

1506-00064

**DESERT SPRINGS WATER SYSTEM
Spring Creek Well No. 6
Construction & Testing Report**

January 1999

**WASHOE COUNTY
DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

P.O. BOX 11130 RENO, NEVADA 89520



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Spring Creek Well No. 6
Construction & Testing Report**

January 1999

**Prepared by:
County of Washoe
Department of Water Resources
Utility Services Division
4930 Energy Way
Reno, NV 89520**

TABLE OF CONTENTS

Summary.....	1
Drilling Operations and Well Construction.....	1
Aquifer Testing.....	4
Aquifer Parameter Estimation	6
Drawdown Estimates.....	15
Water Quality.....	20
Directional and Video Survey.....	20
Recommendations.....	23
Appendix.....	24

Well Driller's Reports
Field Data Sheets-Aquifer Tests
Water Quality Analyses
Directional Survey
Project Cost Summary

TABLES AND FIGURES

TABLES		Page
1	Well Location and Distances.....	3
2	Well Construction Summary	3
3	Pumping Tests Performed.....	4
4	Step Drawdown Test Summary.....	6
5	Aquifer Stress Test Summary.....	11
6	Estimated Drawdown Summary.....	20
7	Water Quality Summary.....	20

FIGURES

1	Well Location Map.....	2
2	Spring Creek Well No.6 Final Well Design.....	5
3	Step Test Drawdown Graph.....	7
4	Specific Drawdown Graph.....	8
5	Total Drawdown Graph.....	9
6	Spring Creek Well No. 6 & SSP4 Mon. Well.....	10
7	Distance - Drawdown Graph.....	12
8	Big Well & Big Well Mon.Well.....	13
9	SSP2 &SSP2a Mon.Well.....	14
10	Barometric Pressure Graph.....	16
11	Olaaregga Monitoring Well.....	17
12	Wingfield Springs Well.....	18

TABLES AND FIGURES cont.

13	Recovery Test Graph.....	19
14	Estimated Drawdown.....	21
15	Piper Diagram.....	22

Summary

The Spanish Springs Village subdivision service area has increased beyond the current peak day production well capacity of the Desert Springs Water system. A 750+ gallon per minute(gpm) production well is needed to meet current water system demand. The targeted well capacity could not be developed near the existing Desert Springs system due to water quality problems. A production well site was found in Tertiary basalt of the Lousetown Formation(Bonham, 1983) in east Spanish Springs Valley during the construction of monitoring wells for the water resource study "Hydrogeology and Simulated Effects of Urban Development on Water Resources of Spanish Springs Valley" conducted by the United States Geological Survey (USGS).

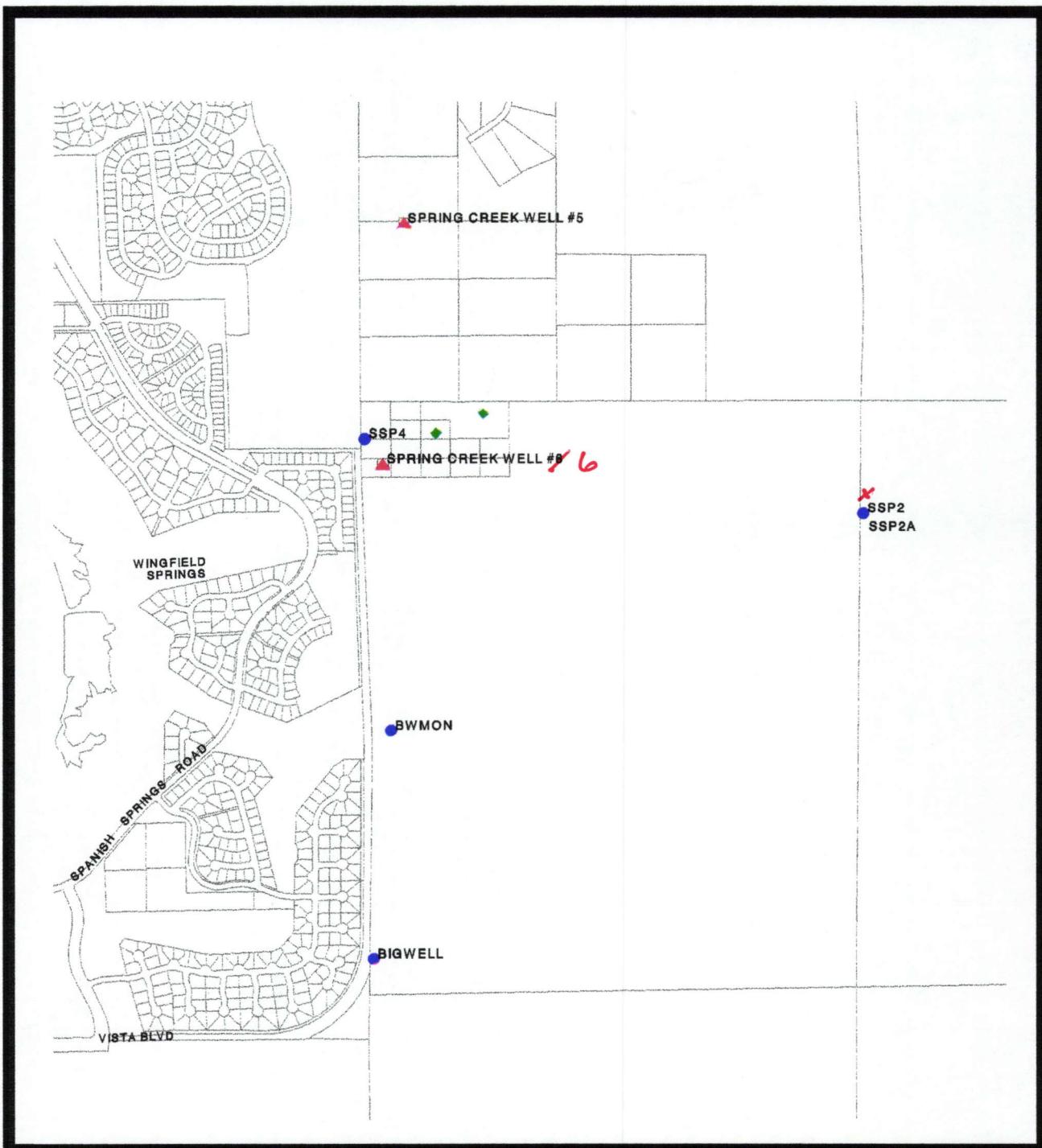
In October 1997, the bid for construction and testing of a 12 inch diameter production well was awarded to Lang Exploratory Drilling of Elko, NV. The contractor started the drilling project on October 19, 1997 and completed well construction and development on October 27, 1997. The 14 inch diameter production well was constructed to a total depth of 800 feet by the dual tube, reverse circulation method. Static water level in the well was measured at 25.5 feet below ground level. Well efficiency and constant discharge testing of Spring Creek Well No. 6 was postponed until June 2, 1998 due to problems associated with routing pumping test discharge through the Wingfield Springs subdivision.

A 7 hour step test consisting of four steps at the pumping rates of 600, 810, 1000 and 1200 gallons per minute(gpm). Well efficiency ranged from 71% at 600 gpm to 56% at 1200 gpm. A 9 day aquifer stress test(constant discharge test) was conducted from June 2 - 11, 1998. The aquifer stress test was terminated before the contracted 10 day test period due to generator failure. A recovery test was conducted immediately upon test failure until June 14, 1998. A transmissivity of 102,500 gallons per day per foot(gpd/ft) and a horizontal hydraulic conductivity of 40 feet per day were calculated for the production well from the constant discharge test data. An average transmissivity of 350,000 gpd/ft and storativity ranging from 0.002-0.0009 were calculated for the monitoring wells used during the constant discharge test. Domestic wells monitored during testing did not experience significant water level declines.

Spring Creek Well No. 6 will yield 1750 gpm from a pumping level of approximately 150 feet with 130 feet of drawdown after 9 days of continuous pumping. Well efficiency at 1750 gpm is 46%. It is recommended that a pump setting of 300 feet be used when equipping the well. Water quality samples for routine domestic analysis by the Nevada State Health Laboratory were collected at 24 and 72 hours after start of pumping. The production well was pumped for 2 hours after recovery test completion so water samples for comprehensive organic and inorganic compound analyses could be collected. Water quality testing shows Spring Creek Well No. 6 meets primary and secondary drinking water standards for the State of Nevada as well as all requirements specified by the federal Safe Drinking Water Act.

Drilling Operations and Well Construction

Lang Exploratory Drilling started the drilling project on October 19, 1997 and completed well construction and development on October 27, 1997. Figure 1 is a location map showing production well SC6 and nearby County monitoring wells and domestic wells. State plane coordinates for the



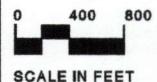
**FIGURE 1
WELL LOCATION MAP**

- PARCELS
- MONITORING WELLS
- ▲ PRODUCTION WELLS
- ◆ OLAREAGGA DOMESTIC WELLS
(APPROXIMATE LOCATION)

SOURCE: WASHOE COUNTY DEPARTMENT OF WATER RESOURCES

DATE: DECEMBER, 1998

Notes: The scale and configuration of all information shown herein are approximate only and are not intended as a guide for design or survey work. Reproduction is not permitted without prior written permission from the Washoe County Department of Water Resources.



Department of Water Resources

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production well and monitoring wells used during aquifer testing are found in Table 1. Table 1 also includes the horizontal distance from the test well to each monitoring well.

Well	Latitude	Longitude	Distance to SC6
Spring Creek Well 6	39° 37' 16.39" North	119° 40' 37.32" West	0.0 Feet
SSP4 Monitoring Well	39° 37' 18.32" North	119° 40' 39.18" West	243.5 Feet
Big Well Monitoring Well	39° 36' 52.53" North	119° 40' 36.32" West	2416.1 Feet
Big Well	39° 36' 32.38" North	119° 40' 38.43" West	4454.5 Feet
SSP2 Monitoring Well	39° 37' 11.55" North	119° 39' 42.44" West	4322.2 Feet

Table 1
Well Location and Distances

A Lang modified, top head drive drilling rig was used for borehole drilling. The 26 inch conductor borehole and 18 inch production casing borehole were drilled using the dual tube, reverse circulation method. The dual tube drilling method was selected in order to reduce drilling fluid infiltration into the aquifer during drilling and minimize loss circulation of drilling fluid in the borehole.

The drilling fluid consisted of potable water from the Desert Springs Water System and Baroid Quik-Gel high yield bentonite mixed in a portable, self contained mud system. A cyclone splitter was used to separate borehole cuttings from the drilling fluid in conjunction with a shale shaker. The mud system was additionally equipped with desanding cones and internal baffles to help maintain a uniform, particulate free drilling fluid for return circulation into the borehole.

The contractor drilled a 26 inch diameter borehole to the depth of 100+ feet for the conductor casing. A 22 inch outside diameter conductor casing was set from 0 to 99 feet and sealed in place with neat cement. Four percent calcium chloride was added to the grout slurry to accelerate the cure time of the seal. The sanitary seal remain undisturbed for 8 hours before drilling resumed. An 18 inch diameter production casing borehole was drilled from 100 to 800 feet. Centralizers were welded on the casing at 60 foot intervals. Table 2 shows a well construction summary for Spring Creek Well No. 6. A copy of the well driller's report is found in Appendix I.

Construction Item	Diameter	Interval	Length
Conductor Casing Borehole	26 Inches	0 to 100 feet	100 feet
Conductor Casing	22 Inches	+1 to 99 feet	100 feet
Production Casing Borehole	18 Inches	100 to 800 feet	700 feet
Production Casing	12 Inches	+2 to 797 feet	799 feet
Blank Production Casing	12 Inches	+2 to 457 feet	459 feet
Wire Wrap Well Screen, 80 slot (0.80")	12 Inches	460 to 797 feet	340 feet
SRI Gravel Pack	1/4 Inch x 1/8 Inch	0 to 800 feet	800 feet
Sanitary Surface Seal	Annulus	0 to 100 feet	100 feet

Table 2.
Well Construction Summary

The production well was installed with a gravel envelope consisting of well rounded, siliceous 1/4 inch by 1/8 inch gravel supplied by Silica Resources Inc., Auburn, California. The gravel was funneled from plastic shipping bags into the conductor casing since the static water level was 25 feet below ground level. A steel, sanitary doughnut seal with a two inch diameter gravel access cap was welded between the 22 inch conductor casing and 12 inch production well casing. Figure 2 shows the final as-built design of Spring Creek Well No. 6.

The production well was developed for 20 hours using an isolation tool that combined mechanical surging with air lifting. An isolation tool constructed of a short section of perforated pipe separated by tight fitting rubber packers at the top and bottom was used to develop the well screen in 20 foot sections. Spring Creek No. 6 was additionally developed using a submersible pump prior to the start of constant discharge testing in June 1998. Pumping development lasted for 10 hours.

Aquifer Testing

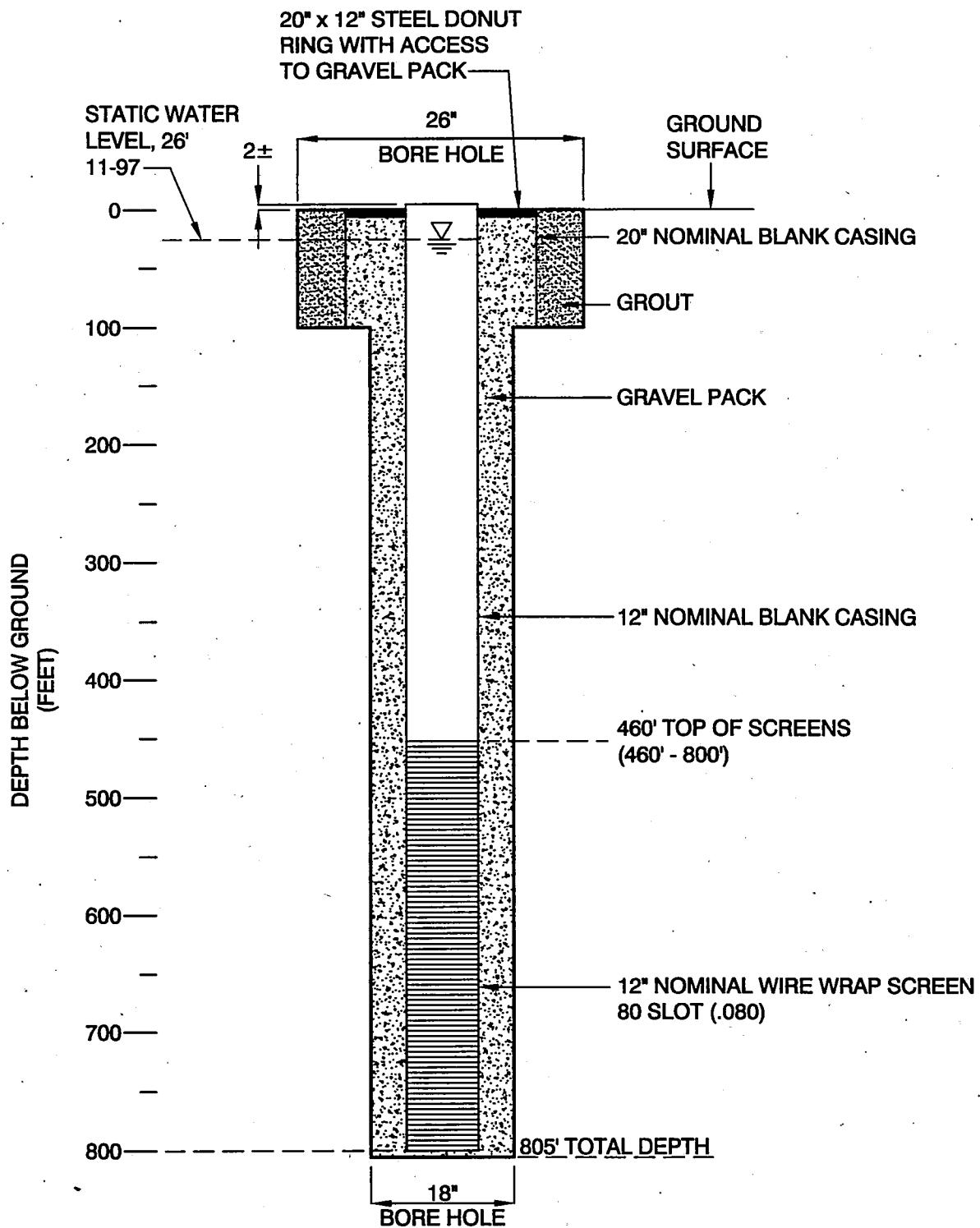
A 100 horsepower submersible pump was installed at a pump setting of 350 feet using 6 inch pump column for step drawdown and aquifer testing. Power to the pump was supplied by an Aggreko quiet running, portable generator. A gate valve installed at the discharge head was used to maintain a constant flow rate during testing. The discharge rate were measured using a Beaver in line flow meter that was modified with internal flow stabilization fins by the contractor. A Rossum sand testing device was installed in front of the flow meter on the discharge pipe. 250 feet of irrigation pipe was used to direct pumping discharge to a drainage ditch located at the eastern edge of the Wingfield Spring subdivision.

A Hermit SE1000C electronic datalogger was used to measure water levels in the test well and monitoring well SSP4. Water levels were measured in the test well in a one inch PVC sounding tube installed five feet above the pump intake. Solinst and Waterline battery operated water level indicators were used to measure static water levels in the monitoring wells during testing. A summary of pumping tests performed is found in Table 3.

Test	Date	Start(Hour)	Stop(Hour)	Duration(min)	Rate(gpm)
Step Test	5/29/98	0905	1545	400	600, 810 1000, 1200
Constant Discharge	6/2/98 to 6/11/98	0800	1200	13,200	1200
Recovery	6/11/98 to 6/14/98	1200	0600	17,160	0

Table 3.
Pumping Tests Performed

A step drawdown test was performed to determine pumping level, specific capacity, and well efficiency for different pumping rates. A discharge rate for the constant discharge and aquifer stress test was selected on the results of the step drawdown test. The step drawdown data were analyzed according to the method of Jacob (1947). Table 4 summarizes the step drawdown analysis.



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SPRING CREEK PRODUCTION WELL #6 FINAL WELL DESIGN

CROSS SECTION

FIGURE 2

Step (n)	Pumping Rate (gpm)	Drawdown (ft.) @ 100 minutes	Spec. Capacity (gpm/foot)	Spec. Drawdown (gpm/foot)	Well Efficiency (%)
1	600	32.47	18.5	0.0541	71
2	810	47.31	17.1	0.0584	65
3	1000	64.09	15.6	0.0641	60
4	1200	83.26	14.4	0.0694	56

Table 4.
Step Drawdown Test Summary

Figure 3 shows a drawdown versus time semi-log plot of the step drawdown data. Figure 4 shows specific drawdown versus discharge which is used to determine the formation loss coefficient (B) and the well loss coefficient (C). Formation loss(BQ), well loss(CQ^2) and total drawdown (Sw) were calculated using the following formula:

$$Sw = BQ + CQ^2$$

Well efficiency (E) was calculated using the formula :

$$E = \frac{I}{I + (C/B)Q}$$

A total drawdown and well efficiency graph is shown in Figure 5. The low 56 % well efficiency and substantial well loss component at the 1200 gpm pumping rate is attributed to the production well being completed in a fractured rock aquifer, not poor well construction or insufficient development. Water drawn into the well during pumping is subjected to increased turbulence caused by flow through a dual porosity aquifer with heterogeneous permeability caused by joint sets and fractures within the consolidated aquifer formation. The higher turbulent flow component causes increased drawdown in the well. The result is a lower well efficiency since well efficiency decreases as drawdown increases.

