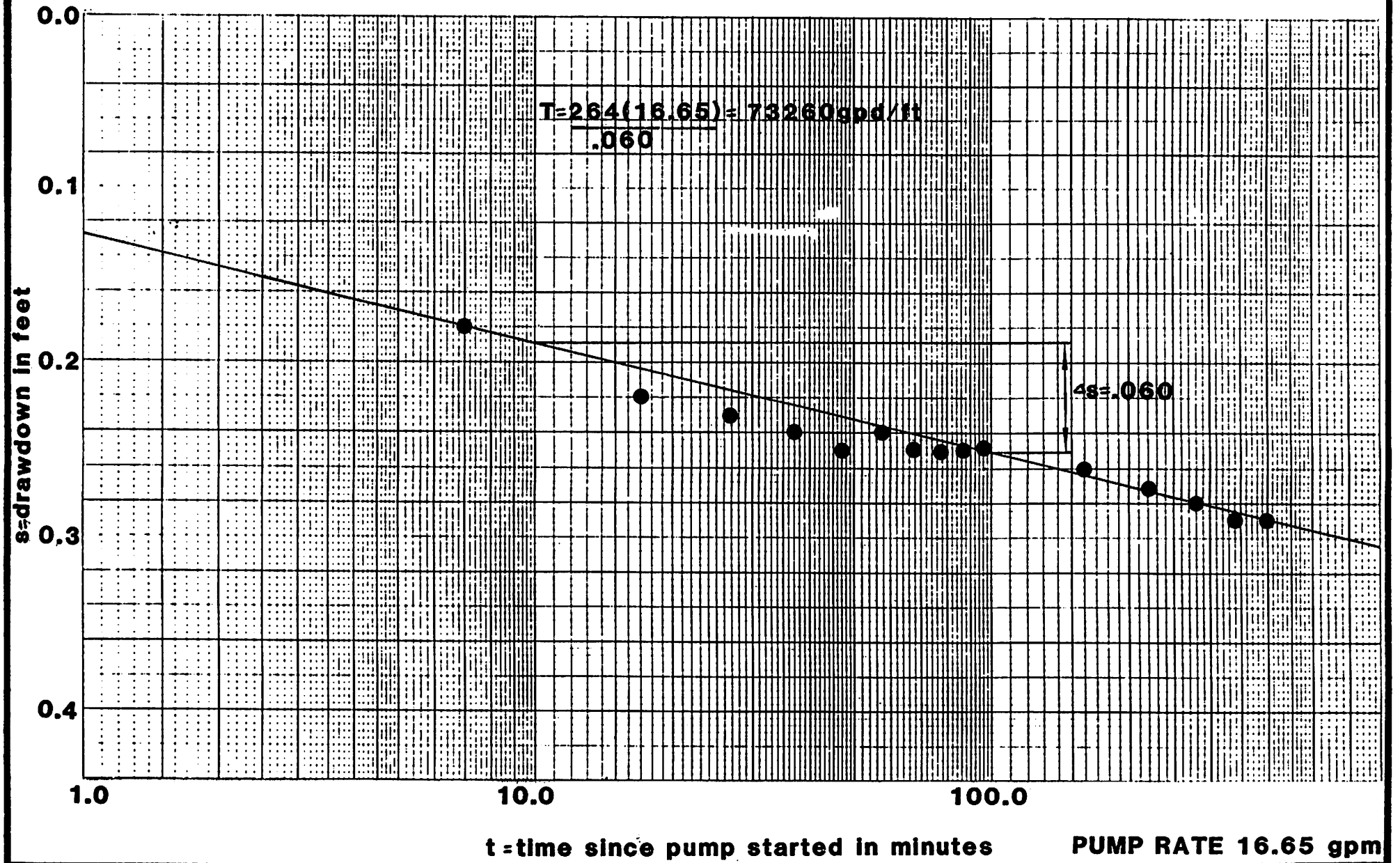
TIME-DRAWDOWN CURVE FOR OBS1

FOX Consulting Engineers and Geologists

Job No: 0109990

Date: 8/14/85

Figure 12



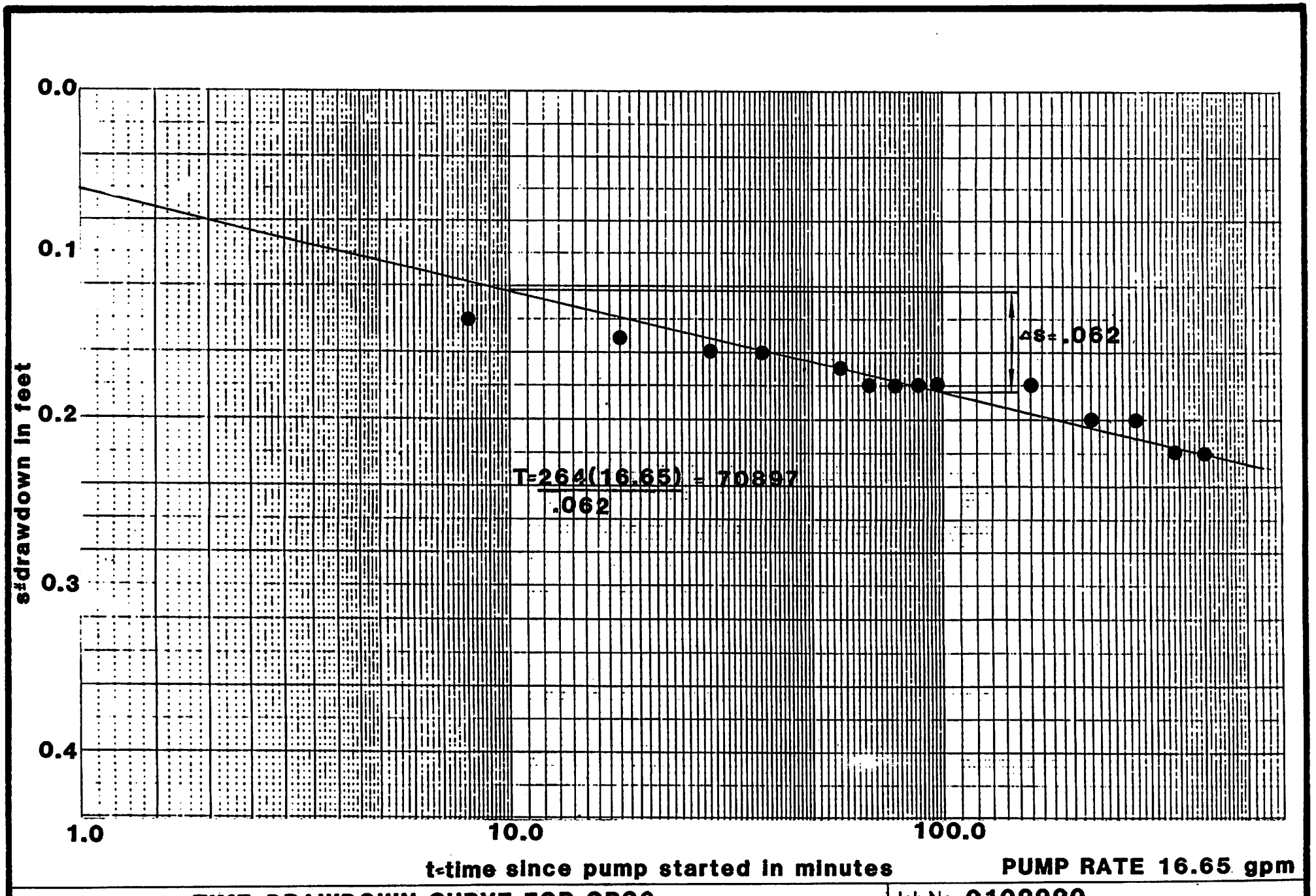
TIME-DRAWDOWN CURVE FOR OBS2

FOX Consulting Engineers and Geologists

Job No: 0109990

Date: 8/14/85

Figure 13



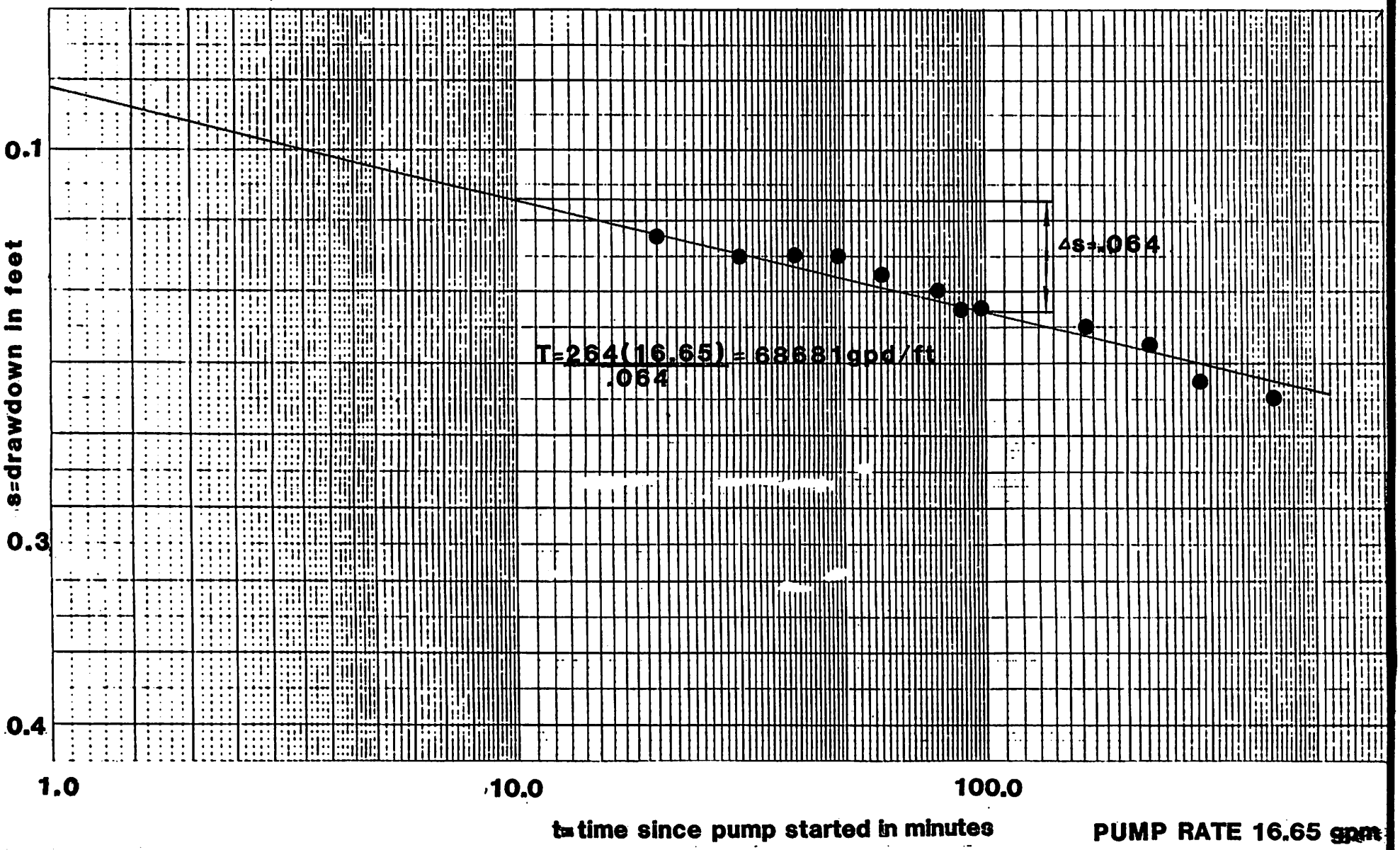
TIME-DRAWDOWN CURVE FOR OBS3

FOX Consulting Engineers and Geologists

Job No: **0109990**

Date: **8/14/85**

Figure **14**



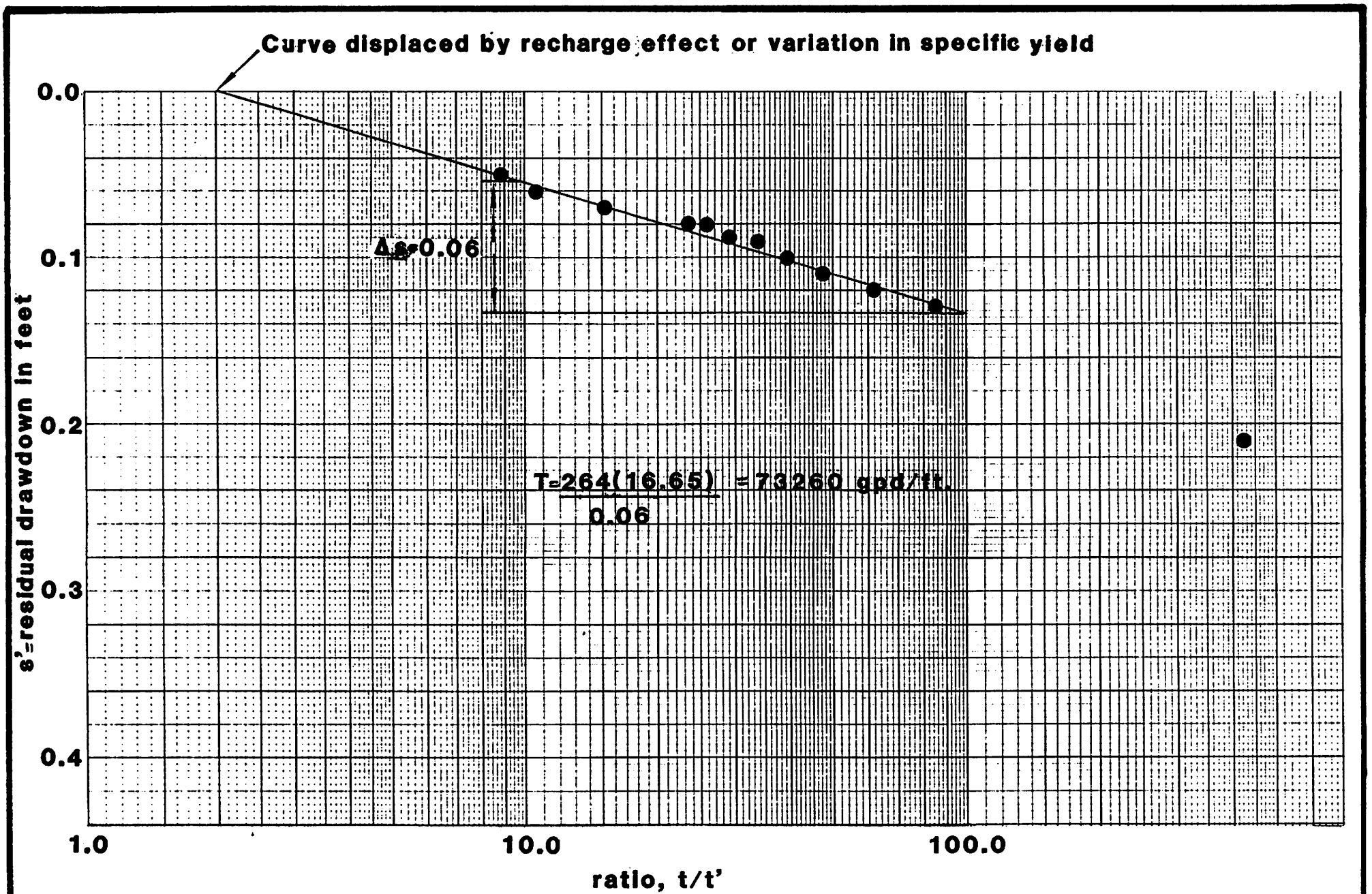
TIME-DRAWDOWN CURVE FOR OBS 4

FOX Consulting Engineers and Geologists

Job No: 0109990

Date: 8/14/85

Figure 15



RECOVERY FOR OBS1

FOX Consulting Engineers and Geologists

Job No: **0109990**

Date: **8/14/85**

Figure **16**

SUMMARY OF DATA FOR MONITORED
UTILITY MANHOLES

Manhole No.	Location	Comments
1	Isleta in front of Sunwest Bank	consistently contains 2 to 3 feet of water and exhibits the highest vapor readings
2	Isleta and Rio Bravo on west island	small quantity of water commonly present, exhibits second highest vapor levels
3	Rio Bravo east of Isleta on island	consistently no vapor reading
4	In front of station on Isleta	readings usually at 0%, always below 5% passive ventilation system installed
5	On Isleta (west side) just north of Clinton	consistently no vapor readings
6	On Isleta (west side) in front of First National Bank	consistently no vapor readings

* See Figure 2

Job No: 0109990
Date: 7/19/85
Table 1

TABLE 2
RESULTS OF LABORATORY CHEMICAL ANALYSIS
OF GROUNDWATER SAMPLES COLLECTED IN THE
VICINITY OF BELL OIL STATION NO. 213

Well No.	Sample/Testing Date		Testing Laboratory	Concentration of Benzene mg/l	Elevation of Top of Pipe*	Water Table Elevation*
MW-1	11/02/84		SLD	8.0	4931.07	4920.65
MW-2	11/02/84		SLD	1.2	4931.91	4920.70
MW-3	11/02/84		SLD	24.0	4931.24	4920.62
MW-4	11/02/84	10/31/84	SLD/TR	ND/.4	4932.48	4920.60
MW-5	11/02/84	10/31/84	SLD/TR	1.25/3.0	4931.93	locked
W-1	11/01/84		TR	.02	4930.66	4920.47
W-2	10/31/84		TR	.02	4928.36	4920.90
W-3	11/02/84		SLD/TR	.007/ .02	4928.72	4921.01
W-4	11/02/84		SLD	8.5	4928.35	4920.72
W-5	10/31/84		TR	.02	4928.84	4920.72
W-6	11/02/84	11/01/84	SLD/TR	ND/ .02	4928.21	4920.75
W-7	11/02/84	10/31/84	SLD/TR	.33/.3	4930.03	4920.43
W-8	10/31/84		TR	.01	4929.12	4920.55
W-9	11/02/84	10/31/84	SLD/TR	.003/ .01	4929.24	4920.83
W-10	10/31/84		TR	.01	4928.91	4920.89
W-11	10/31/84		TR	.01	4929.26	4920.23
W-12	10/31/84		TR	.01	4930.74	4920.93
W-13	10/31/84		TR	.1	4929.11	4920.64
W-14	11/02/84		SLD	.029	4928.39	4920.73
W-15	11/02/84				4928.77	4920.33

NOTE: The "MW" wells are constructed of PVC and are screened 2 feet above the water table to 8 feet below the water table. The "W" wells are constructed of galvanized steel and are screened from just above the water table to four feet below the water table except W-14 which is screened from 8 to 12 feet below the water table.

