...TER-RESOURCES INVESTIGATIONS 82-8

RESULTS OF HYDROLOGIC TESTS AND WATER-CHEMISTRY ANALYSES, WELLS H-6A, H-6B, AND H-6C, AT THE PROPOSED WASTE ISOLATION PILOT PLANT SITE, SOUTHEASTERN NEW MEXICO

PREPARED BY THE
U.S. GEOLOGICAL SURVEY
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Hydrologic testing was conducted at wells H-6A, H-6B, and H-6C in the northwestern part of the proposed Waste Isolation Pilot Plant site in southeastern New Mexico to define hydraulic properties of three water-bearing zones. The zones tested were the Magenta and Culebra Dolomite Members of the Rustler Formation and the Rustler Formation-Salado Formation contact. The Magenta Dolomite and the Rustler-Salado contact yield water to wells at rates less than 0.5 gallon per minute as determined from shut-in and slug tests. A transmissivity value for the Culebra Dolomite Member was obtained by conducting conventional pumping and recovery tests in well H-6B; this well was pumped at a rate of approximately 11 gallons per minute.

Water samples from the Magenta Dolomite Member of the Rustler Formation had a dissolved-solids concentration of 5,760 milligrams per liter. The major chemical constituents of water samples from this zone were sulfate, sodium, and chloride. Water samples from the Culebra Dolomite Member of the Rustler Formation had dissolved-solids concentration of 52,600 milligrams per liter, and samples from the Rustler Formation-Salado Formation contact had 316,000 milligrams per liter; chloride and sodium were the major constituents in the water samples. Radium-266, a naturally occurring radioactive element, was present in samples from all three zones.

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UNITED STATES DEPARTMENT OF THE INTERIOR

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Symbols used in the report

Symbol	Description
Ci	Curie: Unit of radioactivity, the amount of any nuclide that undergoes exactly 3.7×10^{10} radioactive disintegrations per second.
Es	Bulk modulus of elasticity of solid skeleton of an aquifer.
H	Hydraulic head in the well above the initial static hydraulic head at time $t > 0$, in feet.
H_o	Maximum hydraulic head in the well above initial static hydraulic head at time $t > 0$, in feet.
Q	Average discharge or recharge of water from or to the test zone, in cubic feet per day.
S	Storage coefficient: Volume of water an aquifer releases from or takes into storage per unit surface area of the aquifer per unit change in head (dimensionless unit).
T	Transmissivity: The rate at which water is transmitted through a unit width of an aquifer under a unit hydraulic gradient, in feet squared per day.
V	Volume.
h	Hydraulic head, in feet.
h'	Hydraulic head at time $t > 0$, in feet.
h_i	Static hydraulic head, in feet.
h_o	Hydraulic head at time $t = 0$, in feet.
r	Radial distance.
r_c	Radius of drill-stem tubing in the interval over which water levels fluctuate, in feet.
r_s	Radius of open hole.

Symbols used in the report

Symbol	Description
t	Time since initial stress of test zone.
t'	Time since shut-in began.
α	$(r_s^2/r_c^2)S$
β	Tt/r_c^2, dimensionless
Δp	Change in hydraulic head over one log cycle of time.
ρ	Density of fluid.
μ	Micro (10^{-6}).
p	Pico (10^{-12}).

Conversion Factors

In this report, values for measurements except chemical measurements are given in inch-pound units only. The following table contains factors for converting to metric units.

Multiply inch-pound units	By	To obtain metric units
foot	0.3048	meter
foot squared per day	.0929	meter squared per day
cubic foot per day	.02832	cubic meter per day
gallon per minute	3.785	liter per minute
mile	1.609	kilometer
inch	25.40	millimeter
gallon	3.785	liter

National Geodetic Vertical Datum of 1929 (NGVD of 1929): A geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called "Mean Sea Level."

RESULTS OF HYDROLOGIC TESTS AND WATER-CHEMISTRY ANALYSES, WELLS H-6A, H-6B, AND H-6C, AT THE PROPOSED WASTE ISOLATION PILOT PLANT SITE, SOUTHEASTERN NEW MEXICO

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ABSTRACT

Hydrologic testing was conducted at wells H-6A, H-6B, and H-6C in the northwestern part of the proposed Waste Isolation Pilot Plant site in southeastern New Mexico to define hydraulic properties of three water-bearing zones. The zones tested were the Magenta and Culebra Dolomite Members of the Rustler Formation and the Rustler Formation-Salado Formation contact. The Magenta Dolomite and the Rustler-Salado contact yield water to wells at rates less than 0.5 gallon per minute as determined from shut-in and slug tests. These test methods were not applicable for the hydrologic testing of the Culebra Dolomite Member of the Rustler Formation at well H-6B. Therefore, a transmissivity value for the Culebra Dolomite Member was obtained by conducting conventional pumping and recovery tests. Well H-6B was pumped at a rate of approximately 11 gallons per minute. Throughout the testing of the Magenta Dolomite Member and the Rustler-Salado contact, water-pressure response in the test zones was monitored by a pressure-transducer system. The following values were derived for the test zones:

Well	Test zone	Calculated transmissivity (feet squared per day)	Estimated storage coefficient
H-6A	Magenta Dolomite Member of the Rustler Formation	0.3	10^{-5}
H-6B	Culebra Dolomite Member of the Rustler Formation	78	-
H-6C	Rustler Formation-Salado Formation contact	.003	10^{-6}

Water samples from the Magenta Dolomite Member of the Rustler Formation had a dissolved-solids concentration of 5,760 milligrams per liter. The major chemical constituents of water samples from this zone were sulfate, sodium, and chloride. Water samples from the Culebra Dolomite Member of the

Rustler Formation had a dissolved-solids concentration of 52,600 milligrams per liter, and samples from the Rustler Formation-Salado Formation contact had 316,000 milligrams per liter; chloride and sodium were the major constituents in the water samples. Radium-266, a naturally occurring radioactive element, was present in samples from all three zones.

INTRODUCTION

Purpose

The U.S. Geological Survey, at the request of the U.S. Department of Energy, is investigating the geohydrology of the proposed Waste Isolation Pilot Plant (WIPP) site near Carlsbad, New Mexico (fig. 1). The site is intended as a storage facility for defense-associated transuranic waste. The investigation is designed to supplement the work conducted by Sandia National Laboratories, which is responsible for the technical development of the site. The proposed facility would be constructed in bedded salts of the Permian Salado Formation.

The purpose of this publication is to report values of transmissivity, estimates of the storage coefficient, and information on water chemistry for several water-bearing zones above the salt section. The data presented here were obtained from wells H-6A, H-6B, and H-6C.

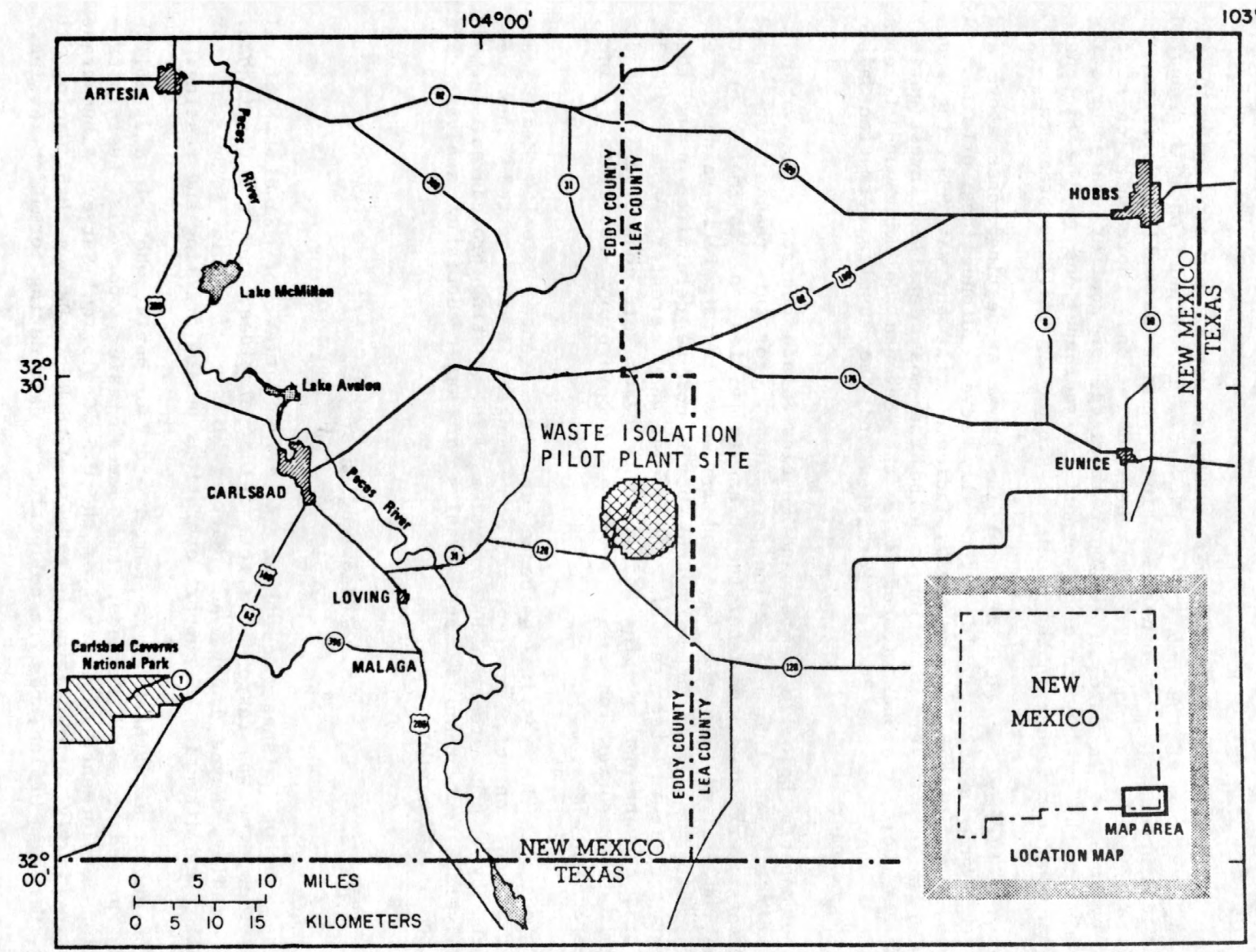

Figure 1.--General location of the proposed Waste Isolation Pilot Plant site.

Scope

The hydraulic properties given in this report pertain only to the specific locations of the H-6 wells. However, in conjunction with measured aquifer characteristics at other locations, onsite as well as offsite, it should be possible to acquire a comprehensive regional representation of the area's hydrology. In turn, a regional knowledge of aquifer characteristics would aid in the prediction of transport of radionuclides to the biosphere via ground-water movement in the event the storage facility is breached.

At the WIPP site, water movement in the water-bearing zones above and below the salt section could potentially move radionuclides offsite. A previous study (Mercer and Orr, 1979) indicates that the water-bearing zones in the Permian Rustler Formation require the most detailed investigation. The three geologic zones tested were the Magenta Dolomite and Culebra Dolomite Members of the Rustler Formation and the Rustler Formation-Salado Formation contact (fig. 2).

The Magenta Dolomite Member and Rustler-Salado contact yield water to wells at rates less than 0.5 gallon per minute. For this reason shut-in and slug tests were used to determine transmissivities and estimates of the storage coefficients at wells H-6A and H-6C. A transmissivity value for the Culebra Dolomite Member at well H-6B could not be determined using these testing techniques because of the relatively greater water yields. Therefore, conventional pumping and recovery tests were conducted for Sandia National Laboratories on well H-6B by Geohydrology Associates, Inc., Albuquerque, New Mexico.

Throughout the testing sequence of the Magenta Dolomite Member and Rustler-Salado contact, water-pressure responses in the tested zones were monitored by a pressure-transducer system. The testing procedures, methods of analysis, test results, and results of water-chemistry analyses are described in this report.

Acknowledgments

The author wishes to thank Robert Statler of Sandia National Laboratories, who was responsible for field operations, and Earl Cunningham, D. L. Bradley, Wayne Laney, and Matthew Wilson of Fenix & Scisson for scheduling and direction of support operations during drilling and testing.

The author also thanks Jerry Mercer and Paul Davis, who helped establish testing procedures and methods, and James Basler, for his test-instrumentation development; (all are from the U.S. Geological Survey, Albuquerque Office). Finally, appreciation is expressed to R. K. DeWees, U.S. Geological Survey, Carlsbad Office, for the collection of data during formation testing.

Age		Rock unit	Depth interval (feet)	Thickness (feet)	Graphic log	Description
QUATERNARY	Holocene	Surficial deposits	0-12	12		Dune sand, reddish-brown, fine, unconsolidated; some caliche rubble.
	Pleistocene	Gatuna Formation	12-38	26		UNCONFORMITY Sandstone and siltstone, poorly sorted, dominantly reddish-orange.
LATE PERMIAN	Ochoan	Dewey Lake Red Beds	38-427	389		UNCONFORMITY Predominantly siltstone with some interbedded sandstone, very fine to fine-grained, dark-reddish-brown with greenish-gray reduction spots and veined selenite, hard to medium hard; some mudstone.
			427-490	63		UNCONFORMITY Anhydrite, light-olive-gray, altering to gypsum, white to translucent; some siltstone, grayish-red to dark-reddish-brown, moderately hard; trace selenite.
		Magenta Dolomite Member	490-514	24		Dolomite, light-olive-gray to olive-gray, silty; some gypsum.
		Rustler Formation	514-604	90		Gypsum, translucent to white; anhydrite, olive-gray, some gypsiferous; trace of siltstone and mudstone; dissolution residue, mud matrix with clay and gypsum fragments.
		Culebra Dolomite Member	604-627	23		Dolomite, light-olive-gray to olive-gray, pitted; some gypsum, light-gray; trace mud.
			627-721	94		Anhydrite, light-olive-gray, very fine crystalline; some altered to gypsum, light-olive-gray; dissolution residue, dark-reddish-brown, mud matrix, with clay, and gypsum fragments; siltstone, dark-greenish-gray with blue tint, gradational color change to pale-brown, hard; some mudstone, dark-reddish-brown.
		Salado Formation (upper part)	721-741 Total depth of well 741	—		Halite, moderate-reddish-brown, medium to coarse crystalline, argillaceous, some dispersed bright-orange polyhalite; anhydrite, grayish-red to moderate-reddish-brown, very fine crystalline, silty with dark-reddish-brown mudstone bands.

EXPLANATION

SAND OR SANDSTONE

ANHYDRITE OR GYPSUM

HALITE

SILTSTONE OR MUDSTONE

DOLOMITE

POLYHALITE

DISSOLUTION RESIDUE-MUD MATRIX WITH MUDSTONE, CLAY, AND GYPSUM

Figure 2.--General stratigraphic sequence at site of wells H-6A, H-6B, and H-6C (depth intervals and thicknesses from H-6C).

HYDROLOGIC TESTING

Shut-in tests and slug tests were used to determine transmissivities and estimates of storage coefficients of the zones in which wells H-6A and H-6C are completed. The locations of the wells are shown in figure 3. These tests were chosen because the test zones generally yield only small quantities of water to the wells (less than 0.5 gallon per minute). Both methods are primarily restricted to wells that are fully developed and fully penetrate a confined aquifer. In addition, the slug test is restricted to wells completed in aquifers of low transmissivity. In order to perform these tests and obtain optimum results, special testing procedures were devised.

Well H-6B, completed in the Culebra Dolomite Member of the Rustler Formation, produced sufficient quantities of water to render shut-in and slug tests ineffective in the determination of transmissivity and storage coefficient values. Therefore, Sandia National Laboratories contracted Geohydrology Associates, Inc., Albuquerque, New Mexico, to conduct conventional pumping and recovery tests on well H-6B and to ascertain a transmissivity value for the test zone. The results of the conventional pumping and recovery tests are given in this report.

Test procedures

Pretest activities

Special care was taken in the drilling program used to complete each test well. Air, air foam, and brine were used at one time or another as drilling and coring fluids (table 1). Drilling was done in such a way as to avoid contaminating or plugging the test zone, so that optimum test results would be possible.

In order to test the different zones above the repository level, three wells were drilled. Each well was completed in a different test zone: well H-6A in the Magenta Dolomite Member of the Rustler Formation, well H-6B in the Culebra Dolomite Member of the Rustler Formation, and well H-6C in the Rustler Formation-Salado Formation contact zone. Each well was drilled to a point above the test zone, cased, and the casing cemented up to the land surface. The test zone was then cored.