A constant discharge test was performed at Spring Creek Well 6 for 120 hours at a constant pumping rate of 1200 gpm. The well was essentially sand free immediately after start up with a sand content of 1.5 parts per million(ppm) measured during the first 35 minutes of pumping. A maximum drawdown of 84.59 feet at a pumping level of 110.09 feet was measured by the Hermit datalogger at the end of testing. Figure 6 shows the observed and simulated drawdown versus time plot from the constant discharge test for Spring Creek Well No. 6 and observation well SSP4. Observation data were collected at the monitoring wells listed in Table 1 and at two nearby domestic wells owned by Ignacio Olareagga (see Figure 1.).

Aquifer Parameter Estimation

Aquifer parameters from the aquifer stress test for all wells were calculated using the Cooper-Jacob straight line method and Well Hydraulics Interpretation Program (WHIP) software from Hydro Geo Chem, Inc. Transmissivity and storativity calculations using WHIP were generated using the double porosity aquifer model. All simulated drawdowns were generated using WHIP. Graphical

Figure 3
STEP DRAWDOWN TEST
Spring Creek Well #6

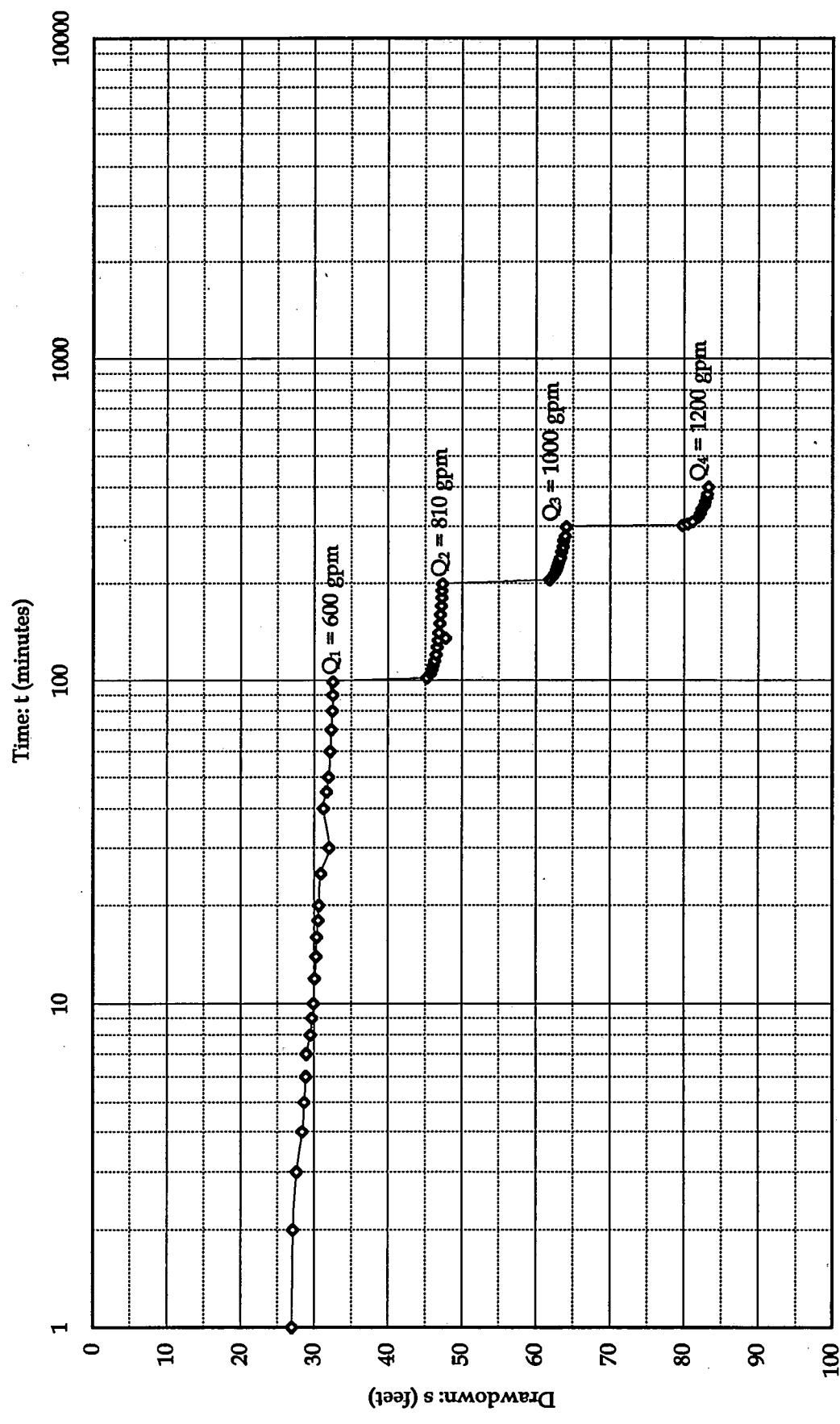


Figure 4
SPECIFIC DRAWDOWN GRAPH
Spring Creek Well #6

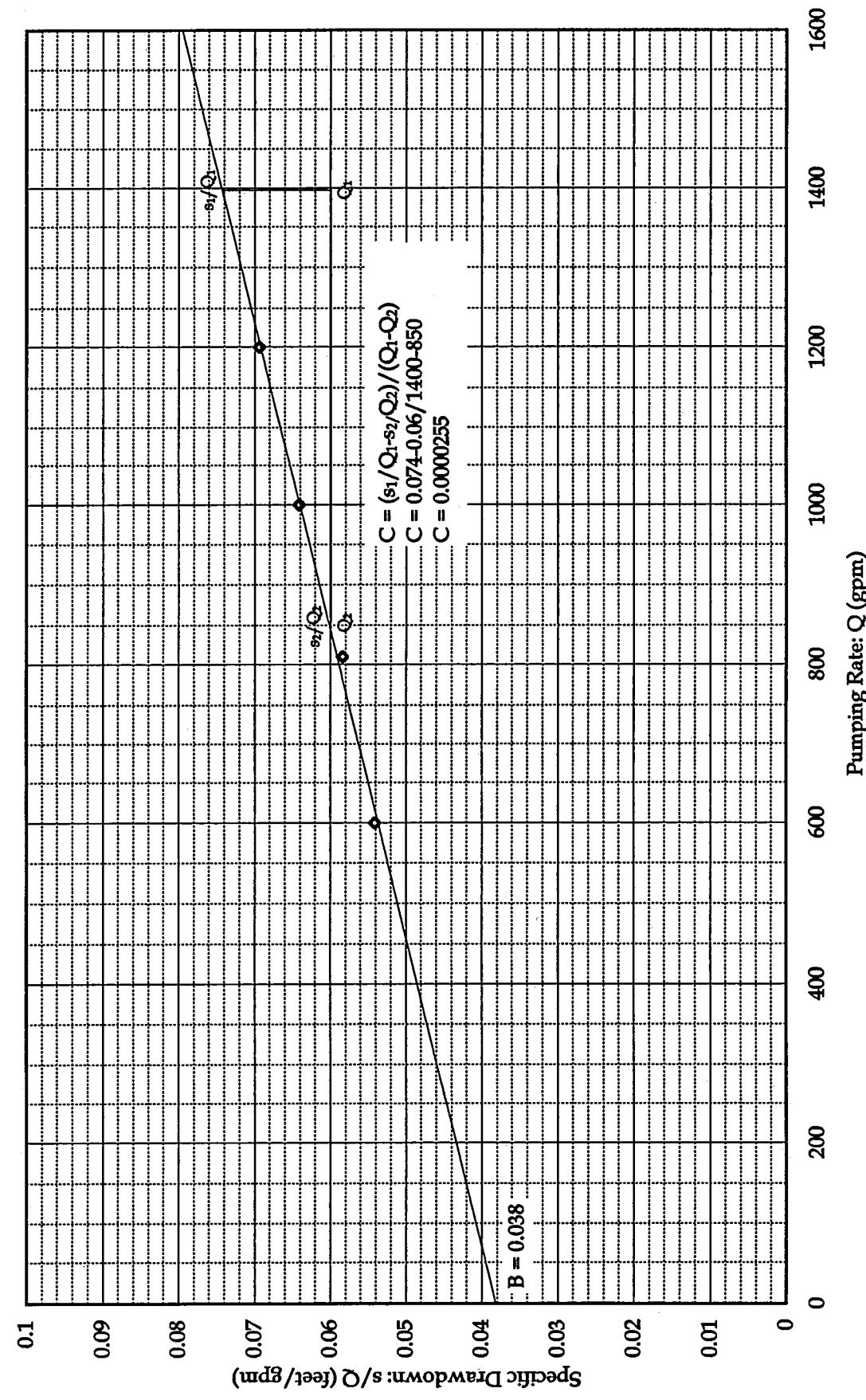


Figure 5
TOTAL DRAWDOWN GRAPH
Spring Creek Well #6

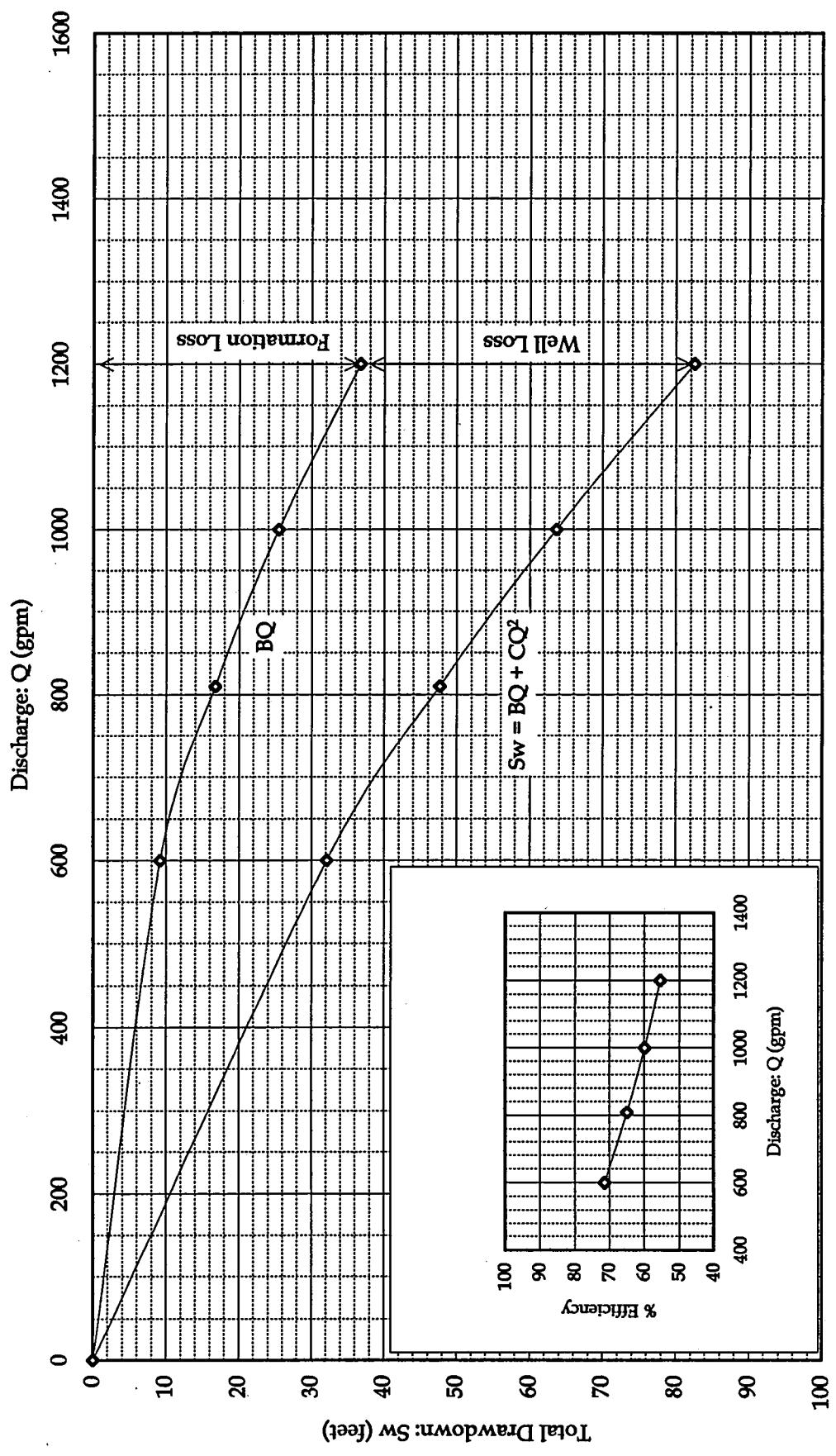
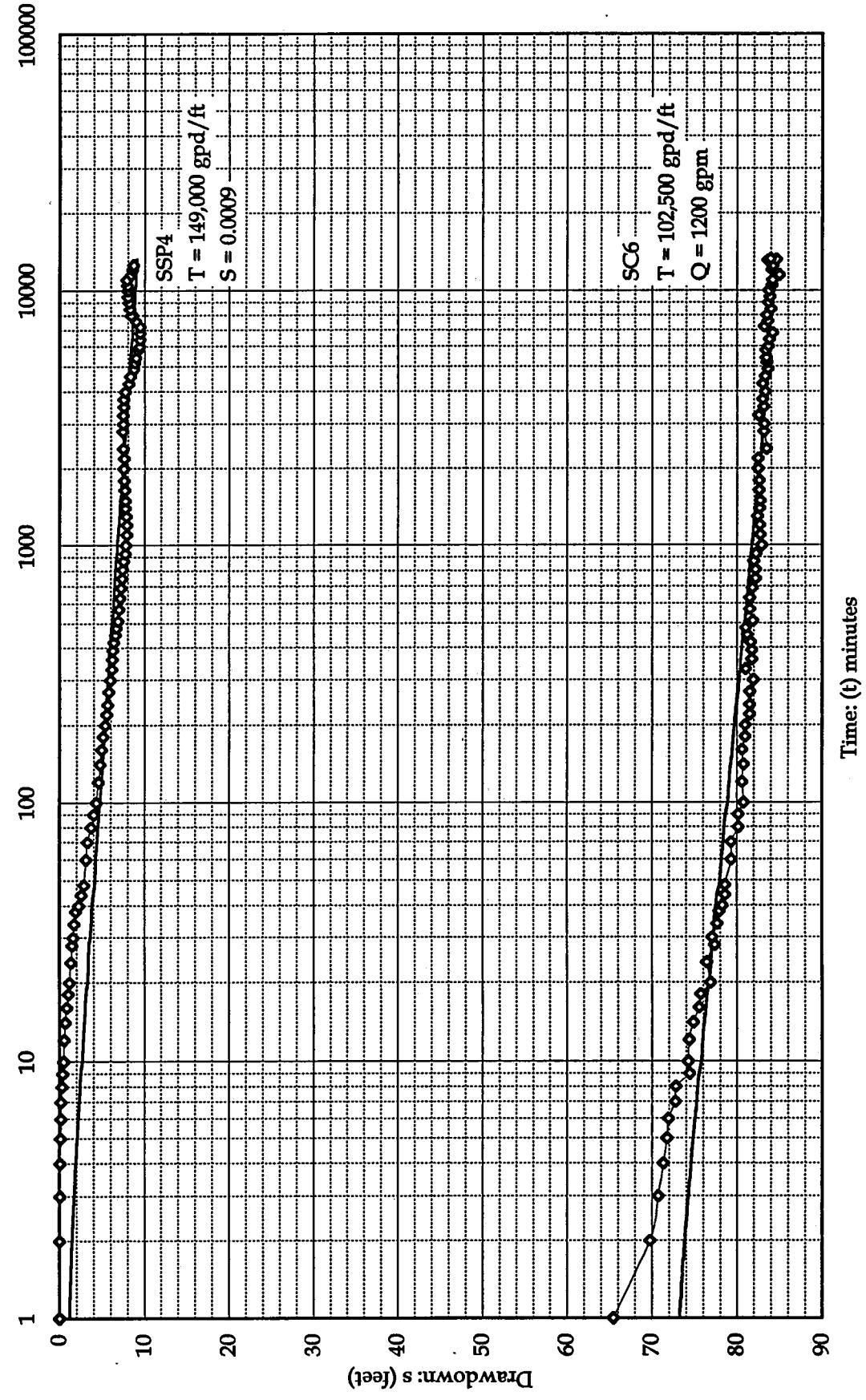


Figure 6
SPRING CREEK WELL #6 & SSP4 MONITORING WELL
Constant Discharge Test Simulated (-) vs. Observed Drawdown



calculations for transmissivity (T) in gallons per day per foot (gpd/ft) and storativity (S) were made using the equations:

$$\text{Transmissivity}(T) = \frac{2640}{\Delta s}$$

$$\text{Storativity}(S) = \frac{0.3 T t_o}{r^2}$$

Horizontal hydraulic conductivity (K) in feet per day was calculated using: $T = Kb$

The aquifer values determined by WHIP for the pumping well were used in matching observed drawdown with simulated drawdown for the monitoring wells involved in the pumping tests. Calculated T and S values for all wells observed in the constant discharge and recovery test are found in Table 5.

Well	Graphical T gallons/day/foot	WHIP T gallons/day/foot	Graphical S dimensionless	WHIP S dimensionless
Aquifer Stress Test				
Spring Creek 6	158,500	102,500	**	**
SSP4	85,600	149,000	0.003	0.0009
Big Well Monitoring Well	340,650	355,000	0.002	0.003
Big Well	364,000	347,000	0.001	0.001
SSP2	368,000	425,000	0.0006	0.0005
Distance-Drawdown Graph	115,000	**	0.004	**
Recovery Test				
Spring Creek 6	**	**	**	**
SSP4	80,000	**	0.001	**

Table 5

Aquifer Stress Test Summary

A transmissivity of 102,500 gpd/ft, horizontal hydraulic conductivity of 39 feet per day and storativity of 0.003 were selected as aquifer parameters for the formation penetrated by Spring Creek Well No. 6. A corresponding aquifer transmissivity of 115,000 gpd/ft and storativity of 0.005 were calculated from the distance-drawdown graph shown in Figure 7. The selected aquifer parameters indicate the formation penetrated by the production well is confined, laterally extensive and highly permeable. The higher transmissivity value calculated for well SSP4 and the well's construction indicate that the monitoring well partially penetrates the aquifer formation.