* The elevations and water levels were determined on 11/05/84.

SLD - New Mexico State Laboratory
TR - Tracer Research

APPENDIX A
CHEMICAL ANALYSIS DATA

TRACER RESEARCH CORPORATION

DATE: Oct. 31 - Nov. 1, 1984 JOB: FOX - Albuquerque, NM

				Total Hydrocarbons		Benzene							
SAMPLE	DATE	TIME	AMT INJ	mg/l	ug/l	mg/l	ug/l	AREA	ug/l	AREA	ug/l	AREA	ug/l
MW4	10/31	11:20	10 ul	.9		.4							
W-1	10/31	10:55	10 ul	<.08		<.02							
W-2	10/31	11:50	10 ul	<.08		<.02							
W-3	10/31	12:09	10 ul	<.08		<.02							
W-4	10/31	12:24	5 ul	40		6							
W-5	10/31	12:46	25 ul	<.02		<.02							
W-6	10/31	13:12	25 ul	<.02		<.01							
MW-3	10/31	13:26	5 ul	70		30							
W-7	10/31	14:06	25 ul	2		.3							
W-8	10/31	14:53	25 ul	.04		<.01							
W-9	10/31	15:15	25 ul	.04		<.01							
MW-5	10/31	15:40	10 ul	9		3							
W-10	10/31	16:06	25 ul	<.02		<.01							
SG7-5	10/31	17:26	2 cc	.002		<.001							

I = interference

Glenn Thompson

TRACER RESEARCH CORPORATION

DATE: Oct. 31 - Nov. 1, 1984 JOB: FOX - Albuquerque, NM

				Total Hydrocarbon		Benzene							
SAMPLE	DATE	TIME	AMT INJ	mg/l	ug/l	mg/l	ug/l	AREA	ug/l	AREA	ug/l	AREA	ug/l
SG7-6	10/31	17:40	.5 cc	.04		<.001							
SG7-8	10/31	17:50	25 ul	.7		.3							
W-11	10/31	16:41	25 ul	.1		<.01							
Before W-13 Dev.	10/31	18:28	25 ul	.6		.1							
W-12	10/31	18:04	25 ul	.04		<.01							
After W-13 Dev.	10/31	18:52	25 ul	.1		.02							
SG13-7.5	11/1	9:01	5 ul	35		I							
SG5-7.5	11/1	9:50	1 cc	.02		I							
SG14-7.5	11/1	10:15	5 ul	40		I							
SG15-7.5	11/1	10:29	5 ul	6		I							
W-6 #1	11/1	10:48	5 ul	<.02		<.02							
W-6 #2	11/1	10:51	5 ul	<.02		<.02							
SG15-8.5	11/1	10:56	10 ul	9		I							
SG16-4	11/1	11:08	10 ul	20		I							

I = interference

Glenn Thompson

TRACER RESEARCH CORPORATION

DATE: Oct. 31 - Nov. 1, 1984 JOB: FOx - Albuquerque, NM

				Total Hydrocarbons		Benzene							
SAMPLE	DATE	TIME	AMT INJ	mg/l	ug/l	mg/l	ug/l	AREA	ug/l	AREA	ug/l	AREA	ug/l
SG17-7.5	11/1	11:25	7 ul	200		I							
SG18-7.5	11/1	11:43	2 ul	150		I							
SG19-7.5	11/1	12:05	5 ul	300		I							
SG20-7.5	11/1	12:22	4 ul	400		I							
SG21-7.5	11/1	12:32	4 ul	400		I							
SG22-7.5	11/1	14:43	5 ul	20		I							
W-1 #1	11/1	11:51	10 ul	<.02		<.02							
W-1 #2	11/1	13:03	25 ul	<.02		<.02							
W6 #1	11/1	13:14	25 ul	<.02		<.02							
W6 #2	11/1	13:20	25 ul	<.02		<.02							
W7	11/1	14:20	25 ul	5		I							
SG22-7.5	11/1	14:43	5 ul	17		I							
SG27-8.0	11/1	15:28	1 cc	<.005		<.005							
SG28-7.5	11/1	16:13	5 ul	100		I							

I = interference

Glenn Thompson

84-1006-C

REPORT TO: Dean Jescavitz
Ground water / Hazardous Waste
EID P.O. Box 968
Santa Fe, NM 87504-0968

LABORATORY

LAB NUMBER ORG-1006.AB
11/02/84

SLD Users Code No. 59600

ALL CONTAINERS WHICH THIS FORM ACCOMPANIES ARE COLLECTIVELY REFERRED TO AS "SAMPLE".