Upon completion of a well, brine was used to flush the well, and then compressed air was used to remove the brine from the well. This action was designed to develop the cored interval as well as guard against any plugging or contamination that might occur. Water levels were monitored until hydrologic testing began to assure that equilibrium had been reached.

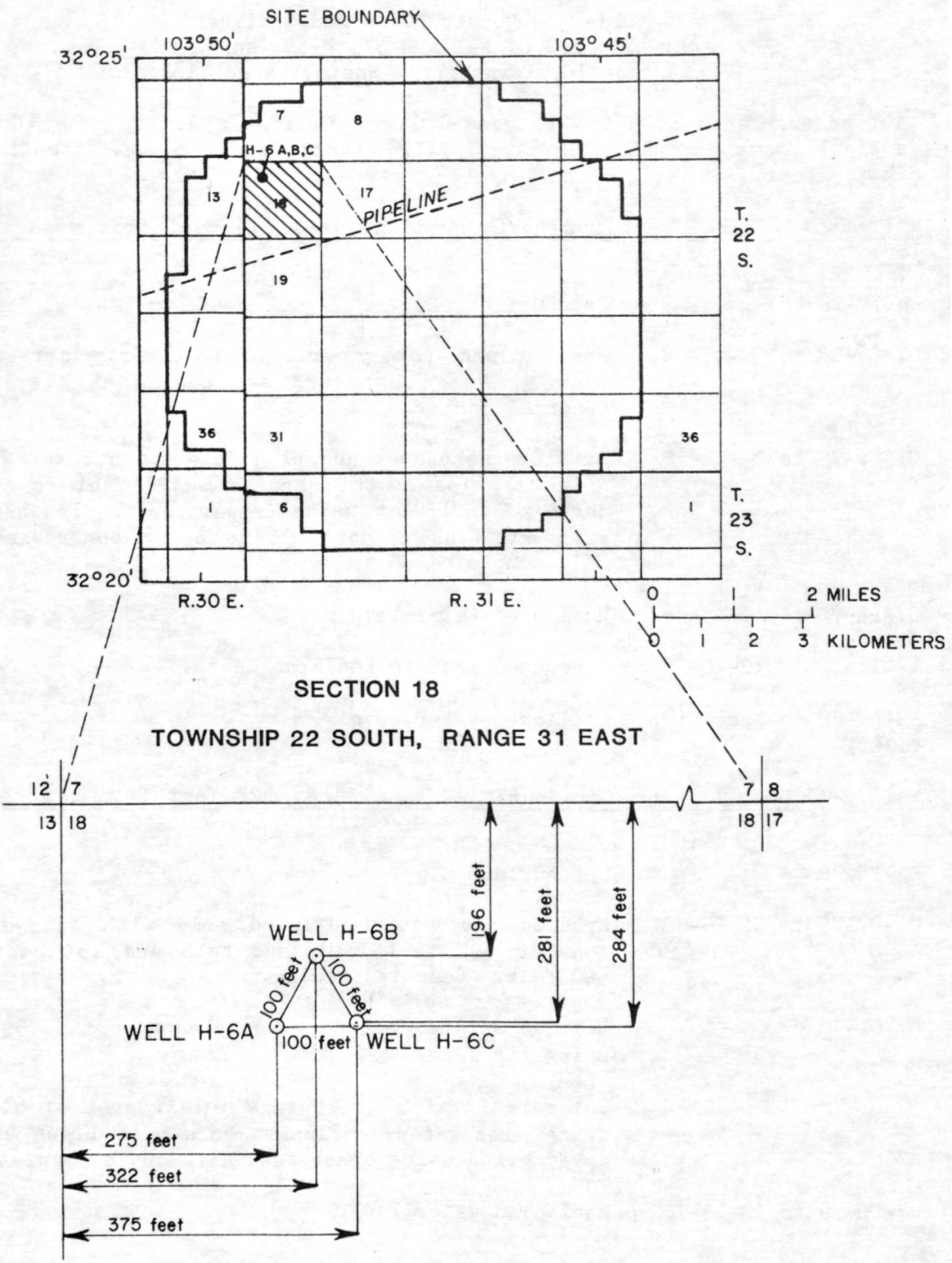

Figure 3.--Location of wells H-6A, H-6B, and H-6C within the proposed site boundary.

Table 1. Construction and testing chronologies of wells H-6A, H-6B, and H-6C (in section 18, Township 22 South, Range 31 East)

[All measurements adjusted to ground level in feet above National Geodetic Vertical Datum of 1929: H-6A, 3,347.3 feet; H-6B, 3,347.6 feet; H-6C, 3,347.9 feet.]

Well H-6A -- 284 feet from north section line, 275 feet from west section line

06-19-78	Set surface pipe.
07-06-78 to 07-07-78	Spudded and rotary drilled hole with air to 475 feet. Cleaned hole and set casing at 474.5 feet. Cemented casing.
07-10-78 to 07-11-78	Drilled out cement and plug, cleaned out to 475 feet using air foam. Cut core from 475 feet to a total depth of 525 feet using freshwater. Flushed hole with brine and removed brine using compressed air. Hole completed.
07-12-78 to 12-15-78	Monitored water levels.
12-16-78 to 12-18-78	Conducted shut-in and slug tests.
12-19-78 to present (1982)	Monitored water levels.

Well H-6B -- 196 feet from north section line, 322 feet from west section line

06-19-78	Set surface pipe.
06-27-78 to 06-29-78	Spudded and rotary drilled hole with air and air foam to 592 feet. Cleaned hole and set casing at 590 feet. Cemented casing.
07-01-78	Drilled out cement and plug, cleaned out to 592 feet using air foam.
07-05-78	Cut core from 592 feet to a total depth of 640 feet using freshwater. Flushed hole with brine and removed brine using compressed air. Hole completed.
07-06-78 to 12-18-78	Monitored water levels.

Table 1. Construction and testing chronologies of wells H-6A, H-6B, and H-6C - Concluded

12-19-78	Attempted to conduct shut-in and slug tests; test results insufficient.
12-20-78 to 09-17-79	Monitored water levels.
09-18-79 to 09-25-79	Pumping and recovery tests conducted by Geohydrology Associates, Inc.
09-26-79 to present (1982)	Monitored water levels.

Well H-6C -- 281 feet from north section line, 375 feet from west section line

06-19-78	Set surface pipe.
06-20-78 to 06-23-78	Spudded and rotary drilled hole with air and air foam to 700 feet. Cleaned hole and obtained geophysical logs. Set casing at 699 feet and cemented in place.
06-26-78	Drilled out cement and plug to 699 feet and cleaned out to 700 feet using air foam. Cut core from 700 feet to a total depth of 741 feet using brine. Flushed hole with brine and removed brine using compressed air. Hole completed.
06-27-78 to 03-20-79	Monitored water levels.
03-21-79 to 04-09-79	Conducted shut-in and slug tests.
04-10-79 to present (1982)	Monitored water levels.

Pressure monitoring system

A downhole pressure transducer was connected to a digital-readout data logger at the surface in order to monitor the response of the tested zone during shut-in and slug tests. This pressure-transducer system has the capability to continuously monitor downhole conditions prior to and throughout the test period, which insures proper initiation and completion of the test.

Water pressures recorded at the land surface reflect the pressure head above the measuring point (fig. 4). Pressure head plus the elevation head is equal to the hydraulic head. By defining the measuring point to be the datum for the elevation head, the pressure head measured is equivalent to the hydraulic head. Therefore, the terms pressure head and hydraulic head are interchangeable in this report.

Shut-in test

The first step in the test sequence was to bail water from the hole in order to stress the water-bearing zone and provide formation water for the forthcoming slug test. The water level was lowered to a point just above the test zone. Next, a pressure transmitter was lowered on a logging cable into the well to monitor water-level recovery in the open hole. The rise in water level was monitored in order to obtain an estimate for the average discharge of water from the test zone. After a discharge value was obtained, the transmitter was removed from the hole.

A special inflatable packer was then lowered into the well on drill-stem tubing to a point just above the test zone. Modifications made to the inflatable packer allowed for continuous monitoring of downhole conditions at the surface. These modifications (fig. 4) consisted of strapping a transducer housing to the tubing directly above the rubber packer element. Inside the housing, a pressure transducer was installed. A length of steel tubing connected to the housing was inserted beneath the packer element and extended to the bottom of the element, where it was exposed to the test zone. This feed-through line allowed the transducer to sense pressures at the test zone after packer inflation. To inflate the packer, the drill-stem tubing was filled with water obtained during bailing. Packer inflation effectively sealed off the test zone. The pressure recovery rate increased significantly because the zone no longer had to supply water to the well bore. The shut-in test was terminated after a static pressure was reached in the test zone. A graphical representation of the ideal water-pressure response in the test zone during the shut-in test is shown in figure 5.

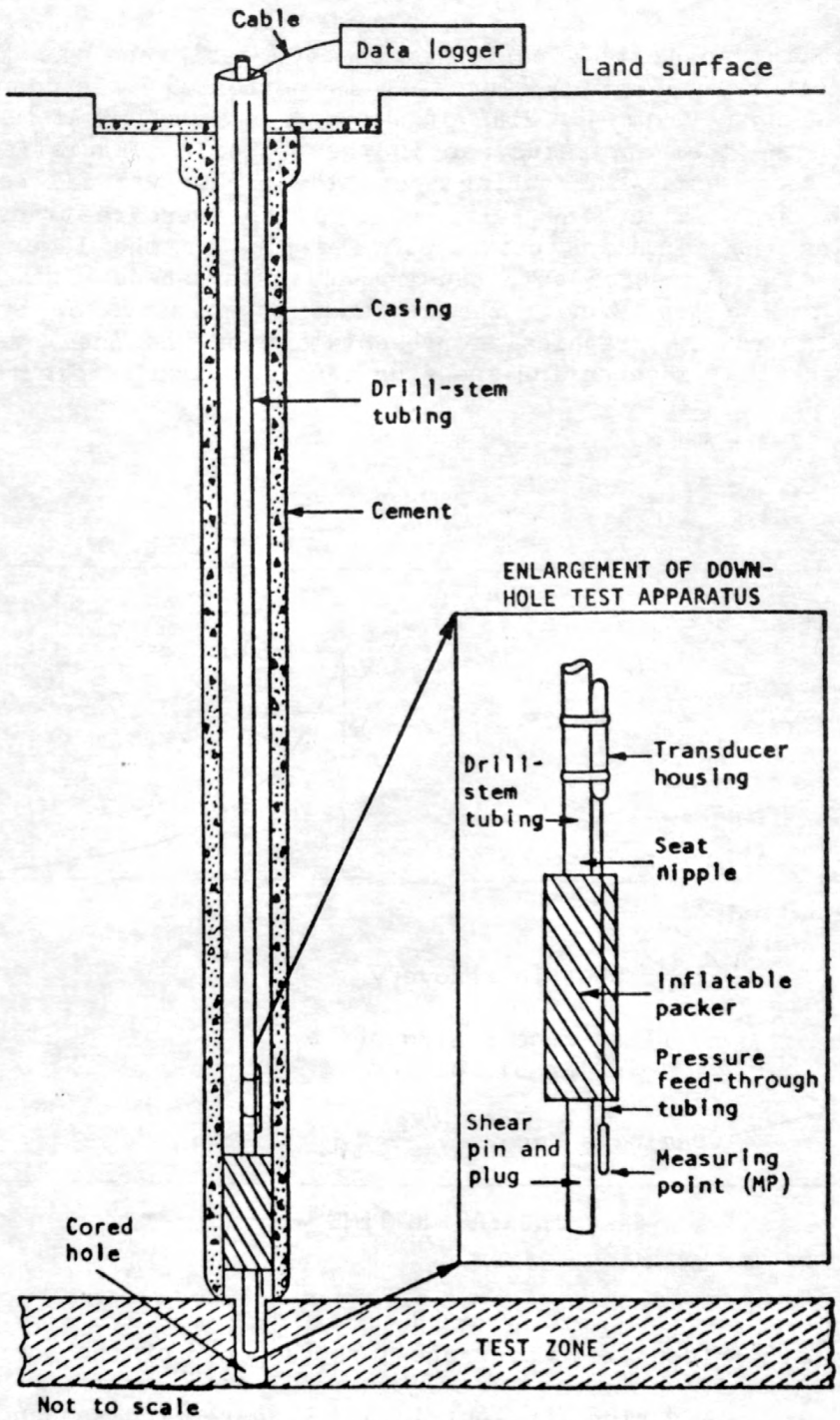

Figure 4.--Typical well-testing configuration for shut-in and slug tests.

Slug test

The second type of test performed on each test zone was the slug test (Cooper and others, 1967). A slug test is performed by suddenly injecting or removing a known volume or slug of water from a well. At the end of the shut-in test, the test apparatus was in the proper configuration for an injection-type slug test. The tubing above the packer was filled with formation water to just above land surface while the pressure-transducer system was monitoring the formation pressure. The plug in the lower part of the packer (fig. 4) was knocked out, causing an instantaneous increase in pressure (slug) to the test zone. The decrease in pressure or hydraulic head was then monitored. A graphical representation of the ideal water-pressure response in the test zone during the slug test is shown in figure 5.

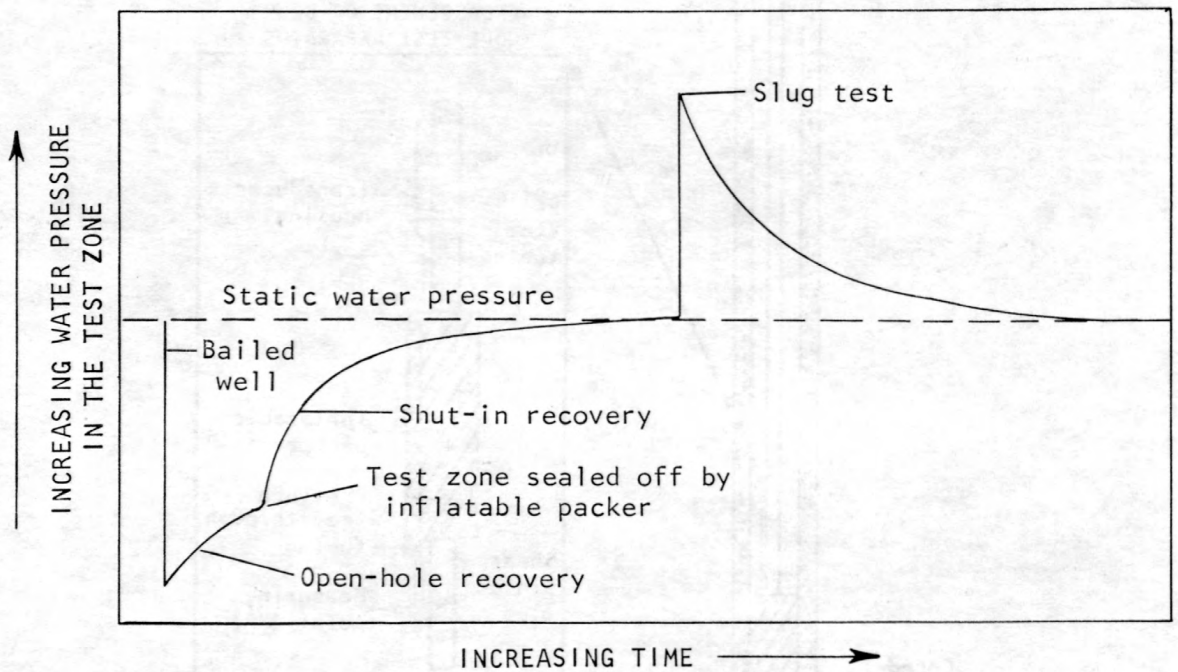

Figure 5.--Idealized water-pressure response of the test zone during the shut-in and slug-testing sequence.

Test analyses

Shut-in test

The method used in analyzing the shut-in test was adapted from the Theis recovery method (Theis, 1935). The following paragraphs describe the use of the method as applied to the shut-in test at WIPP (Dennehy and Davis, 1981).

The time (t) since the initial stress of the test zone is divided by the time (t') since the shut-in test began. The quotient of these two time increments is then plotted on the logarithmic scale of semilogarithmic paper against the hydraulic head in the test zone plotted on the arithmetic scale. Transmissivity is calculated using the following equation:

$$T = \frac{2.30Q}{4\pi\Delta p} \qquad (1)$$

where

T = transmissivity, in feet squared per day;

Q = average discharge or recharge of water from or to the test zone, in cubic feet per day; and

Δp = change in hydraulic head over 1 log cycle of time, in feet.

