

1506-00037

PEEK AND TURNER WELLS
WELL REHABILITATION AND TESTING

December 1994

WASHOE COUNTY
DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

P.O. BOX 11130 RENO, NEVADA 89520



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December 1994

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SUMMARY

The Peek and Turney Wells were rehabilitated and tested for yield and water quality by Washoe County in 1994. Video logs show both wells are properly constructed for pumping or injection use. Step drawdown, constant discharge and recovery tests were done at each well. The Peek Well has a transmissivity of 11,350 gallons per day per foot (gpd/ft) and a hydraulic conductivity of 6 feet per day (ft/day). The Turney Well has a transmissivity of 5,800 gpd/ft and a hydraulic conductivity of 3 ft/day.

The Peek Well can pump 500 gallons per minute (gpm) from a pumping level of 144 feet with 105 feet of drawdown after 30 days of pumping. Well efficiency is 66% at 500 gpm. The Turney Well can pump 300 gpm from a pumping level of 162 feet with a 117 feet of drawdown after 30 days of pumping. Well efficiency is 40 % at 300 gpm. Simultaneous pumping would require reducing the pumping rate to 450 gpm in the Peek Well and 250 gpm in the Turney Well. Both wells were sand free at the end of testing. Water quality in each well meets State of Nevada primary and secondary drinking water standards. A well location map is shown in Figure 1.

REHABILITATION

Carson Pump of Carson City, NV performed all rehabilitation and provided equipment for the Turney well pumping test. Mackay Pump and Geothermal of Reno, NV performed the well rehabilitation and provided pumping test equipment for the Peek well. Rehabilitation consisted of scrubbing, bailing and development by pumping. Video logs were run before and after well rehabilitation.

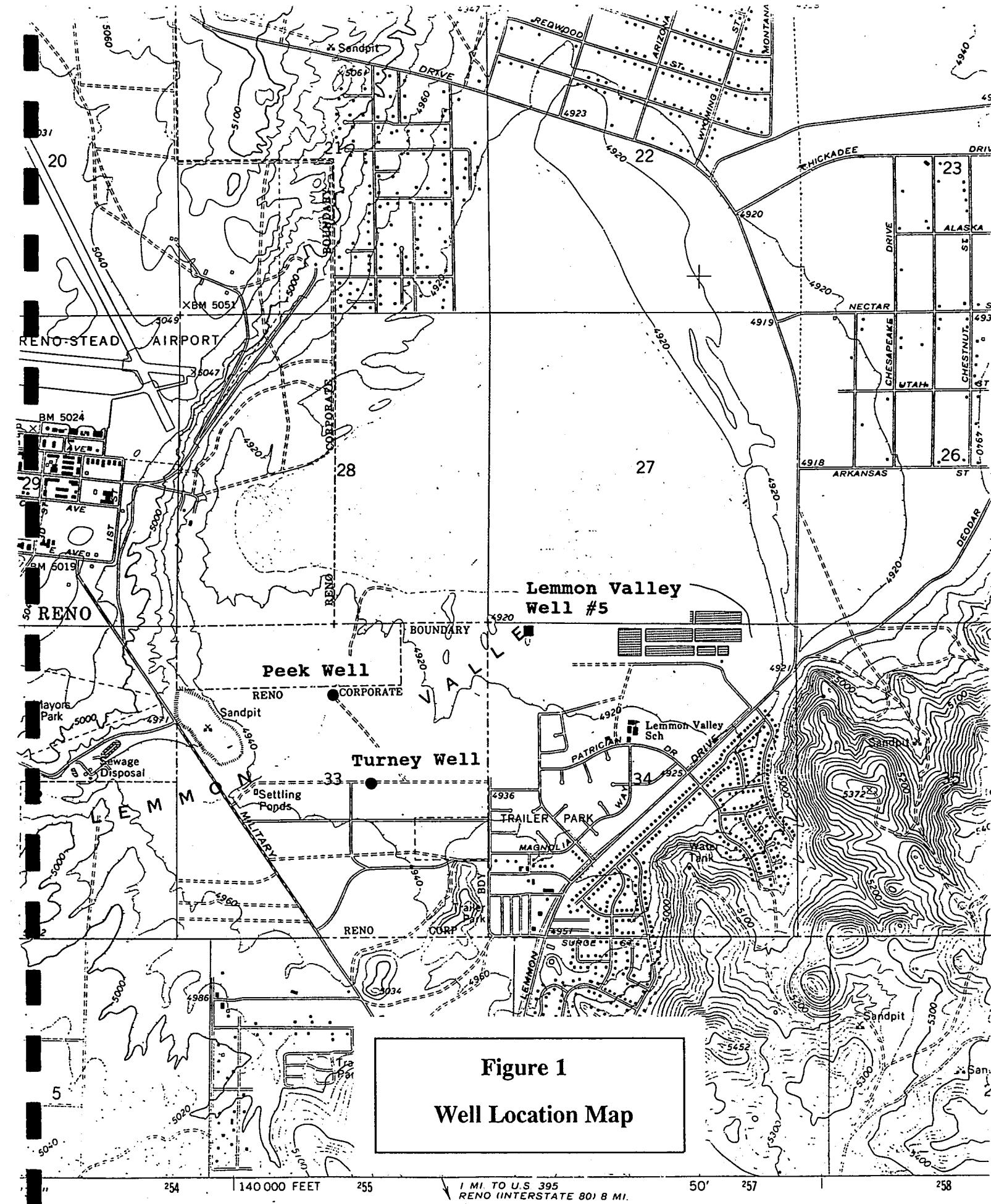
Well condition and construction was determined by video and driller logs. The drillers logs shows both wells are constructed in fine sand, silt and clay basin fill. Copies of Division of Water resources drillers logs for each well are in the appendix. A well construction and rehabilitation summary is found in Table 1.

Table 1
Well Construction

Well	Casing Diameter (ft.)	Total Depth (ft.)	Perf. Interval (ft.)	Rehabilitation Scrub (hrs.)	Pumping (hrs.)	Static W.L. (ft.)
Peek Well	8	445	180-445	37	24	39
Turney Well	10	460	178-460	36	16	45

TEST PUMPING

Pumping tests at both wells were conducted using a submersible pump. Power was supplied by a "Whisper Watt" portable generator. The pumping rate was held constant during testing by a gate valve



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Photography by photogrammetric methods from aerial photographs taken 1966 Field checked 1967

installed at the discharge head. A Rossum sand tester was installed behind the gate valve. The discharge rate during the Peek Well pumping test was measured using a 6 inch by 4 1/2 inch orifice weir and manometer. A 6 inch by 3 inch orifice weir with manometer was used during the Turney Well pumping test.

Water levels in the test wells were measured in a 3/4 inch PVC sounding tube set five feet above the pump intake. Water levels in all observation and test wells were measured to the nearest 0.01 foot using electric sounders. Original pumping test data sheets are found in the appendix. Pumping tests performed are found in Table 2.

Table 2
Pumping Tests Performed

Test	Date	Test Start (hr.)	Test Stop (hr.)	Test Duration (min.)	Pumping Rate (gpm)	Pump Setting (ft.)
Peek Well						
Step Test	12/2/94	0900	1525	400	222-512	170
Constant Q	12/3/94	0845	0845	4320	453	170
Recovery	12/6/94	0845	0900	8655	0	0
Turney Well						
Step Test	9/8/94	0845	1525	400	163-261	185
Constant Q	9/9/94	0830	0945	4320	239	185
Recovery	9/12/94	0945	1615	3270	0	0

STEP DRAWDOWN TESTS

The step drawdown data were analyzed according to the method of Jacob (1947). Well efficiency was calculated using the equations: $S_w = BQ + CQ^2$ and Efficiency = $1 / [1 + (C/B)Q]$. Table 3 summarizes the step drawdown analysis:

Table 3
Step Drawdown Analysis

Step	Rate (gpm)	Duration (min.)	s (ft.)	Q/s (gpm/ft.)	s/Q (ft./gpm)	Eff. (%)
Peek Well						
1	222	100	29.20	7.60	0.132	81
2	339	100	48.89	6.93	0.144	74
3	444	100	69.22	6.41	0.156	69
4	512	100	83.99	6.10	0.163	66
Turney Well						
1	163	100	39.97	4.08	0.245	55
2	199	100	54.01	3.68	0.272	50
3	239	100	71.05	3.36	0.298	46
4	261	100	81.12	3.22	0.311	44

Step drawdown graphs for each well are shown in Figures 2 and 3. Well efficiency solutions for each well are shown in Figures 4 - 7. The low efficiency in both wells is attributed to the millslot perforated casing which greatly decreases the entrance area into the well. The small entrance area increases friction when water enters the well, which results in increased drawdown. The large well loss component in the Turney Well is also caused by the placement of 80 feet of millslot casing in clay.

CONSTANT DISCHARGE TESTS

The Peek constant discharge test ran for 72 hours at a constant pumping rate of 453 gpm. A maximum drawdown of 84.98 feet at a pumping level of 139.20 feet was measured at the end of testing. Observation data was collected in the Turney Well and Lemmon Valley Well 5 (LV5). Sand production was 9 ppm (parts per million) after 60 minutes of pumping. The well was sand free after 100 minutes of pumping and remained sand free for the remainder of the test.

Drawdown in the Turney Well from the Peek pumping test occurred 100 minutes after test start. LV5 was influenced by the Peek Well approximately 300 to 1000 minutes after the start of pumping. The Turney Well and LV5 had respective drawdowns of 7.09 and 2.18 feet at the end of testing. Drawdown and recovery versus time graphs for the pumping well are shown in Figure 8. Drawdown versus time graphs for the observation wells are shown in Figure 9. Recovery data was collected until the static water level in the test well was 95% recovered. A recovery graph for the Turney Well is shown in Figure 10.

Aquifer parameters from the pumping test data were calculated using the Cooper-Jacob straight line method and the Well Hydraulics Interpretation Program (WHIP) computer software. Transmissivity (T) values and storage coefficients (S) for the Peek and observation wells are found in Table 4.

Table 4
Peek Test T & S Values

	Peek	Turney		LV5	
	T gpd/ft	T gpd/ft	S No Units	T gpd/ft	S No Units
Discharge Test					
Graphical	11,390	12,265	7.6×10^{-4}	18,500	3.9×10^{-4}
WHIP	11,309	11,010	9.7×10^{-4}	11,550	8.4×10^{-4}
Average	11,350	11,638	8.7×10^{-4}	15,025	6.2×10^{-4}
Recovery Test					
Graphical	12,900	12,725	9.3×10^{-7}	--	--

A transmissivity of 11,350 gpd/ft, storativity of 9.0×10^{-4} and a hydraulic conductivity of 6 feet/day were selected for aquifer parameters. The hydraulic conductivity and storativity indicate the

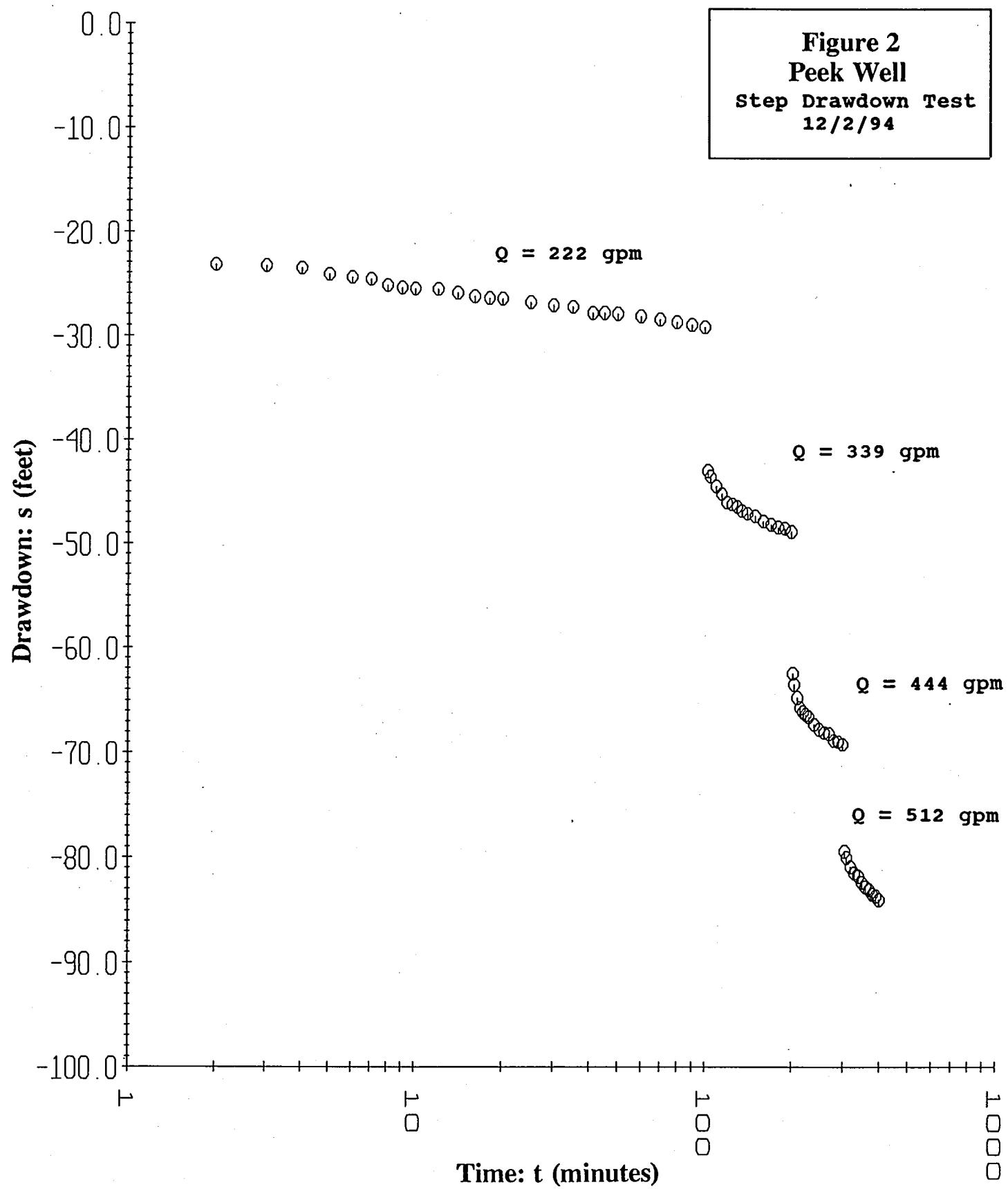
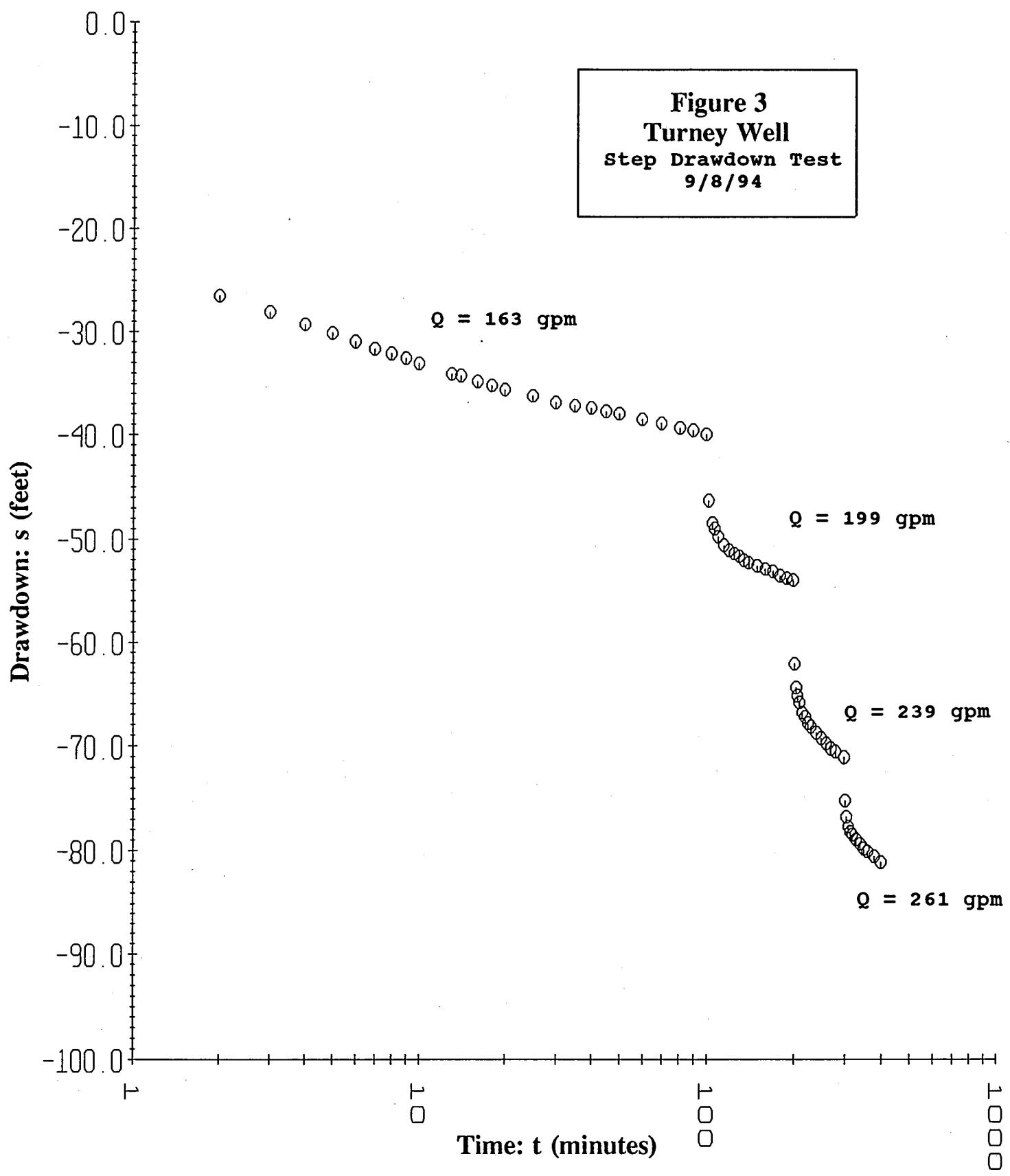