CERTIFICATE OF FIELD PERSONNEL

Sample Type: Water ☒ Soil ☐ Other

Water Supply and/or Code No. ATEX - MW1

City & County Albuquerque, Bernalillo

Collected (date & time) 841101 1500 By (name) Jescavitz

pH=_____; Conductivity=_____ umho/cm at _____ °C; Chlorine Residual=_____

Dissolved Oxygen=_____ mg/l; Alkalinity=_____; Flow Rate=_____

Sampling Location, Methods & Remarks (i.e. odors etc.)

Gasoline odor.

I certify that the statements in this block accurately reflect the results of my field analyses, observations and activities. Signed D. Jescavitz

I certify that I witnessed these field analyses, observations and activities and concur with the statements in this block. Signed _____

Method of Shipment to Laboratory hand delivered.

THIS FORM ACCOMPANIES 2 septum vials with teflon-lined discs identified as:
specimen MW1; duplicate MW1; triplicate _____; blank(s) _____,
and ____ amber glass jug(s) with teflon-lined cap(s) identified as _____,
and ____ other container(s) (describe) _____ identified as _____.

Containers are marked as follows to indicate preservation (circle):

NP: No preservation; sample stored at room temperature (~20°C).
P-~~HCl~~ Acid Sample stored in an ice bath.
P-$Na_2O_3S_2$: Sample preserved with 3 mg $Na_2O_3S_2$/40 ml and stored at room temperature.

CERTIFICATE(S) OF SAMPLE RECEIPT

I (we) certify that this sample was transferred from _____ to _____ at (location) _____ on (date & time) _____ and that the statements in this block are correct.

Disposition of Sample _____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s) _____ _____

I (we) certify that this sample was transferred from _____ to _____ at (location) _____ on (date & time) _____ and that the statements in this block are correct.

Disposition of Sample _____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s) _____ _____

RECEIVED
NOV 16 1984

LIQUID WASTE/GROUND WATER
SURVEILLANCE

ANALYSES REQUESTED — LAB. NO. 1006

PLEASE CHECK THE APPROPRIATE BOXES BELOW TO INDICATE THE TYPE OF ANALYTICAL SCREENS REQUIRED. WHENEVER POSSIBLE LIST SPECIFIC COMPOUNDS SUSPECTED OR REQUIRED.

QUALITATIVE	QUANTATIVE	PURGEABLE SCREEN
		ALIPHATIC HYDROCARBON SCREEN
	X	AROMATIC HYDROCARBON SCREEN
	X	HALOGENATED HYDROCARBON SCREEN
		GAS CHROMATOGRAPH/MASS SPECTROMETER
		SPECIFIC COMPOUNDS

QUALITATIVE	QUANTATIVE	EXTRACTABLES SCREEN
		ALIPHATIC HYDROCARBONS
		CHLORINATED HYDROCARBON PESTICIDES
		CHLOROPHENOXY ACID HERBICIDES
		HYDROCARBON FUEL SCREEN
		ORGANOPHOSPHATE PESTICIDES
		POLYCHLORINATED BIPHENYLS (PCB's)
		POLYNUCLEAR AROMATIC HYDROCARBONS
		SPECIFIC COMPOUNDS

REMARKS:

ANALYTICAL RESULTS

COMPOUND	CONC-ENTRATION	COMPOUND	CONC-ENTRATION
Benzene	8600 µg/l		
Toluene	8000 µg/l		
Ethylbenzene	1500 µg/l		
p-Xylene	1700 µg/l		
m-Xylene	3200 µg/l		
o-Xylene	2600 µg/l		
		* DETECTION LIMIT	

REMARKS: Some substituted benzenes in the C 9-10 range at about 1000-2000 µg/l

CETRIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes (No) . Seal(s) Broken by _____ date _____ .

I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements in this block and the analytical data on this page accurately reflect the analytical results for this sample.

Date(s) of analysis 11/7/84 . Analysts signature A Meyerhen

Icertify that I have reviewed and concur with the analytical results for this sample and with the statements in this block. Reviewers Signature:

84-1003 -C

REPORT TO: Dawn Seccombe
Ground Water / Hazardous Waste
EID, P.O. Box 968
Santa Fe, NM 87504-0968

LABORATORY

LAB NUMBER ORG-1003-AB
11/02/84

SLD Users Code No. 5960

ALL CONTAINERS WHICH THIS FORM ACCOMPANIES ARE COLLECTIVELY REFERRED TO AS "SAMPLE".

CERTIFICATE OF FIELD PERSONNEL

Sample Type: Water ☒ Soil ☐ Other

Water Supply and/or Code No. ATEX MW2

City & County Albuquerque, Bernalillo

Collected (date & time) 11/01 1447 By (name) Seccombe

pH=____; Conductivity=____ umho/cm at ____ °C; Chlorine Residual=____

Dissolved Oxygen=____ mg/l; Alkalinity=____; Flow Rate=____

Sampling Location, Methods & Remarks (i.e. odors etc.)

I certify that the statements in this block accurately reflect the results of my field analyses, observations and activities. Signed Dawn Seccombe

I certify that I witnessed these field analyses, observations and activities and concur with the statements in this block. Signed ____

Method of Shipment to Laboratory Hand-delivered.

THIS FORM ACCOMPANIES 2 septum vials with teflon-lined discs identified as:
specimen MW2; duplicate MW2; triplicate ____; blank(s) ____,
and ____ amber glass jug(s) with teflon-lined cap(s) identified as ____,
and ____ other container(s) (describe) ____ identified as ____.
Containers are marked as follows to indicate preservation (circle):
NP: No preservation; sample stored at room temperature (~20°C).
P-~~ICE~~ Sample stored in an ice bath.
P-$Na_2O_3S_2$: Sample preserved with 3 mg $Na_2O_3S_2$/40 ml and stored at room temperature.

CERTIFICATE(S) OF SAMPLE RECEIPT

I (we) certify that this sample was transferred from ____ to ____ at (location) ____ on (date & time) ____ and that the statements in this block are correct.

Disposition of Sample ____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s) ____

I (we) certify that this sample was transferred from ____ to ____ at (location) ____ on (date & time) ____ and that the statements in this block are correct.

Disposition of Sample ____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s) ____

RECEIVED
NOV 16 1984

LIQUID WASTE/GROUND WATER
SURVEILLANCE

ANALYSES REQUESTED LAB. NO. 1003

PLEASE CHECK THE APPROPRIATE BOXES BELOW TO INDICATE THE TYPE OF ANALYTICAL SCREENS REQUIRED. WHENEVER POSSIBLE LIST SPECIFIC COMPOUNDS SUSPECTED OR REQUIRED.

QUALITATIVE	QUANTATIVE	PURGEABLE SCREEN
		ALIPHATIC HYDROCARBON SCREEN
	X	AROMATIC HYDROCARBON SCREEN
	X	HALOGENATED HYDROCARBON SCREEN
		GAS CHROMATOGRAPH/MASS SPECTROMETER
		SPECIFIC COMPOUNDS

QUALITATIVE	QUANTATIVE	EXTRACTABLES SCREEN
		ALIPHATIC HYDROCARBONS
		CHLORINATED HYDROCARBON PESTICIDES
		CHLOROPHENOXY ACID HERBICIDES
		HYDROCARBON FUEL SCREEN
		ORGANOPHOSPHATE PESTICIDES
		POLYCHLORINATED BIPHENYLS (PCB's)
		POLYNUCLEAR AROMATIC HYDROCARBONS
		SPECIFIC COMPOUNDS

REMARKS:

ANALYTICAL RESULTS

COMPOUND	CONC-ENTRATION	COMPOUND	CONC-ENTRATION
Benzene *	1200 ug/l		
Toluene	70 ug/l		
p-Xylene	22 ug/l		
m-Xylene	14 ug/l		
o-Xylene	32 ug/l		
		* DETECTION LIMIT	

REMARKS: * Sample had a strong septic smell and there were numerous early eluting peaks which could have biased the benzene result to the high side. Attempts at repeating the analysis were not successful because of the instrument problems.

CETRIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes (No) . Seal(s) Broken by _____ date _____ .

I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements in this block and the analytical data on this page accurately reflect the analytical results for this sample.

Date(s) of analysis 11/7/84 . Analysts signature K Meyerhein

Icertify that I have reviewed and concur with the analytical results for this sample and with the statements in this block. Reviewers Signature:

84-1007-C

REPORT TO: Dawn Sercinovic
Ground Water/Haz Waste
EID P.O. Box 968
Santa Fe, NM 87504-0968

ORATORY

LAB NUMBER ORG-1007-17,B
11/02/84

SLD Users Code No. 59600

ALL CONTAINERS WHICH THIS FORM ACCOMPANIES ARE COLLECTIVELY REFERRED TO AS "SAMPLE".

CERTIFICATE OF FIELD PERSONNEL

Sample Type: Water ☒ Soil ☐ Other _____

Water Supply and/or Code No. ATEX - MW3

City & County Albuquerque, Bernalillo

Collected (date & time) 841101 1515 By (name) Sercinovic

pH=_____; Conductivity=_____umho/cm at_____°C; Chlorine Residual=_____

Dissolved Oxygen=_____mg/l; Alkalinity=_____; Flow Rate=_____

Sampling Location, Methods & Remarks (i.e. odors etc.)

Strong Gasoline odor (west sample)

I certify that the statements in this block accurately reflect the results of my field analyses, observations and activities. Signed Dawn Sercinovic

I certify that I witnessed these field analyses, observations and activities and concur with the statements in this block. Signed _____

Method of Shipment to Laboratory hand-delivered.

THIS FORM ACCOMPANIES 2 septum vials with teflon-lined discs identified as:
specimen MW3; duplicate MW3; triplicate_____; blank(s)_____,
and_____ amber glass jug(s) with teflon-lined cap(s) identified as_____,
and_____ other container(s) (describe)_____ identified as_____.

Containers are marked as follows to indicate preservation (circle):

NP: No preservation; sample stored at room temperature (~20°C).
P-~~ICE~~ICED: Sample stored in an ice bath.
P-$Na_2O_3S_2$: Sample preserved with 3 mg $Na_2O_3S_2$/40 ml and stored at room temperature.

CERTIFICATE(S) OF SAMPLE RECEIPT

I (we) certify that this sample was transferred from _____ to _____ at (location)_____ on (date & time)_____ and that the statements in this block are correct.

Disposition of Sample_____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s)_____ _____

I (we) certify that this sample was transferred from _____ to _____ at (location)_____ on (date & time)_____ and that the statements in this block are correct.