Figure 8 shows the observed and simulated drawdown versus time plot from the constant discharge test for the Big Well and the Big Well monitoring well. Figure 9 shows the observed and simulated drawdown versus time plot for the SSP2 and SSP2a monitoring wells. An average transmissivity of 350,000 gpd/ft and storativity of 0.003 was calculated for the Big Well, Big Well monitoring well and SSP2 monitoring well. The approximately three times higher transmissivity calculated for these monitoring wells is attributed to partial penetration of the aquifer by the wells and too short of test pumping duration given their horizontal distance from the test well.

Figure 7
DISTANCE - DRAWDOWN GRAPH
Spring Creek 6 Constant Discharge Test

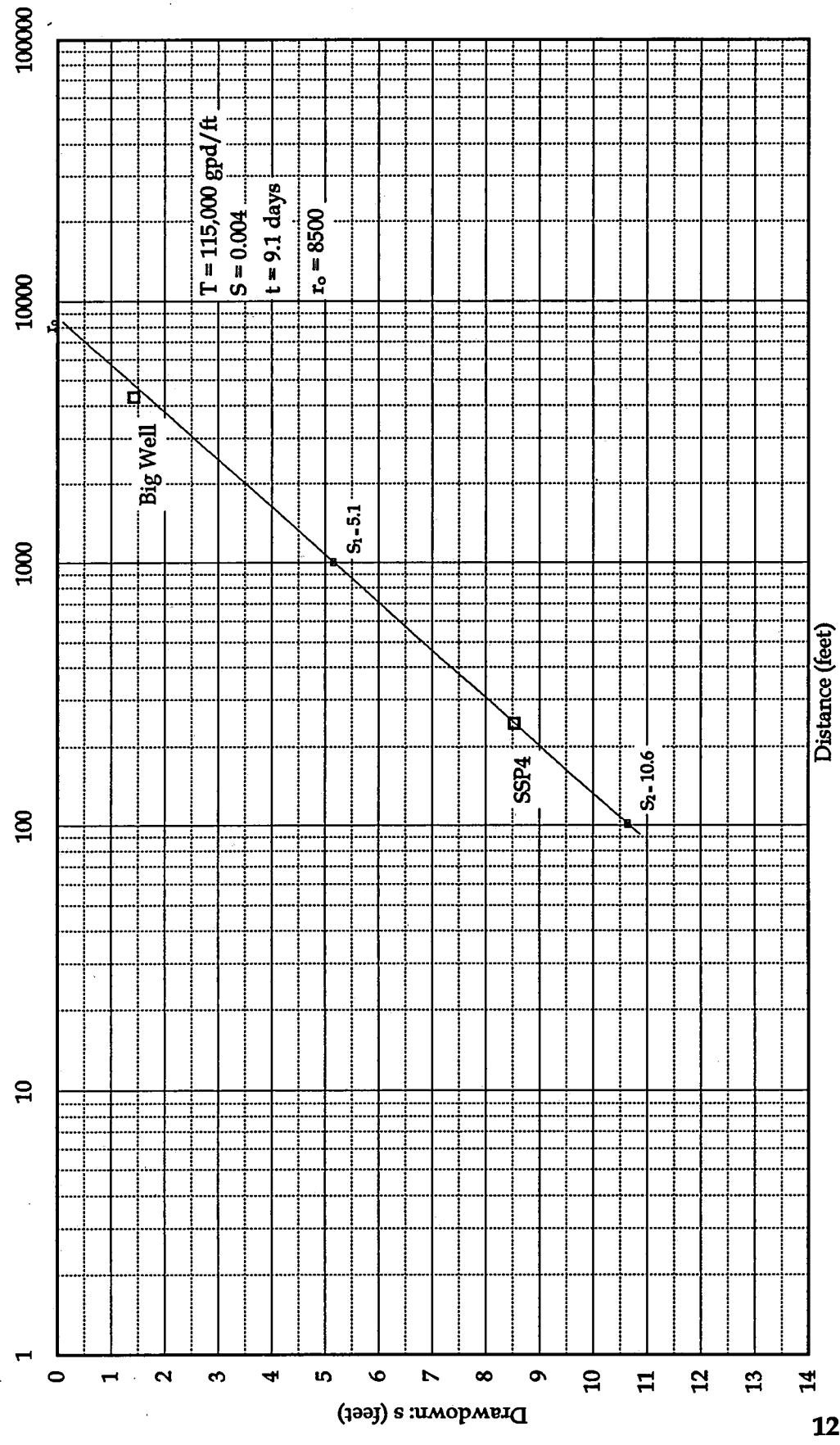


Figure 8
 BIG WELL & BGMW MONITORING WELLS
 Constant Discharge Pumping Test Simulated (-) vs. Observed Drawdown

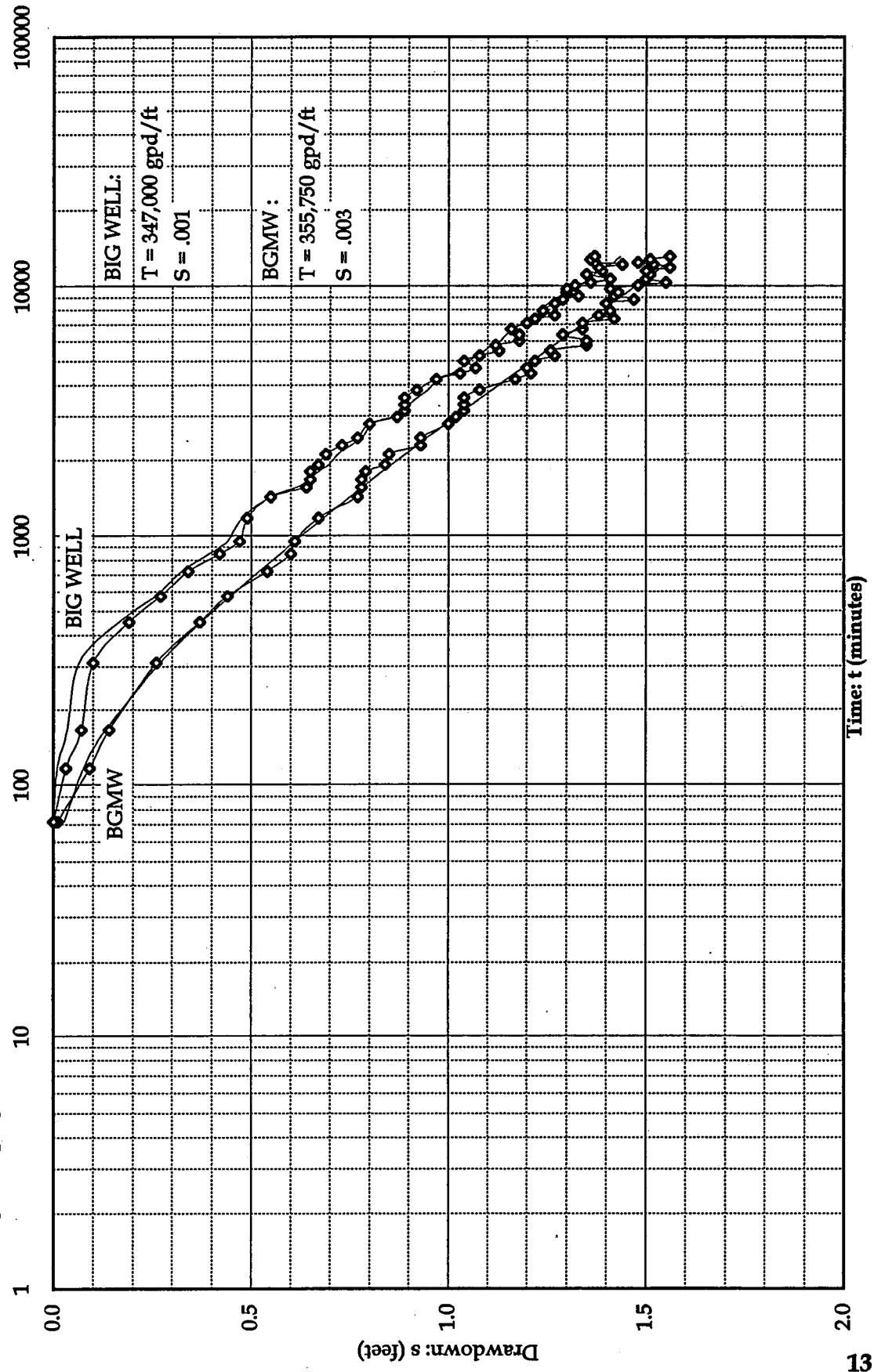
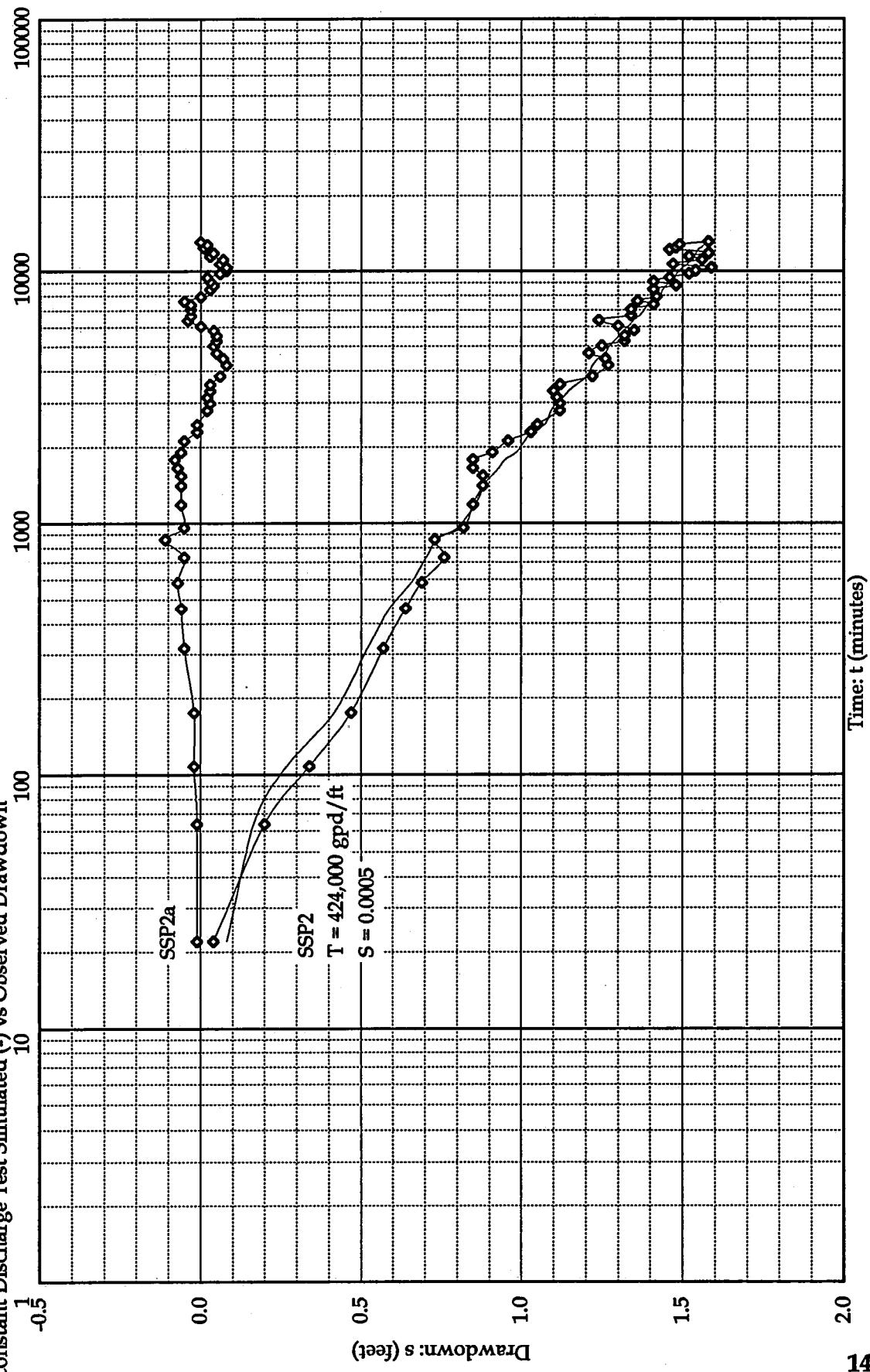


Figure 9
SSP2 & SSP2a MONITORING WELLS
Constant Discharge Test Simulated (-) vs Observed Drawdown



The Big Well and Big Well monitoring well showed similar aquifer parameters while well SSP2 had a higher T value and smaller S value. The storage coefficient calculated at SSP2 was similar to monitoring well SSP4 which is located less than 245 feet away from the production well. This indicates that SSP2 and SSP4 are constructed in the same confined formation and because of the extreme distance, the test was not conducted long enough to observe similar transmissivity values in both monitoring wells. The slightly larger storativity observed at the Big Well and Big Well monitoring well suggest both wells are located on the edge of a confined aquifer where the clay aquitard is thinning. Monitoring well SSP2a is 85 feet deep and constructed in a shallow, unconfined, alluvial aquifer. Figure 9 shows that SSP2a's static water level was not effected by pumping at Spring Creek Well 6. The minor static water level changes correspond to changes in barometric pressure observed during testing. A barometric pressure graph is shown in Figure 10.

Figure 11 is the time versus drawdown graph for an unequipped domestic well owned by Ignacio Olareagga and monitoring well SSP2a. The unequipped domestic well is less than 150 feet deep and is completed in the same shallow, unconfined aquifer as SSP2a. The static water level in the Olareagga monitoring well showed minor fluctuations during the constant discharge test similar to the water level changes observed at well SSP2a. The water level fluctuation in the Olareagga well is also attributed to changes in barometric pressure. The Olareagga domestic well was also measured during testing and showed no discernible negative impacts from test pumping. The field data sheets for the Olareagga wells are found in Appendix I.

The Wingfield Springs Ranch Well, located approximately 3,300 feet southwest of the test well, was monitored by Water Resource Concepts for Wingfield Springs during constant discharge testing. Figure 12 is a time versus drawdown graph for the Wingfield Springs well. Water level measurements were measured by a pressure transducer and recorded by a datalogger. A drawdown of 1.70 feet was measured in the well at the end of the pumping test. A transmissivity of 300,000 gpd/ft for the well was calculated using the Cooper-Jacob straight line method. A storativity value of 0.005 was estimated since the distance between the monitoring and production wells was estimated from a topographic map. The Wingfield well response during testing shows the well is completed in the same volcanic aquifer formation as Spring Creek Well No. 6.

A recovery test drawdown graph for Spring Creek Well No. 6 and well SSP4 is shown in Figure 13. The water level was 95% recovered in the test well within 30 minutes of pump shut off. Water levels recovered in Spring Creek Well No. 6 to within 0.5 feet of the original static water level after approximately 3 days. Production well recovery data was not used for estimating aquifer parameters since early time recovery data was not recorded due to unexpected test failure. Water levels recovered in SSP4 to the pre-test static water level after approximately 3 days. A transmissivity and storativity were calculated for SSP4 using the Cooper-Jacob straight line method and are found in Table 5.

Drawdown Estimates

The aquifer parameters selected from the constant discharge test were used to estimate drawdowns in Spring Creek Well No. 6 for various pumping rates. Estimates for drawdown in the test well after 30 days and one year of continuous pumping were estimated by graphical extension of the plotted simulated drawdowns. Estimated drawdown attributed to well interference at the future Spring

Figure 10
BAROMETRIC PRESSURE
Spring Creek Well #6 Constant Discharge Test

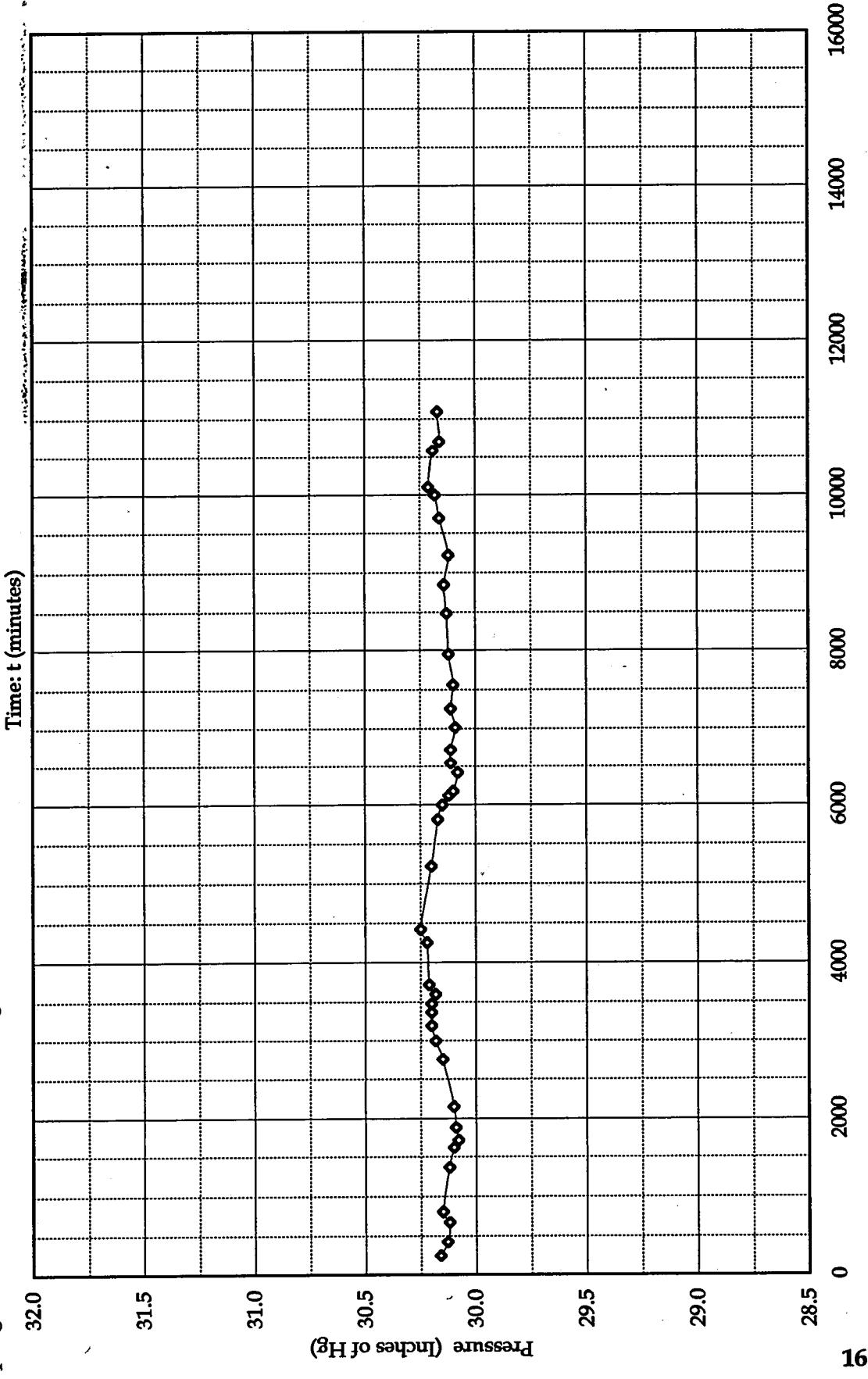


Figure 11
OLAREAGGA & SSP2a MONITORING WELLS
Constant Discharge Test Observed Drawdown