In the above equation, Q may be calculated in several different ways depending on how the test zone was stressed prior to the shut-in. When the hole was bailed before the test zone was shut-in, as was the case in these wells, Q was calculated from the water-level recovery in the open well for the elapsed time between the end of bailing and the beginning of the shut-in.

Slug test

Slug tests were analyzed using standard techniques as presented by Cooper and others (1967). The method of analysis is given in the following paragraphs.

The ratio of hydraulic heads, H/H_o, can be calculated by the following equation:

$$\frac{H}{H_o} = \frac{h' - h_i}{h_o - h_i} \qquad (2)$$

where

H = hydraulic head in the well above the intial static hydraulic head at time $t > 0$, in feet;

H_o = maximum hydraulic head in the well above initial static hydraulic head at time $t > 0$, in feet;

h' = hydraulic head at time $t > 0$, in feet;

h_i = static hydraulic head, in feet; and

h_o = hydraulic head at time $t = 0$, in feet.

From measured values of h', values of H/H_o are computed and are plotted on the arithmetic scale of semilogarithmic paper against the time measurement t, in seconds, on the logarithmic scale. The data curve is then superimposed on type curves by standard curve matching-procedures (Papadopulos and others, 1973). The curve-matching procedure is used to select a value of t corresponding to a value of $\beta = 1.0$ (β is a dimensionless parameter defined as Tt/r_c^2). The transmissivity is then determined from the definition of β as follows:

$$T = \frac{86{,}400\ r_c^2}{t} \qquad (3)$$

where

T = transmissivity, in feet squared per day;

r_c = the radius of the drill-stem tubing in the interval over which the water level fluctuates, in feet; and

t = time, at the match line, in seconds.

Storage coefficient is then determined from the definition of the dimensionless parameter $\alpha = r_s^2 S/r_c^2$:

$$S = \frac{r_c^2}{r_s^2} \alpha \qquad (4)$$

where

S = storage coefficient, dimensionless;

r_c = radius of drill-stem tubing in interval over which water levels fluctuate, in feet;

r_s = radius of open hole, in feet; and

$\alpha = \frac{r_s^2}{r_c^2} S$; value of α obtained by curve matching procedure, dimensionless.

TEST RESULTS

The specially modified hydrologic-testing procedures, along with the established methods of analysis discussed in the preceding section, produced comparable results for transmissivities (T) and estimates for the coefficient of storage (S) in the test zones of wells H-6A and H-6C.

Neither a transmissivity value nor an estimate for the coefficient of storage could be calculated for well H-6B using the hydrologic-testing techniques described in the preceding section. Conventional pumping and recovery tests were conducted on well H-6B, and a transmissivity value was obtained.

All data collected during field operations, such as construction detail of wells (fig. 13) and test data used for calculations (table 5), are included in the Supplemental Information section at the end of this report.

Well H-6A

A transmissivity value of 0.3 foot squared per day was calculated from the slug test for the Magenta Dolomite Member of the Rustler Formation at well H-6A. This value is consistent with the results of the shut-in test performed at well H-6A (table 2). Data plots of the shut-in and slug tests are presented in figures 6 and 7. The complete history of the hydraulic head during testing of well H-6A is shown in figure 8.

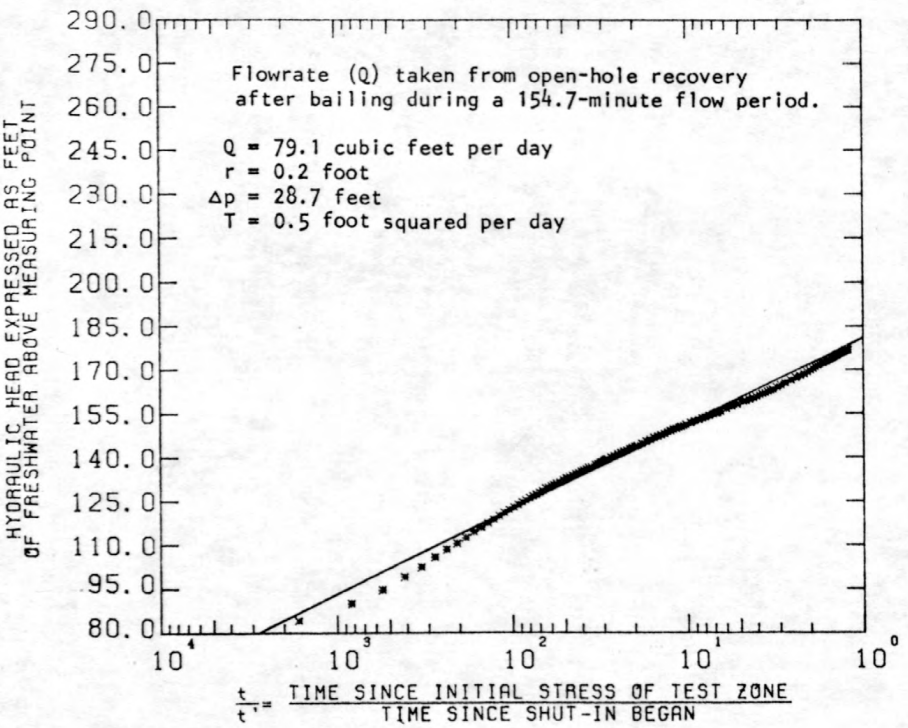

Figure 6.--Results of shut-in test 1 for well H-6A.

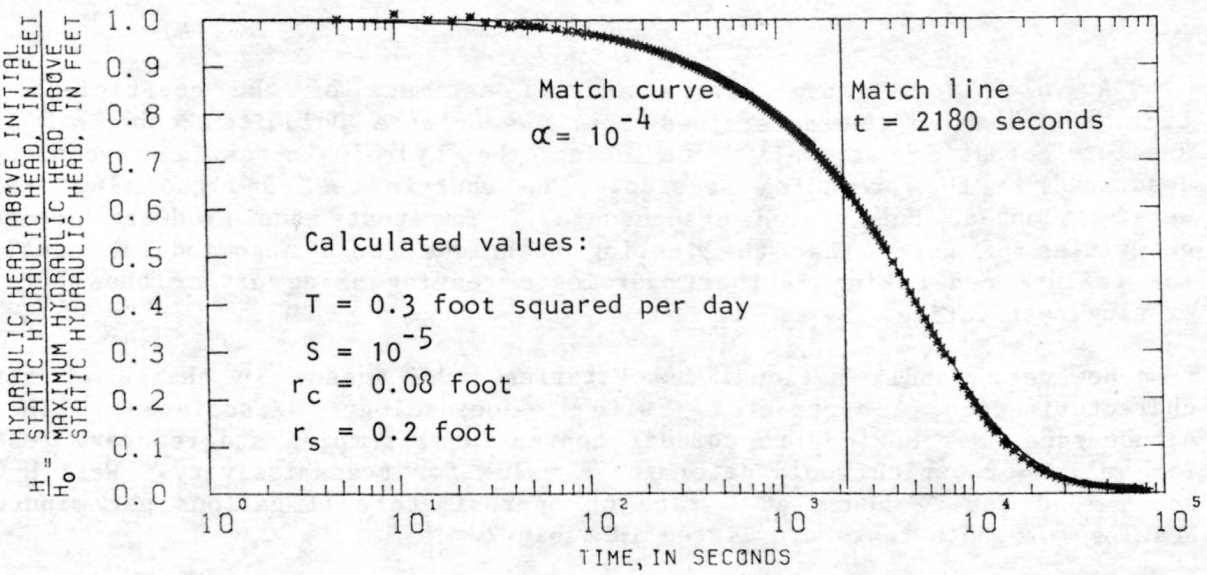

Figure 7 --Results of slug test 1 for well H-6A.

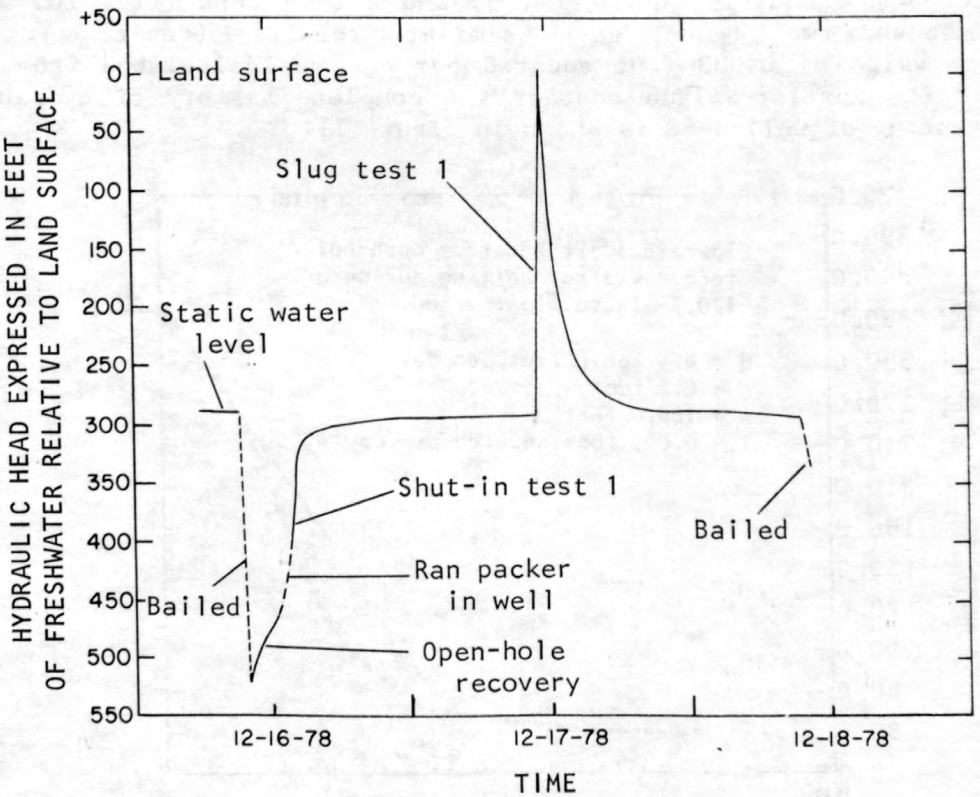

Figure 8.--History of hydraulic head during testing of well H-6A.

Well H-6B

A value for transmissivity and an estimate of the coefficient of storage could not be determined for the Culebra Dolomite Member of the Rustler Formation at well H-6B using the hydrologic-testing techniques described in the preceding section. One shut-in test and two slug tests were attempted, but proved unsuccessful. The test zone produced greater quantities of water than the testing technique could accommodate, causing the failure and making further hydrologic testing using either the shut-in or slug test futile.

However, Sandia National Laboratories, the agency in charge of site characterization, contracted with Geohydrology Associates, Inc., Albuquerque, New Mexico, to conduct conventional pumping and recovery tests for well H-6B, which would determine a value for transmissivity. Well H-6B was pumped for 72 hours at a rate of approximately 11 gallons per minute. Results form both tests are listed in table 2.

Further information concerning either the pumping or the recovery test may be found in a report by Geohydrology Associates, Inc. (1980).

Well H-6C

At well H-6C, a shut-in test (fig. 9) and a slug test (fig. 10) were performed. These two tests gave similar results (table 2). A transmissivity value of 0.003 foot squared per day was calculated from the slug test for the Rustler-Salado contact. A complete history of hydraulic head during testing of well H-6C is shown in figure 11.

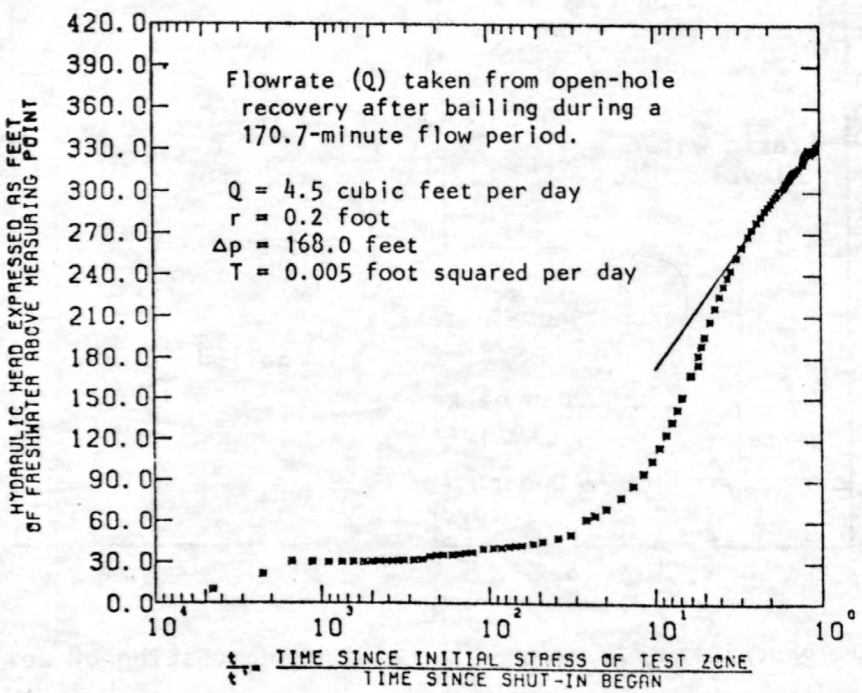

Figure 9.--Results of shut-in test 1 for well H-6C.

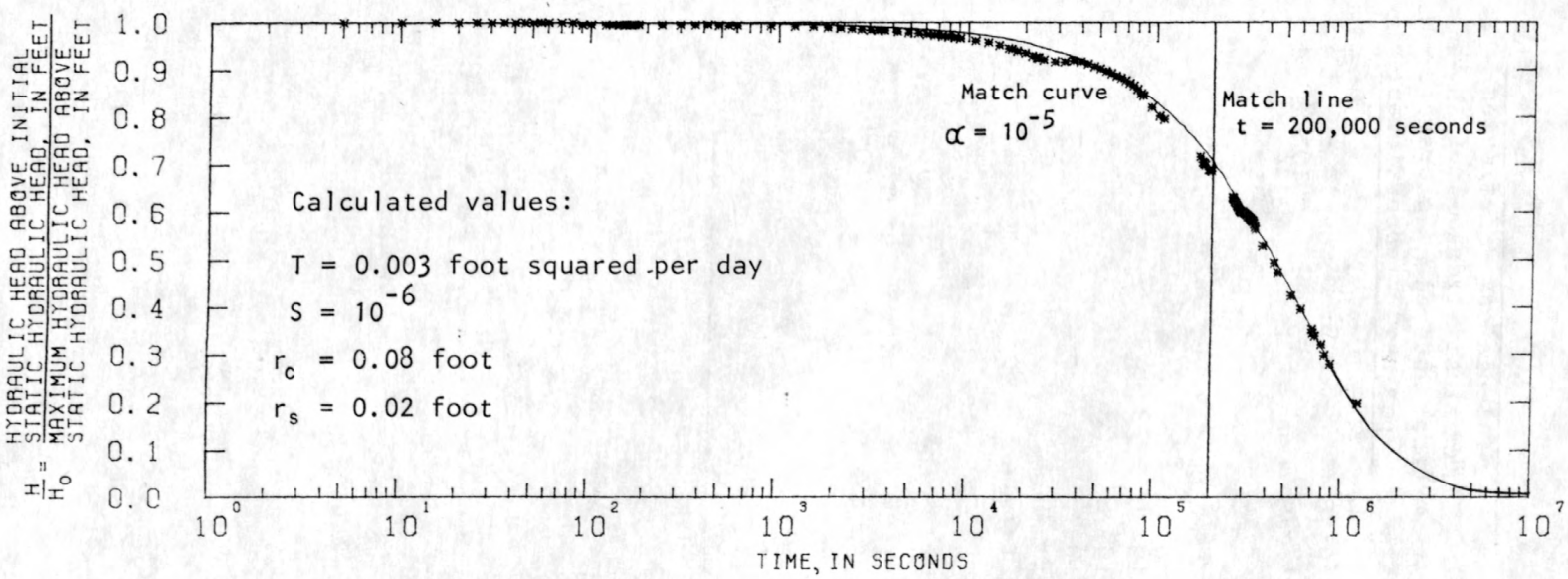

Figure 10.--Results of slug test 1 for well H-6C.