Figure 3
Turney Well
Step Drawdown Test
9/8/94



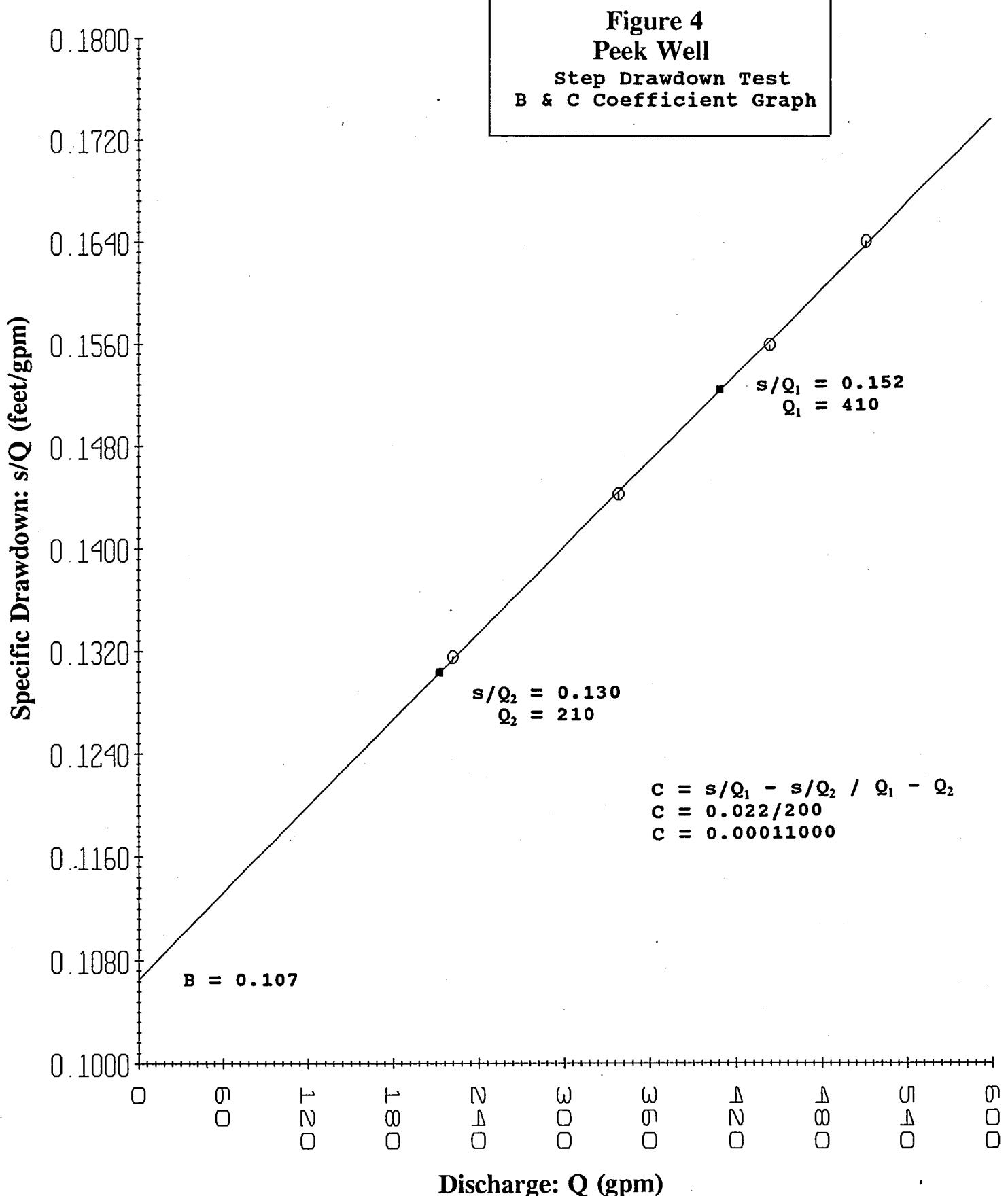
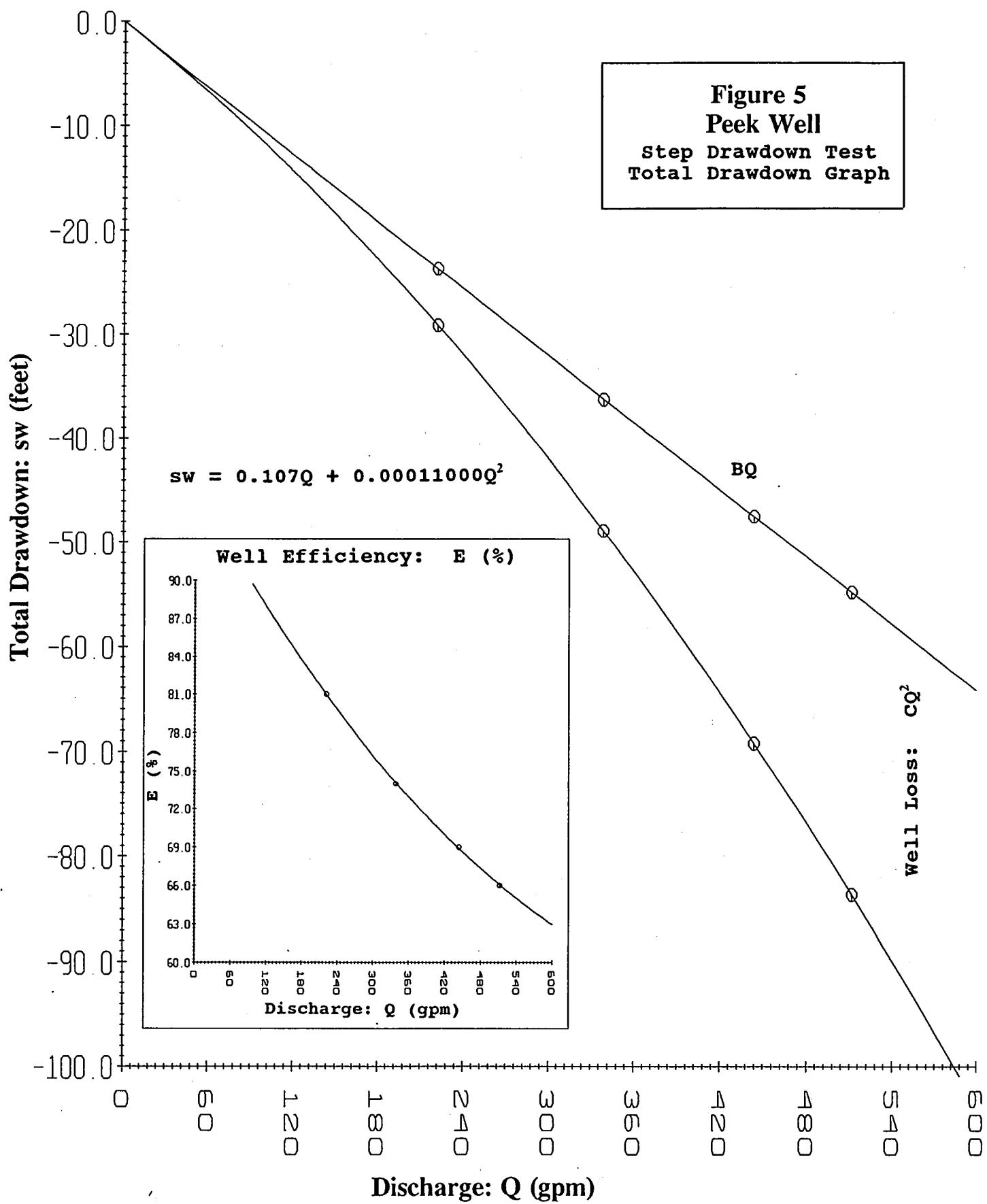


Figure 5
Peak Well
Step Drawdown Test
Total Drawdown Graph



Specific Drawdown: s/Q (feet/gpm)

0.320
0.301
0.282
0.263
0.244
0.225
0.206
0.187
0.168
0.149
0.130

Figure 6
Turney Well
Step Drawdown Test
B & C Coefficient Graph

$$s/Q_2 = 0.196$$

$$Q_2 = 90$$

$$B = 0.138$$

$$s/Q_1 = 0.260$$

$$Q_1 = 185$$

$$C = s/Q_1 - s/Q_2 / Q_1 - Q_2$$

$$C = 0.064/95$$

$$C = 0.00067368$$

0 50 100 150 200 250 300 350

Discharge: Q (gpm)

Figure 7
Turney Well
Step Drawdown Test
Total Drawdown Graph

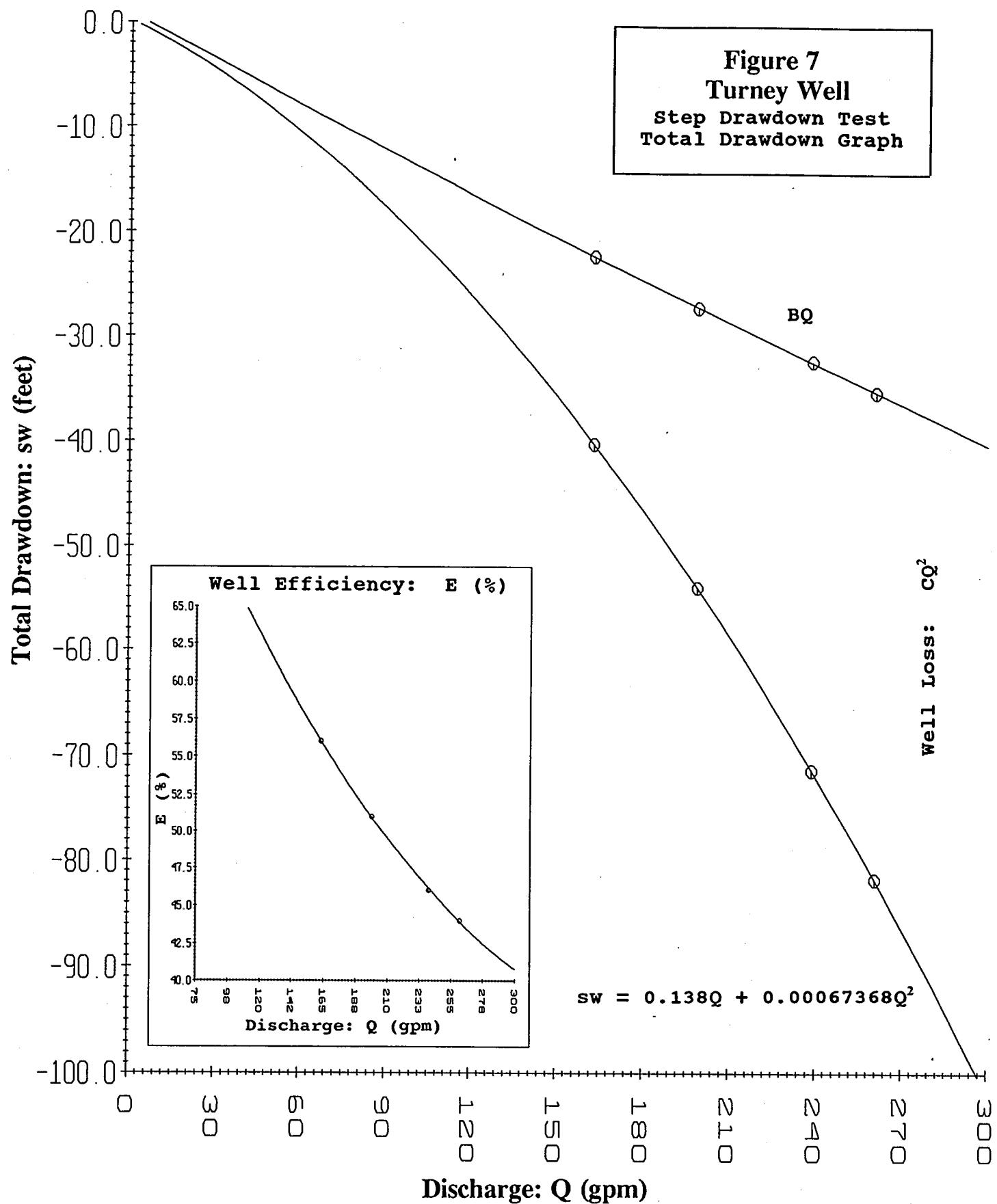
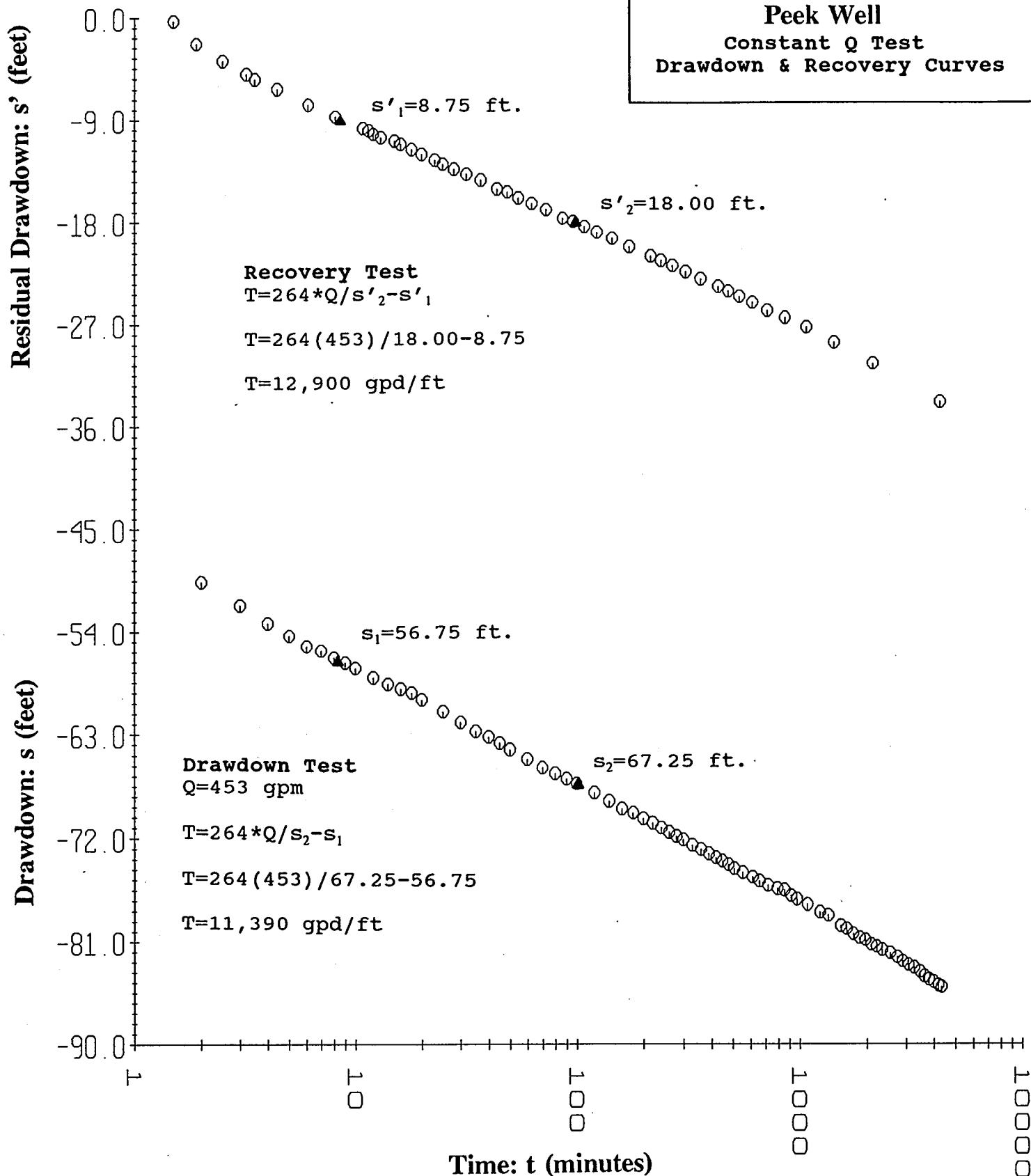