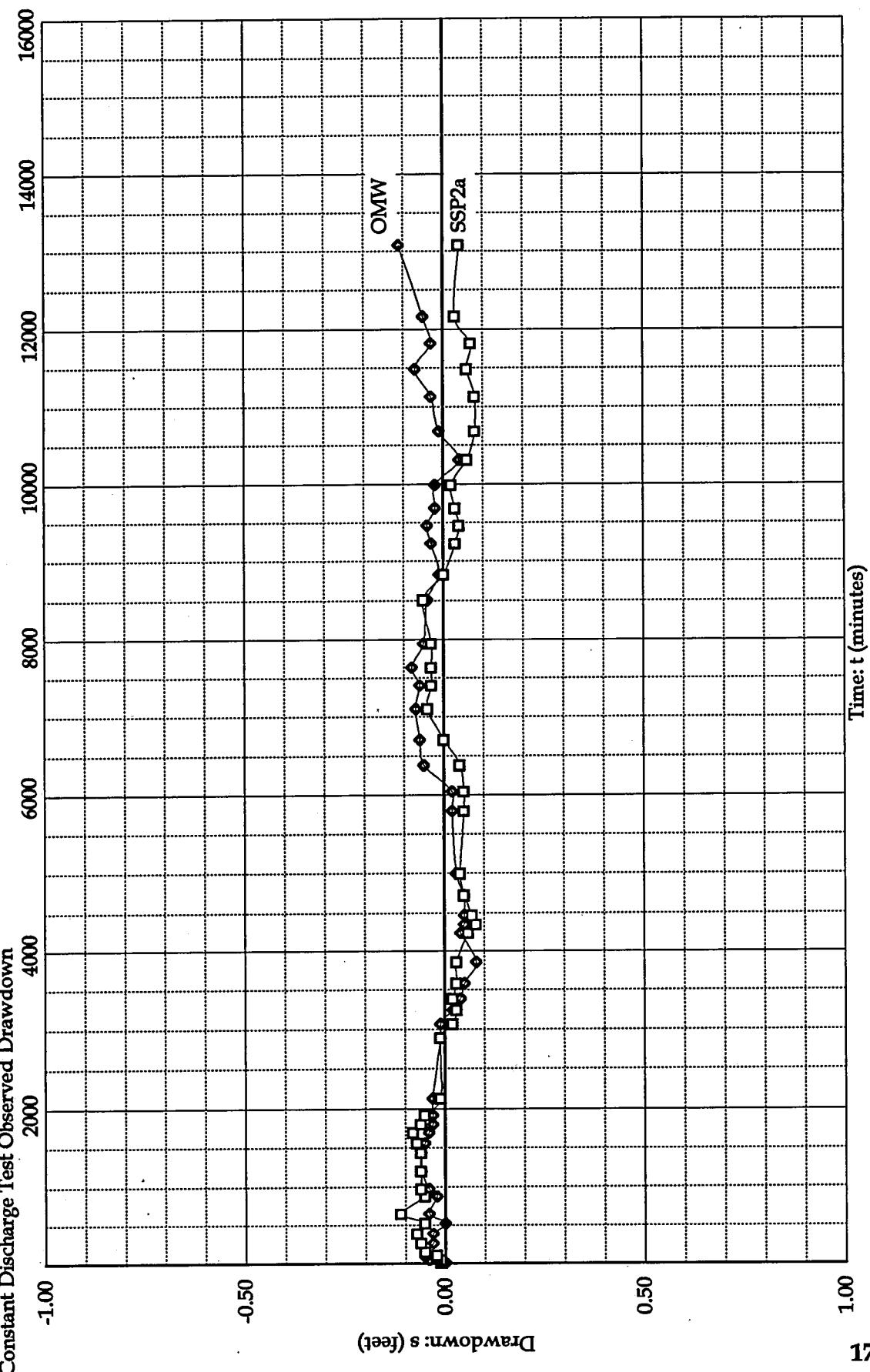


Figure 12
WINGFIELD SPRINGS WELL
Spring Creek Well #6 Constant Discharge Test

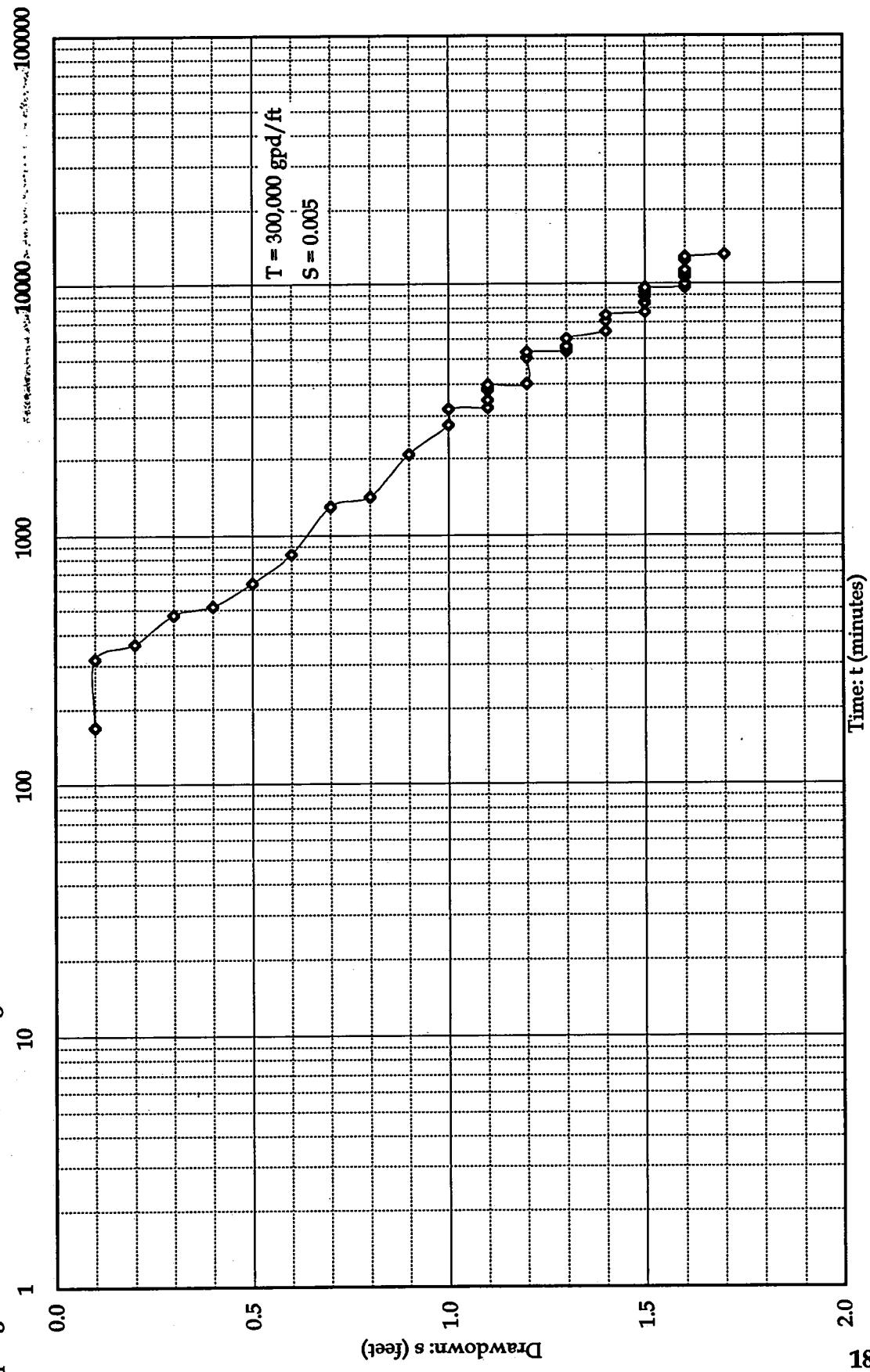
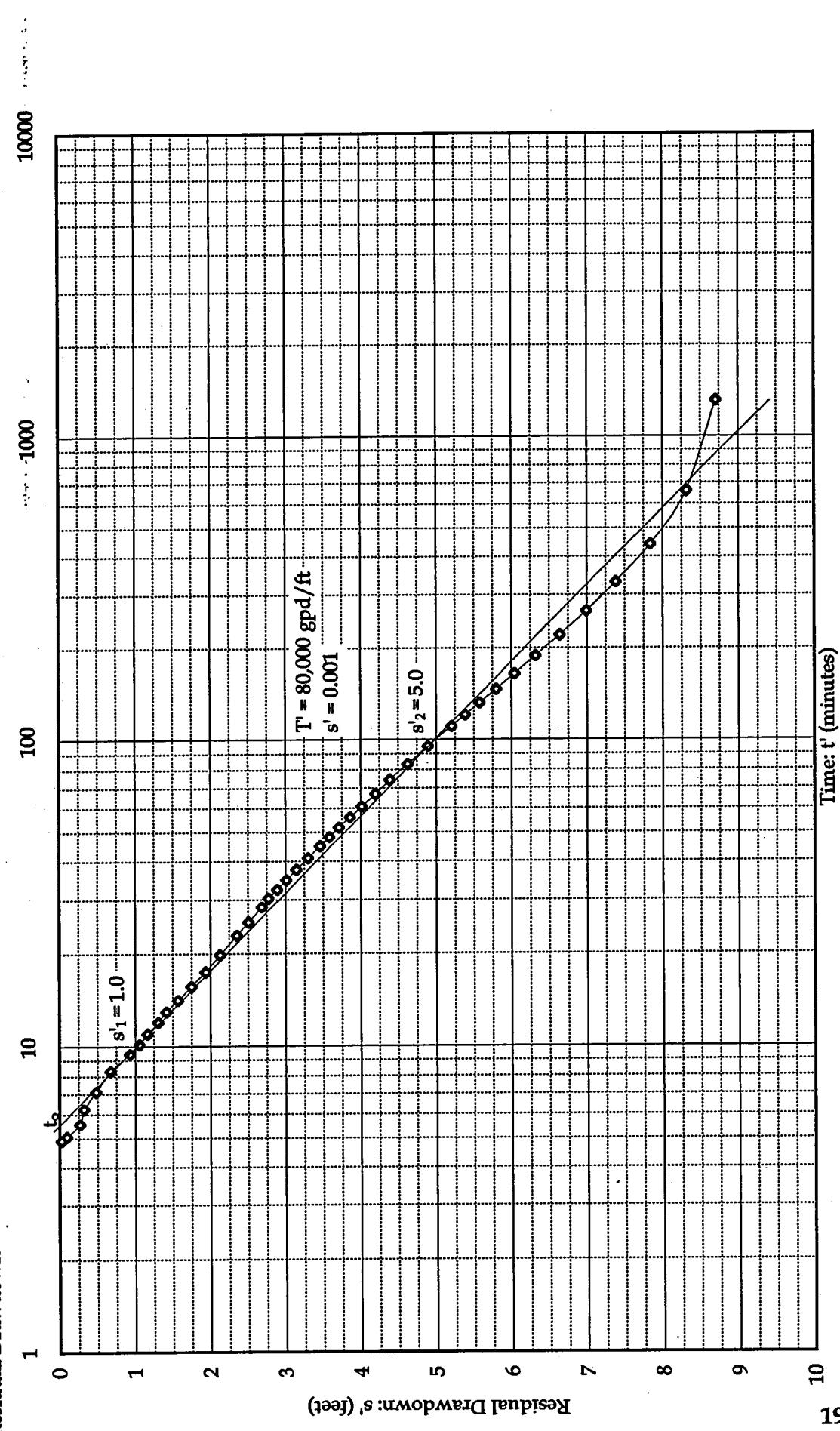


Figure 13
SPRING CREEK WELL #6 RECOVERY TEST
Residual Drawdown



Creek Well No.7/SSP2 monitoring well was estimated similarly. A summary of estimated drawdown and pumping levels at different pumping rates for Spring Creek Well No. 6 and selected monitoring well is found in Table 6. The design pumping rate and estimated drawdowns for that rate are bold highlighted. Figure 14 shows the WHIP simulated drawdown for the test well over nine days of continuous pumping.

Pumping Rate (gpm)	Spring Creek Well #6			Spring Creek Well #6			Spring Creek Well #7/SSP4				
	Drawdown (ft)			Pumping Level (ft)			Drawdown (ft)				
	9 days	30 Days	1 Year		9 days	30 Days	1 Year		9 days	30 Days	1 Year
1200	84	86	90	109	111	115	1.6	2.9	5.3		
1500	105	108	112	130	133	137	2.0	3.5	6.8		
1750	123	126	131	148	151	156	2.3	4.1	7.8		
2000	140	144	149	165	169	174	2.7	4.6	8.8		

Table 6
Estimated Drawdown Summary

Water Quality

Water quality samples for inorganic compounds, volatile organic compounds and synthetic organic compounds were collected during test pumping. Water samples for general inorganic compounds were collected after 24 and 72 hours of test pumping to identify aquifer quality changes. Due to generator failure, a complete water quality sample wasn't collected until after completion of the well recovery test. The well was pumped for two hours upon completion of the recovery test so a water sample could be collected for analyses required of municipal purveyors by the Safe Drinking Water Act(SDWA).

Spring Creek Well No. 6 meets State of Nevada primary and secondary drinking water standards for all parameters tested. A general water quality summary for the well is found in Table 7. Complete water quality analyses for the well is found in the Appendix.

Well	TDS	Nit-N	SO ⁴	Cl	HCO ³	Fe	Na	K	Ca	Fl	As
SC6	133	1.8	17	4	88	0.15	33	5	8	0.20	0.003

Table 7
Water Quality Summary

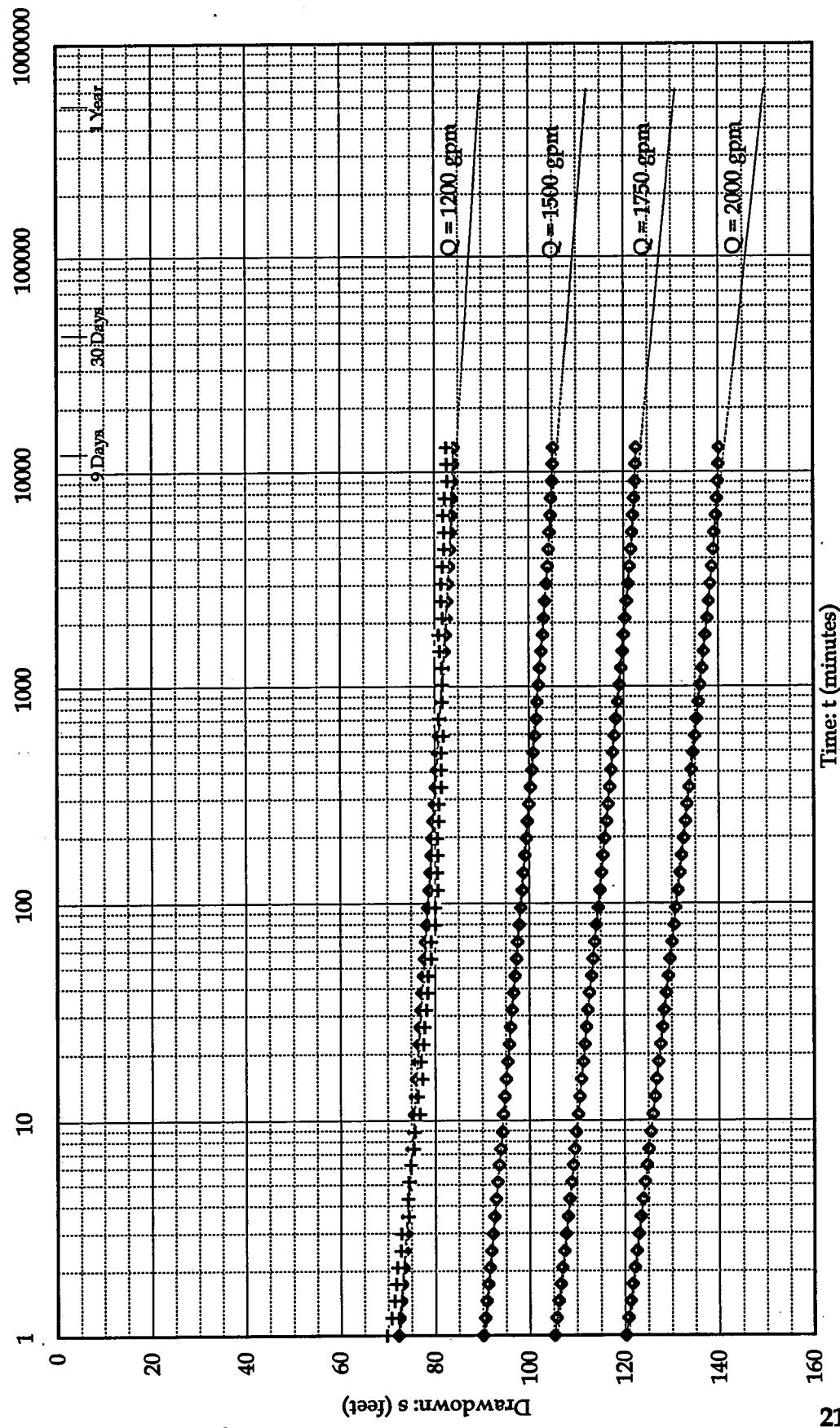
Values in mg/L

Figure 15 is a Piper diagram used to categorize the water analyses for the test well and monitoring well SSP4. The diagram shows both wells are considered to be in a aquifer containing sodium or potassium-bicarbonate waters.

