PARSONS BRINCKERHOFF GORE & STORRIE

VILLAGE OF PALM SPRINGS

WELL COMPLETION REPORT

FOR

REPLACEMENT WELLS

CONSTRUCTED IN 1992

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Submitted to
Eckler Engineering

by:

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TABLE OF CONTENTS

Section			Page
SECTION 1	INTRODUCTION		1-1
SECTION 2	WELL CONSTRUCTION AND TESTING		
	2.1	Test/Pilot Hole Drilling	2-1
	2.2	Geophysical Logging	2-1
	2.3	Final Well Design	2-3
	2.4	Production Well Drilling	2-6
	2.5	Step-Drawdown Testing	2-8
	2.6	Specific Capacity	2-9
	2.7	Well Loss	2-11
	2.8	Well Efficiency	2-13
	2.9	Sand Testing	2-15
	2.10	Water Quality Testing	2-18
	2.11	Television Camera Surveying	2-19
	2.12	Summary of Well Testing	2-20
SECTION 3	HYDROGEOLOGY		
	3.1	General Hydrogeology	3-1
	3.2	Wellfield Site Hydrogeology	3-2
	3.3	Aquifer Transmissivity	3-8
SECTION 4	WELLFIELD MAINTENANCE AND OPERATION		
	4.1	Recommended Testing and Maintenance Procedures	4-1
	4.2	Wellfield Operation	4-3
	4.3	Summary	4-3
REFERENCES			

TABLE OF CONTENTS (continued)

Appendix A - Well Completion Reports

Appendix B - Geologic Logs

Appendix C - Geophysical Logs

Appendix D - Well Construction Chronology

Appendix E - Step-Drawdown Data

Appendix F - Bacterial Analysis

Appendix G - Water Quality Analysis

LIST OF FIGURES

Figure		Page
1-1	General Location Map	1-1
1-2	Well Location Map	1-2
2-1	Analysis of #6-10 Gravel Pack Material	2-3
2-2	Sand Analysis Curves	2-4
2-3	Sand Curve Analysis of a Typical Palm Springs Sample (Well No. 3E, 145-150 feet)	2-5
2-4	General Well Design	2-7
3-1	Cross Section Location Map	3-6
3-2	West - East Cross Section	3-7
3-3	North - South Cross Section	3-9
3-4	Transmissivity Calculation Graph	3-12
3-5	Drawdown Graph Well No. 1E	3-12
3-6	Drawdown Graph Well No. 2E	3-13
3-7	Drawdown Graph Well No. 3E	3-13
3-8	Drawdown Graph Well No. 4E	3-14
3-9	Drawdown Graph Well No. 11E	3-14
3-10	Drawdown Graph Well No. 1W	3-15
3-11	Drawdown Graph Well No. 2W	3-15

LIST OF TABLES

Table		Page
2-1	Drawdown and Specific Capacity	2-10
2-2	Well Loss Constants	2-12
2-3	Well Loss and Well Efficiencies	2-14
2-4	Sand Concentration	2-16
3-1	Development Hours	3-4
3-2	Gravel and Theoretical Volume	3-5
3-3	Transmissivity	3-16
4-1	Design Rates and Specific Capacities at 20 Minutes	4-2

SECTION 1

INTRODUCTION

In September 1991, the Village of Palm Springs (Figure 1-1) was granted a modification of Water Use Permit Number 50-00036-W by the South Florida Water Management District (SFWMD). The modification allows the Village to plug and abandon six (6) public water supply wells in the eastern wellfield and to install six (6) replacement wells, four (4) in the eastern wellfield and two (2) in the western wellfield. The Village did not request a change in allocation in this modification of the permit.

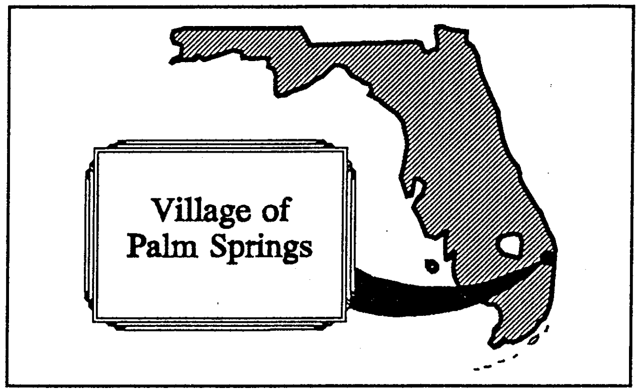

Figure 1-1 General location map

PBG&S was contracted by Eckler Engineering to prepare technical specifications for, and to provide Hydrogeologic Field Services during, the construction of these six (6) replacement production wells for the Village of Palm Springs. The bid opening for the contract specifications was on November 11, 1991. Meridith Corporation was the low bidder with a bid of $308,860.00, or an approximate bid cost of $51,500.00 per well. The high bid was $498,445.00, or $83,100.00 per well. One (1) additional well was added as a replacement for Well No. 11 in the eastern wellfield after the bid process was complete. The total construction cost for the seven wells was $333,203.00 or approximately $47,600.00 per well. This amount is approximately $4000.00 less per well, or 9% less, than the bid amount.

This report describes the test/pilot hole drilling, well construction, testing procedures and results, water quality analyses, and hydrogeology of the wells. The report also includes recommended operation and maintenance procedures for the wells and wellfields. The location of the Village of Palm Springs eastern and western wellfields is shown in Figure 1-2.

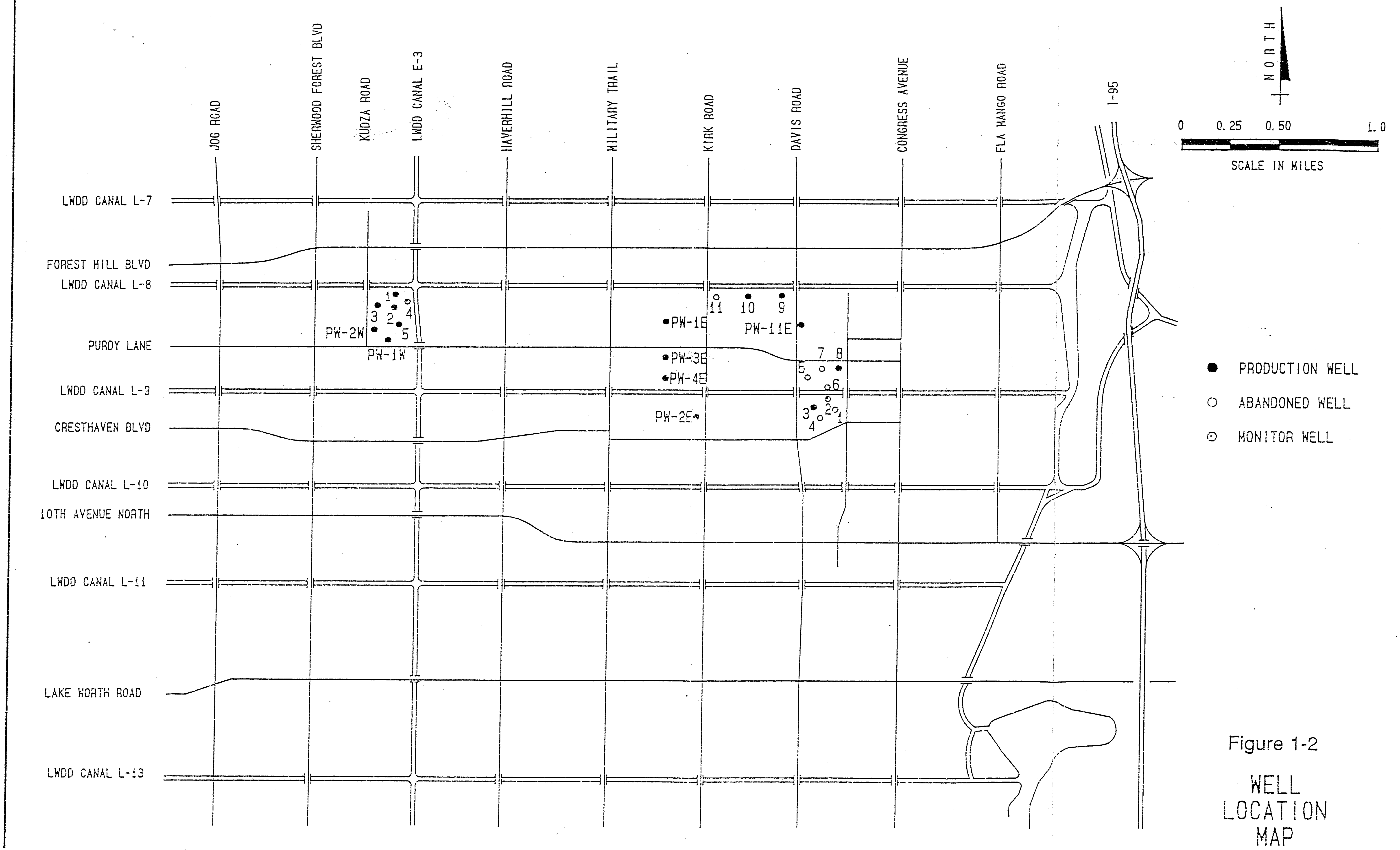

Figure 1-2

WELL LOCATION MAP

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SECTION 2

WELL CONSTRUCTION AND TESTING

2.1 TEST/PILOT HOLE DRILLING

Drilling was initiated on February 7, 1992, for the first of the seven (7) test/pilot holes for the Village of Palm Springs replacement production wells. A test/pilot hole was drilled at each proposed production well site (shown in Figure 1-2) to determine the casing depth, screen interval, screen dimensions, and gravel pack size. The test/pilot holes were drilled using conventional mud rotary techniques. Five (5) of the test/pilot holes were drilled to an approximate depth of 220 feet below land surface (bls). Two (2) of the test/pilot holes were drilled to an approximate depth of 300 feet bls. The exact depths of the test/pilot holes are given in the well completion reports included as Appendix A. The tricone rock bits used to drill the test/pilot holes varied from 5 ¼-inch diameter to 7 ⅞-inch diameter. Temporary 6-inch diameter surface casing was set to approximately 30 feet bls for test/pilot hole drilling of the first six (6) wells. 30-inch diameter surface casing was set approximately 64 feet bls before drilling the test/pilot hole for replacement Well No. 11E.

Formation samples were taken using procedures recommended by UOP, Johnson Division, modified to suit South Florida drilling conditions. The method was as follows: the formation was sampled at ten-foot intervals until rock was encountered; thereafter two (2) sets of samples were taken at five-foot intervals, or at each change in lithology. One (1) set of formation samples was sent by Meridith Corporation to the South Florida Water Management District. One (1) set of formation samples was forwarded to Houston Well Screen Company for sieve analysis. The analyses, along with the geophysical logs and drilling conditions, were used in the determination of casing depth, screen length, screen interval, screen slot size, and gravel pack size. Formation samples were described in the field by a PBG&S hydrogeologist, and a geologic log was compiled for each well. The geologic logs are a composite of the physical properties of the lithologic samples and interpretations by the hydrogeologist of the subsurface conditions encountered during the drilling of the test/pilot holes. Geologic logs of the test/pilot holes are included as Appendix B. The test/pilot hole drilling was completed on June 3, 1992.

2.2 GEOPHYSICAL LOGGING

After each test/pilot hole was drilled, the hole was geophysically logged by Southern Resource Exploration of Gainesville, Florida, (subcontracted to Meridith Corporation), using natural gamma ray, electric (spontaneous potential, single point resistivity, and short normal resistivity) and caliper logs, as required by the SFWMD. The geophysical logs of the wells are included as Appendix C. Geophysical logging was completed June 3, 1992.

Geophysical well logging uses a sensing device, lowered into a well and/or borehole, to record various physical parameters. The physical parameters/measurements indicate characteristics of the rock, the fluid contained in the rock and borehole, and/or the construction characteristics of the well. The following is a brief technical description of the function of each geophysical log and its purpose in the logging program of this wellfield project.

Gamma Ray Log - The gamma ray log measures the amount of radioactivity naturally present in the formation. Gamma radiation is emitted from formation material such as clays and sands with heavy mafic constituents. The gamma ray log is usually effective in determining formation breaks.

Electric Logs - The electric logs are a suite of logs consisting, in this case, of the following: spontaneous potential, single point, and short normal.

Spontaneous Potential - The spontaneous potential (S.P.) is a small electric voltage generated at the boundaries of permeable rock units, especially between such strata and less permeable units. The contact between drilling mud and formation fluid is another area where S.P. may be generated. Generally, in limestones and dolomites of similar water quality in the Biscayne/Turnpike aquifer, the S.P. log generates little useful or correlatable data. It can, however, pick up clay units that might otherwise not be noted during the drilling of the formation.

Resistivity Logs - The electric resistivity of a rock (resistance per unit volume) depends primarily on the amount of fluid contained in the rock and its electrical resistance and/or ionic characteristics. The amount of fluid in the rock is a function of the porosity, hence the porosity of the rock is related to its resistivity. Resistivity is the inverse of conductivity. Therefore a rock with less porosity would be more resistive than a rock with greater porosity, assuming the water quality was the same in both rocks. A porous rock with salt water would have a low resistivity,while the same rock invaded by drilling mud might imitate high resistivity and therefore, low porosity. To measure resistivity, three types of resistivity logs are used to eliminate the interference of drilling procedures with the log representation of the formations characteristics.

a. The single point resistivity log sends out an electrical impulse into the formation and receives it back at the same point. The current therefore measures the formation at the face of the borehole wall. This log is acceptable without long and short normal resistivity logs in a clean borehole uncontaminated by drilling muds.

b. The short normal resistivity log sends the impulse out at one point and receives the signal back at a receiver located 16 inches above the transmitter, hence, the electrical current transmits beyond the borehole wall and into the formation.

c. The long normal resistivity log behaves as the short normal, except that the spacing between the transmitter and the receiver is 60 inches. This allows determination of the resistance at a considerable distance from the borehole. The long normal log was not performed in this logging program.

Caliper Log - The caliper log is a tool that determines the average gauge of the borehole, i.e. measures the diameter of the borehole. The caliper tool is used to find cavities, washouts and fractures in the borehole. The log can be used to determine the proper casing seat for the well, and to determine more accurate volumetric calculations for cementing and gravel packing wells. The log can also be used to find holes, splits and separations in well casings.

2.3 FINAL WELL DESIGN

Upon receiving the necessary data (geophysical logs and sieve analyses) from the subcontractor, PBG&S was able to finalize the well designs, including selection of the casing seat, gravel pack size, screen slot size, and screen interval. PBG&S hydrogeologists determined the final designs of the wells based on the geophysical logs, the geologic logs, the hydrogeologists' observations during the pilot hole drilling, the sieve analyses, gravel pack size analyses, and screen slot size analyses. The sieve, gravel pack, and screen slot size analyses were provided by Houston Well Screen Company. PBG&S concurred with Houston's gravel size recommendation, however decided to choose a well screen

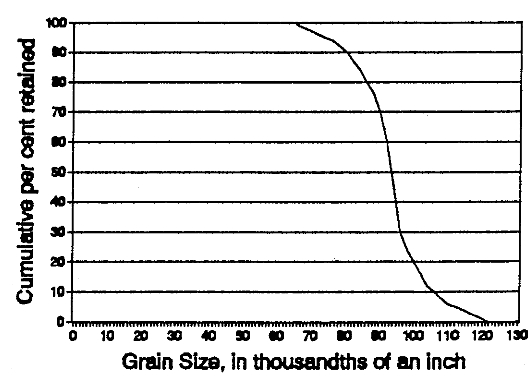

Figure 2-1 Analysis of #6-10 gravel pack material

with a slightly larger slot size (60 slot design instead of the recommended 50 slot). The design criteria were determined with the knowledge that the larger screen slot size also withheld 100% of the gravel pack and that the larger slot size would allow more water to enter the screen at a lower velocity. The gravel pack consisted of 6-10 Pearl/James gravel having a size range of 2.00 to 3.36 mm and a uniformity coefficient of 1.175 (Figure 2-1). When the Pearl/James gravel was not available, Pebble Tec gravel of equal size and quality was substituted.

Figure 2-2 shows idealized types of sand analysis curves. Type A curves are typical of fine, uniform sand that yields limited quantities of water. Class B curves show fine sand with 10 to 20 percent coarse particles. Class C curves are typical of medium and coarse sand mixtures with good permeability. Class D curves are typical of sand and gravel (shell and rock) mixtures with good permeability. Sieve analysis on all of the wells indicated that the sand portion of the samples was a fine-grained sand (Figure 2-3)

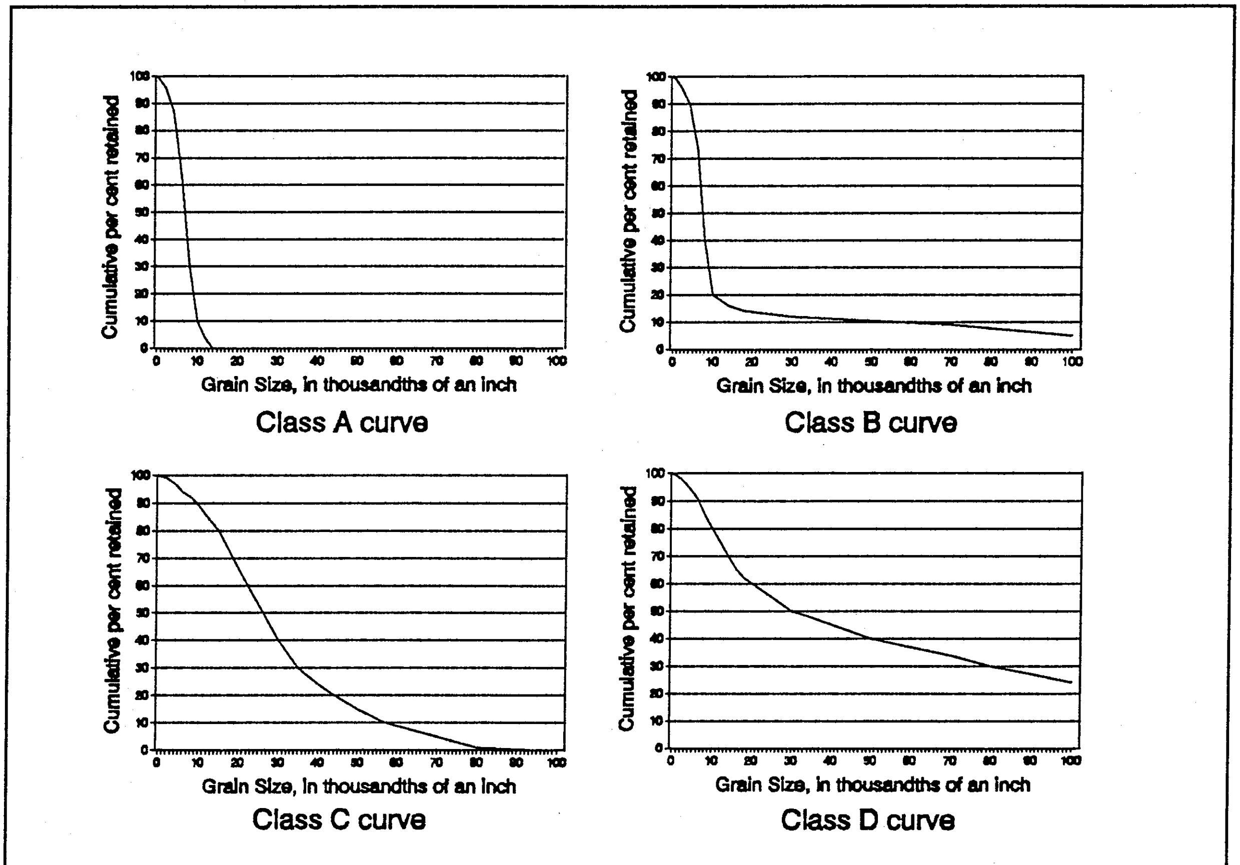

Figure 2-2 Sand analysis curves

matching a Type A curve. This curve indicates a low yield well needing a screen with a fine slot size averaging .10 to .15 inches for a naturally gravel packed well. The screen capacity of this size screen would be 13 gallons per foot of screen, with a yield of approximately 500 gallons per minute (maximum screen transmitting capacity). The rock portion of the sample and the vugular nature of the formation indicate the need for a larger slot size and a gravel pack. The slot size and gravel pack selection were based on the general principle, with noted modifications, of developing the fine sand out, and using the gravel pack as a formation stabilizer and a velocity reduction enhancer. This mechanism is discussed further in Section 3.2 of this report. In general the screen slot size and gravel pack design were done as follows:

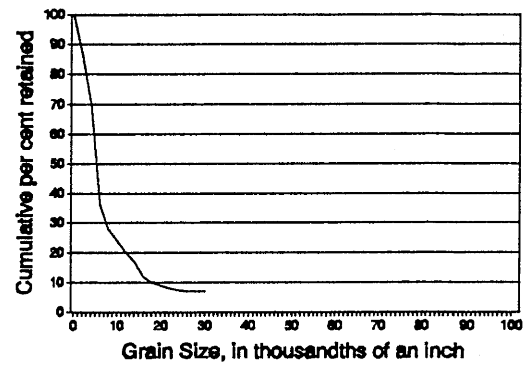

Figure 2-3 Sand curve analysis of a typical Palm Springs sample (Well No. 3E, 145-150 feet)

1. The gravel pack size was selected based on the finest sand, as seen in the sand analysis curves.

2. The 70 percent size was multiplied by a factor between 4 and 9. (Lower factors are used if the formation is fine and uniform, however higher factors are used when the formation is highly non-uniform. The latter condition occurs in Palm Springs where the formation is comprised of rock and shell in addition to the fine-grained sand seen in the sand analysis curves.) The result was considered to be the 70 percent size of the gravel pack material.

3. A smooth curve representing a uniform gravel pack material with a uniformity coefficient of 2.5 or less was drawn through the 70 percent size of the gravel.

4. The range of sieve sizes covering the gravel pack curve was selected, and the percentage of material retained by each sieve was noted.

5. A well screen slot size was selected that would retain 80 percent of the gravel pack material.

Selection of a screen slot size that retains 100 percent of the gravel pack, rather than the standard 80 percent, resulted in less development time for the wells. A larger screen slot size allows more water through the gravel pack at a higher velocity. However, the velocity of the water through the screen decreases, causing less drawdown in the well from friction loss in the wellscreen. Increased velocity through the gravel pack allows fine sand from the formation to move through the gravel pack and into the well without the potential for the sand being trapped in the gravel pack. By maintaining the finer size of the gravel pack, any sand removed from the formation is replaced by the gravel. To facilitate this replacement process, the gravel pack was maintained 30 to 40 feet above the screened interval. This construction practice allowed the weight of the gravel pack to drive the gravel into the formation as the sand was being pulled into the well. Because of the location of the well in close proximity to homes, power lines, and streets (approximately 15 to 20 feet), a conservative gravel pack design was necessary to minimize the potential of developing out the sand without providing the gravel pack as a structural support. This design was used to alleviate the potential of a catastrophic collapse of the formation during well development. The selection of this screen and gravel pack also decreased operational and maintenance costs related to the efficiency of the well, i.e. drawdown.

A graphical representation of the general well design can be found in Figure 2-4. Information on the final design specific to each well can be found in the well completion reports (Appendix A).

2.4 PRODUCTION WELL DRILLING

Meridith Corporation vibrated in 60 feet of 30-inch diameter surface casing after logging the pilot holes for Wells No. 1E, 2E, 3E, 4E, 1W, and 2W. The contractor vibrated in 64 feet of 30-inch diameter surface casing for Well No. 11E before drilling the pilot hole.

After PBG&S's selection of well casing depths, well screen and gravel pack design, the contractor was authorized to proceed with construction of the production wells. To construct each well, the contractor drilled a 29-inch diameter hole using a staged 29-inch diameter ream bit, a 23-inch diameter bit, a 19-inch diameter bit and a 12-inch diameter lead bit. The lead bit was used to ensure that the reamed hole followed the pilot hole. The 20-inch diameter casing was installed and cemented in place using the Halliburton Pressure Grout method. Cementing of the casing was performed by Halliburton Services. The cement used on five (5) of the wells was a Type II neat cement grout, with a yield

GENERAL WELL DESIGN
Village of Palm Springs

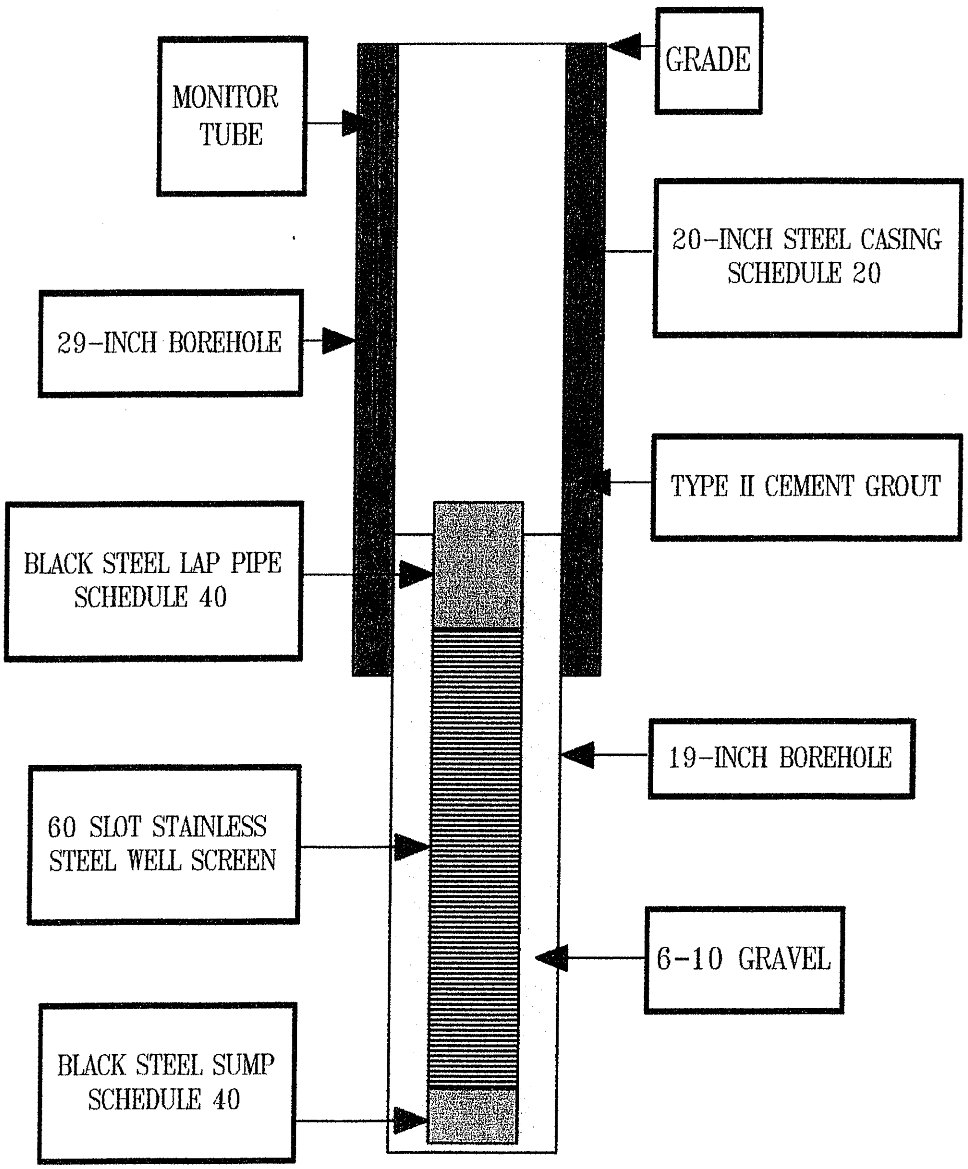

Figure 2-4
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of 1.27 cubic feet per sack, 5.2 gallons of water per sack, and a weight of 15.6 pounds per gallon. Time constraints on site access necessitated the use of a 1% calcium chloride additive to accelerate hardening of the grout on two (2) of the wells (Well No. 2E and Well No. 1W). For wells cemented with Type II neat cement grout, a minimum of 72 hours elapsed before the contractor proceeded to drill out below the casing to the final depth of each well. For wells with the calcium chloride additive, a minimum of 24 hours elapsed before the contractor drilled out below the bottom of the casing. During the cementing of the casing for Well No. 4E, the monitor tube was inadvertently cemented closed. This problem was corrected on September 8, 1992, when Aquifer Maintenance and Performance Systems (AMPS), subcontracted to Meridith Corporation, successfully drilled out the monitor tube. After drilling a 20-inch diameter hole to total depth, the contractor then installed a 12-inch diameter stainless steel well screen. The gravel pack was emplaced as a sterilized slurry around the well screen using a tremie pipe. The tremie method mitigated the possibility of the gravel or the formation bridging in the annulus between the well screen and the borehole. Each well took a variable amount of gravel, ranging from 155 to 649 sacks (see Table 3-2).

All wells were developed using the compressed air development method until they were free of drilling mud and sand, and the gravel pack had stabilized. This method consisted of using an air surge tank and air compressor. Development of each well took a variable amount of time, ranging from 71.0 to 190.5 hours (see Table 3-1). Development water was directed through pipes to storm culverts or to canals. This eliminated the potential for flooding of sites and streets.

The construction details of each well are included in the well completion reports (Appendix A). The chronology of the construction of each well is given in the well chronology reports included in Appendix D.

2.5 STEP-DRAWDOWN TESTING

A step-drawdown test was performed on each well upon completion of development. The data collected during the step-drawdown tests were used in the evaluation of the performance, efficiency, and specific capacity of the respective wells at the different pumping rates.

The step-drawdown tests involved pumping each well for approximately one hour until water level stabilization was reached at each of three increasing pumping rates. The water levels were allowed to recover one hour to static levels before each increase in pumping rate. The changes in water levels within each well were measured with use of an electric water level probe (M-scope) during both the drawdown and recovery periods.

Discharge from each well was controlled using a gate valve and measured with a calibrated flow meter. Use of an orifice plate and manometer was impossible due to the need to direct and control flows into storm culverts. The drawdown data for each well is included in Appendix E.

2.6 SPECIFIC CAPACITY

The productivity (quantity of water produced) of a production well can be expressed in terms of specific capacity. The specific capacity of a well is defined as the ratio of the pumping rate to the drawdown:

$$C_s = \frac{Q}{s} \tag{2.0}$$

where C_s = specific capacity of the well, gallons per minute per foot
Q = pumping rate, gallons per minute
s = drawdown, feet

Estimating the specific capacity of a well requires determining the drawdown from a static water level to a pumping water level within the well at each pumping rate for a given span of time. Specific capacity is measured in gallons per minute pumped per foot of drawdown (gpm/ft per unit of time) and is used to correlate well efficiency. The higher the specific capacity, the more efficient the well, as long as all other factors are equal. Specific capacity changes in a non-linear fashion with increased pumping rates because a well cannot, in reality, be 100 percent efficient. Slight decreases in the specific capacity with increased pumping rates are to be expected in wells that have been fully stabilized and are no longer developing.

Specific capacities derived after 60 minutes of pumping (except where noted) at varying rates range from 16.26 to 451.81 gpm/ft. Table 2-1 shows the specific capacities and drawdowns for each well at each of the well's pumping rates.

Results of the step-drawdown test and the specific capacity analysis on Well No. 3E indicate that the well was still developing at the time of the step-drawdown test. The specific capacity increased through each successive pumping rate, from 24.73 gpm/ft at 550 gpm of discharge at 50 minutes to 27.3 gpm/ft at 1650 gpm of discharge at 50 minutes. These results suggested that the well was increasing in efficiency through

TABLE 2-1
DRAWDOWN AND SPECIFIC CAPACITY

Well Number	Rate (gpm)	Drawdown (ft at 60 min)	Specific Capacity (gpm/ft at 60 min)
1E	685	26.14	26.21
	1050	40.36	26.02
	1400	54.20	25.83
2E	300	17.79	16.86
	700	40.45	17.31
	800	49.20	16.26
3E	550	22.24 (at 50 min)	24.73 (50 min)
	1100	42.77 (at 50 min)	25.72 (50 min)
	1650	60.43 (at 50 min)	27.30 (50 min)
4E	595	20.99	28.35
	1200	40.48	29.38
	1600	55.90	28.62
11E	650	28.78	22.59
	850	39.81	21.35
	1225	58.67	20.88
1W	740	2.13	347.42
	1530	5.36	285.45
	2270	9.78	232.11
2W	700	1.66	451.81
	1380	3.54	389.83
	2100	5.94	353.54

increased discharge rates. This increase in specific capacity cannot occur if the well is completely developed. Wells No. 2E and No. 4E also show slight problems with stabilization of the gravel pack. All of these problems with development will be corrected in time with further pumping at the designed pumping rates and/or current projected operating rates and should not be considered a major concern for the wells' longevity.

2.7 WELL LOSS

Well loss is defined as head loss attributable to well inefficiency due to turbulent flow of water through the well screen and inside the casing to the pump intake (Jacob, 1946). Well loss can be expressed as a well loss constant (C), the well loss in feet (S_w), and as well efficiency (%).

The well loss constant is derived from a comparison of the drawdown data at the various pumping rates of the step-drawdown test. This constant is in turn expressed as well loss in feet or as well efficiency. The value of C may be computed from step-drawdown test data using the following equation (Jacob, 1946):

$$C = \frac{(\Delta s^{i}/\Delta Q_i) - (\Delta s^{i-1}/\Delta Q_{i-1})}{\Delta Q_{i-1} + \Delta Q_i} \qquad (2.1)$$

where C = well loss constant, second^2 per feet^5
i = any given pumping step
Δs^i = incremental drawdown associated with step i, feet
ΔQ_i = incremental pumping that produces incremental drawdown (s^i) associated with step i, cubic feet per second

Table 2-2 lists the well loss constants (C values) for each well. The average C values range from -0.7624 to 5.0082 second^2 per feet^5. Changes in the C value for each well are affected by changes in discharge rates and shifting of the gravel outside the well, especially in unstable wells such as new wells. Well No. 3E has negative C values, confirming the interpretation of the well efficiency data that the well was still developing at the time of the step-drawdown test. (Walton, personal communication, 1985). However, the C value of steps 1 and 2 for Well No. 3E is not considerably greater than the C value of steps 2 and 3, indicating that the well was not developing during the step-drawdown test (Walton, 1991).

The large increase between the value of C of steps 1 and 2 and the value of C of steps 2 and 3, seen in Well No. 2E, indicates that clogging has occurred during the step-

TABLE 2-2
WELL LOSS CONSTANTS

Well Number	C_{1-2} (sec₂/ft⁵)	C_{2-3} (sec^2/ft^5)	$C_{(1+2)-3}$ (sec^2/ft^5)	$C_{1-(2+3)}$ (sec^2/ft^5)	C_{ave} (sec^2/ft^5)
1E	0.1531	0.1645	0.1589	0.1560	0.1581
2E	-0.7625	12.4277	7.4814	0.8863	5.0082
3E	-0.5693	-0.9555	-0.8268	-0.6980	-0.7624
4E	-0.4142	0.9700	0.4553	0.0681	0.2698
11E	2.5766	-1.7013	0.5686	1.2670	0.6777
1W	0.1593	0.2481	0.2191	0.1883	0.2037
2W	0.1125	0.0521	0.0737	0.0918	0.0825

drawdown test (Walton, 1991). The average C value for Well No. 2E is 5.0082 (see Table 2-2). Walton (1991) states that "clogging due to incomplete well development or well deterioration is generally negligible when C is <5 sec^2/ft^5. Values of C between 5 and 10 sec^2/ft^5 indicate mild clogging or well deterioration, and clogging or well deterioration is severe when C is >40 sec^2/ft^5." Well No. 2E shows negligible to mild clogging during the step-drawdown test. This concern is due to the well's production of large amounts of sand, and the concern will probably be alleviated when the flow control valve is in place, thereby reducing formation breakdown due to water hammer and/or surging of the well. It should be noted that this well needs to watched closely and may need more frequent rehabilitation.

Well loss in feet is the approximate head loss in feet due to the well's inefficiency. Well loss in feet may be computed using the following equation (Jacob, 1946):

$$s_w = CQ^2 \tag{2.2}$$

where s_w = well loss, feet
C = well loss constant, second^2 per feet^5
Q = production well discharge, cubic feet per second (cubic feet per second)

Substitution of C, calculated for each well, into the equation 2.2 yields a range in well loss of 0.23 to 15.91 feet (excluding data from Well No. 3E). The negative well losses calculated for Well No. 3E indicate that the well was still developing at the time of the step-drawdown test. Table 2-3 lists the well losses for each well.

2.8 WELL EFFICIENCY

Well efficiency is defined as the percentage of actual drawdown that is attributable to well loss. This number can be obtained by dividing the theoretical drawdown by the actual drawdown, multiplied by 100 percent. For the purposes of this report, the theoretical drawdown is calculated as the actual drawdown minus the well loss. The name 'well efficiency', in this context, can be misleading because it does not confer that the efficiency (productivity) is due to aquifer characteristics (theoretical drawdown) as well as the well characteristics (well loss). Therefore, wells with lower well efficiencies should not be thought of as necessarily inferior to wells with higher well efficiencies. In the case of the Village of Palm Springs, all the new replacement wells were similarly designed. Well efficiencies for the new wells range from 47 to 99 percent (excluding Well No. 3E). Lower well efficiencies in the western wells are not due to well design but are due to the greater transmissivity of the aquifer in the west. Table 2-3 includes well efficiencies for each well.

The well efficiencies for Well No. 3E were calculated to be above 100%, indicating that the well was still developing at the time of the step-drawdown test. Increased well efficiencies with higher pumping rates in Well No. 3E indicate that the well is pumping at greater efficiency at increased pumping rates. Increase in well efficiency should not occur if the well is completely developed. Negative numbers for the well loss along with the increasing specific capacity also indicate that the well is not completely developed. This concern should correct itself after additional pumping.

TABLE 2-3
WELL LOSS AND WELL EFFICIENCIES

Well Number	Rate (gpm)	Well Loss (ft)	Well Efficiency (percent)
1E	685	.37	99
	1050	.87	98
	1400	1.54	97
2E	300	2.24	87
	700	12.18	70
	800	15.91	68
3E	550	-1.14	105
	1100	-4.58	111
	1650	-10.30	117
4E	595	.47	98
	1200	1.93	95
	1600	3.43	94
11E	650	1.42	95
	850	2.43	94
	1225	5.05	91
1W	740	.55	74
	1530	2.37	56
	2270	5.21	47
2W	700	.23	86
	1380	.78	78
	2100	1.81	70

2.9 SAND TESTING

Sand tests were performed on each well to determine the amount of sand produced during pumping. The device used to determine the amount of sand produced by each well was a LAKOS Laval Sand Separator Model No. IL-0100-B. Approximately twenty gallons per minute of water were diverted through the sand separator during each step of the step-drawdown test. Upon completion of each step, the sand was removed from the sand separator, dried, and analyzed for weight by a PBG&S hydrogeologist at the Village of Palm Springs laboratory. The amount of sand produced in milligrams per liter (mg/l) was determined by the following equation (Witt, 1983):

$$S = \frac{S_{wt} \times 1000}{Q \times t \times 3.785} \tag{2.3}$$

where
- S = sand content, milligrams per liter
- S_{wt} = weight of sand, grams
- 1000 = equation constant, milligrams per gram
- Q = rate through the sand separator, gallons per minute
- t = time, minutes
- 3.785 = equation constant, liters per gallon

The results of the sand content analyses are shown in Table 2-4. The amount of sand that the wells pumped during the step-drawdown tests increased with each increase in the pumping rate. Upon the completion of recovery of the final pumping step of the step tests, each well was pumped for one (1) hour and sand samples were collected at 5, 30, and 60 minutes, without stopping the pumping. The sand separator was operated in the manner previously described. Sand samples were removed from the sand separator and analyzed as previously described. The decrease in sand content seen in the second and third samples indicates that most of the sand is produced during the initial surge of the pump (listed as the 5 minute sample in Table 2-4). The amount of sand pumped during normal operation is reflected in the third sample (the 60 minute sample, in Table 2-4) and is a realistic figure for the quantity of sand which will be produced during normal well operations.