Figure 8
Peek Well
Constant Q Test
Drawdown & Recovery Curves



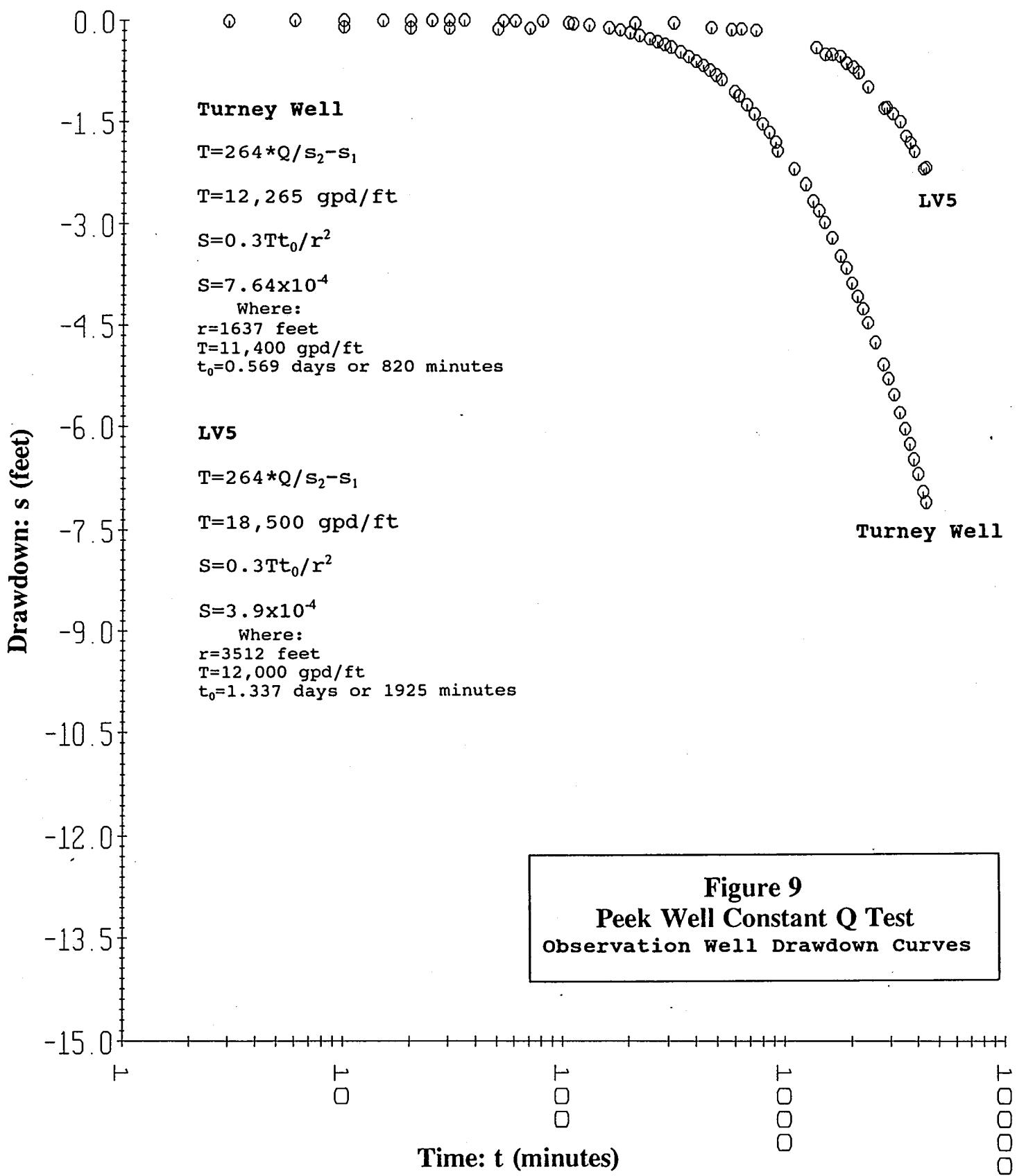
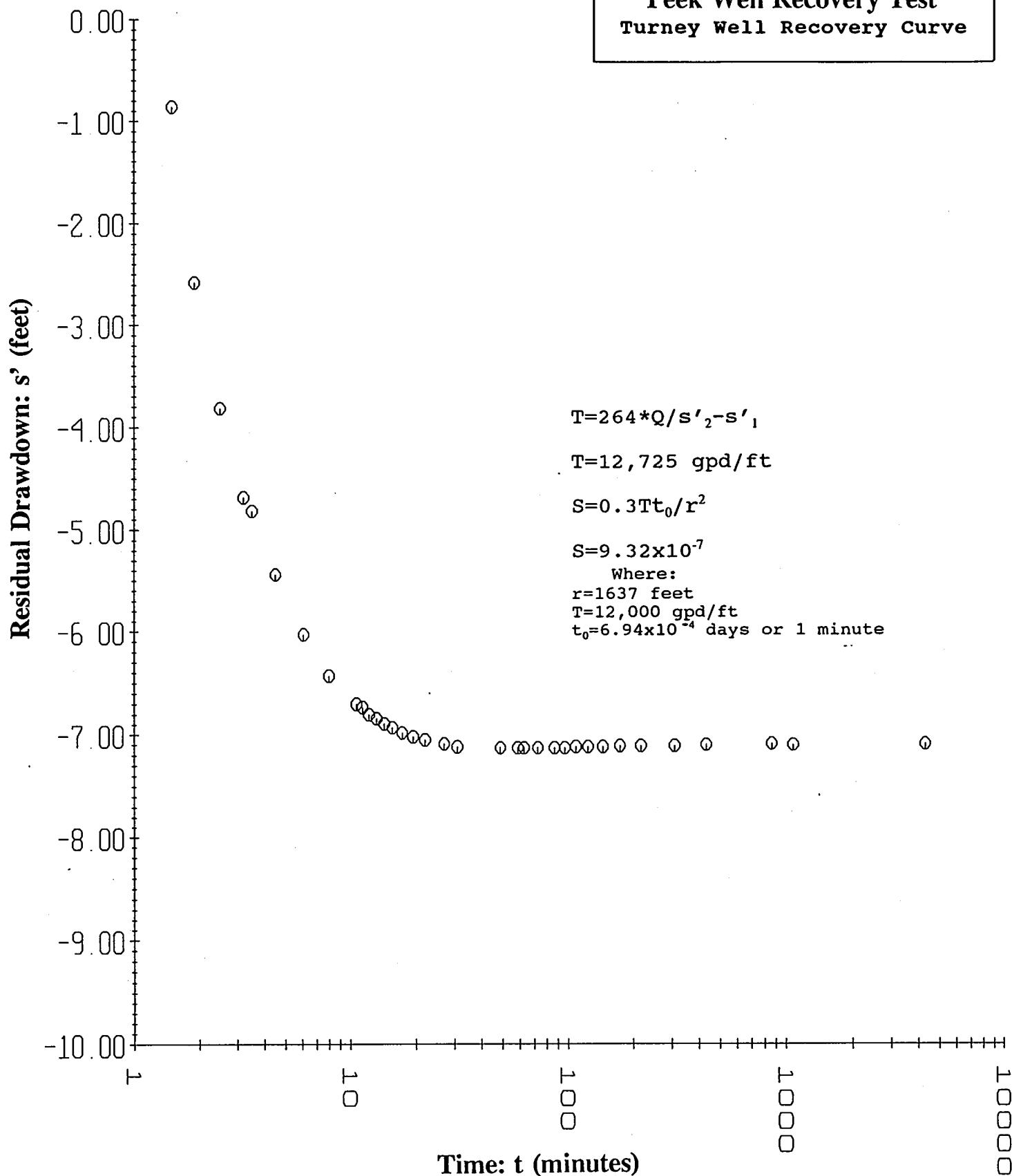


Figure 9
 Peak Well Constant Q Test
 Observation Well Drawdown Curves

Figure 10
Peek Well Recovery Test
TURNNEY WELL RECOVERY CURVE



Peek Well is constructed in semi-confined to confined, moderately sorted sand and silt alluvium. No recharge or boundary conditions were encountered during three days of pumping. The flat slope shown on Figure 8 indicates the primary aquifer penetrated by the Peek Well is uniform and possibly laterally extensive.

The selected parameters for transmissivity and storativity were used to predict areal drawdown caused by Peek Well pumping. Table 5 shows predicted maximum drawdowns for the Peek, Turney and LV5 wells using different pumping scenarios. All drawdown values were generated using Rockware Scientific Software's ROCKWORKS program.

**Table 5
Peek Well Drawdown**

Q	Peek Days			Turney Days			LV5 Days		
	3	10	30	3	10	30	3	10	30
450 gpm	84	89	94	7.1	12	17	2.0	6.0	10
475 gpm	89	94	100	7.5	13	18	2.1	6.2	11
500 gpm	93	99	105	7.9	14	19	2.2	6.5	12
525 gpm	98	104	110	8.3	14	20	2.4	6.9	12

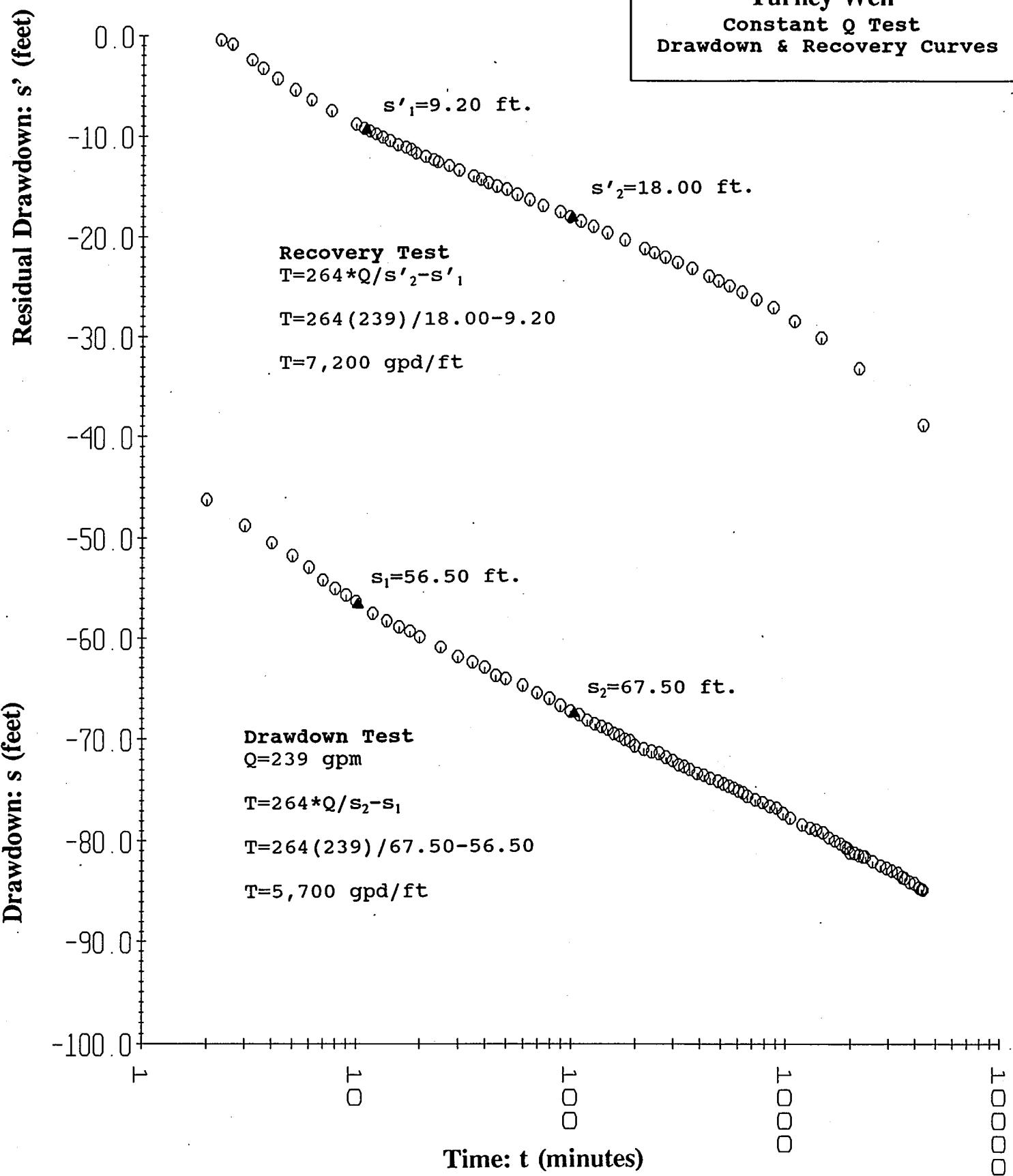
Drawdown in Feet
 $T = 11,350 \text{ gpd/ft}$ $S = 9.0 \times 10^{-4}$

The Turney Well constant discharge test ran for 73 hours at a constant pumping rate of 239 gpm. A maximum drawdown of 84.80 feet at a pumping level of 160.62 feet was measured at the end of testing. Sand production was 48 ppm (parts per million) after 10 minutes of pumping. The well was sand free at the end of testing. Drawdown and recovery versus time graphs for the pumping well are shown in Figure 11. No observation well data was collected during testing. The static water level recovered to a point higher than pre-test measurements, indicating the static water level had not stabilized from rehabilitation and step testing.