Directional and Video Survey

A directional and video survey were done on the well upon completion of well development. The directional survey was used to measure the vertical deviation of the well to verify the well met the contract specifications. A deviation of less than or equal to two thirds(2/3) the well's inside diameter per 100 feet to the top of the well screen was allowed in the contract. A vertical deviation of not more

Figure 14
ESTIMATED DRAWDOWN
Spring Creek Well #6
Field Data (+)



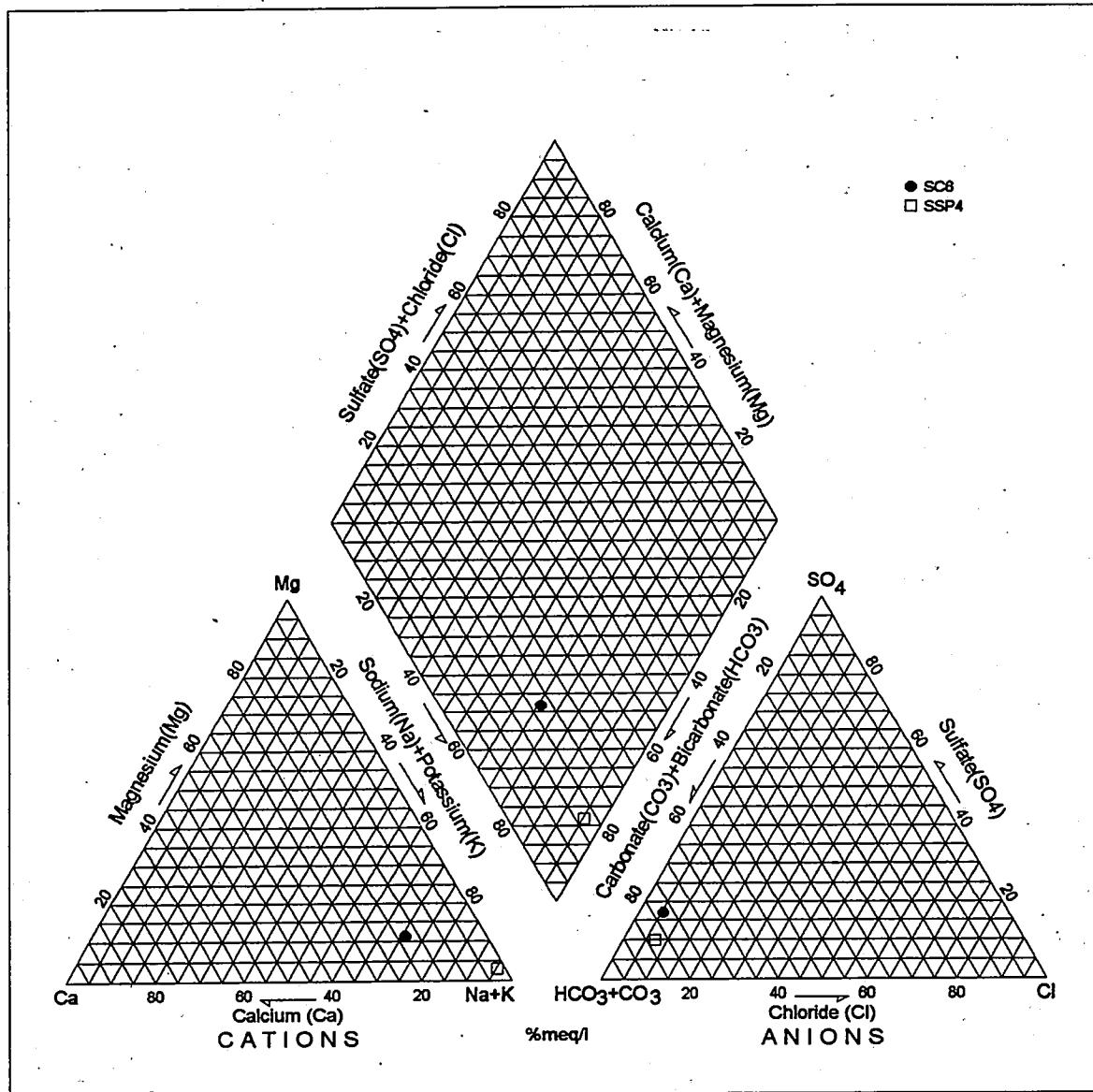


Figure 15
PIPER DIAGRAM

than 0.68 feet per 100 feet or a cumulative total of 2.72 feet at the end of the 400 foot blank casing interval was required for passing. Spring Creek Well No. 6 has a deviation of 0.81 feet at 400 feet and 1.83 feet at 800 feet. A video survey was conducted to document its construction and internal condition. A copy of the directional survey is found in the Appendix.

Recommendations

The recommended pumping rate for Spring Creek Well No. 6 is 1750 gpm. The drawdown in the well will be approximately 131 feet and the pumping level will be approximately 150 feet after 30 days of continuous pumping at 1750 gpm. Well efficiency for the recommended pumping rate is 46%. The pump intake should be set at 300 feet to provide long term protection against any fluctuations in regional water levels or decline in the production well's specific capacity.

APPENDIX

**Well Driller's Reports
Field Data Sheets-Aquifer Tests
Water Quality Analyses
Directional Survey
Project Cost Summary**

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

TYPE of PUMPING TEST STEP DRAWDOWN TEST

HOW Q MEASURED _____ M.P. for WL's _____ elev. _____

HOW WL's MEASURED _____ DEPTH of PUMP/AIRLINE _____ wrt _____

PUMPED WELL NO. 27.93 SSP4 2.8 H.O.C. % SUBMERGENCE: initial _____ ; pumping _____

RADIUS of PUMPED WELL _____ PUMP ON: date 29 MAY 98 time 0905

DISTANCE from PUMPED WELL _____ PUMP OFF: date 29 MAY 98 time 1545

WELL SPRING CREEK NO. 6

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 1 OF 2

TIME $t = 905$ at $t' = 0$			WATER LEVEL DATA STATIC WATER LEVEL 28.04 25.54				2.5° H.O.C.		WATER PRODUCT.	COMMENTS
CLOCK TIME	ELAPSED TIME mins hrs	t	READING	CONVERSIONS of CORRECTIONS	WATER LEVEL	(S) or S'			Q	(NOTE ANY CHANGES IN OBSERVERS)
906		1	STEP I	54.73	26.96				600	
907		2			55.13	27.09				
		3			55.65	27.61				
		4			56.37	28.33				
		5			56.65	28.61				910 -1mb
		6			56.88	28.84				
		7			56.98	28.94				QT
		8			57.51	29.47				
		9			57.71	29.67				
		10			57.91	29.87				
		12			58.08	30.04				
		14			58.26	30.22				
		16			58.35	30.31				
		18			58.58	30.54				
		20			58.61	30.57				
		25			58.91	30.87				
		30			60.03	31.99				
		40			59.28	31.24				QT
		45			59.67	31.63				
		50			60.00	31.96				
		60			60.18	32.14				
		70			60.32	32.28				
		80			60.45	32.41				
		90			60.50	32.46				
		99			60.51	32.47	$\frac{5}{6}Q = 18.18$			
		STEP II								
		102	2		73.30	45.26			810	
		105	5		73.77	45.73				
		108	8		74.00	45.96				
		111	11		74.15	46.11				
		115	15		74.35	46.31				
		120	20		74.52	46.48				
		127	27		74.65	46.61			810	
		133	33		74.80	46.76				
		135	35		74.82	47.78				
		140	40		74.90	46.86				
		150	50		75.06	47.02				
		160	60		75.13	47.09				
		170	70		75.21	47.17				
		180	80		75.29	47.25				

WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

PUMPING TEST DATA

WELL SPRING CREEK No. 6

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 2 OF 2

TYPE of PUMPING TEST STEP DRAWDOWN

HOW Q MEASURED

M.P. for WL's _____ elev.

HOW WI'S MEASURED Electric Sounder

DEPTH of PUMP/AIRLINE _____ wrt

PUMPED WELL NO.

% SUBMERGENCE: initial _____; pumping

RADIUS OF PUMPED WELL

PUMP ON: date 29MAY98 time 0905

DISTANCE from PUMPED WELL

PUMP OFF: date 29 MAY 98 time 1545

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL Spring Creek #6

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 1 OF 4

TYPE of PUMPING TEST Constant Q

HOW Q MEASURED Flow meter

M.P. for WL's elev.

HOW WL's MEASURED Hermit 1000C w/ Pros. Transducer DEPTH of PUMP/AIRLINE 252' wrt H.O.C 2.4

PUMPED WELL NO. Spring Creek #6

% SUBMERGENCE: initial ; pumping

RADIUS of PUMPED WELL

PUMP ON: date 6/1/98 time 0800

DISTANCE from PUMPED WELL

PUMP SET @ 351' PUMP OFF: date 6/11/98 time 1200

TIME $t =$ at $t' = 0$			WATER LEVEL DATA				H.O.C 2.4	WATER PRODUCT.	COMMENTS
CLOCK TIME	ELAPSED TIME mins hrs	t	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(ft or ft')			
0801		1			90.95	65.45		1200	BARD @ 7:30 30.16 EE
		2			95.25	69.75			
		3			96.24	70.74			
		4			96.87	71.37			
		5			97.28	71.78			
		6			97.43	71.93			
		7			98.25	72.75			
		8			98.31	72.81			
		9			99.91	74.41			
0840	10	10			99.75	74.25			
		12			99.88	74.38			
		14			100.38	74.88			Q↑
		16			101.04	75.54			
		18			101.19	75.69			
0820	20	20			102.35	76.85			
		22			102.39	76.89			
		24			101.95	76.45			Q↑
		26			102.42	76.92			
		28			102.89	77.39			
0830	30	30			102.54	77.04	1200		SAND <1 ml 35 minutes
		34			103.17	77.67			
		36			103.11	77.61			
0840	40	40			103.80	78.30			
		44			104.05	78.55			Q/S = 15.3
		48			104.08	78.58	1195		Q↑ @ 0900
		50			104.45	78.95			
0900	1	60			104.83	79.33			
0910	1	70			104.80	79.30	1200		
0920	1	80			105.67	80.17			
0930	1	90			105.64	80.14			
0940	1	100			106.27	80.77			
0950	1	110			105.36	79.86			Flow OK
1000	2	120			106.05	80.55			
1010	2	130			106.27	80.77			
1020	2	140			106.24	80.74			
1030	2	150			106.21	80.71			
1040		160			106.05	80.55			
1050		170			106.27	80.77			
1100	3	180			106.43	80.93	1200		FLOW OK

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL SPRING CREEK WELL #6

PUMPING/OBSERVATION WELL

PUMPING RECOVERY DATA

PAGE 2 OF 4

TYPE of PUMPING TEST CONSTANT Q DISCHARGE

HOW Q MEASURED FLOWMETER

M.P. for WL's TRANSDUCER elev.

HOW WL's MEASURED IN-SITU TRANSDUCER

DEPTH of PUMP/AIRLINE 252' wrt

PUMPED WELL NO. SC6 6" PUMP COLUMN 100HP Pump % SUBMERGENCE: initial 351'; pumping

RADIUS of PUMPED WELL

PUMP ON: date 6/2/98 time 0800

DISTANCE from PUMPED WELL

PUMP OFF: date 6/11/98 time 1200

TIME $t =$ at $t' = 0$			WATER LEVEL DATA STATIC WATER LEVEL 25.50				WATER PRODUCT.	COMMENTS
CLOCK TIME	ELAPSED TIME	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(S) or S'	Q/S	Q (gpm)	(NOTE ANY CHANGES IN OBSERVERS)
mins	hrs	t	t/t'					
1110	3 10	190		106.74	81.24			
1120	3 20	200		106.46	80.96		1200	FLOW OK
1130	3 30	210		106.58	81.08		1195+	QT @ 1135
1140	3 40	220		106.96	81.46			
1150	3 50	230		106.33	80.83		1200	FLOW OK
1200	4 -	240		106.96	81.46	14.7		
1220	4 20	260		106.87	81.37			
1240	4 40	280		107.27	81.77		1200	FLOW OK
1300	5 -	300		107.43	81.93			
1320	5 20	320		106.71	81.21			
1340	5 40	340		107.24	81.74		1200	FLOW OK
1400	6 -	360		107.24	81.74		1197+	QT
1420	6 20	380		107.24	81.74			
1440	6 40	400		107.40	81.90			
1500	7 -	420		107.12	81.62			
1520	7 20	440		107.34	81.84			
1540	7 40	460		106.66	81.16			
1600	8 -	480		106.49	80.99		1200 →	FLOW OK
1630	8 30	510		107.34	81.84			QT @ 1635
1700	9 -	540		106.90	81.40		1205	QT
1730	9 30	570		106.96	81.46			
1800	10 -	600		106.61	81.11			
1830	10 30	630		106.96	81.46		1205	FLOW OK
1900	11 -	660		107.46	81.96	14.6		
1930	11 30	690		107.30	81.80		1205	
2000	12 -	720		107.84	82.34			
2030	12 30	750		107.68	82.18		1205	MW
2100	13 -	780		107.77	82.27			
2130	13 30	810		107.68	82.18			
2200	14 -	840		107.52	82.02		1205	
2300	15 -	900		107.02	81.52			
2400	16 -	960		107.99	82.49		1205	
0200	18 -	1080		107.96	82.46			
0400	20 -	1200		108.12	82.62			
0600	22 -	1320		108.12	82.62			Q is ~ 1210 @ 0645
0800	24 -	1440		108.15	82.65			Bar = 30.12
1000	26 -	1560		107.71	82.21		1200	
1200	28 -	1680		108.37	82.87		1200	
1400	30 -	1800		108.06	82.56	14.53	1200	
1600	32 -	1920		108.78	82.68		1200	SC6

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL SPRING CREEK WELL #6

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 3 OF 4

TYPE OF PUMPING TEST CONSTANT Q DISCHARGE

HOW Q MEASURED FLOWMETER M.P. for WL's TRANSDUCER, elev.

HOW WL's MEASURED IN-SITU TRANSDUCER DEPTH of PUMP/AIRLINE 252 wrt

PUMPED WELL NO. SC6 PUMP COLUMN 6 PUMP %100 SUBMERGENCE: initial 351'; pumping

RADIUS of PUMPED WELL _____ PUMP ON: date 6/2/98 time 0800

DISTANCE from PUMPED WELL _____ PUMP OFF: date 6/11/98 time 1200

TIME $t =$ at $t = 0$			WATER LEVEL DATA			INPUT 1		WATER PRODUCT.		COMMENTS
CLOCK TIME	ELAPSED TIME mins hrs	t	READING	CONVERSIONS OF CORRECTIONS	WATER LEVEL	(S)ors'	Q/S	Q	(NOTE ANY CHANGES IN OBSERVERS)	
1800	34 -	2040			108.24	82.74			EE	
2040	36 -	2200			107.96	82.46			1205 - 1210	
2230	38 -	2310			107.93	82.43			MW	
0100	41	2460			108.21	82.71			1210	
0400	44	2640			108.43	82.93			1220	
0600	46	2760			108.43	82.93			1230	
0800	48	2880			108.53	83.03			1200 - 1210 JS	
1000	50	3000			108.68	83.18			1200	
1200	52	3120			108.21	82.71	14.51		SS	
1400	54	3240			108.75	83.25	14.41			
1600	56	3360			108.62	83.12	14.44			
1800	58	3480			108.15	82.65		1200 DD	BP - 30.38	
2000	60	3600			108.78	83.28			1205	
2200	62 -	3720			108.53	83.03			EE	
0000	64 -	3840			109.03	83.53			1210-15	
0240	66 -	4000			108.84	83.34			1220	
0540	69 -	4180			108.78	83.28			1220	
0800	72 -	4320			108.49	82.99	14.46		H2O SAMPLE SC6B @ 0700	
1100	75 -	4500			109.06	83.56	14.36		SS	
1420		4700			108.96	83.46	14.38			
1740		4900			109.12	83.62	14.35		JS	
2100		5100			109.34	83.84	14.31	1205	MW	
0020		5300			108.68	83.18		1205		
0340		5500			108.81	83.31		1205	MW	
0700	95 -	5700			109.37	83.87	14.31		SS	
1020	98 -	5900			108.75	83.25				
1340	101 -	6100			108.71	83.21	14.42			
1700	105 -	6300			109.72	84.22	14.25	1205	EE	
2020	108 -	6500	6480 @ 8:00PM = 108		109.15	83.65	14.35	1210		
2340	111 -	6700			109.40	83.90		1210 DD		
0500	117 -	7020			108.90	83.40		1215		
0940	121 -	7300	7200 @ 0800 6/7 : 120 HRS		109.03	83.53		1200	EE QT	
1440	126 -	7600			109.12	83.62		1205 DD		
1940	131 -	7900			109.59	84.09		1205 DD		
0040	136 -	8200			109.18	83.68		1205		
0540	141 -	8500			109.47	83.97		1215		
1040	146 -	8800			109.22	83.72		1200	EE QT	
1540	151 -	9100			109.12	83.62	14.41	1205	JH	
2040	156 -	9400	9360 @ 8:00PM 6/8 = 156 m		109.15	83.65		1200 JS		

SC6

WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

PUMPING TEST DATA

WELL SPRING CREEK WELL #6

PUMPING OBSERVATION WELL

PUMPING RECOVERY DATA

PAGE 4 OF 4

TYPE of PUMPING TEST CONSTANT Q DISCHARGE

HOW Q MEASURED

M P for WL's TRANSDUCER elev.

HOW WI'S MEASURED IN-SITU TRANSDUCER

DEPTH of PUMP/AIRLINE 252' wrt

NUMBER WELL NO. 5C1 / "Bump Counter" 100 HP BUMP

% SUBMERGENCE: initial 35' : pumping

PUMPED WELL NO. 3

BUMP ON: date 6/12/98 time 0800

RADIUS of PUMPED WELL _____

PUMP ON: date 8/27/15 time 1300

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL SSP #4

PUMPING/OBSERVATION WELL
PUMPING/RECOVERY DATA

PAGE 1 OF 4

TYPE of PUMPING TEST Constant Q

HOW Q MEASURED Flow meter M.P. for WL's elev.