Disposition of Sample_____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s)_____ _____

RECEIVED
NOV 16 1984

LIQUID WASTE/GROUND WATER
SURVEILLANCE

ANALYSES REQUESTED

LAB. NO. 1007

PLEASE CHECK THE APPROPRIATE BOXES BELOW TO INDICATE THE TYPE OF ANALYTICAL SCREENS REQUIRED. WHENEVER POSSIBLE LIST SPECIFIC COMPOUNDS SUSPECTED OR REQUIRED.

QUALITATIVE	QUANTATIVE	PURGEABLE SCREEN
		ALIPHATIC HYDROCARBON SCREEN
	X	AROMATIC HYDROCARBON SCREEN
	X	HALOGENATED HYDROCARBON SCREEN
		GAS CHROMATOGRAPH/MASS SPECTROMETER
		SPECIFIC COMPOUNDS

QUALITATIVE	QUANTATIVE	EXTRACTABLES SCREEN
		ALIPHATIC HYDROCARBONS
		CHLORINATED HYDROCARBON PESTICIDES
		CHLOROPHENOXY ACID HERBICIDES
		HYDROCARBON FUEL SCREEN
		ORGANOPHOSPHATE PESTICIDES
		POLYCHLORINATED BIPHENYLS (PCB's)
		POLYNUCLEAR AROMATIC HYDROCARBONS
		SPECIFIC COMPOUNDS

REMARKS:

ANALYTICAL RESULTS

COMPOUND	CONC-ENTRATION	COMPOUND	CONC-ENTRATION
Benzene	24000 µg/l		
Toluene	25000 µg/l		
Ethylbenzene	3400 µg/l		
p-Xylene	3900 µg/l		
m-Xylene	4400 µg/l		
o-Xylene	5600 µg/l		
		* DETECTION LIMIT	

REMARKS:

CETRIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes (No) . Seal(s) Broken by _____ date _____ .

I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements in this block and the analytical data on this page accurately reflect the analytical results for this sample.

Date(s) of analysis 11/7/84 . Analysts signature K Mayhew

Icertify that I have reviewed and concur with the analytical results for this sample and with the statements in this block. Reviewers Signature:

84-1008-C

REPORT TO: Devin Jerinovic
Ground Water / Hazardous Waste
EID P.O. Box 968
Santa Fe, NM 87504-0968

LABORATORY

LAB NUMBER ARC-1008-F.15 11-02-84

SLD Users Code No. 59600

ALL CONTAINERS WHICH THIS FORM ACCOMPANIES ARE COLLECTIVELY REFERRED TO AS "SAMPLE".

CERTIFICATE OF FIELD PERSONNEL

Sample Type: Water ☒ Soil ☐ Other

Water Supply and/or Code No. ATEX - MW4

City & County Albuquerque, Bernalillo

Collected (date & time) 11/01 1430 By (name) Jerinovic

pH=____; Conductivity=____ umho/cm at ____ °C; Chlorine Residual=____

Dissolved Oxygen=____ mg/l; Alkalinity=____; Flow Rate=____

Sampling Location, Methods & Remarks (i.e. odors etc.)

Gasoline odor (slight)

I certify that the statements in this block accurately reflect the results of my field analyses, observations and activities. Signed Devin Jerinovic

I certify that I witnessed these field analyses, observations and activities and concur with the statements in this block. Signed ____

Method of Shipment to Laboratory hand-delivered.

THIS FORM ACCOMPANIES 2 septum vials with teflon-lined discs identified as: specimen MW4; duplicate MW4; triplicate ____; blank(s) ____, and ____ amber glass jug(s) with teflon-lined cap(s) identified as ____, and ____ other container(s) (describe) ____ identified as ____.

Containers are marked as follows to indicate preservation (circle):

NP: No preservation; sample stored at room temperature (~20°C).

P-~~ICE~~Cool Sample stored in an ice bath.

P-$Na_2O_3S_2$: Sample preserved with 3 mg $Na_2O_3S_2$/40 ml and stored at room temperature.

CERTIFICATE(S) OF SAMPLE RECEIPT

I (we) certify that this sample was transferred from ____ to ____ at (location) ____ on (date & time) ____ and that the statements in this block are correct.

Disposition of Sample ____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s) ____

I (we) certify that this sample was transferred from ____ to ____ at (location) ____ on (date & time) ____ and that the statements in this block are correct.

Disposition of Sample ____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s) ____

RECEIVED
NOV 16 1984

LIQUID WASTE/GROUND WATER SURVEILLANCE

HNALYSES REQUESTED LAB. NO. 1008

PLEASE CHECK THE APPROPRIATE BOXES BELOW TO INDICATE THE TYPE OF ANALYTICAL SCREENS REQUIRED. WHENEVER POSSIBLE LIST SPECIFIC COMPOUNDS SUSPECTED OR REQUIRED.

QUALITATIVE	QUANTATIVE	PURGEABLE SCREEN	QUALITATIVE	QUANTATIVE	EXTRACTABLES SCREEN
		ALIPHATIC HYDROCARBON SCREEN			ALIPHATIC HYDROCARBONS
	X	AROMATIC HYDROCARBON SCREEN			CHLORINATED HYDROCARBON PESTICIDES
	X	HALOGENATED HYDROCARBON SCREEN			CHLOROPHENOXY ACID HERBICIDES
		GAS CHROMATOGRAPH/MASS SPECTROMETER			HYDROCARBON FUEL SCREEN
					ORGANOPHOSPHATE PESTICIDES
					POLYCHLORINATED BIPHENYLS (PCB's)
					POLYNUCLEAR AROMATIC HYDROCARBONS
		SPECIFIC COMPOUNDS			SPECIFIC COMPOUNDS

REMARKS:

ANALYTICAL RESULTS

COMPOUND	CONC-ENTRATION	COMPOUND	CONC-ENTRATION
Aromatic Purgeables	ND *		
Halogenated Purgeables	ND *		
	-	* DETECTION LIMIT	1ug/l

REMARKS: Repeated with Duplicate bottle.

CETRIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes (No) . Seal(s) Broken by _____ date _____ .
I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements in this block and the analytical data on this page accurately reflect the analytical results for this sample.
Date(s) of analysis 11/7/84 . Analysts signature K Meyerhelm
Icertify that I have reviewed and concur with the analytical results for this sample and with the statements in this block. Reviewers Signature:

84-1012-C

REPORT TO: Dean Descinovic
Ground Water/Hazardous Waste
ED, P.O. Box 968
Santa Fe, New Mexico 87504-0968

LABORATORY _____

LAB NUMBER ORC-1012-AB
11-02-84

SLD Users Code No. 59600

ALL CONTAINERS WHICH THIS FORM ACCOMPANIES ARE COLLECTIVELY REFERRED TO AS "SAMPLE".

CERTIFICATE OF FIELD PERSONNEL

Sample Type: Water ☒ Soil ☐ Other _____

Water Supply and/or Code No. ATEX MWS

City & County Albuquerque, Bernalillo

Collected (date & time) 841031 By (name) Descinovic

pH= _____; Conductivity= _____ umho/cm at _____ °C; Chlorine Residual= _____

Dissolved Oxygen= _____ mg/l; Alkalinity= _____; Flow Rate= _____

Sampling Location, Methods & Remarks (i.e. odors etc.)

I certify that the statements in this block accurately reflect the results of my field analyses, observations and activities. Signed [signature]

I certify that I witnessed these field analyses, observations ~~and~~ activities and concur with the statements in this block. Signed _____

Method of Shipment to Laboratory hand-delivered.

THIS FORM ACCOMPANIES 2 septum vials with teflon-lined discs identified as:
specimen MWS; duplicate MWS; triplicate _____; blank(s) _____,
and _____ amber glass jug(s) with teflon-lined cap(s) identified as _____,
and _____ other container(s) (describe) _____ identified as _____.

Containers are marked as follows to indicate preservation (circle):

(NP): No preservation; sample stored at room temperature (~20°C).
P-ICE: Sample stored in an ice bath.
P-$Na_2O_3S_2$: Sample preserved with 3 mg $Na_2O_3S_2$/40 ml and stored at room temperature.

CERTIFICATE(S) OF SAMPLE RECEIPT

I (we) certify that this sample was transferred from _____ to _____ at (location) _____ on (date & time) _____ and that the statements in this block are correct.

Disposition of Sample _____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s) _____ _____

I (we) certify that this sample was transferred from _____ to _____ at (location) _____ on (date & time) _____ and that the statements in this block are correct.

Disposition of Sample _____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s) _____ _____

RECEIVED
NOV 16 1984

LIQUID WASTE/GROUND WATER
SURVEILLANCE

ANALYSES REQUESTED LAB. NO.

PLEASE CHECK THE APPROPRIATE BOXES BELOW TO INDICATE THE TYPE OF ANALYTICAL SCREENS REQUIRED. WHENEVER POSSIBLE LIST SPECIFIC COMPOUNDS SUSPECTED OR REQUIRED.

QUALITATIVE	QUANTATIVE	PURGEABLE SCREEN	QUALITATIVE	QUANTATIVE	EXTRACTABLES SCREEN
		ALIPHATIC HYDROCARBON SCREEN			ALIPHATIC HYDROCARBONS
	X	AROMATIC HYDROCARBON SCREEN			CHLORINATED HYDROCARBON PESTICIDES
	X	HALOGENATED HYDROCARBON SCREEN			CHLOROPHENOXY ACID HERBICIDES
		GAS CHROMATOGRAPH/MASS SPECTROMETER			HYDROCARBON FUEL SCREEN
					ORGANOPHOSPHATE PESTICIDES
					POLYCHLORINATED BIPHENYLS (PCB's)
					POLYNUCLEAR AROMATIC HYDROCARBONS
		SPECIFIC COMPOUNDS			SPECIFIC COMPOUNDS

REMARKS:

ANALYTICAL RESULTS

COMPOUND	CONC-ENTRATION	COMPOUND	CONC-ENTRATION
Benzene	1250 ug/l		
Toluene	760 ug/l		
Ethylbenzene	130 ug/l		
p-Xylene	210 ug/l		
m-Xylene	540 ug/l		
o-Xylene	240 ug/l		
		* DETECTION LIMIT	

REMARKS:

CETRIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes (No) . Seal(s) Broken by _____ date _____ .
I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements in this block and the analytical data on this page accurately reflect the analytical results for this sample.
Date(s) of analysis 11/11/89 . Analysts signature K Meyerhoff
Icertify that I have reviewed and concur with the analytical results for this sample and with the statements in this block. Reviewers Signature:

84-1002 -C

REPORT TO: Devon Jercinovic
Ground Water/Hazardous Waste
EID P.O. Box 968
Santa Fe, NM 87504-0968

LABORATORY

LAB NUMBER ORG-1002-A,B
11/03/84

SLD Users Code No. 59600

ALL CONTAINERS WHICH THIS FORM ACCOMPANIES ARE COLLECTIVELY REFERRED TO AS "SAMPLE".

CERTIFICATE OF FIELD PERSONNEL

Sample Type: Water ☑ Soil ☐ Other

Water Supply and/or Code No. ATEX - W3

City & County Albuquerque, Bernalillo,

Collected (date & time) 841101 1343 By (name) Jercinovic

pH=____; Conductivity=____ umho/cm at ____°C; Chlorine Residual=____

Dissolved Oxygen=____ mg/l; Alkalinity=____; Flow Rate=____

Sampling Location, Methods & Remarks (i.e. odors etc.)