Aquifer parameters from the pumping test data were calculated using the Cooper-Jacob straight line method and WHIP software. A transmissivity of $5,800 \text{ gpd/ft}$, storativity of 3.1×10^{-3} and hydraulic conductivity of 3 feet/day were obtained for aquifer parameters. The hydraulic conductivity and storativity indicate the aquifer consists of semi-confined to confined, moderately sorted, sand and clay. The pumping test shows that a change to less permeable aquifer material occurs somewhere between the Turney and Peek wells. No recharge or boundary conditions were encountered during three days of pumping.

Transmissivity and storativity were used to predict drawdown

Figure 11
Turney Well
Constant Q Test
Drawdown & Recovery Curves



caused by pumping the Turney Well at 250 and 300 gpm. Storativity was decreased to 8.0×10^{-4} so drawdown data generated by the ROCKWORKS program would match field data. Table 6 shows predicted drawdown in the Turney, Peek and LV5 wells.

Table 6 Turney Well Drawdown											
Q	Turney Days			Peek Days			LV5 Days				
	3	10	30	3	10	30	3	10	30		
250 gpm	86	92	98	5.5	11	16	0.8	3.8	8.2		
300 gpm	103	111	117	6.6	13	19	0.9	4.6	10		
Drawdown in Feet $T = 5,800 \text{ gpd/ft}$ $S = 8.0 \times 10^{-4}$											

SIMULTANEOUS PUMPING

Drawdown values found in Tables 5 and 6 were added together to estimate well interference in the Turney and Peek pumping wells and LV5. Pumping LV5 at 850 gpm to meet municipal demands is estimated to cause an additional 5 feet of drawdown in both wells after 3 days of pumping. This estimate is based on a 3 day pumping test done at LV5 by the Utility Division in 1985. Table 7 shows the estimated total drawdown in each well from simultaneous pumping.

Table 7 Simultaneous Pumping Drawdown											
Well	Peek Well Pumping @ 450 gpm			Turney Well Pumping @ 250 gpm			Interference Drawdown Days				
	3	10	30	3	10	30	3	10	30		
Peek	84	89	94	5.5	11	16	90	100	110		
Turney	7.1	12	17	86	92	98	93	104	115		
LV5	2.0	6.0	10	0.8	3.8	8.2	2.8	10	18		
Drawdown in Feet											

WATER QUALITY

Water quality samples for inorganic chemicals, volatile organic compounds and synthetic organic compounds were collected at each well. Samples were taken at the end of the 72 hour constant discharge test. Inorganic samples were collected in one gallon,

plastic bottles and 60 milliliter(ml) plastic bottles acidified with nitric and sulfuric acid. Volatile organic samples were collected in 40 ml, septum sealed, amber glass bottles with hydrochloric acid used as a preservative. Inorganic samples were analyzed by the Nevada State Health Lab in Reno, Nevada. Volatile and synthetic organics were analyzed by Alpha Analytical Laboratories in Sparks Nevada.

The Peek and Turney wells meet State of Nevada primary and secondary drinking water standards. No volatile organics were found in either well. Complete water quality analyses are found in the appendix. A general water quality summary is found in Table 8.

Table 8
Water Quality Summary

Well	Tds	N	SO ⁴	Cl	HCO ³	Fe	Na	K	Ca	F1	As
Peek	269	0.9	61	9	159	0.06	28	4	37	0.21	0.007
Turney	223	1.8	48	7	137	0.07	19	2	34	0.14	0.003

Values in parts per million

Figure 12 is a Piper diagram used to classify the water analyses from the Peek and Turney wells. The diagram shows that both wells penetrate an aquifer containing mixed cation(Ca,Na,K,Mg) - Bicarbonate waters.

RECOMMENDATIONS

We recommend that the Peek and Turney wells be acquired by Washoe County for use as municipal supply wells, artificial storage and recharge(ASR) wells or a combination of both. The Peek and Turney wells are capable of simultaneous pumping or using one well for injection and one for municipal supply. A combination of injection in the Peek Well and withdrawal from the Turney Well, would expand the capacity of the current water system and help minimize water level decline from long term pumping. The following recommendations assume a 30 day continuous pumping period.

Individual Pumping

Peek Well
 Pumping Rate: 500 gpm
 Well Diameter: 8 inch
 Static W.L.: 39 Feet
 Drawdown: 105 Feet
 Pumping Level: 144 Feet
 Pump Setting: 175 Feet
 Well Efficiency: 66%

Turney Well
 Pumping Rate: 300 gpm
 Well Diameter: 10 inch
 Static W.L.: 45 Feet
 Drawdown: 117 Feet
 Pumping Level: 162 Feet
 Pump Setting: 185 Feet
 Well Efficiency 40%

Simultaneous Pumping

Peek

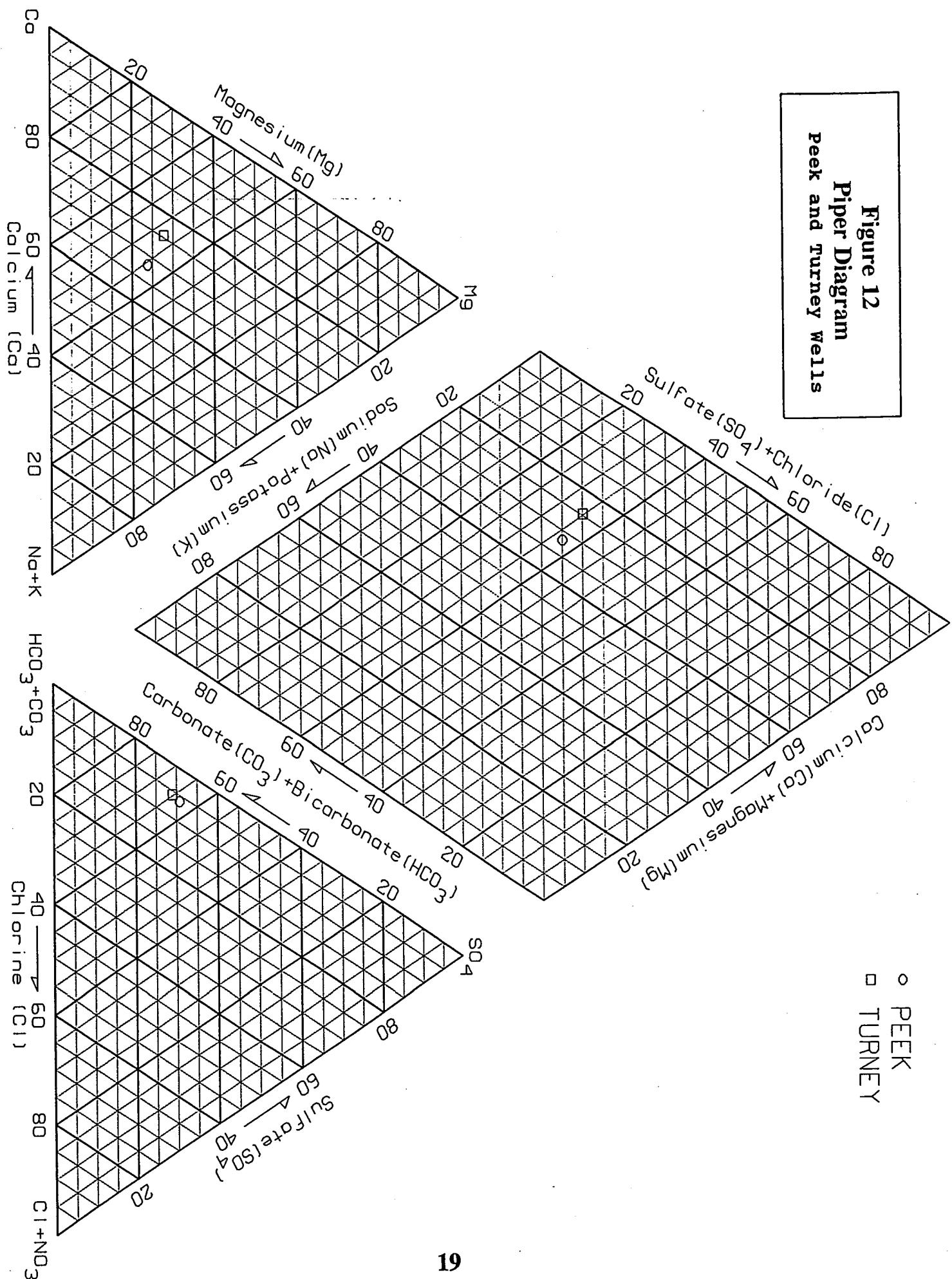
Pumping Rate: 450 gpm
Static W.L.: 39 Feet
Drawdown: 110 Feet
Pumping Level: 149 Feet
Pump Setting: 170 Feet
Well Efficiency: 70%

Turney

Pumping Rate: 250 gpm
Static W.L.: 45 Feet
Drawdown: 115 Feet
Pumping Level: 160 Feet
Pump Setting: 180 Feet
Well Efficiency 45%

The millslot casing used in both wells limits the pumping rate to the recommendations so sand production will remain less than 5 parts per million.

Figure 12
Piper Diagram
Peak and Turney wells



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- Fetter, C.W., 1988, Applied Hydrogeology. Merrill Publishing Co. pp 355-356.
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- Soil Conservation Service, Ground Water. National Engineering Handbook Section 18, Water Resources Publications, p 3-56.

APPENDIX

Peek Well Pumping Test Data Sheets
Turney Well Pumping Test Data Sheets
Well Driller Reports
Water Quality Analyses
Project Bid Proposal

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

TYPE of PUMPING TEST STEP DRAWDOWN TEST

HOW Q MEASURED 6" X 4 1/2" ORIFICE

HOW WL's MEASURED ACMAT SOUNDER

PUMPED WELL NO.

RADIUS of PUMPED WELL

DISTANCE from PUMPED WELL

WELL PEEK WELL

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 1 OF 2

HMP = 2.2'

TOP Casing elev. _____

DEPTH of PUMP/AIRLINE 170 wrt _____

% SUBMERGENCE: initial _____; pumping _____

PUMP ON: date 12/2/94 time 0900

PUMP OFF: date 12/2/94 time _____

CLOCK TIME	TIME		READING	CONVERSIONS OF CORRECTIONS	WATER LEVEL	(S)ors'	SAND ppm	h"	Q	(NOTE ANY CHANGES IN OBSERVERS)
	CLOCK TIME	ELAPSED TIME mins hrs								
0900		1	76.85		22.65			6"	222	STEP I
		2	77.43		23.23					
		3	77.54		23.34				QT	
		4	77.77		23.57					
		5	78.37		24.17				QT	
		6	78.65		24.45					
		7	78.83		24.63					
		8	79.43	80.57	25.23	122				SAND 0900-0910 = 2.3 ml
		9	79.66		25.46					0911 -
		10	79.75		25.55					
		12	79.80		25.60				QT	
		14	80.16		25.96					PSI = 78
		16	80.50		26.30				QB	.
0920		18	80.68		26.48					
		20	80.72		26.52	42				SAND 0910-0920 = 0.8 ml
		25	81.06		26.86	16				START SAND 0923-0933 = 0.3 ml
0930		30	81.35		27.15					
		35	81.50		27.30	6.8			QT	SAND 0933-0943 0.43 ml
		41	82.09		27.89	6.3			QB	SAND 0943-943 0.55 ml
0945		45	82.08		27.88	6.3				START NEW 0955-1005 0.12
0950		50	82.16		27.96	3.2				SAND 1005-1015 0.18 ml
1000		60	82.40		28.20					
1010		70	82.68		28.48				QT	76 PSI
1020		80	82.95		28.75	1.1				SAND 1015-1025 0.20 ml
1030		90	83.20		29.00					
1040		100	83.40		29.20			6"	222	SPECIFIC CAPACITY = 7.6
								14"	339	STEP II
1043		103	97.20		43.00	30				SAND START @ 1040-1055
1045		105	97.74		43.54					54 PSI
1050		110	98.68		44.48					QT
1055		115	99.44		45.24					QT
1100		120	100.28		46.08	13				QT SAND 1055-1105 53 PSI
1105		125	100.44		46.24					
1110		130	100.67		46.47	2.6				1.15 ml d = 0.65
1115		135	101.09		46.89					SAND 1105-1115 QT
1120		141	101.33		47.13	1.8				
1130		150	101.60		47.40					QT
1140		160	102.09		47.89					QT SAND 1133 -
1150		170	102.41		48.21					

WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

PUMPING TEST DATA

TYPE of PUMPING TEST STEP DRAWDOWN TEST

HOW Q MEASURED 6" x 4 1/2" ORIFICE

HOW WL'S MEASURED ACTAT SOUNDER

PUMPED WELL NO.

RADIUS OF PUMPED WELL

DISTANCE from PLUMBED WELL

WELL PEEK WELL

~~PUMPING~~ / OBSERVATION WELL

PUMPING RECOVERY DATA

PAGE 2 OF 2

M.P. for WL's TOP OF CASING elev.

DEPTH of PUMP/AIRLINE 170' wrt

% SUBMERGENCE: initial _____; pumping

PUMP ON: date 12/2/94 time 0900

PUMP OFF: date 12/2/94 time 1540

WASHOE COUNTY

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PUMPING TEST DATA

WELL PEEK WELL

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 1 OF 2

TYPE of PUMPING TEST CONSTANT DISCHARGE TEST

HOW Q MEASURED 6 x 4 1/2" ORIFICE WEIR

M.P. for WL's TDP PVC STILL WELL elev.