HOW WL's MEASURED Hermit 1000 w/ Pres. Transducer DEPTH of PUMP/AIRLINE wrt

PUMPED WELL NO. Spring Creek #6 % SUBMERGENCE: initial ; pumping

RADIUS of PUMPED WELL PUMP ON: date 6/2/98 time 0800

DISTANCE from PUMPED WELL PUMP OFF: date 6/11/98 time 1200

TIME $t =$ at $t' = 0$			WATER LEVEL DATA STATIC WATER LEVEL 27.21 [24.41]			H.O.C. 2.8	WATER PRODUCT.	COMMENTS
CLOCK TIME	ELAPSED TIME mins hrs	t	READING	CONVERSIONS OF CORRECTIONS	WATER LEVEL	(Sors)	Q	(NOTE ANY CHANGES IN OBSERVERS)
0801		1			24.41	0.00		
		2			24.39	+0.02		
		3			24.39	+0.02		
		4			24.41	0.00		
		5			24.43	0.02		
		6			24.46	0.05		
		7			24.49	0.08		
		8			24.52	0.11		
		9			24.56	0.15		
		10			24.61	0.20		
		12			24.70	0.29		
		14			24.79	0.38		
		16			24.88	0.47		
		18			24.98	0.57		
		20			25.08	0.67		
		22			25.17	0.76		
		24			25.26	0.85		
		26			25.35			
		28			25.43	1.02		
		30			25.54	1.13		
		34			25.71	1.30		
		36			25.80	1.39		
		40			25.96	1.55		
		44			26.12	1.71		
		48			26.27	1.86		
		50			26.34	1.93		
0900	1 -	60			26.68	2.27		
0910	1 10	70			26.98	2.57		
0920	1 20	80			27.25	2.84		
0930	1 30	90			27.47	3.06		
		100			27.70	3.29		
		110			27.91	3.50		
1000	2 -	120			28.10	3.69		
		130			28.27	3.86		
		140			28.43	4.02		
		150			28.57	4.16		
		160			28.69	4.28		
		170			28.82	4.41		
		180			28.95	4.54		

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL SSP4 Mon Well

PUMPING / OBSERVATION WELL
PUMPING / RECOVERY DATA

PAGE 2 OF 4

TYPE of PUMPING TEST SC6 CONSTANT Q DISCHARGE

HOW Q MEASURED FLOWMETER

M.P. for WL's _____ elev. _____

HOW WL's MEASURED IN-SITU TRANSDUCER

DEPTH of PUMP/AIRLINE _____ wrt _____

PUMPED WELL NO. SC6

% SUBMERGENCE: initial _____; pumping _____

RADIUS of PUMPED WELL _____

PUMP ON: date 6/2/98 time 0800

DISTANCE from PUMPED WELL _____

PUMP OFF: date 6/11/98 time 1200

CLOCK TIME	TIME			WATER LEVEL DATA				WATER PRODUCT.	COMMENTS
	mins	hrs	t	t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(S) or S'	
1110	3	10	190				29.06	4.65	
1120	3	20	200				29.17	4.76	
1130	3	30	210				29.23	4.82	
1140	3	40	220				29.30	4.89	
1150	3	50	230				29.41	5.00	
1200	4	-	240				29.49	5.08	
1220	4	20	260				29.65	5.24	
1240	4	40	280				29.79	5.38	
1300	5	-	300				29.93	5.52	
1320	5	20	320				30.00	5.59	
1340	5	40	340				30.12	5.71	
1400	6	-	360				30.21	5.80	
1420	6	20	380				30.31	5.90	
1440	6	40	400				30.40	5.99	
1500	7	-	420				30.54	6.13	
1520	7	20	440				30.54	6.13	
1540	7	40	460				30.60	6.19	
1600	8	-	480				30.66	6.25	
1630	8	20	510				30.78	6.37	
1700	9	-	540				30.87	6.46	
1730	9	30	570				30.99	6.58	
1800	10	-	600				31.03	6.62	
1830	10	30	630				31.11	6.70	
1900	11	-	660				31.18	6.77	
1930	11	30	690				31.27	6.86	
2000	12	-	720				31.34	6.93	
2030	12	30	750				31.41	7.00	
2100	13	-	780				31.47	7.06	
2130	13	30	810				31.53	7.12	
2200	14	-	840				31.59	7.18	
2300	15	-	900				31.69	7.28	
2400	16	-	960				31.78	7.37	
0200	18	-	1080				31.94	7.53	
0400	20	-	1200				32.10	7.69	
0600	22	-	1320				32.23	7.82	
0800	24	-	1440				32.29	7.88	
1000	26	-	1560				32.28	7.87	
1200	28	-	1680				32.22	7.81	
1400	30	-	1800				32.15	7.74	
1600	32	-	1920				32.12	7.71	

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL SSP4 MON WELL

PUMPING / OBSERVATION WELL

PUMPING / RECOVERY DATA

PAGE 3 OF 4

TYPE of PUMPING TEST SC 6 CONSTANT Q DISCHARGE

HOW Q MEASURED FLOW METER

M.P. for WL's _____ elev. _____

HOW WL's MEASURED IN-SITU TRANSDUCER

DEPTH of PUMP/AIRLINE _____ wrt _____

PUMPED WELL NO. SC 6

% SUBMERGENCE: initial _____; pumping _____

RADIUS of PUMPED WELL _____

PUMP ON: date 6/2/98 time 0800

DISTANCE from PUMPED WELL _____

PUMP OFF: date 6/11/98 time 1200

TIME $t =$ at $t' = 0$			WATER LEVEL DATA STATIC WATER LEVEL 24.41				WATER PRODUCT.		COMMENTS
CLOCK TIME	ELAPSED TIME mins hrs	t	t'	READING	CONVERSIONS OF CORRECTIONS	WATER LEVEL	(S) or S'	Q	(NOTE ANY CHANGES IN OBSERVERS)
1800	34	2040				32.09	7.68		
2040	36	2200				32.06	7.65		
2230	38	2310				32.04	7.63		MW
2100	41	2460				32.00	7.59		
0400	44	2640		top of 6" casing		31.95	7.54		
0600	46	2760		2"		31.95	7.54		
0700	47	2820		34.50		31.96	7.55		
0800	48	2880		34.50		31.96	7.55		JS
1000	50	3000				31.98	7.57		
1030	50	3030		34.49		31.93	7.52		
1200	52	3120				31.97	7.56		SS
1400	54	3240				31.90	7.49		
1600	56	3360				31.84	7.43		
1800	58	3480				31.84	7.43		DD
2000	60	3600				31.87	7.46		
2200	62	3720				31.89	7.48		EE
0000	64	-	3840			31.90	7.49		
0240		4000				31.89	7.48		
0540	69	4180				31.92	7.51		
0800	72	4320				31.95	7.54		SS
1100	75	4500				31.93	7.52		
1420		4700		34.54	1.05	31.96	7.55		
1740		4900		34.68	+	32.14	7.73		JS
2100		5100				32.54	8.13		MW
0020		5300				32.66	8.25		
0340		5500				32.85	8.44		
0700		5700				33.06	8.65		SS
1020		5900				33.24	8.83		
1340		6100				33.29	8.88		
1700	105	-	6300			33.37	8.96		EE
2020	108	20	6500			33.51	9.10		
2340	111	40	6700			33.62	9.21		DD
0500	117		7020		36.33 +1.05	33.72	9.31 +1.56		"
0940	121	40	7300	MP Top 6" - 2.80'	33.98	33.88	9.47		EE SSP4 36.78 T.O.C.
1440	126	40	7600			33.91	9.50		
1940	131	40	7900			33.94	9.53		DD
0040	136	40	8200			33.72	9.31		
0540	141	40	8500			33.39	8.98		
1040	146	40	8800			33.13	8.72		EE

SPP4

WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

PUMPING TEST DATA

WELL SSP4

PUMPING OBSERVATION WELL

PUMPING RECOVERY DATA

PAGE 4 OF 4

TYPE of PUMPING TEST CONSTANT Q TEST

HOW Q MEASURED

HOW WI'S MEASURED IN-SITU TRANSDUCER

NUMBER MELTINGS Sixty Six #6

PUMPED WELL NO. SPRING CREEK F-8

RADIUS of PUMPED WELL _____

DISTANCE from PUMPED WELL _____

M.P. for WL's TRANSDUCER elev. _____

DEPTH of PUMP/AIRLINE _____ wrt _____

% SUBMERGENCE: initial : pumping

% SUBMERGENCE: initial _____, pumping _____
SWIMB ON: 11/13/98 TIME: 0800

PUMP ON : date 6/27/18 time 0000

PUMP OFF : date 6/11/98 time 1200

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL Big Well

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 1 OF 2

TYPE of PUMPING TEST Constant Q

HOW Q MEASURED Flow meter

M.P. for WL's T.O.C. elev.

HOW WL's MEASURED electric sounder

DEPTH of PUMP/AIRLINE wrt

PUMPED WELL NO. Spring Creek #6

% SUBMERGENCE: initial ; pumping

RADIUS of PUMPED WELL

PUMP ON: date 5/2/98 time 0800

DISTANCE from PUMPED WELL

PUMP OFF: date time

TIME $t =$ at $t' = 0$			WATER LEVEL DATA STATIC WATER LEVEL 30.85				WATER PRODUCT.		COMMENTS	
CLOCK TIME	ELAPSED TIME MM:SS	t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(S or S')		Q	(NOTE ANY CHANGES IN OBSERVERS)	
0810	00:10		30.85			0.00			BAR	
0833	00:33		30.85			0.00				
0915	07:55		30.88			0.03				
1000	12:00		30.92			0.07				
1043	16:33		30.95			0.10			EE	
1300	3:00		31.04			0.19				
1525	4:45		31.12			0.27				
1730	5:30		31.19			0.34				
2000	7:20		31.27			0.42			MW arrives	
2200	8:40		31.32			0.47			MW	
2345	9:45		31.34			0.49				
0330	11:70		31.40			0.55				
0747	14:27		31.49			0.64			RV	
0954	15:54		31.50			0.65				
1155	16:75		31.50			0.65				
1400	18:00		31.52			0.67			SS	
1600	19:20		31.54			0.69				
1905	21:05		31.58			0.73			EE	
2200	22:00		31.62			0.77			MW	
0045	24:45		31.65			0.80				
0630	27:00		31.72			0.87				
0930	29:30		31.74			0.89			JS	
1225	31:45		31.74			0.89				
1530	33:30		31.74			0.89				
1920	35:00		31.77			0.92			DO	
2335	38:15		31.82			0.97			EE	
0615	42:15		31.88			1.03				
1010	44:50		31.92			1.07			SS	
1415	46:55		31.99			1.04				
1930	50:10		31.93			1.08			JS	
2340	52:00		31.98			1.13			MW	
0340	55:00		31.97			1.12				
0820	57:00		32.03			1.18			SS	
1220	60:20		32.03			1.18				
1800	63:00		32.01			1.16			EE	
2330	66:00		32.05			1.20			DD	
0600	70:00		32.07			1.22				
1100	73:00		32.12			1.27			EE	
1440	76:00		32.09			1.24				

WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

PUMPING TEST DATA

WELL Big Well
PUMPING OBSERVATION WELL
PUMPING RECOVERY DATA
PAGE 2 OF 2

TYPE of PUMPING TEST CONSTANT Q TEST

HOW Q IS MEASURED

M.P. for WL's T.O.C. elev.

HOW WI'S MEASURED

DEPTH of PUMP/AIRLINE _____ wrt

PLUMBED WELL NO. : SPRING CREEK #6

% SUBMERGENCE : initial _____ ; pumping

RADIUS of PLUMBED WELL

PUMP ON : date 6/2/98 time 0800

DISTANCE from BURNED WELL

PUMP OFF : date _____ time _____

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL Big Well MW

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 1 OF 2

TYPE of PUMPING TEST Constant Q

HOW Q MEASURED Flow meter

HOW WL's MEASURED electric sounder

PUMPED WELL NO. Spring Creek #6

RADIUS of PUMPED WELL

DISTANCE from PUMPED WELL

M.P. for WL's SIDE HOLE IN CASING elev.

DEPTH of PUMP/AIRLINE wrt

% SUBMERGENCE: initial ; pumping

PUMP ON: date 6/2/98 time 0800

PUMP OFF: date 6/11/98 time 1200

TIME $t =$ at $t' = 0$			WATER LEVEL DATA STATIC WATER LEVEL 9.63				WATER PRODUCT.	COMMENTS
CLOCK TIME	ELAPSED TIME	t / t'	READING	CONVERSIONS OF CORRECTIONS	WATER LEVEL	(S) or S'	Q	(NOTE ANY CHANGES IN OBSERVERS)
0829	145 min	29	9.59			+0.04		RV
0912		72	9.64			0.01		
0956		116	9.72			0.09		
1046		166	9.77			0.14		EE
1310		310	9.89			0.26		
1532		452	10.00			0.37		
1735		575	10.07			0.44		
2005		725	10.17			0.54		
2210		850	10.23			0.60		MW chk mp
2350		950	10.24			0.61		
0335		1175	10.30			0.67		
0745		1425	10.40			0.77		RV
0950		1550	10.41			0.78		
1150		1670	10.41			0.78		
1357		1797	10.42			0.79		SS
1555		1915	10.47			0.84		
1910	35 min	2110	10.48			0.85		EE
2205		2285	10.56			0.93		MW
0850		2450	10.56			0.93		
0635		2790	10.63			1.00		
0935	49 min	2975	10.65			1.02		JS
1230	52 min	3150	10.67			1.04		SS
1535	55 min	3335	10.67			1.04		
1915	57 min	3555	10.67			1.04		DD
2340		3820	10.71			1.08		EE
0620	70 min	4220	10.80			1.17		
1015	74 min	4455	10.84			1.21		SS
1420		4700	10.83			1.20		
1935		5015	10.85			1.22		JS
2345		5265	10.90			1.27		MW
0345		5505	10.89			1.26		
0825		5785	10.93			1.35		SS
1225		6025	10.98			1.35		
1805	106 min	6365	10.92			1.29		EE
2335		6695	10.97			1.34		DD
0610		7090	10.97			1.34		
1105		7385	11.05			1.42		EE
1445		7605	11.01			1.38		

BWMW

WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

PUMPING TEST DATA

WELL BIG WELL MW

PUMPING / OBSERVATION WELL

PUMPING / RECOVERY DATA

PAGE 2 OF 2

TYPE of PUMPING TEST CONSTANT Q TEST

HOW Q MEASURED

FLOW METER

M.P. for WL's SIDE HOLE IN CASING elev.

HOW WI'S MEASURED ELECTRIC SPARKER

DEPTH of PUMP/AIRLINE _____ wrt

% SURMERGENCE : initial : pumping

PUMPED WELL NO. _____

78 SUBMERGENCE - Initial 1000, pump
PUMP ON 1000 1000 1000 1000

RADIUS of PUMPED WELL _____

PUMP ON : date 6/2/48 time 8000

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL SSP 2

PUMPING / OBSERVATION WELL

PUMPING / RECOVERY DATA

PAGE 1 OF 3

TYPE of PUMPING TEST Constant Q

HOW Q MEASURED Flow meter

M.P. for WL's TOP 6" CASING elev.

HOW WL's MEASURED electric sounder

DEPTH of PUMP/AIRLINE _____ wrt _____

PUMPED WELL NO. Spring Creek #6

% SUBMERGENCE: initial _____; pumping _____

RADIUS of PUMPED WELL _____

PUMP ON: date 6/2/98 time 0800

DISTANCE from PUMPED WELL _____

PUMP OFF: date 6/11/98 time 1200

CLOCK TIME mins hrs	ELAPSED TIME t	at t' = 0	WATER LEVEL DATA				WATER PRODUCT Q	COMMENTS (NOTE ANY CHANGES IN OBSERVERS)
			t / t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL		
0822	22			129.91		0.04		EV
0904	64			130.07		0.20		
0948	108			130.21		0.34		
1056	176			130.34		0.47		EE
1317	317			130.44		0.57		
1540	460			130.51		0.64		
1745	585			130.56		0.69		
2015	735			130.63		0.76		
2226	860			130.60		0.73		MW VV
2400	960			130.69		0.82		
0345	1185			130.72		0.85		
0730	1410			130.75		0.88		RV
0940	1540			130.75		0.88		
1140	1660			130.72		0.85		
1349	1789			130.72		0.85		SS
1549	3147	1909		130.78		0.91		
1920	3520	2120		130.83		0.96		EE
2200	2300			130.90		1.03		MW
0100	2460			130.92		1.05		
1645	2800			130.99		1.12		
0050	4950	2990		130.99		1.12		JS
1242	5242	3162		130.98		1.11		SS
1546	5546	3346		130.97		1.10		
1900	hrs 59	3540		130.99		1.12		DD
2348		3828		131.09		1.22		EE
0625	7025	4225		131.14		1.27		
1027	7427	4467		131.13		1.26		SS
1427		4707		131.08		1.21		
1950		5030		131.12		1.25		JS
2350		5270		131.19		1.32		MW
0400		5520		131.19		1.32		MW
0830		5790		131.22		1.35		SS
1235		6035		131.17		1.30		
1810	1010	6370		131.11		1.24		EE
2300		6610		131.21		1.34		DD
0550		7070		131.21		1.34		
1115		7395		131.28		1.41		EE
1455		7615		131.23		1.36		

SSPZ

WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

PUMPING TEST DATA

WELL SSPZ

PUMPING ~~OBSERVATION~~ WELL

PUMPING & RECOVERY DATA

PAGE 2 OF 2

TYPE of PUMPING TEST CONSTANT Q TEST

HOW Q MEASURED

M.P. for WL's TOP 6" CASING elev.

HOW WI'S MEASURED ELECTRIC SOUNDER

DEPTH of PUMP/AIRLINE _____ wrt

HOW WELL MEASURED SUMMER CREEK #6

% SUBMERGENCE: initial _____; pumping

PUMPED WELL NO. _____

BUMP ON: date 6/2/98 time 0800

RADIUS of PUMPED WELL _____

PUMP ON: date 8/27/98 time 1300

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

TYPE of PUMPING TEST Constant Q

HOW Q MEASURED Flow meter

HOW WL's MEASURED electric sounder

PUMPED WELL NO. Spring Creek #6

RADIUS of PUMPED WELL

DISTANCE from PUMPED WELL

WELL SSP2A

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 1 OF 2

M.P. for WL's TOP 6" CASING elev.