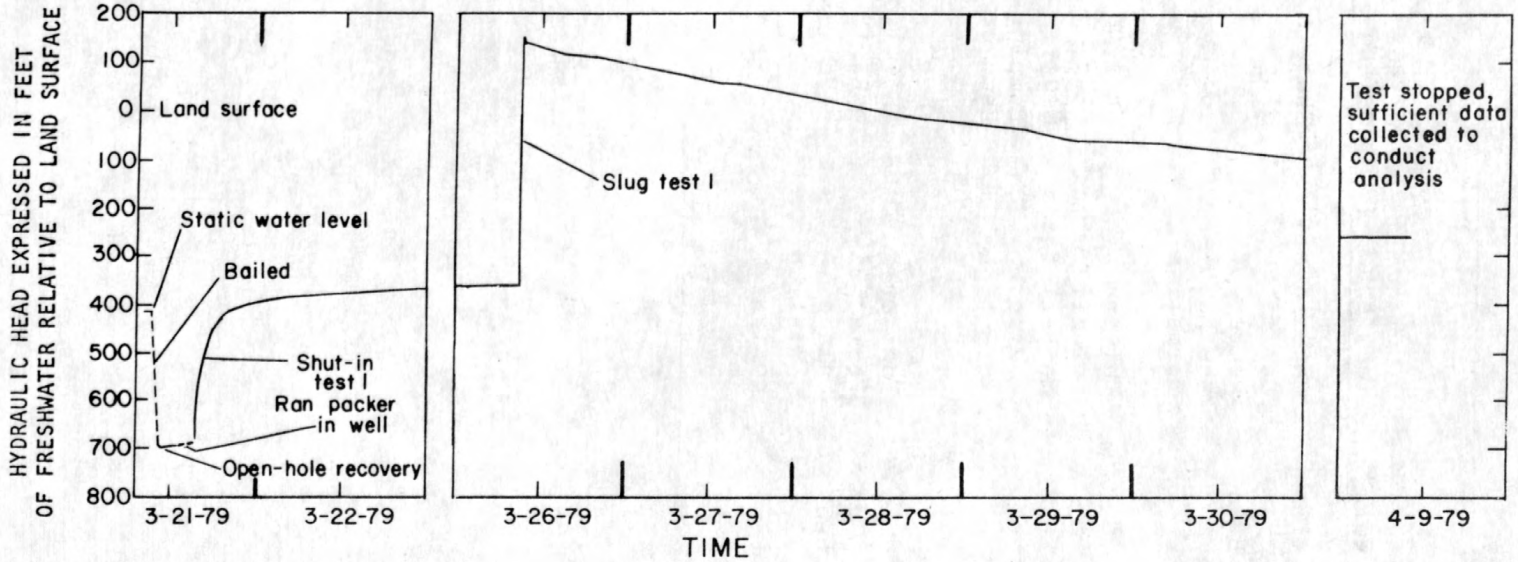

Figure 11.--History of hydraulic head during testing of well H-6C.

Table 2. Hydrologic-test results

Well	Test zone	Test method	Date	Calculated transmissivities (feet squared per day)	Estimates of storage coefficient
H-6A	Magenta Dolomite Member of the Rustler Formation	Shut-in	12-16-78	0.5	-
		Slug	12-17-78	.3	10^{-5}
H-6B	Culebra Dolomite Member of the Rustler Formation	Shut-in	12-19-78	-	-
		Slug	12-19-78	-	-
		Slug	12-19-78	-	-
		Pumping	09-18-79	73	-
		Recovery	09-21-79	83	-
H-6C	Rustler Formation-Salado Formation contact	Shut-in	03-21-79	.005	-
		Slug	03-26-79	.003	10^{-6}

Evaluation of test results

Slug tests may give a more accurate value for transmissivity than the shut-in tests in zones of low transmissivity. In the case of the shut-in test, it is difficult to fit a straight line to the steep part of the shut-in curve in order to determine the absolute change in pressure over one log cycle (Δp). Slight inflections in the recovery curve at late times make it possible to fit several lines, each yielding a different transmissivity value, through the same curve. In slug tests, the transmissivity value is calculated using a curve-matching procedure that is not as sensitive to the choice of the curve being matched.

In addition to this difficulty with the shut-in test, technical problems result from the use of an average discharge of water (Q) from the test zone in calculating transmissivity. The discharge from the well is in fact continually decreasing after the zone has been stressed (bailed). Although the use of an average discharge is reasonable, it is important to obtain as accurate an estimate of the average discharge as possible. However, logistics of performing the shut-in test prevented the measurement of discharge throughout the total time from bailing until shut-in. Discharge measurements ended at the beginning of the setting of the packer. Due to the depth of the test zones below land surface, the time between the start of setting the packer and the actual shut-in was several hours. The continually decreasing discharge during this period of no measurement dictates that the calculated value always would be larger than the actual average discharge for the entire flow period; therefore, the computed transmissivity would be larger than the actual value.

Pressure readings taken at the beginning of the shut-in tests in zones with low transmissivity indicate that early pressure recovery can be affected by both well-bore storage effects and possible formation-damage effects incurred during drilling. Because a shut-in test uses a packer seated in a water-filled hole, the well-bore storage effects, though present, are small and represent only the difference between the storage coefficient and the elasticity of the water in the borehole. In the beginning of the shut-in test in figure 9, the pressure recovery is more influenced by formation-damage effects than by well-bore storage. These effects apparently cause the initial part of the shut-in tests to remain somewhat flat; thus, Δp was calculated using only late-time pressure-recovery data.

Slug tests can provide a rough estimate of the magnitude of the storage coefficient. Storage estimates were obtained by a curve-matching technique described by Cooper, Bredehoft, and Papadopulos (1967). These estimates depend upon the shapes of the type curves, which vary only slightly when alpha (α) differs by an order of magnitude; therefore, storage, which is directly proportional to alpha, is estimated only to the order of magnitude.

Although the slug test has clear advantages over the shut-in test in low transmissive zones, the transmissivity values calculated from the shut-in test data still serve as a useful check for the transmissivities calculated from the slug test; thus, the shut-in test remains an integral part of the hydrologic-testing procedure.

WATER CHEMISTRY

Ground water in each test zone is mineralized, as indicated by dissolved-solids concentrations of 5,760 milligrams per liter in the Magenta Dolomite Member; 52,600 milligrams per liter in the Culebra Dolomite Member; and 316,000 milligrams per liter in the Rustler Formation-Salado Formation contact. According to categories assigned by the U.S. Geological Survey (Hem, 1970), water in the Magenta Dolomite Member is moderately saline, whereas water in the Culebra Dolomite Member and Rustler-Salado contact is briny.

Detailed information on the composition of water obtained from the Magenta, Culebra, and Rustler-Salado contact at wells H-6A, H-6B, and H-6C is presented in table 3. The table includes the major dissolved anions and cations, radioactive constituents, and some miscellaneous constituents.

Sampling methods

Samples for water-chemistry analyses were collected from wells H-6A, H-6B, and H-6C after completion of the hydrologic-testing sequence. Stresses of the formation during hydrologic testing acted to further develop the wells for water-chemistry samples. Before collection of the water samples, the wells were bailed to remove water standing in the casing and obtain fresh flow from the formation. Samples were then collected with either a stainless steel sampling tool or the bailing tool.

Analyses of total, suspended, and dissolved metals were made on the water samples but are not reported due to problems with the sampling technique. Bailing caused vigorous aeration of the water in the well bores, which resulted in precipitation of metals previously in solution. The bailing process also caused flakes of corroding metal to be dislodged from the side of the casing or bailer and suspended in the sample water.

Radiochemistry

Radioactivity is present in water from the Magenta Dolomite and Culebra Dolomite Members of the Rustler Formation and Rustler Formation - Salado Formation contact due to the natural radioactive decay of uranium, an element widely disseminated throughout the crust of the Earth. In order to establish background conditions, radiochemistry for the three zones was determined. The concentration of radium-226, in picocuries per liter, in samples was 11 from the Magenta, 6.6 from the Culebra, and 280 from the Rustler-Salado contact (table 3).

Table 3. Chemical composition of water obtained from well H-6A, Magenta Dolomite Member, and well H-6B, Culebra Dolomite Member of the Rustler Formation; and well H-6C, Rustler Formation-Salado Formation contact

[Chemical analyses in milligrams per liter unless otherwise noted; g/mL = grams per milliliter; pCi/L = picocuries per liter; μg/L = micrograms per liter; U-nat = uranium, natural; Cs-137 = cesium-137; Sr/Y-90 = strontium-yttrium-90]

Constituent or property	Well H-6A[1/]	Well H-6B[2/]	Well H-6C[3/]
Density, g/mL at 20° Celsius	1.077	1.040	1.210
Alkalinity, as calcium carbonate	42	85	1
Nitrogen, nitrite plus nitrate (NO_2+NO_3), dissolved	.03	.02	--
Phosphate, ortho, dissolved (PO_4)	.00	.25	--
Phosphorus, ortho, dissolved (P)	.00	.08	--
Carbon, organic, total (C)	5.4	23	--
Carbon, organic, dissolved (C)	1.7	1.1	--
Carbon organic, suspended total (C)	.4	.5	--
Hardness, total ($CaCO_3$)	2,000	7,000	97,000
Hardness, noncarbonate ($CaCO_3$)	2,000	6,900	97,000
Calcium, dissolved (Ca)	520	1,200	4,200
Magnesium, dissolved (Mg)	160	970	21,000
Sodium, dissolved (Na)	1,100	18,000	80,000
Sodium adsorption ratio	11	94	112
Sodium, percent	54	84	62
Potassium, dissolved (K)	46	500	8,000
Chloride, dissolved (Cl)	1,200	28,000	200,000
Sulfate, dissolved (SO_4)	2,700	3,800	2,000

Table 3. Chemical composition of water obtained from well H-6A, Magenta Dolomite Member, and well H-6B, Culebra Dolomite Member of the Rustler Formation; and well H-6C, Rustler Formation-Salado Formation contact - Concluded

Constituent or property	Well H-6A[1/]	Well H-6B[2/]	Well H-6C[3/]
Fluoride, dissolved (F)	1.4	1.5	1.0
Bromide, dissolved, catalytic method (Br)	--	--	827
Silica, dissolved (SiO_2)	7.7	8.5	1.4
Gross alpha, dissolved (pCi/L as U-nat)	--	--	< 7,500
Gross alpha, suspended total (pCi/L as U-nat)	--	--	.9
Gross beta, dissolved (pCi/L as Cs-137)	43	< 420	6,800
Gross beta, suspended total (pCi/L as Cs-137)	--	--	< .7
Radium 226, dissolved, radon method (pCi/L)	11	6.6	280
Solids, sum of constituents, dissolved	5,760	52,600	316,000
Uranium, dissolved extraction (µg/L)	6.7	4.3	< .04
Gross alpha, dissolved (µg/L as U-nat)	110	< 1,200	< 11,000
Gross alpha, suspended total (µg/L as U-nat)	--	--	1.3
Gross beta, dissolved (pCi/L as Sr/Y-90)	39	< 390	6,200
Gross beta, suspended total (pCi/L as Sr/Y-90)	--	--	< .7

[1/] Sampled 12-20-78, 0940 hours.
[2/] Sampled 12-09-78, 1150 hours.
[3/] Sampled 04-09-79, 1200 hours.

Chemical composition

Chemical composition of the water from the three zones is represented by a bar graph diagram in figure 12. Vertical bars are used to represent total anions and total cations. The bars are divided by horizontal lines to show the proportional concentrations of the major ions, in milliequivalents per liter.

Major cations and anions of the three ground waters also are listed in table 4. Dissolved cations and anions are given in milliequivalents per liter, milligrams per liter, and percentage composition.

The concentration of dissolved ionic constituents is greatest at the Rustler-Salado contact and least in the Magenta Dolomite Member. The water at the Rustler-Salado contact and in the Culebra Dolomite Member is very mineralized; the zones are noticeably different in the percentage composition of dissolved ionic species. Dissolved ionic composition for the brine in the Rustler-Salado contact is predominantly chloride and sodium, with magnesium, calcium, potassium, and sulfate comprising most of the remainder of the dissolved ions. The dissolved composition of the Culebra Dolomite Member brine is predominantly chloride and sodium, with magnesium, sulfate, calcium, and potassium comprising most of the remainder of the dissolved ions. Predominant dissolved ions in the Magenta Dolomite Member are sulfate and sodium, with chloride, calcium, magnesium, and potassium comprising most of the remainder of the dissolved ions. In all three wells, the percentages of chloride in solution increased with depth. The percentages of sulfate and, to a lesser extent, calcium decreased with depth to small values at the Rustler-Salado contact (table 4).

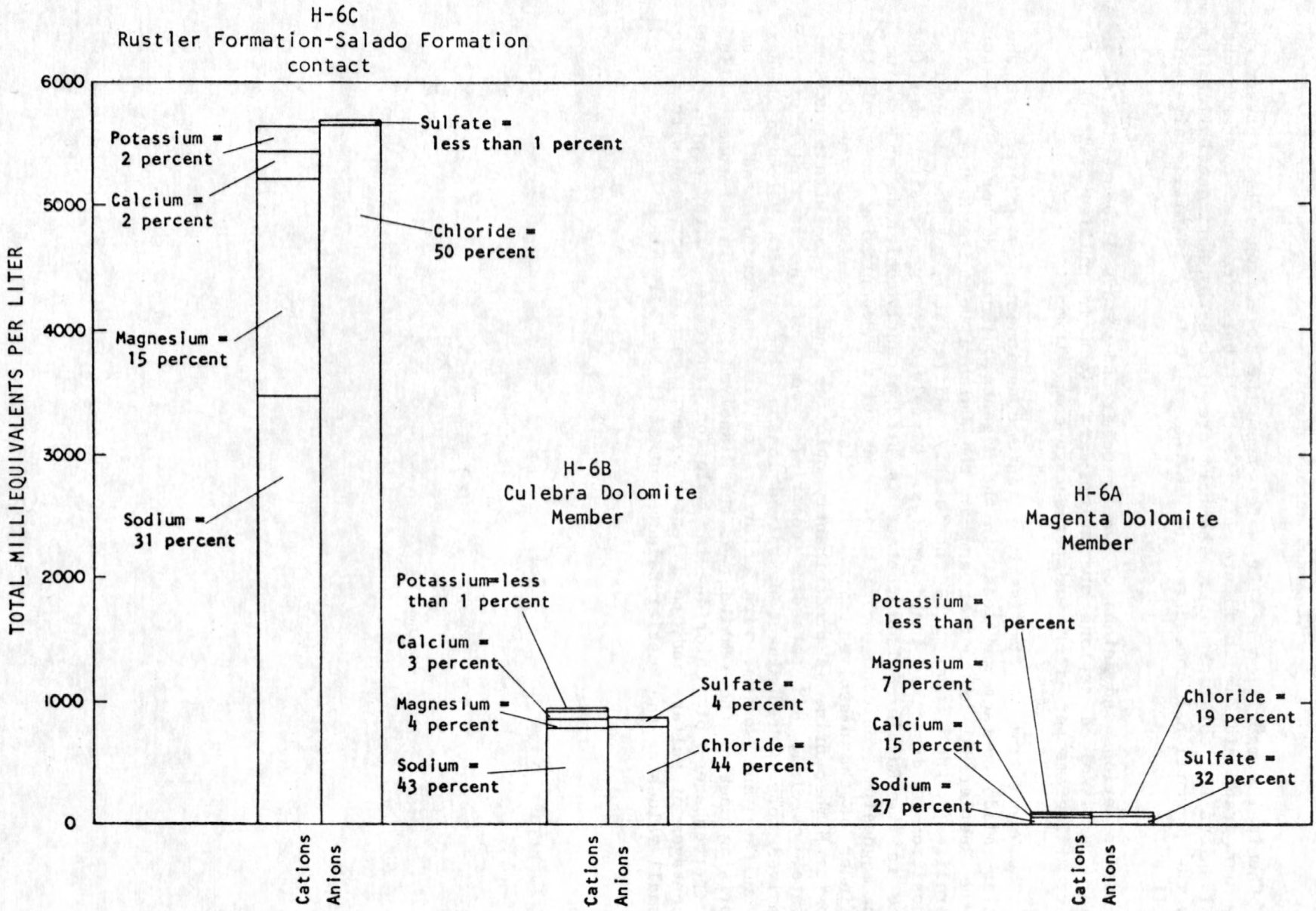

Figure 12.--Percentage composition of water from the Magenta Dolomite and Culebra Dolomite Members of the Rustler Formation and Rustler Formation-Salado Formation contact.