I certify that the statements in this block accurately reflect the results of my field analyses, observations and activities. Signed [signature]

I certify that I witnessed these field analyses, observations and activities and concur with the statements in this block. Signed ____

Method of Shipment to Laboratory hand-delivered.

THIS FORM ACCOMPANIES 2 septum vials with teflon-lined discs identified as:
specimen W3; duplicate W3; triplicate ____; blank(s) ____,
and ____ amber glass jug(s) with teflon-lined cap(s) identified as ____,
and ____ other container(s) (describe) ____ identified as ____.

Containers are marked as follows to indicate preservation (circle):

NP: No preservation; sample stored at room temperature (~20°C).

P-~~ICE~~: Cold. Sample stored in an ice bath.

P-$Na_2O_3S_2$: Sample preserved with 3 mg $Na_2O_3S_2$/40 ml and stored at room temperature.

CERTIFICATE(S) OF SAMPLE RECEIPT

I (we) certify that this sample was transferred from ____ to ____ at (location) ____ on (date & time) ____ and that the statements in this block are correct.

Disposition of Sample ____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s) ____

I (we) certify that this sample was transferred from ____ to ____ at (location) RECEIVED on (date & time) ____ and that the statements in this block are correct.

Disposition of Sample ____. Seal(s) Intact: Yes ☐ No ☐ . NOV 16 1984

Signature(s) ____

LIQUID WASTE/GROUND WATER SURVEILLANCE

ANALYSES REQUESTED LAB. NO. 1002

PLEASE CHECK THE APPROPRIATE BOXES BELOW TO INDICATE THE TYPE OF ANALYTICAL SCREENS REQUIRED. WHENEVER POSSIBLE LIST SPECIFIC COMPOUNDS SUSPECTED OR REQUIRED.

QUALITATIVE	QUANTATIVE	PURGEABLE SCREEN
		ALIPHATIC HYDROCARBON SCREEN
	X	AROMATIC HYDROCARBON SCREEN
	X	HALOGENATED HYDROCARBON SCREEN
		GAS CHROMATOGRAPH/MASS SPECTROMETER
		SPECIFIC COMPOUNDS

QUALITATIVE	QUANTATIVE	EXTRACTABLES SCREEN
		ALIPHATIC HYDROCARBONS
		CHLORINATED HYDROCARBON PESTICIDES
		CHLOROPHENOXY ACID HERBICIDES
		HYDROCARBON FUEL SCREEN
		ORGANOPHOSPHATE PESTICIDES
		POLYCHLORINATED BIPHENYLS (PCB's)
		POLYNUCLEAR AROMATIC HYDROCARBONS
		SPECIFIC COMPOUNDS

REMARKS:

ANALYTICAL RESULTS

COMPOUND	CONC-ENTRATION	COMPOUND	CONC-ENTRATION
Benzene	7 ug/l		
Toluene	5 ug/l		
Ethylbenzene	ND *		
m-Xylene	5 ug/l		
p&o-Xylene	5 ug/l		
		* DETECTION LIMIT	

REMARKS: Numerous other substituted benzenes in the C5-10 at about 5-20 ppb

CETRIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes (No) . Seal(s) Broken by _____ date _____ .
I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements in this block and the analytical data on this page accurately reflect the analytical results for this sample.
Date(s) of analysis 11/6/84 . Analysts signature K Meyerhen
Icertify that I have reviewed and concur with the analytical results for this sample and with the statements in this block. Reviewers Signature:

84-1005-C

REPORT TO: Dena Dennovic
Ground Water / Hazardous Waste
EID P.O. Box 968
Santa Fe, NM 87504-0968

LABORATORY

LAB NUMBER ORE-1005-A,B
11/02/84

SLD Users Code No. 59600

ALL CONTAINERS WHICH THIS FORM ACCOMPANIES ARE COLLECTIVELY REFERRED TO AS "SAMPLE".

CERTIFICATE OF FIELD PERSONNEL

Sample Type: Water ☒ Soil ☐ Other

Water Supply and/or Code No. ATEX - WA

City & County Albuquerque, ~~Bernalillo~~ Bernalillo

Collected (date & time) 10/31/84 1420 By (name) Dennovic

pH=____; Conductivity=____ umho/cm at ____ °C; Chlorine Residual=____

Dissolved Oxygen=____ mg/l; Alkalinity=____; Flow Rate=____

Sampling Location, Methods & Remarks (i.e. odors etc.)

I certify that the statements in this block accurately reflect the results of my field analyses, observations and activities. Signed Dena Dennovic

I certify that I witnessed these field analyses, observations and activities and concur with the statements in this block. Signed ____

Method of Shipment to Laboratory hand-delivered.

THIS FORM ACCOMPANIES 2 septum vials with teflon-lined discs identified as:
specimen WA; duplicate WA; triplicate ____; blank(s) ____,
and ____ amber glass jug(s) with teflon-lined cap(s) identified as ____,
and ____ other container(s) (describe) ____ identified as ____.
Containers are marked as follows to indicate preservation (circle):
NP: No preservation; sample stored at room temperature (~20°C).
P-~~ICE~~: Sample stored in an ice bath.
P-$Na_2O_3S_2$: Sample preserved with 3 mg $Na_2O_3S_2$/40 ml and stored at room temperature.

CERTIFICATE(S) OF SAMPLE RECEIPT

I (we) certify that this sample was transferred from ____ to ____ at (location) ____ on (date & time) ____ and that the statements in this block are correct.

Disposition of Sample ____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s) ____

I (we) certify that this sample was transferred from ____ to ____ at (location) ____ on (date & time) ____ and that the statements in this block are correct.

Disposition of Sample ____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s) ____

RECEIVED
NOV 16 1984
LIQUID WASTE & GROUND WATER
SURVEILLANCE

ANALYSES REQUESTED

LAB. NO. 1005

PLEASE CHECK THE APPROPRIATE BOXES BELOW TO INDICATE THE TYPE OF ANALYTICAL SCREENS REQUIRED. WHENEVER POSSIBLE LIST SPECIFIC COMPOUNDS SUSPECTED OR REQUIRED.

QUALITATIVE	QUANTATIVE	PURGEABLE SCREEN
		ALIPHATIC HYDROCARBON SCREEN
	X	AROMATIC HYDROCARBON SCREEN
	X	HALOGENATED HYDROCARBON SCREEN
		GAS CHROMATOGRAPH/MASS SPECTROMETER
		SPECIFIC COMPOUNDS

QUALITATIVE	QUANTATIVE	EXTRACTABLES SCREEN
		ALIPHATIC HYDROCARBONS
		CHLORINATED HYDROCARBON PESTICIDES
		CHLOROPHENOXY ACID HERBICIDES
		HYDROCARBON FUEL SCREEN
		ORGANOPHOSPHATE PESTICIDES
		POLYCHLORINATED BIPHENYLS (PCB's)
		POLYNUCLEAR AROMATIC HYDROCARBONS
		SPECIFIC COMPOUNDS

REMARKS:

ANALYTICAL RESULTS

COMPOUND	CONC-ENTRATION	COMPOUND	CONC-ENTRATION
Benzene	8500 µg/l		
Toluene	26000 µg/l		
Ethyl benzene	3000 µg/l		
p-Xylene	2800 µg/l		
m-Xylene	5500 µg/l		
o-Xylene	4700 µg/l		
		* DETECTION LIMIT	

REMARKS: Some substituted benzenes in the C9-10 range at lower concentrations (about 1/10 of others)

CETRIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes (No) . Seal(s) Broken by _____ date _____ .

I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements in this block and the analytical data on this page accurately reflect the analytical results for this sample.

Date(s) of analysis 11/7/84 . Analysts signature K Meyerhelm

Icertify that I have reviewed and concur with the analytical results for this sample and with the statements in this block. Reviewers Signature:

84- 1001 -C

REPORT TO: Dean Jercinovic
Ground Water / Hazardous Waste
P.O. Box 968
ED
Santa Fe, NM 87504-0968

LABORATORY

LAB NUMBER WC-1001-A,B
11/02/84

SLD Users Code No. 59600

ALL CONTAINERS WHICH THIS FORM ACCOMPANIES ARE COLLECTIVELY REFERRED TO AS "SAMPLE".

CERTIFICATE OF FIELD PERSONNEL

Sample Type: Water ☒ Soil ☐ Other _____

Water Supply and/or Code No. ATEX - WC

City & County Albuquerque, Bernalillo

Collected (date & time) 11/01 1331 By (name) Jercinovic

pH=_____; Conductivity=_____umho/cm at _____°C; Chlorine Residual=_____

Dissolved Oxygen=_____mg/l; Alkalinity=_____; Flow Rate=_____

Sampling Location, Methods & Remarks (i.e. odors etc.)

Ground water

I certify that the statements in this block accurately reflect the results of my field analyses, observations and activities. Signed [signature]

I certify that I witnessed these field analyses, observations and activities and concur with the statements in this block. Signed _____

Method of Shipment to Laboratory Hand-delivered.

THIS FORM ACCOMPANIES 2 septum vials with teflon-lined discs identified as:
specimen WC; duplicate WC; triplicate _____; blank(s) _____,
and _____ amber glass jug(s) with teflon-lined cap(s) identified as _____,
and _____ other container(s) (describe) _____ identified as _____.
Containers are marked as follows to indicate preservation (circle):

NP: No preservation; sample stored at room temperature (~20°C).
P-~~ICE~~: Sample stored in an ice bath.
P-$Na_2O_3S_2$: Sample preserved with 3 mg $Na_2O_3S_2$/40 ml and stored at room temperature.

CERTIFICATE(S) OF SAMPLE RECEIPT

I (we) certify that this sample was transferred from _____ to _____ at (location) _____ on (date & time) _____ and that the statements in this block are correct.

Disposition of Sample _____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s) _____ _____

I (we) certify that this sample was transferred from _____ to _____ at (location) RECEIVED on (date & time) _____ and that the statements in this block are correct.

Disposition of Sample _____. Seal(s) Intact NOV 16 1984 No ☐ .

Signature(s) _____ _____

~~LIQUID WASTE/GROUND WATER~~
SURVEILLANCE

ANALYSES REQUESTED

LAB. NO. 1001

PLEASE CHECK THE APPROPRIATE BOXES BELOW TO INDICATE THE TYPE OF ANALYTICAL SCREENS REQUIRED WHENEVER POSSIBLE LIST SPECIFIC COMPOUNDS SUSPECTED OR REQUIRED.

QUALITATIVE	QUANTATIVE	PURGEABLE SCREEN
		ALIPHATIC HYDROCARBON SCREEN
	X	AROMATIC HYDROCARBON SCREEN
	X	HALOGENATED HYDROCARBON SCREEN
		GAS CHROMATOGRAPH/MASS SPECTROMETER
		SPECIFIC COMPOUNDS

QUALITATIVE	QUANTATIVE	EXTRACTABLES SCREEN
		ALIPHATIC HYDROCARBONS
		CHLORINATED HYDROCARBON PESTICIDES
		CHLOROPHENOXY ACID HERBICIDES
		HYDROCARBON FUEL SCREEN
		ORGANOPHOSPHATE PESTICIDES
		POLYCHLORINATED BIPHENYLS (PCB's)
		POLYNUCLEAR AROMATIC HYDROCARBONS
		SPECIFIC COMPOUNDS

REMARKS:

ANALYTICAL RESULTS

COMPOUND	CONC-ENTRATION	COMPOUND	CONC-ENTRATION
m-Xylene	6 µg/l		
o-Xylene	4 µg/l		
		* DETECTION LIMIT	

REMARKS: Numerous other substituted benzenes in the C9-10 range at about 5-10ppb

CETRIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes (No) . Seal(s) Broken by _____ date _____ .