HOW WL's MEASURED ACTAT

DEPTH of PUMP/AIRLINE 170' wrt

PUMPED WELL NO. PEEK WELL

% SUBMERGENCE: initial ; pumping

RADIUS of PUMPED WELL

PUMP ON: date 12/3/94 time 0845

DISTANCE from PUMPED WELL

PUMP OFF: date 12/6/94 time 0845

TIME $t =$ at $t' = 0$			WATER LEVEL DATA STATIC WATER LEVEL 54.22				WATER PRODUCT.		COMMENTS		
CLOCK TIME	ELAPSED TIME mins hrs	t	t'	READING	CONVERSIONS OF CORRECTIONS	WATER LEVEL	(S)ors'	SAND	h''	Q	(NOTE ANY CHANGES IN OBSERVERS)
		1		98.96		44.74		25"	453		
		2		103.80		49.58				40PSI	
		3		105.85		51.63				SAND 0845-	
		4		107.45		53.23				QT	
		5		108.57		54.35					
		6		109.50		55.28				QT	
		7		109.89		55.67				QT	
		8		110.51		56.29				36PSI	
		9		110.97		56.75					
0855		10		111.45		57.23	121			SAND 0845-0855 2.3ml	
		12		112.28		58.06				QT	
		14		112.85		58.63				SAND 0855-0905 2.8ml	Δ 0.5
		16		113.25		59.03				QT	
		18		113.60		59.38				QT	
0905		20		114.18		59.96	26			QT	
0910		25		115.20		60.98					
0915		30		116.15		61.93	11			SAND 0905-0915 3.0ml	0.0.2
0920		35		116.94		62.72				33PSI	
0925		40		117.43		63.21	16			QT SAND NEW 0918-0928 0.3 ml	
0930		45		117.96		63.74				SAND 0928-0949 0.65 Δ	0.35
0935		50		118.53		64.31				31PSI	
0945		60		119.34		65.12	9			QT	
0955		70		120.10		65.88				SAND 0949-1019 0.85 Δ 0.5C	
1005		80		120.60		66.38				QT 30PSI	
1015		90		121.08		66.86	9				
1025		100		121.48		67.26	3			QT SAND 1019-1028 0.90ml Δ 0.05	
1045	-2	120		122.29		68.07	3			QT SAND STAB 1030-1051 0.12	Δ 0.
1105	20	140		123.02		68.80	2.8			29PSI 1051-1110 0.22	0.0.
1125	40	160		123.65		69.46	2.1			QT SAND 1110-1130 0.30	Δ 0.
1145	-3	180		124.04		69.82	1.7			QT SAND 1130-1153 0.375 29PSI	Δ 0.:0
1205	20	200		124.53		70.31				QT ADJUST ENGINE TO 61HZ 30PSI	
1225	40	220		124.92		70.70	1.3			SAND 1153-1213 0.425 Δ 0.05	
1245	-4	240		125.34		71.12	2.0			QT	
1305	20	260		125.72		71.50	1.9			SAND 1213-1233 0.5 Δ 0.075	
1325	40	280		126.06		71.84	0.8			QT 29PSI SAND 1233-1301 0.65	Δ 0.10
1345	-5	300		126.35		72.13				QT SAND 1301-1333 0.65	Δ 0.
1415	30	330		126.83		72.61	1.0			STABLE SAND 1333-1433 0.0 ml	
1445	-6	360		127.17		72.95				QT	
1515	30	390		127.55		73.33	1.7			SAND 1433-1533 0.0 ml	Δ 0.10

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL PEAK WELL

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 2 OF 2

TYPE OF PUMPING TEST CONSTANT DISCHARGE TEST

HOW Q MEASURED 6" X 4 1/2" ORIFICE WEIR

M.P. for WL's TOP PVC STIL WELL elev.

HOW WL'S MEASURED ACTAT SOUNDER

DEPTH of PUMP/AIRLINE 170' wrt

PUMPED WELL NO.

% SUBMERGENCE: initial ; pumping

RADIUS of PUMPED WELL

PUMP ON: date 12/3/94 time 0845

DISTANCE from PUMPED WELL

PUMP OFF: date 12/6/94 time 0845

TIME $t =$ at $t = 0$				WATER LEVEL DATA STATIC WATER LEVEL 54.22				WATER PRODUCT.	COMMENTS		
CLOCK TIME	ELAPSED TIME mins hrs	t	t'	READING	CONVERSIONS OR CORRECTIONS	WATER LEVEL	(S) or S'	SAND PPM	h''	Q	(NOTE ANY CHANGES IN OBSERVERS)
1545	- 7	420		127.90		73.68			25"	453	QT ^{4.00} SAND 1532-1415 0.26
1615	30 7	450		128.18		73.96	0.9			QT	
1645	- 8	480		128.48		74.26					
17:5	30 8	510		128.84		74.62				QT	
1800		555		129.19		74.97				QT	
1900		615		129.59		75.37				QT 0.60 E 7:30PM	
1945	0 11	660		129.93		75.71					0.30 E
2045	0 12	720		130.30		76.08				QT 0.90 E 2045.	
2200	15 13	795		130.58		76.36	25"				
2300	15 14	855		130.72		76.50	24 3/4			QT	
2400	15 15	915		131.19		76.97	24 7/8			QT 1.1 @ 2400	
0100		975		131.48		77.26				QT	
0250		1085		131.95		77.73					
0520		1235		132.63		78.41	25"				fuel @ 0600
0710		1345		132.89		78.67	25"				1.9 @ 0710
0815	30 23	1410									2.0 E 0815 Cleared tube
1015	30 25	1530		133.83		79.61					
	05 27	1625		134.58		79.86				QT	
1345	0 29	1740		134.52		80.30				QT Sand 0.5 min	
1545	0 31	1860		134.87		80.65					
1745	0 33	1980		135.06		80.84					
1945	0 35	2100		135.48		81.26	25 1/4"	QT			Sand = 0.6 @ 570 min
2145		2220		135.65		81.43	25"				H2 were 61.5 so took card off. He dropped to 60.5, Q upped
2355		2350		135.94		81.72	25"				
0320		2555		136.23		82.01	25"				
0630		2745		136.58		82.36	24 7/8				QT fuel @ 630
0905	20 48	2900		136.97		82.75					
1200	15 51	3075		137.27		83.05	24 7/8"				EE QT @ 1125
1500	15 54	3255		137.51		83.29					
1820	35 57	3455		137.87		83.65					
2105		3620		138.28		84.06	25"				
0005		3800		138.54		84.32	25"				
0255		3970		138.75		84.53	25"				
0630		4185		139.05		84.83	24 7/8"				
0844		4319		139.20		84.98				QT	

WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

PUMPING TEST DATA

WELL_Turney

PUMPING / OBSERVATION WELL
PUMPING / RECOVERY DATA

PAGE 2 OF 2

TYPE of PUMPING TEST

HOW Q MEASURED $6 \times 4\frac{1}{2}$ orifice

HOW WL's MEASURED

PUMPED WELL NO. Peek well

RADIUS of PUMPED WELL

DISTANCE from PUMPED WELL

M.P. for WL's top of sounding tube elev.

DEPTH of PUMP/AIRLINE _____ wrt

% SUBMERGENCE: initial _____; pum

PUMP ON : date 12/3/94 time 8:45

PUMP OFF : date 12/6/94 time 0845

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL TURNER WELL

PUMPING OBSERVATION WELL

PUMPING RECOVERY DATA

PAGE 1 OF 2

TYPE OF PUMPING TEST CONSTANT DISCHARGE

HOW Q MEASURED 6" x 4 1/2" ORIFICE

M.P. for WL's TOP SOUNDING TUBE elev.

HOW WL's MEASURED ELECTRIC SOUNDER (Salinst)

DEPTH of PUMP/AIRLINE wrt

PUMPED WELL NO. PEEK WELL

% SUBMERGENCE: initial ; pumping

RADIUS of PUMPED WELL

PUMP ON: date 12/3/94 time 8:45

DISTANCE from PUMPED WELL

PUMP OFF: date 12/6/94 time 0845

CLOCK TIME	TIME			WATER LEVEL DATA				WATER PRODUCT	COMMENTS
	mins	hrs	t	t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL		
0845			1		51.41				
			3		51.41				
			6		51.41				
			10		51.41				
			15		51.41				
			20		51.41				
			25		51.41				
			30		51.41				
			35		51.41				
			53		51.42		.01		
			60		51.42		.01		
			80		51.42		.01		
1035	50	1	110		51.46		.05		
1055	10	2	130		51.48		.07		
1125	40	2	160		51.52		.11		
1145	0	3	180		51.55		.14		
1205	20	3	200		51.59		.18		
1225	40	3	220		51.63		.22		
1250	5	4	245		51.68		.27		
1310	25	4	265		51.72		.31		
1330	45	4	285		51.76		.35		
1350	5	5	305		51.80		.39		
1420	35	5	335		51.87		.46		
1450	5	6	365		51.94		.53		
1520	35	6	395		52.01		.60		
1550	5	7	425		52.07		.66		
1620	25	7	455		52.14		.73		
1650			485		52.21		.80		
1720	35	8	515		52.28		.87		
1835			590		52.46		1.05		
1900			615		52.52		1.11		
	10	11	67.0		52.65		1.24		
2050	5	12	725		52.79		1.38		
2150	5	13	785		52.94		1.53		
2250	5	14	845		53.07		1.66		
2350	5	15	905		53.22		1.81		
0050			920		53.35		1.94		
0300			1095		53.62		2.21		
0515			1230		53.84		2.43		
					54.00		2.67		

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

TYPE of PUMPING TEST Constant Q

HOW Q MEASURED orifice weir

HOW WL's MEASURED electric sounder

PUMPED WELL NO. Peek well

RADIUS of PUMPED WELL

DISTANCE from PUMPED WELL

WELL Lemmon Valley Well #5

PUMPING OBSERVATION WELD

PUMPING RECOVERY DATA

PAGE 1 OF 2

M.P. for WL's top of sounding tube lev.

DEPTH of PUMP/AIRLINE wrt

% SUBMERGENCE: initial _____; pumping _____

PUMP ON: date 12/3/94 time 0845

PUMP OFF: date 12/6/94 time 0845

CLOCK TIME	TIME at t=0			WATER LEVEL DATA				WATER PRODUCT.	COMMENTS (NOTE ANY CHANGES IN OBSERVERS)
	CLOCK TIME	ELAPSED TIME mins hrs	t	t'	READING	CONVERSIONS of CORRECTIONS	WATER LEVEL		
845			0						
			1		48.15			0.01	
			4		48.24				
			6		48.19				
			7		48.21				
			8		48.20				
			9		48.23				
			10		48.20				
			12		48.20				
			14		48.20				
			16		48.22				
			18		48.21				
			20		48.21				
			25		48.21				
			30		48.22				
			35		48.22				
925			40		48.22				
			45		48.22				
			50		48.23				
945	0	1	60		48.23				
0955	10	1	70		48.22				
1030	45	1	105		48.14		.04		
1100	15	2			48.14		.04		
1215	30	3	210		48.14		.04		
1358			313		48.13		.03		
1627			462		48.20		.10		
1815			570		48.23		.13		
1915			630		48.22		.12		
			735		48.24		.14		
0735			1370		48.50		.40		
	5	25	1505		48.60		.50		
	50	26	1610		48.60		.50		
	10	21	1750		48.63		.53		
1555	10	31	1870		48.73		.63		
1805	20	33	2000		48.79		.69		
2000	15	35	2115		48.87		.77		
2345			2340		49.08		.98		
0655			2770		49.39		1.29		

WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

PUMPING TEST DATA

WFIL LV WELL #5

PUMPING OBSERVATION WELL

PUMPING/RECOVERY DATA

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TYPE of PUMPING TEST CONSTANT Q

HOW Q MEASURED 6" x 4 1/2" ORIFICE

HOW WE MEASURE ACTAT SOUNDS

HOW WELL MEASURED BUMPER WELL NO. PEEK WELL

PUMPED WELL NO. _____

RADIUS of PUMPED WELL _____

M.P. for WL's TOP OF SPADING TUE elev.

DEPTH of PUMP/AIRLINE _____ wrf

8% SUBMERGENCE : initial : DUTY

% SUBMERGENCE: initial _____, pumpin
THURS 20 JUN 1973 100-2815

PUMP ON : date 12/3/14 time 0043

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL PEAK WELL

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 1 OF 2

TYPE OF PUMPING TEST CONSTANT DISCHARGE-RECOVERY

HOW Q MEASURED 6" x 4 1/2" ORIFICE WEIR

M.P. for WL's TOP PVC STILE WELL elev.

HOW WL's MEASURED ACTAT SOUNDER (green)

DEPTH of PUMP/AIRLINE 170' wrt

PUMPED WELL NO.

% SUBMERGENCE: initial _____; pumping _____

RADIUS of PUMPED WELL _____

PUMP ON: date 12/3/94 time 0845

DISTANCE from PUMPED WELL _____

PUMP OFF: date 12/6/94 time 0845

TIME $t = 4320$ at $t' = 0$			WATER LEVEL DATA STATIC WATER LEVEL 54.22				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)
0844		4319		139.20					max. S = 139.20
0846		4321	1	88.09			33.87		
0847		4322	2	2161	84.64		30.42		
0848		4323	3	1441	82.80		28.58		
0849		4324	4	1081	81.47		27.25		
0850		4325	5	2651	80.65		26.43		
0851		4326	6	721	80.09		25.78		
0852		4327	7	618	79.29		25.07		
0853		4328	8	541	78.75		24.53		
0854		4329	9	481	78.27		24.05		
0855		4330	10	433	77.86		23.69		
0857		4332	12	361	77.19		22.97		
0859		4334	14	310	76.57		22.35		
0901		4336	16	271	76.05		21.83		
0903		4338	18	241	75.60		21.38		
0905		4340	20	217	75.22		21.00		
0910		4345	25	174	74.39		20.17		
0915		4350	30	145	73.67		19.45		
0920		4355	35	124	73.13		18.91		86.4% recovery
0925		4360	40	109	72.63		18.41		
0930		4365	45	97	72.17		17.95		
0935		4370	50	87	71.87		17.65		
0945		4380	60	73	71.09		16.87		87.9% recovery
0955		4390	70	63	70.55		16.33		
1005		4400	80	55	70.06		15.84		
1015		4410	90	49	69.54		15.32		89.0% recovery
1025		4420	100	44	69.27		15.05		
1045		4440	120	37	68.52		14.30		
1105	20 74	4460	140	31.9	68.01		13.79		90.1% recovery
1125	40 74	4480	160	28.0	67.57		13.35		
1145	0 75	4500	180	25.0	67.12		12.90		
1205	20 75	4520	200	22.6	66.74		12.52		
1235	50 75	4550	230	19.8	66.24		12.02		91.4% recovery
1305	20 76	4580	260	17.6	65.81		11.59		
1335	50 76	4610	290	15.9	65.35		11.13		92.0% recovery
1405	20 77	4640	320	14.5	65.06		10.84		
1435	50 77	4670	350	13.3	64.75	Add 0.10 if sounder tube is taken out.	10.53		
1505	20 78	4700	380	12.4	64.46		10.24		
1535	50 78	4730	410	11.5	64.13		9.91		92.9% recovery

WASHOE COUNTY



**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

PUMPING TEST DATA

TYPE of PUMPING TEST Constant Q

HOW Q MEASURED 6" x 4 1/2" orifice weir

HOW WL's MEASURED electric sander (green Actat)

PUMPED WELL NO. Peek

RADIUS of PUMPED WELL

DISTANCE from BUMPERD WELL

WELL PeeK

PUMPING OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 2 OF 2

PUMP OFF : date 12/6/94 time 0845

% SUBMERGENCE: initial : pumping

BUMP ON: 12/12/84 Time: 0845

PUMP ON: date 12/3/94 time 0833

PUMP OFF: date 12/6/94 time 0845

AMM 氨氣管

A	WATER TESTS	COMMENTS
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WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL TURNER WELL

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 1 OF 2

TYPE of PUMPING TEST CONSTANT DISCHARGE RECOVERY

HOW Q MEASURED 6" X 4 1/2" ORIFICE

M.P. for WL's TOP SOUNDING TUBE elev.