Table 4. Major cations and anions of water from the Magenta Dolomite and Culebra Dolomite Members of the Rustler Formation and Rustler Formation-Salado Formation contact

[meq/L, milliequivalent per liter; mg/L, milligrams per liter]

Well	Test zone (depth below land surface)	Chemical composition	meq/L	mg/L	Percentage composition
		Cations			
		Calcium	25.95	520	15
	Magenta	Magnesium	13.16	160	7
H-6A	Dolomite	Sodium	47.85	1,100	27
	Member	Potassium	1.18	46	< 1
	(492-511 feet)	Anions			
		Chloride	33.85	1,200	19
		Sulfate	56.21	2,700	32
		Cations			
		Calcium	59.88	1,200	3
	Culebra	Magnesium	79.79	970	4
	Dolomite	Sodium	783.00	18,000	43
H-6B	Member	Potassium	12.79	500	< 1
	(604-627 feet)	Anions			
		Chloride	789.88	28,000	44
		Sulfate	79.12	3,800	4
		Cations			
	Rustler	Calcium	209.58	4,200	2
	Formation-	Magnesium	1,727.46	21,000	15
H-6C	Salado	Sodium	3,480.00	80,000	31
	Formation	Potassium	204.56	8,000	2
	contact	Anions			
	(721 feet)	Chloride	5,642.00	200,000	50
		Sulfate	41.64	2,000	< 1

SUMMARY

Wells H-6A, H-6B, and H-6C are located at the Waste Isolation Pilot Plant site near Carlsbad, New Mexico. Drilling of these wells began during June 1978 and was completed during August 1978. Hydrologic testing and water-chemistry investigations were completed by September 1979.

The Magenta Dolomite Member of the Rustler Formation at well H-6A and the Rustler Formation-Salado Formation contact at well H-6C yield water to wells at rates less than 0.5 gallon per minute. For this reason, shut-in tests and slug tests were used to calculate transmissivities and estimates for the storage coefficients. The Culebra Dolomite Member of the Rustler Formation at well H-6B had too large a yield for shut-in and slug tests, but a transmissivity value was determined by a consultant using conventional pumping and recovery tests.

Special testing procedures were developed to perform the shut-in and slug test combination. A distinct component of the procedure included a pressure-transducer system used throughout the testing sequence to monitor the water-pressure response in the tested zone.

Hydrologic-testing results are as follow:

Well	Test zone	Calculated transmissivity (feet squared per day)	Estimated storage coefficient
H-6A	Magenta Dolomite Member of the Rustler Formation	0.3	10^{-5}
H-6B	Culebra Dolomite Member of the Rustler Formation	78	-
H-6C	Rustler Formation-Salado Formation contact	.003	10^{-6}

The slug test may give a more accurate value for transmissivity than the shut-in test for the following reasons:

(1) Subjectivity in determining the straight line part of the shut-in curve to be used in acquiring the change in the hydraulic head throughout one log cycle of time (Δp);

(2) Difficulty met in obtaining a sufficient flow time preceding the shut-in to determine an actual average discharge (Q) of water from the test zone; and

(3) Early time readings taken during the shut-in tests were apparently dominated by well-bore storage and formation-damage effects.

In addition, the slug test has the added advantage of providing an estimate of the storage coefficient.

Although the slug test appears to give more reliable results, the shut-in test will continue to be used at the WIPP site because it consists of monitoring test-zone pressures during preparations for the slug test. In addition, should anything go wrong with either test, the remaining test will still provide a transmissivity value.

Chemical analyses of ground water obtained from the Magenta Dolomite Member showed this water to be moderately saline based on dissolved-solids concentration of 5,760 milligrams per liter. The predominate ions in the water from the Magenta were sulfate and sodium. Chemical analyses of water obtained from the Culebra Dolomite Member and Rustler-Salado contact showed these waters to be briny based on dissolved-solids concentrations of 52,600 and 316,000 milligrams per liter, respectively. The predominate ions in the waters from both the Culebra Dolomite Member and the Rustler-Solado contact were sodium and chloride. Radium-226, a naturally ocurring radioactive element, is present in the water of all three test zones.

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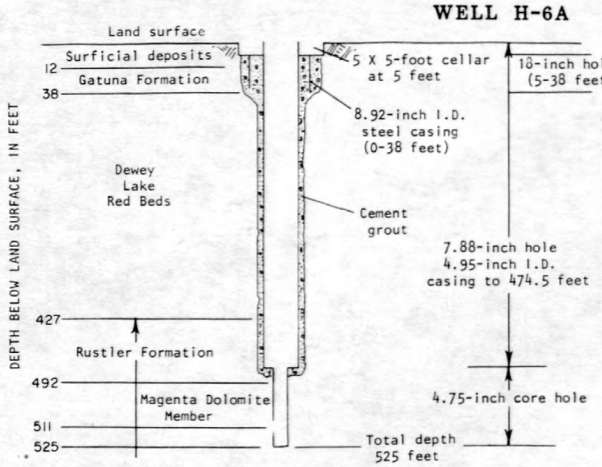
SUPPLEMENTAL INFORMATION

This section contains data collected during field operations, including construction detail of wells (figure 13) and test data (table 5) used for the calculations that appear earlier in the text.

WELL H-6A



LOCATION: 284 feet from north line, 275 feet from west line, section 18, Township 22 South, Range 31 East, Eddy County, New Mexico

ALTITUDE: 3347.3 feet

TOTAL DEPTH: 525 feet

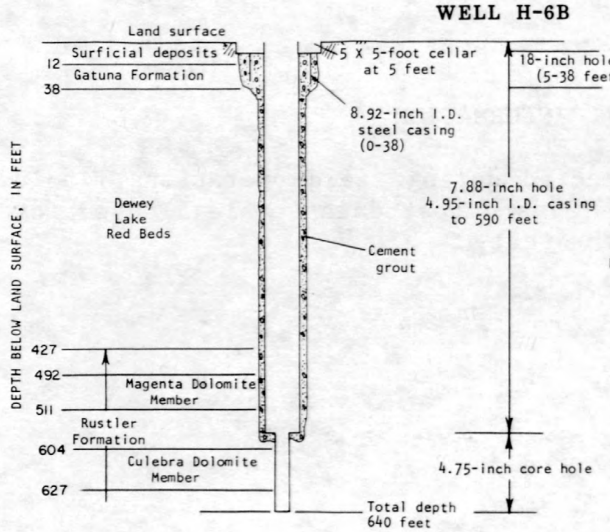
DATE COMPLETED: July 11, 1978

DRILLING CONTRACTOR: Pennsylvania Drilling Company, Carlsbad, New Mexico

DRILLING METHOD: Drilled 18-inch hole using auger (5-38 feet). Rotary drilled 7.88-inch hole with air to 475 feet. Cut 4.75-inch core using freshwater (475 to 525 feet)

WELL-CASING RECORD: 8.92-inch I.D. steel casing (0-38 feet). 4.95-inch I.D. steel casing (0-474.5 feet)

WELL H-6B



LOCATION: 196 feet from north line, 322 feet from west line, section 18, Township 22 South, Range 31 East, Eddy County, New Mexico

ALTITUDE: 3347.6 feet

TOTAL DEPTH: 640 feet

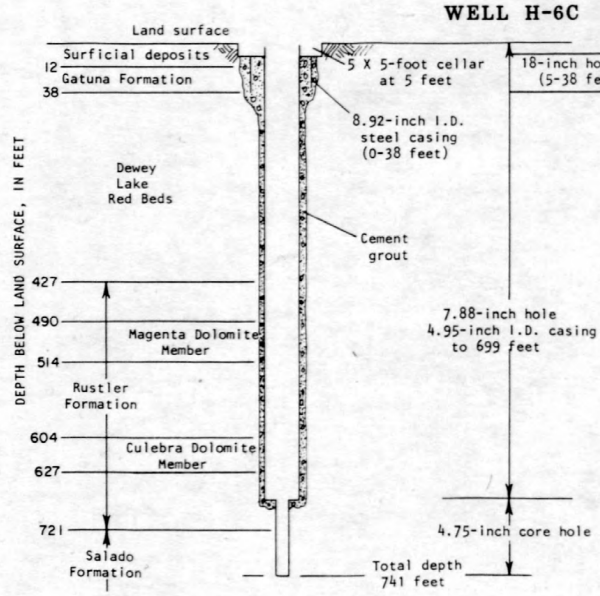
DATE COMPLETED: July 5, 1978

DRILLING CONTRACTOR: Pennsylvania Drilling Company, Carlsbad, New Mexico

DRILLING METHOD: Drilled 18-inch hole using auger (5-38 feet). Rotary drilled 7.88-inch hole with air (38-492 feet), changed to air foam (492-592 feet) Cut 4.75-inch core using freshwater (592-640 feet)

WELL-CASING RECORD: 8.92-inch I.D. steel casing (0-38 feet). 4.95-inch I.D. steel casing (0-590)

WELL H-6C



LOCATION: 281 feet from north line, 375 feet from west line, section 18, Township 22 South, Range 31 East, Eddy County, New Mexico

ALTITUDE: 3347.9 feet

TOTAL DEPTH: 741 feet

DATE COMPLETED: June 26, 1978

DRILLING CONTRACTOR: Pennsylvania Drilling Company, Carlsbad, New Mexico

DRILLING METHOD: Drilled 18-inch hole using auger (5-38 feet). Rotary drilled 7.88-inch hole with air (38-508 feet), changed to air foam (508-700 feet). Cut 4.75-inch core using brine (700-721 feet), changed to air foam (721-741 feet)

WELL-CASING RECORD: 8.92-inch I.D. steel casing (0-38 feet). 4.95-inch I.D. steel casing (0-699 feet)

Figure 13.--Construction detail of wells H-6A, H-6B, and H-6C.

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C

H-6A - Bailing Test 1

Starting date: 12-16-78
Hole depth: 525 feet
Cased interval: 0-474.5 feet
Tested interval: 474.5-525 feet
Diameter of tested interval: 4.75 inches
Geologic unit tested: Magenta Dolomite Member of the Rustler Formation

Water levels were measured with a pressure transducer.
Measuring point (MP) for the recovery from bailing was the pressure transducer, which was 523 feet below land surface.
Static water level was 292.9 feet below land surface.

Type of bailer: Dart valve
Length: 19.5 feet
Diameter: 3.5 inches
Capacity: 9.75 gallons

A circular stock tank was used to hold the water removed during bailing.
Diameter of the stock tank: 7 feet.

Clock time	Bailer number	Depth of water in tank (feet)	Total volume in tank (gallons)	Water pressure (feet of freshwater above MP)	Time since bailing stopped (minutes: seconds)
Date: 12-16-78					
0929	1	-	-	-	-
0930	2	0.08	23.0	-	-
0936	3	-	-	-	-
0937	4	.15	43.2	-	-
0938	5	-	-	-	-
0939	6	-	-	-	-
0940	7	.30	86.4	-	-
0942	8	-	-	-	-
0943	9	-	-	-	-
0944	10	.40	115.2	-	-
0945	11	-	-	-	-
0946	12	-	-	-	-
0948	13	.52	149.7	-	-
0949	14	-	-	-	-
0953	15	-	-	-	-
0954	16	.64	184.2	-	-
0955	17	-	-	-	-
0956	18	-	-	-	-
0958	19	.74	213.0	-	-

Table 5. Hydrologic-test data for wells H-6A, H-6B and H-6C - Continued.

H-6A Bailing Test 1 - Continued

Clock time	Bailer number	Depth of water in tank (feet)	Total volume in tank (gallons)	Water pressure (feet of freshwater above MP)	Time since bailing stopped (minutes: seconds)
Date: 12-16-78					
0959	20	-	-	-	-
1000	21	-	-	-	-
1002	22	0.85	244.7	-	-
1004	23	-	-	-	-
1005	24	.90	259.1	-	0
-	-	-	-	0	5:20
-	-	-	-	0.1	6:00
-	-	-	-	.2	6:05
-	-	-	-	.4	6:15
-	-	-	-	.5	6:30
-	-	-	-	.7	6:45
-	-	-	-	.9	7:00
-	-	-	-	1.1	7:15
-	-	-	-	1.2	7:30
-	-	-	-	1.3	7:45
-	-	-	-	1.5	8:00
-	-	-	-	1.7	8:15
-	-	-	-	1.8	8:30
-	-	-	-	1.9	8:45
-	-	-	-	2.1	9:00
-	-	-	-	2.2	9:15
-	-	-	-	2.3	9:30
-	-	-	-	2.5	9:45
-	-	-	-	2.6	10:00
-	-	-	-	2.7	10:15
-	-	-	-	2.9	10:30
-	-	-	-	3.0	10:45
-	-	-	-	3.1	11:00
-	-	-	-	3.4	11:30
-	-	-	-	3.6	12:00
-	-	-	-	3.9	12:30
-	-	-	-	4.2	13:00
-	-	-	-	4.4	13:30
-	-	-	-	4.7	14:00
-	-	-	-	4.9	14:30
-	-	-	-	5.1	15:00
-	-	-	-	5.4	15:30
-	-	-	-	5.7	16:00
-	-	-	-	6.2	17:00
-	-	-	-	6.7	18:00
-	-	-	-	7.2	19:00
-	-	-	-	7.7	20:00

Table 5. Hydrologic-test data for wells H-6A, H-6B and H-6C - Continued.

H-6A Bailing Test 1 - Concluded

Clock time	Bailer number	Depth of water in tank (feet)	Total volume in tank (gallons)	Water pressure (feet of freshwater above MP)	Time since bailing stopped (minutes: seconds)
Date: 12-16-78					
-	-	-	-	8.2	21:00
-	-	-	-	8.8	22:00
-	-	-	-	9.3	23:00
-	-	-	-	9.8	24:00
-	-	-	-	10.3	25:00
-	-	-	-	10.8	26:00
-	-	-	-	11.3	27:00
-	-	-	-	11.8	28:00
-	-	-	-	12.8	30:00
-	-	-	-	13.8	32:00
-	-	-	-	14.8	34:00
-	-	-	-	15.8	36:00
-	-	-	-	16.8	38:00
-	-	-	-	17.9	40:00
-	-	-	-	18.8	42:00
-	-	-	-	19.9	44:00
-	-	-	-	20.9	46:00
-	-	-	-	21.8	48:00
-	-	-	-	22.8	50:00
-	-	-	-	25.2	55:00
-	-	-	-	27.6	60:00
-	-	-	-	30.1	65:00
-	-	-	-	32.2	70:00
-	-	-	-	34.5	75:00
-	-	-	-	36.8	80:00
-	-	-	-	39.0	85:00
-	-	-	-	41.1	90:00
-	-	-	-	43.2	95:00
-	-	-	-	44.9	100:00
-	-	-	-	47.2	107:00
-	-	-	-	48.7	111:00
-	-	-	-	51.9	120:00
-	-	-	-	55.9	130:00
-	-	-	-	59.0	140:00
-	-	-	-	62.5	150:00
-	-	-	-	65.3	160:00

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6A - Shut-In Test 1

Starting date: 12-16-78
Shut in after: Bailing
Diameter of tested interval: 4.75 inches
Geologic unit tested: Magenta Dolomite Member of the Rustler Formation
Hole depth: 525 feet
Cased interval: 0-474.5 feet
Tested interval: 474.5-525 feet
Packer type: Lynes PIP **
Diameter: 4.5 inches

Packer set at 469.0 feet below land surface.
Measuring point (MP) was transducer pressure port below the packer which was 472.6 feet below land surface.
Static water level was 292.9 feet below land surface.