I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements in this block and the analytical data on this page accurately reflect the analytical results for this sample.

Date(s) of analysis 11/6/84 . Analysts signature K. Meyerhen

Icertify that I have reviewed and concur with the analytical results for this sample and with the statements in this block. Reviewers Signature:

APPENDIX B

PUMP TEST DATA

84-1000-C Received 11/29/84

REPORT TO: Dean Decinque
Ground Water / Hazardous Waste
EID P.O. Box 968
Santa Fe, NM 87504-968

LABORATORY SLD

LAB NUMBER RGC. 10001 - A, B
11/02/84

SLD Users Code No. 59600

ALL CONTAINERS WHICH THIS FORM ACCOMPANIES ARE COLLECTIVELY REFERRED TO AS "SAMPLE".

CERTIFICATE OF FIELD PERSONNEL

Sample Type: Water ☒ Soil ☐ Other _____

Water Supply and/or Code No. ATEX, W-7

City & County Albuquerque, Bernalillo

Collected (date & time) 84/11/01 1405 By (name) Decinque

pH=_____; Conductivity=_____umho/cm at _____°C; Chlorine Residual=_____

Dissolved Oxygen=_____mg/l; Alkalinity=_____; Flow Rate=_____

Sampling Location, Methods & Remarks (i.e. odors etc.)

I certify that the statements in this block accurately reflect the results of my field analyses, observations and activities. Signed Dean Decinque

I certify that I witnessed these field analyses, observations and activities and concur with the statements in this block. Signed _____

Method of Shipment to Laboratory hand-delivered.

THIS FORM ACCOMPANIES 2 septum vials with teflon-lined discs identified as:
specimen W-7; duplicate W-7; triplicate _____; blank(s) _____,
and _____ amber glass jug(s) with teflon-lined cap(s) identified as _____,
and _____ other container(s) (describe) _____ identified as _____.

Containers are marked as follows to indicate preservation (circle):
NP: No preservation; sample stored at room temperature (~20°C).
P-ICE: Sample stored in an ice bath.
P-$Na_2O_3S_2$: Sample preserved with 3 mg $Na_2O_3S_2$/40 ml and stored at room temperature.

CERTIFICATE(S) OF SAMPLE RECEIPT

I (we) certify that this sample was transferred from _____ to _____ at (location) _____ on (date & time) _____ and that the statements in this block are correct.

Disposition of Sample _____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s) _____ _____

I (we) certify that this sample was transferred from _____ to _____ at (location) _____ on (date & time) _____ and that the statements in this block are correct.

Disposition of Sample _____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s) _____ _____

RECEIVED
NOV 16 1984
LIQUID WASTE/GROUND WATER SURVEILLANCE

ANALYSES REQUESTED

LAB. NO. 1000

PLEASE CHECK THE APPROPRIATE BOXES BELOW TO INDICATE THE TYPE OF ANALYTICAL SCREENS REQUIRED WHENEVER POSSIBLE LIST SPECIFIC COMPOUNDS SUSPECTED OR REQUIRED.

QUALITATIVE	QUANTATIVE	PURGEABLE SCREEN
		ALIPHATIC HYDROCARBON SCREEN
	X	AROMATIC HYDROCARBON SCREEN
	X	HALOGENATED HYDROCARBON SCREEN
		GAS CHROMATOGRAPH/MASS SPECTROMETER
		SPECIFIC COMPOUNDS

QUALITATIVE	QUANTATIVE	EXTRACTABLES SCREEN
		ALIPHATIC HYDROCARBONS
		CHLORINATED HYDROCARBON PESTICIDES
		CHLOROPHENOXY ACID HERBICIDES
		HYDROCARBON FUEL SCREEN
		ORGANOPHOSPHATE PESTICIDES
		POLYCHLORINATED BIPHENYLS (PCB's)
		POLYNUCLEAR AROMATIC HYDROCARBONS
		SPECIFIC COMPOUNDS

REMARKS:

ANALYTICAL RESULTS

COMPOUND	CONC-ENTRATION	COMPOUND	CONC-ENTRATION
Benzene	.33mg/l 330 µg/l	Numerous other substituted	
Toluene	200 µg/l	benzenes in the C9-10 range	
Ethylbenzene	500 µg/l	at about 500-1000 µg/l	
p-Xylene	700 µg/l		
m-Xylene	1400 µg/l		
o-Xylene	950 µg/l		
		* DETECTION LIMIT	

REMARKS:

CETRIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes (No) . Seal(s) Broken by _____ date _____ .

I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements in this block and the analytical data on this page accurately reflect the analytical results for this sample.

Date(s) of analysis 11/6/84 . Analysts signature K Meyerhein

Icertify that I have reviewed and concur with the analytical results for this sample and with the statements in this block. Reviewers Signature:

REPORT TO: Dean Jercinovic
Ground Water Protection Section
EID, P.O. Box 968
Santa Fe, NM 87504-0968

LABORATORY 84-1010-C

LAB NUMBER ORG - 1010 - A3
11-2-84

SLD Users Code No. 5960

ALL CONTAINERS WHICH THIS FORM ACCOMPANIES ARE COLLECTIVELY REFERRED TO AS "SAMPLE".

CERTIFICATE OF FIELD PERSONNEL

Sample Type: Water ☒ Soil ☐ Other _____

Water Supply and/or Code No. ATEX W9 TUBING SAMPLE

City & County Albuquerque, Bernalillo

Collected (date & time) 841031 By (name) Jercinovic

pH= _____; Conductivity= _____ umho/cm at _____ °C; Chlorine Residual= _____

Dissolved Oxygen= _____ mg/l; Alkalinity= _____; Flow Rate= _____

Sampling Location, Methods & Remarks (i.e. odors etc.)

I certify that the statements in this block accurately reflect the results of my field analyses, observations and activities. Signed _____

I certify that I witnessed these field analyses, observations and activities and concur with the statements in this block. Signed _____

Method of Shipment to Laboratory hand-delivered.

THIS FORM ACCOMPANIES 2 septum vials with teflon-lined discs identified as:
specimen W9 (tubing); duplicate W9 (tubing); triplicate _____; blank(s) _____,
and _____ amber glass jug(s) with teflon-lined cap(s) identified as _____,
and _____ other container(s) (describe) _____ identified as _____.

Containers are marked as follows to indicate preservation (circle):

(NP) No preservation; sample stored at room temperature (~20°C).
P-ICE: Sample stored in an ice bath.
P-$Na_2O_3S_2$: Sample preserved with 3 mg $Na_2O_3S_2$/40 ml and stored at room temperature.

CERTIFICATE(S) OF SAMPLE RECEIPT

I (we) certify that this sample was transferred from _____ to _____ at (location) _____ on (date & time) _____ and that the statements in this block are correct.

Disposition of Sample _____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s) _____ _____

I (we) certify that this sample was transferred from _____ to _____ at (location) _____ on (date & time) _____ and that the statements in this block are correct.

Disposition of Sample _____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s) _____ _____

RECEIVED
NOV 16 1984

LIQUID WASTE/GROUND WATER
SURVEILLANCE

ANALYSES REQUESTED LAB. NO.

PLEASE CHECK THE APPROPRIATE BOXES BELOW TO INDICATE THE TYPE OF ANALYTICAL SCREENS REQUIRED WHENEVER POSSIBLE LIST SPECIFIC COMPOUNDS SUSPECTED OR REQUIRED.

QUALITATIVE	QUANTATIVE	PURGEABLE SCREEN
		ALIPHATIC HYDROCARBON SCREEN
	X	AROMATIC HYDROCARBON SCREEN
	X	HALOGENATED HYDROCARBON SCREEN
		GAS CHROMATOGRAPH/MASS SPECTROMETER
		SPECIFIC COMPOUNDS

QUALITATIVE	QUANTATIVE	EXTRACTABLES SCREEN
		ALIPHATIC HYDROCARBONS
		CHLORINATED HYDROCARBON PESTICIDES
		CHLOROPHENOXY ACID HERBICIDES
		HYDROCARBON FUEL SCREEN
		ORGANOPHOSPHATE PESTICIDES
		POLYCHLORINATED BIPHENYLS (PCB's)
		POLYNUCLEAR AROMATIC HYDROCARBONS
		SPECIFIC COMPOUNDS

REMARKS:

ANALYTICAL RESULTS

COMPOUND	CONC-ENTRATION	COMPOUND	CONC-ENTRATION
Benzene	2.0 µg/l	Trisubstituted Benzenes	Present
Toluene	5.3 µg/l	Tetrasubstituted Benzenes	Present
Ethylbenzene	20 µg/l	Naphthylene	Present
o-Xylene	1.4 µg/l		
m-Xylene	4 µg/l		
o-Xylene	3 µg/l		
		* DETECTION LIMIT	

REMARKS:

CETRIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes (No) . Seal(s) Broken by _____ date _____ .

I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements in this block and the analytical data on this page accurately reflect the analytical results for this sample.

Date(s) of analysis 11/18 . Analysts signature K Meyerhein

Icertify that I have reviewed and concur with the analytical results for this sample and with the statements in this block. Reviewers Signature:

84-1011-C

REPORT TO: Devon Jesinovic
Ground Water Hazardous Waste
ED, P.O. Box 968
Santa Fe, NM 87504-0968

LABORATORY _____

LAB NUMBER ORE-1011-A,B

SLD Users Code No. 59600

ALL CONTAINERS WHICH THIS FORM ACCOMPANIES ARE COLLECTIVELY REFERRED TO AS "SAMPLE".

CERTIFICATE OF FIELD PERSONNEL

Sample Type: Water ☒ Soil ☐ Other _____

Water Supply and/or Code No. ATEX WS9 Bailed Sample

City & County Albuquerque, Bernalillo

Collected (date & time) 9A 10/31 By (name) Jesinovic

pH=_____; Conductivity=_____umho/cm at _____°C; Chlorine Residual=_____

Dissolved Oxygen=_____mg/l; Alkalinity=_____; Flow Rate=_____

Sampling Location, Methods & Remarks (i.e. odors etc.)

I certify that the statements in this block accurately reflect the results of my field analyses, observations and activities. Signed _____

I certify that I witnessed these field analyses, observations and activities and concur with the statements in this block. Signed _____

Method of Shipment to Laboratory Hand-Delivered.

THIS FORM ACCOMPANIES 2 septum vials with teflon-lined discs identified as:
specimen WS9 Bailed; duplicate WS9 (Bailed) triplicate _____; blank(s) _____,
and _____ amber glass jug(s) with teflon-lined cap(s) identified as _____,
and _____ other container(s) (describe) _____ identified as _____.

Containers are marked as follows to indicate preservation (circle):

(NP) No preservation; sample stored at room temperature (~20°C).
P-ICE: Sample stored in an ice bath.
P-$Na_2O_3S_2$: Sample preserved with 3 mg $Na_2O_3S_2$/40 ml and stored at room temperature.

CERTIFICATE(S) OF SAMPLE RECEIPT

I (we) certify that this sample was transferred from _____ to _____ at (location) _____ on (date & time) _____ and that the statements in this block are correct.