HOW WL's MEASURED SOLINST SOUNDER

DEPTH of PUMP/AIRLINE _____ wrt _____

PUMPED WELL NO. PEEK WELL

% SUBMERGENCE: initial _____ ; pumping _____

RADIUS of PUMPED WELL _____

PUMP ON: date 12/3/94 time 0845

DISTANCE from PUMPED WELL _____

PUMP OFF: date 12/6/94 time 0845

TIME $t = 4320$ at $t' = 0$ 0845			WATER LEVEL DATA STATIC WATER LEVEL 51.41				WATER PRODUCT.		COMMENTS
CLOCK TIME	ELAPSED TIME mins hrs	t	t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or S'	Q	(NOTE ANY CHANGES IN OBSERVERS)
0844		-		58.50			7.09		
0846		4321	1	4321	58.50				
0847		4322	2	2161	58.50				
0848		4323	3	1441	58.50				
0849		4324	4	1081	58.51		7.10		
0850		4325	5	865	58.51				
0851		4326	6	721	58.51				
0852		4327	7	618	58.51				
0853		4328	8	541	58.51				
0854		4329	9	481	58.51				
0855		4330	10	433	58.51				
0857		4332	12	361	58.51				
0859		4334	14	310	58.52		7.11		
0901		4336	16	271	58.52				
0903		4338	18	241	58.52				
0905		4340	20	217	58.52				
0910		4345	25	174	58.52				
0915		4350	30	145	58.53		7.12		
0920		4355	35	124	58.53				
0925		4360	40	109	58.53				
0930		4365	45	97	58.54		7.13		
0935		4370	50	87	58.54				
0945	- 1	4380	60	73	58.54				
1000		4395	75	59	58.54				
1015		4410	90	49	58.54				
1110	25 74	4465	145	31	58.52		7.12		
1135	59 74	4490	170	26.4	58.50		7.09		
1210	25 75	4525	205	22.1	58.46		7.05		
1240	55 75	4555	235	19.4	58.43		7.02		
1310	25 76	4585	265	17.3	58.39		6.98		
1340	55 76	4615	295	15.6	58.34		6.93		
1410	25 77	4645	325	14.3	58.30		6.89		
1440	55 77	4675	355	13.2	58.25		6.84		
1510	25 78	4705	385	12.2	58.21		6.80		
1540	55 78	4735	415	11.4	58.14		6.73		
1610	25 79	4765	445	10.7	58.11		6.70		
1900	15 82	4935	615	8.0	57.84		6.43		
2055	10 86	5170	850	6.1	57.44		6.03		
0625	40 92	5560	1240	4.5	56.85		5.44		
1440	0 0	1.700	1.700	2.48	51.22		0.01		

WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

PUMPING TEST DATA

WELL Turney Well

PUMPING / OBSERVATION WELL

PUMPING RECOVERY DATA

PAGE 2 OF 2

£5.00 plus

of something very slow.

TYPE of PUMPING TEST Constant Discharge - Recovery

HOW Q MEASURED 6" x 4 1/2" orifice weir

HOW WL's MEASURED Salinst electric sounder

M.P. for WL's top of sounding tube elev

DEPTH of PUMP/AIRLINE _____ wrt

PUMPED WELL N

% SUBMERGENCE: initial _____; pumping.

RADIUS of PUMPED WELL

PUMP ON : date 12/3/94 time 0845

DISTANCE from PUMPED WELL

PUMP OFF : date 12/6/94 time 0845

WASHOE COUNTY



**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

PUMPING TEST DATA

TYPE of PUMPING TEST Constant Q

HOW Q MEASURED 6" x 4½" orifice Weir

HOW WL's MEASURED electric sander

PUMPED WELL NO. Peels

RADIUS of PUMPED WELL

DISTANCE from PUMPED WELL

WELL-5 well #5

PUMPING /OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 1 OF 1

M.P. for WL's _____ elev.

DEPTH of PUMP/AIRLINE _____ wrt

% SUBMERGENCE: initial _____; pumping

PUMP ON : date 12/3/94 time 0845

BUMP OFF: date 13/16/84 N-2 0845

PUMP OFF: date 7-8-17 time 3:30

WASHOE COUNTY

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UTILITY DIVISION

PUMPING TEST DATA

WELL Turney well

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 1 OF 2

TYPE of PUMPING TEST Step Drawdown Test

HOW Q MEASURED 6x3 orifice

M.P. for WL's TOP PVC STILLWELL elev.

HOW WL's MEASURED Salinst + 09870

DEPTH of PUMP/AIRLINE 185' wrt

PUMPED WELL NO.

% SUBMERGENCE: initial _____; pumping _____

RADIUS of PUMPED WELL _____

PUMP ON: date 9/8/94 time 0845

DISTANCE from PUMPED WELL _____

PUMP OFF: date _____ time _____

TIME $t = 0845$ at $t' = 0$			WATER LEVEL DATA STATIC WATER LEVEL <u>75.09</u>					WATER PRODUCT		COMMENTS	
CLOCK TIME	ELAPSED TIME mins hrs	t	t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(S) or (S')	Q/S	gpm	Q	(NOTE ANY CHANGES IN OBSERVERS)
0845		1		97.74	STEP I		22.65		163	24"	163 9pm 846.30 static sand
		2		101.60			26.51				
		3		103.18			28.09				
		4		104.38			29.29				
		5		105.24			30.15				
		6		106.06			30.97				
		7		106.75			31.66				
		8		107.20			32.11				
		9		107.64			32.55				
		10		108.14			33.05	4.93			2.7 sand
		13		109.16			34.07				
		14		109.32			34.23				
0901		16		109.88			34.79				
0903		18		110.28			35.19				
0905		20		110.68			35.59				
0910		25		111.30			36.21				
0915		30		111.94			36.85				
0920		35		112.24			37.15				
0925		40		112.46			37.37				
0930		45		112.80			37.71				
0935		50		113.02			37.93				
0945		60		113.54			38.50				0943 QT
0955		70		113.98			38.89				>60psi
1005		81		114.43			39.34				1000 QT
1015		90		114.66			39.57	4.12			1017 QT
1025		100		115.06			39.97	4.07			>60psi
					STEP II				199	36"	
1027		102	2	121.40			46.31				
1030		105	5	123.55			48.46				
1032		107	7	124.06			48.97				
1035		110	10	124.84			49.75	4.00			QT
1040		115	15	125.68			50.59				
1045		120	20	126.18			51.09				QT
1050		125	25	126.49			51.40				
1055		130	30	126.76			51.67				1056 QT
1100		135	35	127.16			52.07				60 psi
1105		140	40	127.40			52.31				
1115		150	50	127.71			52.62				

WASHOE COUNTY

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UTILITY DIVISION

PUMPING TEST DATA

WELL TURNER WELL

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 2 OF 2

TYPE of PUMPING TEST STEP DRAWDOWN TEST

HOW Q MEASURED 6" X 3" ORIFICE

M.P. for WL's TOP OF PVC S.W. elev.

HOW WL's MEASURED SOLIN ST # 09870

DEPTH of PUMP/AIRLINE 185' wrt

PUMPED WELL NO.

% SUBMERGENCE: initial ; pumping

RADIUS of PUMPED WELL

PUMP ON: date 9/8/94 time 0845

DISTANCE from PUMPED WELL

PUMP OFF: date 9/8/94 time 1525

TIME $t = 0845$ at $t = 0$			WATER LEVEL DATA STATIC WATER LEVEL 75.09					WATER PRODUCT.		COMMENTS	
CLOCK TIME	ELAPSED TIME mins hrs	t	t/t'	READING	CONVERSIONS of CORRECTIONS	WATER LEVEL	(S) or (S')	Q/S	K	Q	(NOTE ANY CHANGES IN OBSERVERS)
1125		160 60		128.03		52.94			199	1119 Q↑	
1136		171 71		128.26		53.17					
1145		180 80		128.69		53.60					
1155		190 90		128.91		53.82					PSI 56-60
1205		200 100		129.10		54.01	3.68				
				STEP III					52"	239	
1207		202 2		137.20		62.10					
1210		205 5		139.52		64.43					52 psi
1212		207 7		140.30		65.21					Q↑ e 1211
1215		210 10		140.96		65.87					
1220		215 15		141.94		66.85					
1225		220 20		142.35		67.26					
1230		225 25		142.94		67.85					
1235		230 30		143.26		68.17					Q↑ e 1232 52 psi
1245		240 40		143.85		68.76	3.47				
1255		250 50		144.36		69.27					
1305		260 60		144.86		69.77					
1315		270 70		145.34		70.25					Q↑ 1310
1325		280 80		145.62		70.53					Q↑ 1330
1345		300 100		146.14		71.05	3.36				50-51 psi
				STEP IV					62"	261	
1347		302 2		150.26		75.17					
1350		305 5		151.84		76.75					46 psi
1355		310 10		152.78		77.69	3.35				Q↑ -
1400		315 15		153.28		78.19					
1405		320 20		153.56		78.47					
1415		330 30		154.02		78.93	3.30				
1425		340 40		154.46		79.37					
1435		350 50		154.92		79.83					Q↑ @ 1433
1445		360 60		155.18		80.04	3.25				
1505		380 80		155.66		80.57					Q↑ @ 1515
1525		400 100		156.21		81.12	3.21				44 psi
1533		408		160.68					70"	278	VALVE WIDE OPEN
1538		413		160.96					60"-70"		VALVE @ 40 psi
											FUEL @ 934" BELOW
											TOP OF TANK.
											GEN HOMS: 2268.8

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION
John M. Collins, Chief Sanitary Engineer

POST OFFICE BOX 11130
RENO, NEVADA 89520
PHONE: (702) 785-4743



SAND PRODUCTION

PROJECT SEPT 8, 1994 STEP DRAWDOWN TEST TURNER WELL

DATE _____

PAGE _____ OF _____ PAGES

FLOW	CLOCK TIME	ML	IN SAND	PPM	(TIME SINCE START OR PREVIOUS)
163gpm	0840	START			
"	0856	2.7ml	2.7ml	10 min	
	0901	3.5ml	0.8ml	5 min	
	0904	START			
	0909	0.6ml	0.6ml	5	
	0914	0.95ml	0.35ml	5	
	0919	1.40ml	0.45ml	5	
	0924	2.20ml	0.80ml	5	
	0925	START			
	0927	0.55ml	0.55ml	5	
	0935	0.75ml	0.20ml	8	
	0940	1.10	0.35ml	5	
	0946	1.60	0.50ml	6	
	0956	2.90	1.30ml	10	
	1000	START			
	1005	.30ml	.30ml	5	
	1010	.50ml	.20ml	5	
	1016	.65ml	.15ml	6	
163/199	1024	.80ml	.15ml	8	
	1031	1.30ml	.50ml	7	
199	1034	START			
	1039	.30ml	.30ml	5	
	1044	.70ml	.40ml	10	
	1059	1.05ml	.35ml	10	
	1109	1.90ml	.85ml	10	
	1112	START			
	1117	1.1ml	1.1ml	5	
	1127	2.0ml	0.9ml	10	
	1132	2.1ml	0.1ml	5	
	1138	2.5ml	0.4ml	6	35.2

WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION
John M. Collins, Chief Sanitary Engineer**

**POST OFFICE BOX 11130
RENO, NEVADA 89520
PHONE: (702) 785-4743**



DATE _____

PAGE _____ OF _____ PAGES

PROJECT Flow

FLOW	CLOCK	mL	IN SAND	TIME INTERVAL	PPM	(SINCE START OF TEST)
199 gpm	1140	START				
	1150	.30 ml	.30 ml	10	15.8	
1205 ↑ 199/239	1200	.40 ml	.10 ml	10	5.3 ppm	
	1213	1.10 ml	.70 ml	3	17.3 ppm	
	1216	1.30 ml	.20 ml	3	35 ppm	
239	1218	START				
	1228	.50 ml	.50 ml	10	26 ppm	
	1238	.80 ml	.30 ml	10	15.8 ppm	
	1248	1.15 ml	.35 ml	10	18.5 ppm	
1300 258	1.70 ml	.55 ml	12	5.28		
239	1303	START				
	1313	0.25	.25 ml	10	13.2 ppm	
	1328	0.45	.20 ml	15	7 ppm	
239/264 @ 1345	1343	0.60	.15 ml	15		
	1352	0.75	.15 ml	9	8.8 ppm	
261	1354	START				
	1410	.20 ml	.20 ml	16	6.6 ppm	
	1430	.40 ml	.20 ml	20	5.3 ppm	
	1451	.70 ml	.30 ml	21	7.5 ppm	
	1520	.80 ml	.10 ml	30		

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL Turney Well

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 1 OF 3

TYPE of PUMPING TEST Constant Q

HOW Q MEASURED 6x3" orifice = 52" → 51.5"

M.P. for WL's TOP of PVC elev.

HOW WL's MEASURED Actat - tape measure

DEPTH of PUMP/AIRLINE 185' wrt

PUMPED WELL NO.

% SUBMERGENCE: initial _____; pumping _____

RADIUS of PUMPED WELL

PUMP ON: date 9/9/94 time 0830

DISTANCE from PUMPED WELL

PUMP OFF: date 9/12/94 time 0945

CLOCK TIME	TIME $t =$ $t' = t + t_0$			WATER LEVEL DATA				WATER PRODUCT	COMMENTS (NOTE ANY CHANGES IN OBSERVERS)
	ELAPSED TIME min hrs	t	t'	t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL		
0830		1			118.69		42.86	52"	239
		2			122.02		46.19		
		3			124.57		48.74		
		4			126.28		50.45		5
		5			127.55		51.72		$s_{and} = .6 \text{ ml e 5 min}$
		6			128.72		52.89		
		7			130.00		54.17		
		8			130.85		55.02		
		9			131.50		55.67		
0840		10			132.13		56.30		$s_{and} = .9 \text{ ml e 10 min}$
		12			133.30		57.47	Q↑	
		14			134.05		58.22	Q↑	
0846		16			134.66		58.83	Q↑	
		18			135.07		59.24		DISCHARGE DIRTY
0850		20			135.65		59.82	Q↑	
0855		25			136.72		60.89		
0900		30			137.70		61.87	51.5"	238
0905		35			138.25		62.42	Q↑	
0910		40			138.76		62.93	Q↑	
0915		45			139.59		63.76	Q↑	
0920		50			139.91		64.08		
0930		60			140.56		64.73	Q↑	
0940		70			141.30		65.47	Q↑	
0950		80			141.85		66.02	Q↑	
1000		90			142.53		66.70	Q↑	
1010		100			143.10		67.27	Q↑	
1020		110			143.46		67.63	Q↑	
1030		120			143.99		68.16	Q↑	
1040		130			144.36		68.53	Q↑	
1050		140			144.61		68.78	Q↑	
1100		150			144.87		69.04	Q↑	
1110		160			145.30		69.47	Q↑	
1120		170			145.48		69.65	Q↑	
1130		180			145.87		70.04	Q↑	
1140		190			146.00		70.17		
1150		200			146.49		70.66	Q↑	
1210		220			146.80		70.97	Q↑	
1230		240			147.05		71.22		
1250		260			147.22		71.39	Q↑	
		270					71.77	Q↑	

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

TYPE OF PUMPING TEST Constant Q

HOW Q MEASURED 6" x 3" orifice

HOW WL's MEASURED Anstat - tape measure

PUMPED WELL NO.