DEPTH of PUMP/AIRLINE _____ wrt _____

% SUBMERGENCE: initial _____; pumping _____

PUMP ON: date 6/2/98 time 0800

PUMP OFF: date 6/11/98 time 1200

CLOCK TIME	TIME		WATER LEVEL DATA				WATER PRODUCT	COMMENTS
	mins	hrs	t	t'	READING	CONVERSIONS OR CORRECTIONS		
0820			20		129.00		+0.01	
0905			65		129.00		+0.01	
0950			110		128.99		+0.02	
1058			178		128.99		+0.02	EE
1320			320		128.96		+0.05	
1542			462		128.95		+0.06	
1747			587		128.94		+0.07	
2017			737		128.96		+0.05	
2220			860		128.90		+0.11	MW
2400			960		128.90		+0.05	
0345			1185		128.95		+0.06	
0732			1412		128.95		+0.06	RV
0943			1543		128.95		+0.06	
1142			1662		128.94		+0.07	
1347			1787		128.93		+0.08	SS
1547	31	47	1907		128.95		+0.06	
1922	35	22	2122		128.96		+0.05	
2220			2300		129.00		+0.01	MW
0100			2460		129.00		+0.01	
0645			2800		129.03		0.02	
0945	44	45	2985		129.04		0.03	JS
1240	52	40	3160		129.03		0.02	SS
1545	55	45	3345		129.04		0.03	
1900	56	57	3540		129.04		0.03	DD
2350			3830		129.07		0.06	
0628	70	28	4228		129.09		0.08	
1025	74	25	4465		129.08		0.07	SS
1430			4710		129.06		0.05	
1945			5025		129.05		0.04	JS
2350			5270		129.06		0.05	MW
0400			5520		129.06		0.05	
0832			5792		129.05		0.04	SS
1232			6032		129.01		0.00	
1812	10b	12	6372		128.97		+0.04	EE
2300			6660		128.98		+0.03	DD
0550			7070		128.98		+0.03	
1115			7395		128.98		+0.03	EE
1455			7615		128.96		+0.05	

SSP2A

WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

PUMPING TEST DATA

WELL SSPZA

PUMPING OBSERVATION WELL

PUMPING RECOVERY DATA

PAGE 2 OF 2

TYPE of PUMPING TEST CONSTANT Q TEST

HOW Q MEASURED FLOWMETER

HOW WL's MEASURED ELECTRIC SOUNDER

SPURRED WELL NO. Special Case #6

PUMPED WELL NO. SPRING CREEK

RADIUS of PUMPED WELL _____

M.P. for WL's TOP 2" CASING elev. _____

DEPTH of PUMP/AIRLINE _____ wrt _____

% SUBMERGENCE: initial : pumping

BUMP ON: date 6/3/98 time 0800

PUMP ON: date 8/2/18 time 0800

PUMP OFF : date 6/11/98 time 1200

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

TYPE of PUMPING TEST Constant Q

HOW Q MEASURED Flow meter

M.P. for WL's _____ elev. _____

HOW WL's MEASURED electric sounder

DEPTH of PUMP/AIRLINE _____ wrt _____

PUMPED WELL NO. Spring Creek #6

% SUBMERGENCE: initial _____; pumping _____

RADIUS of PUMPED WELL _____

PUMP ON: date 6/12/98 time 0800

DISTANCE from PUMPED WELL _____

PUMP OFF: date 6/11/98 time 1200

WELL Ola reagg a MW
 PUMPING/OBSERVATION WELL (barrel)
 PUMPING/RECOVERY DATA

PAGE 1 OF 2

TIME $t =$ at $t' = 0$			WATER LEVEL DATA STATIC WATER LEVEL 39.92				WATER PRODUCT	COMMENTS
CLOCK TIME	ELAPSED TIME mins hrs	t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(S) or S'	Q	(NOTE ANY CHANGES IN OBSERVERS)
8:09		9			39.92	0.00		SS
8:42		42			39.88	+0.04		
9:20		80			39.87	+0.05		
9:47		107			39.87	+0.05		
10:30		150			39.87	+0.05		EE
12:25		265			39.89	+0.03		
14:30		390			39.89	+0.03		
16:45		525			39.92	+0.00		
18:50		650			39.88	+0.04		
22:40		880			39.90	+0.02		MW
00:10		970			39.88	+0.04		
04:00		1200			39.86	+0.06		
07:58		1438			39.86	+0.06		RV
10:00		1560			39.87	+0.05		
12:20		1700			39.88	+0.04		
14:06		1806			39.89	+0.03		SS
16:04		1924			39.89	+0.03		
19:40		2140			39.89	+0.03		
08:10		2890			39.91	+0.01		JS
11:05		3065			39.91	+0.01		
14:00		3240			39.94	0.02		
16:30		3390			39.96	0.04		
19:40		3580			39.97	0.05		
00:15		3855			39.99	0.08		EE
06:40		4240			39.96	0.04		
08:30		4350			39.97	0.05		SS
10:35		4475			39.97	0.05		
14:42		4722			39.97	0.05		
19:20		5000			39.95	0.03		JS
08:40		5800			39.94	0.02		SS
12:50		6050			39.94	0.02		
18:25		6385			39.87	+0.05		EE
20:45		6705			39.86	+0.06		DD
06:20		7100			39.85	+0.07		
11:36		7410			39.86	+0.06		EE
15:20		7640			39.84	+0.08		
20:30		7950			39.87	+0.05		DD
05:50		8510			39.88	+0.04		
11:16		8830			39.91	+0.01		EE

OMW

WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

PUMPING TEST DATA

WELL OLAREAGGA MON WELL
PUMPING OBSERVATION WELL (BARRE)
PUMPING RECOVERY DATA
PAGE 2 OF 2

TYPE of PUMPING TEST CONSTANT Q TEST

HOW Q MEASURED FLOW METER M.P. for WL's TOP CASING elev. _____
HOW WL's MEASURED ELECTRIC SOUNDER DEPTH of PUMP/AIRLINE _____ wrt _____
PUMPED WELL NO. SPRING CREEK #6 % SUBMERGENCE: initial _____; pumping _____
RADIUS of PUMPED WELL _____ PUMP ON: date 6/2/98 time 0800
DISTANCE from PUMPED WELL _____ PUMP OFF: date 6/11/98 time 1200

WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

PUMPING TEST DATA

(*) Do Not measure between
10pm and 6 a.m.
WELL Olareagga Domestic
PUMPING OBSERVATION WELL (Shec)
PUMPING RECOVERY DATA
PAGE | OF |

TYPE of PUMPING TEST Constant Q

HOW Q MEASURED

HOW WL'S MEASURED: electric sounder

PUMPED WELL NO Spring Creek #6

RADIUS of BUMBED WELL

DISTANCE from PUMPER WELL

M.P. for WL's _____ elev. _____

elev

DEPTH of PUMP/AIRLINE _____ wrt _____

art

% SUBMERGENCE : initial : pumping

110

BUMP SN: date 6/2/98 time 2:30P

3

PUMP ON: date 5/2/16 time 00:00

3

PUMP OFF : date _____ time _____

1

WATER

1

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

TYPE of PUMPING TEST BAROMETRIC READINGS

HOW Q MEASURED _____ M.P. for WL's _____ elev. _____

HOW WL's MEASURED _____ DEPTH of PUMP/AIRLINE _____ wrt _____

PUMPED WELL NO. _____ % SUBMERGENCE: initial _____ ; pumping _____

RADIUS of PUMPED WELL _____ PUMP ON: date 6/2/98 time 0800

DISTANCE from PUMPED WELL _____ PUMP OFF: date _____ time _____

WELL SPRING CREEK #6

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE _____ OF _____

CLOCK TIME	TIME			WATER LEVEL DATA				WATER PRODUCT.	COMMENTS
	ELAPSED TIME mins	at t = 0 hrs	t	t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL		
0730					6/2/98	30.16			EE
1200		240			"	30.16			
1500		420			"	30.13			
1915		675			"	30.12			
2130		810			"	30.15			
0645		1365			6/3	30.12			RV
1100		1620				30.10			
1238		1718				30.08			SS
1525		1885				30.09			
2000	36	2160				30.10			EE
0600		2760				30.15			
1000	50	3200				30.18			JS
1315		3195				30.20			SS
1610		3370				30.20			
1800		3480				30.20			DD
2000		3600				30.19			
2200		3720				30.21			EE
0700		4260				30.22			
0940		4420				30.25			SS
2300		5220				30.20			MW
0855		5815				30.17			SS
1200		6000				30.15			
1400		6120				30.12			
1500		6180				30.10			
1900		6420				30.08			EE
2100		6540				30.11			
0000		6720				30.11			DD
0500		7020				30.09			
0900		7260				30.11			EE
1400		7560				30.10			
2030		7950				30.12			DD
0530		8490				30.13			
1130		8850				30.14			EE
1745		9225				30.12			EE
0140		9700				30.16			JS
0640		10,000				30.18			
0820		10,100				30.21			RV
1630		10,590				30.19			SS
1830		10,710				30.16			
		11,100				30.12			

(PLEASE PRINT OR TYPE)

RECEIVED

98 JUN 15 AM 11:46

NEVADA DIVISION OF HEALTH

1660 N. Virginia Street
Reno, Nevada 89503

(702) 688-1335

133365

WATER CHEMISTRY ANALYSIS:

ANALYSIS FEES MAY APPLY TO SOME TYPES OF SAMPLES.

TYPE OF ANALYSIS:

 Check here for ROUTINE DOMESTIC ANALYSIS.
Circle the constituents needed for PARTIAL ANALYSIS.

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by John Hulett Date 6-15-98
 Owner NCWD Phone _____
 Address P.O. Box 1130
 City Reno State NV

REPORT TO:

Name Terri Stetich
 Address P.O. Box 1130
 City Reno
 State NV Zip 89520-0027

All of the information below must be filled in
or the analysis will not be performed.

State NV County WASHOE
 Township 20 Range 21 Section 7
 General Location Spring Creek East System
 Source Address Spring Creek East #6
 New well

REASON FOR ANALYSIS:

- Loan
 Personal health reasons
 Purchase of the property
 Rental or sale of property
 Subdivision approval
 Other SDWA

USE OF WATER:

- Domestic drinking water
 Geothermal
 Industrial or mining
 Irrigation
 Other

Initials

SOURCE OF WATER:

Filter Yes No
 Public Yes No
 Spring _____
 Well Depth _____ ft.
 Hot Cold Depth _____ ft.
 IN USE Yes No
 Type G.W.
 Name 800-
 Surface Casing diameterin.
 Casing depthft.

The results below are representative only of the sample submitted to this laboratory.

Constituent	ppm	FOR LABORATORY USE ONLY				S.U.	PRINT OTHER DESIRED CONSTITUENTS BELOW	
		Constituent	ppm	Constituent	ppm		Constituent	ppm
J.S. @ 103° C.	133	Chloride	4	Iron	0.15	Color	Sb	
Hardness	32	Nitrate -N	1.8	Manganese	0.01	Turbidity	Be	
Calcium	8	Alkalinity	80	Copper	0.00	pH	Cd	
Magnesium	3	Bicarbonate	88	Zinc	0.01	EC	Cr	
Sodium	33	Carbonate	5	Barium	0.02	SI@20C -0.42	Hg	
Potassium	5	Fluoride	0.20	Boron	0.1		Se	
Sulfate	17	Arsenic	0.003	Silica	37		Tl	
CN	<0.01	MBAS	<0.1	NO ₂	<0.1	Gross A	Pb	
						Gross B	Ni	

Fee _____

Remarks PO # 107879

Collected by 800 6/19/98

PWS I.D. _____

SDWA-Pri. _____

2nd _____ 3rd _____

Da. _____ Init. _____

Units _____ milligrams per liter



Alpha Analytical, Inc.

155 Glendale Avenue, Suite 21
Sparks, Nevada 89431
(702) 355-1044
FAX: (702) 355-0406
1-800-283-1183

RECEIVED Las Vegas, Nevada
(702) 498-3312
JUL 07 1998 FAX: (702) 736-7523
Sacramento, California
WASHOE COUNTY, 916) 366-9089
DEPT. OF WATER RESOURCES FAX: (916) 366-9138

ANALYTICAL REPORT

CLIENT: Washoe County Utility Division
P.O. Box 11130
Reno, NV 89520
Attn: Terry Svetich
PWS/DWR#: 800

Client Sample ID: Spring Creek # 6

Lab Sample ID: 98061508-01A

Date Sampled: 6/15/98

Date Received: 6/15/98

Matrix: DRINKING WATER

National Primary Drinking Water Phase II and Phase V - Regulated and Unregulated Synthetic Organic Compounds (SOCs)

Analyte	Result	R.L.	Units	Date Analyzed	Analyte	Result	R.L.	Units	Date Analyzed
E504.1 EDB AND DBCP					E525.2 SVOCS BY GCMS				
1,2-Dibromo-3-chloropropane	ND	0.02	µg/L	6/20/98	Alachlor	ND	0.2	µg/L	6/29/98
1,2-Dibromoethane	ND	0.01	µg/L	6/20/98	Atrazine	ND	0.1	µg/L	6/29/98
E505 ORGANOHALIDE PESTICIDES AND PCBs					Benz(a)pyrene	ND	0.02	µg/L	6/29/98
Hexachlorocyclopentadiene	ND	0.1	µg/L	6/23/98	bis(2-Ethylhexyl)phthalate	ND	0.6	µg/L	6/29/98
Hexachlorobenzene	ND	0.1	µg/L	6/23/98	bis(2-Ethylhexyl)adipate	ND	0.6	µg/L	6/29/98
gamma-BHC	ND	0.02	µg/L	6/23/98	Butachlor	ND	1.0	µg/L	6/29/98
Alachlor	ND	0.2	µg/L	6/23/98	Metolachlor	ND	1.0	µg/L	6/29/98
Heptachlor	ND	0.04	µg/L	6/23/98	Metribuzin	ND	1.0	µg/L	6/29/98
Aldrin	ND	0.2	µg/L	6/23/98	Propachlor	ND	1.0	µg/L	6/29/98
Heptachlor epoxide	ND	0.02	µg/L	6/23/98	Simazine	ND	0.07	µg/L	6/29/98
Dieldrin	ND	0.2	µg/L	6/23/98	E531.1 CARBAMATES				
Endrin	ND	0.01	µg/L	6/23/98	Aldicarb	ND	0.5	µg/L	6/17/98
Methoxychlor	ND	0.1	µg/L	6/23/98	Aldicarb sulfoxide	ND	0.5	µg/L	6/17/98
Chlordane	ND	0.2	µg/L	6/23/98	Aldicarb sulfone	ND	0.8	µg/L	6/17/98
Toxaphene	ND	1.0	µg/L	6/23/98	Carbaryl	ND	1.0	µg/L	6/17/98
Aroclor 1016	ND	0.08	µg/L	6/23/98	Carbofuran	ND	0.9	µg/L	6/17/98
Aroclor 1221	ND	20	µg/L	6/23/98	3-Hydroxycarbofuran	ND	1.0	µg/L	6/17/98
Aroclor 1232	ND	0.5	µg/L	6/23/98	Methomyl	ND	1.0	µg/L	6/17/98
Aroclor 1242	ND	0.3	µg/L	6/23/98	Oxamyl	ND	2.0	µg/L	6/17/98
Aroclor 1248	ND	0.1	µg/L	6/23/98	E547 GLYPHOSATE				
Aroclor 1254	ND	0.1	µg/L	6/23/98	Glyphosate	ND	6.0	µg/L	6/18/98
Aroclor 1260	ND	0.2	µg/L	6/23/98	E548.1 ENDOTHALL				
E515.1 CHLORINATED ACID HERBICIDES					Endothall	ND	9.0	µg/L	6/18/98
Dalapon	ND	1.0	µg/L	6/25/98	E549.1 DIQUAT/PARAQUAT				
Dicamba	ND	0.5	µg/L	6/25/98	Diquat	ND	0.4	µg/L	6/19/98
2,4-D	ND	0.1	µg/L	6/25/98					
PCP	ND	0.04	µg/L	6/25/98					
2,4,5-TP	ND	0.2	µg/L	6/25/98					
Dinoseb	ND	0.2	µg/L	6/25/98					
Pichloram	ND	0.1	µg/L	6/25/98					

ND = Not Detected

Approved By:

Walter Hinchman

Walter Hinchman
Quality Assurance Officer

Date: 7/2/98



Alpha Analytical, Inc.

255 Glendale Avenue, Suite 21
Sparks, Nevada 89431
(702) 355-1044
FAX: (702) 355-0406
1-800-283-1183

e-mail: alpha@powernet.net
<http://www.powernet.net/~alpha>

Las Vegas, Nevada
(702) 498-3312
FAX: (702) 736-7523
Sacramento, California
(916) 366-9089
FAX: (916) 366-9138

RECEIVED ANALYTICAL REPORT

JUL 07 1998

Washoe County Utility Division
P.O. Box 11130
Reno, NV 89520

WASHOE COUNTY
DEPT. OF WATER RESOURCES

Job#: 143874
Phone: 954-4600
Attn: Terri Svetich

Client ID: Spring Creek #6
Lab ID: WCU98061508-01

Sampled: 06/15/98
Received: 06/15/98

Analyzed: 06/19/98

SDWA VOLATILES PLUS LISTS 1 AND 3 UNREGULATED COMPOUNDS EPA 524.2

Compound	Concentration ug/L	RL ug/L	Compound	Concentration ug/L	RL ug/L	
1 Benzene	ND	0.50	28 Chloroform	ND	0.50	
2 Vinyl Chloride	ND	0.50	29 Chloromethane	ND	0.50	
3 Carbon tetrachloride	ND	0.50	30 o-Chlorotoluene	ND	0.50	
4 1,2-Dichloroethane	ND	0.50	31 p-Chlorotoluene	ND	0.50	
5 Trichloroethylene	ND	0.50	32 Dibromomethane	ND	0.50	
6 p-Dichlorobenzene	ND	0.50	33 m-Dichlorobenzene	ND	0.50	
7 1,1-Dichloroethylene	ND	0.50	34 1,1-Dichloroethane	ND	0.50	
8 1,1,1-Trichloroethane	ND	0.50	35 1,1-Dichloropropene	ND	0.50	
10 Regulated Volatile Organic Compounds (VOC's) (Phase II)						
9 Cis-1,2-Dichloroethylene	ND	0.50	36 1,3-Dichloropropane	ND	0.50	
10 1,2-Dichloropropane	ND	0.50	37 e,z-1,3-Dichloropropene	ND	0.50	
11 Ethylbenzene	ND	0.50	38 2,2-Dichloropropane	ND	0.50	
12 Monochlorobenzene	ND	0.50	39 1,1,1,2-Tetrachloroethane	ND	0.50	
13 o-Dichlorobenzene	ND	0.50	40 1,1,2,2-Tetrachloroethane	ND	0.50	
14 Styrene	ND	0.50	41 1,2,3-Trichloropropane	ND	0.50	
15 Tetrachloroethylene	ND	0.50	List 3 - Monitoring Required at State Discretion			
16 Toluene	ND	0.50	42 Bromochloromethane	ND	0.50	
17 Trans-1,2-Dichloroethylene	ND	0.50	43 n-Butylbenzene	ND	0.50	
18 Xylenes (total)	ND	0.50	44 Dichlorodifluoromethane	ND	0.50	
3 Regulated Volatile Organic Compounds (VOC's) (Phase V)						
19 Dichloromethane	ND	0.50	45 Fluorotrichloromethane	ND	0.50	
20 1,1,2-Trichloroethane	ND	0.50	46 Hexachlorobutadiene	ND	0.50	
21 1,2,4-Trichlorobenzene	ND	0.50	47 Isopropylbenzene	ND	0.50	
List 1 - Unregulated Compounds - All Systems						
22 Bromobenzene	ND	0.50	48 p-Isopropyltoluene	ND	0.50	
23 Bromodichloromethane	ND	0.50	49 Naphthalene	ND	0.50	
24 Bromoform	ND	0.50	50 n-Propylbenzene	ND	0.50	
25 Bromomethane	ND	0.50	51 sec-Butylbenzene	ND	0.50	
26 Chlorodibromomethane	ND	0.50	52 tert-Butylbenzene	ND	0.50	
27 Chloroethane	ND	0.50	53 1,2,3-Trichlorobenzene	ND	0.50	
			54 1,2,4-Trimethylbenzene	ND	0.50	
			55 1,3,5-Trimethylbenzene	ND	0.50	
			ND-Not Detected			
			RL-Reporting Limit			

Approved by:

Roger Scholl

Date: 6/24/98

Roger L. Scholl, Ph.D.
Laboratory Director

RECEIVED

JUN-3 PM 2:05

1660 N. Virginia Street

Reno, Nevada 89503

(702) 688-1335

138159

WATER CHEMISTRY ANALYSIS:

Fees may apply to some types of samples.

TYPE OF ANALYSIS:

 Check here for ROUTINE DOMESTIC ANALYSIS.
Circle the constituents needed for PARTIAL ANALYSIS.

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by R. Van Hoozer Date 6/3/98
 Owner WASHOE COUNTY Phone 954-4600
 Address P.O. Box 11130
 City RENO State NV

REPORT TO:

Name E.D. EVANS : WASHOE COUNTY DEPT. OF WATER RES.