Disposition of Sample _____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s) _____ _____

I (we) certify that this sample was transferred from _____ to _____ at (location) _____ on (date & time) _____ and that the statements in this block are correct.

Disposition of Sample _____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s) _____ _____

RECEIVED
NOV 16 1984

LIQUID WASTE/GROUND WATER
SURVEILLANCE

ANALYSES REQUESTED LAB. NO.

PLEASE CHECK THE APPROPRIATE BOXES BELOW TO INDICATE THE TYPE OF ANALYTICAL SCREENS REQUIRED. WHENEVER POSSIBLE LIST SPECIFIC COMPOUNDS SUSPECTED OR REQUIRED.

QUALITATIVE	QUANTATIVE	PURGEABLE SCREEN
		ALIPHATIC HYDROCARBON SCREEN
	X	AROMATIC HYDROCARBON SCREEN
	X	HALOGENATED HYDROCARBON SCREEN
		GAS CHROMATOGRAPH/MASS SPECTROMETER
		SPECIFIC COMPOUNDS

QUALITATIVE	QUANTATIVE	EXTRACTABLES SCREEN
		ALIPHATIC HYDROCARBONS
		CHLORINATED HYDROCARBON PESTICIDES
		CHLOROPHENOXY ACID HERBICIDES
		HYDROCARBON FUEL SCREEN
		ORGANOPHOSPHATE PESTICIDES
		POLYCHLORINATED BIPHENYLS (PCB's)
		POLYNUCLEAR AROMATIC HYDROCARBONS
		SPECIFIC COMPOUNDS

REMARKS:

ANALYTICAL RESULTS

COMPOUND	CONC-ENTRATION	COMPOUND	CONC-ENTRATION
Benzene	3.0 µg/l	Trimethylbenzenes	present
Toluene	7.4 µg/l	Tetramethyl benzenes	present
Ethylbenzene	2.5 µg/l	Naphthylene	present
o-Xylene	2.6 µg/l		
m-Xylene	7.3 µg/l		
o-Xylene	6.1 µg/l		
^		* DETECTION LIMIT	1 µg/l

REMARKS:

CETRIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes (No). Seal(s) Broken by _____ date _____.
I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements in this block and the analytical data on this page accurately reflect the analytical results for this sample.
Date(s) of analysis 11/11/84. Analysts signature K Meyerhen
Icertify that I have reviewed and concur with the analytical results for this sample and with the statements in this block. Reviewers Signature:

84-1004 -C

REPORT TO: Dean Jercinovic
Ground Water / Hazardous Waste
FID, P.O. Box 968
Santa Fe, NM 87504-0968

LABORATORY

LAB NUMBER ORG-1004-A,B
11/02/84

SLD Users Code No. 59600

ALL CONTAINERS WHICH THIS FORM ACCOMPANIES ARE COLLECTIVELY REFERRED TO AS "SAMPLE".

CERTIFICATE OF FIELD PERSONNEL

Sample Type: Water ☒ Soil ☐ Other

Water Supply and/or Code No. ATEX, WIA

City & County Albuquerque Bernalillo

Collected (date & time) 11/01 1551 By (name) Jercinovic

pH=_____; Conductivity=_____umho/cm at _____°C; Chlorine Residual=_____

Dissolved Oxygen=_____mg/l; Alkalinity=_____; Flow Rate=_____

Sampling Location, Methods & Remarks (i.e. odors etc.)

I certify that the statements in this block accurately reflect the results of my field analyses, observations and activities. Signed [signature]

I certify that I witnessed these field analyses, observations and activities and concur with the statements in this block. Signed _____

Method of Shipment to Laboratory hand-delivered.

THIS FORM ACCOMPANIES 2 septum vials with teflon-lined discs identified as:
specimen WIA; duplicate WIA; triplicate _____; blank(s) _____,
and ____ amber glass jug(s) with teflon-lined cap(s) identified as _____,
and ____ other container(s) (describe) _____ identified as _____.

Containers are marked as follows to indicate preservation (circle):
NP: No preservation; sample stored at room temperature (~20°C).
P-~~ICE~~: Sample stored in an ice bath.
P-$Na_2O_3S_2$: Sample preserved with 3 mg $Na_2O_3S_2$/40 ml and stored at room temperature.

CERTIFICATE(S) OF SAMPLE RECEIPT

I (we) certify that this sample was transferred from _____ to _____ at (location) _____ on (date & time) _____ and that the statements in this block are correct.

Disposition of Sample _____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s) _____ _____

I (we) certify that this sample was transferred from _____ to _____ at (location) _____ on (date & time) _____ and that the statements in this block are correct.

Disposition of Sample _____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s) _____ _____

RECEIVED
NOV 16 1984

LIQUID WASTE/GROUND WATER
SURVEILLANCE

ANALYSES REQUESTED LAB. NO. 1004

PLEASE CHECK THE APPROPRIATE BOXES BELOW TO INDICATE THE TYPE OF ANALYTICAL SCREENS REQUIRED. WHENEVER POSSIBLE LIST SPECIFIC COMPOUNDS SUSPECTED OR REQUIRED.

QUALITATIVE	QUANTATIVE	PURGEABLE SCREEN	QUALITATIVE	QUANTATIVE	EXTRACTABLES SCREEN
		ALIPHATIC HYDROCARBON SCREEN			ALIPHATIC HYDROCARBONS
	X	AROMATIC HYDROCARBON SCREEN			CHLORINATED HYDROCARBON PESTICIDES
	X	HALOGENATED HYDROCARBON SCREEN			CHLOROPHENOXY ACID HERBICIDES
		GAS CHROMATOGRAPH/MASS SPECTROMETER			HYDROCARBON FUEL SCREEN
					ORGANOPHOSPHATE PESTICIDES
					POLYCHLORINATED BIPHENYLS (PCB's)
					POLYNUCLEAR AROMATIC HYDROCARBONS
		SPECIFIC COMPOUNDS			SPECIFIC COMPOUNDS

REMARKS:

ANALYTICAL RESULTS

COMPOUND	CONC-ENTRATION	COMPOUND	CONC-ENTRATION
Benzene	29 ug/l		
Toluene	98 ug/l		
Ethylbenzene	37 ug/l		
p-Xylene	40 ug/l		
m-Xylene	103 ug/l		
o-Xylene	57 ug/l		
		* DETECTION LIMIT	

REMARKS: Also other aromatic substituted benzenes in the C 9-10 range at about 10-50 ppb range

CETRIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes (No) . Seal(s) Broken by _____ date _____ .
I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements in this block and the analytical data on this page accurately reflect the analytical results for this sample.
Date(s) of analysis 11/7/84 . Analysts signature L Meyerhofer
Icertify that I have reviewed and concur with the analytical results for this sample and with the statements in this block. Reviewers Signature:

PUMP TEST DATA

Project Name Alex Fuel Spill Date 3/6/85

Project No. 0109990 Engr./Geo. S. Brewer

	Pumped Well Data	Observation Well
Depth	25'	15'
Diameter	.42'	.17'
Screen Sections	10'-20'	10'-15'
Gravel or Sand Pack	—	—
Static Water Level	10.21	10.24
Aquifer Thickness	27	27
Distance from Pumped Well		5'

Method of Measurement

Drawdowns	Recovery	Discharge
PW ☒ M-Scope	☒ PW	☒ Orifice
0651 ☒ Steel Tape	☒ 0651	☐ Weir
☐ Air Line	☐	☒ Guage (GPM)
		☐ Other (explain)

Length of Air Line _____ ft. _____

Remarks: write on form at time t

Pumping rate 16.65 gpm 0651

Date	Time (minutes)	Flow Rate (GPM)	Pumping Well Drawdown t (minutes)	Pumping Well Drawdown s (feet)	Pumping Well Recovery t' (minutes)	Pumping Well Recovery s' (feet)	Observation Well Drawdown t (minutes)	Observation Well Drawdown s (feet)	Observation Well Recovery t' (minutes)	Observation Well Recovery s' (feet)	Pumping Well t/t'	Observ. Well t/t'
3/6/85	11:00	SWL	0	10.21'			0	10.24				
	11:25	start	pump									
			3	.30								
			5	.31			5	.30				
			7	.32								
			9	.35								
			10	.35			10	.33				
			15	.35			15	.34				
			25	.365			25	.36				
			35	.40			35	.37				
			45	.42			45	.38				
			55	.43			55	.39				
			65	.45			65	.39				
			75	.46			75	.38				
			85	.47			85	.38				
			95	.48			95					
							152	.393				
			155	.57								
							212	.40				
			215	.62								
			275	.65								

PUMP TEST DATA

FOX Consulting Engineers and Geologists

Job No: 0109990

Date:

Figure

PUMP TEST DATA

Project Name Atex Fuel Spill Date 3/6/95

Project No. 0109990 Engr./Geo. S. Brewer

	Pumped Well Data	Observation Well
Depth	25'	15'
Diameter	.42'	.17'
Screen Sections	10'-20'	10'-15'
Gravel or Sand Pack	—	—
Static Water Level	10.21	10.24
Aquifer Thickness	27	27
Distance from Pumped Well		5'

Method of Measurement

Drawdowns	Recovery	Discharge
PW ☒ M-Scope	☒ PW	☒ Orifice
0051 ☒ Steel Tape	☒ 0051	☐ Weir
☐ Air Line	☐	☒ Guage (GPM)
		☐ Other (explain)

Length of Air Line _____ ft. _____

Remarks: write on form at time t

0651

Date	Time (minutes)	Flow Rate (GPM)	Pumping Well Drawdown t (minutes)	Pumping Well Drawdown s (feet)	Pumping Well Recovery t' (minutes)	Pumping Well Recovery s' (feet)	Observation Well Drawdown t (minutes)	Observation Well Drawdown s (feet)	Observation Well Recovery t' (minutes)	Observation Well Recovery s' (feet)	Pumping Well t/t'	Observ. Well t/t'
							277	.41				
			335	.67								
							337	.41				
			395	.76								
							397	.42				
	18:30		425		Pump off Begin recovery							
			426		1			0	1	.21		426
			428		3							
			430		5				5	.13		86
			432		7				7	.12		61.7
			434		9				9	.11		48.2
			436		11				11	.10		39.6
			438		13				13	.09		33.7
			440		15				15	.09		29.3
			442		17				17	.08		26
			444		19				19	.08		23.4
			455		30	.50			30	.07	15.2	15.2
			460		35	.02					13.1	
			465		40				40	.06		11.6
			475		45				45	.06		10.6
			480		50						9.6	9.6

Trouble with M-scale cable

PUMP TEST DATA

FOX Consulting Engineers and Geologists

Job No:

Date:

Figure

PUMP TEST DATA

Project Name Alex Fuel Spill **Date** 3/6/85

Project No. 0109990 **Engr./Geo.** S. Brewer

	Pumped Well Data	Observation Well
Depth	25'	15'
Diameter	.42'	.17'
Screen Sections	10'-20'	10'-15'
Gravel or Sand Pack	—	—
Static Water Level	10.21	10.24
Aquifer Thickness		
Distance from Pumped Well		5'

Method of Measurement

Drawdowns	Recovery	Discharge
PW ☒ M-Scope	☒ PW	☒ Orifice
Obs1 ☒ Steel Tape	☒ Obs1	☐ Weir
☐ Air Line	☐	☒ Guage (GPM)
		☐ Other (explain)