RADIUS of PUMPED WELL

DISTANCE from PUMPED WELL

WELL Turney Well

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 2 OF 3

M.P. for WL's TOP OF PVC elev.

DEPTH of PUMP/AIRLINE 185' wrt

% SUBMERGENCE: initial _____; pumping _____

PUMP ON: date 9/9/94 time 0830

PUMP OFF: date 9/12/94 time 0945

TIME $t =$ at $t = 0$				WATER LEVEL DATA STATIC WATER LEVEL 75.83				WATER PRODUCT.		COMMENTS
CLOCK TIME	ELAPSED TIME mins hrs	'	' / ' / '	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(S) or S'		Q	(NOTE ANY CHANGES IN OBSERVERS)
1330		300		147.89		72.06		51.5"	238	Q↑
1350		320		148.32		72.49				
1410		340		148.47		72.64				Q↑
1430		360		148.76		72.93				Q↑
1500		390		149.14		73.31				EE Q↑ 1640 H ₂ O SAMPLE
1530		420		149.32		73.49				Q↑
1600		450		149.62		73.79				Q↑
1640		490		149.89		74.06				EE Q↑ 1640 H ₂ O SAMPLE
1710		520		150.17		74.34				
1740	10	550		150.37		74.54				Q↑ e 1755
1810	40	580		150.57		74.74				
1840	10	610		150.85		75.02				
1910	40	640		151.02		75.19				Q↑
1940	10	670		151.38		75.55				
2040	10	730		151.73		75.90				Q↑ e 2015
2140	10	790		152.00		76.17				
2240	10	850		152.36		76.53				Q↑ e 2155
2345	15	915		152.52		76.69				Q↑ e 2350
0050		980		153.07		77.24				Q↑ e 0050
0207		1057		153.52		77.69				
0430		1200		154.20		78.37				Q↑ e 0430
0620		1310		154.53		78.70				Q↑ - Fuel is down 2"
0750		1400		154.70		78.87				Q↑
0930		1500		154.97		79.14				Q↑ e 0105 - Fuel is down 1/1
1110		1600		155.51		79.68				D.Turney + R.Robertson Filling fuel
1250		1700		155.82		79.99				Q↑
1430		1800		156.09		80.26				Q↑
1610		1900		156.45		80.62				Q↑
1700		1950		156.55		80.72				Q↑ DAN
1750		2000		157.00		81.17				
1930		2100		157.09		81.21				Q↑
2110		2200		157.25		81.42				Q↑
2250		2300		157.38		81.55				OK
2350		2360		157.35		81.58				OK
0300		2550		157.85		82.02				OK
0650		2780		158.28		82.45				OK
0950		2960		158.51		82.68				Q↑ e 1000 EE
1250		3140		158.79		82.96				EE Q↑ e 1330
1610		3140		158.98		83.15				DAN
				159.47		83.57				Q↑



WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

PUMPING TEST DATA

WELL TURNED WELL

PUMPING/OBSERVATION WELL

~~PUMPING/RECOVERY DATA~~

PAGE 3 OF 3

TYPE of PUMPING TEST CONSTANT Q

HOW Q MEASURED 6 x 3" side Weir

HOW WL'S MEASURED ACTAT ELECTRIC SOUNDER

PUMPED WELL NO. _____

RADIUS of PUMPED WELL - _____

DISTANCE from PUMPED WELL

M.P. for WL's TOP OF PVC elev. _____

DEPTH of PUMP/AIRLINE 185' wrt

% SUBMERGENCE: initial _____ : pumping _____

BUMP ON : date 9/19/94 Time 0830

PUMP ON: date 2-11-74 time 0330
2315

PUMP OFF : date 9/13/94 time 0945

WATER

A	WATER PRODUCT	COMMENTS
---	------------------	----------

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

TYPE of PUMPING TEST CONSTANT Q RECOVERY TEST

HOW Q MEASURED _____

M.P. for WL's ID of PVC elev.

HOW WL's MEASURED SOLINST SOUNDER

DEPTH of PUMP/AIRLINE _____ wrt _____

PUMPED WELL NO. _____

% SUBMERGENCE: initial _____; pumping _____

RADIUS of PUMPED WELL _____

PUMP ON: date 9/9/94 time 0830

DISTANCE from PUMPED WELL _____

PUMP OFF: date 9/12/94 time 0945

WELL Tunney Well

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 1 OF _____

TIME $t = 4395 \text{ at } t=0$				WATER LEVEL DATA STATIC WATER LEVEL 75.83				WATER PRODUCT.	COMMENTS	
CLOCK TIME	ELAPSED TIME mins hrs	\uparrow	\uparrow'	\uparrow/\uparrow'	READING	CONVERSIONS OR CORRECTIONS	WATER LEVEL	S or S)	Q	(NOTE ANY CHANGES IN OBSERVERS)
0944		4394			160.62			84.79		
0945		4395	0							
0946		4396	1	4396	114.68			38.85		
0947		4397	2	2198	108.94			33.11		
		4398	3	1466	105.91			30.08		
		4399	4	1100	104.28			28.45		
0950		4400	5	880	102.91			27.08		
		4401	6	734	102.10			26.27		
		4402	7	629	101.36			25.53		
		4403	8	550	100.72			24.89		
		4404	9	489	100.22			24.39		
0955		4405	10	441	99.75			23.92		
1057		4407	12	367	98.96			23.13		% Recovery
0959		4409	14	315	98.36			22.53		73.4%
1001		4411	16	276	97.83			22.00		
1003		4413	18	245	97.39			21.56		
1005		4415	20	221	96.97			21.14		
1010		4420	25	179	96.12			20.29		76%
1015		4425	30	148	95.41			19.58		
1020		4430	35	127	94.82			18.99		
1025		4435	40	111	94.30			18.47		78%
1030		4440	45	99	93.88			18.05		
1035		4445	50	89	93.41			17.58		79%
1045		4455	60	74	92.80			16.97		80%
1055		4465	70	64	92.24			16.41		80.7%
1105		4475	80	56	91.72			15.89		81.3%
1115		4485	90	50	91.23			15.40		
1125		4495	100	45	90.91			15.08		82.2%
1135		4505	110	41	90.56			14.73		
1145		4515	120	38	90.21			14.38		83%
1155		4525	130	35	89.90			14.07		
1215		4545	150	30	89.30			13.47		84%
1235		4565	170	27	88.85			13.02		
1255		4585	190	24	88.46			12.63		85.1%
1305		4595	200	23	88.23			12.40		
1325		4615	220	21	87.87			12.04		85.8%
1345		4635	240	19	87.53			11.70		86.2%
1405		4655	260	18	87.15			11.32		
1425		4675	280	17	86.92			11.09		

WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

PUMPING TEST DATA

TYPE of PUMPING TEST CONSTANT Q RECOVERY TEST

WELL TURNER WELL
PUMPING/OBSERVATION WELL
PUMPING/RECOVERY DATA
PAGE 2 OF

TYPE OF PUMPING TEST _____
 HOW Q MEASURED _____ M.P. for WL's TOP OF PVC elev. _____
 HOW WL's MEASURED SOLINET SONDEER DEPTH of PUMP/AIRLINE _____ wrt _____
 PUMPED WELL NO. _____ % SUBMERGENCE: initial _____ ; pumping _____
 RADIUS of PUMPED WELL _____ PUMP ON: date 9/9/94 time 0830
 DISTANCE from PUMPED WELL _____ PUMP OFF: date 9/12/94 time 0945

NEVADA DIVISION OF HEALTH
1660 N. Virginia Street
Reno, Nevada 89503
(702) 688-1335

117782

WATER CHEMISTRY ANALYSIS:

Attn: 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 IS YET LICH Date 12/17/94
Owner GEORGE PEEK Phone _____
Address _____
City _____ State _____

REPORT TO:

Name WASHOE CO. UTILITY DIV / TERRI SVETICH
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 NV County WASHOE
Township _____ Range _____
General Location LEMMON VALLEY
Source Address PEEK WELL OFF OF MILITARY RD ON PLAYA

REASON FOR ANALYSIS: **USE OF WATER:**
 Loan Domestic drinking water
 Personal health reasons Geothermal
 Purchase of the property Industrial or mining
 Rental or sale of property Irrigation
 Subdivision approval Other NOT IN USE
 Other SDWA Initials ETS

INVESTIGATING POTENTIAL**SOURCE OF WATER:**

Filter Yes No
 Public Yes No
 Spring _____
 Well Depth _____ ft.
 Hot _____ Cold
 IN USE Yes No

Type GW LV TR-ST
PUMP #2
Name PEEK WELL
Surface _____
Casing diameter _____ in.
Casing depth _____ ft.

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

FOR LABORATORY USE ONLY							PRINT OTHER DESIRED CONSTITUENTS BELOW			
-Constituent	311 ppm	Constituent	20.3 ppm	Constituent	0.0 ppm	-Constituent	7782	S.U.	Constituent	ppm
T.D.S. @ 103° C.	269	Chloride	9	Iron	0.06	Color	12		Cd	<0.001
Hardness	142	Nitrate-N	0.9	Manganese	0.01	Turbidity	0.5		Cr	<0.005
Calcium	37	Alkalinity	130	Copper	0.00	pH	7.86		Ag	<0.005
Magnesium	12	Bicarbonate	159	Zinc	0.01	EC	389		Hg	<0.005
Sodium	28	Carbonate	0	Barium	0.09	SiO ₂ OC	-0.00		Pb	<0.005
Potassium	4	Fluoride	0.21	Boron	0.0				Se	<0.001
Sulfate	61	Arsenic	0.007	Silica	43					
<u>MBAS</u>		<u>60.1</u>		GROSS ALPHA	<3 pCi/l					
				GROSS BETA	<3 pCi/l					

Fee _____
 Collected by _____
 PWS I.D. N/A 135
 SDWA-Pri. 13 Sec.
 1st 1/16/95 3rd 1/16/95
 Date Rec'd 1/16/95 Init. IS YET LICH
 ppm = parts per million, milligrams per liter
 S.U. = Standard Units

Remarks Eng 1/16/95 new KRC
12/16/94

RESULTS REPORTED

JAN 13 1995

TOTAL P.02



Alpha Analytical, Inc.

555 Colorado Avenue, Suite 21
Sparks, Nevada 89431
(775) 325-1644
FAX: (775) 325-0406
1-800-283-1183

Boise, Idaho
(208) 336-2148

Las Vegas, Nevada
(702) 566-7227

ANALYTICAL REPORT

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

Job#: 143874
Phone: 856-7300
Attn: Terri Svetich

Sampled: 12/05/94 Received: 12/06/94 Analyzed: 12/13/94
Alpha Analytical Number: WCU120694-01
Client I.D. Number: Lemmon Valley Test Pump 2

**Report of GC/MS Analysis for
SDWA VOLATILES PLUS LISTS 1 AND 3
UNREGULATED COMPOUNDS
EPA 524.2**

Compound	Concentration ug/L	Detection Limit	Compound	Concentration ug/L	Detection Limit
8 Regulated Volatile Organic Compounds (VOC's) (Phase I)					
1. Benzene	ND	0.50 ug/L	28. Chloroform	ND	0.50 ug/L
2. Vinyl Chloride	ND	0.50 ug/L	29. Chloromethane	ND	0.50 ug/L
3. Carbon tetrachloride	ND	0.50 ug/L	30. o-Chlorotoluene	ND	0.50 ug/L
4. 1,2-Dichloroethane	ND	0.50 ug/L	31. p-Chlorotoluene	ND	0.50 ug/L
5. Trichloroethylene	ND	0.50 ug/L	32. Dibromomethane	ND	0.50 ug/L
6. p-Dichlorobenzene	ND	0.50 ug/L	33. m-Dichlorobenzene	ND	0.50 ug/L
7. 1,1-Dichloroethylene	ND	0.50 ug/L	34. 1,1-Dichloroethane	ND	0.50 ug/L
8. 1,1,1-Trichloroethane	ND	0.50 ug/L	35. 1,1-Dichloropropene	ND	0.50 ug/L
10 Regulated Volatile Organic Compounds (VOC's) (Phase II)					
9. cis-1,2-Dichloroethylene	ND	0.50 ug/L	36. 1,3-Dichloropropane	ND	0.50 ug/L
10. 1,2-Dichloropropane	ND	0.50 ug/L	37. e,z-1,3-Dichloropropene	ND	0.50 ug/L
11. Ethylbenzene	ND	0.50 ug/L	38. 2,2-Dichloropropane	ND	0.50 ug/L
12. Monochlorobenzene	ND	0.50 ug/L	39. 1,1,1,2-Tetrachloroethane	ND	0.50 ug/L
13. o-Dichlorobenzene	ND	0.50 ug/L	40. 1,1,2,2-Tetrachloroethane	ND	0.50 ug/L
14. Styrene	ND	0.50 ug/L	41. 1,2,3-Trichloropropane	ND	0.50 ug/L
15. Tetrachloroethylene	ND	0.50 ug/L	List 3 - Monitoring Required at State Discretion.		
16. Toluene	ND	0.50 ug/L	42. Bromochloromethane	ND	0.50 ug/L
17. trans-1,2-Dichloroethylene	ND	0.50 ug/L	43. n-Butylbenzene	ND	0.50 ug/L
18. Xylenes (total)	ND	0.50 ug/L	44. Dichlorodifluoromethane	ND	0.50 ug/L
3 Regulated Volatile Organic Compounds (VOC's) (Phase V)					
19. Dichloromethane	ND	0.50 ug/L	45. Fluorotrichloromethane	ND	0.50 ug/L
20. 1,1,2-Trichloroethane	ND	0.50 ug/L	46. Hexachlorobutadiene	ND	0.50 ug/L
21. 1,2,4-Trichlorobenzene	ND	0.50 ug/L	47. Isopropylbenzene	ND	0.50 ug/L
List 1 - Unregulated Compounds - All Systems					
22. Bromobenzene	ND	0.50 ug/L	48. p-Isopropyltoluene	ND	0.50 ug/L
23. Bromodichloromethane	ND	0.50 ug/L	49. Naphthalene	ND	0.50 ug/L
24. Bromoform	ND	0.50 ug/L	50. n-Propylbenzene	ND	0.50 ug/L
25. Bromomethane	ND	0.50 ug/L	51. sec-Butylbenzene	ND	0.50 ug/L
26. Chlorodibromomethane	ND	0.50 ug/L	52. tert-Butylbenzene	ND	0.50 ug/L
27. Chloroethane	ND	0.50 ug/L	53. 1,2,3-Trichlorobenzene	ND	0.50 ug/L

ND - Not Detected

Approved By: Roger L. Scholl Date: 12/15/94
Roger L. Scholl, Ph.D.
Laboratory Director



Alpha Analytical, Inc.