REMARKS: t = time since bailing began (minutes)
t' = time since shut-in (minutes)

Clock time	Stop watch time (minutes: seconds)	Water pressure (feet of freshwater above MP)	t/t'	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 12-16-78					
1350:00	-	53.4	-	0	Pretest reading
1357:00	-	55.7	-	0	Pretest reading
1405:00	0:00	-	-	0	-
-	:10	84.1	1657.0	0	-
-	:20	89.8	829.0	0	-
-	:30	94.4	553.0	0	-
-	:40	98.8	415.0	0	-
-	:50	102.1	332.2	0	-
-	1:00	105.6	277.0	0	-
-	1:10	108.2	237.6	0	-
-	1:20	110.2	208.0	0	-
-	1:30	112.2	185.0	0	-
-	1:40	114.3	166.6	0	-

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6A - Shut-In Test 1 - Continued

Clock time	Stop watch time (minutes: seconds)	Water pressure (feet of freshwater above MP)	t/t'	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 12-16-78					
-	1:50	115.7	151.6	0	-
-	2:00	117.2	139.0	0	-
-	2:10	118.5	128.4	0	-
-	2:20	119.7	119.3	0	-
-	2:30	120.8	111.4	0	-
-	2:40	121.8	104.5	0	-
-	2:50	122.7	98.4	0	-
-	3:00	123.6	93.0	0	-
-	3:10	124.4	88.2	0	-
-	3:20	125.1	83.8	0	-
-	3:30	125.8	79.9	0	-
-	3:40	126.5	76.3	0	-
-	3:50	127.1	73.0	0	-
-	4:00	127.7	70.0	0	-
-	4:10	128.3	67.2	0	-
-	4:20	129.1	64.7	0	-
-	4:30	129.5	62.3	0	-
-	4:40	130.0	60.1	0	-
-	4:50	130.4	58.1	0	-
-	5:00	130.9	56.2	0	-
-	5:15	131.3	53.6	0	-
-	5:30	132.1	51.2	0	-
-	5:45	132.7	49.0	0	-
-	6:00	133.2	47.0	0	-
-	6:15	133.7	45.2	0	-
-	6:30	134.2	43.5	0	-
-	6:45	134.7	41.9	0	-
-	7:00	135.1	40.4	0	-
-	7:15	135.6	39.1	0	-
-	7:30	136.0	37.8	0	-
-	7:45	136.4	36.6	0	-
-	8:00	136.8	35.5	0	-
-	8:30	137.5	33.5	0	-
-	8:45	137.9	32.5	0	-
-	9:00	138.2	31.7	0	-
-	9:15	138.4	30.8	0.02	-
-	9:30	138.9	30.1	.02	-
-	9:45	139.2	29.3	.02	-

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6A - Shut-In Test 1 - Continued

Clock time	Stop watch time (minutes: seconds)	Water pressure (feet of freshwater above MP)	t/t'	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 12-16-78					
-	10:00	139.4	28.6	0.02	-
-	10:30	140.0	27.3	.02	-
-	11:00	140.5	26.1	.02	-
-	11:30	141.1	25.0	.02	-
-	12:00	141.6	24.0	.02	-
-	12:30	142.0	23.1	.02	-
-	13:00	142.4	22.2	.02	-
-	13:30	142.9	21.4	.02	-
-	14:00	143.3	20.7	.02	-
-	14:30	143.7	20.0	.02	-
-	15:00	144.0	19.4	.02	-
-	16:00	144.7	18.3	.02	-
-	17:00	145.4	17.2	.02	-
-	18:00	146.0	16.3	.02	-
-	19:00	146.6	15.5	.02	-
-	20:00	147.1	14.8	.02	-
-	21:00	147.6	14.1	.02	-
-	22:00	148.0	13.5	.02	-
-	23:00	148.5	13.0	.02	-
-	24:00	148.9	12.5	.02	-
-	25:00	149.4	12.0	.02	-
-	26:00	149.7	11.6	.02	-
-	27:00	150.1	11.2	.02	-
-	28:00	150.4	10.9	.02	-
-	29:00	150.7	10.5	.02	-
-	30:00	151.1	10.2	.02	-
-	32:00	151.7	9.63	.02	-
-	34:00	152.2	9.12	.02	-
-	36:00	152.7	8.67	.02	-
-	38:00	153.2	8.26	.02	-
-	40:00	153.5	7.90	.02	-
-	42:00	154.0	7.57	.02	-
-	45:00	154.6	7.13	.02	-
-	47:00	155.0	6.87	.02	-
-	48:00	155.2	6.75	.02	-
-	50:00	155.6	6.52	.02	-
-	55:00	156.5	6.02	.01	-
-	60:00	157.3	5.60	.01	-
-	65:00	158.0	5.25	.01	-

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6A - Shut-In Test 1 - Continued

Clock time	Stop watch time (minutes: seconds)	Water pressure (feet of freshwater above MP)	t/t'	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 12-16-78					
-	72:00	159.0	4.83	0.02	-
-	75:00	159.2	4.68	.02	-
-	80:00	159.7	4.45	.02	-
-	85:00	160.2	4.25	.02	-
-	90:00	160.7	4.07	.03	-
-	95:00	161.2	3.91	.02	-
-	100:00	161.6	3.76	.03	-
-	105:00	162.0	3.63	.03	-
-	110:00	162.4	3.51	.03	-
-	115:00	162.8	3.40	.03	-
-	120:00	163.2	3.30	.04	-
-	130:00	163.9	3.12	.04	-
-	140:00	164.6	2.97	.04	-
-	154:00	165.3	2.790	0	The following data
-	174:00	166.3	2.59	.03	were taken from a
-	194:00	167.2	2.42	.06	data logger and
-	214:00	167.9	2.29	.12	corrected for in-
-	234:00	168.5	2.18	.04	accuracies caused
-	254:00	169.2	2.09	.05	by temperature and
-	274:00	169.8	2.01	.05	power fluctuations.
-	294:00	170.4	1.94	.04	-
-	314:00	170.9	1.88	.05	-
-	334:00	171.4	1.83	.12	-
-	354:00	171.9	1.78	.08	-
-	374:00	172.2	1.74	.08	-
-	394:00	172.3	1.70	.12	-
-	414:00	172.6	1.67	.09	-
-	434:00	172.8	1.64	.11	-
-	454:00	173.0	1.61	.11	-
-	474:00	173.3	1.58	.14	-
-	494:00	173.4	1.56	.14	-
-	514:00	173.7	1.54	.12	-
-	534:00	173.8	1.52	.10	-
-	554:00	174.0	1.50	.11	-
-	574:00	174.2	1.48	.10	-
-	594:00	174.4	1.46	.10	-

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6A - Shut-In Test 1 - Concluded

Clock time	Stop watch time (minutes: seconds)	Water pressure (feet of freshwater above MP)	t/t'	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 12-17-78					
-	614:00	174.5	1.45	0.10	-
-	634:00	174.7	1.44	.09	-
-	654:00	174.8	1.42	.10	-
-	674:00	175.0	1.41	.10	-
-	694:00	175.1	1.40	.08	-
-	714:00	175.3	1.39	.09	-
-	734:00	175.3	1.38	.09	-
-	754:00	175.4	1.37	.08	-
-	774:00	175.5	1.36	.09	-
-	794:00	175.6	1.35	.10	-
-	814:00	175.7	1.339	.08	-
-	834:00	175.8	1.331	.06	-
-	854:00	175.8	1.323	.07	-
-	874:00	176.0	1.316	.07	-
-	894:00	176.0	1.309	.05	-
-	914:00	176.0	1.302	.04	-
-	934:00	176.1	1.296	.04	-
-	954:00	176.1	1.289	.08	-
-	974:00	176.2	1.283	.04	-
-	994:00	176.3	1.278	.05	-
-	1014:00	176.6	1.272	.04	-
-	1034:00	176.5	1.267	.04	-
-	1054:00	176.5	1.262	.04	-
-	1074:00	176.5	1.257	.04	-
-	1094:00	176.5	1.252	.04	-
0837	-	176.6	1.248	.04	Following measure-
0917	-	176.7	1.240	.03	ments were direct
1004	-	176.8	1.230	.03	readings.
1035	-	176.7	1.224	.03	-
1059	-	176.7	1.220	- .02	-

**The use of the trade name is for descriptive purposes only and does not imply endorsement by the U.S. Geological Survey.

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6A - Slug Test 1

Starting date: 12-17-78
Hole depth: 525 feet
Inside diameter (ID) of tubing: 2.0 inches
Geologic unit tested: Magenta Dolomite Member of the Rustler Formation
Cased interval: 0-474.5 feet
Tested interval: 474.5-525 feet
Diameter of tested interval: 4.75 inches
Packer type: Lynes PIP with feed through
Diameter: 4.5 inches

Packer set at 469.0 feet below land surface.
Measuring point (MP) was transducer pressure port below packer which was 472.6 feet below land surface.
Static water level was 292.9 feet below land surface.

REMARKS: $\frac{H}{H_o} = \frac{h' - h_i}{h_o - h_i}$

Clock time	Water pressure (feet of freshwater above MP)	Time (seconds)	H/H_o	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 12-17-78					
1113	176.6	-	-	0	Pretest reading
1114	618.9	0	-	0	-
-	471.4	5	1.000	0	*
-	475.2	10	-	0	-
-	471.4	15	1.000	0	-
-	471.2	20	0.999	0	-
-	473.4	25	-	-0.01	-
-	470.3	30	.996	0	-
-	469.4	35	.993	.01	-
-	467.2	40	.986	- .01	-
-	468.4	45	.990	0	-
-	467.8	50	.988	.01	-
-	467.4	55	.986	0	-
-	466.8	60	.984	.01	-
-	465.9	70	.981	.01	-
-	464.7	80	.977	0	-
-	464.2	90	.976	.01	-
-	463.3	100	.973	- .01	-
-	462.4	110	.969	0	-
-	461.5	120	.966	0	-

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6A - Slug Test 1 - Continued

Clock time	Water pressure (feet of freshwater above MP)	Time (seconds)	H/H_o	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 12-17-78					
-	460.7	130	0.964	0	-
-	459.8	140	.961	0	-
-	458.9	150	.958	0	-
-	458.1	160	.955	-0.01	-
-	457.3	170	.952	- .01	-
-	456.5	180	.949	- .01	-
-	455.8	190	.947	- .01	-
-	455.0	200	.944	- .01	-
-	454.2	210	.942	- .01	-
-	453.4	220	.939	- .01	-
-	452.7	230	.937	- .01	-
-	451.9	240	.934	- .01	-
-	451.1	250	.931	- .01	-
-	450.3	260	.928	- .01	-
-	449.6	270	.926	- .01	-
-	448.9	280	.924	- .01	-
-	448.1	290	.921	- .01	-
-	447.4	300	.919	- .01	-
-	446.3	315	.915	- .01	-
-	445.3	330	.911	- .01	-
-	444.2	345	.908	- .01	-
-	443.2	360	.904	- .01	-
-	442.3	375	.901	- .01	-
-	441.3	390	.898	- .01	-
-	440.4	405	.895	- .01	-
-	439.4	420	.891	- .01	-
-	438.5	435	.888	- .02	-
-	437.7	450	.886	- .02	-
-	436.7	465	.882	- .02	-
-	435.8	480	.879	- .02	-
-	435.0	495	.877	- .02	-
-	434.2	510	.874	- .02	-

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6A - Slug Test 1 - Continued

Clock time	Water pressure (feet of freshwater above MP)	Time (seconds)	H/H_o	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 12-17-78					
-	433.3	525	0.871	-0.02	-
-	432.5	540	.868	- .02	-
-	431.5	555	.865	- .02	-
-	431.0	570	.863	- .02	-
-	430.3	585	.861	- .02	-
-	429.5	600	.858	- .02	-
-	428.7	615	.855	- .02	-
-	428.0	630	.853	- .02	-
-	427.3	645	.850	- .02	-
-	426.6	660	.848	- .02	-
-	425.8	675	.845	- .02	-
-	425.2	690	.843	- .02	-
-	424.5	705	.841	- .02	-
-	423.8	720	.839	- .01	-
-	422.3	750	.833	- .01	-
-	421.0	780	.829	- .01	-
-	419.6	810	.824	- .01	-
-	418.2	840	.820	- .01	-
-	416.9	870	.815	- .01	-
-	415.7	900	.811	- .01	-
-	414.5	930	.807	- .01	-
-	413.1	960	.802	- .01	-
-	411.8	990	.798	- .01	-
-	410.6	1020	.794	- .01	-
-	409.4	1050	.790	- .01	-
-	408.0	1080	.785	- .01	-
-	406.9	1110	.781	- .01	-
-	405.7	1140	.777	- .01	-
-	404.5	1170	.773	- .01	-
-	403.3	1200	.769	- .01	-
-	402.1	1230	.765	- .01	-
-	401.0	1260	.761	- .01	-
-	399.8	1290	.757	- .01	-
-	398.7	1320	.753	- .01	-
-	397.5	1350	.749	- .01	-
-	396.4	1380	.746	- .01	-
-	395.3	1410	.742	- .01	-
-	394.2	1440	.738	- .01	-

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6A - Slug Test 1 - Continued

Clock time	Water pressure (feet of freshwater above MP)	Time (seconds)	H/H_o	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 12-17-78					
-	393.1	1470	0.734	-0.01	-
-	392.0	1500	.731	- .01	-
-	389.8	1560	.723	- .02	-
-	387.7	1620	.716	- .02	-
-	385.5	1680	.709	- .02	-
-	383.4	1740	.701	- .02	-
-	381.4	1800	.695	- .02	-
-	379.3	1860	.688	- .02	-
-	377.3	1920	.681	- .02	-
-	375.3	1980	.674	- .03	-
-	373.4	2040	.668	- .03	-
-	371.4	2100	.661	- .03	-
-	369.5	2160	.654	- .03	-
-	367.6	2220	.648	- .04	-
-	365.7	2280	.641	- .04	-
-	363.8	2340	.635	- .04	-
-	361.9	2400	.629	- .04	-
-	358.3	2520	.616	- .04	-
-	354.7	2640	.604	- .04	-
-	351.3	2760	.593	- .04	-
-	347.9	2880	.581	- .04	-
-	344.5	3000	.570	- .04	-
-	341.2	3120	.558	- .04	-
-	338.1	3240	.548	- .04	-
-	334.9	3360	.537	- .04	-
-	331.9	3480	.527	- .04	-
-	328.9	3600	.517	- .04	-
-	321.5	3900	.492	- .04	-
-	314.5	4200	.468	- .06	-
-	308.6	4500	.448	- .06	-
-	302.7	4800	.428	- .07	-
-	296.9	5100	.408	- .06	-
-	291.4	5400	.389	- .07	-
-	286.1	5700	.371	- .08	-
-	281.2	6000	.355	- .08	-
-	276.5	6300	.339	- .09	-
-	272.0	6600	.324	- .10	-
-	268.0	6900	.310	- .10	-

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6A - Slug Test 1 - Continued

Clock time	Water pressure (feet of freshwater above MP)	Time (seconds)	H/H_o	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
ıte: 12-17-78					
-	263.8	7200	0.296	-0.10	-
-	260.1	7800	.283	- .11	-
-	249.8	8400	.248	- .12	-
-	243.8	9000	.228	- .12	-
-	238.3	9600	.209	- .13	-
-	233.5	10200	.193	- .14	-
-	229.1	10800	.178	- .14	-
-	225.0	11400	.164	- .14	-
-	221.3	12000	.152	- .14	-
-	218.1	12600	.141	- .15	-
-	215.1	13200	.131	- .15	-
-	209.2	14400	.111	- .15	-
-	207.1	15000	.103	- .13	-
-	203.1	16200	.090	- .12	-
-	198.5	18000	.074	- .13	-
-	195.0	19800	.062	- .15	-
-	192.3	21600	.053	- .16	-
-	190.1	23400	.046	- .16	-
-	188.5	25200	.040	- .18	-
-	187.1	27000	.036	- .18	-
-	185.9	28800	.032	- .17	-
-	185.0	30600	.028	- .17	-
-	184.2	32400	.026	- .17	-
-	183.6	34200	.024	- .18	-
-	183.0	36000	.022	- .19	-
-	182.5	37800	.020	- .20	-
-	182.2	39600	.019	- .20	-
-	181.9	41400	.018	- .20	-
-	181.6	43200	.017	- .20	-
-	181.3	45000	.016	- .20	-
Date: 12-18-78					
-	181.0	46800	.015	- .22	-
-	180.7	48600	.014	- .24	-
-	180.7	50400	.014	- .24	-
-	180.5	52200	.013	- .25	-
-	180.4	54000	.013	- .24	-

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6A - Slug Test 1 - Concluded

Clock time	Water pressure (feet of freshwater above MP)	Time (seconds)	H/H_o	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 12-18-78					
-	180.3	55800	0.013	-0.25	-
-	180.2	57600	.012	- .25	-
-	180.1	59400	.012	- .27	-
-	179.9	61200	.011	- .28	-
-	179.9	63000	.011	- .29	-
-	179.7	64800	.011	- .30	-
-	179.6	66600	.010	- .30	-
-	179.6	68400	.010	- .31	-
-	179.6	70200	.010	- .31	-
-	179.5	72000	.010	- .30	-
-	179.2	73800	.009	- .31	-

* $\frac{H}{H_o} = \frac{h' - 176.6}{471.4 - 176.6}$

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6A - Bailing Test 2

Starting date: 12-18-78
Hole depth: 525 feet
Cased interval: 0-474.5 feet
Tested interval: 474.5-525 feet
Diameter of tested interval: 4.75 inches
Geologic unit tested: Magenta Dolomite Member of the Rustler Formation

Water levels were measured with a pressure transducer.