Length of Air Line _____ ft. _____

Remarks: write on form at time t

Obs1

Date	Time (minutes)	Flow Rate (GPM)	Pumping Well Drawdown t (minutes)	Pumping Well Drawdown s (feet)	Pumping Well Recovery t' (minutes)	Pumping Well Recovery s' (feet)	Observation Well Drawdown t (minutes)	Observation Well Drawdown s (feet)	Observation Well Recovery t' (minutes)	Observation Well Recovery s' (feet)	Pumping Well t/t'	Observ. Well t/t'
3/6/85			485		55				55	.052	8.8	8.8
	19:35		490		60	0.0					8.2	
			end test									

PUMP TEST DATA

FOX Consulting Engineers and Geologists

Job No:

Date:

Figure

PUMP TEST DATA

Project Name Alex Fuel Spill **Date** 3/6/85

Project No. 0109990 **Engr./Geo.** S. Blewett

	Observation Well Data	Observation Well
Depth	15'	15'
Diameter	.17'	.17'
Screen Sections	10-15'	10-15'
Gravel or Sand Pack	—	—
Static Water Level	10.49	10.42
Aquifer Thickness		
	10'	15'

Method of Measurement

Drawdowns	Recovery	Discharge
☐ M-Scope	☐	☒ Orifice
☒ Steel Tape	☒	☐ Weir
☐ Air Line	☐	☒ Guage (GPM)
		☐ Other (explain)

Length of Air Line _____ ft. _____

Remarks: write on form at time t

0652 0653

Date	Time (minutes)	Flow Rate (GPM)	Observation Well Drawdown t (minutes)	Drawdown s (feet)	Recovery t' (minutes)	Recovery s' (feet)	Observation Well Drawdown t (minutes)	Drawdown s (feet)	Recovery t' (minutes)	Recovery s' (feet)	Observ. Well t/t'	Observ. Well t/t'
3/6/85							161	.18				
			219	.27								
							221	.20				
			279	.29								
							291	.20				
			339	.29								
							341	.22				
			399	.29								
							401	.22				
	18:30		425		pump	off	begin	recovery				
			429		4	.15					101.3	
			431		6	.13					71.8	
			433		8	.12			8	.10	54.1	54.1
			435		10	.11			10	.09	43.5	43.5
			437		12	.10			12	.09	36.4	36.4
			439		14	.09			14	.09	31.4	31.4
			441		16	.09			16	.09	27.6	27.6
			443		18	.09			18	.08	24.6	24.6
			457		32	.08					14.3	
			458						33	.07		13.9
			466		41	.07					11.4	

PUMP TEST DATA

FOX Consulting Engineers and Geologists

Job No: 0109990

Date:

Figure

PUMP TEST DATA

Project Name Ater Fuel Spill Date 3/6/85

Project No. 0109990 Engr./Geo. S. Brewer

	Observation Well Data	Observation Well
Depth	15'	15'
Diameter	.17'	.17'
Screen Sections	10-15'	10-15'
Gravel or Sand Pack	—	—
Static Water Level	10.49	10.42
Aquifer Thickness	27	27
	10'	15'

Method of Measurement

Drawdowns	Recovery	Discharge
☐ M-Scope	☐	☒ Orifice
☒ Steel Tape	☒	☐ Weir
☐ Air Line	☐	☒ Guage (GPM)
		☐ Other (explain)

Length of Air Line _____ ft. _____

Remarks: write on form at time t

Pump rate 16.65 GPM 0652 0653

Date	Time (minutes)	Flow Rate (GPM)	Observation Well Drawdown t (minutes)	s (feet)	Recovery t' (minutes)	s' (feet)	Observation Well Drawdown t (minutes)	s (feet)	Recovery t' (minutes)	s' (feet)	Observ. Well t/t'	Observ. Well t/t'
3/6/85	11:00	SWL		10.49				10.42				
start pump	11:25		7	.18								
							8	.14				
			17	.22								
							18	.15				
			27	.23								
							29	.16				
			37	.24								
							38	.16				
			47	.25								
							48	.17				
			57	.24								
							58	.17				
			67	.25								
							68	.18				
			78	.25			78	.19				
			87	.25								
							88	.18				
			96	.25								
							97	.18				
			159	.26								

PUMP TEST DATA

Project Name Atex Fuel Spill Date 3/6/95

Project No. 0109990 Engr./Geo. S. Brauer

	Observation Well Data	Observation Well
Depth	15'	15'
Diameter	.17'	.17'
Screen Sections	10-15	10-15
Gravel or Sand Pack	—	—
Static Water Level	10.49	10.42
Aquifer Thickness		
	10'	15'

Method of Measurement

Drawdowns	Recovery	Discharge
☐ M-Scope	☐	☒ Orifice
☒ Steel Tape	☒	☐ Weir
☐ Air Line	☐	☒ Guage (GPM)
		☐ Other (explain)

Length of Air Line _____ ft. _____

Remarks: write on form at time t

Date	Time (minutes)	Flow Rate (GPM)	Observation Well Drawdown t (minutes)	Drawdown s (feet)	Recovery t' (minutes)	Recovery s' (feet)	Observation Well Drawdown t (minutes)	Drawdown s (feet)	Recovery t' (minutes)	Recovery s' (feet)	Observ. Well t/t'	Observ. Well t/t'
3/6/95			467						42	.08		11.1
			476		51	.06			51	.03	9.3	9.3
			486		61	.06					8.0	
			497						62	.03		7.9
				end test								

PUMP TEST DATA

Project Name Alex Fuel Spill Date 3/6/85

Project No. [illegible] Engr./Geo. [illegible]

	Observation Well Data	Observation Well
Depth	15'	15.5'
Diameter	.17'	.17
Screen Sections	10-15'	5.5-15.5
Gravel or Sand Pack	—	—
Static Water Level	10.992	11.480
Aquifer Thickness	[illegible]	[illegible]
	20	25

Method of Measurement

Drawdowns	Recovery	Discharge
☐ M-Scope	☐	☒ Orifice
☒ Steel Tape	☒	☐ Weir
☐ Air Line	☐	☒ Guage (GPM)
		☐ Other (explain)

Length of Air Line _____ ft. _____

Remarks: write on form at time t

Pump rate [illegible] OBS 4 MW#3

Date	Time (minutes)	Flow Rate (GPM)	Observation Well Drawdown t (minutes)	Drawdown s (feet)	Recovery t' (minutes)	Recovery s' (feet)	Observation Well Drawdown t (minutes)	Drawdown s (feet)	Recovery t' (minutes)	Recovery s' (feet)	Observ. Well t/t'	Observ. Well t/t'
3/6/85	11:00	SWL		10.992								
	11:25	Start	pump									
			20	.13			21	.10				
			30	.14								
							32	.11				
			39	.14								
							40	.10				
			49	.14								
							50	.12				
			60	.15								
							61	.12				
							72	.12				
			79	.16								
							81	.12				
			89	.17								
							90	.12				
			98	.17								
							100	.12				
			163	.18								
							167	.13				

PUMP TEST DATA

Project Name Atra Fuel Spill Date 3/6/95

Project No. 0109990 Engr./Geo. S. Bl...

	Observation Well Data	Observation Well
Depth	15'	15.5'
Diameter	.17'	.17'
Screen Sections	10-15'	5.5-15.5'
Gravel or Sand Pack	—	—
Static Water Level	10.992	11.480
Aquifer Thickness		
	20	25

Method of Measurement

Drawdowns	Recovery	Discharge
☐ M-Scope	☐	☒ Orifice
☒ Steel Tape	☒	☐ Weir
☐ Air Line	☐	☒ Guage (GPM)
		☐ Other (explain)

Length of Air Line _____ ft. _____

Remarks: write on form at time t

0654 MW#3

Date	Time (minutes)	Flow Rate (GPM)	Observation Well Drawdown t (minutes)	Drawdown s (feet)	Recovery t' (minutes)	Recovery s' (feet)	Observation Well Drawdown t (minutes)	Drawdown s (feet)	Recovery t' (minutes)	Recovery s' (feet)	Observ. Well t/t'	Observ. Well t/t'
			223	.19								
			253	.21								
							295	.14				
			345	.21								
							347	.15				
			403	.22								
							405	.16				
	1930		425		Pump off		Begin recovery					
			[illegible]		33'	.08	?				13.9	
			[illegible]		43	.09					10.9	
			[illegible]		53	.07					9.0	
			[illegible]		63	.05					7.7	

PUMP TEST DATA

FOX Consulting Engineers and Geologists

Job No: 0109990

Date:

Figure

PUMP TEST DATA

Project Name [illegible] Date 3/6/85

Project No. [illegible] Engr./Geo. [illegible]

	Observation Well Data	Observation Well
Depth	15.0	15.2
Diameter	.17'	.17'
Screen Sections	5-15	5.2-15.2
Gravel or Sand Pack	—	—
Static Water Level	12.74	11.27
Aquifer Thickness		
	100.09'	113.25'

Method of Measurement

Drawdowns	Recovery	Discharge
☐ M-Scope	☐	☑ Orifice
☒ Steel Tape	☒	☐ Weir
☐ Air Line	☐	☒ Guage (GPM)
		☐ Other (explain)

Length of Air Line _____ ft. _____

Remarks: write on form at time t

MW #4 MW #1

Date	Time (minutes)	Flow Rate (GPM)	Observation Well Drawdown t (minutes)	Drawdown s (feet)	Recovery t' (minutes)	Recovery s' (feet)	Observation Well Drawdown t (minutes)	Drawdown s (feet)	Recovery t' (minutes)	Recovery s' (feet)	Observ. Well t/t'	Observ. Well t/t'
3/6/85	11:00	SWL		12.74				11.27				
	11:25	[illegible] pump										
			23	.03								
			33	.03								
							34	.02				
			42	.03								
							44	.03				
			52	.03								
							54	.03				
			63	.03								
							64	.04				
			74	.04								
			32	.04								
							83	.04				
			91	.04								
							93	.04				
			101	.04								
							103	.05				
			160	.07								
							170	.05				
			227	.07								

PUMP TEST DATA

Project Name Mesa Fuel Spill Date 3/6/13

Project No. 0109990 Engr./Geo. [illegible]

	Observation Well Data	Observation Well
Depth	13.0'	15.2'
Diameter	.17'	.17'
Screen Sections	9-13'	5.2-15.2
Gravel or Sand Pack	—	—
Static Water Level	12.74	11.27
Aquifer Thickness		
	100.08'	113.25'

MW#4 MW#1

Method of Measurement

Drawdowns	Recovery	Discharge
☐ M-Scope	☐	☒ Orifice
☒ Steel Tape	☒	☐ Weir
☐ Air Line	☐	☒ Guage (GPM)
		☐ Other (explain)

Length of Air Line _____ ft. _____

Remarks: write on form at time t

Date	Time (minutes)	Flow Rate (GPM)	Observation Well Drawdown t (minutes)	Drawdown s (feet)	Recovery t' (minutes)	Recovery s' (feet)	Observation Well Drawdown t (minutes)	Drawdown s (feet)	Recovery t' (minutes)	Recovery s' (feet)	Observ. Well t/t'	Observ. Well t/t'
							229	.06				
			287	.07								
							239	.06				
			347	.07								
							349	.07				
			407	.08								
							409	.08				