Under normal operating conditions, the concentration of sand produced by the wells was less than the American Water Works Association (AWWA) Standard for Water Wells A100-90 of 5 mg/l sand for water supply wells. Any recommendations for limiting sediment concentration must take into account how the water will be used, the method

TABLE 2-4
SAND CONCENTRATION

Well Number	Rate (gpm)	Sand Concentration (mg/l)
1E	685	.09
	1400	.04
	1800	.09
	1050 (5 min)	1.59
	1050 (30 min)	.09
	1050 (60 min)	.02
2E	300	5.49
	700	5.28
	800	21.99
	700 (5 min)	308.94
	700 (30 min)	6.93
	700 (60 min)	1.09
3E	550	.20
	1100	.22
	1600	2.80
	1100 (5 min)	10.57
	1100 (30 min)	.44
	1100 (60 min)	<.02
4E	595	.02
	1200	<.02
	1600	<.02
	1200 (5 min)	<.02
	1200 (30 min)	<.02
	1200 (60 min)	<.02
11E	650	.22
	850	.02
	1225	.31
	1225 (5 min)	7.40
	1225 (30 min)	.31
	1225 (60 min)	.02

TABLE 2-4 (CONTINUED)
SAND CONCENTRATION

Well Number	Rate (gpm)	Sand Concentration (mg/l)
1W	740	<.02
	1530	.02
	2270	.02
	1460 (5 min)	.59
	1460 (30 min)	<.02
	1460 (60 min)	<.02
2W	700	.04
	1380	.04
	2100	.15
	1380 (5 min)	1.06
	1380 (30 min)	<.02
	1380 (60 min)	<.02

of treatment, the type of sediment, and the origin of the sediment. The U.S. Environmental Protection Agency and the National Water Well Association (1975) have recommended the following limits:

1. 1 mg/l - water to be used directly in contact with, or in the processing of, food beverages.

2. 5 mg/l - water for homes, institutions, municipalities, and industries.

3. 10 mg/l - water for sprinkler irrigation systems, industrial evaporative cooling systems, and other uses where a moderate amount of sand is not especially harmful.

4. 15 mg/l - water for flood-type irrigation and where the nature of the water-bearing formations and the overlying strata are such that pumping this amount of sand will not seriously shorten the useful life of the well.

The limits suggest reasonable goals that can be achieved if good well design, construction, and development practices are followed. In older wells or wells in problem aquifers, a well may pump unacceptable amounts of sediment. If the well cannot be redeveloped by conventional techniques, a special sand separator can be installed as a permanent of the well system. Although sand separators are efficient, they may not remove all sediment and should not be used as a substitute for good well design and construction practices. In addition, if sufficient sand is removed, this removal could cause catastrophic collapse of the formation.

The amount of sand pumped by Palm Springs' new wells is minimal by any recognized standard and should not have an adverse impact on the life expectancy of the pumps and/or the wells. The well head system is configured with slow opening and slow closing flow control valves which will further reduce the sand pumpages of the wells. This valving is designed to minimize the initial surge (water hammer) of the pump's operation, thereby minimizing the damage to the well and the formation. The Village purchased the sand separator and should incorporate sand testing into the maintenance program for the production wells (outlined in detail in Section 4 of this report). The sand separator will verify the amount of sand being produced by the wells. This information, along with periodic specific capacity and bacteriological testing, will be used to detect potential problems before they become critical to the operation of the well and wellfield.

2.10 WATER QUALITY TESTING

Pumped water samples for each well were collected during well testing and sent for analysis to Micrim Labs, Inc., of Miami, Florida, and Paul R. McGinnes and Associates Consulting Laboratories, Inc., of West Palm Beach, Florida.

Micrim Labs performed total bacterial (including total coliform), algal and fungal analyses on the water samples. Wells No. 3E and No. 2W were initially found to contain heavy growths of bacteria, including *pseudomonas sp.* These two wells were re-tested to determine if the growths were due to sampling and/or analytical error. Results of the second bacteria tests were satisfactory. Copies of Micrim Labs' reports are included in Appendix F.

McGinnes Labs performed turbidity, inorganic, volatile organic, organic chemical, secondary chemical, and radiological analyses with satisfactory results. Copies of the McGinnes reports for each well are found in Appendix G.

2.11 TELEVISION CAMERA SURVEYING

The television camera survey allows for the visual examination of the well casing, borehole, and well screens. It is useful in determining the internal integrity of the well and may also be used to look at obstructions in the borehole such as lost drilling tools. The television camera may also be used to view geologic structures. The television camera surveys for the Village of Palm Springs were used to confirm the structural integrity of the new wells, verify screen and lap pipe depths of the well, and to give the Village a permanent visual record of the well to be used if rehabilitation efforts are required for the wells at some future date.

The television surveys for the Village of Palm Springs new wells were run August 19-20, 1992, by Deep Venture Services of Perry, Florida, subcontracted to Meridith Corporation. The wells were surveyed using Deep Venture's RVC-360 Radial View Camera. This camera allows for the viewing of the well not only in the normal view straight down the well but also to rotate up to 80° from vertical to view welded joints, the sides of the casing, etc. The wells surveyed were Nos. 1E, 2E, 3E, 4E, 1W and 2W. Well No. 11E was not surveyed because the permanent pump was already installed and the Deep Venture could not gain access to the well. PBG&S recommends that this well be camera surveyed within a year after the well was completed in order to confirm, within the contractor's warranty period, that the well was constructed as originally designed. The following is a summary of PBG&S's findings for each well:

Well No. 1E - This well appears to be as originally designed. The bottom of the hole was surveyed at 199 feet bls, indicating approximately three feet of sediment fill in the sump.

Well No. 2E - The bottom of the well was surveyed at 147 feet bls, indicating sediment fill of approximately nine feet (five feet in the sump and four feet in the screen). Otherwise, the well appears to be as originally designed. After cleaning the sediment out of the bottom of the well, the well was resurveyed using a Black-and-White television camera. Both the bottom four feet of the screen and the seam joining screen to sump appeared to be intact and as originally designed.

Well No. 3E - The bottom of the well was surveyed at 207 feet bls. indicating sediment fill of approximately seven feet (five feet in the sump and two feet in the screen). Otherwise the well appears to be as originally designed.

Well No. 4E - This well appears to be as originally designed. The bottom of the hole was surveyed at approximately 185 feet bls, indicating sediment fill of approximately three feet in the sump.

Well No. 1W - The bottom of the hole was surveyed at 165 feet bls, indicating approximately two feet of sediment fill in the sump. There appears to be grass caught in the well screen. This is due to the fact that the well screen for this well was stored on the ground at the Pratt Water Treatment Plant for an extended amount of time, allowing the grass to grow through and into the screen. Grass and debris on the outside of the screen were removed before the screen was installed, however, grass on the inside went undetected. This is not a cause for concern and should not affect the performance of the well. Otherwise, the well appears to be as originally designed.

Well No. 2W - The bottom of the well was surveyed at 177 feet bls, indicating approximately seven feet of sediment fill (five feet in the sump and two feet in the screen). Otherwise the well appears to as originally designed.

The wells were considered to be substantially complete under this contract when the television surveys were finished (including the second television survey on Well No. 2E), with the exception of Well No. 4E and Well No. 11E. Well No. 4E was considered to be substantially complete when the monitor tube was drilled out, and Well No. 11E when the step-drawdown test was concluded. After the wells were substantially complete, the contractor cleaned out the sediment from the bottoms of wells 2E, 3E, and 2W.

2.12 SUMMARY OF WELL TESTING

During the construction of the new replacement wells for the Village of Palm Springs, step-drawdown tests, sand tests, and water quality analyses were performed and the results analyzed. The chronology of the construction and testing of each well is included herein as Appendix D. The analyses of the data collected during wellfield construction are summarized below.

1. The drawdowns in the wells range from 3.54 to 42.77 after approximately one hour of pumping at the wells' design capacities.

2. The specific capacities range from 17 to 390 gpm/ft of drawdown after approximately one hour of pumping at the wells' design capacities.

3. The well losses range from .78 to 12.18 feet at the wells' design capacities.

4. The well efficiencies range from 56 to 98 percent at the wells' design capacities.

5. The sand contents in the water produced by the wells range from <.02 to 1.09 mg/l at the wells' design capacities under normal operating conditions.

6. The raw water quality was satisfactory, meets State requirements for raw water supply, and will meet all current regulations for treated water after treatment.

7. The television camera surveys show the wells to be installed as designed.

8. The wells should function and maintain the capacities described, provided the Village maintains the proscribed rehabilitation program outlined in Section 4 of this report.

SECTION 3

HYDROGEOLOGY

3.1 GENERAL HYDROGEOLOGY

Throughout eastern central Palm Beach County, there exist three distinct hydrogeologic units. These units are the sand-clay limestone unit (surficial sands) including the Pamlico Sand and the Anastasia Formation; the calcareous sandstone/arenaceous limestone unit (production zone) of the Anastasia/Fort Thompson Formations; and the green clay unit of the Hawthorn Group. The first two units comprise the surficial aquifer system. This surficial aquifer reflects a lateral gradational change (from south to north) from the Biscayne aquifer to the Turnpike aquifer. Distinction between the two aquifers is somewhat arbitrary, however in the Palm Springs area the aquifer is generally referred to as the Turnpike aquifer. The third unit is the Hawthorn Group which consists of the Tamiami Formation and the Hawthorn Formation. The top of this unit is an aquiclude considered to be the base of the surficial aquifer system. The lithology below the top of the clay unit was not penetrated and is not discussed in this report.

The upper sand unit consists mainly of fine-grained quartz sand of the Pamlico Sand/Anastasia Formation in the upper 70 feet. The Pamlico Sand is the same unit which comprises the existing dunal ridges as well as the Pleistocene paleo-dune ridges. The Anastasia Formation is also Pleistocene in age. Clay lenses and silty clay lenses can exist throughout the Anastasia sand unit and act to retard downward migration of fluids. These properties give a delayed yield unconfined aquifer and/or leaky artesian aquifer response in the surficial aquifer system. The sands may contain organic silts and clays which are naturally occurring at depth and may add a color (organic) concern in the raw water.

Underlying the sand unit is a gray, medium- to fine-grained, vugular, arenaceous limestone or calcareous sandstone, referred to as the production zone of the Turnpike aquifer. Most municipal water supply wells and irrigation wells in Palm Beach County obtain their water from the upper portion of this unit, from 100 feet to 200 feet below land surface (bls). The wells can be constructed with open hole and/or screen and gravel pack, depending on local conditions. Few water supply wells draw water from the deeper portion of the aquifer, because it begins a gradation into the Hawthorn Group and usually exhibits lower permeabilities and poorer water quality.

Transmissivity of the surficial aquifer decreases northward along the length of Palm Beach County and also westward. According to Land et. al. (1973):

> "The permeability of the shallow aquifer decreases northward and westward because of the increasing content of fine sand and marly material." "Generally, the ability of the aquifer to yield water to pumping wells increases from north to south in the coastal area; however, many local conditions will cause large changes in permeability with depth and location."

The decrease in the productivity of the aquifer westward is also due, in part, to a decrease in the aquifer thickness. In the coastal area, the aquifer is 250 to 300 feet thick, but on the western fringe of the County, the thickness is 10 feet or less. There are areas in which the production zone has been dissected by paleo river channels which were cut through the rock unit during Pleistocene glacial periods. These were later infilled with a fine- to medium-grained sand during Pleistocene interglacial transgression of the seas. These areas produce less water than the calcareous sandstone/limestone units.

The decrease in permeability/productivity of the shallow aquifer adversely affects the water quality. The quality becomes poorer further inland (west of U.S. 441), with increases in the amount of iron, magnesium, hydrogen sulfide, total dissolved solids, color, and turbidity. The poor water quality reflects a decrease in quantity and rate of water circulating through the aquifer in the western part of the County. This decrease is caused by both the decrease in permeability and the lack of pumpage in the western area.

The green clay unit underlying the limestone unit represents the base of the Turnpike aquifer. The transition from the Turnpike aquifer to the Hawthorn aquiclude does not occur as an abrupt change, but is gradational, with the lithologic material becoming more sandy, silty, and clayey. The hydraulic properties of the clay unit, the Hawthorn aquiclude, are well known, and the unit is considered to be impermeable. The vertical hydraulic conductivity of the unit is approximately 10^{-5} centimeters per second in the more permeable portions of the unit.

3.2 WELLFIELD SITE HYDROGEOLOGY

As previously discussed, each of the wells vary in specific capacity, well efficiency, and sand content. All of the wells were constructed with the same design and method, and little variation occurred during the construction, development and testing of the wells. Well performance variations are primarily attributable to variations in properties of the production zone, i.e. the transmissivity.

In the Village of Palm Springs area, the depth to the base of the sand unit ranges from approximately 30 feet bls in the western wells to 115 feet bls in the eastern-most well. This indicates the varying degree of cementation of the sand and the depositional environments. The color ranged from 30 to 60 and is within the current treatment capabilities of the Palm Springs water treatment facilities. Therefore the production of trihalomethanes is not considered to be of concern for treatment capabilities (personal communication with Donald Eckler). Color is greater in the western portions of Palm Beach County than in the eastern coastal ridge portions. Existing pump test data at the western wellfield (CH_2M Hill, 1983) indicate that the aquifer in this area is leaky artesian. This appears to be a local condition and may represent a slow, delayed yield response and/or recharge from the local canals.

The limestone unit in the Palm Springs area ranges from approximately 240 feet thick (40 to 280 feet bls in Well No. 2W) in the western wellfield to approximately 210 feet thick (60 to 270 feet bls in Well No. 2E), in the eastern wellfield. The rock varies in induration, ranging from poor to good. The vugs and solution cavities are partially and completely filled with a fine-grained quartz. This sand is due to the dissolution and removal of the calcium carbonate (calcite), leaving the silicon dioxide (quartz) sand grains in the vugs.

These properties of the production zone, assumed to be Anastasia Formation in the east and the Fort Thompson/Anastasia Formations in the west, required the installation of well screens and gravel packs. The well screen and gravel pack serve two functions: as a formation stabilizer and as a filter to prevent large quantities of sand from entering the well. A formation stabilizer is needed because of the incompetent nature of the rock, which has a tendency to break down and collapse during well construction and development. This concern is exemplified in Well No. 2E. The continued development and removal of rock and sand without some form of formation stabilization could lead to collapse of the formation. The second function of the screen and gravel pack is interrelated with the first. Most of the voids in the rock are filled with a very fine quartz sand. As the sand is removed during development, the gravel replaces the sand in the voids. The gravel then acts as a filter preventing large amounts of sand from migrating through the formation and gravel pack into the operating well.

The length of time necessary for well development (Table 3-1) at a given location is dependent on the number of voids, the amount of fine sand contained within the voids, the extent that the voids are interconnected within the formation, and the design of the screen and gravel pack. The development is a function of the size of the sand, and the velocity created by the development water. The amount of sand, voids and poorly lithified rock encountered during the construction of the wells is exemplified in the amount of gravel used in each well (Table 3-2). The average amount of gravel used was 2.96 cubic feet of gravel per foot of gravel interval for the eastern wells and 3.95 cubic feet of gravel

TABLE 3-1
DEVELOPMENT HOURS

Well Number	Development (hrs)
1E	71.0
2E	166.5
3E	77.5
4E	112.0
11E	190.5
1W	86.0
2W	124.0

per foot of gravel interval for the western wellfield. This reflects an excess of 1448 cubic feet of gravel over the total theoretical volumes of 796 cubic feet, or an average of 2.82 times (2.61 times in the eastern wellfield and 3.48 times in the western wellfield) the amount of gravel needed to fill the theoretical volume of the annulus between a 12-inch diameter well screen and a 20-inch diameter bore hole. Although a percent of porosity cannot be determined, the excess amount of gravel does give a conceptual idea of the porosity of the production zone.

The geology of the production zone, including the depositional sequence, diagenetic changes, structure and regional extent is important in understanding the hydrogeology of the aquifer. This knowledge can be applied in future wellfield investigations and designs. The sediments of the production zone consist of a fine- to medium-grained quartz sand, with coarse to fine shell fragments and traces of heavy mineral sand grains. These types of sediments are usually deposited in shallow water and high energy environments on or near a beach. Clays, such as those sometimes found above and below the production zone, and other very fine-grained sediments are deposited in the low energy environments of lagoons. For the purpose of this report, diagenesis can be defined as

TABLE 3-2
GRAVEL AND THEORETICAL VOLUME

Well Number	Gravel Interval (ft)	Amount Gravel Used (cubic feet)	Amount Gravel Per Foot of Gravel Interval (cubic feet)	Theoretical Volume (cubic feet)	"Excess" Gravel (cubic feet)
1E	105	155	1.48	119	36
2E	74	326	4.41	84	242
3E	116	208	1.79	132	76
4E	133	649	4.88	151	498
11E	103	243	2.36	117	126
1W	75	362	4.83	85	277
2W	95	318	3.35	108	210

those processes, chemical and physical, which affect the sediments after deposition. The diagenesis of the production zone consisted mainly of the dissolution of the calcareous particles (shell fragments) and the reprecipitation of calcium carbonate as the cementing agent. The dissolution of the shell fragments accounts for the vugular nature of the production zone.

The base of the Turnpike aquifer system is the green clay of the Hawthorn aquiclude. This unit exists at a depth of approximately 275 to 300 feet bls in the Palm Springs area.

Two generalized geologic cross sections have been drawn from lithologic information obtained during the drilling of the pilot hole. The location of these cross sections is shown in Figure 3-1. These sections are included in this report as Figures 3-2 and 3-3. The cross section A-A' (Figure 3-2) runs west to east from Well No. 2W to Well No. 11E. It shows that the depth to the top of the production zone (arenaceous

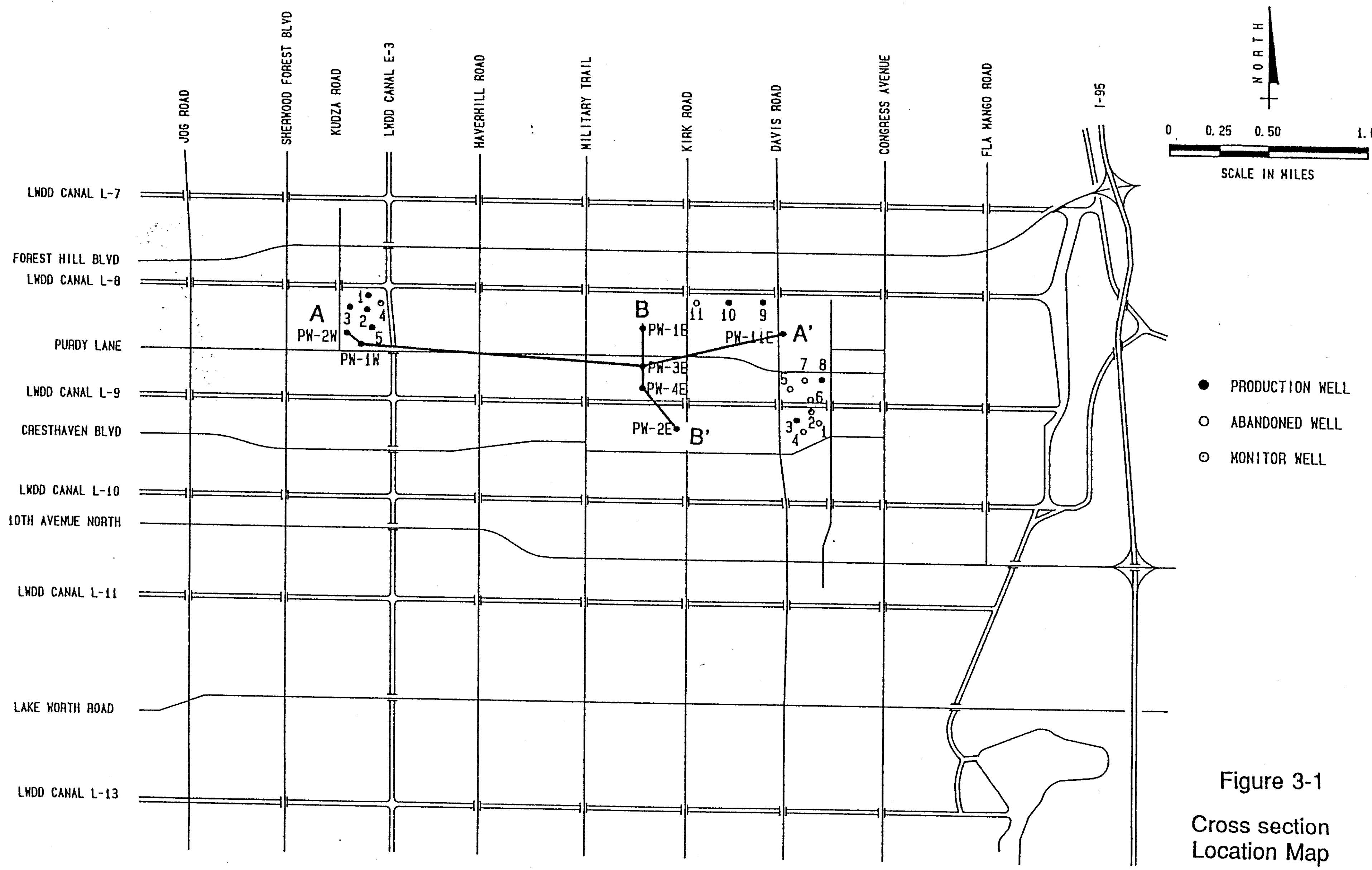

Figure 3-1

Cross section Location Map

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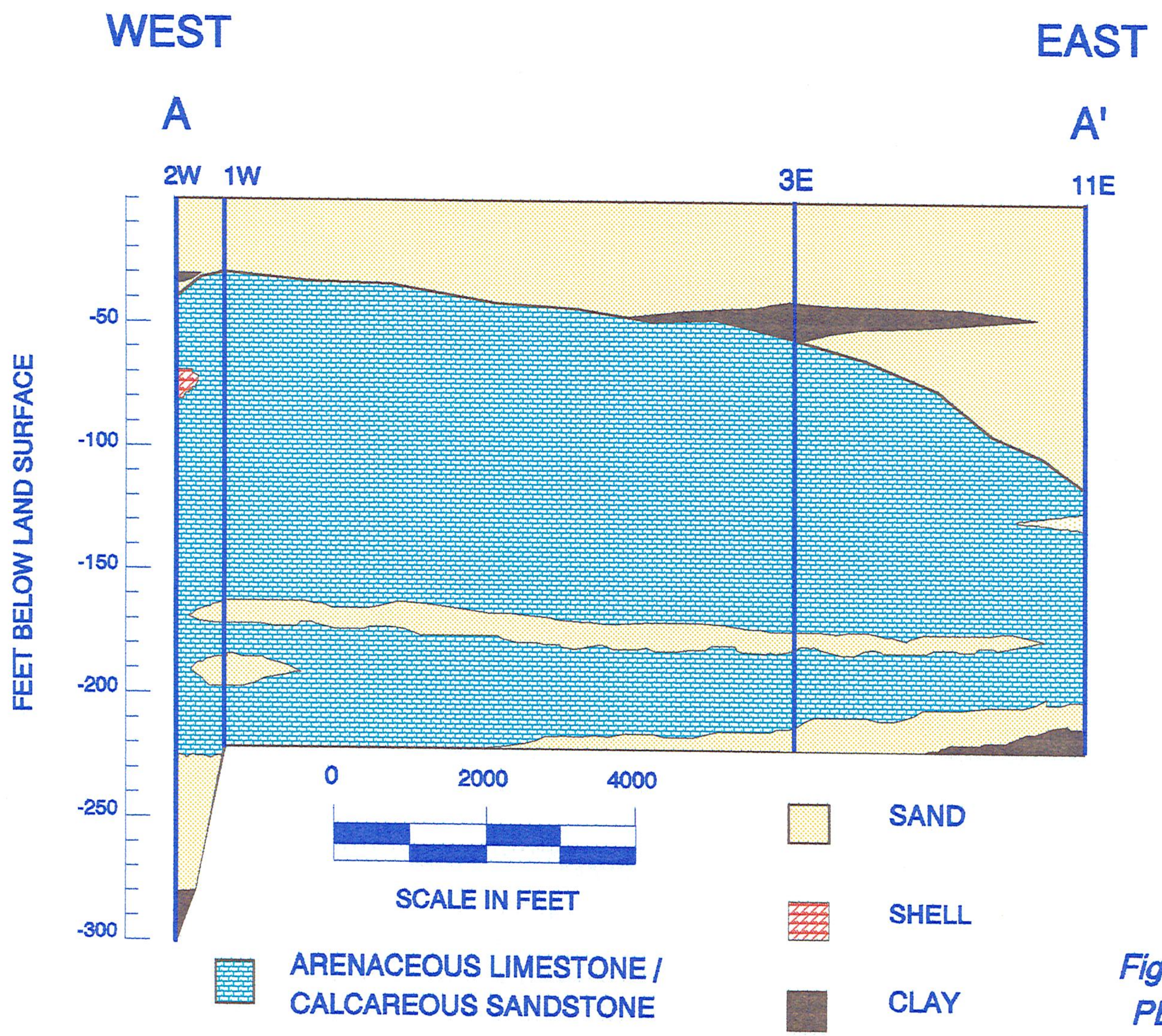

Figure 3-2
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limestone/calcareous sandstone shown in the cross sections as blue) increases to the east. The production zone is overlain in two of the wells (No. 2W and No. 3E) by clay. Sand and clay occur at the base of the production zone in Well No. 2W and Well No. 11E. The geology and the function of the wells would indicate no concise discernable pattern of well function based on geologic trends, except that the productivity is significantly higher in the western wellfield than the eastern wellfield by an order of magnitude. There also appears to be a tendency for the wells north of Purdy Lane to be more productive than those south of Purdy Lane (see Figure 3-1). The cause of this apparent change might be determined by running a long duration (72 hours or greater) pump test sufficient to define boundary conditions of the aquifer and an extensive test well drilling program. However there is no apparent need for the Village to perform this work at this time.

Cross section B-B' (Figure 3-3) runs north to south from Well No. 1E to Well No. 2E. This cross section shows that the production zone is of a uniform thickness. Large sand layers are found in the production zone, especially in Well No. 4E, and layers of shell or coquina are found in Well No. 1E and Well No. 2E. The base of the production zone is underlain by clay in Well No. 2E.

3.3 AQUIFER TRANSMISSIVITY

From the data gathered during the step-drawdown tests, it is possible to calculate aquifer transmissivity using the Jacob method (also called the Cooper-Jacob method). The criteria for this method are as follows:

1. Flow is entirely horizontal, radial and laminar.

2. The well fully penetrates the aquifer.

3. There are no vertical components of flow.

4. No water is stored in the well (i.e. drawdown and recovery data are not affected by well storage capacity).

5. The uniformly porous aquifer is overlain and underlain by aquicludes, with negligible vertical hydraulic conductivity (except in a water table aquifer that is of uniform grain size, i.e. no delayed-yield response. Under this condition the Jacob method can apply to water table conditions).

6. The aquifer is homogeneous, isotropic, infinite in areal extent, and has a constant thickness throughout.

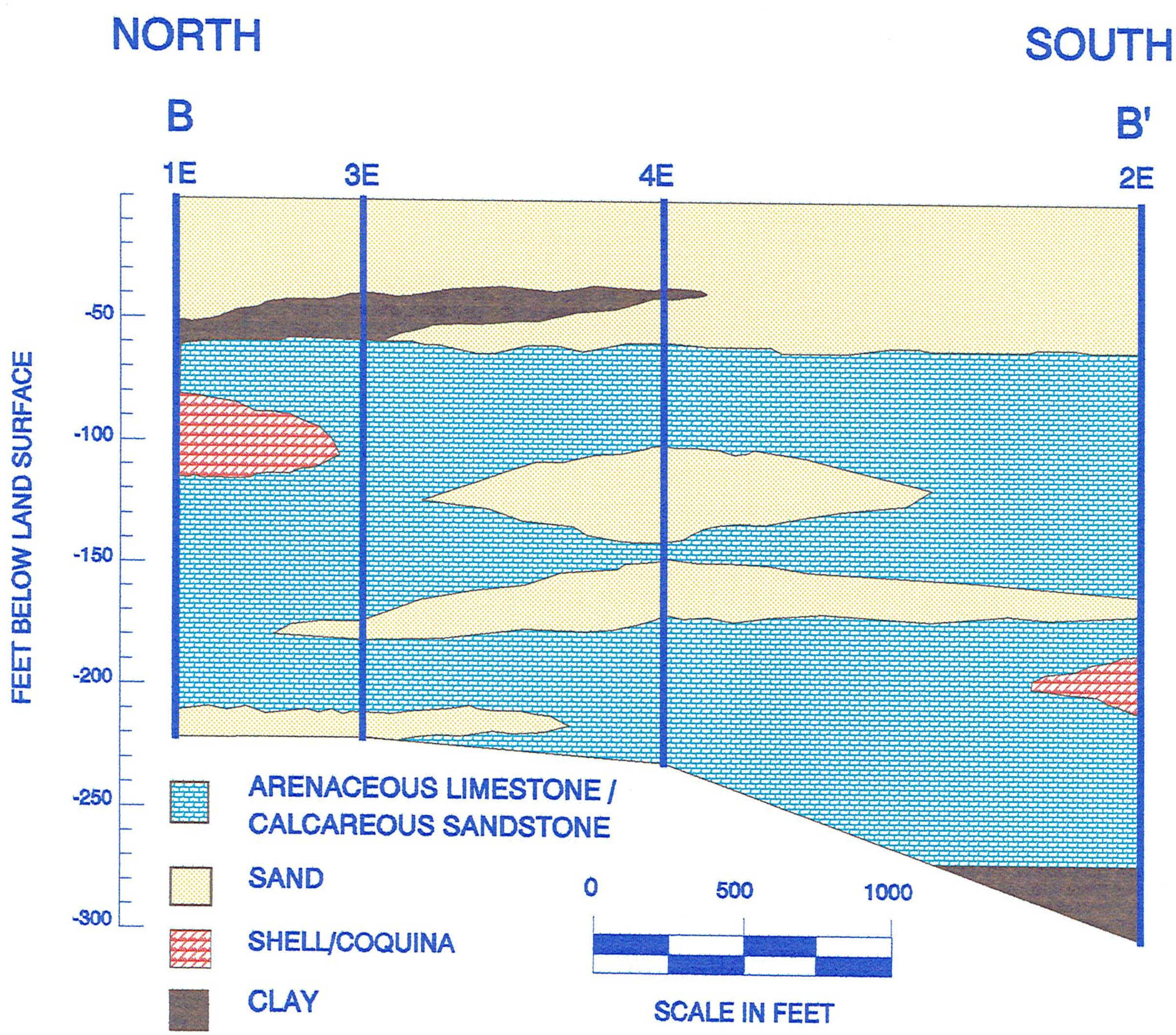

Figure 3-3
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7. Wells have infinitesimal diameter, and discharge is constant.

8. There are no boundaries and/or discontinuities.

9. Before pumping the piezometric surface is horizontal.

10. There is no recharge to the aquifer.

11. The groundwater density and viscosity are constant.

12. Groundwater flow can be described by Darcy's Law.

13. Head losses through the well screen and pump intake are negligible.

14. The aquifer is compressible and completely elastic.

These conditions must be met during the duration of the pumpage and in the area of influence of the wells during the time of pumpage, and/or corrections must be made to account for conditions not met. The following remarks note for each criterion how the aquifer and/or wells meet the conditions and/or how corrections were made:

1. The majority of flow during the duration of pumping is horizontal and radial.

2. The wells fully penetrate the producing unit of the aquifer.

3. The vertical components of flow are a delayed yield response and are seen "instantaneously" in the production well.

4. The water stored in the well is negligible compared to the amount withdrawn.

5. Although this water table aquifer shows a delayed yield response, the transmissivities can be calculated from the first and third portions of the drawdown curve because these portions of the curve correspond to the Theis equation.

6. For the area tested, over the duration of the test this statement is valid, as evidenced by the drawdown data.

7. Discharge was constant. Well diameter does not effect the calculation of the transmissivity in this equation, only the storage coefficient.

8. No boundary conditions are indicated in the drawdown data during the duration of the test.

9. Because hydraulic gradient is negligible (based on regional canal elevations and flow data), this statement is valid.

10. Based on the step-drawdown data, recharge was negligible.

11. Based on chemical analysis, this does not appear to be a concern.

12. This statement is valid.

13. The head losses are constant at a given pumping rate and therefore do not effect the calculation of transmissivity, i.e. head losses do not effect the change is drawdown, Δs, between log cycles.

14. This statement is valid, based on the information available.

The use of the Jacob method to obtain storage coefficient and specific yield values would not be valid using normal conventional methods of analysis (Witt, 1990).

The Jacob method uses the equation

$$T = \frac{264Q}{\Delta s} \tag{3.0}$$

where T = transmissivity, gallons per day per foot
Q = pumping rate, gallons per minute
Δs = the slope of the time-drawdown graph expressed as the change in drawdown between any two values of time on the log scale whose ratio is 10.

Figure 3-4 illustrates calculation of Δs and transmissivity.

The time-drawdown graphs for the Village of Palm Springs' wells at each well's design capacity are shown in Figures 3-5 through 3-11. Transmissivity values are given in Table 3-3.

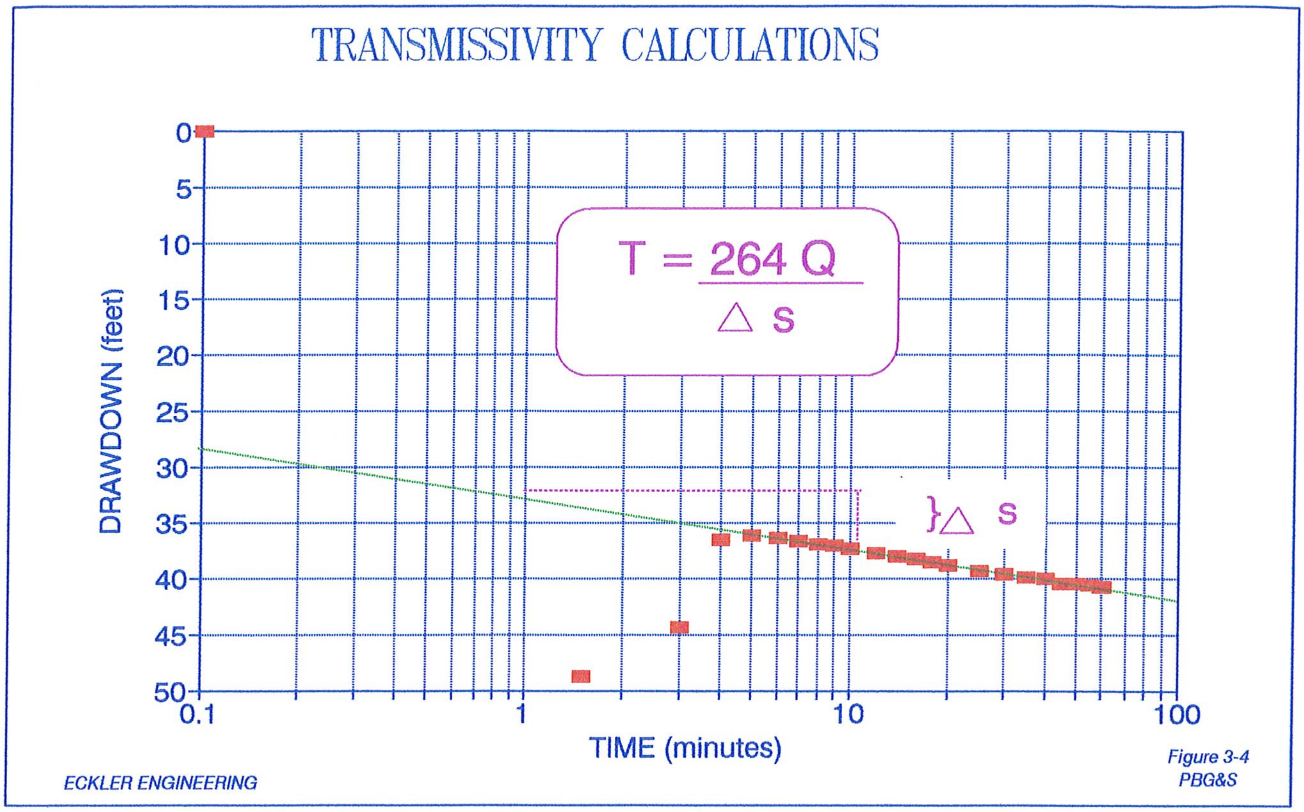

Figure 3-4
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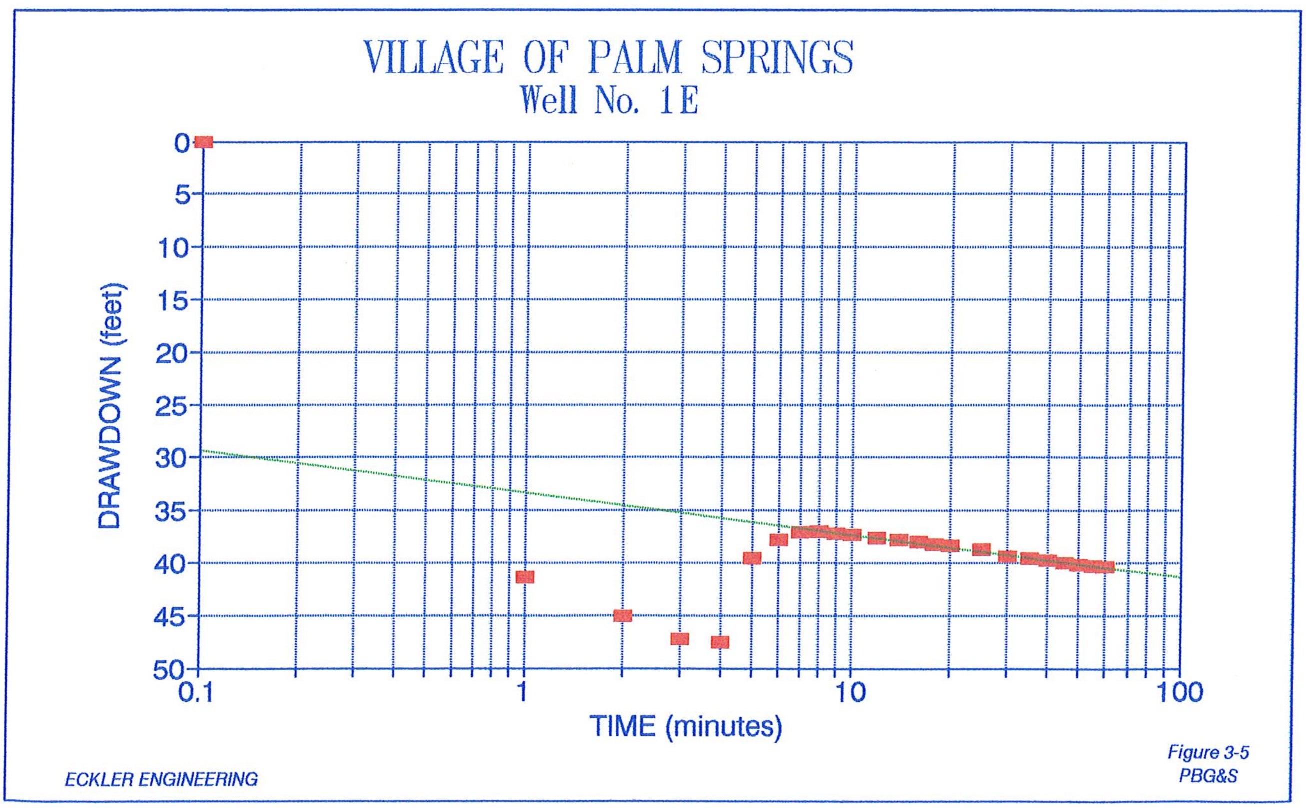