Static water level was 292.9 feet below land surface.

Type of bailer: Dart valve
Length: 19.5 feet
Diameter: 3.5 inches
Capacity: 9.75 gallons

A circular stock tank was used to hold the water removed during bailing.
Diameter of the stock tank: 7 feet.
Remarks: 0.54 foot of water in tank prior to bailing.

Clock time	Bailer number	Depth of water in tank (feet)	Total volume in tank (gallons)	Water pressure (feet of freshwater above MP)	Time since bailing stopped (minutes: seconds)
Date: 12-18-78					
1047	1	0.57	164.1	-	-
1048	2	.61	175.6	-	-
1050	3	.64	184.2	-	-
1054	4	.67	192.9	-	-
1055	5	.71	204.4	-	-
1056	6	.74	213.0	-	-
1058	7	.77	221.7	-	-
1059	8	.81	233.2	-	-
1100	9	.84	241.8	-	-
1101	10	.87	250.4	-	-
1103	11	.90	259.1	-	-
1104	12	.93	267.7	-	-
1106	13	.96	276.4	-	-
1107	14	.97	279.2	-	-

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6B - Bailing Test 1

Starting date: 12-19-78
Hole depth: 640 feet
Cased interval: 0-590 feet
Tested interval: 590-640 feet
Diameter of tested interval: 4.75 inches
Geologic unit tested: Culebra Dolomite Member of the Rustler Formation

Water levels were measured with a pressure transducer.
Measuring point (MP) for the recovery from bailing was the pressure transducer which was 309 feet below land surface.
Static water level was 294.8 feet below land surface.

Type of bailer: Dart valve
Length: 19.5 feet
Diameter: 3.5 inches
Capacity: 9.75 gallons

A circular stock tank was used to hold the water removed during bailing.
Diameter of the stock tank: 7 feet.

Clock time	Bailer number	Depth of water in tank (feet)	Total volume in tank (gallons)	Water pressure (feet of freshwater above MP)	Time since bailing stopped (minutes: seconds)
Date: 12-19-78					
0829	1	0.04	11.5	-	-
0830	2	.08	23.0	-	-
0831	3	.11	31.7	-	-
0832	4	.16	46.1	-	-
0833	5	.19	54.7	-	-
0834	6	.24	69.1	-	-
0835	7	.27	77.7	-	-
0836	8	.30	86.4	-	-
0837	9	.33	95.0	-	-
0838	10	.37	106.5	-	-
0839	11	.40	115.2	-	-
0840	12	.44	126.7	-	-
0841	13	.47	135.3	-	-
0842	14	.50	144.0	-	-
0843	15	.53	152.6	-	-
0844	16	.56	161.2	-	-
0845	17	.59	169.9	-	-
0846	18	.62	178.5	-	-

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6B - Bailing Test 1 - Continued

Clock time	Bailer number	Depth of water in tank (feet)	Total volume in tank (gallons)	Water pressure (feet of freshwater above MP)	Time since bailing stopped (minutes: seconds)
Date: 12-19-78					
0847	19	0.65	187.1	-	-
0848	20	.69	198.6	-	-
0850	21	.72	207.3	-	-
0851	22	.76	218.8	-	-
0852	23	.79	227.4	-	-
0853	24	.82	236.1	-	-
0854	25	.85	244.7	-	-
0855	26	.88	253.4	-	-
0856	27	.91	262.0	-	-
0857	28	.94	270.6	-	-
0858	29	.98	282.1	-	-
0859	30	1.01	290.8	-	-
0900	31	1.04	299.4	-	-
0900:30	32	1.07	308.0	-	-
0901	33	1.10	316.7	-	-
0902	34	1.13	325.3	-	-
0903	35	1.17	336.8	-	-
0904	36	1.20	345.5	-	-
0905	37	1.23	354.1	-	-
0906	38	1.26	362.8	-	-
0907	39	1.28	368.5	-	-
0908	40	1.31	377.1	-	-
0909	41	1.34	385.8	-	-
0910	42	1.38	397.3	-	-
0911	43	1.41	405.9	-	-
0912	44	1.44	414.6	-	-
0913	45	1.47	423.2	-	-
0914	46	1.50	431.8	-	-
0915	47	1.53	440.5	-	-
0916	48	1.56	449.1	-	-
0917	49	1.59	457.8	-	-
0918	50	1.61	463.5	-	-
0919	51	1.64	472.2	-	-
0920	52	1.67	480.8	-	-
0921	53	1.70	489.4	-	-
0922	54	1.73	498.1	-	-
0926	55	1.77	509.6	-	-
0927	56	1.80	518.2	-	-
0928	57	1.83	526.9	-	-

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6B - Bailing Test 1 - Concluded

Clock time	Bailer number	Depth of water in tank (feet)	Total volume in tank (gallons)	Water pressure (feet of freshwater above MP)	Time since bailing stopped (minutes: seconds)
Date: 12-19-78					
0929	58	1.87	538.4	-	-
0929:54	59	1.91	549.9	-	-
-	-	-	-	0.0	-
-	-	-	-	.4	3:30
-	-	-	-	.5	3:40
-		-	-	.6	3:50
-	-	-	-	.6	4:00
-	-	-	-	.7	4:10
-	-	-	-	.8	4:20
-	-	-	-	.8	4:30
-	-	-	-	.9	4:40
-	-	-	-	.9	4:50
-	-	-	-	1.0	5:00
-	-	-	-	1.1	5:15
-	-	-	-	1.1	5:30
-	-	-	-	1.2	5:45
-	-	-	-	1.2	6:00
-	-	-	-	1.3	6:30
-	-	-	-	1.4	7:00
-	-	-	-	1.5	8:00
-	-	-	-	1.6	9:00
-	-	-	-	1.7	10:00
-	-	-	-	1.8	12:00
-	-	-	-	1.9	13:00
-	-	-	-	2.0	15:00
-	-	-	-	2.3	20:00
-	-	-	-	2.4	25:00
-	-	-	-	2.6	30:00
-	-	-	-	2.7	35:00
-	-	-	-	2.8	40:00
-	-	-	-	2.9	42:00

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6B - Shut-In Test 1

Starting date: 12-19-78
Shut in after: Bailing
Hole depth: 640 feet
Cased interval: 0-590 feet
Tested interval: 590-640 feet
Diameter of tested interval: 4.75 inches
Geologic unit tested: Culebra Dolomite Member of the Rustler Formation
Packer type: Lynes PIP
Diameter: 4.5 inches

Packer set at 584.0 feet below land surface.
Measuring point (MP) was transducer pressure port below the packer which was 587.6 feet below land surface.
Static water level was 294.8 feet below land surface as measured at 0810 on 12-19-78.

REMARKS: t = time since bailing began (minutes)
t'= time since shut-in (minutes)

Clock time	Stop watch time (minutes: seconds)	Water pressure (feet of freshwater above MP)	t/t'	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 12-19-78					
1152	-	291.5	-	-	Pretest
1159	0:0	-	-	-	-
-	0:05	293.3	-	-	-
-	0:10	291.8	-	-	-
-	0:15	291.7	-	-	-
-	0:20	291.6	-	-	-
-	0:25	291.6	-	-	-
-	0:30	291.6	-	-	-
-	0:35	291.6	-	-	-
-	0:40	291.6	-	-	-
-	0:45	291.6	-	-	-
-	0:50	291.6	-	-	-
-	0:55	291.5	-	-	-
-	1:00	291.5	-	-	-
-	1:10	291.5	-	-	-
-	1:20	291.5	-	-	-
-	1:30	291.5	-	-	-

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6B - Shut-In Test 1 - Concluded

Clock time	Stop watch time (minutes: seconds)	Water pressure (feet of freshwater above MP)	t/t'	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 12-19-78					
-	1:40	291.5	-	-	-
-	1:50	291.6	-	-	-
-	2:00	291.5	-	-	-
-	2:30	291.6	-	-	-
-	3:00	291.6	-	-	-
-	3:30	291.6	-	-	-
-	4:00	291.6	-	-	-
-	5:00	291.6	-	-	-
-	6:00	291.6	-	-	-
-	7:00	291.6	-	-	-
-	8:00	291.6	-	-	-
-	10:00	291.6	-	-	Hydraulic head stabilized soon after packer was set. Formation at static. Shut-in test not possible.

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6B - Slug Test 1

Starting date: 12-19-78
Hole depth: 640 feet
Inside diameter (ID) of tubing: 2.0 inches
Geologic unit tested: Culebra Dolomite Member of the Rustler Formation.
Cased interval: 0-590 feet
Tested interval: 590-640 feet
Diameter of tested interval: 4.75 inches
Packer type: Lynes PIP with feed through
Diameter: 4.5 inches

Packer set at 584.0 feet below land surface.
Measuring point (MP) was transducer pressure port below packer which was 587.6 feet below land surface.
Static water level was 294.8 feet below land surface.

REMARKS: $\frac{H}{H_o} = \frac{h' - h_i}{h_o - h_i}$

Clock time	Water pressure (feet of freshwater above MP)	Time (seconds)	H/H_o	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 12-19-78					
-	291.5	-	-	0	Pretest
-	369.0	0	-	0	-
-	369.0	5	-	0	-
-	390.4	10	-	0	-
-	388.5	15	-	0	-
-	378.2	20	-	0	-
-	-	25	-	0	-
-	363.0	30	-	0	-
-	351.0	35	-	0	-
-	-	40	-	0	-
-	336.0	45	-	0	-
-	329.2	50	-	0	-
-	322.8	55	-	0	-
-	316.5	60	-	0	-
-	308.8	70	-	0	-
-	305.1	80	-	0	-
-	300.1	90	-	0	-
-	298.2	100	-	0	-
-	297.1	110	-	0	-
-	296.4	120	-	0	-
-	295.8	130	-	0	-
-	295.5	140	-	0	-
-	295.1	150	-	0	-
-	294.1	160	-	0	-
-	294.6	170	-	0	-

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6B - Slug Test 1 - Continued

Clock time	Water pressure (feet of freshwater above MP)	Time (seconds)	H/H_o	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 12-19-78					
-	294.5	180	-	0	-
-	294.3	190	-	0	-
-	294.1	200	-	0	-
-	294.0	210	-	0	-
-	293.9	220	-	0	-
-	293.8	230	-	0	-
-	293.7	240	-	0	-
-	293.7	250	-	0	-
-	293.6	260	-	0	-
-	293.5	270	-	0	-
-	293.4	280	-	0	-
-	293.4	290	-	0	-
-	293.4	300	-	0	-
-	293.3	315	-	0	-
-	293.3	330	-	0	-
-	293.2	345	-	0	-
-	293.1	360	-	0	-
-	293.1	375	-	0	-
-	293.0	390	-	0	-
-	293.0	405	-	0	-
-	292.9	420	-	0	-
-	292.9	435	-	0	-
-	292.8	450	-	0	-
-	292.8	465	-	0	-
-	292.8	480	-	0	-
-	292.7	495	-	0	-
-	292.7	510	-	0	-
-	292.6	525	-	0	-
-	292.6	540	-	0	-
-	292.6	555	-	0	-
-	292.6	570	-	0	-
-	292.6	585	-	0	-
-	292.6	600	-	0	-
-	292.6	630	-	0	-
-	292.5	660	-	0	-

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6B - Slug Test 1 - Concluded

Clock time	Water pressure (feet of freshwater above MP)	Time (seconds)	H/H_o	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 12-19-78					
-	292.5	720	-	0	-
-	292.5	780	-	0	-
-	292.4	840	-	0	-
-	292.4	900	-	0	-
-	292.4	960	-	0	-
-	292.2	1020	-	0	-
-	292.2	1080	-	0	-
-	292.2	1140	-	0	-
-	292.2	1200	-	0	-
-	292.2	1500	-	0	Zone too productive, not able to calculate T value.

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6B - Slug Test 2

Starting date: 12-19-78
Hole depth: 640 feet
Inside diameter (ID) of tubing: 2.0 inches
Geologic unit tested: Culebra Dolomite Member of the Rustler Formation
Cased interval: 0-590 feet
Tested interval: 590-640 feet
Diameter of tested interval: 4.75 inches
Packer type: Lynes PIP with feed through
Diameter: 4.5 inches

Packer set at 584.0 feet below land surface.
Measuring point (MP) was transducer pressure port below packer which was 587.6 feet below land surface.
Static water level was 294.8 feet below land surface.

REMARKS: $\frac{H}{H_o} = \frac{h' - h_i}{h_o - h_i}$

Clock time	Water pressure (feet of freshwater above MP)	Time (seconds)	H/H_o	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 12-19-78					
-	292.4	-	-	0	Pretest
-	-	0	-	0	-
-	381.0	5	-	0	-
-	385.0	10	-	0	-
-	379.9	15	-	0	-
-	372.1	20	-	0	-
-	363.0	25	-	0	-
-	357.1	30	-	0	-
-	348.4	35	-	0	-
-	341.1	40	-	0	-
-	334.0	45	-	0	-
-	328.5	50	-	0	-
-	322.7	55	-	0	-
-	317.8	60	-	0	-
-	309.1	70	-	0	-
-	304.1	80	-	0	-
-	300.5	90	-	0	-
-	298.7	100	-	0	-
-	297.7	110	-	0	-
-	296.9	120	-	0	-
-	296.4	130	-	0	-
-	295.0	140	-	0	-
-	295.7	150	-	0	-
-	295.4	160	-	0	-
-	295.2	170	-	0	-

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6B - Slug Test 2 - Concluded

Clock time	Water pressure (feet of freshwater above MP)	Time (seconds)	H/H_o	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 12-19-78					
-	295.0	180	-	0	-
-	294.8	190	-	0	-
-	294.7	200	-	0	-
-	294.6	210	-	0	-
-	294.5	220	-	0	-
-	294.4	230	-	0	-
-	294.3	240	-	0	-
-	294.3	250	-	0	-
-	294.2	260	-	0	-
-	294.1	270	-	0	-
-	294.1	280	-	0	-
-	294.0	290	-	0	-
-	294.0	300	-	0	-
-	293.9	315	-	0	-
-	293.9	330	-	0	-
-	293.8	345	-	0	-
-	293.8	360	-	0	-
-	293.8	375	-	0	-
-	-	390	-	0	-
-	293.7	405	-	0	-
-	293.6	420	-	0	-
-	293.6	435	-	0	-
-	293.5	450	-	0	-
-	293.5	465	-	0	-
-	293.4	480	-	0	-
-	293.4	510	-	0	-
-	293.4	540	-	0	-
-	293.4	570	-	0	-
-	293.3	600	-	0	-
-	293.2	630	-	0	-
-	293.2	660	-	0	-
-	293.2	720	-	0	-
-	293.1	780	-	0	-
-	293.1	840	-	0	-
-	293.0	1080	-	0.01	-
-	293.0	1200	-	.01	-
-	292.9	1500	-	.01	Zone too productive, not able to calculate T value.

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6C - Bailing Test 1

Starting date: 3-21-79
Hole depth: 741 feet
Cased interval: 0-699 feet
Tested interval: 699-741 feet
Diameter of tested interval: 4.75 inches
Geologic unit tested: Rustler Formation-Salado Formation contact

Water levels were measured with a pressure transducer.
Measuring point (MP) for the recovery from bailing was the pressure transducer which was 703 feet below land surface.
Static water level was 417.6 feet below land surface.

Type of bailer: Dart valve
Length: 19.5 feet
Diameter: 3.5 inches
Capacity: 9.75 gallons

A circular stock tank was used to hold the water removed during bailing.
Diameter of the stock tank: 7 feet.