Address P.O. Box 11130

City RENO

State NV

Zip 89520

All of the information below must be filled in
or the analysis will not be performed.

State NEVADA County WASHOE
 Township 20N Range 21E Section 7
 General Location SPANISH SPRINGS
 Source Address 1/4 MILE EAST OF WINGFIELD SPRINGS SURVEYOR

REASON FOR ANALYSIS:

- | | |
|--|--|
| <input type="checkbox"/> Loan | <input type="checkbox"/> Domestic drinking water |
| <input type="checkbox"/> Personal health reasons | <input type="checkbox"/> Geothermal |
| <input type="checkbox"/> Purchase of the property | <input type="checkbox"/> Industrial or mining |
| <input type="checkbox"/> Rental or sale of property | <input type="checkbox"/> Irrigation |
| <input type="checkbox"/> Subdivision approval | <input checked="" type="checkbox"/> Other MUNICIPAL SUPPLY |
| <input checked="" type="checkbox"/> Other Municipal Water Supply | Initials SCL |

USE OF WATER:

SOURCE OF WATER:

Filter Yes No
 Public Yes No
 Spring
 Well Depth 800 ft. Casing diameter 12 in.
 Hot Cold
 IN USE Yes No

Type Ground Water

Name Spring Creek Well #6

Surface

Casing diameter 12 in.

Casing depth 800 ft.

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY							PRINT OTHER DESIRED CONSTITUENTS BELOW	
Constituent	ppm	Constituent	ppm	Constituent	ppm	S.U.	Constituent	ppm
T.D.S. @ 70°C.	154	Chloride	7	Iron	0.03	Color	3	
Hardness	32	Nitrate -N	1.8	Manganese	0.00	Turbidity	0.3	
Calcium	8	Alkalinity	78	Copper	0.00	pH	8.20	
Magnesium	3	Bicarbonate	85	Zinc	0.00	EC	227	
Sodium	34	Carbonate	5	Barium	0.00	SI@20C -0.51		
Potassium	5	Fluoride	0.19	Boron	0.0			
Sulfate	12	Arsenic < 0.003		Silica	39			

Fee.....

Remarks P.O. 167879

Collected by.....

PWS I.D.

SDWA-Pri.

1st..... 2nd..... 3rd.....

Date Rec'd. Init.

ppm = parts per million, milligrams per liter

S.U. = Standard Units

RESULTS REPORTED

6/18/98

JUN 22 1998

NEVADA DIVISION OF HEALTH

1660 N. Virginia Street

Reno, Nevada 89503

(702) 688-1335

JUN-3 AM 9:08

138165

All of the information below must be filled in
or the analysis will not be performed.

State... NEVADA County... Washoe
 Township... ZON Range... ZIE Section... 7
 General Location... SPANISH SPRINGS
 Source Address... 1/4 MILE EAST OF WINSFIELD SPRINGS SUBDIVISION

REASON FOR ANALYSIS: USE OF WATER:

- | | |
|--|---|
| <input type="checkbox"/> Loan | <input type="checkbox"/> Domestic drinking water |
| <input type="checkbox"/> Personal health reasons | <input type="checkbox"/> Geothermal |
| <input type="checkbox"/> Purchase of the property | <input type="checkbox"/> Industrial or mining |
| <input type="checkbox"/> Rental or sale of property | <input type="checkbox"/> Irrigation |
| <input type="checkbox"/> Subdivision approval | <input checked="" type="checkbox"/> Other MUNICIPAL WATER |
| <input checked="" type="checkbox"/> Other MUNICIPAL WATER Supply
New Well | Initials... SCB |

SOURCE OF WATER:

Filter <input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Type...
Public <input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Name...
Spring		Surface
Well <input checked="" type="checkbox"/>	Depth 800 ft.	Casing diameter 17 in.
Hot.....	Cold <input checked="" type="checkbox"/>	Casing depth 800 ft.
IN USE <input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	

The results below are representative only of the sample submitted to this laboratory.

Constituent	172 ppm	0.58 Constituent	FOR LABORATORY USE ONLY			-391 ppm	138165 Constituent	S.U.	PRINT OTHER DESIRED CONSTITUENTS BELOW	
			18.0 ppm	4.0 Constituent	0.0 Constituent				Constituent	ppm
T.D.S. @ 93°C. 86	133	Chloride	6	Iron	0.06	Color	3			
Hardness	32	Nitrate -N	3.5	Manganese	0.00	Turbidity	0.2			
Calcium	8	Alkalinity	80	Copper	0.00	pH	8.15			
Magnesium	3	Bicarbonate	98	Zinc	0.00	EC	229			
Sodium	33	Carbonate	0	Barium	0.01	Si620C	-0.53			
Potassium	6	Fluoride	0.20	Boron	0.1					
Sulfate	15	Arsenic	< 0.003	Silica	39					

Fee.....
 Collected by.....
 PWS I.D.
 SDWA—Pri.
 Sec.
 1st.... 2nd.... 3rd....
 Date Rec'd. Init.
 ppm = parts per million, milligrams per liter
 S.U. = Standard Units

Remarks... P.O.F 167879

6/25/98

RESULTS RECEIVED

JUN 29 1998

>>> Welenco. Inc.>>>
DIRECTIONAL SURVEY

Date: 11-11-1997

Company : LANG EXPLORATORY DRILLING
Well No : SPRING CREEK #6
Field : SPANISH SPRINGS
State : NEVADA
Witnessed By: DAN DRAGON County: WASHOE
Location : SPANISH SPRINGS Rec. By: ROBERTI
Remarks : RBTSN GYRO TOOL #2536
OTHER SERVICES: S.S. VIDEO

Measured Depth, Feet	Incli- nation, Degrees	Direc- tion, True	Course Deviation, Degrees	True Vertical Feet	Closure Depth, Feet	Closure Distance, Feet	Bearing, True Degrees
0	0.0	0	0.00	0.00	0.00	0.00	0.0
50	0.2	102	0.09	50.00	0.09	102.0	
100	0.2	236	0.17	100.00	0.13	130.9	
150	0.2	285	0.17	150.00	0.13	207.6	
200	0.3	158	0.22	200.00	0.23	204.0	
250	0.1	112	0.17	250.00	0.35	180.7	
300	0.1	293	0.09	300.00	0.35	180.6	
350	0.3	188	0.17	350.00	0.46	187.7	
400	0.2	198	0.22	400.00	0.68	189.1	
450	0.1	216	0.13	450.00	0.81	191.4	
500	0.1	172	0.09	500.00	0.89	191.7	
550	0.2	137	0.13	550.00	0.98	186.7	
600	0.3	136	0.22	600.00	1.13	178.2	
650	0.3	154	0.26	650.00	1.36	172.2	
700	0.2	208	0.22	700.00	1.55	172.6	
750	0.2	198	0.17	750.00	1.71	175.5	
790	0.2	140	0.14	789.99	1.83	175.1	

Equip.: L-17 Office: BFL Job No.: 28735

Calculation Method: Balanced Tangential

Company:

LANG EXPLORATORY DRILLING

Well #:

SPRING CREEK #6

Date: 11-11-1997

PLANE OF
CLOSURE 0 90 DEGREES

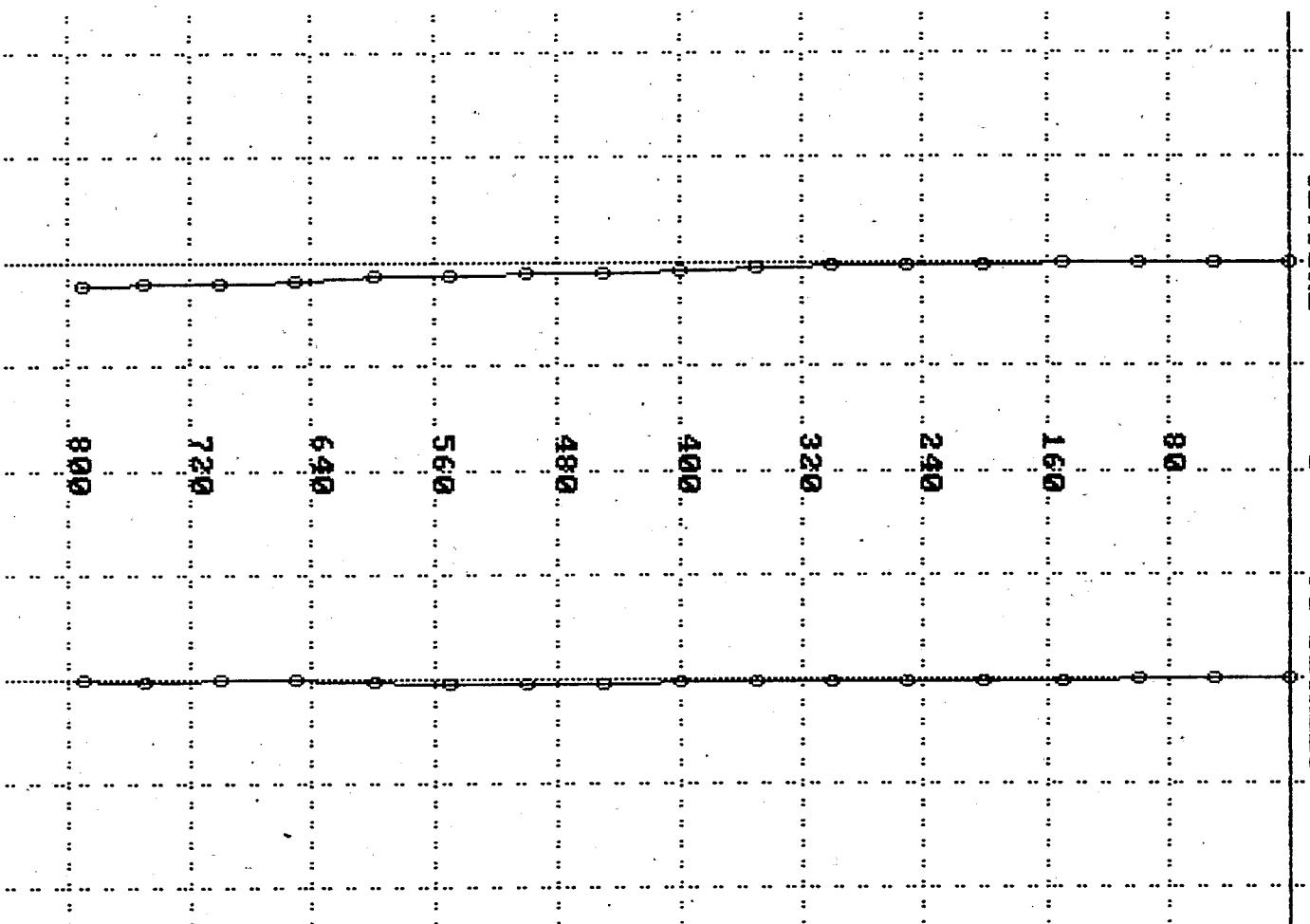
ROTATED

VERTICAL SECTION

Vert Scale = 80 Ft/Div
Horz Scale = 8 Ft/Div

CLOSURE

Distance: 1.83 FEET
Bearing: 175.1 DEGREES
T.U.D.: 789.99 FEET



Calc. Method:

Reflux Tangent

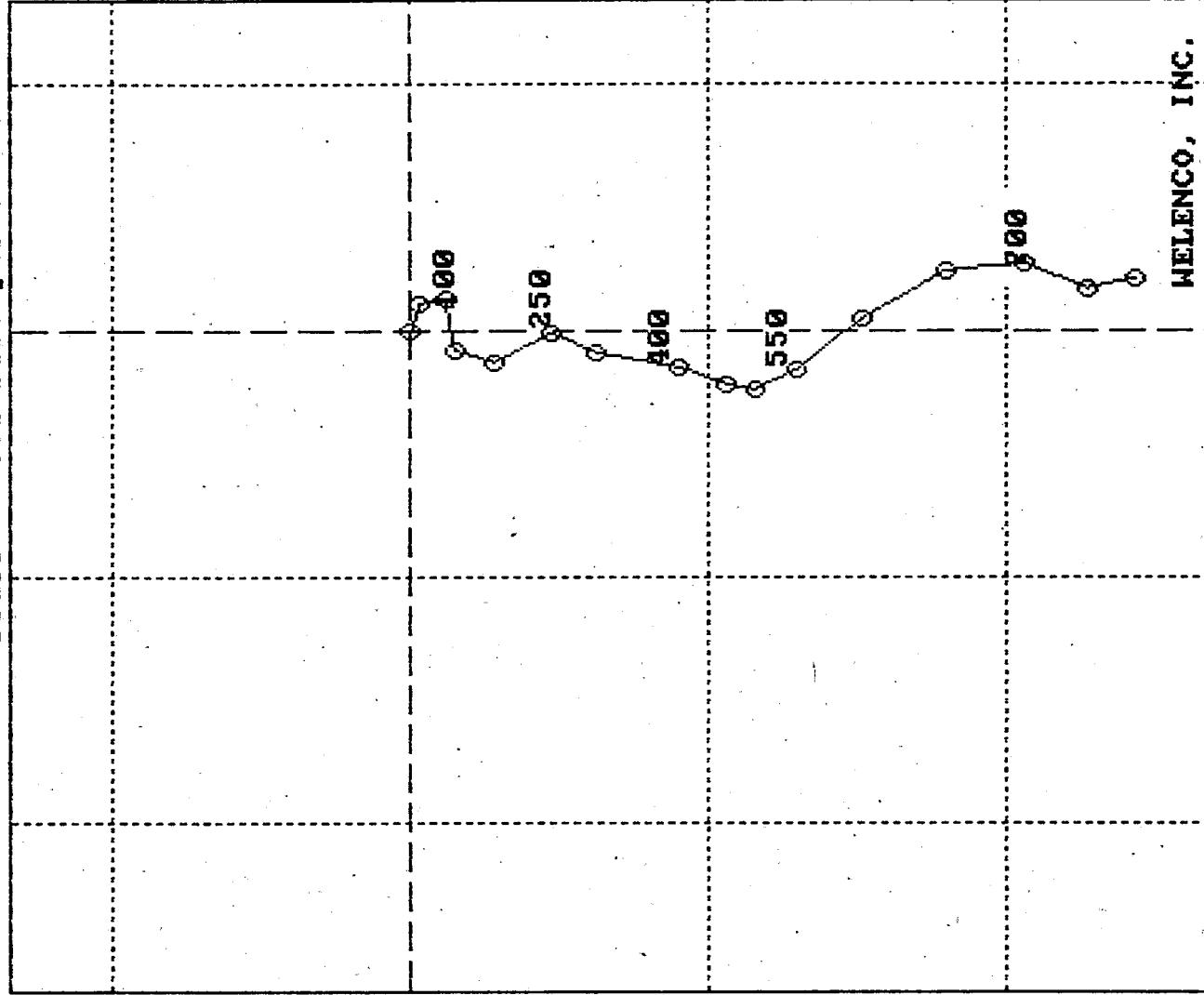
Company: LANG EXPLORATORY DRILLING

PLAN VIEW

Well #: SPRING CREEK #6

Date: 11-11-1997

Scale = .75 Feet per Division



CLOSURE

Distance: 1.83 FEET

Bearing: 175.1 DEGREES

T.V.D.: 789.99 FEET

Calc. Method
Balanced Tangential

WELLENCO, INC.

DRILLING BUDGET
SPRING CREEK WELL # 6
June, 1998

ITEM	Quantity	Unit	Unit Price	Quantity	Cost	SC #6
1 Mobilize-Demobilize	1	Each	18500.00	1	18500.00	
2 Drill 26" Borehole	100	Lineal Foot	165.00	100	16500.00	
3 22" Conductor Casing	101	Lineal Foot	65.00	101	6565.00	
4 Sanitary Seal	100	Lineal Foot	41.00	100	4100.00	
5 Drill 18" Borehole	700	Lineal Foot	82.00	695	56990.00	
6 12" Blank Casing	450	Lineal Foot	35.00	458	16030.00	
7 12" Wire Wrap	350	Lineal Foot	47.00	341	16027.00	
8 Gravel Pack	35	Cubic Yard	390.00	28	10920.00	
9 Air Lift Development	40	Hour	375.00	20	7500.00	
10 Pumping Develop.	24	Hour	210.00	10	2100.00	
11 Test Pumping	250	Hour	180.00	228	41040.00	
12 Video Survey	1	Each	1100.00	1	1100.00	
13 Plumbness Test	1	Each	1500.00	1	1500.00	
14 Disinfect/Capping	1	Each	500.00	1	500.00	
15 Stand By	10	Hour	240.00	0	0.00	
					Total	99372.00

ITEM	Quantity	Unit	Unit Price	Qty Pay Period 1	Cost SC6 Pay Period 1	Qty Pay Period 2	Cost SC6 Pay Period 2	Qty Pay Period 3	Cost SC6 Pay Period 3	Bid Item Remaining	Percent Item Used
1 Mobilize-Demobilize	1	Each	18500.00	1	18500.00	0	0.00	0	0.00	0	100
2 Drill 26" Borehole	100	Lineal Foot	165.00	100	16500.00	0	0.00	0	0.00	0	100
3 22" Conductor Casing	101	Lineal Foot	65.00	101	6565.00	0	0.00	0	0.00	0	100
4 Sanitary Seal	100	Lineal Foot	41.00	100	4100.00	0	0.00	0	0.00	0	100
5 Drill 18" Borehole	700	Lineal Foot	82.00	695	56990.00	0	0.00	0	0.00	5	99
6 12" Blank Casing	450	Lineal Foot	35.00	458	16030.00	0	0.00	0	0.00	-8	102
7 12" Wire Wrap	350	Lineal Foot	47.00	341	16027.00	0	0.00	0	0.00	9	97
8 Gravel Pack	35	Cubic Yard	390.00	28	10920.00	0	0.00	0	0.00	7	80
9 Air Lift Development	40	Hour	375.00	20	7500.00	0	0.00	0	0.00	20	50
10 Pumping Develop.	24	Hour	210.00	0	0.00	0	0.00	10	2100.00	14	42
11 Test Pumping	250	Hour	180.00	0	0.00	0	0.00	228	41040.00	22	91
12 Video Survey	1	Each	1100.00	0	0.00	1	1100.00	0	0.00	0	100
13 Plumbness Test	1	Each	1500.00	0	0.00	1	1500.00	0	0.00	0	100
14 Disinfect/Capping	1	Each	500.00	1	500.00	0	0.00	0	0.00	0	100
15 Stand By	10	Hour	240.00	0	0.00	0	0.00	0	0.00	10	0
Pay Per 1	153632.00					Pay Per 2	2600.00			Pay Per 3	43140.00
BUDGET USED						BUDGET USED	199372.00			BUDGET USED	199372.00
BID AMOUNT						BID AMOUNT	219455.00			BID AMOUNT	219455.00
BUDGET REQUESTED						BUDGET REQUESTED	200183.00			BUDGET REQUESTED	200183.00