Figure 3-5
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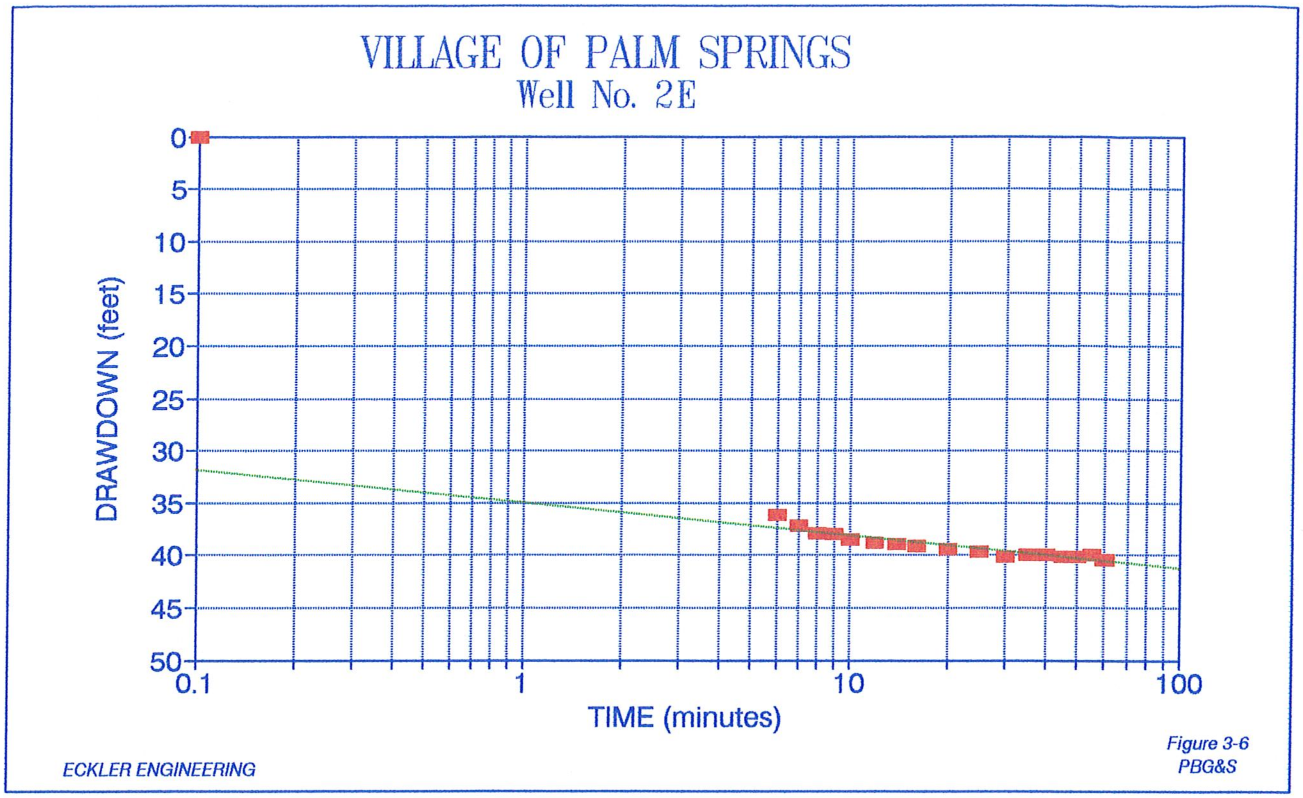

Figure 3-6
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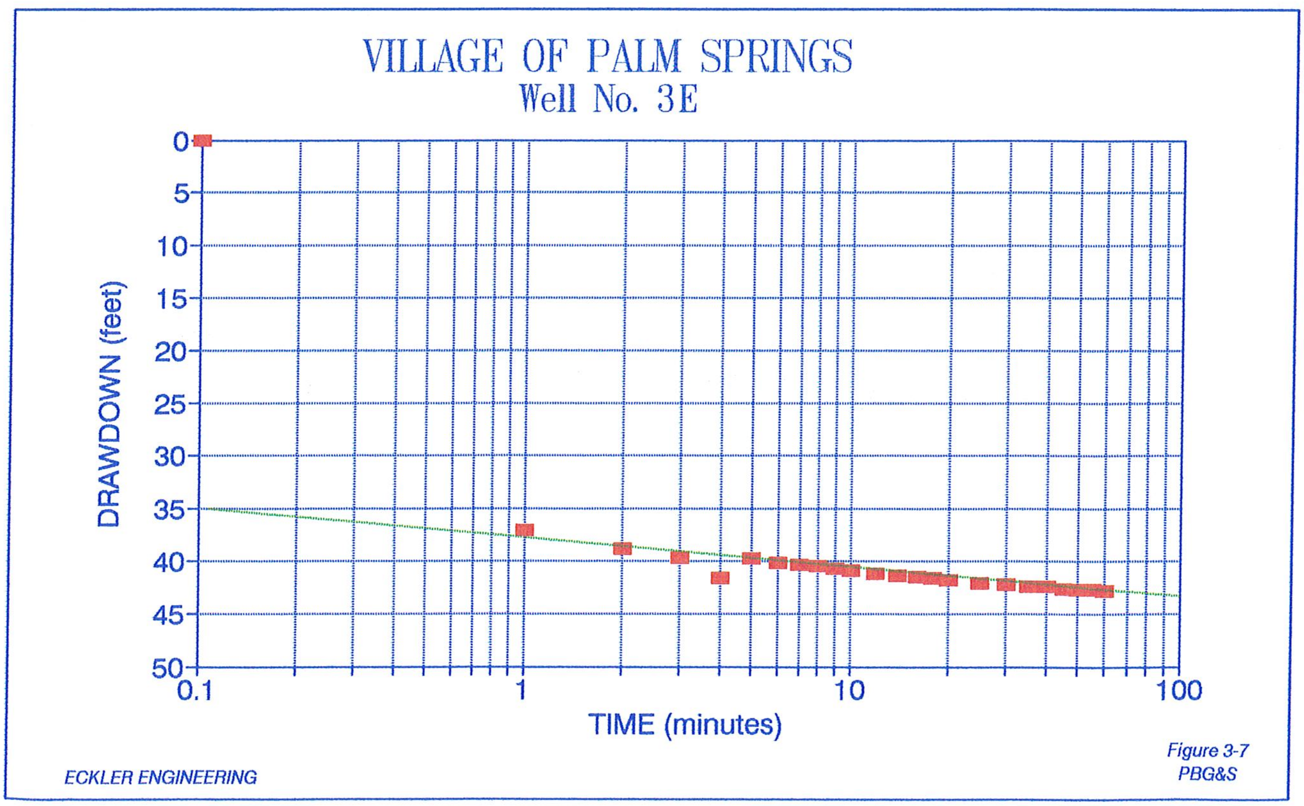

Figure 3-7
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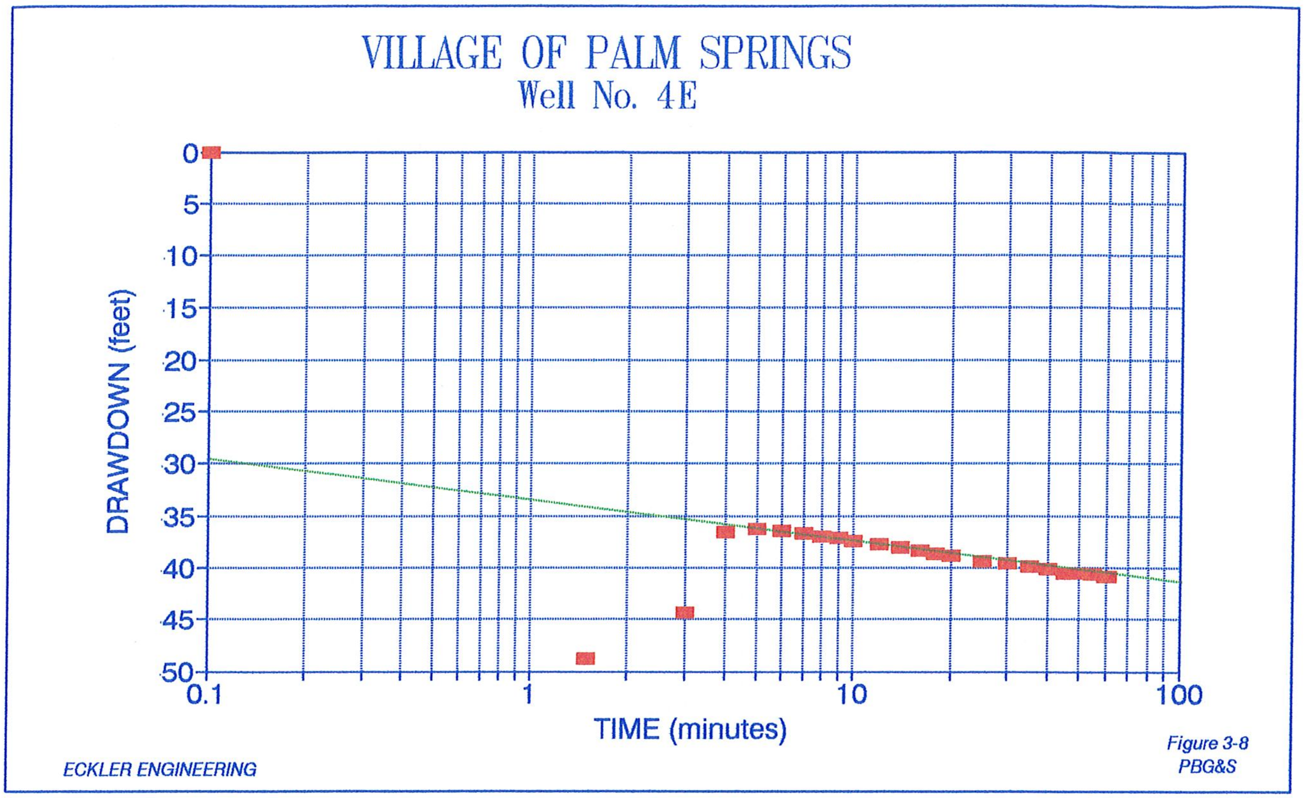
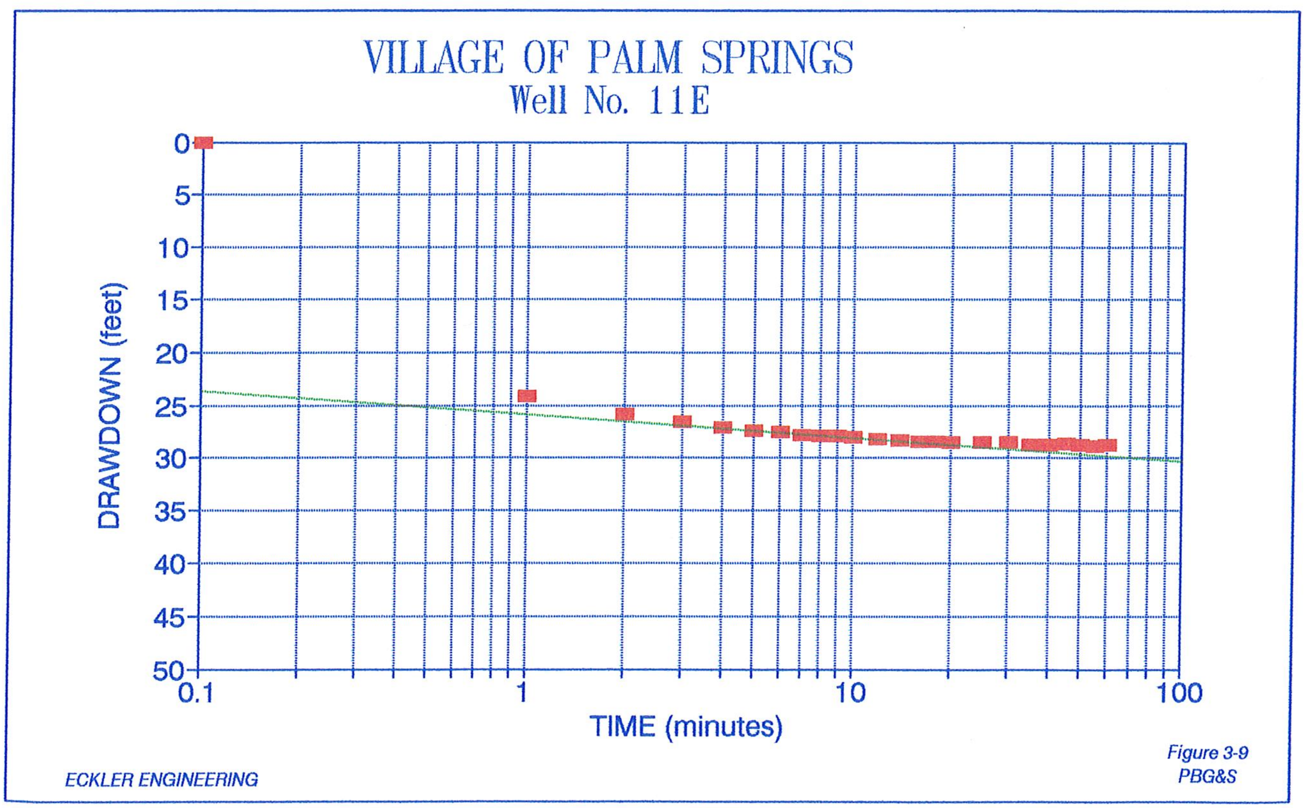
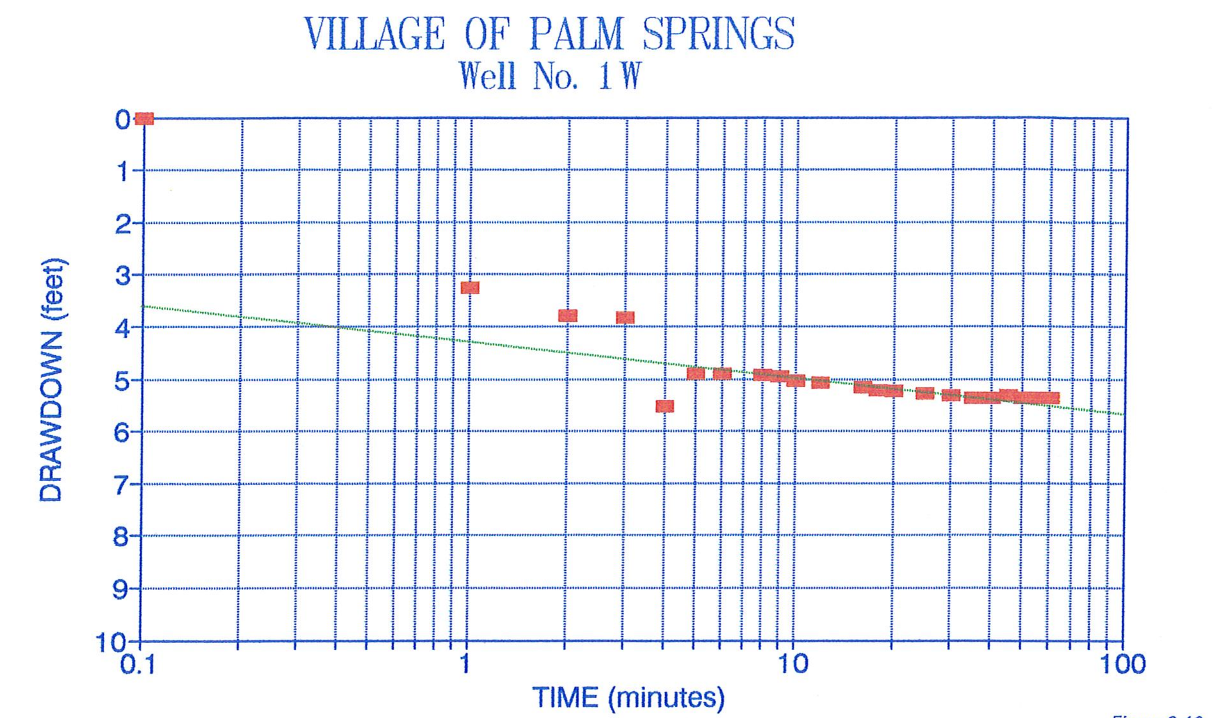

VILLAGE OF PALM SPRINGS
Well No. 4E
DRAWDOWN (feet)
0
5
10
15
20
25
30
35
40
45
50
0.1
1
10
100
TIME (minutes)
ECKLER ENGINEERING
Figure 3-8
PBG&S


VILLAGE OF PALM SPRINGS
Well No. 11E
DRAWDOWN (feet)
0
5
10
15
20
25
30
35
40
45
50
0.1
1
10
100
TIME (minutes)
ECKLER ENGINEERING
Figure 3-9
PBG&S



ECKLER ENGINEERING

Figure 3-10
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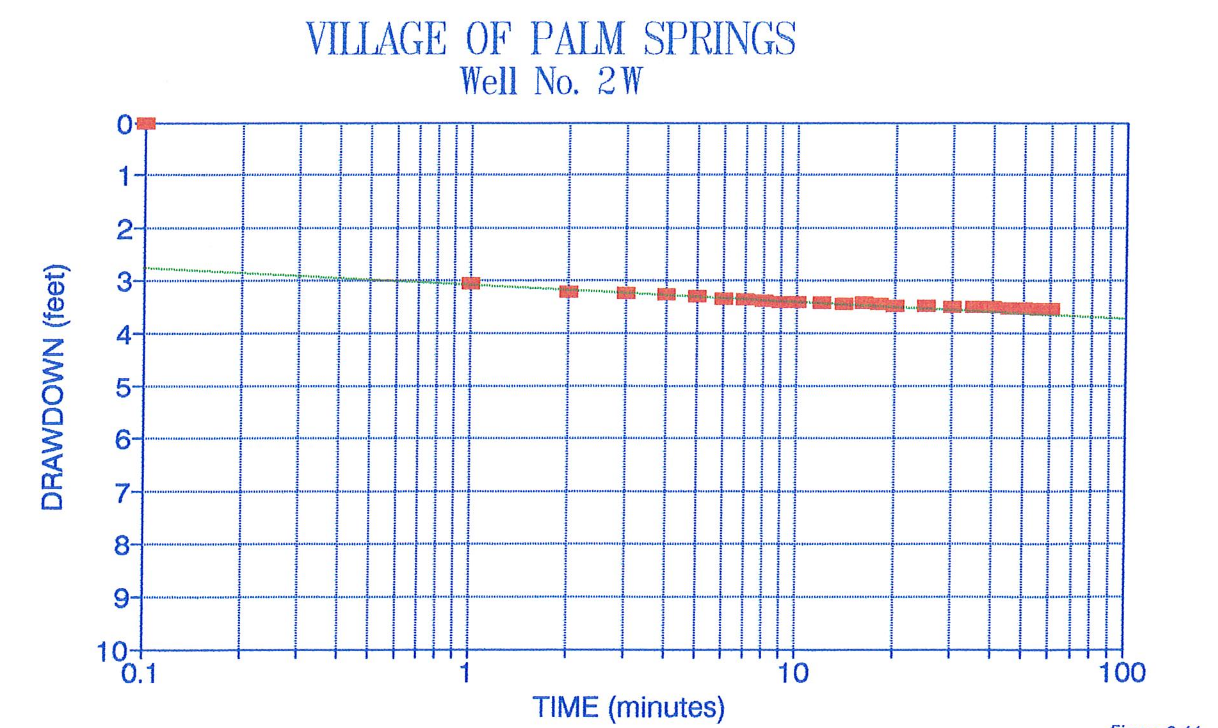

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Figure 3-11
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TABLE 3-3
TRANSMISSIVITY

Well Number	Rate (gpm)	Δ s (ft)	Transmissivity (gpd/ft)
1E	1050	3.95	70,177
2E	700	3.10	59,613
3E	1100	2.65	109,585
4E	1200	4.50	70,400
11E	650	1.95	88,000
1W	1530	.65	621,415
2W	1380	.26	1,401,231

Another aquifer characteristic, storage coefficient, is calculated using data obtained from the time-drawdown graphs. The equation for storage coefficient is

$$S=\frac{0.3Tt_0}{r^2} \qquad (3.1)$$

where S = storage coefficient
T = transmissivity, gallons per day per foot
t_0 = intercept of the straight line at zero drawdown, days
r = the effective radius of the well.

The storage coefficient was not calculated for this report because the effective radius of the well (r) is not known.

Transmissivity values of the production unit in the vicinity of the eastern wellfield were calculated by CH_2M Hill (1983) to be in the range of 100,000 to 538,000 gallons per day per foot (gpd/ft), and in the western wellfield were calculated to be 1,250,000 gpd/ft. Using information gathered from the step-drawdown tests, PBG&S calculated the transmissivities in the eastern wellfield to range from 59,600 to 109,600 gpd/ft (see Table 3-3). Transmissivities of the western wellfield ranged form 621,400 to 1,401,200 gpd/ft (see Table 3-3). The storage coefficient and specific yield were not calculated because no aquifer performance tests were performed by PBG&S.

SECTION 4

WELLFIELD MAINTENANCE AND OPERATION

4.1 RECOMMENDED TESTING AND MAINTENANCE PROCEDURES

In order to sustain well performance and increase well life, the Village of Palm Springs must monitor and evaluate the performance of the wells through specific testing procedures and must perform regular maintenance on the well. PBG&S strongly recommends that the Village's regular maintenance program include the following testing and preventative maintenance procedures to enhance well life and well efficiency:

Weekly - The Village of Palm Springs Utilities staff should

1. Record static water levels at each well.

2. Record the drawdowns from the static water levels after 20 minutes of continuous pumping at the design pumping rate of each well.

3. Record the pumping rate of each well (gpm).

4. Calculate the Specific Capacity using the following formula:

   Specific Capacity (gpm/ft) = Pumping Rate (gpm) ÷ drawdown (feet).

If the specific capacity drops by 20% or more of the original specific capacity (see Table 4-1 for the original specific capacities of each well at 20 minutes), then the Utilities staff should

a. Contact a hydrogeologist.

b. Perform a sand test as described in Section 2.9 of this report.

c. Take water samples to be analyzed for total bacterial (including total coliform), algal and fungal, as performed by Micrim Labs of Miami, Florida.

TABLE 4-1
DESIGN RATES AND SPECIFIC CAPACITIES AT 20 MINUTES

Well Number	Design Rate (gpm)	Specific Capacity (gpm/ft at 20 min)
1E	1200	27.43
2E	700	17.74
3E	1200	26.31
4E	1200	31.04
11E	700	22.81
1W	1400	281.07
2W	1400	396.55

Monthly - The Village of Palm Springs Utilities staff should run a bacteria scan for fecal coliform on each well.

Yearly - The Village of Palm Springs Utilities staff should

1. Take water samples from each well to be analyzed for total bacterial (including total coliform), algal and fungal, as performed by Micrim Labs of Miami, Florida.

2. Take water samples from each well to be analyzed for Priority Pollutants.

3. Perform a step-drawdown test on each well as described in Section 2.5 of this report.

4. Perform a sand test on each well as described in Section 2.9 of this report.

5. Tag the top of the gravel pack.

6. Shock chlorinate each well with a 1000 mg/l solution of calcium hypochlorite (HTH).

Every five years - The Village of Palm Springs Utilities staff should

1. Pull and visually inspect the well pumps for wear.

2. Inspect the flow control valves for wear.

3. Television survey each well.

4.2 WELLFIELD OPERATION

The Village of Palm Springs wellfields should be operated on a schedule such that wells should be turned ON and should remain ON for a period of time consisting of no more than one (1) week of continuous pumping, and should be turned OFF and should remain OFF for a period of time of the same endurance as the well's most recent ON period. ON and OFF cycling of the wells should be minimized.

For the eastern wellfield, Wells Nos. 3, 11E, 10, 3E, and 2E should be run together and Wells Nos. 8, 9, 1E, and 4E should be run together.

For the western wellfield, Wells Nos. 1, 5, and 2W should be run together and Wells Nos. 2, 3, and 1W should be run together.

The Village should maintain an individual file on each well. This file should contain all records of work/maintenance performed on the well.

4.3 SUMMARY

The wells as constructed by Meridith Corporation should function within the final design parameters of the wells, provided the Village of Palm Springs maintains, operates, and tests the wells as recommended. Each well will react differently to the stresses placed upon it and, on average, may need rehabilitation approximately every five (5) years.

This report is respectfully submitted to Eckler Engineering. PBG&S and the West Palm Beach office staff want to express our thanks to Eckler Engineering for the opportunity to provide our knowledge and expertise to this project. We would also like to express our thanks to the Village of Palm Springs staff, including the Village Council, Mr. Patrick Miller, Village Manager, Mr. William Leasure, Utilities Director, Mr. Richard Gift, Assistant Utilities Director, and Donald Ray and the rest of the Utilities staff for their assistance in this effort.

Respectfully Submitted,
PARSONS BRINCKERHOFF GORE & STORRIE INC.

Anne E. Dodd
Hydrogeologist

Gerhardt M. Witt, P.G.
Area Manager/Supervising Hydrogeologist

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APPENDIX A

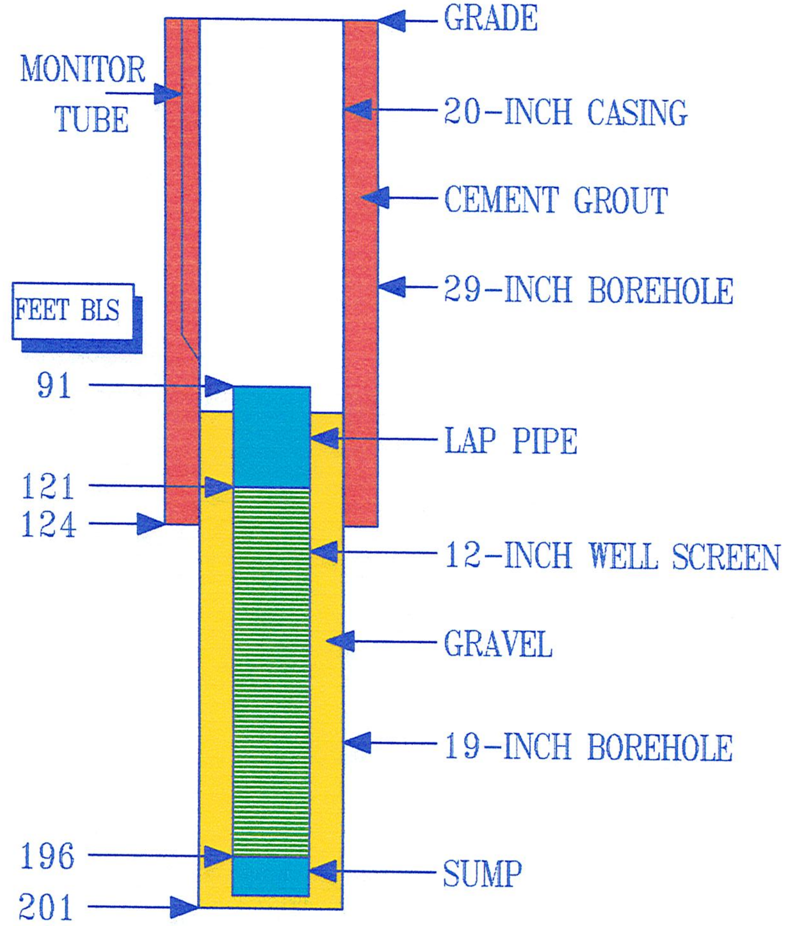
WELL COMPLETION REPORTS

WELL COMPLETION REPORT

No. 1E

Owner:	Village of Palm Springs
Well Number:	PW-1E
Start Date:	2/20/92
Completion Date:	8/19/92
Method drilled:	Conventional Mud Rotary
Pilot Hole Depth:	220 feet bls
Pilot Hole Diameter:	5.25 inches
Final Hole Depth:	201 feet bls
Final Hole Diameter:	12 inches
Casing Depth:	124 feet bls
Casing Diameter:	20 inches
Amount Cement:	257 sacks
Monitor Tube Depth:	94 feet bls
Screen Interval:	121-196 feet bls
Screen Diameter:	12 inches
Screen Slot Size:	.060 inches
Screen Design Capacity:	2143 gpm
Gravel Pack Interval:	96-201 feet bls
Gravel Pack Size:	2-3.36 mm
Amount Gravel:	155 sacks
Development:	71 hours
Production Capacity:	1200 gpm
Timed Drawdown:	40 feet
Specific Capacity:	26.02 gpm/ft
Sand Content:	.02 mg/liter

Well Completion Diagram



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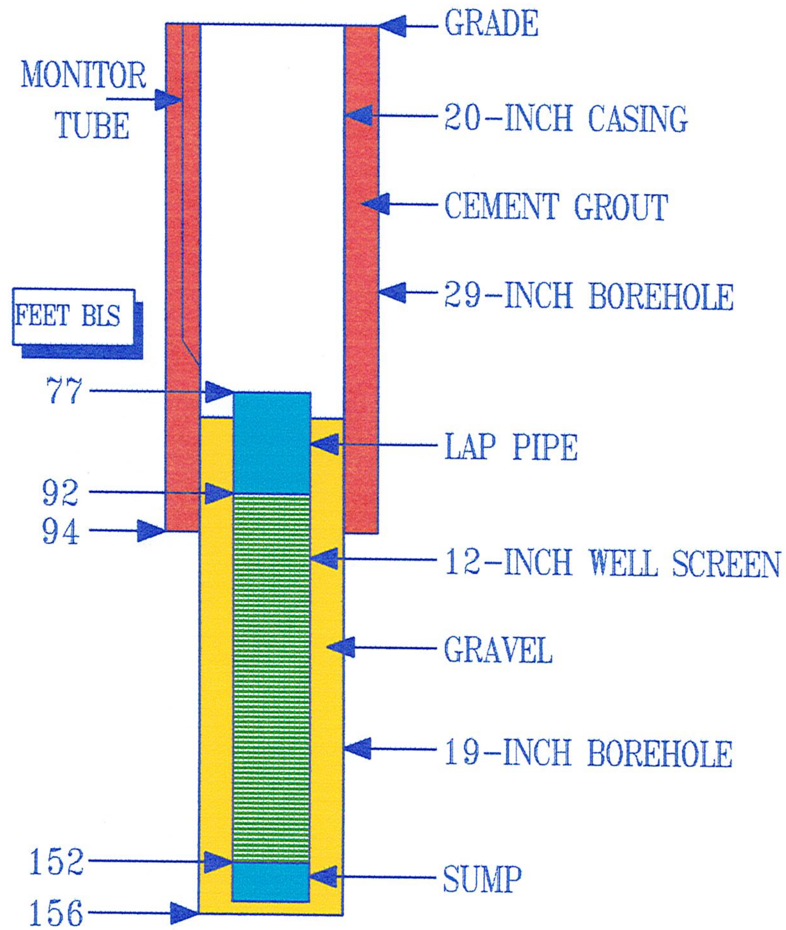
WELL COMPLETION REPORT
No. 2E

Owner:	Village of Palm Springs
Well Number:	PW-2E
Start Date:	2/12/92
Completion Date:	9/25/92
Method drilled:	Conventional Mud Rotary
Pilot Hole Depth:	300 feet bls
Pilot Hole Diameter:	5.75 inches
Final Hole Depth:	156 feet bls
Final Hole Diameter:	12 inches
Casing Depth:	94 feet bls
Casing Diameter:	20 inches
Amount Cement:	212 sacks
Monitor Tube Depth:	64 feet bls
Screen Interval:	92-152 feet bls
Screen Diameter:	12 inches
Screen Slot Size:	.060 inches
Screen Design Capacity:	1726 gpm
Gravel Pack Interval:	82-156 feet bls
Gravel Pack Size:	2-3.36 mm
Amount Gravel:	326 sacks
Development:	166.5 hours
Production Capacity:	700 gpm
Timed Drawdown:	40.45 feet
Specific Capacity:	17.31 gpm/ft
Sand Content:	1.09 mg/liter

Well Completion Diagram



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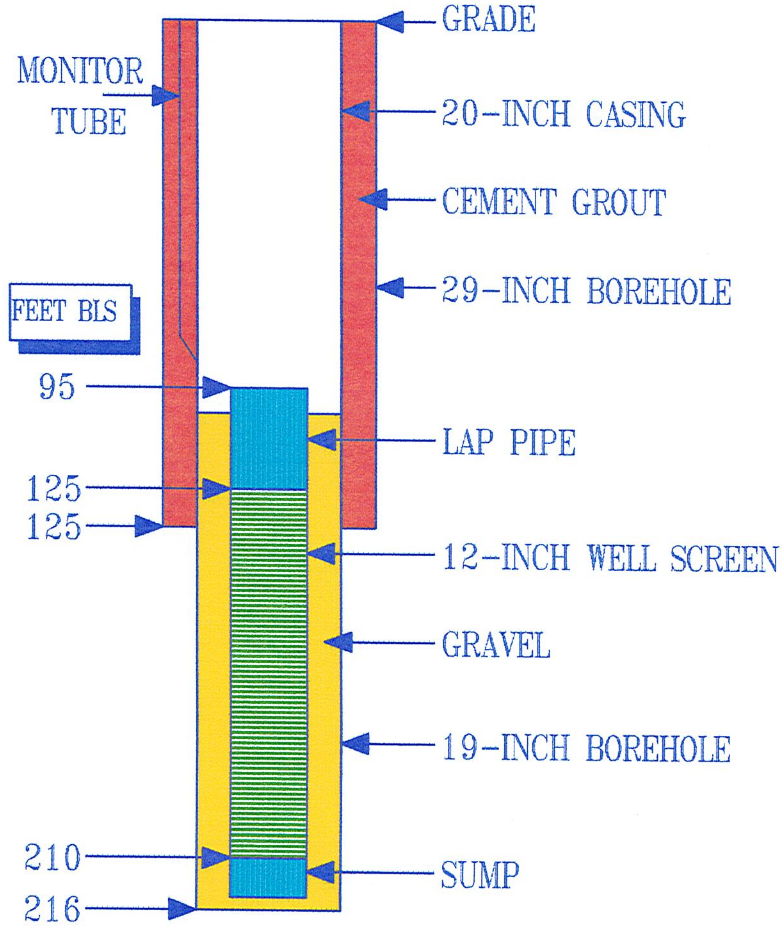
WELL COMPLETION REPORT
No. 3E

Owner:	Village of Palm Springs
Well Number:	PW-3E
Start Date:	2/17/92
Completion Date:	8/19/92
Method drilled:	Conventional Mud Rotary
Pilot Hole Depth:	220 feet bls
Pilot Hole Diameter:	5.75 inches
Final Hole Depth:	216 feet bls
Final Hole Diameter:	12 inches
Casing Depth:	125 feet bls
Casing Diameter:	20 inches
Amount Cement:	330 sacks
Monitor Tube Depth:	95 feet bls
Screen Interval:	125-210 feet bls
Screen Diameter:	12 inches
Screen Slot Size:	.060 inches
Screen Design Capacity:	2530 gpm
Gravel Pack Interval:	100-216 feet bls
Gravel Pack Size:	2-3.36 mm
Amount Gravel:	208 sacks
Development:	77.5 hours
Production Capacity:	1200 gpm
Timed Drawdown:	42.77 feet
Specific Capacity:	25.72 gpm/ft
Sand Content:	<.02 mg/liter

Well Completion Diagram



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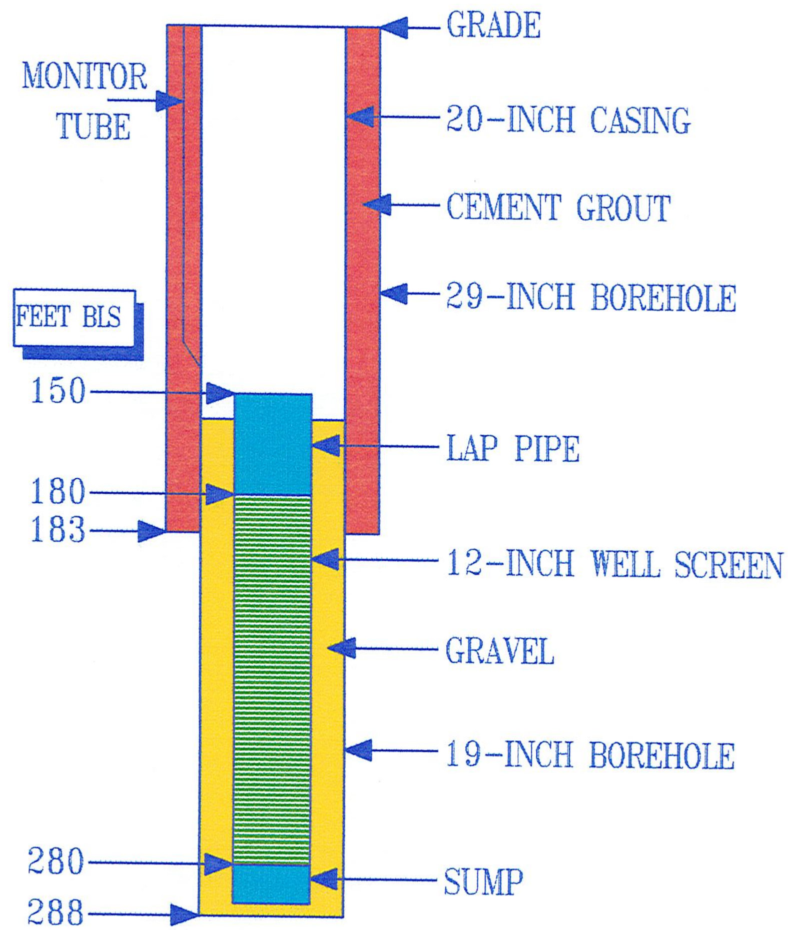
WELL COMPLETION REPORT
No. 4E

Owner:	Village of Palm Springs
Well Number:	PW-4E
Start Date:	2/07/92
Completion Date:	9/8/92
Method drilled:	Conventional Mud Rotary
Pilot Hole Depth:	230 feet bls
Pilot Hole Diameter:	5.5 inches
Final Hole Depth:	288 feet bls
Final Hole Diameter:	12 inches
Casing Depth:	183 feet bls
Casing Diameter:	20 inches
Amount Cement:	587 sacks
Monitor Tube Depth:	153 feet bls
Screen Interval:	180-280 feet bls
Screen Diameter:	12 inches
Screen Slot Size:	.060 inches
Screen Design Capacity:	2887 gpm
Gravel Pack Interval:	155-288 feet bls
Gravel Pack Size:	2-3.36 mm
Amount Gravel:	649 sacks
Development:	112 hours
Production Capacity:	1200 gpm
Timed Drawdown:	40.48 feet
Specific Capacity:	29.38 gpm/ft
Sand Content:	<.02 mg/liter

Well Completion Diagram



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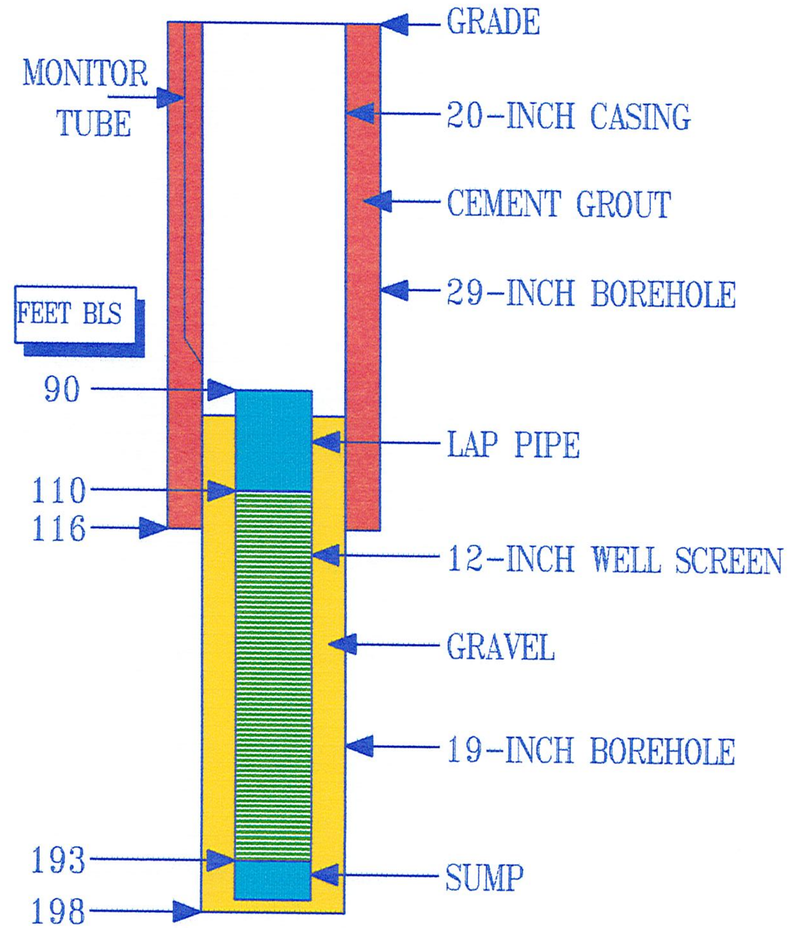
WELL COMPLETION REPORT
No. 11E

Owner:	Village of Palm Springs
Well Number:	PW-11E
Start Date:	5/28/92
Completion Date:	8/12/92
Method drilled:	Conventional Mud Rotary
Pilot Hole Depth:	220 feet bls
Pilot Hole Diameter:	7.88 inches
Final Hole Depth:	198 feet bls
Final Hole Diameter:	12 inches
Casing Depth:	116 feet bls
Casing Diameter:	20 inches
Amount Cement:	250 sacks
Monitor Tube Depth:	91 feet bls
Screen Interval:	110-193 feet bls
Screen Diameter:	12 inches
Screen Slot Size:	.060 inches
Screen Design Capacity:	2292 gpm
Gravel Pack Interval:	95-198 feet bls
Gravel Pack Size:	2-3.36 mm
Amount Gravel:	243 sacks
Development:	190.5 hours
Production Capacity:	700 gpm
Timed Drawdown:	28.78 feet
Specific Capacity:	22.59 gpm/ft
Sand Content:	.02 mg/liter