Clock time	Bailer number	Depth of water in tank (feet)	Total volume in tank (gallons)	Water pressure (feet of freshwater above MP)	Time since bailing stopped (minutes:seconds)
Date: 3-21-79					
0908	1	-	-	-	-
0921	2	-	-	-	-
0926	3	-	-	-	-
0928	4	-	-	-	-
0929	5	0.15	43.2	-	-
0931	6	-	-	-	-
0932	7	-	-	-	-
0934	8	-	-	-	-
0936	9	-	-	-	-
0938	10	.32	92.1	-	-
0940	11	-	-	-	-
0942	12	-	-	-	-
0944	13	-	-	-	-
0945	14	-	-	-	-
0948	15	.50	144.0	-	-
0950	16	-	-	-	-
0952	17	-	-	-	-
0954	18	-	-	-	-

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6C - Bailing Test 1 - Concluded

Clock time	Bailer number	Depth of water in tank (feet)	Total volume in tank (gallons)	Water pressure (feet of freshwater above MP)	Time since bailing stopped (minutes:seconds)
Date: 3-21-79					
0956	19	-	-	-	-
0958	20	0.67	192.9	-	-
1000	21	-	-	-	-
1002	22	-	-	-	-
1004	23	-	-	-	-
1006	24	-	-	-	-
1008	25	.86	247.6	-	-
1010	26	-	-	-	-
1013	27	-	-	-	-
1015	28	-	-	-	-
1018	29	-	-	-	-
1027:20	-	-	-	0	9:20
-	-	-	-	0.2	10:30
-	-	-	-	.2	11:00
-	-	-	-	.3	11:15
-	-	-	-	.4	11:55
-	-	-	-	.5	12:45
-	-	-	-	.6	13:25
-	-	-	-	.7	14:30
-	-	-	-	.8	15:26
-	-	-	-	.9	16:27
-	-	-	-	1.0	17:30
-	-	-	-	1.1	18:38
-	-	-	-	1.2	19:45
-	-	-	-	1.3	20:57
-	-	-	-	1.5	25:00
-	-	-	-	1.8	30:00
-	-	-	-	2.1	36:00
-	-	-	-	2.3	42:00
-	-	-	-	2.4	45:00
-	-	-	-	2.5	50:00
-	-	-	-	2.7	60:00
-	-	-	-	2.8	70:00
-	-	-	-	3.0	81:00
-	-	-	-	3.1	90:00
-	-	-	-	3.2	100:00
-	-	-	-	3.3	110:00
-	-	-	-	3.4	120:00
-	-	-	-	3.5	135:00
-	-	-	-	3.7	150:00
-	-	-	-	4.0	180:00

Table 5. Hydrologic-test data for well H-6A, H-6B, and H-6C - Continued.

H-6C - Shut-In Test 1

Starting date: 3-21-79
Shut in after: Bailing
Diameter of tested interval: 4.75 inches
Geologic unit tested: Rustler Formation-Salado Formation contact
Hole depth: 741 feet
Packer type: Lynes PIP
Cased interval: 0-699 feet
Diameter: 4.50 inches
Tested interval: 699-741 feet

Packer set at 694.2 feet below land surface.
Measuring point (MP) was transducer pressure port below the packer which was 697.7 feet below land surface.
Static water level was 417.6 feet below land surface

REMARKS: t = time since bailing began (minutes)
t'= time since shut in (minutes)

Clock time	Stop watch time (minutes: seconds)	Water pressure (feet of freshwater above MP)	t/t'	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 3-21-79					
1513:30	-	6.7	-	0	Pretest
1524:56	0:00	-	-	0	-
-	:05	9.7	4524.2	0	-
-	:10	21.2	2262.6	0	-
-	:15	30.3	1508.7	0	-
-	:20	30.0	1131.8	0	-
-	:25	29.8	905.6	0	-
-	:30	29.8	754.9	0	-
-	:35	30.0	647.2	0	-
-	:40	30.0	566.4	0	-
-	:45	30.3	503.6	0	-
-	:50	30.5	453.3	0	-
-	:55	30.5	412.2	0	-
-	1:00	30.5	377.9	0	-
-	1:05	30.7	348.9	0	-
-	1:10	31.2	324.1	0	-
-	1:20	31.4	283.7	0	-
-	1:30	31.9	252.3	0	-
-	1:40	33.7	227.2	0	-
-	1:50	34.7	206.6	0	-

Table 5. Hydrologic-test data for well H-6A, H-6B, and H-6C - Continued.

H-6C - Shut-In Test 1 - Continued

Clock time	Stop watch time (minutes: seconds)	Water pressure (feet of freshwater above MP)	t/t'	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 3-21-79					
-	2:00	34.9	189.5	0	-
-	2:15	35.1	168.5	0	-
-	2:30	35.8	151.8	0	-
-	2:45	36.5	138.1	0	-
-	3:00	37.0	126.6	0	-
-	3:30	39.5	108.7	0	-
-	4:00	40.0	95.2	0	-
-	4:30	40.2	84.8	0	-
-	5:00	41.1	76.4	0	-
-	5:30	42.0	69.5	0	-
-	6:00	42.5	63.8	0	-
-	7:00	43.7	54.8	0	-
-	8:00	45.1	48.1	0	-
-	10:00	47.8	38.7	0	-
-	12:00	50.4	32.4	0	-
-	15:00	61.7	26.1	0	-
-	17:00	64.2	23.2	-0.01	-
-	20:00	69.5	19.8	- .01	-
-	25:00	77.6	16.1	- .01	-
-	30:00	86.2	13.6	- .01	-
-	35:00	95.2	11.8	- .01	-
-	40:00	104.4	10.4	- .01	-
1609:56	45:00	113.9	9.4	- .02	-
-	50:00	123.4	8.5	- .01	-
-	55:00	132.6	7.9	0	-
-	60:00	141.8	7.3	0	-
-	65:00	150.8	6.8	0	-
1630	-	151.1	6.8	0	-
-	75:00	167.2	6.0	0	-
1640	-	167.7	6.0	-0.01	-
-	85:00	175.1	5.7	.01	-
1650	-	181.8	5.4	.01	-
-	90:00	188.7	5.2	.02	-
1700	-	195.4	4.96	.03	-
1710	-	206.3	4.59	.03	-
1720	-	216.2	4.28	.05	-

Table 5. Hydrologic-test data for well H-6A, H-6B, and H-6C - Continued.

H-6C - Shut-In Test 1 - Continued

Clock time	Stop watch time (minutes: seconds)	Water pressure (feet of freshwater above MP)	t/t'	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 3-21-79					
1730	-	224.5	4.01	.06	-
1740	-	231.7	3.79	.06	-
1750	-	237.9	3.60	.06	-
1800	-	243.2	3.43	.07	-
1820	-	252.5	3.15	.09	-
1840	-	259.6	2.93	.11	-
1910	-	268.0	2.67	0.14	-
1930	-	272.6	2.54	.14	-
2000	-	278.1	2.37	.15	-
2030	-	282.3	2.24	.17	-
2100	-	286.2	2.13	.17	-
2130	-	289.4	2.03	.17	-
2200	-	291.9	1.95	.18	-
2230	-	294.3	1.89	.17	-
2300	-	296.4	1.83	.17	-
2330	-	298.5	1.78	.17	-
Date: 3-22-79					
0000	-	300.3	1.73	.17	-
0030	-	301.7	1.69	.16	-
0100	-	302.8	1.66	.17	-
0130	-	304.0	1.62	.15	-
0200	-	305.6	1.59	.15	-
0230	-	306.8	1.57	.15	-
0300	-	308.2	1.54	.15	-
0330	-	309.3	1.52	.15	-
0400	-	310.5	1.50	.15	-
0430	-	311.2	1.48	.15	-
0500	-	312.3	1.46	.17	-
0530	-	312.8	1.45	.17	-
0600	-	313.7	1.43	.18	-
0630	-	313.9	1.42	.19	-
0700	-	314.4	1.40	.19	-
0730	-	314.9	1.39	.19	-
0800	-	315.1	1.38	.19	-
0900	-	316.2	1.36	.17	-
1100	-	317.6	1.32	.14	-
1500	-	319.7	1.27	.08	-

Table 5. Hydrologic-test data for well H-6A, H-6B, and H-6C - Continued.

H-6C - Shut-In Test 1 - Concluded

Clock time	Stop watch time (minutes: seconds)	Water pressure (feet of freshwater above MP)	t/t'	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 3-22-79					
1600	-	321.3	1.26	.15	The following data
1700	-	323.2	1.25	.17	were taken from a
1800	-	324.1	1.24	.20	data logger and cor-
1900	-	324.8	1.23	.23	rected for inaccura-
2000	-	325.7	1.22	.30	cies caused by tem-
2100	-	326.2	1.21	.36	perature and power
2200	-	326.6	1.205	.38	fluctuations.
2300	-	327.1	1.199	0.40	-
Date: 3-23-79					
0000	-	327.6	1.193	.41	-
0100	-	327.8	1.187	.43	-
0200	-	328.3	1.182	.47	-
0300	-	328.7	1.177	.47	-
0400	-	329.6	1.172	.50	-
0500	-	330.1	1.167	.51	-
0600	-	330.3	1.163	.54	-
0700	-	329.6	1.159	.56	-
0800	-	328.5	1.155	.42	-
1540	-	326.2	1.130	-	-
Date: 3-24-79					
1040	-	327.8	1.093	-	-
1730	-	329.9	1.085	-	-
Date: 3-25-79					
1000	-	329.9	1.069	-	-
Date: 3-26-79					
0900	-	332.6	1.055	.22	-

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6C - Slug Test 1

Starting date: 3-26-79
Hole depth: 741 feet
Inside diameter (ID) of tubing: 2.0 inches
Geologic unit tested: Rustler Formation-Salado Formation contact
Cased interval: 0-699 feet
Tested interval: 699-741 feet
Diameter of tested interval: 4.75 inches
Packer type: Lynes PIP with feed through
Diameter: 4.5 inches

Packer set at 694.2 feet below land surface.
Measuring point (MP) was transducer pressure port below packer which was 697.7 feet below land surface.
Static water level was 417.6 feet below land surface.

REMARKS: $\frac{H}{H_o} = \frac{h' - h_i}{h_o - h_i}$

Clock time	Water pressure (feet of freshwater above MP)	Time (seconds)	H/H_o	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 3-26-79					
0905:58	332.6	0	-	0	Pretest
-	842.5	5	-	0	-
-	842.7	10	1.000	0	*
-	842.7	15	1.000	0	-
-	842.7	20	1.000	0	-
-	842.7	25	1.000	0	-
-	842.7	30	1.000	0	-
-	842.7	35	1.000	0	-
-	842.7	40	1.000	0	-
-	842.7	45	1.000	0	-
-	842.7	50	1.000	0	-
-	842.7	55	1.000	0	-
-	842.7	60	1.000	0	-
-	842.7	70	1.000	0	-
-	842.7	80	1.000	0	-
-	840.4	90	0.995	0	-
-	840.6	100	.996	0	-
-	840.4	120	.995	0	-
-	840.4	130	.995	0	-
-	840.4	140	.995	0	-
-	840.4	150	.995	0	-
-	840.4	160	.995	0	-
-	840.4	170	.995	0	-

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6C - Slug Test 1 - Continued

Clock time	Water pressure (feet of freshwater above MP)	Time (seconds)	H/H_o	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 3-26-79					
0908:58	840.4	180	0.995	0	-
0909:58	840.2	240	.995	0	-
-	840.2	300	.995	0	-
-	839.9	360	.995	0	-
-	839.9	420	.995	0	-
-	839.7	480	.994	0	-
-	839.5	540	.994	0	-
-	839.5	600	.994	0	-
-	838.8	900	.992	0	-
-	838.3	1200	.991	0	-
-	837.8	1500	.990	0	-
-	836.9	1800	.989	0	-
-	836.5	2100	.988	0	-
-	835.8	2400	.986	0	-
-	835.3	2700	.986	0	-
-	834.6	3000	.984	0	-
-	834.1	3300	.983	0	-
-	833.7	3600	.982	0	-
-	832.8	4200	.981	0	-
-	831.8	4800	.979	0	-
-	830.9	5400	.977	-0.01	The following were
-	829.8	5998	.975	.04	taken from a data
-	828.6	6596	.972	.04	logger and corrected
-	827.7	7194	.971	.03	for inaccuracies
-	827.0	7793	.969	.02	caused by tempera-
-	826.3	8391	.968	.02	ture and power fluc-
-	825.1	8989	.966	.02	tuations -
-	822.6	10783	.961	0	-
-	820.7	12578	.957	- .01	-
-	817.7	14372	.951	- .03	-
-	814.5	16167	.945	- .05	-
-	813.6	16765	.943	- .09	-
1405:19	811.5	17961	.939	- .05	-
1435:15	809.4	19757	.935	- .07	-
-	806.2	21553	.928	- .10	-
-	804.6	22750	.925	- .11	-
-	804.6	23222	.925	- .12	-

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6C - Slug Test 1 - Continued

Clock time	Water pressure (feet of freshwater above MP)	Time (seconds)	H/H_o	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 3-26-79					
-	804.3	23400	0.925	-0.12	-
-	802.5	24832	.921	- .08	-
-	800.2	28409	.917	- .07	-
-	800.2	31986	.917	- .05	-
-	801.3	35563	.919	0	-
-	800.2	39140	.917	.01	-
-	797.9	42717	.912	.13	-
-	795.1	46294	.907	.14	-
-	792.8	49872	.902	.16	-
-	790.0	53449	.897	.19	-
Date: 3-27-79					
-	787.5	57026	.892	.23	-
-	784.7	60603	.886	.25	-
-	782.4	64180	.882	.25	-
-	779.9	67757	.877	.27	-
-	777.1	71334	.871	.29	-
-	774.5	74912	.866	.31	-
-	770.6	78489	.859	.33	-
-	766.0	82066	.850	.34	-
-	763.5	84062	.845	.20	-
-	751.2	93602	.821	.20	-
-	742.0	103442	.803	.20	-
-	738.5	109442	.796	.20	-
Date: 3-28-79					
08:45	698.1	171542	.716	-	-
-	692.3	176342	.705	-	-
-	690.7	179642	.702	-	-
-	689.1	183242	.699	-	-
-	684.5	190442	.690	-	-
1500	683.5	194042	.688	-	-
1600	682.6	197642	.686	-	-

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Continued.

H-6C - Slug Test 1 - Continued

Clock time	Water pressure (feet of freshwater above MP)	Time (seconds)	H/H_o	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 3-29-79					
0800	654.4	255242	0.631	-	-
-	653.0	258842	.628	-0.03	-
-	650.3	262442	.623	- .07	The following data
-	648.4	266042	.619	- .08	were taken from a
-	645.9	269642	.614	- .11	data logger and cor-
-	643.8	273242	.610	- .14	rected for inaccur-
-	641.5	276842	.606	- .17	acies caused by tem-
-	640.1	280442	.603	- .19	perature and power
-	638.5	284042	.600	- .20	fluctuations.
-	638.7	287642	.600	- .20	-
-	639.0	291242	.601	- .19	-
-	638.5	294842	.600	- .16	-
-	637.1	298442	.597	- .13	-
-	635.9	302042	.595	- .10	-
-	635.3	305642	.593	- .07	-
-	633.4	309242	.590	- .03	-
-	633.6	312842	.590	- .02	-
Date: 3-30-79					
0100	631.8	316442	.587	0	-
-	631.6	320042	.586	.01	-
-	629.9	323642	.583	.03	-
0400	629.7	327242	.582	.04	-
-	628.8	330842	.581	.04	-
-	626.2	334442	.576	.09	-
-	623.2	338042	.570	.09	-
-	620.2	341642	.564	.09	-
-	602.5	371342	.529	.09	-
Date: 3-31-79					
0800	584.0	428042	.493	-	-
-	573.8	447842	.473	-	-

Table 5. Hydrologic-test data for wells H-6A, H-6B, and H-6C - Concluded.

H-6C - Slug Test 1 - Concluded

Clock time	Water pressure (feet of freshwater above MP)	Time (seconds)	H/H_o	Change in barometric pressure (inches of mercury referenced to 0)	Remarks
Date: 4-1-79					
1245	548.6	531542	0.423	-	-
Date: 4-2-79					
0815	533.8	601742	.394	-	-
Date: 4-3-79					
0815	512.4	688142	.352	-	-
1020	508.7	695642	.345	-	-
-	505.2	714542	.338	-	-
Date: 4-4-79					
0805	496.2	773942	.321	-	-
1630	484.6	804242	.298	-	-
Date: 4-5-79					
0855	475.4	863342	.280	-	-
Date: 4-9-79					
0930	433.4	1211042	.197	-	-

$$* \frac{H}{H_o} = \frac{h' - 332.6}{842.7-332.6}$$

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