Well Completion Diagram



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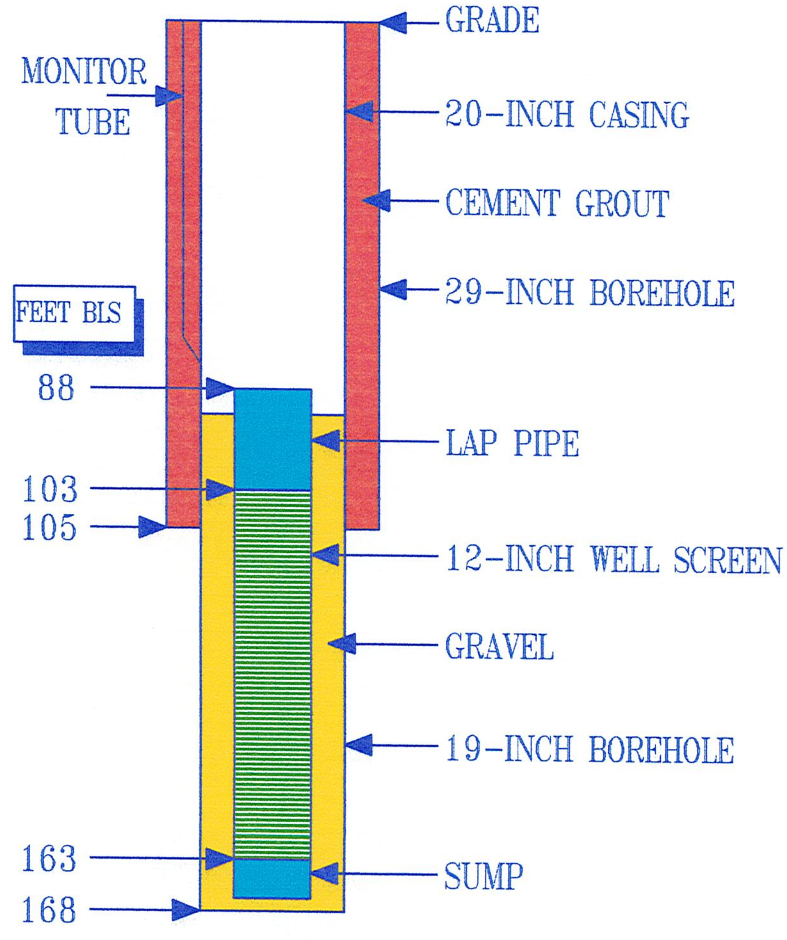
WELL COMPLETION REPORT

No. 1 W

Owner:	Village of Palm Springs
Well Number:	PW-1W
Start Date:	2/27/92
Completion Date:	8/20/92
Method drilled:	Conventional Mud Rotary
Pilot Hole Depth:	220 feet bls
Pilot Hole Diameter:	5.25 inches
Final Hole Depth:	168 feet bls
Final Hole Diameter:	12 inches
Casing Depth:	105 feet bls
Casing Diameter:	20 inches
Amount Cement:	300 sacks
Monitor Tube Depth:	75 feet bls
Screen Interval:	103-163 feet bls
Screen Diameter:	12 inches
Screen Slot Size:	.060 inches
Screen Design Capacity:	1726 gpm
Gravel Pack Interval:	93-168 feet bls
Gravel Pack Size:	2-3.36 mm
Amount Gravel:	362 sacks
Development:	86 hours
Production Capacity:	1400 gpm
Timed Drawdown:	5.36 feet
Specific Capacity:	285.45 gpm/ft
Sand Content:	<.02 mg/liter

Well Completion Diagram



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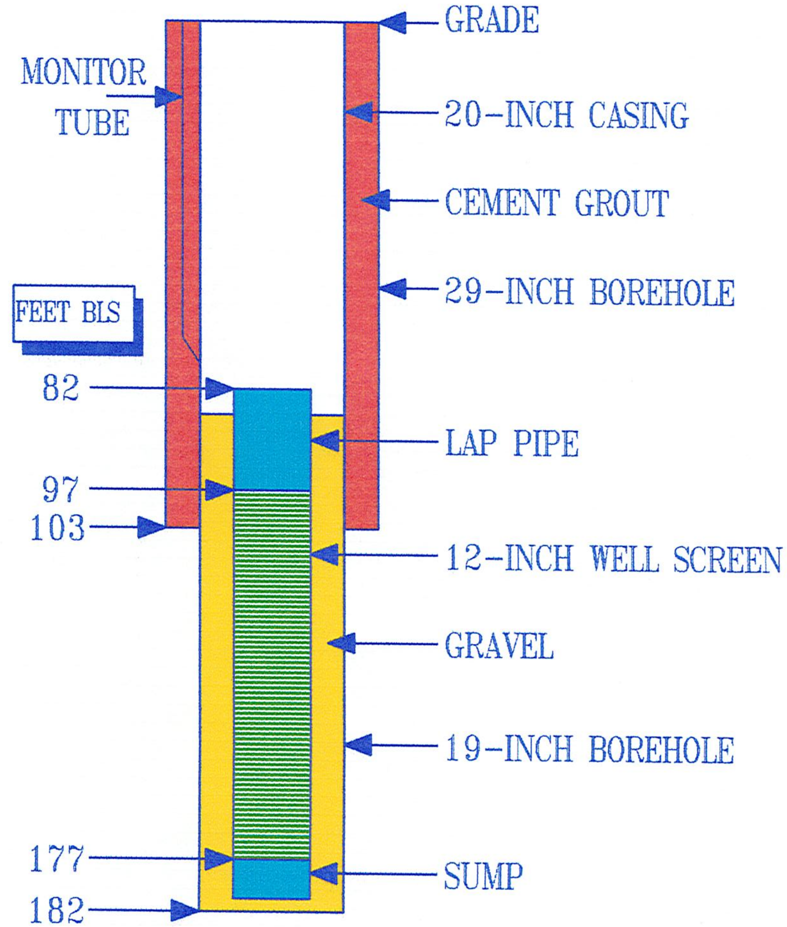
WELL COMPLETION REPORT
No. 2W

Owner:	Village of Palm Springs
Well Number:	PW-2W
Start Date:	2/24/92
Completion Date:	8/20/92
Method drilled:	Conventional Mud Rotary
Pilot Hole Depth:	300 feet bls
Pilot Hole Diameter:	5.25 inches
Final Hole Depth:	182 feet bls
Final Hole Diameter:	12 inches
Casing Depth:	103 feet bls
Casing Diameter:	20 inches
Amount Cement:	300 sacks
Monitor Tube Depth:	73 feet bls
Screen Interval:	97-177 feet bls
Screen Diameter:	12 inches
Screen Slot Size:	.060 inches
Screen Design Capacity:	2202 gpm
Gravel Pack Interval:	87-182 feet bls
Gravel Pack Size:	2-3.36 mm
Amount Gravel:	318 sacks
Development:	124 hours
Production Capacity:	1400 gpm
Timed Drawdown:	3.54 feet
Specific Capacity:	389.83 gpm/ft
Sand Content:	<.02 mg/liter

Well Completion Diagram



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APPENDIX B

GEOLOGIC LOGS

GEOLOGIC LOG
WELL NO. 1E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
0-5	Dark brown clay/muck with quartz sand Clay with fine-grained sand, clear Shells-none
5-10	Quartz Fine- to medium-grained sand, clear Very clean
10-15	Quartz Fine- to medium-grained sand, clear Very clean
15-20	Quartz Fine- to medium-grained sand, clear A small percentage of amber sand grains
20-25	Amber quartz Fine- to medium-grained sand, clear and amber grains 50% amber sand; 50% clear sand
25-30	Amber quartz Fine- to medium-grained sand, clear and amber grains 50% amber sand; 50% clear sand
30-35	Amber quartz Fine- to medium-grained sand 90% amber sand; 10% clear sand
35-40	Amber quartz Fine- to medium-grained sand Lighter shade of brown than the above sample; 90% amber sand; 10% clear sand
40-45	Light brown quartz Medium- to fine-grained sand, subround to subangular 40-30% anglar amber quartz sand, medium-grained
45-50	Light tan quartz Fine- to very fine-grained sand, round to subround

GEOLOGIC LOG
WELL NO. 1E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
50-55	Light tan quartz Fine- to very fine-grained sand, round to subround Trace medium quartz sand; trace clay?
55-60	Light tan quartz Very fine-grained sand Trace clay
60-65	Light tan to gray limestone biomicrite Medium- to fine-grained 40% medium-to fine-grained quartz sand
65-70	Light tan to gray limestone biomicrite Medium- to fine-grained 40% medium- to fine-grained quartz sand
70-75	Light tan to gray limestone biomicrite Medium- to fine-grained Shells-fragments Medium- to fine-grained quartz sand, somewhat less than above
75-80	Limestone Medium- to fine-grained Shells-fragments 40% loose shell fragments; Pelecypods medium- to fine-grained quartz sand as above
80-85	Light tan shell Medium- to course-grained Shells-fragments Cementation-none 10% quartz sand medium- to fine-grained "beach sand"
85-90	Light tan shell Medium- to coarse-grained Shells-fragments Cementation-none

Depth (ft)	Geologic Description
90-95	Light tan shell Medium- to coarse-grained Shells-fragments Cementation-none Shells coarser; 20% sand quartz medium- to fine-grained, round to subround
95-100	Light tan shell Medium- to coarse-grained Shells-fragments Cementation-none Shells coarser; 30% quartz sand medium- to fine-grained, round to subround
100-105	Light tan shell Medium- to coarse-grained Shells-fragments Cementation-none Trace quartz sand, "beach sand"
105-110	Light tan shell Medium- to coarse-grained Shells-fragments Cementation-none 20% fine-to very fine-grained quartz sand, subround; trace of mafics
110-115	Light tan shell Medium- to coarse-grained Shells-fragments Cementation-none 20% fine- to very fine-grained quartz sand subround; trace of mafics, traces whole small shells
115-120	Light gray quartz sandstone Medium- to fine-grained Cementation-good, Porosity-fair

GEOLOGIC LOG
WELL NO. 1E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
120-125	Light gray quartz sandstone Medium- to very fine-grained Shells-fragments Cementation-fair Shell from uphole; sand, quartz, fine to very fine gravel
125-130	Light gray quartz sandstone Medium- to very fine-grained Shells-fragments Cementation-fair Shell from uphole; sand, quartz, fine to very fine gravel; mafics
130-135	Light gray sandstone Fine- to medium-grained Cementation-good to fair, mafics
135-140	Light gray limestone/sandstone Medium- to fine-grained Cementation-good 20% quartz sand medium
140-145	Light gray quartz sandstone Medium- to fine-grained Mafics
145-150	Light gray quartz sandstone Medium- to fine-grained Mafics; shell fragments from uphole contamination
150-155	Light tan to off-white limestone/biomicrite Medium- to fine-grained Cementation-good, porosity-good Hole taking fluid
155-160	Light tan to off-white arenaceous limestone/biomicrite Medium- to fine-grained Cementation-good, porosity-good Hole taking fluid; medium- to fine-grained quartz sand; mafics

GEOLOGIC LOG
WELL NO. 1E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
160-165	Light tan arenaceous limestone/biomicrite Medium- to fine-grained Loose shell fragments; loose quartz sand medium- to fine-grained
165-170	Light tan arenaceous limestone/biomicrite Medium- to fine-grained Loose shell fragments; 25-30% loose quartz sand medium-to fine-grained; mafics
170-175	Light tan arenaceous limestone/biomicrite Medium- to fine-grained Loose shell fragments; 25-30% loose quartz sand medium- to fine-grained; mafics
175-180	Arenaceous limestone/biomicrite Medium- to coarse-grained Shells-fragments Medium- to fine-grained quartz sand
180-185	Light gray calcareous sandstone Medium- to fine-grained Cementation-good, porosity-good
185-190	Light tan limestone biomicrite Fine-grained Shells-Fragments Porosity-good
190-195	Light tan limestone/biomicrite Fine grained Shells-fragments Porosity-good
195-200	Light tan limestone biomicrite Fine grained Shells-fragments Porosity-good

GEOLOGIC LOG
WELL NO. 1E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
200-205	Light gray quartz sandstone Medium- to fine-grained Cementation-good, porosity-good Moderately hard Sand
205-210	Light gray quartz sandstone Medium- to fine-grained Cementation-good, porosity-good Moderately hard Sand
210-215	Light gray quartz sandstone Medium- to fine-grained Cementation-good, porosity-good Moderately hard 50% sand loose quartz medium-to fine-grained subangular to subround, mafics
215-220	Light gray quartz Sand fine- to medium-grained subround mafics

GEOLOGIC LOG
WELL NO. 2E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
0-3	Fill material Comprised mostly of shell rock
3-5	Dark brown to black hardpan Clayey with sand and silt Large amounts of organics; some cementation
5-8	Dark brown to black hardpan Clayey with sand and silt Large amounts of organics; some cementation
8-10	Light tan quartz sand Fine- to medium-grained, subround Some amber quartz grains
10-15	Light tan quartz sand Fine- to medium-grained 3 to 4% amber sand; some coarser-grained frosted sand grains
15-20	Light tan quartz sand Fine- to medium-grained, subround to subangular Shells-fragments, percentage-1, 3-4% amber sand; some coarser-grained frosted sand; shell fragments may be uphole contamination
20-25	Sand Fine- to medium-grained, subround to subangular Frosted shells-fragments
25-30	Light gray quartz sand Fine- to medium-grained, subangular to angular 45% amber sand
30-35	Light brown to amber quartz sand Very fine- to fine-grained, angular

GEOLOGIC LOG
WELL NO. 2E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
35-40	Brown to amber quartz sand Fine- to medium-grained, angular clear 90% amber sand; 10% frosted rounded quartz sand
40-45	Light tan to gray quartz sand Fine- to medium-grained 45% amber sand: medium grained, angular
45-50	Light tan quartz sand Very fine-grained, subround, clear
50-55	Light tan quartz sand Very fine-grained, subround, clear
55-59	Light tan quartz sand Very fine-grained, subround, clear
59-60	Arenaceous sandstone Fine- to medium-grained Porosity-good
60-65	Gray limestone/arenaceous Fine- to medium-grained Cementation-good, porosity-good to excellent Biomicrite and quartz sand; hole taking fluid; lost circulation at 65 feet
65-67	Gray limestone/arenaceous Fine- to medium-grained Cementation-good, porosity-good to excellent Biomicrite and quartz sand; hole taking fluid; lost circulation at 65 feet
67-70	Gray limestone biomicrite Cementation-Good Hard

GEOLOGIC LOG
WELL NO. 2E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
70-75	Light gray limestone biomicrite Fine- to medium-grained Cementation-good to excellent, porosity-good to excellent 25% sand: quartz, medium-grained
75-78	Light gray limestone biomicrite Fine- to medium-grained Cementation-good to excellent, porosity-good to excellent 25% sand: quartz, medium-grained
78-80	Light gray limestone biomicrite Fine- to medium-grained Cementation-good to excellent, porosity-good to excellent 25% sand: quartz, medium-grained; softer than above sample
80-85	Light gray arenaceous sandstone Fine- to medium-grained Shells-fragments, Cementation-good, porosity-fair to good Moderately hard Coarse to fine shell fragments
85-90	Gray calcareous sandstone Fine- to medium-grained Shells-fragments, Quartz sand in calcareous matrix; whole pelecypods
90-95	Gray calcareous sandstone Fine- to medium-grained Shells-fragments, Quartz sand in calcareous matrix; whole pelecypods

GEOLOGIC LOG
WELL NO. 2E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
95-100	Gray calcareous sandstone Fine- to medium-grained Shells-fragments, Quartz sand in calcareous matrix; whole pelecypods
100-105	Gray calcareous sandstone Fine- to medium-grained Cementation-fair to good, porosity-fair to good Calcareous cement
105-110	Gray calcareous sandstone Fine- to medium-grained Cementation-fair to good, porosity-fair to good Calcareous cement
110-115	Gray calcareous sandstone Fine- to medium-grained Cementation-fair to good, porosity-fair to good Calcareous cement
115-120	Gray calcareous sandstone Fine- to medium-grained Cementation-fair to good, porosity-fair to good Calcareous cement
120-125	Light gray sandstone Fine- to medium-grained Shells-fragments Cementation-fair to good Loose sand medium- to fine-grained shell fragments and quartz sand
125-130	Light gray sandstone Fine- to medium-grained Shells-fragments Cementation-fair to good Loose sand medium- to fine-grained shell fragments and quartz sand

Depth (ft)	Geologic Description
130-135	Limestone biomicrite Fine-grained Shells-fragments Cementation-good, porosity-good Some fluid loss
135-140	Limestone biomicrite Fine-grained Shells-fragments, Cementation-good, porosity-good Some fluid loss
140-145	Light tan to gray limestone biomicrite Medium- to coarse-grained Cementation-good, porosity-fair
145-150	Light gray limestone biomicrite Fine- to medium-grained Shells-fragments Cementation-good Abundant shell fragments
150-155	Light gray limestone biomicrite Fine- to medium-grained Shells-fragments Cementation-good Abundant shell fragments
155-160	Light tan limestone biomicrite Shells-fragments Cementation-fair, porosity-fair Friable? Abundant shell fragments
160-165	Light gray limestone/coquina Medium- to coarse-grained Cementation-poor Friable Sand: 45% of sample, medium-grained quartz; beach sand?

GEOLOGIC LOG
WELL NO. 2E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
165-170	Light gray limestone/coquina Medium- to coarse-grained Cementation-poor Friable Sand: 45% of sample, medium-grained quartz; beach sand?
170-175	Limestone/coquina Fine- to coarse-grained Shells-fragments Bimodal; larger grained quartz sand; medium-grained phosphorite?
175-180	Light gray sandstone Fine- to coarse-grained Shells-fragments Quartz sand: medium- to fine-grained, clear, subround to subangular; coarse- to fine-grained shell fragments
180-185	Light gray limestone/sandstone Fine- to coarse-grained Clay: gray soft pliable streaks
185-190	Coquina Fine- to coarse-grained Shells-fragments Fine-grained to medium-grained quartz sand and shells
190-195	Coquina Fine- to coarse-grained Shells-fragments Fine-grained to medium-grained quartz sand and shells
195-200	Coquina Fine- to coarse-grained Shells-fragments Fine-grained to medium-grained quartz sand and shells

Depth (ft)	Geologic Description
200-205	Light gray coquina/sandstone Fine- to medium-grained to coarse-grained Shells-fragments Cementation-poor Shell fragments bimodal
205-210	Light gray coquina/sandstone Fine- to medium-grained to coarse-grained Shells-fragments Cementation-poor Shell fragments bimodal
210-215	Light gray sandstone Fine- to medium-grained Shells-fragments Cementation-poor Quartz sand medium- to fine-grained, phosphorite, subangular-subround; shell fragments medium- to coarse-grained
215-220	Light gray sandstone Fine- to medium-grained Shells-fragments Cementation-fair Quartz sand medium- to fine-grained, phosphorite, subangular to subround shell fragments medium- to coarse-grained
220-225	Light gray limestone biomicrite Fine- to medium-grained Cementation-good to excellent, porosity-good
225-230	Light gray limestone biomicrite Fine- to medium-grained Cementation-good to excellent, porosity-good
230-235	Light gray limestone biomicrite Fine- to medium-grained Cementation-good to excellent, porosity-good

GEOLOGIC LOG
WELL NO. 2E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
235-240	Light gray limestone biomicrite Fine- to medium-grained Cementation-good to excellent, porosity-good
240-245	Light gray limestone biomicrite Fine- to medium-grained Cementation-fair, porosity-fair
245-250	Light gray limestone biomicrite Fine- to medium-grained Cementation-fair, porosity-fair
250-255	Light gray limestone biomicrite Fine- to medium-grained Cementation-fair, porosity-fair White "marl", fine clay, soft, pliable
255-260	Light gray limestone biomicrite Fine- to medium-grained Cementation-fair, porosity-fair White "marl," fine clay, soft, pliable
260-265	Off-white to light gray marl and limestone Soft, friable Greater percentage of marl than limestone
265-270	Off-white to light gray marl and limestone Friable Greater percentage of marl than limestone
270-275	Light gray limestone and clay Soft Gray green clay
275-280	Light gray limestone and clay Soft Gray green clay

GEOLOGIC LOG
WELL NO. 2E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
280-285	Light gray limestone and clay Sandy/silty Hawthorn; more clay
285-290	Light gray limestone and clay Sandy/silty Hawthorn; more clay
290-295	Light gray limestone and clay Sandy/silty Hawthorn; more clay
295-300	Light gray limestone and clay Sandy/silty Hawthorn; more clay; T.D. hole at 300 feet

GEOLOGIC LOG
WELL NO. 3E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
0-5	Fill material and sand
5-10	Fill material and sand
10-15	Light gray to brown quartz sand Fine-grained to medium-grained, round to subround Amber sand grains
15-20	Light gray to brown quartz sand Fine- to medium-grained, round to subround Amber sand grains
20-25	Light brown quartz sand Very fine- to medium-grained, subround 25% amber grains, angular
25-30	Light brown quartz sand Very fine- to medium-grained, subround 25% amber grains, angular
30-35	Quartz sand Fine- to medium-grained, subround to subangular, clear 20% angular amber sand grains; clay trace-brown soft, pliable
35-40	Quartz sand Fine- to medium-grained subround to subangular, clear 20% angular amber sand grains; clay trace-brown soft, pliable
40-45	Quartz sand and clay Fine- to medium-grained
45-50	Quartz sand and clay Fine- to medium-grained

GEOLOGIC LOG
WELL NO. 3E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
50-55	Quartz sand and clay Fine- to medium-grained
55-60	Sandstone Fine- to medium-grained Cementation-good, Cavity at 59 feet - lost circulation
60-65	Light gray quartz sandstone Fine- to medium-grained Cementation-good, porosity-good to excellent 20% medium- to fine-grained clear quartz sand
65-70	Light gray quartz sandstone Fine- to medium-grained Cementation-good, porosity-good to excellent Lost circulation; hard at 69-70 feet; 20% medium- to fine-grained clear quartz sand
70-75	Light gray quartz sandstone Fine- to medium-grained Cementation-good, porosity-good Less fluid loss than before; harder formation
75-80	Light gray quartz sandstone Fine- to medium-grained Cementation-good, porosity-good Less fluid loss than before; harder formation; fractured
80-85	Light gray calcareous sandstone Fine-grained, subround, clear Shells-fragments Cementation-good, porosity-fair Moderately hard

GEOLOGIC LOG
WELL NO. 3E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
85-90	Light gray calcareous sandstone Fine-grained, subround clear Shells-fragments Cementation-good, porosity-fair Hard 20% loose quartz sand, medium-grained to fine-grained
90-95	Light gray calcareous sandstone Fine-grained, subround, clear Shells-fragments, percentage-10, weathering-none Cementation-poor to fair, porosity-not discernable Moderately hard 10% loose quartz sand, medium-grained to fine-grained; trace mafics
95-100	Yellowish light gray arenaceous limestone Fine- to coarse-grained, subangular to angular, clear Shells-fragments, percentage-40, weathering-none Cementation-poor to fair, porosity-fair Soft Abundant loose shell fragments; 10% fine- to medium-grained quartz, sand; trace mafics
100-105	Yellowish light gray calcareous sandstone Medium- to course-grained, subround to subangular, clear shells-fragments, percentage-25, Weathering-moderate Cementation-poor, porosity-not discernable Moderately hard 20% loose sand, medium-grained; loose shells; trace mafics
105-110	Yellowish light gray calcareous sandstone Medium- to coarse-grained, subround to subangular Clear shells-fragments, percentage-35, Weathering-moderate Cementation-poor, porosity-not discernable Moderately hard 20% loose sand, medium grained; loose shells; trace mafics

GEOLOGIC LOG
WELL NO. 3E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
110-115	Yellowish light gray calcareous sandstone Fine- to coarse-grained, angular, clear Shells-fragments, percentage-55, weathering-moderate Cementation-poor, porosity-not discernable Soft to moderately hard 15% loose sand, fine-grained; trace mafics
115-120	Yellowish light gray calcareous sandstone Medium- to coarse-grained, subangular, clear Shells-fragments, percentage-30, weathering-moderate Cementation-fair to good, porosity-not discernable Moderately hard 20% loose sand, fine-grained; trace mafics
120-125	Yellowish light gray calcareous sandstone Fine- to course-grained, subround to subangular, clear Shells-fragments, percentage-15, weathering-moderate Cementation-poor, porosity-not discernable Soft to moderately hard 10% loose fine-grained sand; trace mafics
125-130	Light gray sandstone Medium to coarse-grained, subangular, clear Shells-fragments, percentage-5, weathering-moderate Cementation-fair to good, porosity-fair Hard 10% loose fine-grained sand; trace mafics
130-135	Yellowish light gray calcareous sandstone Fine- to coarse-grained, subround to subangular, clear Shells-fragments, percentage-20, weathering-moderate Cementation-poor to fair, porosity-not discernable Soft to moderately hard 15% loose fine-grained sand; trace mafics
135-140	Light gray calcareous sandstone Medium- to coarse, subround, clear Shells-fragments, percentage-5, weathering-moderate Cementation-fair, porosity-fair Moderately hard 10% loose fine-grained sand; trace mafics

GEOLOGIC LOG
WELL NO. 3E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
140-145	Light gray arenaceous limestone Fine- to medium-grained, subround, clear Shells-fragments, percentage-50, weathering-moderate Cementation-poor, porosity-not discernable Soft 20% loose fine-grained sand; trace mafics
145-150	Light gray arenaceous limestone Medium- to coarse-grained, subangular, clear Shells-fragments, percentage-50, weathering-moderate Cementation-poor to fair, porosity-not discernable Soft to moderately hard 15% loose fine-grained sand; trace mafics
150-155	Light gray calcareous sandstone Fine- to coarse-grained, subround to subangular, clear Shells-fragments, percentage-20, weathering-moderate Cementation-fair to good, porosity-poor Moderately hard to hard 10% loose fine-grained sand; trace mafics
155-160	Light gray arenaceous limestone Medium- to coarse, subround, clear Shells-fragments, percentage-60, weathering-moderate Cementation-poor to fair, porosity-not discernable Moderately hard 10% loose fine-grained sand; trace mafics
160-165	Light gray calcareous sandstone Fine- to coarse-grained, subround, clear Shells-fragments, percentage-30, weathering-moderate Cementation-poor, porosity-not discernable Soft 25% loose fine-grained sand; trace mafics
165-170	Light gray arenaceous limestone Fine- to medium-grained, subround, clear Shells-fragments, percentage-70, weathering-moderate Cementation-poor, porosity-not discernable Soft 20% loose fine-rained sand; trace mafics

Depth (ft)	Geologic Description
170-175	Light gray arenaceous limestone Fine-to medium-grained, subround, clear Shells-fragments, percentage-70, weathering-moderate Cementation-poor, porosity-not discernable Soft 20% loose fine-grained sand; trace mafics
175-180	Light gray sand Fine-grained, subround, clear Shells-fragments, percentage-20, weathering-moderate Cementation-poor, porosity-not discernable Soft 20% medium-grained shell fragments
180-185	Yellow gray calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-25, weathering-moderate Cementation-fair, porosity-fair Moderately hard 20% fine-grained quartz sand; trace mafics
185-190	Light gray calcareous sandstone Fine- to coarse-grained, subround, clear Shells-fragments, percentage-40, weathering-moderate Cementation-fair, porosity-poor to fair Moderately hard 10% loose calcareous sand
190-195	Light gray calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-30, weathering-moderate Cementation-poor, porosity-poor Soft
195-200	Light gray calcareous sandstone Fine- to medium-grained, subround to subangular, clear Shells-fragments, percentage-20, weathering-moderate Cementation-fair, porosity-fair Moderately hard 20% fine-grained quartz sand

GEOLOGIC LOG
WELL NO. 3E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
200-205	Yellow gray sandstone and sand Fine-grained, round to subround, clear Shells-fragments, percentage-10, weathering-None Cementation-poor, porosity-not discernable Soft 25% loose sand, medium to fine-grained quartz
205-210	Yellow gray sandstone and sand Fine-grained, round to subround, clear Shells-fragments, percentage-10, weathering-none Cementation-poor, porosity-not discernable Soft 25% loose sand, medium- to fine-grained quartz
210-215	Light gray sandstone and sand Fine- to medium-grained, round to subround Clear Shells-fragments, percentage-10, weathering-Moderate Cementation-fair, porosity-fair Moderately hard 40% loose quartz sand medium- to fine-grained; trace mafics
215-220	Light gray sandstone and sand Fine- to medium-grained, round to subround Clear Shells-fragments, percentage-10, weathering-Moderate Cementation-fair, porosity-fair Moderately hard 40% loose quartz sand medium- to fine-grained; trace mafics

GEOLOGIC LOG
WELL NO. 4E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
0-5	Black organic sand and silt
5-10	Brown quartz sand
10-15	Brown quartz sand Amber sand and clear quartz
15-20	Brown quartz sand Amber sand and clear quartz
20-25	Amber quartz sand Fine- to medium-grained, subround to subangular
25-30	Amber quartz sand Fine- to medium-grained, subround to subangular
30-35	Amber quartz sand Very fine- to medium-grained, subround to subangular
35-36	Amber quartz sand Very fine- to medium-grained, subround to subangular
36-40	Clay
40-45	Light tan quartz sand Very fine- to fine-grained 10% illmenite
45-50	Light tan quartz sand Very fine- to fine-grained 10% illmenite
50-55	Light tan quartz sand Very fine- to fine-grained 10% illmenite

GEOLOGIC LOG
WELL NO. 4E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
55-58	Light tan quartz sand Very fine- to fine-grained 10% illmenite
58-60	Gray calcareous sandstone Fine- to medium-grained Shells-fragments Cementation-good, porosity-good Calcite crystals; cemented shell fragments
60-65	Gray calcareous sandstone Fine-grained Cementation-poor to good, porosity-good Calcite crystals; some rock is very friable
65-70	Gray calcareous sandstone Fine-grained Cementation-poor to good, porosity-good Calcite crystals; some rock is very friable
70-75	Gray calcareous sandstone Fine-grained Cementation-poor, porosity-good Fine- to medium-grained quartz sand; calcite crystals
75-80	Gray calcareous sandstone Fine-grained Cementation-poor, porosity-good Fine- to medium-grained quartz sand; calcite crystals
80-85	Gray calcareous sandstone Fine-grained Shells-fragments, weathering-extensive Cementation-fair Not as friable as before

GEOLOGIC LOG
WELL NO. 4E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
85-90	Gray calcareous sandstone Fine-grained Shells-fragments, weathering-extensive Cementation-fair
90-95	Gray calcareous sandstone Fine-grained Shells-fragments Cementation-fair
95-98	Gray calcareous sandstone Fine-grained Shells-fragments Cementation-fair
98-100	Quartz sand Fine-grained, subround to subangular
100-105	Gray quartz sand Medium-grained Shells-fragments Lots of shells and fragments
105-110	Gray quartz sand Fine- to medium-grained Shells-fragments Small shell fragments
110-113	Gray sand/silt Very fine-grained Shells-fragments Small shell fragments
113-115	Gray sand/silt Very fine-grained Shells-fragments Small shell fragments; beginning to see rock again

GEOLOGIC LOG
WELL NO. 4E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
115-120	Gray sand/silt Very fine-grained Shells-fragments Small shell fragments; beginning to see rock again
120-125	Gray quartz sand Very fine- to fine-grained Shells-fragments Very little rock
125-130	Gray quartz sand Very fine- to fine-grained Shells-fragments Some rock: thin gray fine-grained sandstone
130-135	Gray quartz sand Fine-grained Shells-fragments Many small shell fragments
135-140	Quartz sand and silt Very fine- to fine-grained Shells-fragments Many small shell fragments; some larger fragments; some thin layers of indurated sands
140-145	Light tan to gray limestone/arenaceous biomicrite Shells-fragments Cementation-poor to fair Friable Medium- to fine-grained calacareous sand
145-150	Light gray sand, calcareous & quartz Very fine- to fine-grained Shells-fragments Large coral: porities sp. and pelecypods - oyster; shell bleached and worn, shows transport

GEOLOGIC LOG
WELL NO. 4E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
150-155	Light tan limestone and sand Very fine- to fine-grained Shells-fragments
155-160	Light tan to light gray sand, shells Medium- to coarse-grained, subround to angular Shells-fragments
160-165	Light tan to gray sand, calcareous Fine- to medium-grained, subangular to angular Shells-fragments Note: driller says this is rock
165-170	Quartz sand Very fine- to medium-grained, subangular Shells-fragments, percentage-30, Coarse- to medium-grained shell fragments; driller says this is rock
170-175	Gray calcareous sandstone Fine- to medium-grained Shells-fragments Sand: very fine- to medium-grained
175-180	Light gray calcareous sandstone Fine- to medium-grained Shells-fragments Cementation-fair Sand: fine to very fine-grained quartz
180-185	Light gray calcareous sandstone Fine- to medium-grained Shells-fragments Soft to moderately hard Sand and shell fragments

GEOLOGIC LOG
WELL NO. 4E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
185-190	Light gray calcareous sandstone Fine- to medium-grained Shells-fragments Soft to moderately hard Sand and shell fragments
190-193	Light gray calcareous sandstone Fine- to medium-grained Shells-fragments Soft to moderately hard Sand and shell fragments
193-195	Light gray calcareous sandstone Fine- to medium-grained Shells-fragments Cementation-good Hard
195-200	Light gray calcareous sandstone Fine- to medium-grained Shells-fragments Cementation-good Hard
200-205	Light gray calcareous sandstone Fine- to medium-grained Shells-fragments Cementation-good Hard
205-210	Light gray calcareous sandstone Fine- to medium-grained Shells-fragments Cementation-good Hard

GEOLOGIC LOG
WELL NO. 4E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
210-215	Light gray calcareous sandstone Fine- to medium-grained Shells-fragments Cementation-good Hard
215-220	Light gray calcareous sandstone Fine- to medium-grained Shells-fragments Cementation-good Hard
220-225	Light gray calcareous sandstone Fine- to medium-grained Shells-fragments Cementation-good Hard
225-230	Light gray calcareous sandstone Fine- to medium-grained Shells-fragments Cementation-good Hard

GEOLOGIC LOG
WELL NO. 11E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
10-20	Brown quartz sand Fine- to medium-grained, subround, clear Shells-fragments, percentage-2, weathering-extensive Mostly clear; 20% amber sand and mafics and shell
20-30	Tan Sand Fine- to medium-grained, subangular, clear Shells-fragments, weathering-moderate Cementation-not discernable, porosity-not discernable Soft Trace of amber sand
30-40	Light tan sand quartz Fine- to medium-grained, subangular, clear Shells-fragments, percentage-20, Weathering-moderate to extensive Cementation-poor, porosity-not discernable Soft Trace amber sand mafics
40-50	Light grey sand quartz/shell Fine- to medium-grained, subround to subangular clear Shells-fragments, percentage-35, Weathering-moderate to extensive Cementation-poor, porosity-not discernable Soft Sand and shell, shell fragments, beaches trace mafics
50-60	Gray quartz Fine- to medium-grained, subangular, clear Shells-fragments, percentage-10, weathering-moderate 2% mafics
60-65	Gray quartz sand Fine- to medium-grained, subangular, clear Shells-fragments, percentage-20, weathering-moderate Some small whole shells; 2% mafics

GEOLOGIC LOG
WELL NO. 11E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
65-70	Gray quartz sand Fine-grained, subround to subangular, clear Shells-fragments, percentage-10, weathering-moderate 2% mafics
70-75	Gray quartz sand Fine-grained, subangular, clear Shells-fragments, percentage-10, weathering-moderate 2% mafics
75-80	Gray quartz sand Fine- to medium-grained, subround, clear Shells-fragments, percentage-10, weathering-moderate 2% mafics
80-85	Gray quartz sand Fine-grained, subround, clear Shells-fragments, percentage-15, weathering-moderate 5% mafics
85-90	Gray quartz sand Fine-grained, subround, clear Shells-fragments, percentage-15, weathering-moderate 5% mafics
90-95	Gray quartz sand Fine-grained, subround, clear Shells-fragments, percentage-15, weathering-moderate 5% mafics
95-100	Gray quartz sand Fine-grained, subround, clear Shells-fragments, percentage-15, weathering-moderate 5% mafics

GEOLOGIC LOG
WELL NO. 11E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
100-105	Gray quartz sand Fine-grained, subround, clear Shells-fragments, percentage-20, weathering-moderate 5% mafics
105-110	Gray quartz sand Fine-grained, subround, clear Shells-fragments, percentage-20, weathering-moderate 5% mafics
110-115	Gray quartz sand Fine-grained, subround, clear Shells-fragments, percentage-20, weathering-moderate 2% mafics
115-120	Gray calcareous sandstone Medium-grained, subround, clear Shells-fragments, percentage-15, weathering-moderate to extensive Cementation-good, porosity-not discernable Hard 20% sand with shall fragments
120-125	Gray calcareous sandstone Medium-grained, subround, clear Shells-fragments, percentage-15, weathering-moderate Cementation-good, porosity-not discernable Hard 50% sand with shell fragments
125-130	Gray quartz sand Fine-grained, subround, clear Shells-fragments, percentage-10, weathering-moderate Also still seeing the calcareous sandstone as above

GEOLOGIC LOG
WELL NO. 11E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
130-135	Gray Sandstone calcareous Fine- to medium-grained, subround, to subangular clear Shells-fragments, percentage-20, weathering-moderate Cementation-excellent, porosity-good Hard to extremely hard Casing seat in this interval, trace mafics
135-140	Gray calcareous sandstone Medium-grained, subangular, clear Shells-fragments, percentage-20, weathering-moderate Cementation-excellent, porosity-excellent Hard 10% mafics, 20% sand quarts medium-grained to fine-grained
140-145	Gray sandstone calcareous Medium-grained, subangular, clear Shells-fragments, percentage-20, weathering-moderate Cementation-excellent, porosity-good Moderately hard to hard 25% sand medium-grained, to fine-grained, grained quartz, 10% mafics
145-150	Light gray calcareous sandstone Medium-grained, subangular, frosted Shells-fragments, percentage-25, weathering-moderate Cementation-good, porosity-good Hard 20% sand medium to fine-grained quartz, 5% mafics
150-155	Light gray arenaceous limestone Medium- to coarse-grained, subangular, to angular Shells-fragments, percentage-51, weathering-extensive Cementation-good, porosity-excellent Moderately hard 15% mafics, 25% quartz sand medium to fine-grained

Depth (ft)	Geologic Description
155-160	Light gray arenaceous limestone Medium- to coarse-grained, subangular, to angular Shells-fragments, percentage-60, weathering-extensive Cementation-good, porosity-good to excellent Hard Trace mafics
160-165	Light gray arenaceous limestone Very fine- to medium-grained, subangular, clear Shells-fragments, percentage-55, weathering-moderate Cementation-poor to fair, porosity-fair Soft to moderately hard 45% loose quartz sands medium- to fine-grained, trace of mafics.
165-170	Tan limestone arenaceous Medium- to coarse-grained, angular Shells-fragments, percentage-25, weathering-moderate Cementation-good, porosity-good Moderately hard 25% quartz sand medium- to fine-grained, 5% mafics
170-175	Tan limestone arenaceous Medium- to coarse-grained, subangular, Shells-fragments, percentage-65, weathering-moderate Cementation-good, porosity-good Hard 20% quartz sand medium- to fine-grained
175-180	Light tan biomicrite Fine- to medium-grained, subangular, Shells-fragments, percentage-10, weathering-moderate Cementation-fair to good, porosity-fair Moderately hard 20% quartz sand medium to fine-grained, quartz, trace mafics

Depth (ft)	Geologic Description
180-185	Green Sandstone/siltstone calcareous Very fine- to fine-grained, round to subround, clear Shells-fragments, percentage-20, weathering-moderate to extensive Cementation-excellent, porosity-fair to good Hard Sandstone with silt mafics
185-190	Gray green calcareous sandstone Fine- to medium-grained, subangular, clear Shells-fragments, percentage-40, weathering-moderate to extensive Cementation-excellent, porosity-fair to good Hard Traces of loose quartz sand
190-195	Gray greenish sandstone Very fine- to fine-grained, subround, clear Shells-fragments, percentage-15, weathering-moderate Cementation-excellent, porosity-good to excellent Hard, some crystaline surfaces 25% quartz sand, very fine- to fine-grained
195-200	Light gray green sandstone Very fine- to medium-grained, round to subround clear Shells-fragments, percentage-15, weathering-moderate Cementation-excellent, porosity-good Hard 25% loose quartz sand medium to fine-grained
200-205	Light gray sand Very fine- to fine-grained, subround, clear Shells-fragments, percentage-35, weathering-moderate Cementation-not discernable, porosity-not discernable Soft Clayey sand, cohesive sand

GEOLOGIC LOG
WELL NO. 11E
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
205-210	Light gray sand and sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-20, weathering-moderate Cementation-fair, porosity-not discernable Soft Clayey trace of sandstone
210-215	Light gray Very fine- to fine-grained, subangular, clear Shells-fragments, percentage-20, weathering-moderate Cementation-not discernable, porosity-not discernable Soft Traces of sandstone as above, some dark gray clay
215-220	Gray/greenish quartz sand and clay Very fine- to fine-grained, subangular, clear Shells-fragments, percentage-20, weathering-moderate Soft A significant (50%) amount of clay, T.D. hole

GEOLOGIC LOG
WELL NO. 1W
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
0-5	Brown sand Fine- to medium-grained, round, clear Cementation-not discernable, porosity-not discernable Soft Organics, soil horizon
5-10	Light tan shells and sand Fine-grained sand, round, clear Shells-whole, percentage-40, weathering-none Cementation-not discernable, porosity-not discernable Soft Sand and whole shells, gastropods, turritella sp. and pelecypods.
10-15	Light brown sand/quartz Medium- to coarse-grained, subround to subangular Frosted to clear Shells-whole, percentage-5, weathering-none Cementation-not discernable, porosity-not discernable Soft Coarse-grained, quartz sand grains round to subangular Frosted and clear amber
15-20	Light brown sand/hardpan Fine- to medium-grained to coarse-grained Round to subround Frosted to clear Shells-whole, percentage-5, weathering-moderate Cementation-hardpan, porosity-not discernable Soft Trace of brown hardpan, amber colored quartz sand
20-25	Amber sand Fine- to medium- to coarse-grained Subround to angular Frosted to clear Cementation-not discernable, porosity-not discernable Soft Bimodal quartz sand 50% amber 50% clear/frosted quartz sand

GEOLOGIC LOG
WELL NO. 1W
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
25-30	Light brown sand/shells Fine- to coarse-grained, round to subround Frosted to clear Shells-fragments, percentage-35, weathering-moderate Cementation-not discernable, porosity-not discernable Soft
30-35	Light gray sandstone calcareous Fine- to medium-grained, subround, clear Shells-fragments, percentage-10, weathering-moderate Cementation-good, porosity-good Moderately hard to hard Hit rock at 32 feet
35-40	Light gray sandstone calcareous Fine- to medium-grained, subround, clear Shells-fragments, percentage-10, weathering-moderate Cementation-good, porosity-good Moderately hard to hard
40-45	Light gray green sandstone Fine- to medium-grained, subround, clear Cementation-good, porosity-good, Moderately hard to hard sucrosic
45-50	Light gray green sandstone Fine- to medium-grained, subround, clear Cementation-good, porosity-good Moderately hard to hard, sucrosic

GEOLOGIC LOG
WELL NO. 1W
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
50-55	Light gray green sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-10, Cementation-fair, porosity-good Moderately hard, sucrosic/friable
55-60	Light gray green sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-10, Cementation-fair, porosity-good Moderately hard, sucrosic/friable
60-65	Light gray green sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-5, Weathering-none to moderate Cementation-fair, porosity-not discernable Moderately hard 10% loose clear quartz sand fine- to medium-grained
65-70	Light gray green sandstone Fine- to coarse-grained, subround, clear, Shells-none Cementation-poor fair, porosity-fair Soft to moderately hard, sucrosic Friable sandstone 10% loose fine- to medium-grained Clear quartz sand, trace mafics
70-75	Light gray sandstone Fine- to coarse-grained, subround clear Shells-none Cementation-poor fair, porosity-fair Soft to moderately hard, sucrosic Friable sandstone 10% loose fine- to medium-grained Clear quartz sand, trace mafics

GEOLOGIC LOG
WELL NO. 1W
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
75-80	Light yellowish gray calcareous sandstone Fine- to coarse-grained, subround, clear Shells-fragments, percentage-20, weathering-moderate Cementation-fair, porosity-fair Moderately hard, sucrosic 15% loose fine-grained quartz sand and fine-grained shell fragments
80-85	Light yellowish gray calcareous sandstone Fine- to coarse-grained, subround, clear Shells-fragments, percentage-20, weathering-moderate Cementation-fair, porosity-fair Moderately hard, sucrosic 15% loose fine-grained quartz sand and fine-grained shell fragments
85-90	Light gray calcareous sandstone Fine- to medium-grained, subround, clear, Shells-fragments, percentage-5, weathering-moderate Cementation-fair to good, porosity-fair Hard 10% loose fine-grained quartz sand and shell
90-95	Light gray calcareous sandstone Fine- to medium-grained, subround, clear, Shells-fragments, percentage-5, weathering-moderate Cementation-fair, porosity-fair Moderately hard to hard 10% loose fine-grained quartz sand and shell
95-100	Yellowish light gray calcareous sandstone Fine- to coarse-grained, subround to subangular, clear Shells-fragments, percentage-30, weathering-moderate Cementation-fair, porosity-good Moderately hard 20% loose fine-grained to coarse-grained, quartz sand and shells

GEOLOGIC LOG
WELL NO. 1W
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
100-105	Light greenish gray sandstone Fine- to coarse-grained, subround, clear, Shells-fragments, percentage-10, weathering-moderate Cementation-poor to fair, porosity-good Moderately hard Calcite crystals, 20% loose fine-grained to medium-grained sand; lost circulation at 103 feet.
105-110	Light gray sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-5, weathering-moderate Cementation-fair, porosity-good Moderately hard 10% loose fine-grained to medium-grained quartz and lost circulation at 108
110-115	Light gray sandstone Fine- to medium-grained, subround, clear, Shells-fragments, percentage-5, weathering-moderate Cementation-fair, porosity-good Moderately hard 10% loose fine-grained to medium-grained quartz
115-120	Light gray sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-5, weathering-moderate Cementation-poor to fair, porosity-good Moderately hard Calcite crystals; loosing fluid to hole; trace mafics.
120-125	Light gray calcareous sandstone Fine-grained, subround, clear, Shells-fragments, percentage-5 Cementation-good, porosity-good Moderately hard to hard Trace mafics, loosing fluid to hole

GEOLOGIC LOG
WELL NO. 1W
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
125-130	Light gray calcareous sandstone Fine- to medium-grained, subround, clear, Shells-fragments, percentage-2 Cementation-good, porosity-good Hard, sucrosic Trace mafics, loosing fluid to hole
130-135	Light gray calcareous sandstone Fine- to medium-grained, subround, clear, Shells-fragments, percentage-2 Cementation-good, porosity-good Hard sucrosic Trace mafics, loosing fluid to hole
135-140	Light gray calcareous sandstone Fine- to medium-grained, round to subround, clear Shells-none Cementation-good, porosity-good Moderately hard to hard Loosing fluid throughout interval 120-140 feet
140-145	Yellow light gray calcareous sandstone Fine- to medium-grained, subround, clear, Shells-fragments, percentage-10, weathering-moderate Cementation-good, porosity-good Moderately hard to hard, sucrosic Trace mafics, hole taking fluid
145-150	Light yellow grey calcareous sandstone Fine- to medium-grained, round to subround, clear, Shells-fragments, percentage-10, weathering-moderate Cementation-good, porosity-good Hard, sucrosic crystalline Lost circulation at 149 feet, hole continues to take fluid

Depth (ft)	Geologic Description
150-155	Light yellow gray calcareous sandstone Fine- to medium-grained, subround, clear, Shells-fragments, percentage-5, weathering-none Cementation-good, porosity-good Hard to extremely hard, sucrosic/crystalline Calcite crystals, hole taking fluid
155-160	Gray sandstone Fine- to medium-grained, subround, clear, Shells-fragments, percentage-5, weathering-moderate Cementation-good to excellent, porosity-fair to good Hard to extremely hard Extremely dense/hard 157-160 feet, hole taking fluid
160-164	Light gray sandstone Fine- to medium-grained, subround, clear, Shells-fragments Cementation-good to excellent, porosity-fair to good Extremely hard Very hard/dense, lost circulation at 164 feet
164-167	VOID Lost circulation, bit fell free for 3 feet
167-175	Light brown sand Medium-grained, subround, clear, Shells-none, percentage-1 Cementation-not discernable, porosity-not discernable Taking large amount fluid Note: sand sample from 167-175 feet, drilled blind 167-180, intermediate returns

GEOLOGIC LOG
WELL NO. 1W
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
175-180	Rock Moderately hard to hard Drilled blind, hole taking large amount of drilling mud, no circulation
180-185	Rock Extremely hard Lost circulation, drilling blind
185-190	Light gray sand Fine- to medium-grained, subround, clear, Shells-fragments, percentage-25, weathering-moderate Cementation-not discernable, porosity-not discernable Soft to moderately hard Layered, sample contaminated because of circulation problems, hole still taking fluid
190-195	Light gray sand Fine- to medium-grained, subround, clear Shells-fragments, percentage-40, weathering-moderate Cementation-fair to not discernable, porosity-fair to not discernable Soft to moderately hard Layered again, sample may be contaminated, hard and soft layers
195-200	Light gray sandstone/sand calcareous Fine- to medium-grained, subround, clear, Shells-fragments, percentage-50, weathering-moderate Cementation-fair to good, porosity-fair Soft to moderately hard Layered as previously described

Depth (ft)	Geologic Description
200-205	Gray white calcareous sandstone Fine- to medium-grained, round to subround, clear Shells-fragments, percentage-20, weathering-moderate Cementation-poor, porosity-poor to fair Soft to moderately hard Layered traces of marl
205-210	Gray white calcareous sandstone Fine- to medium-grained, subround, clear, Shell, percentage-40, weathering-moderate Cementation-poor, porosity-not discernable Soft Marl trace in samples
210-215	Gray-white calcareous sandstone Fine- to medium-grained, subangular Shells-fragments, percentage-25, weathering-moderate Cementation-good, porosity-poor Soft to moderately hard
215-220	Gray-white calcareous sandstone Fine- to medium-grained, subround, clear, Shells-fragments, percentage-20, weathering-moderate Cementation-poor to fair, porosity-not discernable Soft Hole still taking fluid, T.D. 220 feet

GEOLOGIC LOG
WELL NO. 2W
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
0-5	Dark gray to black organic sand Fine- to medium-grained, subround, clear Shells-fragments, percentage-10 Weathering-moderate to extensive Cementation-not discernable Soft Organic sand, i.e. top soil and fill material
5-10	Light tan to beige shell fragments and sand Fine- to course grained, subround to subangular, clear Shells-fragments, percentage-50, weathering-extensive Cementation-poor to fair Soft Shell, marl
10-14	Light tan to beige shell fragments and sand Fine- to course-grained, subround to subangular, clear Shells-fragments, percentage-50, weathering-extensive Cementation-poor to fair Soft Shell, marl
14-22	Light gray sandstone Fine- to medium-grained, subround clear Shells-fragments, weathering-moderate Cementation-good, porosity-fair Hard 40% loose sand, quartz, medium- to fine- grained, clear
22-27	Light gray sand Fine- to medium-grained, round to subround, clear Shells-fragments, percentage-5, weathering-moderate Cementation-not discernable, porosity-not discernable Soft

GEOLOGIC LOG
WELL NO. 2W
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
27-30	Light tan to gray shell, sandstone, sand Medium- to course-grained, subround, clear Shells-fragments, percentage-30, weathering-moderate Cementation-fair, porosity-good Moderately hard 30% sand, quartz, medium- to fine-grained, clear, round
30-33	Gray clay Shells-none, weathering-none Cementation-poor, porosity-poor Soft Sand/quartz, medium- to fine-grained
33-35	Light tan to beige shell/sand Fine- to medium- to course-grained Subround to subangular, clear Shells-fragments, percentage-70, Weathering-moderate to extensive Cementation-poor, porosity-fair Soft 30% medium- to fine-grained quartz sand
35-40	Light gray to tan sandstone shell and clay Fine- to course-grained, subround, clear Shells-fragments, percentage-40, Weathering-moderate to extensive Cementation-poor, porosity-poor to fair Soft Layers of each - small (half foot)
40-45	Gray calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-5, weathering-moderate Cementation-good, porosity-excellent Hard, sucrosic Lost circulation throughout section

GEOLOGIC LOG
WELL NO. 2W
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
45-50	Gray calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-5, weathering-moderate Cementation-good, porosity-excellent Hard, sucrosic Lost circulation throughout section
50-55	Gray calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-5, weathering-moderate Cementation-good, porosity-excellent Hard, sucrosic Lost circulation throughout section
55-60	Gray calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-5, weathering-moderate Cementation-good, porosity-excellent Hard, sucrosic Lost circulation throughout section
60-65	Gray calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-5, weathering-moderate Cementation-good, porosity-excellent Hard, sucrosic Lost circulation throughout section
65-70	Gray calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-5, weathering-moderate Cementation-good, porosity-excellent Hard, sucrosic Lost circulation throughout section

GEOLOGIC LOG
WELL NO. 2W
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
70-75	Yellowish light gray shells Fine- to course-grained, subangular Shells-fragments, percentage-99, weathering-moderate Cementation-poor, porosity-good Soft Traces of sandstone from uphole contamination Lost fluid in hole
75-80	Yellowish light gray shells Fine- to course-grained, subangular Shells-fragments, percentage-99, weathering-moderate Cementation-poor, porosity-good Soft Finer grained than above, lost fluid in hole
80-85	Yellowish light gray calcareous sandstone Medium-grained, subround, clear Shells-fragments, percentage-15, weathering-moderate Cementation-good, porosity-fair Moderately hard
85-90	Light gray calcareous sandstone Medium-grained, subround to subangular, clear Shells-fragments, percentage-5, weathering-moderate Cementation-good, porosity-fair Hard
90-95	Light gray calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-15, weathering-moderate Cementation-good, porosity-good Moderately hard to hard Lost circulation at 93 feet - hole continues to take fluid

Depth (ft)	Geologic Description
95-100	Light gray calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-10, weathering-moderate Cementation-good, porosity-good Hard Continues to take fluid
100-105	Light gray sandstone calcareous Fine- to medium-grained, subround, clear Shells-fragments, percentage-5, weathering-moderate Cementation-good, porosity-good Moderately hard, sucrosic Loosing fluid
105-110	Light gray sandstone Medium-grained, round to subround, clear Shells-fragments, percentage-5, weathering-moderate Cementation-good, porosity-good Moderately hard Loosing fluid
110-115	Light gray calcareous sandstone Fine- to medium-grained, subround Shells-fragments, percentage-5, weathering-none Cementation-good, porosity-good Moderately hard Lost circulation 105+ feet
115-120	Light gray calcareous sandstone Fine- to medium-grained, subround Shells-fragments, percentage-5, weathering-none Cementation-fair, porosity-fair Moderately hard

GEOLOGIC LOG
WELL NO. 2W
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
120-125	Light grey calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-10, weathering-none Cementation-fair to good, porosity-good Moderately hard to hard, sucrosic Continued to loose water to formation, trace of mafics
125-130	Light gray calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-15, weathering-none Cementation-good, porosity-good Moderately hard to hard 15% loose sand, medium- to fine-grained quartz, round to subround, trace mafics
130-135	Light gray calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-10, weathering-moderate Cementation-fair to good, porosity-good Moderately hard to hard, sucrosic 15% loose sand, medium- to fine-grained quartz and mafics, sandstone, 20% mafics
135-140	Light gray calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-5, weathering-moderate Cementation-fair to good, porosity-good Moderately hard, sucrosic/crystalline 5% loose sand quartz, medium- to fine-grained, trace mafics, hole continues to take fluid
140-145	Light gray to gray white calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-10, weathering-moderate Cementation-fair, porosity-good Moderately hard, sucrosic 5% loose sand quartz, medium- to fine-grained, trace mafics, hole continues to take fluid

GEOLOGIC LOG
WELL NO. 2W
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
145-150	Light gray calcareous sandstone Fine- to course-grained, subround, clear Shells-fragments, percentage-10, weathering-moderate Cementation-good, porosity-good Moderately hard, sucrosic Calcite crystals; 5% loose sand as above
150-155	Light gray calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-5, weathering-moderate Cementation-good, porosity-good Moderately hard to hard, sucrosic Mafics in matrix, calcite crystals
155-160	Light gray calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-5, weathering-none Cementation-good, porosity-good Moderately hard to hard, sucrosic Calcite crystals, trace mafics
160-165	Light gray calcareous sandstone Fine- to medium-grained, round to subround, clear Shells-fragments, percentage-8, weathering-none Cementation-good, porosity-good Moderately hard to hard, sucrosic Crystalline surface - loosing fluid throughout section, trace loose sand and mafics
165-170	Light gray calcareous sandstone Fine- to medium-grained, round to subround, clear Shells-fragments, percentage-5, weathering-none Cementation-good, porosity-good Moderately hard to hard, sucrosic and crystalline Calcite crystals - trace loose sand and mafics

GEOLOGIC LOG
WELL NO. 2W
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
170-175	Light gray calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-25, weathering-moderate Cementation-good, porosity-good Moderately hard Gradational change from sandstone unit to limestone unit
175-180	Off white to white gray arenaceous limestone Medium- to course-grained, subangular to angular Shells-fragments, percentage-55, weathering-extensive Cementation-fair, porosity-fair to good Moderately hard Arenaceous biomicrite with trace of sand
180-185	Off white to white gray arenaceous limestone Medium- to course-grained, subangular to angular Shells-fragments, percentage-55, weathering-extensive Cementation-fair, porosity-fair to good Moderately hard Arenaceous biomicrite with trace of sand
185-190	Light gray calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-15, weathering-moderate Cementation-fair to good, porosity-fair to good Moderately hard Gradational back to sandstone, trace limestone
190-195	Off white to gray white arenaceous limestone Fine- to medium- to course-grained, subround to subangular, clear Shells-fragments, percentage-45, weathering-moderate Cementation-fair, porosity-good Moderately hard to hard Biomicrite limestone, about 50% limestone, 50% sandstone in plain beds

Depth (ft)	Geologic Description
195-200	Off white to gray white arenaceous limestone Fine- to medium- to course-grained, subround to subangular, clear Shells-fragments, percentage-45, weathering-moderate Cementation-fair, porosity-good Moderately hard to hard Biomicrite limestone, about 50% limestone, 50% sandstone in plain beds
200-205	Light gray calcareous sandstone Fine- to medium-grained, subround to subangular, clear Shells-fragments, percentage-20, weathering-moderate Cementation-good, porosity-fair Moderately hard sucrosic 20% loose sand and shell
205-210	Light gray calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-20, weathering-moderate Cementation-fair, porosity-fair Moderately hard 25% loose sand quartz, medium- to fine-grained
210-215	Light gray calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments, percentage-10, weathering-moderate Cementation-good, porosity-good Moderately hard to hard, sucrosic 20% loose sand quartz, medium- to fine-grained, subround
220-225	Light gray calcareous sandstone Fine-grained, round to subround, clear Shells-fragments, percentage-10, weathering-none Cementation-poor, porosity-fair Moderately hard 50% loose sand, fine-grained, subround, trace of mafics

GEOLOGIC LOG
WELL NO. 2W
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
225-230	Light gray sand Fine-grained, round to subround, clear Shells-none, percentage-1 Cementation-not discernable, porosity-not discernable Soft Trace mafics
230-235	Light gray sandstone and sand Fine-grained, round, clear Shells-fragments, percentage-5, weathering-moderate Cementation-poor, porosity-poor Soft 10% mafics
235-240	Light gray sandstone and sand Fine- to medium-grained, round to subround, clear Shells-fragments, percentage-10, weathering-moderate Cementation-poor, porosity-poor to fair Soft 50% sand, medium- to fine-grained quartz
240-245	Light gray calcareous sandstone Fine- to medium-grained, subangular, clear Shells-fragments, percentage-15, weathering-moderate Cementation-poor, porosity-poor Soft 50% medium-grained quartz sand; 10% mafics
245-250	Light gray calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments Cementation-poor to not discernable, porosity-fair Soft 50-60% sand, medium- to fine-grained, trace of mafics

GEOLOGIC LOG
WELL NO. 2W
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
250-255	Light gray calcareous sandstone Fine- to medium-grained, subround, clear Shells-fragments Cementation-poor to not discernable, porosity-fair Soft 50-60% sand, medium- to fine-grained, trace of mafics
255-260	Gray sand Fine- to course-grained, round to subround, clear Shells-fragments, percentage-15, weathering-moderate Cementation-not discernable, porosity-not discernable Soft
260-265	Light gray sand Fine- to medium-grained, subround, clear Shells-fragments, percentage-10, weathering-moderate Cementation-not discernable, porosity-not discernable Soft
265-270	Light gray sand Fine- to medium-grained, subround, clear Shells-fragments, percentage-10, weathering-moderate Cementation-not discernable, porosity-not discernable Soft
270-275	Light gray sandstone and sand Fine-grained, round to subround, clear Shells-fragments, percentage-15, weathering-moderate Cementation-poor to not discernable, porosity-poor Soft to moderately hard 60% sand, medium- to fine-grained quartz
275-280	Light gray sandstone and sand Fine-grained, round to subround, clear Shells-fragments, percentage-15, weathering-moderate Cementation-poor to not discernable, porosity-poor Soft to moderately hard 60% sand, medium- to fine-grained quartz

GEOLOGIC LOG
WELL NO. 2W
VILLAGE OF PALM SPRINGS

Depth (ft)	Geologic Description
280-285	Light gray green sands/clay Medium- to course-grained, round to subround, clear Shells-fragments, percentage-5, weathering-moderate Cementation-not discernable, porosity-not discernable Soft, clayey Grey green clay
285-290	Light gray green sand Fine- to medium-grained, round to subround, clear Shells-fragments, percentage-5, weathering-none to moderate Cementation-not discernable, porosity-not discernable Soft, clayey Gray green clay
290-295	Light gray green sand/clay Fine- to medium-grained, round to subround, clear Shells-fragments, percentage-20, weathering-moderate Cementation-not discernable, porosity-not discernable Soft, clayey silty sand Phosphorite green clay
295-300	Light gray green clayey sand Fine- to medium-grained, round, clear Shells-none Cementation-not discernable, porosity-not discernable Soft clayey sand Increasing percentage of gray green clay, T.D. hole in Hawthorne formation

APPENDIX C

GEOPHYSICAL LOGS

APPENDIX D

WELL CONSTRUCTION CHRONOLOGY

WELL CONSTRUCTION CHRONOLOGY

Well No. PW-1E

Date	Well Construction - Work Description
February 20-21, 1992	AMPS drilled a 5¼-inch diameter test/pilot hole to a total depth of 220 feet below land surface (bls). Lithologic samples were logged by PBG&S. Caliper, electric, and gamma ray logs were run by Southern Resource Exploration.
March 3, 1992	Meridith Corporation vibrated in 60 feet of 30-inch diameter surface casing.
March 10-11, 1992	Meridith has reamed a 29-inch diameter borehole to a depth of 125 feet bls. 124 feet of 20-inch diameter casing were emplaced. The annular space was pressure grouted by Halliburton Company with Type II neat cement.
April 1, 1992	Meridith has reamed a 20-inch diameter borehole to a depth of 201 feet bls. A 5 foot sump, 75 feet of 12-inch diameter 60-slot stainless steel well screen, and 30 feet of lap pipe were emplaced. Gravel pack was pumped into the annular space as a slurry using chlorinated water.
April 2-21, 1992	Meridith developed the well with compressed air. The annular space was replenished with gravel as needed.
April 30, 1992	A step-drawdown test was conducted using rates of 685, 1050, and 1400 gpm. Sand content and water quality samples were taken.
August 19, 1992	A color television camera survey was performed by Deep Venture Services.

WELL CONSTRUCTION CHRONOLOGY

Well No. PW-2E

Date	Well Construction - Work Description
February 12-13, 1992	AMPS drilled a 5¾-inch diameter test/pilot hole to a total depth of 300 feet bls. Lithologic samples were logged by PBG&S. Caliper, electric and gamma ray logs were run by Southern Resource Exploration.
March 4, 1992	Meridith Corporation vibrated in 60 feet of 30-inch diameter surface casing.
April 29, 1992	Meridith Corporation has reamed a 29-inch diameter borehole to 94 feet bls. 94 feet of 20-inch diameter casing were emplaced. The annular space was pressure grouted by Halliburton Company with Type II cement with 1% calcium chloride additive.
May 14, 1992	Meridith has reamed a 20-inch diameter borehole to a total depth of 156 feet. A 5 foot sump, 60 feet of 12-inch diameter 60-slot stainless steel well screen, and 15 feet of lap pipe were emplaced. Gravel pack was pumped into the annular space as a slurry using chlorinated water.
May 20 - June 24, 1992	Meridith developed the well with compressed air. The annular space was replenished with gravel as needed.
July 1, 1992	A step-drawdown test was conducted using rates of 300,700, and 800 gpm. Sand content and water quality samples were taken.
July 2-7, 1992	Pumped well to try to further develop out fines.
August 19-20, 1992	A color television camera survey was performed by Deep Venture Services.
Septeember 25, 1992	After cleaning sediment from the bottom of the well, a black and white camera survey was performed by AMPS.

WELL CONSTRUCTION CHRONOLOGY

Well No. PW-3E

Date	Well Construction - Work Description
February 17-18, 1992	AMPS drilled a 5¾-inch diameter test/pilot hole to a total depth of 220 feet bls. Lithologic samples were logged by PBG&S. Caliper, electric, and gamma ray logs were run by Southern Resource Exploration.
March 3, 1992	Meridith Corporation vibrated in 60 feet of 30-inch diameter surface casing.
March 20, 1992	Meridith has reamed a 29-inch diameter borehole to a depth of 125 feet. 125 feet of 20-inch diameter casing were emplaced. The annular space was pressure grouted by Halliburton Company with Type II neat cement.
March 26, 1992	Meridith has reamed a 20-inch diameter borehole to a total depth of 216 feet bls. A 5 foot sump, 85 feet of 12-inch diameter 60 slot stainless steel well screen and 30 feet of lap pipe were emplaced. Gravel pack was pumped into the annular space as a slurry using chlorinated water.
March 26 - April 7, 1992	Meridith developed the well with compressed air. The annular space was replenished with gravel as needed.
April 8, 1992	Surge task blowout while developing, hitting the air compressor batteries and releasing battery acid, and hitting a fuel tank and spilling diesel fuel. The spills were immediately cleaned up.
April 16-23, 1992	Meridith developed the well with compressed air. The annular space was replenished with gravel as needed.
May 4, 1992	A step-drawdown test was conducted using rates of 550, 1100, and 1650 gpm. Sand content and water quality samples were taken.
August 19, 1992	A color television camera survey was performed by Deep Venture Services.

WELL CONSTRUCTION CHRONOLOGY

Well No. PW-4E

Date	Well Construction - Work Description
February 7, 10, 1992	AMPS drilled a 5½-inch diameter test/pilot hole to a total depth of 230 feet bls. Lithologic samples were logged by PBG&S.
February 11, 1992	Caliper, electric, and gamma ray logs were run by Southern Resource Exploration.
March 3, 1992	Meridith Corporation vibrated in 60 feet of 30-inch diameter surface casing.
April 10, 1992	Meridith Corporation has reamed a 29-inch diameter borehole to a depth of 187 feet bls. 183 feet of 20-inch diameter casing were emplaced. The annular space was pressure grouted by Halliburton Company with Type II neat cement. The monitor tube was accidentally cemented in while cementing the casing.
April 14, 1992	Meridith has reamed a 20-inch diameter borehole to a depth of 230 feet bls, and then drilled an additional 20 feet to 250 feet bls, before flushing the hole.
April 15, 1992	Meridith has drilled to 288 feet bls using the reverse air method. Began development using compressed air.
April 28, 1992	Began step drawdown test at rates of 700, 1400 and 2100 gpm. Quit at 1400 gpm step because the well produced too much sand. Start to develop well at 2550 gpm.
May 13, 1992	Meridith has reamed a 20-inch diameter borehole to a depth of 288 feet bls using reverse air method. A 5 foot sump, 100 feet of 12-inch diameter 60-slot stainless steel well screen, and 30 feet of lap pipe were emplaced. Gravel pack was pumped into the annular space as a slurry using chlorinated water.

WELL CONSTRUCTION CHRONOLOGY

Well No. PW-4E (Continued)

May 20 - June 11, 1992	Meridith developed the well with compressed air. The annular space was replenished with gravel as needed.
June 16, 1992	A step-drawdown test was conducted using rates of 595, 1200, and 1600 gpm. Sand content and water quality samples were taken.
August 19, 1992	A color television camera survey was performed by Deep Venture Services.
September 8, 1992	AMPS drilled out the monitor tube that had been inadvertently cemented in.

WELL CONSTRUCTION CHRONOLOGY

Well No. PW-1W

Date	Well Construction - Work Description
February 27-28, 1992	AMPS drilled a 5¼-inch diameter test/pilot hole to a total depth of 200 feet bls. Lithologic samples were collected by PBG&S. Caliper, electric and gamma ray logs were run by Southern Resource Exploration.
March 4, 1992	Meridith Corporation vibrated in 60 feet of 30-inch diameter surface casing.
April 22, 1992	Meridith Corporation has reamed a 29-inch diameter borehole to a depth of 106 feet. 105 feet of 20-inch diameter casing were emplaced. The annular space was pressure grouted by Halliburton Company with Type II cement with 1% calcium chloride additive.
July 7, 1992	Meridith has reamed a 20-inch diameter borehole to a depth of 168 feet bls. A 5 foot sump, 60 feet of 12-inch diameter, 60-slot stainless steel well screen, and 15 feet of lap pipe were emplaced. Gravel pack was pumped into the annular space as a slurry using chlorinated water.
July 8 - August 4, 1992	Meridith developed the well with compressed air. The annular space was replenished with gravel as needed.
August 5, 1992	A step-drawdown test was conducted using rates of 740, 1530, and 2270 gpm. Sand content and water quality samples were taken.
August 20, 1992	A color television camera survey was performed by Deep Venture Services.

WELL CONSTRUCTION CHRONOLOGY

Well No. PW-2W

Date	Well Construction - Work Description
February 24-26, 1992	AMPS drilled a 5¼-inch diameter test/pilot hole to a total depth of 300 feet bls. Lithologic samples were logged by PBG&S. Caliper, electric and gamma ray logs were run by Southern Resource Exploration.
March 4, 1992	Meridith Corporation vibrated in 60 feet of 30-inch diameter surface casing.
April 8, 1992	Meridith Corporation has reamed a 29-inch diameter borehole to a depth of 103 feet bls. 103 feet of 20-inch diameter casing were emplaced. The annular space was pressure grouted by Halliburton Company with Type II neat cement.
June 2-3, 1992	Meridith has reamed a 20-inch diameter borehole to a total depth of 182 feet bls. A 5 foot sump, 80 feet of 12-inch diameter 60-slot stainless steel well screen, and 15 feet of lap pipe were emplaced. Gravel pack was pumped into the annular space as a slurry using chlorinated water.
June 10 - July 1, 1992	Meridith developed the well with compressed air. The annular space was replenished with gravel as needed.
July 13, 1992	A step-drawdown test was conducted using rates of 700, 1380, and 2100 gpm. Sand content and water quality samples were taken.
August 20, 1992	A color television camera survey was performed by Deep Venture Services.

WELL CONSTRUCTION CHRONOLOGY

Well No. PW-11E

Date	Well Construction - Work Description
May 28, 1992	Meridith Corporation vibrated in 64 feet of 30-inch diameter surface casing.
June 2-3, 1992	Meridith drilled a 7⅞-inch diameter test/pilot hole to a total depth of 220 feet bls. Lithologic samples were logged by PBG&S. Caliper, electric, and gama ray logs were run by Southern Resource Exploration.
June 5, 1992	Meridith has reamed a 29-inch diameter borehole to a depth of 116 feet bls. 116 feet of 20-inch diameter casing were emplaced. The annular space was pressure grouted by Halliburton Company with Type II neat cement.
June 24, 1992	Meridith has reamed a 20-inch diameter borehole to a depth of 198 feet bls. A 5 foot sump, 83 feet of 12-inch diameter 60-slot stainless steel well screen, and 20 feet of lap pipe were emplaced. Gravel pack was pumped into the annular space as a slurry using chlorinated water.
July 8 - August 6, 1992	Meridith developed with compressed air. The annular space was replenished with gravel as needed.
August 12, 1992	A step-drawdown test was conducted using rates of 650, 850, and 1225 gpm. Sand content and water quality samples were taken.

APPENDIX E

STEP-DRAWDOWN DATA

STEP-DRAWDOWN TEST RECORD

Project Name: Village of Palm Springs
Well No.: 1E
Step: 1
Date: 4/30/92
Reference Point: Ground Level
Elevation of Measuring Point (ft): 2.33
Elevation of Ground Level (ft): 20 (approx)
Pre-Test Water Level (ft): 13.05
(Ref. Measuring Point)

Elapsed Time (Min)	Time (Hr:Min)	Held (Ft)	Water Tape Dist. (Ft)	Level Below R.P. (Ft)	Drawdown (Ft)	Pumping Rate (GPM)	Remarks
0	9:15	13.05		10.72	0.00	850	
0.33	9:15:20	36.75		34.42	23.70		
0.67	9:15:40	37.70		35.37	24.65		
1	9:16	39.63		37.30	26.58		
2	9:17	41.91		39.58	28.86		
3	9:18	37.42		35.09	24.37	685	
4	9:19	37.06		34.73	24.01		
5	9:20	37.23		34.90	24.18		
6	9:21	37.35		35.02	24.30		
7	9:22	37.51		35.18	24.46		
8	9:23	37.70		35.37	24.65		
9	9:24	37.85		35.52	24.80		
10	9:25	37.96		35.63	24.91		
12	9:27	38.18		35.85	25.13		
14	9:29	38.27		35.94	25.22		
16	9:31	38.42		36.09	25.37		
18	9:33	38.64		36.31	25.59		
20	9:35	38.74		36.41	25.69		
25	9:40	39.06		36.73	26.01		
30	9:45	39.22		36.89	26.17		
35	9:50	39.40		37.07	26.35		
40	9:55	39.48		37.15	26.43		
45	10:00	39.58		37.25	26.53		
50	10:05	39.71		37.38	26.66		
55	10:10	39.19		36.86	26.14		
60	10:15	39.19		36.86	26.14		

Specific Capacity: 26.21 gpm per foot of drawdown
at 685 gpm at 60 min

STEP-DRAWDOWN TEST RECORD

Project Name: Village of Palm Springs
Well No.: 1E
Step: 2
Date: 4/30/92
Reference Point: Ground Level
Elevation of Measuring Point (ft): 2.33
Elevation of Ground Level (ft): 20 (approx)
Pre-Test Water Level (ft): 14.93
(Ref. Measuring Point)

Elapsed Time (Min)	Time (Hr:Min)	Held (Ft)	Water Tape Dist. (Ft)	Level Below R.P. (Ft)	Drawdown (Ft)	Pumping Rate (GPM)	Remarks
0	3:15	14.93		12.60	0.00	1050	
1	3:16	56.35		54.02	41.42		
2	3:17	60.03		57.70	45.10		
3	3:18	62.22		59.89	47.29		
4	3:19	62.51		60.18	47.58		
5	3:20	54.50		52.17	39.57		
6	3:21	52.73		50.40	37.80		
7	3:22	52.01		49.68	37.08		Sand Sample
8	3:23	51.92		49.59	36.99		
9	3:24	52.11		49.78	37.18		
10	3:25	52.23		49.90	37.30		
12	3:27	52.51		50.18	37.58		
14	3:29	52.79		50.46	37.86		
16	3:31	52.93		50.60	38.00		
18	3:33	53.14		50.81	38.21		
20	3:35	53.21		50.88	38.28		
25	3:40	53.70		51.37	38.77		
30	3:45	54.24		51.91	39.31		Sand Sample
35	3:50	54.46		52.13	39.53		
40	3:55	54.72		52.39	39.79		
45	4:00	54.94		52.61	40.01		
50	4:05	55.09		52.76	40.16		
55	4:10	55.24		52.91	40.31		
60	4:15	55.29		52.96	40.36		Sand Sample

Specific Capacity: 26.02 gpm per foot of drawdown
at 1050 gpm at 60 min

STEP-DRAWDOWN TEST RECORD

Project Name: Village of Palm Springs
Well No.: 1E
Step: 3
Date: 4/30/92
Reference Point: Ground Level
Elevation of Measuring Point (ft): 2.33
Elevation of Ground Level (ft): 20 (approx)
Pre-Test Water Level (ft): 13.52
(Ref. Measuring Point)

Elapsed Time (Min)	Time (Hr:Min)	Held (Ft)	Water Tape Dist. (Ft)	Level Below R.P. (Ft)	Drawdown (Ft)	Pumping Rate (GPM)	Remarks
0	11:15	13.52		11.19	0.00	1350	
0.33	11:15:20	42.15		39.82	28.63		
0.66	11:15:40	55.42		53.09	41.90		
1	11:16	59.84		57.51	46.32		
2	11:17	56.10		53.77	42.58		
3	11:18	55.61		53.28	42.09		
4	11:19	56.97		54.64	43.45		
5	11:20	60.94		58.61	47.42		
6	11:21	62.07		59.74	48.55		
7	11:22	63.12		60.79	49.60		
8	11:23	63.53		61.20	50.01		
9	11:24	63.82		61.49	50.30	1400	
10	11:25	64.09		61.76	50.57		
12	11:27	64.63		62.30	51.11		
14	11:29	65.05		62.72	51.53		
16	11:31	65.40		63.07	51.88		
18	11:33	65.65		63.32	52.13		
20	11:35	65.73		63.40	52.21		
25	11:40	66.32		63.99	52.80		
30	11:45	66.69		64.36	53.17		
35	11:50	66.85		64.52	53.33		
40	11:55	67.05		64.72	53.53		
45	12:00	67.21		64.88	53.69		
50	12:05	67.42		65.09	53.90		
55	12:10	67.59		65.26	54.07		
60	12:15	67.72		65.39	54.20		

Specific Capacity: 25.83 gpm per foot of drawdown
at 1400 gpm at 60 min

STEP-DRAWDOWN TEST RECORD

Project Name: Village of Palm Springs
Well No.: 2E
Step: 1
Date: 7/01/92
Reference Point: Ground Level
Elevation of Measuring Point (ft): 3.83
Elevation of Ground Level (ft): 20 (approx)
Pre-Test Water Level (ft): 10.93
(Ref. Measuring Point)

Elapsed Time (Min)	Time (Hr:Min)	Held (Ft)	Water Tape Dist. (Ft)	Level Below R.P. (Ft)	Drawdown (Ft)	Pumping Rate (GPM)	Remarks
0	9:00	10.93		7.10	0.00		
1	9:01						
2	9:02						
3	9:03						
4	9:04						
5	9:05						
6	9:06						
7	9:07						
8	9:08						
9	9:09						
10	9:10	30.03		26.20	19.10	300	Sand Separator at
12	9:12	29.13		25.30	18.20		15 gal/min
14	9:14	29.13		25.30	18.20		
16	9:16	29.93		26.10	19.00		
18	9:18	28.83		25.00	17.90		
20	9:20	28.85		25.02	17.92		
25	9:25	28.87		25.04	17.94		
30	9:30	28.94		25.11	18.01		
35	9:35	28.94		25.11	18.01		
40	9:40	28.97		25.14	18.04		
45	9:45	29.00		25.17	18.07		
50	9:50	28.87		25.04	17.94		
55	9:55	28.94		25.11	18.01		
60	10:00	28.72		24.89	17.79		

Specific Capacity: 16.86 gpm per foot of drawdown
at 300 gpm at 60 min

STEP-DRAWDOWN TEST RECORD

Project Name: Village of Palm Springs
Well No.: 2E
Step: 2
Date: 7/01/92
Reference Point: Ground Level
Elevation of Measuring Point (ft): 3.83
Elevation of Ground Level (ft): 20 (approx)
Pre-Test Water Level (ft): 10.93
(Ref. Measuring Point)

Elapsed Time (Min)	Time (Hr:Min)	Held (Ft)	Water Tape Dist. (Ft)	Level Below R.P. (Ft)	Drawdown (Ft)	Pumping Rate (GPM)	Remarks
0	11:00	11.00		7.17	0.00		Set rate
1	11:01						
2	11:02						
3	11:03						
4	11:04						
5	11:05						
6	11:06	47.21		43.38	36.21	700 gpm	Sand Separator
7	11:07	48.21		44.38	37.21		at 15 gal / min
8	11:08	48.87		45.04	37.87		
9	11:09	49.00		45.17	38.00		
10	11:10	49.50		45.67	38.50		
12	11:12	49.82		45.99	38.82		
14	11:14	49.93		46.10	38.93		
16	11:16	50.10		46.27	39.10		
18	11:18						
20	11:20	50.45		46.62	39.45		
25	11:25	50.65		46.82	39.65		
30	11:30	51.15		47.32	40.15		
35	11:35	50.99		47.16	39.99		
40	11:40	51.01		47.18	40.01		
45	11:45	51.15		47.32	40.15		
50	11:50	51.21		47.38	40.21		
55	11:55	50.95		47.12	39.95		
60	12:00	51.45		47.62	40.45		

Specific Capacity: 17.31 gpm per foot of drawdown
at 700 gpm at 60 min

STEP-DRAWDOWN TEST RECORD

Project Name: Village of Palm Springs
Well No.: 2E
Step: 3
Date: 7/01/92
Reference Point: Ground Level
Elevation of Measuring Point (ft): 3.83
Elevation of Ground Level (ft): 20 (approx)
Pre-Test Water Level (ft): 10.93
(Ref. Measuring Point)

Elapsed Time (Min)	Time (Hr:Min)	Held (Ft)	Water Tape Dist. (Ft)	Level Below R.P. (Ft)	Drawdown (Ft)	Pumping Rate (GPM)	Remarks
0	1:00	11.00		7.17	0.00	800 gpm	
1	1:01	54.50		50.67	43.50		
2	1:02						
3	1:03	54.00		50.17	43.00		
4	1:04						
5	1:05	53.00		49.17	42.00		Sand Separator
6	1:06						at 15 gal / min
7	1:07	56.30		52.47	45.30		
8	1:08	56.70		52.87	45.70		
9	1:09	56.78		52.95	45.78		
10	1:10	57.30		53.47	46.30		
12	1:12	57.58		53.75	46.58		
14	1:14	58.15		54.32	47.15		
16	1:16	58.23		54.40	47.23		
18	1:18	58.63		54.80	47.63		
20	1:20	58.90		55.07	47.90		
25	1:25	59.25		55.42	48.25		
30	1:30						
35	1:35	59.70		55.87	48.70		
40	1:40	59.90		56.07	48.90		
45	1:45	59.67		55.84	48.67		
50	1:50	60.05		56.22	49.05		
55	1:55	60.12		56.29	49.12		
60	2:00	60.20		56.37	49.20		

Specific Capacity: 16.26 gpm per foot of drawdown
at 800 gpm at 60 min

STEP-DRAWDOWN TEST RECORD

Project Name: Village of Palm Springs
Well No.: 3E
Step: 1
Date: 5/4/92
Reference Point: Ground Level
Elevation of Measuring Point (ft): 2.83
Elevation of Ground Level (ft): 20 (approx)
Pre-Test Water Level (ft): 13.18
(Ref. Measuring Point)

Elapsed Time (Min)	Time (Hr:Min)	Held (Ft)	Water Tape Dist. (Ft)	Level Below R.P. (Ft)	Drawdown (Ft)	Pumping Rate (GPM)	Remarks
0	1:10	13.18		10.35	0.00		ADJUSTING
1	1:11	31.32		28.49	18.14		RATE
2	1:12	41.69		38.86	28.51		
3	1:13	41.18		38.35	28.00		
4	1:14	40.79		37.96	27.61		
5	1:15	40.28		37.45	27.10		Sand @ 20 gpm
6	1:16	39.21		36.38	26.03		
7	1:17	35.20		32.37	22.02	550	
8	1:18	34.81		31.98	21.63		
9	1:19	34.55		31.72	21.37		
10	1:20	34.69		31.86	21.51		
12	1:22	34.68		31.85	21.50		
14	1:24	34.73		31.90	21.55		
16	1:26	34.84		32.01	21.66		
18	1:28	34.91		32.08	21.73		
20	1:30	34.95		32.12	21.77		
25	1:35	35.11		32.28	21.93		
30	1:40	35.18		32.35	22.00		
35	1:45	35.27		32.44	22.09		
40	1:50	35.28		32.45	22.10		
45	1:55	35.33		32.50	22.15		
50	2:00	35.42		32.59	22.24		(50 minute test)

Specific Capacity: 24.73 gpm per foot of drawdown
at 550 gpm at 50 min

STEP-DRAWDOWN TEST RECORD

Project Name: Village of Palm Springs
Well No.: 3E
Step: 2
Date: 5/4/92
Reference Point: Ground Level
Elevation of Measuring Point (ft): 2.83
Elevation of Ground Level (ft): 18 (approx)
Pre-Test Water Level (ft): 13.99
(Ref. Measuring Point)

Elapsed Time (Min)	Time (Hr:Min)	Held (Ft)	Water Tape Dist. (Ft)	Level Below R.P. (Ft)	Drawdown (Ft)	Pumping Rate (GPM)	Remarks
0	3:00	13.99		11.16	0.00	1100	
1	3:01	51.08		48.25	37.09		
2	3:02	52.85		50.02	38.86		
3	3:03	53.66		50.83	39.67		
4	3:04	55.59		52.76	41.60		
5	3:05	53.78		50.95	39.79		
6	3:06	54.15		51.32	40.16		
7	3:07	54.34		51.51	40.35		
8	3:08	54.51		51.68	40.52		
9	3:09	54.67		51.84	40.68		
10	3:10	54.88		52.05	40.89		
12	3:12	55.16		52.33	41.17		
14	3:14	55.37		52.54	41.38		
16	3:16	55.55		52.72	41.56		
18	3:18	55.64		52.81	41.65		
20	3:20	55.80		52.97	41.81		
25	3:25	56.07		53.24	42.08		
30	3:30	56.22		53.39	42.23		
35	3:35	56.43		53.60	42.44		
40	3:40	56.43		53.60	42.44		
45	3:45	56.68		53.85	42.69		
50	3:50	56.76		53.93	42.77		
55	3:55	56.74		53.91	42.75		
60	4:00	56.83		54.00	42.84		

Specific Capacity: 25.68 gpm per foot of drawdown
at 1100 gpm at 60 min

STEP-DRAWDOWN TEST RECORD

Project Name: Village of Palm Springs
Well No.: 3E
Step: 3
Date: 5/4/92
Reference Point: Ground Level
Elevation of Measuring Point (ft): 2.83
Elevation of Ground Level (ft): 18 (approx)
Pre-Test Water Level (ft): 14.55
(Ref. Measuring Point)

Elapsed Time (Min)	Time (Hr:Min)	Held (Ft)	Water Tape Dist. (Ft)	Level Below R.P. (Ft)	Drawdown (Ft)	Pumping Rate (GPM)	Remarks
0	5:00	14.55		11.72	0.00	1650	
1	5:01	62.15		59.32	47.60		
2	5:02	64.67		61.84	50.12		
3	5:03	64.85		62.02	50.30		
4	5:04	69.77		66.94	55.22		
5	5:05	71.11		68.28	56.56		
6	5:06	71.54		68.71	56.99		
7	5:07	71.91		69.08	57.36		
8	5:08	72.15		69.32	57.60		
9	5:09	72.40		69.57	57.85		
10	5:10	72.64		69.81	58.09		
12	5:12	72.93		70.10	58.38		
14	5:14	73.15		70.32	58.60		
16	5:16	73.45		70.62	58.90		
18	5:18	73.55		70.72	59.00		
20	5:20	73.74		70.91	59.19		
25	5:25	74.08		71.25	59.53		
30	5:30	74.26		71.43	59.71		
35	5:35	74.51		71.68	59.96		
40	5:40	74.63		71.80	60.08		
45	5:45	74.79		71.96	60.24		
50	5:50	74.98		72.15	60.43		
55	5:55	75.08		72.25	60.53		
60	6:00	75.11		72.28	60.56		

Specific Capacity: 27.25 gpm per foot of drawdown
at 1650 gpm at 60 min

STEP-DRAWDOWN TEST RECORD

Project Name: Village of Palm Springs
Well No.: 4E
Step: 1
Date: 6/16/92
Reference Point: Ground Level
Elevation of Measuring Point (ft): 3.38
Elevation of Ground Level (ft): 18 (approx)
Pre-Test Water Level (ft): 13.45
(Ref. Measuring Point)

Elapsed Time (Min)	Time (Hr:Min)	Held (Ft)	Water Tape Dist. (Ft)	Level Below R.P. (Ft)	Drawdown (Ft)	Pumping Rate (GPM)	Remarks
0	8:00	13.53		10.15	0.00	600	
1	8:01	33.29		29.91	19.76		
2	8:02	30.44		27.06	16.91		
3	8:03	30.12		26.74	16.59		
4	8:04	30.68		27.30	17.15		
5	8:05	31.03		27.65	17.50		
6	8:06	31.34		27.96	17.81		
7	8:07	31.70		28.32	18.17		
8	8:08	31.89		28.51	18.36		
9	8:09	32.06		28.68	18.53		
10	8:10	32.16		28.78	18.63		
12	8:12	32.42		29.04	18.89		
14	8:14	32.79		29.41	19.26		
16	8:16	32.83		29.45	19.30		
18	8:18	33.07		29.69	19.54		
20	8:20	33.24		29.86	19.71	595	setting rate to
25	8:25	33.47		30.09	19.94		20 gpm
30	8:30	33.70		30.32	20.17		
35	8:35	33.82		30.44	20.29		
40	8:40	34.00		30.62	20.47		
45	8:45	34.19		30.81	20.66		
50	8:50	34.34		30.96	20.81		
55	8:55	34.42		31.04	20.89		
60	9:00	34.52		31.14	20.99		

Specific Capacity: 28.35 gpm per foot of drawdown
at 595 gpm at 60 min

STEP-DRAWDOWN TEST RECORD

Project Name: Village of Palm Springs
Well No.: 4E
Step: 2
Date: 6/16/92
Reference Point: Ground Level
Elevation of Measuring Point (ft): 3.38
Elevation of Ground Level (ft): 20 (approx)
Pre-Test Water Level (ft): 13.45
(Ref. Measuring Point)

Elapsed Time (Min)	Time (Hr:Min)	Held (Ft)	Water Tape Dist. (Ft)	Level Below R.P. (Ft)	Drawdown (Ft)	Pumping Rate (GPM)	Remarks
0	10:00	14.17		10.79	0.00	1305	adjusting rate
1.5	10:01:30	62.94		59.56	48.77		
2	10:02	64.40		61.02	50.23	1260	
3	10:03	58.51		55.13	44.34	1220	
4	10:04	50.79		47.41	36.62		
5	10:05	50.43		47.05	36.26		
6	10:06	50.61		47.23	36.44	1200	
7	10:07	50.84		47.46	36.67		
8	10:08	51.15		47.77	36.98		
9	10:09	51.31		47.93	37.14		
10	10:10	51.55		48.17	37.38		
12	10:12	51.94		48.56	37.77		
14	10:14	52.24		48.86	38.07		
16	10:16	52.50		49.12	38.33		
18	10:18	52.79		49.41	38.62		
20	10:20	53.03		49.65	38.86		
25	10:25	53.55		50.17	39.38		
30	10:30	53.81		50.43	39.64		
35	10:35	54.09		50.71	39.92		
40	10:40	54.26		50.88	40.09		
45	10:45	54.68		51.30	40.51		
50	10:50	54.70		51.32	40.53		
55	10:55	54.82		51.44	40.65		
60	11:00	55.01		51.63	40.84		

Specific Capacity: 29.38 gpm per foot of drawdown
at 1200 gpm at 60 min

STEP-DRAWDOWN TEST RECORD

Project Name: Village of Palm Springs
Well No.: 4E
Step: 4
Date: 6/16/92
Reference Point: Ground Level
Elevation of Measuring Point: 3.38
Elevation of Ground Level: ?
Pre-Test Water Level (ft) 13.45
(Ref. Measuring Point)

Elapsed Time (Min)	Time (Hr:Min)	Held (Ft)	Water Tape Dist. (Ft)	Level Below R.P. (Ft)	Drawdown (Ft)	Pumping Rate (GPM)	Remarks
0	4:00	15.99		12.61	0.00		adjusting rate
1	4:01	62.21		58.83	46.22		
2	4:02	66.23		62.85	50.24		
3	4:03	56.36		52.98	40.37		
4	4:04	62.62		59.24	46.63		
5	4:05	64.17		60.79	48.18	1600	
6	4:06	65.03		61.65	49.04		
7	4:07	65.61		62.23	49.62		
8	4:08	66.06		62.68	50.07		
9	4:09	66.45		63.07	50.46		
10	4:10	66.92		63.54	50.93		
12	4:12	67.65		64.27	51.66		
14	4:14	68.18		64.80	52.19		
16	4:16	68.58		65.20	52.59		
18	4:18	68.91		65.53	52.92		
20	4:20	69.20		65.82	53.21		
25	4:25	69.92		66.54	53.93		
30	4:30	70.39		67.01	54.40		
35	4:35	70.79		67.41	54.80		
40	4:40	71.05		67.67	55.06		
45	4:45	71.37		67.99	55.38		
50	4:50	71.61		68.23	55.62		
55	4:55	71.78		68.40	55.79		
60	5:00	71.89		68.51	55.90		

Specific Capacity: 28.62 gpm per foot of drawdown
at 1600 gpm at 60 min

STEP-DRAWDOWN TEST RECORD

Project Name: Village of Palm Springs
Well No.: 11E
Step: 1
Date: 8/12/92
Reference Point: Ground Level
Elevation of Measuring Point (ft): 1.50
Elevation of Ground Level (ft): 19 (approx)
Pre-Test Water Level (ft): 6.77
(Ref. Measuring Point)

Elapsed Time (Min)	Time (Hr:Min)	Held (Ft)	Water Tape Dist. (Ft)	Level Below R.P. (Ft)	Drawdown (Ft)	Pumping Rate (GPM)	Remarks
0	8:00	6.80		5.30	0.00		
1	8:01	30.95		29.45	24.15		
2	8:02	32.65		31.15	25.85	650	
3	8:03	33.43		31.93	26.63		
4	8:04	33.95		32.45	27.15		
5	8:05	34.23		32.73	27.43		Sand Separator at
6	8:06	34.37		32.87	27.57		20 gal/min
7	8:07	34.59		33.09	27.79		
8	8:08	34.73		33.23	27.93		
9	8:09	34.74		33.24	27.94		
10	8:10	34.83		33.33	28.03		
12	8:12	35.00		33.50	28.20		
14	8:14	35.15		33.65	28.35		
16	8:16	35.21		33.71	28.41		
18	8:18	35.27		33.77	28.47		
20	8:20	35.30		33.80	28.50		
25	8:25	35.37		33.87	28.57		
30	8:30	35.40		33.90	28.60		
35	8:35	35.53		34.03	28.73		
40	8:40	35.53		34.03	28.73		
45	8:45	35.47		33.97	28.67		
50	8:50	35.60		34.10	28.80		
55	8:55	35.64		34.14	28.84		
60	9:00	35.58		34.08	28.78		

Specific Capacity: 22.59 gpm per foot of drawdown
at 650 gpm at 60 min

STEP-DRAWDOWN TEST RECORD

Project Name: Village of Palm Springs
Well No.: 11E
Step: 2
Date: 8/12/92
Reference Point: Ground Level
Elevation of Measuring Point (ft): 1.50
Elevation of Ground Level (ft): 19 (approx)
Pre-Test Water Level (ft): 6.63
(Ref. Measuring Point)

Elapsed Time (Min)	Time (Hr:Min)	Held (Ft)	Water Tape Dist. (Ft)	Level Below R.P. (Ft)	Drawdown (Ft)	Pumping Rate (GPM)	Remarks
0	10:00	6.63		5.13	0.00		Sand Separator at
1	10:01	37.21		35.71	30.58	850	20 gal/min
2	10:02	40.21		38.71	33.58		
3	10:03	41.26		39.76	34.63		
4	10:04	41.93		40.43	35.30		
5	10:05	42.49		40.99	35.86		
6	10:06	42.85		41.35	36.22		
7	10:07	43.12		41.62	36.49		
8	10:08	43.45		41.95	36.82		
9	10:09	43.53		42.03	36.90		
10	10:10	43.79		42.29	37.16		
12	10:12	43.93		42.43	37.30		
14	10:14	44.21		42.71	37.58		
16	10:16	44.48		42.98	37.85		
18	10:18	44.67		43.17	38.04		
20	10:20	45.01		43.51	38.38		
25	10:25	45.19		43.69	38.56		
30	10:30	45.30		43.80	38.67		
35	10:35	46.24		44.74	39.61		
40	10:40	46.23		44.73	39.60		
45	10:45	46.54		45.04	39.91		
50	10:50	46.55		45.05	39.92		
55	10:55	46.61		45.11	39.98		
60	11:00	46.44		44.94	39.81		

Specific Capacity: 21.35 gpm per foot of drawdown
at 850 gpm at 60 min

STEP-DRAWDOWN TEST RECORD

Project Name: Village of Palm Springs
Well No.: 11E
Step: 3
Date: 8/12/92
Reference Point: Ground Level
Elevation of Measuring Point (ft): 1.50
Elevation of Ground Level (ft): 19 (approx)
Pre-Test Water Level (ft): 6.75
(Ref. Measuring Point)

Elapsed Time (Min)	Time (Hr:Min)	Held (Ft)	Water Tape Dist. (Ft)	Level Below R.P. (Ft)	Drawdown (Ft)	Pumping Rate (GPM)	Remarks
0	2:00	6.75		5.25	0.00	1225	Sand Separator at
1	2:01						20 gal/min.
2	2:02						
3	2:03						
4	2:04						
5	2:05						
6	2:06						
7	2:07	62.03		60.53	55.28		
8	2:08	62.34		60.84	55.59		
9	2:09	62.51		61.01	55.76		
10	2:10	62.67		61.17	55.92		
12	2:12	62.98		61.48	56.23		
14	2:14	63.42		61.92	56.67		
16	2:16	63.78		62.28	57.03		
18	2:18	64.08		62.58	57.33		
20	2:20	64.03		62.53	57.28		
25	2:25	64.33		62.83	57.58		
30	2:30	64.31		62.81	57.56		
35	2:35	64.78		63.28	58.03		
40	2:40	65.11		63.61	58.36		
45	2:45	64.99		63.49	58.24		
50	2:50	65.21		63.71	58.46		
55	2:55	65.31		63.81	58.56		
60	3:00	65.42		63.92	58.67		

Specific Capacity: 20.88 gpm per foot of drawdown
at 1225 gpm at 60 min

STEP-DRAWDOWN TEST RECORD

Project Name: Village of Palm Springs
Well No.: 1W
Step: 1
Date: 8/05/92
Reference Point: Ground Level
Elevation of Measuring Point (ft): 1.17
Elevation of Ground Level (ft): 18 (approx)
Pre-Test Water Level (ft): 6.27
(Ref. Measuring Point)

Elapsed Time (Min)	Time (Hr:Min)	Held (Ft)	Water Tape Dist. (Ft)	Level Below R.P. (Ft)	Drawdown (Ft)	Pumping Rate (GPM)	Remarks
0	8:45	6.27		5.10	0.00	700	Adjusting sand
1	8:46	8.11		6.94	1.84		separator to
2	8:47	8.18		7.01	1.91	720	20 gal/min
3	8:48	8.20		7.03	1.93		
4	8:49						
5	8:50	8.23		7.06	1.96		
6	8:51	8.21		7.04	1.94	720	
7	8:52						
8	8:53	8.30		7.13	2.03		
9	8:54	8.34		7.17	2.07		
10	8:55	8.38		7.21	2.11		
12	8:57	8.36		7.19	2.09		
14	8:59	8.37		7.20	2.10		
16	9:01	8.38		7.21	2.11		
18	9:03	8.40		7.23	2.13		
20	9:05	8.40		7.23	2.13	740	
25	9:10	8.40		7.23	2.13		
30	9:15	8.40		7.23	2.13		
35	9:20	8.40		7.23	2.13		
40	9:25	8.40		7.23	2.13		
45	9:30	8.40		7.23	2.13		
50	9:35	8.40		7.23	2.13		
55	9:40	8.40		7.23	2.13		
60	9:45	8.40		7.23	2.13		

Specific Capacity: 347.42 gpm per foot of drawdown
at 740 gpm at 60 min

STEP-DRAWDOWN TEST RECORD

Project Name: Village of Palm Springs
Well No.: 1W
Step: 2
Date: 8/05/92
Reference Point: Ground Level
Elevation of Measuring Point (ft): 1.17
Elevation of Ground Level (ft): 18 (approx)
Pre-Test Water Level (ft): 5.90
(Ref. Measuring Point)

Elapsed Time (Min)	Time (Hr:Min)	Held (Ft)	Water Tape Dist. (Ft)	Level Below R.P. (Ft)	Drawdown (Ft)	Pumping Rate (GPM)	Remarks
0	10:45	5.90		4.73	0.00		Adjusting rate
1	10:46	9.17		8.00	3.27	1100	
2	10:47	9.69		8.52	3.79		
3	10:48	9.74		8.57	3.84	1220	
4	10:49	11.43		10.26	5.53		
5	10:50	10.81		9.64	4.91		
6	10:51	10.81		9.64	4.91	1450	
7	10:52						
8	10:53	10.83		9.66	4.93		
9	10:54	10.85		9.68	4.95		
10	10:55	10.93		9.76	5.03		
12	10:57	10.98		9.81	5.08	1470	
14	10:59						
16	11:01	11.05		9.88	5.15		
18	11:03	11.12		9.95	5.22		
20	11:05	11.13		9.96	5.23		
25	11:10	11.18		10.01	5.28		
30	11:15	11.21		10.04	5.31		
35	11:20	11.26		10.09	5.36		
40	11:25	11.27		10.10	5.37	1530	
45	11:30	11.21		10.04	5.31		
50	11:35	11.26		10.09	5.36		
55	11:40	11.26		10.09	5.36		
60	11:45	11.26		10.09	5.36		

Specific Capacity: 285.45 gpm per foot of drawdown
at 1530 gpm at 60 min

STEP-DRAWDOWN TEST RECORD

Project Name: Village of Palm Springs
Well No.: 1W
Step: 3
Date: 8/05/92
Reference Point: Ground Level
Elevation of Measuring Point (ft): $\boxed{1.17}$
Elevation of Ground Level (ft): 18 (approx)
Pre-Test Water Level (ft): 6.07
(Ref. Measuring Point)

Elapsed Time (Min)	Time (Hr:Min)	Held (Ft)	Water Tape Dist. (Ft)	Level Below R.P. (Ft)	Drawdown (Ft)	Pumping Rate (GPM)	Remarks
0	12:45	6.07		4.90	0.00		
1	12:46	13.30		12.13	7.23		
2	12:47	13.47		12.30	7.40		
3	12:48	15.07		13.90	9.00	2270	
4	12:49	15.05		13.88	8.98		
5	12:50	15.30		14.13	9.23		
6	12:51	15.37		14.20	9.30		
7	12:52	15.43		14.26	9.36		
8	12:53	15.47		14.30	9.40		
9	12:54	15.50		14.33	9.43		
10	12:55	15.53		14.36	9.46		
12	12:57	15.56		14.39	9.49		
14	12:59	15.67		14.50	9.60		
16	1:01	15.67		14.50	9.60		
18	1:03	15.71		14.54	9.64		
20	1:05	15.71		14.54	9.64		
25	1:10	15.75		14.58	9.68		
30	1:15	15.79		14.62	9.72		
35	1:20	15.85		14.68	9.78		
40	1:25	15.85		14.68	9.78		
45	1:30	15.83		14.66	9.76		
50	1:35	15.83		14.66	9.76		
55	1:40	15.83		14.66	9.76		
60	1:45	15.85		14.68	9.78		

Specific Capacity: 232.11 gpm per foot of drawdown
at 2270 gpm at 60 min

STEP-DRAWDOWN TEST RECORD

Project Name: Village of Palm Springs
Well No.: 2W
Step: 1
Date: 7/13/92
Reference Point: Ground Level
Elevation of Measuring Point (ft): 1.83
Elevation of Ground Level (ft): 18 (approx)
Pre-Test Water Level (ft): 6.63
(Ref. Measuring Point)

Elapsed Time (Min)	Time (Hr:Min)	Held (Ft)	Water Tape Dist. (Ft)	Level Below R.P. (Ft)	Drawdown (Ft)	Pumping Rate (GPM)	Remarks
0	9:00	6.63		4.80	0.00	700	
1	9:01	7.92		6.09	1.29		
2	9:02	8.10		6.27	1.47	730	
3	9:03	8.19		6.36	1.56		
4	9:04	8.20		6.37	1.57		opening sand
5	9:05	8.24		6.41	1.61		separator
6	9:06	8.18		6.35	1.55		
7	9:07	8.21		6.38	1.58		
8	9:08	8.21		6.38	1.58		
9	9:09	8.19		6.36	1.56		
10	9:10	8.22		6.39	1.59		
12	9:12	8.24		6.41	1.61	750	20 gal/min
14	9:14	8.23		6.40	1.60		
16	9:16	8.24		6.41	1.61		
18	9:18	8.25		6.42	1.62		
20	9:20	8.25		6.42	1.62		
25	9:25	8.27		6.44	1.64		
30	9:30	8.38		6.55	1.75		
35	9:35	8.25		6.42	1.62		
40	9:40	8.32		6.49	1.69		
45	9:45	8.29		6.46	1.66		
50	9:50	8.31		6.48	1.68		
55	9:55	8.32		6.49	1.69		
60	10:00	8.29		6.46	1.66		

Specific Capacity: 451.81 gpm per foot of drawdown
at 750 gpm at 60 min

STEP-DRAWDOWN TEST RECORD

Project Name: Village of Palm Springs
Well No.: 2W
Step: 2
Date: 7/13/92
Reference Point: Ground Level
Elevation of Measuring Point (ft): 1.83
Elevation of Ground Level (ft): 18(approx)
Pre-Test Water Level (ft): 6.63
(Ref. Measuring Point)

Elapsed Time (Min)	Time (Hr:Min)	Held (Ft)	Water Tape Dist. (Ft)	Level Below R.P. (Ft)	Drawdown (Ft)	Pumping Rate (GPM)	Remarks
0	11:00	6.63		4.80	0.00		
1	11:01	9.69		7.86	3.06		
2	11:02	9.85		8.02	3.22		
3	11:03	9.87		8.04	3.24		
4	11:04	9.89		8.06	3.26		
5	11:05	9.94		8.11	3.31	1380	
6	11:06	9.97		8.14	3.34		
7	11:07	9.99		8.16	3.36		
8	11:08	10.01		8.18	3.38		
9	11:09	10.03		8.20	3.40		
10	11:10	10.03		8.20	3.40		
12	11:12	10.06		8.23	3.43		
14	11:14	10.07		8.24	3.44		
16	11:16	10.06		8.23	3.43		
18	11:18	10.08		8.25	3.45		
20	11:20	10.11		8.28	3.48		
25	11:25	10.11		8.28	3.48		
30	11:30	10.13		8.30	3.50		
35	11:35	10.13		8.30	3.50		
40	11:40	10.14		8.31	3.51		
45	11:45	10.15		8.32	3.52		
50	11:50	10.16		8.33	3.53		
55	11:55	10.17		8.34	3.54		
60	12:00	10.17		8.34	3.54		

Specific Capacity: 389.83 gpm per foot of drawdown
at 1380 gpm at 60 min

STEP-DRAWDOWN TEST RECORD

Project Name: Village of Palm Springs
Well No.: 2W
Step: 3
Date: 7/13/92
Reference Point: Ground Level
Elevation of Measuring Point (ft): 1.83
Elevation of Ground Level (ft): 18 (approx)
Pre-Test Water Level (ft): 6.63
(Ref. Measuring Point)

Elapsed Time (Min)	Time (Hr:Min)	Held (Ft)	Water Tape Dist. (Ft)	Level Below R.P. (Ft)	Drawdown (Ft)	Pumping Rate (GPM)	Remarks
0	1:00	6.58		4.75	0.00		
1	1:01	11.81		9.98	5.23		
2	1:02	11.94		10.11	5.36		
3	1:03	12.07		10.24	5.49		
4	1:04	12.14		10.31	5.56		
5	1:05	12.17		10.34	5.59	2100	
6	1:06	12.22		10.39	5.64		
7	1:07	12.27		10.44	5.69		
8	1:08	12.25		10.42	5.67		
9	1:09	12.30		10.47	5.72		
10	1:10	12.31		10.48	5.73		
12	1:12	12.35		10.52	5.77		
14	1:14	12.37		10.54	5.79		
16	1:16	12.41		10.58	5.83		sand separator
18	1:18	12.41		10.58	5.83		at 15 gal/min
20	1:20	12.43		10.60	5.85		
25	1:25	12.43		10.60	5.85		
30	1:30	12.47		10.64	5.89		
35	1:35	12.46		10.63	5.88		
40	1:40	12.46		10.63	5.88		
45	1:45	12.49		10.66	5.91		
50	1:50	12.50		10.67	5.92		
55	1:55	12.51		10.68	5.93		
60	2:00	12.52		10.69	5.94		

Specific Capacity: 353.54 gpm per foot of drawdown
at 2100 gpm at 60 min

APPENDIX F

BACTERIAL ANALYSIS

MICROBIOLOGY

MICRIN-LABS, INC.
9507 S.W. 160 St., Suite 240
Miami, Florida 33157
(305) 251-5524
1-800-330-GERM

Medicare Provider No.: L8315
Employer I.D. No.: 59-1936507
Florida State Licensure No.: 800001156

PHYSICIAN OR INSTITUTION

Meridith Corporation

(1)

PHONE No. ( )

REPORT #:92E3-92E4-92E5
DATE RECEIVED:5-1-92
PATIENT NAME:
PATIENT LAST NAME:VILLAGE OF PALM SPRINGS/MERIDITH CORPORATION
SOURCE OF CULTURE:ENV. WATER
TEST REQUESTED:BACTERIAL ID/TOTAL COLIFORM/FECAL COLIFORM
DATE REPORTED OUT:5-5-92

1E

COMMENTS:

Organisms Are Listed In Order Of Predominance

S = Sensitive
R = Not Sensitive
I = Intermediate Susceptability
MS = Moderately Sensitive

	1 AMPICILLIN	2 CARBENICILLIN	3 CLINDAMYCIN	4 CEPHALOTHIN	5 COLISTIN	6 CHLORAMPHENICOL	7 ERYTHOMYCIN	8 FURADANTIN	9 GANTRISIN	10 GENTAMICIN	11 AMIKACIN	12 METHICILLIN	13 NALIDIXIC ACID	14 PENICILLIN	15 SEPTRA/BACTRIM	16 TOBRAMYCIN	17 TETRACYCLINES	18 METRONIDAZOLE	19 AUGMENTIN	20 CIPROFLOXACIN	21	22
BACTERIAL ID: POST CONCENTRATION - AEROMONAS HYDROPHILA																						
ENTEROBACTER CLOACAE																						
ENTEROBACTER AGGLOMERANS																						
TOTAL COLIFORM COUNT: 0 CFU/100 ML																						
FECAL COLIFORM COUNT: 0 CFU/100 ML																						

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[illegible]

MICROBIOLOGY

MICRIM LABS, INC.
9507 S.W. 160 St., Suite 240
Miami, Florida 33157
(305) 251-5524
1-800-330-GERM

Medicare Provider No.: L8315
Employer I.D. No.: 59-1936507
Florida State Licensure No.: 800001156

PHYSICIAN OR INSTITUTION

Meridith Corp.

( )

( )

PHONE No.

REPORT #: 7-2-92
DATE RECEIVED: 92677-92678-92679 2E
PATIENT NAME:
PATIENT LAST NAME: WATER/RECEIVED 7-2-92
SOURCE OF CULTURE: ENV. WATER
TEST REQUESTED: TOTAL COLIFORM COUNT/BATERIAL-FUNGAL ID
DATE REPORTED OUT: 7-6-92

COMMENTS:

Organisms Are Listed In Order Of Predominance S = Sensitive R = Not Sensitive = Intermediate Susceptability S = Moderately Sensitive	1 AMPICILLIN	2 CARBENICILLIN	3 CLINDAMYCIN	4 CEPHALOTHIN	5 COLISTIN	6 CHLORAMPHENICOL	7 ERYTHOMYCIN	8 FURADANTIN	9 GANTRISIN	10 GENTAMICIN	11 AMIKACIN	12 METHICILLIN	13 NALIDIXIC ACID	14 PENICILLIN	15 SEPTRA/BACTRIM	16 TOBRAMYCIN	17 TETRACYCLINES	18 METRONIDAZOLE	19 AUGMENTIN	20 CIPROFLOXACIN	21	22
TOTAL COLIFORM COUNT: 0 CFU/100 ML																						
BACTERIA: VERY LIGHT GROWTH OF BACILLUS SP.																						
FUNGUS: LIGHT GROWTH OF ACREMONIUM SP.																						
2E																						

MICROBIOLOGY

Miami, Florida 33157
(305) 251-5524
1-800-330-GERM

Medicare Provider No.: L0315
Employer I.D. No.: 59-1936507
Florida State Licensure No.: 800001156

PHYSICIAN OR INSTITUTION

Meridith Corp.

(1440)

(   )

PHONE No.

REPORT #:92E309
DATE RECEIVED:5-7-92
PATIENT NAME:
PATIENT LAST NAME:VILLAGE OF PALM SPRINGS #3E
SOURCE OF CULTURE:ENV. WATER
TEST REQUESTED:BACTERIAL ID
DATE REPORTED OUT:5-11-92

COMMENTS:

Organisms Are Listed In Order Of Predominance

S = Sensitive
R = Not Sensitive
I = Intermediate Susceptability
MS = Moderately Sensitive

Organism	1 AMPICILLIN	2 CARBENICILLIN	3 CLINDAMYCIN	4 CEPHALOTHIN	5 COLISTIN	6 CHLORAMPHENICOL	7 ERYTHOMYCIN	8 FURADANTIN	9 GANTRISIN	10 GENTAMICIN	11 AMIKACIN	12 METHICILLIN	13 NALIDIXIC ACID	14 PENICILLIN	15 SEPTRA/BACTRIM	16 TOBRAMYCIN	17 TETRACYCLINES	18 METRONIDAZOLE	19 AUGMENTIN	20 CIPROFLOXACIN	21	22
HEAVY GROWTH OF AEROMONAS HYDROPHILA																						
A. CALCOACETICUS																						
PSEUDOMONAS FLUORESCENS																						
PSEUDOMONAS/ALCALIGENES SP.																						
FUNGI: CLADOSPORIUM SP., PENICILLIUM SP.																						

MAY 15 1992

Microbiologist

MICROBIOLOGY

Miami, Florida 33157
(305) 251-5524
1-800-330-GERM

Medicare Provider No.: L8313
Employer I.D. No.: 59-1936507
Florida State Licensure No.: 800001156

PHYSICIAN OR INSTITUTION

Meridith Corp.

(1440)

(   )

PHONE No.

REPORT #:92E308
DATE RECEIVED:5-7-92
PATIENT NAME:
PATIENT LAST NAME:VILLAGE OF PALM SPRINGS #3E
SOURCE OF CULTURE:ENV. WATER
TEST REQUESTED:TOTAL COLIFORM COUNT
DATE REPORTED OUT:5-11-92

COMMENTS:

Organisms Are Listed In Order Of Predominance S = Sensitive R = Not Sensitive I = Intermediate Susceptability MS = Moderately Sensitive	1 AMPICILLIN	2 CARBENICILLIN	3 CLINDAMYCIN	4 CEPHALOTHIN	5 COLISTIN	6 CHLORAMPHENICOL	7 ERYTHOMYCIN	8 FURADANTIN	9 GANTRISIN	10 GENTAMICIN	11 AMIKACIN	12 METHICILLIN	13 NALIDIXIC ACID	14 PENICILLIN	15 SEPTRA/BACTRIM	16 TOBRAMYCIN	17 TETRACYCLINES	18 METRONIDAZOLE	19 AUGMENTIN	20 CIPROFLOXACIN	21	22
TOTAL COLIFORM COUNT: 0 CFU/100 ML																						

Microbiologist

MICROBIOLOGY

Miami, Florida 33157
(305) 251-5524
1-800-330-GERM

Medicare Provider No.: L8315
Employer I. D. No.: 59-1936507
Florida State Licensure No.: 800001156

PHYSICIAN OR INSTITUTION

Meredith Corp.

(1)

PHONE No. ( )

REPORT #:92F932-933-934-935
DATE RECEIVED:6-18-92
PATIENT NAME:
PATIENT LAST NAME:VILLAGE OF PALM SPRINGS/WELL #4E
SOURCE OF CULTURE:ENV. WATER
TEST REQUESTED:T.P.C/T.C.C./FUNGAL & BACTERIAL ID
DATE REPORTED OUT:6-20-92

COMMENTS:

Organisms Are Listed In Order Of Predominance S = Sensitive R = Not Sensitive I = Intermediate Susceptability MS = Moderately Sensitive	1 AMPICILLIN	2 CARBENICILLIN	3 CLINDAMYCIN	4 CEPHALOTHIN	5 COLISTIN	6 CHLORAMPHENICOL	7 ERYTHOMYCIN	8 FURADANTIN	9 GANTRISIN	10 GENTAMICIN	11 AMIKACIN	12 METHICILLIN	13 NALIDIXIC ACID	14 PENICILLIN	15 SEPTRA/BACTRIM	16 TOBRAMYCIN	17 TETRACYCLINES	18 METRONIDAZOLE	19 AUGMENTIN	20 CIPROFLOXACIN	21	22
TOTAL PLATE COUNT: 9 CFU/100 ML																						
TOTAL COLIFORM COUNT: 0 CFU/100 ML																						
FUNGAL REPORT TO FOLLOW																						
BACTERIAL ID: LIGHT GROWTH OF BACILLUS SP.																						

Microbiologist

MICROBIOLOGY

Miami, Florida 33157
(305) 251-5524
1-800-330-GERM

Medicare Provider No.: L8315
Employer I.D. No.: 59-1936507
Florida State Licensure No.: 800001156

PHYSICIAN OR INSTITUTION
Meridith Corp.

(1)

PHONE No. (   )

REPORT #:92F934
DATE RECEIVED:6/18/92
PATIENT NAME:
PATIENT LAST NAME:VILLAGE OF PALM SPRINGS/WELL #4E
SOURCE OF CULTURE:ENV. WATER
TEST REQUESTED:C.F.
DATE REPORTED OUT:6/29/92

JUL 1 - 1992

COMMENTS:

Organisms Are Listed In Order Of Predominance

S = Sensitive
R = Not Sensitive
I = Intermediate Susceptability
MS = Moderately Sensitive

	1 AMPICILLIN	2 CARBENICILLIN	3 CLINDAMYCIN	4 CEPHALOTHIN	5 COLISTIN	6 CHLORAMPHENICOL	7 ERYTHOMYCIN	8 FURADANTIN	9 GANTRISIN	10 GENTAMICIN	11 AMIKACIN	12 METHICILLIN	13 NALIDIXIC ACID	14 PENICILLIN	15 SEPTRA/BACTRIM	16 TOBRAMYCIN	17 TETRACYCLINES	18 METRONIDAZOLE	19 AUGMENTIN	20 CIPROFLOXACIN	21	22
NO FUNGAL GROWTH ISOLATED																						

Microbiologist

MICROBIOLOGY

9507 S.W. 160 St., Suite 240
Miami, Florida 33157
(305) 251-5524
1-800-330-GERM

Medicare Provider No.: L8315
Employer I.D. No.: 59-1936507
Florida State Licensure No.: 800001156

PHYSICIAN OR INSTITUTION
MERIDITH CORPORATION
2911 W. WASHINGTON ST.
ORLANDO FL
32805
(895)

PHONE No. (407) 295-2641

SEP 1992
RECEIVED

REPORT #:92H639-92G640-92H641
DATE RECEIVED:8-13-92
PATIENT NAME:
PATIENT LAST NAME:VILLAGE OF PALM SPRINGS/WELL #11E
SOURCE OF CULTURE:ENV. WATER
TEST REQUESTED:TOTAL COLIFORM COUNT/BACTERIAL-FUNGAL ID
DATE REPORTED OUT:8-17-92

COMMENTS:

Organisms Are Listed In Order Of Predominance S = Sensitive R = Not Sensitive I = Intermediate Susceptability MS = Moderately Sensitive	1 AMPICILLIN	2 CARBENICILLIN	3 CLINDAMYCIN	4 CEPHALOTHIN	5 COLISTIN	6 CHLORAMPHENICOL	7 ERYTHOMYCIN	8 FURADANTIN	9 GANTRISIN	10 GENTAMICIN	11 AMIKACIN	12 METHICILLIN	13 NALIDIXIC ACID	14 PENICILLIN	15 SEPTRA/BACTRIM	16 TOBRAMYCIN	17 TETRACYCLINES	18 METRONIDAZOLE	19 AUGMENTIN	20 CIPROFLOXACIN	21	22
FUNGAL ID: NO FUNGAL GROWTH ISOLATED																						
BACTERIAL: TOTAL PLATE COUNT - 2 CFU/100 ML																						
STAPH COAGULASE NEGATIVE																						
TOTAL COLIFORM COUNT: 0 CFU/100 ML																						

Microbiologist

MICROBIOLOGY

Miami, Florida 33157
(305) 251-5524
1-800-330-GERM

Medicare Provider No.: L8315
Employer I.D. No.: 59-1936507
Florida State Licensure No.: 800001156

PHYSICIAN OR INSTITUTION
MERIDITH CORPORATION
2911 W. WASHINGTON ST.
ORLANDO FL
32805
(895)

PHONE No. (407) 295-2641

REPORT #:92H277-98H278-92H279
DATE RECEIVED:8/6/92
PATIENT NAME:
PATIENT LAST NAME:WELL 1W VILLAGE OF PALM SPRINGS
SOURCE OF CULTURE:ENV. WATER
TEST REQUESTED:TOTAL COLIFORM COUNT/BACTERIAL & FUNGAL I.D.
DATE REPORTED OUT:8/10/92

COMMENTS:

Organisms Are Listed In Order Of Predominance

S = Sensitive
R = Not Sensitive
I = Intermediate Susceptability
MS = Moderately Sensitive

	1 AMPICILLIN	2 CARBENICILLIN	3 CLINDAMYCIN	4 CEPHALOTHIN	5 COLISTIN	6 CHLORAMPHENICOL	7 ERYTHOMYCIN	8 FURADANTIN	9 GANTRISIN	10 GENTAMICIN	11 AMIKACIN	12 METHICILLIN	13 NALIDIXIC ACID	14 PENICILLIN	15 SEPTRA/BACTRIM	16 TOBRAMYCIN	17 TETRACYCLINES	18 METRONIDAZOLE	19 AUGMENTIN	20 CIPROFLOXACIN	21	22
TOTAL COLIFORM COUNT - 0 CFU/100ML																						
TOTAL PLATE COUNT - 2 CFU/100 ML - BACILLUS SP.																						
1 CFU/100ML - PENICILLIUM SP.																						

Microbiologist

MICROBIOLOGY

Miami, Florida 33157
(305) 251-5524
1-800-330-GERM

Medicare Provider No.: L8315
Employer I.D. No.: 59-1936607
Florida State Licensure No.: 800001156

PHYSICIAN OR INSTITUTION
MERIDITH CORPORATION
2911 W. WASHINGTON ST.
ORLANDO FL
32805
(895)

PHONE No. (407) 295-2641

V. Palm Springs

REPORT #:926697-698-699
DATE RECEIVED:7-15-92
PATIENT NAME:
PATIENT LAST NAME:VILLAGE OF PALM SPRINGS/WELL #2W
SOURCE OF CULTURE:ENV. WATER
TEST REQUESTED:TOTAL COLIFORM COUNT/BACTERIAL-FUNGAL ID
DATE REPORTED OUT:7-18-92

COMMENTS:

Organisms Are Listed In Order Of Predominance

S = Sensitive
R = Not Sensitive
I = Intermediate Susceptability
MS = Moderately Sensitive

Organisms	1 AMPICILLIN	2 CARBENICILLIN	3 CLINDAMYCIN	4 CEPHALOTHIN	5 COLISTIN	6 CHLORAMPHENICOL	7 ERYTHOMYCIN	8 FURADANTIN	9 GANTRISIN	10 GENTAMICIN	11 AMIKACIN	12 METHICILLIN	13 NALIDIXIC ACID	14 PENICILLIN	15 SEPTRA/BACTRIM	16 TOBRAMYCIN	17 TETRACYCLINES	18 METRONIDAZOLE	19 AUGMENTIN	20 CIPROFLOXACIN	21	22
TOTAL COLIFORM COUNT: 0 CFU/100 ML																						
HEAVY GROWTH OF BACTERIA:																						
PSEUDOMONAS AERUGINOSA ;																						
PSEUDOMONAS FLUORESCENS, PSEUDOMONAS/ALCALIGENES SP.																						
TOTAL PLATE COUNT: 8 CFU –																						
FUNGUS: ASPERGILLUS NIGER																						

Microbiologist

MICROBIOLOGY

Miami, Florida 33157
(305) 251-5524
1-800-330-GERM

Medicare Provider No.: L8315
Employer I.D. No.: 59-1936507
Florida State Licensure No.: 800001156

PHYSICIAN OR INSTITUTION
MERIDITH CORPORATION
2911 W. WASHINGTON ST.
ORLANDO FL
32805
(695)

PHONE No. (407) 295-2641

REPORT #:9261549-9261650-9261651
DATE RECEIVED:7-31-92
PATIENT NAME:
PATIENT LAST NAME:VILLAGE OF PALM SPRINGS/WELL #2W
SOURCE OF CULTURE:WATER
TEST REQUESTED:TOTAL COLIFORM COUNT/BACTERIAL-FUNGAL
DATE REPORTED OUT:8-3-92

AUG 06 1992

COMMENTS:

Organisms Are Listed In Order Of Predominance

S = Sensitive
R = Not Sensitive
I = Intermediate Susceptability
MS = Moderately Sensitive

Organisms	1 AMPICILLIN	2 CARBENICILLIN	3 CLINDAMYCIN	4 CEPHALOTHIN	5 COLISTIN	6 CHLORAMPHENICOL	7 ERYTHOMYCIN	8 FURADANTIN	9 GANTRISIN	10 GENTAMICIN	11 AMIKACIN	12 METHICILLIN	13 NALIDIXIC ACID	14 PENICILLIN	15 SEPTRA/BACTRIM	16 TOBRAMYCIN	17 TETRACYCLINES	18 METRONIDAZOLE	19 AUGMENTIN	20 CIPROFLOXACIN	21	22
TOTAL COLIFORM COUNT: 0 CFU/100 ML																						
NO BACTERIAL GROWTH ISOLATED																						
FUNGAL ID: 2 CFU/100 ML																						
CURVULARIA SP.																						

Microbiologist

APPENDIX G

WATER QUALITY ANALYSIS

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

PUBLIC WATER SYSTEM INFORMATION
Public Water System I.D. Number: 4501058
Public Water System Name: Village of Palm Springs WTP
Public Water System Type:
(X) Community ( ) Non-Community ( ) Non-Transient Non-Community

LABORATORY CERTIFICATION INFORMATION
Lab Certification Number: 86140
Parameter Groups Analyzed: Inorganic, Volatile Organic, Organic & Secondary Chemical and Radiological
Subcontracted Lab Certification Number (if any): 86137, 87239

SAMPLE INFORMATION
Sample Collection Date (MM/DD/YY): 05/05/92
Laboratory Sample Number: 92-05-043
Sample Location (be specific): Well #1E and Well #3E
Sample Type (check all applicable)

( ) Check	( ) Regular Distribution	( ) Composite
( ) Clearance	( ) Maximum Residence	( ) Plant Tap
(X) Raw	(X) Well	( ) Resample
( ) Special ______		

Sampler Name, Title, Phone: Margaret Ezerski, Field Technician (407) 842-2849

ANALYSIS INFORMATION
Extraction Date (MM/DD/YY): 05/11/92
Laboratory Contact: Thomas Colgan
Resample Requested? (check one) ( ) Yes (X) No
Analyses Submitted: Turbidity___; Inorganic X ; Trihalomethane Volatile Organic X ; Organic Chemical X ; Secondary Chemical X ; Radiological X ; Unregulated Organic Purgeable__; Unregulated Organic Pesticide__; Unregulated Base Neutral Extractable__; Unregulated Acid Extractable__; (Check all analyses which apply).

I HEREBY CERTIFY that all data submitted are correct.

Signature Rebecca Elliott
Name Rebecca Elliott
Title Director of Operations
Laboratory McGinnes Laboratories
Date 06/01/92

Mail Results to the appropriate DER or ACPHU Office.

DER/ACPHU Reviewing Official

____

Sample Interpretation (check one)
( ) Satisfactory ( ) Unsatisfactory

Effective 06/01/89

PAUL R. MCGINNES AND ASSOC
CONSULTING LABORATORIES, INC.
4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

9205043-01A
Report Date: 06/01/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: HERSHEL SCOTT

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #1E
ECR II PRIMARY INORGANICS (PWS030)

Date Received: 05/06/92
Date Collected: 05/05/92 16:20:00

Water sample collected by M. Ezerski of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
1005	Total Arsenic, As	01A	<0.002	mg/L	EPA 206.2	0.002	05/13/92	RAC
1010	Total Barium, Ba	01A	<0.02	mg/L	EPA 208.2	0.02	05/14/92	RAC
1015	Total Cadmium, Cd	01A	<0.005	mg/L	EPA 213.2	0.005	05/12/92	GDP
1020	Total Chromium, Cr	01A	<0.005	mg/L	EPA 218.2	0.005	05/13/92	RAC
1025	Fluoride, F-	01A	0.08	mg/L	EPA 340.2	0.02	05/07/92	LNJ
1030	Total Lead, Pb	01A	<0.002	mg/L	EPA 239.2	0.002	05/15/92	RAC
1035	Total Mercury, Hg	01A	<0.001	mg/L	EPA 245.1	0.001	05/08/92	GDP
1040	Nitrate, N	01A	0.1	mg/L	EPA 352.1	0.1	05/06/92	ELM
1045	Total Selenium, Se	01A	<0.005	mg/L	EPA 270.2	0.005	05/14/92	RAC
1050	Total Silver, Ag	01A	<0.01	mg/L	EPA 272.1	0.01	05/12/92	GDP
1052	Sodium, Na	01A	36.1	mg/L	EPA 273.1	0.5	05/15/92	GDP
	Nitrite, N	01A	<0.01	mg/L	EPA 354.1	0.01	05/06/92	ELM

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

K Jackson
Department Manager(s)

Thomas Colgan
Project Manager.

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

9205043-01B
Report Date: 06/01/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: HERSHEL SCOTT

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #1E
FAC 17-550 SECONDARY INORGANICS (PWS031)

Date Received: 05/06/92
Date Collected: 05/05/92 16:20:00

Water sample collected by M. Ezerski of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
1016	Calcium, Ca	01B	100	mg/L	EPA 215.1	1	05/15/92	GDP
1017	Chloride, Cl-	01B	56	mg/L	EPA 325.3	4	05/07/92	CEB
1022	Total Copper, Cu	01B	<0.01	mg/L	EPA 220.2	0.01	05/11/92	GDP
1025	Fluoride, F-	01B	0.08	mg/L	EPA 340.2	0.02	05/07/92	LNJ
1028	Total Iron, Fe	01B	0.23	mg/L	EPA 236.1	0.01	05/08/92	GDP
1032	Total Manganese, Mn	01B	<0.005	mg/L	EPA 243.1	0.005	05/18/92	GDP
1055	Sulfate, SO4	01B	6	mg/L	EPA 375.4	2	05/13/92	CEB
1095	Total Zinc, Zn	01B	0.020	mg/L	EPA 289.1	0.005	05/11/92	GDP
1901	Carbon Dioxide(nomograph)	01B	30.0	mg/L	CALC.	0.5	05/15/92	LNJ
1905	Color, APHA	01B	35	units	EPA 110.2	1	05/07/92	JYD
1920	Total Odor Number	01B	1	T.O.N.	EPA 140.1	1	05/06/92	JYD
1924	pH	01B	7.02	units	EPA 150.1	---	05/05/92	MAE
1926	Conductivity @ 25 Deg.C	01B	710	uhmos/cm	EPA 120.1	10	05/05/92	MAE
1927	Total Alkalinity, CaCO3	01B	260	mg/L	EPA 310.1	4	05/06/92	CEB
1930	Total Dissolved Solids	01B	431	mg/L	EPA 160.1	1	05/13/92	JYD
1996	Temperature	01B	25.2	deg. C	EPA 170.1	---	05/05/92	MAE
1997	pHs	01B	6.98	units	CALC	---	05/26/92	TPC
2909	Foaming Agents, MBAS	01B	0.03	mg/L	EPA 425.1	0.02	05/06/92	LNJ
9996	Dissolved Oxygen, O2	01B	2.2	mg/L	EPA 360.1	0.1	05/05/92	MAE
	Corrosivity, L.I.	01B	0.04	L.I.	CALC.	---	05/26/92	TPC
	Calcium Hardness, CaCO3	01B	250	mg/L	CALC	2	05/15/92	GDP

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

Department Manager(s)

Project Manager

CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

9205043-01C
Report Date: 06/01/92

Attn: HERSHEL SCOTT

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #1E
COMMENT: Radiological analysis for Gross Alpha was performed by Controls for Environmental Pollution, DHRS #87239.

Date Received: 05/06/92
Date Collected: 05/05/92 16:20:00

Water sample collected by M. Ezerski of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
4000	Gross Alpha (PWS033)	01C	< 2	pCi/L	EPA 900	2	05/21/92	CEP

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

Controls for Environmental Pollution
Department Manager(s)

Project Manager

PAUL R. MCGINNES AND ASSOC.
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

June 1, 1992

Client: MEREDITH CORPORATION
Attn: Hershel Scott
2911 West Washington Street
Orlando, FL 32805

Sample: Water sample received in lab on 05/07/92. Collected on 05/05/92 by Margaret Ezerski of McGinnes Laboratories.

Job No. 92-05-043

Project: VILLAGE OF PALM SPRINGS
RAW WELL #1E

Analysis: FAC 17-550 VOC CHEMICALS

PARAM. ID	VOC CHEMICALS	SAMPLE NUMBER	RESULT	METHOD	DL	DATE/ TECH
2946	Ethylene Dibromide, ppm	01D	<0.00001	504	0.00001	05/11 HLW
2969	p-Dichlorobenzene, ppm	01D	<0.010	524	0.010	05/14 HLW
2976	Vinyl Chloride, ppm	01D	<0.001	524	0.001	05/14 HLW
2977	1,1-Dichloroethene, ppm	01D	<0.005	524	0.005	05/14 HLW
2980	1,2-Dichloroethane, ppm	01D	<0.003	524	0.003	05/14 HLW
2981	1,1,1 Trichloroethane, ppm	01D	<0.010	524	0.010	05/14 HLW
2982	Carbon Tetrachloride, ppm	01D	<0.003	524	0.003	05/14 HLW
2984	Trichlorothene, ppm	01D	<0.003	524	0.003	05/14 HLW
2987	Tetrachloroethene, ppm	01D	<0.003	524	0.003	05/14 HLW
2990	Benzene, ppm	01D	<0.001	524	0.001	05/14 HLW

Methods: All analyses performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. EPA Methods 504 and 524.2.

Department Manager(s)

Project Manager
DHRS Lab ID No. 86140/E86070

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

9205043-01E
Report Date: 06/01/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: HERSHEL SCOTT

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #1E
FAC 17-550 PRIMARY ORGANICS (PWS029)
COMMENT: Analysis of EPA Method 505 compounds was performed by Broward Testing Labs, DHRS #86137.

Date Received: 05/06/92
Date Collected: 05/07/92 08:25:00

Water sample collected by M. Ezerski of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
2005	Endrin	01E	<.0001	mg/L	EPA 505	0.0001	05/15/92	BTL
2010	Lindane	01E	<0.004	mg/L	EPA 505	0.004	05/15/92	BTL
2015	Methoxychlor	01E	<0.05	mg/L	EPA 505	0.05	05/15/92	BTL
2020	Toxaphene	01E	<0.005	mg/L	EPA 505	0.005	05/15/92	BTL
2105	2,4-D	01E	<0.002	mg/L	EPA 515	0.002	05/19/92	ROM
2110	2,4,5-TP (Silvex)	01E	<0.001	mg/L	EPA 515	0.001	05/19/92	ROM

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

Department Manager(s)

Project Manager

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

PUBLIC WATER SYSTEM INFORMATION
Public Water System I.D. Number: 4501058
Public Water System Name: Village of Palm Springs WTP
Public Water System Type:
(X) Community ( ) Non-Community ( ) Non-Transient Non-Community

LABORATORY CERTIFICATION INFORMATION
Lab Certification Number: 86140
Parameter Groups Analyzed: Turbidity, Inorganic, Volatile Organic, Organic, Secondary Chemical, and Radiological
Subcontracted Lab Certification Number (if any): 86137, 87239

SAMPLE INFORMATION
Sample Collection Date (MM/DD/YY): 07/01/92
Laboratory Sample Number: 92-07-013
Sample Location (be specific): Well #2E
Sample Type (check all applicable)

( ) Check ( ) Regular Distribution ( ) Composite
( ) Clearance ( ) Maximum Residence ( ) Plant Tap
(X) Raw (X) Well ( ) Resample
( ) Special ______________________

Sampler Name, Title, Phone: Kathy Stewart, Field Technician
(407) 842-2849

ANALYSIS INFORMATION
Extraction Date (MM/DD/YY):
Laboratory Contact: Thomas Colgan
Resample Requested? (check one) ( ) Yes (X) No
Analyses Submitted: Turbidity X ; Inorganic X ; Trihalomethane Volatile Organic X ; Organic Chemical X ; Secondary Chemical X ; Radiological X ; Unregulated Organic Purgeable__; Unregulated Organic Pesticide__; Unregulated Base Neutral Extractable__; Unregulated Acid Extractable__; (Check all analyses which apply).

I HEREBY CERTIFY that all data submitted are correct.

Signature ______________________
Name Rebecca Elliott
Title Director of Operations
Laboratory McGinnes Laboratories
Date 07/27/92

Mail Results to the appropriate DER or ACPHU Office.

DER/ACPHU Reviewing Official

____

Sample Interpretation (check one)
( ) Satisfactory ( ) Unsatisfactory

Effective 06/01/89

PAUL K. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.
4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

9207013-01A
Report Date: 07/27/92

Attn: ED ST. ONGE

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #2E
ECR II PRIMARY INORGANICS (PWS030)

Date Received: 07/01/92
Date Collected: 07/01/92 14:15:00

Water sample collected by K. Stewart of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
1005	Total Arsenic, As	01A	<0.002	mg/L	EPA 206.2	0.002	07/10/92	JHW
1010	Total Barium, Ba	01A	<0.02	mg/L	EPA 208.2	0.02	07/10/92	JHW
1015	Total Cadmium, Cd	01A	<0.005	mg/L	EPA 213.1	0.005	07/09/92	GDP
1020	Total Chromium, Cr	01A	<0.005	mg/L	EPA 218.2	0.005	07/10/92	JHW
1025	Fluoride, F-	01A	0.19	mg/L	EPA 340.2	0.02	07/07/92	LNJ
1030	Total Lead, Pb	01A	<0.002	mg/L	EPA 239.2	0.002	07/13/92	JHW
1035	Total Mercury, Hg	01A	<0.001	mg/L	SW 7470	0.001	07/15/92	GDP
1040	Nitrate, N	01A	< 0.1	mg/L	EPA 352.1	0.1	07/02/92	ELM
1045	Total Selenium, Se	01A	<0.005	mg/L	EPA 270.2	0.005	07/10/92	JHW
1050	Total Silver, Ag	01A	<0.01	mg/L	EPA 272.1	0.01	07/10/92	GDP
1052	Sodium, Na	01A	28.6	mg/L	EPA 273.1	0.5	07/08/92	GDP
	Nitrite, N	01A	<0.01	mg/L	EPA 354.1	0.01	07/02/92	ELM

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

Department Manager(s)

Thomas Colgan
Project Manager

Paul R. McGinnes and Associates
Consulting Laboratories, Inc.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

9207013-01B
Report Date: 07/27/92

Attn: ED ST. ONGE

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #2E
FAC 17-550 PRIMARY ORGANICS (PWS029)
COMMENT: EPA Method 505 compounds were analyzed by Broward Testing Laboratory, DHRS #86137.

Date Received: 07/01/92
Date Collected: 07/01/92 14:15:00

Water sample collected by K. Stewart of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
2005	Endrin	01B	<.0001	mg/L	EPA 505	0.0001	07/13/92	BTL
2010	Lindane	01B	<0.004	mg/L	EPA 505	0.004	07/13/92	BTL
2015	Methoxychlor	01B	<0.05	mg/L	EPA 505	0.05	07/13/92	BTL
2020	Toxaphene	01B	<0.005	mg/L	EPA 505	0.005	07/13/92	BTL
2105	2,4-D	01B	<0.002	mg/L	EPA 515	0.002	07/10/92	ROM
2110	2,4,5-TP (Silvex)	01B	<0.001	mg/L	EPA 515	0.001	07/10/92	ROM

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

Department Manager(s)

Thomas Colgan
Project Manager

PAUL R. MCGINNES AND ASSOCIATES CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

9207013-01C
Report Date: 07/27/92

Attn: ED ST. ONGE

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #2E
FAC 17-550 SECONDARY INORGANICS (PWS031)

Date Received: 07/01/92
Date Collected: 07/01/92 14:15:00

Water sample collected by K. Stewart of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
1016	Calcium, Ca	01C	102	mg/L	EPA 215.1	1	07/08/92	GDP
1017	Chloride, Cl-	01C	47	mg/L	EPA 325.3	4	07/06/92	CEB
1022	Total Copper, Cu	01C	<0.01	mg/L	EPA 220.2	0.01	07/09/92	GDP
1025	Fluoride, F-	01C	0.19	mg/L	EPA 340.2	0.02	07/07/92	LNJ
1028	Total Iron, Fe	01C	0.13	mg/L	EPA 236.1	0.01	07/08/92	GDP
1032	Total Manganese, Mn	01C	<0.005	mg/L	EPA 243.1	0.005	07/09/92	GDP
1055	Sulfate, SO4	01C	5	mg/L	EPA 375.4	2	07/10/92	CEB
1095	Total Zinc, Zn	01C	<0.005	mg/L	EPA 289.1	0.005	07/09/92	GDP
1901	Carbon Dioxide(nomograph)	01C	36	mg/L	CALC.	1	07/08/92	LNJ
1905	Color, APHA	01C	31	units	EPA 110.2	1	07/01/92	JYD
1920	Total Odor Number	01C	12	T.O.N.	EPA 140.1	1	07/01/92	JYD
1924	pH	01C	7.14	units	EPA 150.1	---	07/01/92	KRS
1926	Conductivity @ 25 Deg.C	01C	750	umhos/cm	EPA 120.1	10	07/01/92	KRS
1927	Total Alkalinity, CaCO3	01C	283	mg/L	EPA 310.1	4	07/02/92	CEB
1930	Total Dissolved Solids	01C	437	mg/L	EPA 160.1	1	07/02/92	JYD
1996	Temperature	01C	28.3	deg. C	EPA 170.1	---	07/01/92	KRS
1997	pHs	01C	6.88	units	CALC	---	07/17/92	TPC
2909	Foaming Agents, MBAS	01C	0.07	mg/L	EPA 425.1	0.05	07/02/92	LNJ
9996	Dissolved Oxygen, O2	01C	5.6	mg/L	EPA 360.1	0.1	07/01/92	KRS
	Corrosivity, L.I.	01C	0.26	L.I.	CALC.	---	07/17/92	TPC
	Calcium Hardness, CaCO3	01C	255	mg/L	CALC	2	07/08/92	GDP

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

K Baker
Department Manager(s)

Thomas Colgan
Project Manager

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

9207013-01D
Report Date: 07/27/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: ED ST. ONGE

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #2E
FAC 17-550 PRIMARY INORGANICS -
SODIUM & TURBIDITY ONLY (PWS030 & PWS026)

Date Received: 07/01/92
Date Collected: 07/01/92 14:15:00

Water sample collected by K. Stewart of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
0100	Turbidity	01D	0.63	N.T.U.	EPA 180.1	0.01	07/02/92	CEB
1052	Sodium, Na	01D	28.6	mg/L	EPA 273.1	0.5	07/08/92	GDP

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

Department Manager(s)

Thomas Colgan
Project Manager

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

July 27, 1992

Client: MEREDITH CORPORATION
Attn: Ed St. Onge
2911 West Washington Street
Orlando, FL 32805

Sample: Water sample received in lab on 07/01/92. Collected on 07/01/92 by Kathy Stewart of McGinnes Laboratories.

Project: VILLAGE OF PALM SPRINGS WTP
WELL #2E

Job No. 92-07-013

Analysis: FAC 17-550 VOC CHEMICALS

PARAM. ID	VOC CHEMICALS	SAMPLE NUMBER	RESULT	METHOD	DL	DATE/ TECH
2946	Ethylene Dibromide, ppm	01E	<0.00001	504	0.00001	07/07 HLW
2969	p-Dichlorobenzene, ppm	01E	<0.010	524	0.010	07/06 HLW
2976	Vinyl Chloride, ppm	01E	<0.001	524	0.001	07/06 HLW
2977	1,1-Dichloroethene, ppm	01E	<0.005	524	0.005	07/06 HLW
2980	1,2-Dichloroethane, ppm	01E	<0.003	524	0.003	07/06 HLW
2981	1,1,1 Trichloroethane, ppm	01E	<0.010	524	0.010	07/06 HLW
2982	Carbon Tetrachloride, ppm	01E	<0.003	524	0.003	07/06 HLW
2984	Trichlorothene, ppm	01E	<0.003	524	0.003	07/06 HLW
2987	Tetrachloroethene, ppm	01E	<0.003	524	0.003	07/06 HLW
2990	Benzene, ppm	01E	<0.001	524	0.001	07/06 HLW

Methods: All analyses performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. EPA Methods 504 and 524.2.

Kathryn D Gamble
Department Manager

Thomas Colgan
Project Manager
DHRS Lab ID No. 86140/E86070

PAUL R. MCGINNES AND ASSOCIATES CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

9207013-01F
Report Date: 07/27/92

Attn: ED ST. ONGE

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #2E

Date Received: 07/01/92
Date Collected: 07/01/92 14:15:00

Water sample collected by K. Stewart of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
4000	Gross Alpha (PWS033)	01F	3 ± 2	pCi/L	EPA 900	2	07/20/92	CEP

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

Controls for Environmental Pollution
Department Manager(s)

Thomas Colgan
Project Manager

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.
4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

PUBLIC WATER SYSTEM INFORMATION
Public Water System I.D. Number: 4501058
Public Water System Name: Village of Palm Springs WTP
Public Water System Type:
(X) Community ( ) Non-Community ( ) Non-Transient Non-Community

LABORATORY CERTIFICATION INFORMATION
Lab Certification Number: 86140
Parameter Groups Analyzed: Inorganic, Volatile Organic, Organic & Secondary Chemical and Radiological
Subcontracted Lab Certification Number (if any): 86137, 87239

SAMPLE INFORMATION
Sample Collection Date (MM/DD/YY): 05/05/92
Laboratory Sample Number: 92-05-043
Sample Location (be specific): Well #1E and Well #3E
Sample Type (check all applicable)

( ) Check
( ) Clearance
(X) Raw
( ) Special ______
( ) Regular Distribution
( ) Maximum Residence
(X) Well
( ) Composite
( ) Plant Tap
( ) Resample

Sampler Name, Title, Phone: Margaret Ezerski, Field Technician
(407) 842-2849

ANALYSIS INFORMATION
Extraction Date (MM/DD/YY): 05/11/92
Laboratory Contact: Thomas Colgan
Resample Requested? (check one) ( ) Yes (X) No
Analyses Submitted: Turbidity___; Inorganic X ; Trihalomethane Volatile Organic X ; Organic Chemical X ; Secondary Chemical X ; Radiological X ; Unregulated Organic Purgeable__; Unregulated Organic Pesticide__; Unregulated Base Neutral Extractable__; Unregulated Acid Extractable__; (Check all analyses which apply).

I HEREBY CERTIFY that all data submitted are correct.

Signature Rebecca Elliott
Name Rebecca Elliott
Title Director of Operations
Laboratory McGinnes Laboratories
Date 06/01/92

Mail Results to the appropriate DER or ACPHU Office.

DER/ACPHU Reviewing Official

____

Sample Interpretation (check one)
( ) Satisfactory ( ) Unsatisfactory

Effective 06/01/89

PAUL R. McGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

9205043-02A
Report Date: 06/01/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: HERSHEL SCOTT

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #3E
ECR II PRIMARY INORGANICS (PWS030)

Date Received: 05/06/92
Date Collected: 05/05/92 15:50:00

Water sample collected by M. Ezerski of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
1005	Total Arsenic, As	02A	<0.002	mg/L	EPA 206.2	0.002	05/13/92	RAC
1010	Total Barium, Ba	02A	<0.02	mg/L	EPA 208.2	0.02	05/14/92	RAC
1015	Total Cadmium, Cd	02A	<0.005	mg/L	EPA 213.2	0.005	05/12/92	GDP
1020	Total Chromium, Cr	02A	<0.005	mg/L	EPA 218.2	0.005	05/13/92	RAC
1025	Fluoride, F-	02A	0.07	mg/L	EPA 340.2	0.02	05/07/92	LNJ
1030	Total Lead, Pb	02A	<0.002	mg/L	EPA 239.2	0.002	05/15/92	RAC
1035	Total Mercury, Hg	02A	<0.001	mg/L	EPA 245.1	0.001	05/08/92	GDP
1040	Nitrate, N	02A	< 0.1	mg/L	EPA 352.1	0.1	05/06/92	ELM
1045	Total Selenium, Se	02A	<0.005	mg/L	EPA 270.2	0.005	05/14/92	RAC
1050	Total Silver, Ag	02A	<0.01	mg/L	EPA 272.1	0.01	05/12/92	GDP
1052	Sodium, Na	02A	35.1	mg/L	EPA 273.1	0.5	05/15/92	GDP
	Nitrite, N	02A	<0.01	mg/L	EPA 354.1	0.01	05/06/92	ELM

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

Department Manager(s)

Project Manager

PAUL R. McGINNES AND ASSOC.
CONSULTING LABORATORIES, INC.
4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

9205043-02B
Report Date: 06/01/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: HERSHEL SCOTT

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #3E
FAC 17-550 SECONDARY INORGANICS (PWS031)

Date Received: 05/06/92
Date Collected: 05/05/92 15:50:00

Water sample collected by M. Ezerski of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
1016	Calcium, Ca	02B	98	mg/L	EPA 215.1	1	05/15/92	GDP
1017	Chloride, Cl-	02B	52	mg/L	EPA 325.3	4	05/07/92	CEB
1022	Total Copper, Cu	02B	<0.01	mg/L	EPA 220.2	0.01	05/11/92	GDP
1025	Fluoride, F-	02B	0.07	mg/L	EPA 340.2	0.02	05/07/92	LNJ
1028	Total Iron, Fe	02B	<0.01	mg/L	EPA 236.1	0.01	05/08/92	GDP
1032	Total Manganese, Mn	02B	<0.005	mg/L	EPA 243.1	0.005	05/18/92	GDP
1055	Sulfate, SO4	02B	6	mg/L	EPA 375.4	2	05/13/92	CEB
1095	Total Zinc, Zn	02B	<0.005	mg/L	EPA 289.1	0.005	05/11/92	GDP
1901	Carbon Dioxide(nomograph)	02B	48.0	mg/L	CALC.	0.5	05/15/92	LNJ
1905	Color, APHA	02B	30	units	EPA 110.2	1	05/07/92	JYD
1920	Total Odor Number	02B	1	T.O.N.	EPA 140.1	1	05/06/92	JYD
1924	pH	02B	6.95	units	EPA 150.1	---	05/05/92	MAE
1926	Conductivity @ 25 Deg.C	02B	690	uhmos/cm	EPA 120.1	10	05/05/92	MAE
1927	Total Alkalinity, CaCO3	02B	258	mg/L	EPA 310.1	4	05/06/92	CEB
1930	Total Dissolved Solids	02B	415	mg/L	EPA 160.1	1	05/13/92	JYD
1996	Temperature	02B	25.0	deg. C	EPA 170.1	---	05/05/92	MAE
1997	pHs	02B	6.99	units	CALC	---	05/26/92	TPC
2909	Foaming Agents, MBAS	02B	0.02	mg/L	EPA 425.1	0.02	05/06/92	LNJ
9996	Dissolved Oxygen, O2	02B	4.2	mg/L	EPA 360.1	0.1	05/05/92	MAE
	Corrosivity, L.I.	02B	-0.04	L.I.	CALC.	---	05/26/92	TPC
	Calcium Hardness, CaCO3	02B	245	mg/L	CALC	2	05/15/92	GDP

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

Department Manager(s)

Project Manager

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

9205043-02C
Report Date: 06/01/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: HERSHEL SCOTT

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #3E
COMMENT: Radiological analysis for Gross Alpha was performed by Controls for Environmental Pollution, DHRS #87239.

Date Received: 05/06/92
Date Collected: 05/05/92 15:50:00

Water sample collected by M. Ezerski of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
4000	Gross Alpha (PWS033)	02C	< 2	pCi/L	EPA 900	2	05/21/92	CEP

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

Controls for
Environmental Pollution
Department Manager(s)

Project Manager

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

June 1, 1992

Client: MEREDITH CORPORATION
Attn: Hershel Scott
2911 West Washington Street
Orlando, FL 32805

Sample: Water sample received in lab on 05/07/92. Collected on 05/05/92 by Margaret Ezerski of McGinnes Laboratories.

Job No. 92-05-04

Project: VILLAGE OF PALM SPRINGS
RAW WELL #3E

Analysis: **FAC 17-550 VOC CHEMICALS**

PARAM. ID	VOC CHEMICALS	SAMPLE NUMBER	RESULT	METHOD	DL	DATE/ TECH
2946	Ethylene Dibromide, ppm	02D	<0.00001	504	0.00001	05/11 HLW
2969	p-Dichlorobenzene, ppm	02D	<0.010	524	0.010	05/14 HLW
2976	Vinyl Chloride, ppm	02D	<0.001	524	0.001	05/14 HLW
2977	1,1-Dichloroethene, ppm	02D	<0.005	524	0.005	05/14 HLW
2980	1,2-Dichloroethane, ppm	02D	<0.003	524	0.003	05/14 HLW
2981	1,1,1 Trichloroethane, ppm	02D	<0.010	524	0.010	05/14 HLW
2982	Carbon Tetrachloride, ppm	02D	<0.003	524	0.003	05/14 HLW
2984	Trichlorothene, ppm	02D	<0.003	524	0.003	05/14 HLW
2987	Tetrachloroethene, ppm	02D	<0.003	524	0.003	05/14 HLW
2990	Benzene, ppm	02D	<0.001	524	0.001	05/14 HLW

Methods: All analyses performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. EPA Methods 504 and 524.2.

Department Manager(s)

Project Manager
DHRS Lab ID No. 86140/E86070

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

9205043-02E
Report Date: 06/01/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: HERSHEL SCOTT

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #3E
FAC 17-550 PRIMARY ORGANICS (PWS029)
COMMENT: Analysis of EPA Method 505 compounds was performed by Broward Testing Labs, DHRS #86137.

Date Received: 05/06/92
Date Collected: 05/07/92 08:35:00

Water sample collected by M. Ezerski of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
2005	Endrin	02E	<.0001	mg/L	EPA 505	0.0001	05/15/92	BTL
2010	Lindane	02E	<0.004	mg/L	EPA 505	0.004	05/15/92	BTL
2015	Methoxychlor	02E	<0.05	mg/L	EPA 505	0.05	05/15/92	BTL
2020	Toxaphene	02E	<0.005	mg/L	EPA 505	0.005	05/15/92	BTL
2105	2,4-D	02E	<0.002	mg/L	EPA 515	0.002	05/19/92	ROM
2110	2,4,5-TP (Silvex)	02E	<0.001	mg/L	EPA 515	0.001	05/19/92	ROM

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

Department Manager(s)

Project Manager

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.
4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

PUBLIC WATER SYSTEM INFORMATION
Public Water System I.D. Number: 4501058
Public Water System Name: Village of Palm Springs WTP
Public Water System Type:
(X) Community ( ) Non-Community ( ) Non-Transient Non-Community

LABORATORY CERTIFICATION INFORMATION
Lab Certification Number: 86140
Parameter Groups Analyzed: Turbidity, Inorganic Volatile Organic, Organic, Secondary Chemical and Radiological
Subcontracted Lab Certification Number (if any): 86137, 87239

SAMPLE INFORMATION
Sample Collection Date (MM/DD/YY): 06/16/92
Laboratory Sample Number: 92-06-168
Sample Location (be specific): Well #4E
Sample Type (check all applicable)
( ) Check ( ) Regular Distribution ( ) Composite
( ) Clearance ( ) Maximum Residence ( ) Plant Tap
(X) Raw (X) Well ( ) Resample
( ) Special ____________
Sampler Name, Title, Phone: Thomas Colgan, Utility Coordinator (407) 842-2849

ANALYSIS INFORMATION
Extraction Date (MM/DD/YY): 06/23/92
Laboratory Contact: Thomas Colgan
Resample Requested? (check one) ( ) Yes (X) No
Analyses Submitted: Turbidity X ; Inorganic X ; Trihalomethane Volatile Organic X ; Organic Chemical x ; Secondary Chemical X ; Radiological X ; Unregulated Organic Purgeable__; Unregulated Organic Pesticide__; Unregulated Base Neutral Extractable__; Unregulated Acid Extractable__; (Check all analyses which apply).

I HEREBY CERTIFY that all data submitted are correct.

Signature ____________
Name Rebecca Elliott
Title Director of Operations
Laboratory McGinnes Laboratories
Date 07/21/92

Mail Results to the appropriate DER or ACPHU Office.

DER/ACPHU Reviewing Official

____

Sample Interpretation (check one)
( ) Satisfactory ( ) Unsatisfactory

Effective 06/01/89

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

9206168-01A
Report Date: 07/21/92

Attn: HERSHEL SCOTT

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #4E
ECR II PRIMARY INORGANICS (PWS030)

Date Received: 06/16/92
Date Collected: 06/16/92 12:25:00

Water sample collected by T. Colgan of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
1005	Total Arsenic, As	01A	<0.002	mg/L	EPA 206.2	0.002	06/23/92	GDP
1010	Total Barium, Ba	01A	<0.02	mg/L	EPA 208.2	0.02	06/17/92	RAC
1015	Total Cadmium, Cd	01A	<0.005	mg/L	EPA 213.2	0.005	06/17/92	GDP
1020	Total Chromium, Cr	01A	<0.005	mg/L	EPA 218.2	0.005	06/18/92	RAC
1025	Fluoride, F-	01A	0.47	mg/L	EPA 340.2	0.02	06/19/92	LNJ
1030	Total Lead, Pb	01A	<0.002	mg/L	EPA 239.2	0.002	06/17/92	GDP
1035	Total Mercury, Hg	01A	<0.001	mg/L	SW 7470	0.001	06/19/92	GDP
1040	Nitrate, N	01A	0.2	mg/L	EPA 352.1	0.1	06/17/92	ELM
1045	Total Selenium, Se	01A	<0.005	mg/L	EPA 270.2	0.005	06/17/92	RAC
1050	Total Silver, Ag	01A	<0.01	mg/L	EPA 272.1	0.01	06/17/92	GDP
1052	Sodium, Na	01A	36.2	mg/L	EPA 273.1	0.5	06/22/92	GDP
	Nitrite, N	01A	<0.01	mg/L	EPA 354.1	0.01	06/16/92	ELM

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

L Jackson
Department Manager(s)

Thomas Colgan
Project Manager

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

9206168-01B
Report Date: 07/24/92

Attn: HERSHEL SCOTT

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #4E
FAC 17-550 PRIMARY ORGANICS (PWS029)
COMMENT: The sample for analysis of EPA Method 515 compounds was resampled on 07/02/92.

Date Received: 06/16/92
Date Collected: 06/16/92 12:25:00

Water sample collected by T. Colgan of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
2005	Endrin	01B	<.0001	mg/L	SM 509A	0.0001	06/26/92	BTL
2010	Lindane	01B	<0.004	mg/L	SM 509A	0.004	06/26/92	BTL
2015	Methoxychlor	01B	<0.05	mg/L	SM 509A	0.05	06/26/92	BTL
2020	Toxaphene	01B	<0.005	mg/L	SM 509A	0.005	06/26/92	BTL
2105	2,4-D	01B	<0.002	mg/L	EPA 515	0.002	07/10/92	ROM
2110	2,4,5-TP (Silvex)	01B	<0.001	mg/L	EPA 515	0.001	07/10/92	ROM

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

L Jackson
Department Manager(s)

Thomas Colgan
Project Manager

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

9206168-01C
Report Date: 07/21/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: HERSHEL SCOTT

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #4E
FAC 17-550 SECONDARY INORGANICS (PWS031)

Date Received: 06/16/92
Date Collected: 06/16/92 12:25:00

Water sample collected by T. Colgan of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
1016	Calcium, Ca	01C	104	mg/L	EPA 215.1	1	06/22/92	GDP
1017	Chloride, Cl-	01C	63	mg/L	EPA 325.3	4	06/18/92	CEB
1022	Total Copper, Cu	01C	<0.01	mg/L	EPA 220.2	0.01	06/25/92	GDP
1025	Fluoride, F-	01C	0.47	mg/L	EPA 340.2	0.02	06/19/92	LNJ
1028	Total Iron, Fe	01C	0.06	mg/L	EPA 236.1	0.01	06/17/92	GDP
1032	Total Manganese, Mn	01C	<0.005	mg/L	EPA 243.1	0.005	06/25/92	GDP
1055	Sulfate, SO4	01C	4	mg/L	EPA 375.4	2	06/16/92	CEB
1095	Total Zinc, Zn	01C	<0.005	mg/L	EPA 289.2	0.005	06/25/92	GDP
1901	Carbon Dioxide(nomograph)	01C	27	mg/L	CALC.	1	06/22/92	LNJ
1905	Color, APHA	01C	32	units	EPA 110.2	1	06/16/92	JYD
1920	Total Odor Number	01C	5	T.O.N.	EPA 140.1	1	06/16/92	JYD
1925	pH	01C	7.21	units	EPA 9040	---	06/16/92	LJH
1926	Conductivity @ 25 Deg. C	01C	660	umhos/cm	EPA 120.1	10	06/16/92	LJH
1927	Total Alkalinity, CaCO3	01C	267	mg/L	EPA 310.1	4	06/17/92	CEB
1930	Total Dissolved Solids	01C	429	mg/L	EPA 160.1	1	06/18/92	JYD
1996	Temperature	01C	25.0	deg. C	EPA 170.1	---	06/16/92	TPC
1997	pHs	01C	6.95	units	CALC	---	07/01/92	TPC
2909	Foaming Agents, MBAS	01C	0.04	mg/L	EPA 425.1	0.02	06/18/92	LNJ
9996	Dissolved Oxygen, O2	01C	3.3	mg/L	EPA 360.1	0.1	06/16/92	TPC
	Corrosivity, L.I.	01C	0.26	L.I.	CALC.	---	07/01/92	TPC
	Calcium Hardness, CaCO3	01C	260	mg/L	CALC	2	06/22/92	GDP

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

L Jackson
Department Manager(s)

Thomas Colgan
Project Manager

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

9207040-01A
Report Date: 07/24/92

Attn: ED ST. ONGE

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #4E

Date Received: 07/02/92
Date Collected: 07/02/92

Water sample collected by K. Stewart of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
2105	2,4-D	01A	<0.002	mg/L	EPA 515	0.002	07/10/92	ROM
2110	2,4,5-TP (Silvex)	01A	<0.001	mg/L	EPA 515	0.001	07/10/92	ROM

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

K. J. Gamble
Department Manager(s)

Thomas Colgan
Project Manager

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

9206168-01F
Report Date: 07/21/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: HERSHEL SCOTT

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #4E
FAC 17-550 PRIMARY INORGANICS -
SODIUM & TURBIDITY ONLY (PWS030 & PWS026)

Date Received: 06/16/92
Date Collected: 06/16/92 12:25:00

Water sample collected by T. Colgan of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
0100	Turbidity	01F	0.27	N.T.U.	EPA 180.1	0.01	06/16/92	CEB
1052	Sodium, Na	01F	36.2	mg/L	EPA 273.1	0.5	06/22/92	GDP

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

L Jackson
Department Manager(s)

Thomas Colgan
Project Manager

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

9206168-01E
Report Date: 07/21/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: HERSHEL SCOTT

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #4E

Date Received: 06/16/92
Date Collected: 06/16/92 12:25:00

Water sample collected by T. Colgan of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
4000	Gross Alpha (PWS033)	01E	< 2	pCi/L	EPA 900	2	07/07/92	CEP

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

Controls for Environmental Pollution
Department Manager(s)

Thomas Colgan
Project Manager

PAUL R. McGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

July 21, 1992

Client: MEREDITH CORPORATION
Attn: Ed St. Onge
2911 West Washington Street
Orlando, FL 32805

Sample: Water sample received in lab on 06/16/92. Collected on 06/16/92 by Thomas Colgan of McGinnes Laboratories.

Project: VILLAGE OF PALM SPRINGS
WELL #4E

Job No. 92-06-168

Analysis: **FAC 17-550 VOC CHEMICALS**

PARAM. ID	VOC CHEMICALS	SAMPLE NUMBER	RESULT	METHOD	DL	DATE/ TECH
2946	Ethylene Dibromide, ppm	01D	<0.00001	504	0.00001	06/17 HLW
2969	p-Dichlorobenzene, ppm	01D	<0.010	524	0.010	06/22 HLW
2976	Vinyl Chloride, ppm	01D	<0.001	524	0.001	06/22 HLW
2977	1,1-Dichloroethene, ppm	01D	<0.005	524	0.005	06/22 HLW
2980	1,2-Dichloroethane, ppm	01D	<0.003	524	0.003	06/22 HLW
2981	1,1,1 Trichloroethane, ppm	01D	<0.010	524	0.010	06/22 HLW
2982	Carbon Tetrachloride, ppm	01D	<0.003	524	0.003	06/22 HLW
2984	Trichlorothene, ppm	01D	<0.003	524	0.003	06/22 HLW
2987	Tetrachloroethene, ppm	01D	<0.003	524	0.003	06/22 HLW
2990	Benzene, ppm	01D	<0.001	524	0.001	06/22 HLW

Methods: All analyses performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. EPA Methods 504 and 524.2.

Department Manager

Thomas Colgan
Project Manager
DHRS Lab ID No. 86140/E86070

PAUL R. McGINNES ...
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

9208134-01A
Report Date: 09/09/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: ED ST. ONGE

Project ID: VILLAGE OF PALM SPRINGS WTP
Sample ID: RAW WELL #11E
ECR II PRIMARY INORGANICS (PWS030)

Date Received: 08/11/92
Date Collected: 08/11/92 15:20:00

Water sample collected by Joyce Thomasson of McGinnes Laboratories using laboratory-supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
1005	Total Arsenic, As	01A	<0.002	mg/L	EPA 206.2	0.002	08/19/92	JHW
1010	Total Barium, Ba	01A	<0.02	mg/L	EPA 208.2	0.02	08/18/92	JHW
1015	Total Cadmium, Cd	01A	<0.005	mg/L	EPA 213.1	0.005	08/18/92	RAC
1020	Total Chromium, Cr	01A	<0.005	mg/L	EPA 218.2	0.005	08/17/92	JHW
1025	Fluoride, F-	01A	0.13	mg/L	EPA 340.2	0.02	08/12/92	LNJ
1030	Total Lead, Pb	01A	0.005	mg/L	EPA 239.2	0.002	08/20/92	JHW
1035	Total Mercury, Hg	01A	<0.001	mg/L	SW 7470	0.001	08/18/92	RAC
1040	Nitrate, N	01A	< 0.1	mg/L	EPA 352.1	0.1	08/13/92	ELM
1045	Total Selenium, Se	01A	<0.005	mg/L	EPA 270.2	0.005	08/19/92	JHW
1050	Total Silver, Ag	01A	<0.01	mg/L	EPA 272.1	0.01	08/17/92	RAC
1052	Sodium, Na	01A	22.0	mg/L	EPA 273.1	0.5	08/21/92	RAC
	Nitrite, N	01A	<0.01	mg/L	EPA 354.1	0.01	08/13/92	ELM

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

L Jackson
Department Manager(s)

Thomas Colgan
Project Manager

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

#HV2

PUBLIC WATER SYSTEM INFORMATION
Public Water System I.D. Number: 4501058
Public Water System Name: Village of Palm Springs WTP
Public Water System Type:
(X) Community ( ) Non-Community ( ) Non-Transient Non-Community

LABORATORY CERTIFICATION INFORMATION
Lab Certification Number: 86140
Parameter Groups Analyzed: Turbidity, Inorganic, Volatile Organic, Organic Chemical, Secondary Chemical and Radiological.
Subcontracted Lab Certification Number (if any): 84172, 86137

INFORMATION
Sample Collection Date (MM/DD/YY): 08/11/92
Laboratory Sample Number: 92-08-134
Sample Location (be specific): Well #11E
Sample Type (check all applicable)
( ) Check
( ) Clearance
(X) Raw
( ) Special ____
( ) Regular Distribution
( ) Maximum Residence
(X) Well
( ) Composite
( ) Plant Tap
( ) Resample
Sampler Name, Title, Phone: Joyce Thomasson, Field Technician (407) 842-2849

ANALYSIS INFORMATION
Extraction Date (MM/DD/YY): 08/14/92
Laboratory Contact: Thomas Colgan
Resample Requested? (check one) ( ) Yes (X) No
Analyses Submitted: Turbidity X ; Inorganic X ; Trihalomethane Volatile Organic X ; Organic Chemical X ; Secondary Chemical X ; Radiological X ; Unregulated Organic Purgeable__; Unregulated Organic Pesticide__; Unregulated Base Neutral Extractable__; Unregulated Acid Extractable__; (Check all analyses which apply).

I HEREBY CERTIFY that all data submitted are correct.

Signature ____
Name Rebecca Elliott
Title Director of Operations
Laboratory McGinnes Laboratories
Date 09/09/92

Mail Results to the appropriate DER or ACPHU Office.

DER/ACPHU Reviewing Official

____

Sample Interpretation (check one)
( ) Satisfactory ( ) Unsatisfactory

Effective 06/01/89

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

9208134-01B
Report Date: 09/09/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: ED ST. ONGE

Project ID: VILLAGE OF PALM SPRINGS WTP
Sample ID: RAW WELL #11E
FAC 17-550 PRIMARY ORGANICS (PWS029)
COMMENT: EPA Method 505 compounds were analyzed by Broward Testing Laboratory, DHRS #86137.

Date Received: 08/11/92
Date Collected: 08/11/92 15:20:00

Water sample collected by Joyce Thomasson of McGinnes Laboratories using laboratory-supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
2005	Endrin	01B	<.0001	mg/L	EPA 505	0.0001	08/22/92	BTL
2010	Lindane	01B	<0.004	mg/L	EPA 505	0.004	08/22/92	BTL
2015	Methoxychlor	01B	<0.05	mg/L	EPA 505	0.05	08/22/92	BTL
2020	Toxaphene	01B	<0.005	mg/L	EPA 505	0.005	08/22/92	BTL
2105	2,4-D	01B	<0.002	mg/L	EPA 515	0.002	08/17/92	ROM
2110	2,4,5-TP (Silvex)	01B	<0.001	mg/L	EPA 515	0.001	08/17/92	ROM

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

K D Gamble
Department Manager(s)

Rhonda Colgan
Project Manager

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

9208134-01C
Report Date: 09/09/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: ED ST. ONGE

Project ID: VILLAGE OF PALM SPRINGS WTP
Sample ID: RAW WELL #11E
FAC 17-550 SECONDARY INORGANICS (PWS031)

Date Received: 08/11/92
Date Collected: 08/11/92 15:20:00

Water sample collected by Joyce Thomasson of McGinnes Laboratories using laboratory-supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
1016	Calcium, Ca	01C	106	mg/L	EPA 215.1	1	08/25/92	RAC
1017	Chloride, Cl-	01C	33	mg/L	EPA 325.3	4	08/12/92	CEB
1022	Total Copper, Cu	01C	<0.01	mg/L	EPA 220.2	0.01	08/26/92	RAC
1025	Fluoride, F-	01C	0.13	mg/L	EPA 340.2	0.02	08/12/92	LNJ
1028	Total Iron, Fe	01C	0.03	mg/L	EPA 236.1	0.01	08/26/92	RAC
1032	Total Manganese, Mn	01C	<0.005	mg/L	EPA 243.1	0.005	08/25/92	RAC
1055	Sulfate, SO4	01C	28	mg/L	EPA 375.4	2	08/19/92	CEB
1095	Total Zinc, Zn	01C	0.018	mg/L	EPA 289.1	0.005	08/25/92	RAC
1901	Carbon Dioxide(nomograph)	01C	45	mg/L	CALC.	1	08/20/92	LNJ
1905	Color, APHA	01C	34	units	EPA 110.2	1	08/12/92	JYD
1920	Total Odor Number	01C	17	T.O.N.	EPA 140.1	1	08/11/92	JYD
1924	pH	01C	7.0	units	EPA 150.1	---	08/11/92	JET
1926	Conductivity @ 25 Deg.C	01C	700	umhos/cm	EPA 120.1	10	08/11/92	JET
1927	Total Alkalinity, CaCO3	01C	255	mg/L	EPA 310.1	4	08/12/92	CEB
1930	Total Dissolved Solids	01C	440	mg/L	EPA 160.1	1	08/18/92	JYD
1996	Temperature	01C	28.5	deg. C	EPA 170.1	---	08/11/92	JET
1997	pHs	01C	6.91	units	CALC	---	08/28/92	TPC
2909	Foaming Agents, MBAS	01C	0.07	mg/L	EPA 425.1	0.02	08/12/92	LNJ
9996	Dissolved Oxygen, O2	01C	5.1	mg/L	EPA 360.1	0.1	08/11/92	JET
	Corrosivity, L.I.	01C	0.09	L.I.	CALC.	---	08/28/92	TPC
	Calcium Hardness, CaCO3	01C	265	mg/L	CALC	2	08/25/92	RAC

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

L Jackson
Department Manager(s)

Thomas Colgan
Project Manager

PAUL R. McGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

9208134-01D
Report Date: 09/09/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: ED ST. ONGE

Project ID: VILLAGE OF PALM SPRINGS WTP
Sample ID: RAW WELL #11E
FAC 17-550 PRIMARY INORGANICS -
SODIUM & TURBIDITY ONLY (PWS030 & PWS026)

Date Received: 08/11/92
Date Collected: 08/11/92 15:20:00

Water sample collected by Joyce Thomasson of McGinnes Laboratories using laboratory-supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
0100	Turbidity	01D	0.24	N.T.U.	EPA 180.1	0.01	08/12/92	CEB
1052	Sodium, Na	01D	22.0	mg/L	EPA 273.1	0.5	08/21/92	RAC

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

L Jackson
Department Manager(s)

Thomas Colgan
Project Manager

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

September 9, 1992

Client: MEREDITH CORPORATION
Attn: Ed St. Onge
2911 West Washington Street
Orlando, FL 32805

Sample: Water sample received in lab on 08/11/92. Collected on 08/11/92 by Joyce Thomasson of McGinnes Laboratories.

Job No. 92-08-134

Project: VILLAGE OF PALM SPRINGS WTP
WELL #11E

Analysis: FAC 17-550 VOC CHEMICALS

PARAM. ID	VOC CHEMICALS	SAMPLE NUMBER	RESULT	METHOD	DL	DATE/ TECH
2946	Ethylene Dibromide, ppm	01E	<0.00001	504	0.00001	08/14 HLW
2969	p-Dichlorobenzene, ppm	01E	<0.010	524	0.010	08/13 KGG
2976	Vinyl Chloride, ppm	01E	<0.001	524	0.001	08/13 KGG
2977	1,1-Dichloroethene, ppm	01E	<0.005	524	0.005	08/13 KGG
2980	1,2-Dichloroethane, ppm	01E	<0.003	524	0.003	08/13 KGG
2981	1,1,1 Trichloroethane, ppm	01E	<0.010	524	0.010	08/13 KGG
2982	Carbon Tetrachloride, ppm	01E	<0.003	524	0.003	08/13 KGG
2984	Trichlorothene, ppm	01E	<0.003	524	0.003	08/13 KGG
2987	Tetrachloroethene, ppm	01E	<0.003	524	0.003	08/13 KGG
2990	Benzene, ppm	01E	<0.001	524	0.001	08/13 KGG

Methods: All analyses performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. EPA Methods 504 and 524.2.

K D Damide
Department Manager

Thomas Colgan
Project Manager
DHRS Lab ID No. 86140/E86070

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

9208134-01F
Report Date: 09/09/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: ED ST. ONGE

Project ID: VILLAGE OF PALM SPRINGS WTP
Sample ID: RAW WELL #11E
COMMENT: Radiological analysis for Gross Alpha was performed by Pembroke Laboratories, DHRS #84172.

Date Received: 08/11/92
Date Collected: 08/11/92 15:20:00

Water sample collected by Joyce Thomasson of McGinnes Laboratories using laboratory-supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
4000	Gross Alpha (PWS033)	01F	<1.±5.	pCi/L	EPA 900	1.0	09/08/92	P.L.

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

Pembroke Laboratories
Department Manager(s)

Thomas Colgan
Project Manager

PAUL R. McGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.
4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

PUBLIC WATER SYSTEM INFORMATION
Public Water System I.D. Number: 4501058
Public Water System Name: Village of Palm Springs WTP
Public Water System Type:
(X) Community ( ) Non-Community ( ) Non-Transient Non-Community

LABORATORY CERTIFICATION INFORMATION
Lab Certification Number: 86140
Parameter Groups Analyzed: Turbidity, Inorganic, Volatile Organic, Organic Chemical, Secondary Chemical and Radiological.
Subcontracted Lab Certification Number (if any): 84172, 86137

4HUL

INFORMATION
Sample Collection Date (MM/DD/YY): 08/06/92
Laboratory Sample Number: 92-08-082
Sample Location (be specific): Well #1W
Sample Type (check all applicable)

( ) Check	( ) Regular Distribution	( ) Composite
( ) Clearance	( ) Maximum Residence	( ) Plant Tap
(X) Raw	(X) Well	( ) Resample
( ) Special ______		

Sampler Name, Title, Phone: Kathy Stewart, Field Technician
(407) 842-2849

ANALYSIS INFORMATION
Extraction Date (MM/DD/YY): 08/10/92
Laboratory Contact: Thomas Colgan
Resample Requested? (check one) ( ) Yes (X) No
Analyses Submitted: Turbidity X ; Inorganic X ; Trihalomethane Volatile Organic X ; Organic Chemical X ; Secondary Chemical X ; Radiological X ; Unregulated Organic Purgeable__; Unregulated Organic Pesticide__; Unregulated Base Neutral Extractable__; Unregulated Acid Extractable__; (Check all analyses which apply).

I HEREBY CERTIFY that all data submitted are correct.

Signature Rebecca Elliott
Name Rebecca Elliott
Title Director of Operations
Laboratory McGinnes Laboratories
Date 09/09/92

Mail Results to the appropriate DER or ACPHU Office.

DER/ACPHU Reviewing Official

____

Sample Interpretation (check one)
( ) Satisfactory ( ) Unsatisfactory

Effective 06/01/89

PAUL R. McGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

9208082-01A
Report Date: 09/09/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: ED ST. ONGE

Project ID: VILLAGE OF PALM SPRINGS WTP
Sample ID: WELL # 1W
ECR II PRIMARY INORGANICS (PWS030)

Date Received: 08/06/92
Date Collected: 08/06/92 09:30:00

Water sample collected by Kathy Stewart of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
1005	Total Arsenic, As	01A	<0.002	mg/L	EPA 206.2	0.002	08/11/92	JHW
1010	Total Barium, Ba	01A	<0.02	mg/L	EPA 208.2	0.02	08/18/92	JHW
1015	Total Cadmium, Cd	01A	<0.005	mg/L	EPA 213.1	0.005	08/18/92	RAC
1020	Total Chromium, Cr	01A	<0.005	mg/L	EPA 218.2	0.005	08/13/92	JHW
1025	Fluoride, F-	01A	0.32	mg/L	EPA 340.2	0.02	08/12/92	LNJ
1030	Total Lead, Pb	01A	<0.002	mg/L	EPA 239.2	0.002	08/14/92	JHW
1035	Total Mercury, Hg	01A	<0.001	mg/L	SW 7470	0.001	08/18/92	RAC
1040	Nitrate, N	01A	0.1	mg/L	EPA 352.1	0.1	08/07/92	ELM
1045	Total Selenium, Se	01A	<0.005	mg/L	EPA 270.2	0.005	08/18/92	JHW
1050	Total Silver, Ag	01A	<0.01	mg/L	EPA 272.1	0.01	08/17/92	RAC
1052	Sodium, Na	01A	23.2	mg/L	EPA 273.1	0.5	08/21/92	RAC
	Nitrite, N	01A	0.01	mg/L	EPA 354.1	0.01	08/06/92	ELM

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

L. Jackson
Department Manager(s)

Thomas Colgan
Project Manager

PAUL R. McGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

9208082-01B
Report Date: 09/09/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: ED ST. ONGE

Project ID: VILLAGE OF PALM SPRINGS WTP
Sample ID: WELL # 1W
FAC 17-550 PRIMARY ORGANICS (PWS029)
COMMENT: EPA Method 505 compounds were analyzed by Broward Testing Laboratory, DHRS #86137.

Date Received: 08/06/92
Date Collected: 08/06/92 09:30:00

Water sample collected by Kathy Stewart of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
2005	Endrin	01B	<.0001	mg/L	EPA 505	0.0001	08/22/92	BTL
2010	Lindane	01B	<0.004	mg/L	EPA 505	0.004	08/22/92	BTL
2015	Methoxychlor	01B	<0.05	mg/L	EPA 505	0.05	08/22/92	BTL
2020	Toxaphene	01B	<0.005	mg/L	EPA 505	0.005	08/22/92	BTL
2105	2,4-D	01B	<0.002	mg/L	EPA 515	0.002	08/17/92	ROM
2110	2,4,5-TP (Silvex)	01B	<0.001	mg/L	EPA 515	0.001	08/17/92	ROM

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

K.J. Gamble
Department Manager(s)

Thomas Colgan
Project Manager

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

9208082-01C
Report Date: 09/09/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: ED ST. ONGE

Project ID: VILLAGE OF PALM SPRINGS WTP
Sample ID: WELL # 1W
FAC 17-550 SECONDARY INORGANICS (PWS031)

Date Received: 08/06/92
Date Collected: 08/06/92 09:30:00

Water sample collected by Kathy Stewart of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
1016	Calcium, Ca	01C	82	mg/L	EPA 215.1	1	08/25/92	RAC
1017	Chloride, Cl-	01C	36	mg/L	EPA 325.3	4	08/07/92	CEB
1022	Total Copper, Cu	01C	<0.01	mg/L	EPA 220.2	0.01	08/26/92	RAC
1025	Fluoride, F-	01C	0.32	mg/L	EPA 340.2	0.02	08/12/92	LNJ
1028	Total Iron, Fe	01C	<0.01	mg/L	EPA 236.1	0.01	08/26/92	RAC
1032	Total Manganese, Mn	01C	<0.005	mg/L	EPA 243.1	0.005	08/25/92	RAC
1055	Sulfate, SO4	01C	5	mg/L	EPA 375.4	4	08/10/92	CEB
1095	Total Zinc, Zn	01C	<0.005	mg/L	EPA 289.1	0.005	08/25/92	RAC
1901	Carbon Dioxide(nomograph)	01C	30	mg/L	CALC.	1	08/12/92	LNJ
1905	Color, APHA	01C	60	units	EPA 110.2	1	08/07/92	JYD
1920	Total Odor Number	01C	1	T.O.N.	EPA 140.1	1	08/06/92	LNJ
1924	pH	01C	7.10	units	EPA 150.1	---	08/06/92	KRS
1926	Conductivity @ 25 Deg.C	01C	550	umhos/cm	EPA 120.1	10	08/06/92	KRS
1927	Total Alkalinity, CaCO3	01C	216	mg/L	EPA 310.1	4	08/06/92	CEB
1930	Total Dissolved Solids	01C	325	mg/L	EPA 160.1	1	08/11/92	JYD
1996	Temperature	01C	28.9	deg. C	EPA 170.1	---	08/06/92	KRS
1997	pHs	01C	7.09	units	CALC	---	08/27/92	TPC
2909	Foaming Agents, MBAS	01C	0.07	mg/L	EPA 425.1	0.02	08/07/92	LNJ
9996	Dissolved Oxygen, O2	01C	3.80	mg/L	EPA 360.1	0.01	08/06/92	KRS
	Corrosivity, L.I.	01C	0.01	L.I.	CALC.	---	08/27/92	TPC
	Calcium Hardness, CaCO3	01C	205	mg/L	CALC	2	08/25/92	RAC

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

K Jackson

Department Manager(s)

Thomas Colglazier

Project Manager

PAUL R. McGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

9208082-01D
Report Date: 09/09/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: ED ST. ONGE

Project ID: VILLAGE OF PALM SPRINGS WTP
Sample ID: WELL # 1W
FAC 17-550 PRIMARY INORGANICS -
SODIUM & TURBIDITY ONLY (PWS030 & PWS026)

Date Received: 08/06/92
Date Collected: 08/06/92 09:30:00

Water sample collected by Kathy Stewart of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
0100	Turbidity	01D	0.41	N.T.U.	EPA 180.1	0.01	08/07/92	CEB
1052	Sodium, Na	01D	23.2	mg/L	EPA 273.1	0.5	08/21/92	RAC

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

K Jackson
Department Manager(s)

Thomas Colgan
Project Manager

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

September 9, 1992

Client: MEREDITH CORPORATION
Attn: Ed St. Onge
2911 West Washington Street
Orlando, FL 32805

Sample: Water sample received in lab on 08/06/92. Collected on 08/06/92 by Kathy Stewart of McGinnes Laboratories.

Project: VILLAGE OF PALM SPRINGS WTP
WELL #1W

Job No. 92-08-08

Analysis: FAC 17-550 VOC CHEMICALS

PARAM. ID	VOC CHEMICALS	SAMPLE NUMBER	RESULT	METHOD	DL	DATE/ TECH
2946	Ethylene Dibromide, ppm	01E	<0.00001	504	0.00001	08/14 HLW
2969	p-Dichlorobenzene, ppm	01E	<0.010	524	0.010	08/10 KGG
2976	Vinyl Chloride, ppm	01E	<0.001	524	0.001	08/10 KGG
2977	1,1-Dichloroethene, ppm	01E	<0.005	524	0.005	08/10 KGG
2980	1,2-Dichloroethane, ppm	01E	<0.003	524	0.003	08/10 KGG
2981	1,1,1 Trichloroethane, ppm	01E	<0.010	524	0.010	08/10 KGG
2982	Carbon Tetrachloride, ppm	01E	<0.003	524	0.003	08/10 KGG
2984	Trichlorothene, ppm	01E	<0.003	524	0.003	08/10 KGG
2987	Tetrachloroethene, ppm	01E	<0.003	524	0.003	08/10 KGG
2990	Benzene, ppm	01E	<0.001	524	0.001	08/10 KGG

Methods: All analyses performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. EPA Methods 504 and 524.2.

KGGamble
Department Manager

Thomas Colgan
Project Manager
DHRS Lab ID No. 86140/E86070

PAUL R. MCGINNES AND ASSOCIATES CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

9208082-01F
Report Date: 09/09/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: ED ST. ONGE

Project ID: VILLAGE OF PALM SPRINGS WTP
Sample ID: WELL # 1W
COMMENT: Radiological analysis for Gross Alpha was performed by Pembroke Laboratories, DHRS #84172.

Date Received: 08/06/92
Date Collected: 08/06/92 09:30:00

Water sample collected by Kathy Stewart of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
4000	Gross Alpha (PWS033)	01F	<1.±6.	pCi/L	EPA 900	1.0	08/31/92	P.L.

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

Pembroke Laboratories
Department Manager(s)

Project Manager

PAUL R. MCGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

RECEIVED AUG 1992

PUBLIC WATER SYSTEM INFORMATION
Public Water System I.D. Number: 4501058
Public Water System Name: Village of Palm Springs WTP
Public Water System Type:
(X) Community ( ) Non-Community ( ) Non-Transient Non-Community

LABORATORY CERTIFICATION INFORMATION
Lab Certification Number: 86140
Parameter Groups Analyzed: Turbidity, Inorganic, Volatile Organic, Organic Chemical, Secondary Chemical and Radiological.
Subcontracted Lab Certification Number (if any): 86137, 87239

INFORMATION
Sample Collection Date (MM/DD/YY): 07/14/92
Laboratory Sample Number: 92-07-151
Sample Location (be specific): Well #2W
Sample Type (check all applicable)

( ) Check	( ) Regular Distribution	( ) Composite
( ) Clearance	( ) Maximum Residence	( ) Plant Tap
(X) Raw	(X) Well	( ) Resample
( ) Special ____		

Sampler Name, Title, Phone: Thomas Colgan, Project Manager (407) 842-2849

ANALYSIS INFORMATION
Extraction Date (MM/DD/YY): 07/17/92
Laboratory Contact: Thomas Colgan
Resample Requested? (check one) ( ) Yes (X) No
Analyses Submitted: Turbidity X ; Inorganic X ; Trihalomethane Volatile Organic X ; Organic Chemical X ; Secondary Chemical X ; Radiological X ; Unregulated Organic Purgeable__; Unregulated Organic Pesticide__; Unregulated Base Neutral Extractable__; Unregulated Acid Extractable__; (Check all analyses which apply).

I HEREBY CERTIFY that all data submitted are correct.

Signature ____
Name Rebecca Elliott
Title Director of Operations
Laboratory McGinnes Laboratories
Date 08/10/92

Mail Results to the appropriate DER or ACPHU Office.

DER/ACPHU Reviewing Official

____

Sample Interpretation (check one)
( ) Satisfactory ( ) Unsatisfactory

Effective 06/01/89

PAUL R. McGINNES AND ASSOCIATES CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

AUG 1992
RECEIVED

9207151-01A
Report Date: 08/10/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: ED ST. ONGE

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #2W (JC PARK)
ECR II PRIMARY INORGANICS (PWS030)

Date Received: 07/14/92
Date Collected: 07/14/92 09:45:00

Water sample collected by T. Colgan of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
1005	Total Arsenic, As	01A	<0.002	mg/L	EPA 206.2	0.002	07/17/92	JHW
1010	Total Barium, Ba	01A	<0.02	mg/L	EPA 208.2	0.02	07/21/92	GDP
1015	Total Cadmium, Cd	01A	<0.005	mg/L	EPA 213.1	0.005	07/22/92	GDP
1020	Total Chromium, Cr	01A	<0.005	mg/L	EPA 218.2	0.005	07/23/92	JHW
1025	Fluoride, F-	01A	0.22	mg/L	EPA 340.2	0.02	07/17/92	SFL
1030	Total Lead, Pb	01A	0.010	mg/L	EPA 239.2	0.002	07/20/92	JHW
1035	Total Mercury, Hg	01A	<0.001	mg/L	SW 7470	0.001	07/15/92	GDP
1040	Nitrate, N	01A	0.1	mg/L	EPA 352.1	0.1	07/14/92	ELM
1045	Total Selenium, Se	01A	<0.005	mg/L	EPA 270.2	0.005	07/20/92	GDP
1050	Total Silver, Ag	01A	<0.01	mg/L	EPA 272.1	0.01	07/22/92	GDP
1052	Sodium, Na	01A	20.8	mg/L	EPA 273.1	0.5	07/27/92	RAC
	Nitrite, N	01A	<0.01	mg/L	EPA 354.1	0.01	07/14/92	ELM

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

L Jackson
Department Manager(s)

Thomas Colgan
Project Manager

Paul R. McGinnes and Associates
Consulting Laboratories, Inc.
4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

19 20 21 22 23 24 25 26 27 28 29 30 31 — 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
AUG 1992
RECEIVED

9207151-01B
Report Date: 08/10/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: ED ST. ONGE

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #2W (JC PARK)
FAC 17-550 PRIMARY ORGANICS (PWS029)
COMMENT: Analysis of EPA Method 505 compounds was performed by Broward Testing Laboratory, DHRS #86137

Date Received: 07/14/92
Date Collected: 07/14/92 09:45:00

Water sample collected by T. Colgan of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
2005	Endrin	01B	<.0001	mg/L	EPA 505	0.0001	07/21/92	BTL
2010	Lindane	01B	<0.004	mg/L	EPA 505	0.004	07/21/92	BTL
2015	Methoxychlor	01B	<0.05	mg/L	EPA 505	0.05	07/21/92	BTL
2020	Toxaphene	01B	<0.005	mg/L	EPA 505	0.005	07/21/92	BTL
2105	2,4-D	01B	<0.002	mg/L	EPA 515	0.002	07/17/92	ROM
2110	2,4,5-TP (Silvex)	01B	<0.001	mg/L	EPA 515	0.001	07/17/92	ROM

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

KW Dimick
Department Manager(s)

Thomas Colgan
Project Manager

PAUL R. MCGINNES AND ASSOCIATES CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

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MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

9207151-01C
Report Date: 08/10/92

Attn: ED ST. ONGE

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #2W (JC PARK)
FAC 17-550 PRIMARY INORGANICS -
SODIUM & TURBIDITY ONLY (PWS030 & PWS026)

Date Received: 07/14/92
Date Collected: 07/14/92 09:45:00

Water sample collected by T. Colgan of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
0100	Turbidity	01C	0.18	N.T.U.	EPA 180.1	0.01	07/15/92	CEB
1052	Sodium, Na	01C	20.8	mg/L	EPA 273.1	0.5	07/27/92	RAC

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

L Jackson
Department Manager(s)

Thomas Colgan
Project Manager

PAUL R. McGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.
4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 (407) 842-2849

RECEIVED AUG 1992

August 10, 1992

Client: MEREDITH CORPORATION
Attn: Ed St. Onge
2911 West Washington Street
Orlando, FL 32805

Sample: Water sample received in lab on 07/14/92. Collected on 07/14/92 by Thomas Colgan of McGinnes Laboratories.

Project: VILLAGE OF PALM SPRINGS WTP
WELL #2W (JC PARK)

Job No. 92-07-15[illegible]

Analysis: **FAC 17-550 VOC CHEMICALS**

PARAM. ID	VOC CHEMICALS	SAMPLE NUMBER	RESULT	METHOD	DL	DATE/ TECH
2946	Ethylene Dibromide, ppm	01D	<0.00001	504	0.00001	07/20 HLW
2969	p-Dichlorobenzene, ppm	01D	<0.010	524	0.010	07/17 HLW
2976	Vinyl Chloride, ppm	01D	<0.001	524	0.001	07/17 HLW
2977	1,1-Dichloroethene, ppm	01D	<0.005	524	0.005	07/17 HLW
2980	1,2-Dichloroethane, ppm	01D	<0.003	524	0.003	07/17 HLW
2981	1,1,1 Trichloroethane, ppm	01D	<0.010	524	0.010	07/17 HLW
2982	Carbon Tetrachloride, ppm	01D	<0.003	524	0.003	07/17 HLW
2984	Trichlorothene, ppm	01D	<0.003	524	0.003	07/17 HLW
2987	Tetrachloroethene, ppm	01D	<0.003	524	0.003	07/17 HLW
2990	Benzene, ppm	01D	<0.001	524	0.001	07/17 HLW

Methods: All analyses performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. EPA Methods 504 and 524.2.

KD Gamble
Department Manager

Thomas Colgan
Project Manager
DHRS Lab ID No. 86140/E86070

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CONSULTING LABORATORIES, INC.
4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 (407) 842-2849

AUG 1992
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Client: MEREDITH CORPORATION
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2911 West Washington Street
Orlando, FL 32805

Sample: Water sample received in lab on 07/14/92. Collected on 07/14/92 by Thomas Colgan of McGinnes Laboratories.

Project: VILLAGE OF PALM SPRINGS WTP
WELL #2W (JC PARK)

Job No. 92-07-151

Analysis: FAC 17-550 VOC CHEMICALS

PARAM. ID	VOC CHEMICALS	SAMPLE NUMBER	RESULT	METHOD	DL	DATE/ TECH
2946	Ethylene Dibromide, ppm	01D	<0.00001	504	0.00001	07/20 HLW
2969	p-Dichlorobenzene, ppm	01D	<0.010	524	0.010	07/17 HLW
2976	Vinyl Chloride, ppm	01D	<0.001	524	0.001	07/17 HLW
2977	1,1-Dichloroethene, ppm	01D	<0.005	524	0.005	07/17 HLW
2980	1,2-Dichloroethane, ppm	01D	<0.003	524	0.003	07/17 HLW
2981	1,1,1 Trichloroethane, ppm	01D	<0.010	524	0.010	07/17 HLW
2982	Carbon Tetrachloride, ppm	01D	<0.003	524	0.003	07/17 HLW
2984	Trichlorothene, ppm	01D	<0.003	524	0.003	07/17 HLW
2987	Tetrachloroethene, ppm	01D	<0.003	524	0.003	07/17 HLW
2990	Benzene, ppm	01D	<0.001	524	0.001	07/17 HLW

Methods: All analyses performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. EPA Methods 504 and 524.2.

KD Gamble
Department Manager

Thomas Colgan
Project Manager
DHRS Lab ID No. 86140/E86070

PAUL R. McGINNES AND ASSOCIATES
CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

AUG 1992
RECEIVED

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

9207151-01E
Report Date: 08/10/92

Attn: ED ST. ONGE

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #2W (JC PARK)
COMMENT: Radiological analysis for Gross Alpha was performed by Controls for Environmental Pollution, DHRS #87239.

Date Received: 07/14/92
Date Collected: 07/14/92 09:45:00

Water sample collected by T. Colgan of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
4000	Gross Alpha (PWS033)	01E	3 ± 2	pCi/L	EPA 900	2	07/29/92	CEP

All analyses by McGinnes Laboratories were performed using EPA and DER approved methods per McGinnes Laboratories Quality Assurance Plan #870232. All quality assurance samples met regulatory and in-house quality control limits unless otherwise specified. DHRS Laboratory ID Nos. 86140/E86070.

Controls for Environmental Pollution — Thomas Colgan

Department Manager(s) — Project Manager

PAUL R. MCGINNES AND ASSOCIATES CONSULTING LABORATORIES, INC.

4168 WESTROADS DRIVE - WEST PALM BEACH, FLORIDA 33407-1241 - (407) 842-2849

RECEIVED AUG 1992

9207151-01F
Report Date: 08/10/92

MEREDITH CORPORATION
2911 W. WASHINGTON STREET
ORLANDO, FL 32805

Attn: ED ST. ONGE

Project ID: VILLAGE OF PALM SPRINGS
Sample ID: WELL #2W (JC PARK)
FAC 17-550 SECONDARY INORGANICS (PWS031)

Date Received: 07/14/92
Date Collected: 07/14/92 09:45:00

Water sample collected by T. Colgan of McGinnes Laboratories using laboratory supplied containers.

Param ID#	Test Name	Sample Number	Result	Units	Method	Detection Limit	Date Analyzed	Analyst
1016	Calcium, Ca	01F	78	mg/L	EPA 215.1	1	07/26/92	RAC
1017	Chloride, Cl-	01F	31	mg/L	EPA 325.3	4	07/15/92	CEB
1022	Total Copper, Cu	01F	<0.01	mg/L	EPA 220.2	0.01	07/20/92	GDP
1025	Fluoride, F-	01F	0.22	mg/L	EPA 340.2	0.02	07/17/92	SFL
1028	Total Iron, Fe	01F	0.06	mg/L	EPA 236.1	0.01	07/16/92	GDP
1032	Total Manganese, Mn	01F	<0.005	mg/L	EPA 243.1	0.005	07/16/92	GDP
1055	Sulfate, SO4	01F	7	mg/L	EPA 375.4	2	07/22/92	CEB
1095	Total Zinc, Zn	01F	<0.005	mg/L	EPA 289.1	0.005	07/20/92	GDP
1901	Carbon Dioxide(nomograph)	01F	40	mg/L	CALC.	1	07/21/92	LNJ
1905	Color, APHA	01F	40	units	EPA 110.2	1	07/14/92	KBA
1920	Total Odor Number	01F	2	T.O.N.	EPA 140.1	1	07/14/92	JYD
1924	pH	01F	6.85	units	EPA 150.1	---	07/14/92	TPC
1926	Conductivity @ 25 Deg. C	01F	500	umhos/cm	EPA 120.1	10	07/21/92	KRS
1927	Total Alkalinity, CaCO3	01F	209	mg/L	EPA 310.1	4	07/14/92	CEB
1930	Total Dissolved Solids	01F	307	mg/L	EPA 160.1	1	07/17/92	KBA
1996	Temperature	01F	26.0	deg. C	EPA 170.1	---	07/14/92	TPC
1997	pHs	01F	7.16	units	CALC	---	07/28/92	TPC
2909	Foaming Agents, MBAS	01F	0.04	mg/L	EPA 425.1	0.02	07/14/92	LNJ
9996	Dissolved Oxygen, O2	01F	4.0	mg/L	EPA 360.1	0.1	07/14/92	TPC
	Corrosivity, L.I.	01F	-0.31	L.I.	CALC.	---	07/28/92	TPC
	Calcium Hardness, CaCO3	01F	196	mg/L	CALC	2	07/27/92	RAC

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R Jackson
Department Manager(s)

Thomas Colgan
Project Manager