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Borg Idaho
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Las Vegas, Nevada
702-386-6747

Analytical Report For The

National Primary Drinking Water Phase II and Phase V
Regulated and Unregulated Synthetic Organic Compounds (SOC's)

Client ID: Lemmon Valley
Test Pump 2
Lab ID: WCU120694-01
Sampled: 12/05/94
Received: 12/06/94
Analyzed: 12/20/94

Washoe County Utilities
P.O. Box 11130
Reno NV 89520
Attn: Terri Svetich

Contaminant	Concentration ug/L	Detection Limit ug/L	EPA Method
Aalachlor	ND	0.20	505
Aldrin	ND	0.20	505
Chlordane (Technical)	ND	0.20	505
Dieldrin	ND	0.20	505
Endrin	ND	0.01	505
Heptachlor	ND	0.04	505
Heptachlor Epoxide	ND	0.02	505
Hexachlorobenzene	ND	0.10	505
Hexachlorocyclopentadiene	ND	0.10	505
Lindane	ND	0.02	505
Methoxychlor	ND	0.10	505
Aroclor-1016 (Screen)	ND	0.08	505
Aroclor-1221 (Screen)	ND	20	505
Aroclor-1232 (Screen)	ND	0.50	505
Aroclor-1242 (Screen)	ND	0.30	505
Aroclor-1248 (Screen)	ND	0.10	505
Aroclor-1254 (Screen)	ND	0.10	505
Aroclor-1260 (Screen)	ND	0.20	505
Toxaphene	ND	1.0	505

ND - Not Detected

Approved By:

Roger L. Scholl Date: 4/13/95
Roger L. Scholl, Ph.D.
Laboratory Director



Alpha Analytical, Inc.

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Sparks, Nevada 89431

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Borac, Idaho

208-336-4448

Las Vegas, Nevada

(702) 386-6747

Analytical Report

For The

National Primary Drinking Water Phase II and Phase V
Regulated and Unregulated Synthetic Organic Compounds (SOC's)

Client ID: Lemmon Valley Test Pump 2	Wahoe County Utilities P.O. Box 11130
Lab ID: WCU120694-01	Reno NV 89502
Sampled: 12/05/94	Attn: Terri Svetich
Received: 12/05/94	
Analyzed: 12/07-21/94	

Contaminant	Concentration ug/L	Detection Limit ug/L	EPA Method
1,2-Dibromo-3-Chloropropane (DBCP)	ND	0.02	504
1,2-Dibromoethane (EDB)	ND	0.01	504
Dalapon	ND	1.0	515.1
Dicamba	ND	1.0	515.1
Dinoseb	ND	0.20	515.1
2,4-D	ND	0.10	515.1
Pichloram	ND	0.10	515.1
Pentachlorophenol	ND	0.04	515.1
2,4,5-TP (Silvex)	ND	0.20	515.1
Aldicarb	ND	0.50	531.1
Aldicarb Sulfoxide	ND	0.50	531.1
Aldicarb Sulfone	ND	0.80	531.1
Carbofuran	ND	0.90	531.1
Oxamyl	ND	2.0	531.1
Glyphosate	ND	6.0	547
Endothall	ND	9.0	548
Diquat	ND	0.40	549

ND - Not Detected

Approved By:

Roger L. Scholl Date: 1/13/95
Roger L. Scholl, Ph.D.
Laboratory Director



ENVIRONMENTAL

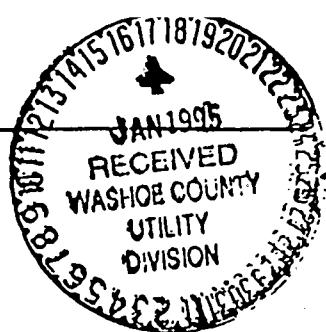
ANALYTICAL CHEMISTS

December 15, 1994

Alpha Analytical
255 Glendale Avenue, Suite 21
Sparks , NV 89431

LAB No: SP 407487-1

RE: Organic Analysis
Matrix: Drinking Water



Sampling Site: WCU120694-01

Sample Description: Lemmon Valley Test Pump
Sampled by : Alpha Analytical
Container : Amber Glass TFE-Cap
Preservatives:

Sampled : December 5, 1994
Received : December 7, 1994
Extracted : December 12, 1994
Analyzed : December 13, 1994
QA/QC ID# : SP 94121200I

EPA METHOD 525

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE MCL ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Benzo(a)pyrene	0.02	0.2	ND	0.02	ND
Hexachlorocyclopentadiene	0.1	50	ND	0.1	ND
bis(2-Ethylhexyl)adipate	0.6	400	ND	0.6	ND
bis(2-Ethylhexyl)phthalate	0.6	4	ND	0.6	ND
SURROGATE	SAMPLE AR	SAMPLE % REC		LAB AR	BLANK % REC.
Perylene-d12	50-150	82		50-150	74

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
ug/L = Micrograms Per Liter (ppb) ND = Not Detected at or above the DLR. AR = Acceptable Range.
♦ = DLR adjusted because of dilutions, concentrations, or limited sample.

See attached report for Quality Assurance data. If you have any questions, please call

FGL ENVIRONMENTAL

Kelly A. Dunnahoo, B.S.
Organic Laboratory Manager

Darrell H. Nelson, B.S.
Laboratory Director

KAD/DHN:tld

RECEIVED

1934 SEP 13 PM 3:58 5890

WATER CHEMISTRY ANALYSIS:

Note: 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 E.O. EVANS

Date 9/12/34

Owner DORN TURNER

Phone 637-7777

Address 7900 N. VIRGINIA ST. #35

City RENO State NV

REPORT TO:

Name E.O. EVANS

Address P.O. BOX 11134

City RENO

State NV

Zip 89503

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

FOR LABORATORY USE ONLY								PRINT OTHER DESIRED CONSTITUENTS BELOW		
Constituent	ppm	Conc'n	ppm	Conc'n	ppm	Conc'n	ppm	S.U.	Constituent	ppm
Conductivity	260	0.6	18.2	ppm	0.0	ppm	5144	constituent	115890	s.u.
T.D.S. @ 103° C.	223	Chloride	7	Iron	0.07	Color	5	Cd	<0.001	
Hardness	134	Nitrate	-N	Manganese	0.05	Turbidity	0.5	Cr	<0.005	
Calcium	34	Alkalinity	112	Copper	0.00	pH	7.76	Pb	<0.005	
Magnesium	12	Bicarbonate	137	Zinc	0.03	EC	340	Hg	<0.0005	
Sodium	19	Carbonate	0	Barium	0.13	SiO ₂ 0C	-0.20	Se	0.001	
Potassium	2	Fluoride	0.14	Boron	0.0			Ag	<0.005	
Sulfate	48	Arsenic	0.003	Silica	39					
<i>MBAS <0.1</i>				GROSS ALPHA	<3 p.p.m.					
				GROSS BETA	3 p.p.m.					

Fee.....

Remarks

Collected by.....

PWS I.D. N/A *✓*SDWA—Pri. Sec. *✓*1st 2nd 3rd *✓*Date Rec'd. Init. *✓*ppm = parts per million, milligrams per liter
S.U. = Standard Units

RESULTS PREPARED

OCT 28 1934

1934

SAMPLE: TURNER WELL

115890

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

State NEVADA County WASHOE
 Township 21N Range 19E Section 33
 General Location LYNN VALLEY
 Source Address 1/2 MILE NORTH OF MILITARY ROAD

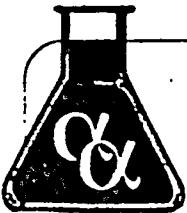
REASON FOR ANALYSIS:

- Loan Domestic drinking water
 Personal health reasons Geothermal
 Purchase of the property Industrial or mining
 Rental or sale of property Irrigation
 Subdivision approval Other... *Drinking Test*
 Other *FDR 72 ft pump test* Initials *E.O. EVANS*

EVALUATING POTENTIAL FOR PUBLIC USE

SOURCE OF WATER:

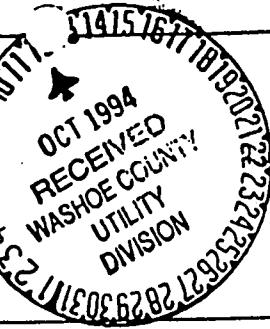
Filter Yes No Type GROUNDWATER
 Public Yes No Name TURNER WELL
 Spring _____ Surface N/A
 Well Depth 460 ft. Casing diameter 10 in.
 Hot _____ Cold Casing depth 460 ft.
 IN USE Yes No



Alpha Analytical, Inc.

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Boise, Idaho
(208) 336-4145



Vegas, Nevada
702-386-6717

ANALYTICAL REPORT

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

Job #: 143874
Phone: 856-7300
Attn: Terri Svetich

Sampled: 09/12/94 Received: 09/13/94 Analyzed: 09/16/94
Alpha Analytical Number: WCU091394-01
Client I.D. Number: Turney Well

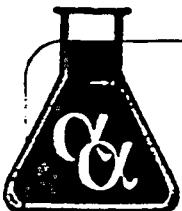
**Report of GC/MS Analysis for
SDWA VOLATILES PLUS LISTS 1 AND 3
UNREGULATED COMPOUNDS
EPA 524.2**

Compound	Concentration ug/L	Detection Limit	Compound	Concentration ug/L	Detection Limit
8 Regulated Volatile Organic Compounds (VOC's)					
(Phase I)			28. Chloroform	ND	0.50 ug/L
1. Benzene	ND	0.50 ug/L	29. Chloromethane	ND	0.50 ug/L
2. Vinyl Chloride	ND	0.50 ug/L	30. o-Chlorotoluene	ND	0.50 ug/L
3. Carbon tetrachloride	ND	0.50 ug/L	31. p-Chlorotoluene	ND	0.50 ug/L
4. 1,2-Dichloroethane	ND	0.50 ug/L	32. Dibromomethane	ND	0.50 ug/L
5. Trichloroethylene	ND	0.50 ug/L	33. m-Dichlorobenzene	ND	0.50 ug/L
6. p-Dichlorobenzene	ND	0.50 ug/L	34. 1,1-Dichloroethane	ND	0.50 ug/L
7. 1,1-Dichloroethylene	ND	0.50 ug/L	35. 1,1-Dichloropropene	ND	0.50 ug/L
8. 1,1,1-Trichloroethane	ND	0.50 ug/L	36. 1,3-Dichloropropene	ND	0.50 ug/L
10 Regulated Volatile Organic Compounds (VOC's)			37. o,z-1,3-Dichloropropene	ND	0.50 ug/L
(Phase II)			38. 2,2-Dichloropropene	ND	0.50 ug/L
9. cis-1,2-Dichloroethylene	ND	0.50 ug/L	39. 1,1,1,2-Tetrachloroethane	ND	0.50 ug/L
10. 1,2-Dichloropropane	ND	0.50 ug/L	40. 1,1,2,2-Tetrachloroethane	ND	0.50 ug/L
11. Ethylbenzene	ND	0.50 ug/L	41. 1,2,3-Trichloropropane	ND	0.50 ug/L
12. Monochlorobenzene	ND	0.50 ug/L	List 3 - Monitoring Required at State Discretion		
13. o-Dichlorobenzene	ND	0.50 ug/L	42. Bromochloromethane	ND	0.50 ug/L
14. Styrene	ND	0.50 ug/L	43. n-Butylbenzene	ND	0.50 ug/L
15. Tetrachloroethylene	ND	0.50 ug/L	44. Dichlorodifluoromethane	ND	0.50 ug/L
16. Toluene	ND	0.50 ug/L	45. Fluorotrifluoromethane	ND	0.50 ug/L
17. trans-1,2-Dichloroethylene	ND	0.50 ug/L	46. Hexachlorobutadiene	ND	0.50 ug/L
18. Xylenes (total)	ND	0.50 ug/L	47. Isopropylbenzene	ND	0.50 ug/L
3 Regulated Volatile Organic Compounds (VOC's)			48. p-Isopropyltoluene	ND	0.50 ug/L
(Phase V)			49. Naphthalene	ND	0.50 ug/L
19. Dichloromethane	ND	0.50 ug/L	50. n-Propylbenzene	ND	0.50 ug/L
20. 1,1,2-Trichloroethane	ND	0.50 ug/L	51. sec-Butylbenzene	ND	0.50 ug/L
21. 1,2,4-Trichlorobenzene	ND	0.50 ug/L	52. tert-Butylbenzene	ND	0.50 ug/L
List 1 - Unregulated Compounds - All Systems			53. 1,2,3-Trichlorobenzene	ND	0.50 ug/L
22. Bromobenzene	ND	0.50 ug/L	54. 1,2,4-Trimethylbenzene	ND	0.50 ug/L
23. Bromodichloromethane	ND	0.50 ug/L	55. 1,3,5-Trimethylbenzene	ND	0.50 ug/L
24. Bromoform	ND	0.50 ug/L			
25. Bromomethane	ND	0.50 ug/L			
26. Chlorodibromomethane	ND	0.50 ug/L			
27. Chloroethane	ND	0.50 ug/L			

ND - Not Detected

Approved By: Roger L. Scholl
Roger L. Scholl, Ph.D.
Laboratory Director

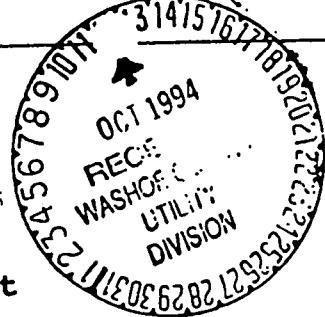
Date: 9/22/94



Alpha Analytical, Inc.

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Boise, Idaho
(208) 336-2135



Vegas, N.V.
702-356-1234

Analytical Report For The

Phase II National Primary Drinking Water Regulated and Unregulated Synthetic Organic Compounds

Client ID: Turney Well
Lab ID: WCU091394-01
Sampled: 09/12/94
Received: 09/13/94
Analyzed: 09/17/94

Washoe County Utilities
P.O. Box 11130
Reno NV 89520
Attn: Terri Svetich

Regulated Compounds	Concentration ug/L	Detection Limit ug/L	EPA Method
Alethlor	ND	0.20	505
Aldrin	ND	0.20	505
Atrazine	ND	0.10	505
Chlordane (Technical)	ND	0.20	505
Dieldrin	ND	0.20	505
Endrin	ND	0.01	505
Heptachlor	ND	0.04	505
Heptachlor Epoxide	ND	0.02	505
Hexachlorobenzene	ND	0.10	505
Hexachlorocyclopentadiene	ND	0.10	505
Lindane	ND	0.02	505
Methoxychlor	ND	0.10	505
Aroclor-1016 (Screen)	ND	0.08	505
Aroclor-1221 (Screen)	ND	20	505
Aroclor-1232 (Screen)	ND	0.50	505
Aroclor-1242 (Screen)	ND	0.30	505
Aroclor-1248 (Screen)	ND	0.10	505
Aroclor-1254 (Screen)	ND	0.10	505
Aroclor-1260 (Screen)	ND	0.20	505
Toxaphene	ND	1.0	505

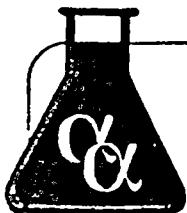
ND - Not Detected

Approved By:

Roger L. Scholl, Ph.D.
Laboratory Director

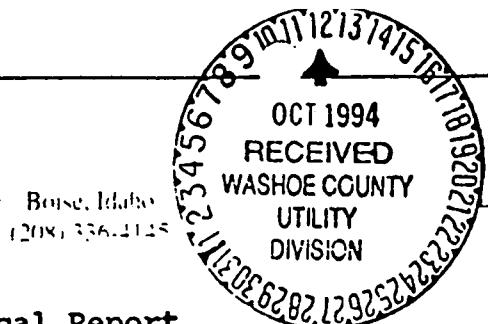
Date:

10/7/94



Alpha Analytical, Inc.

255 Glendale Avenue, Suite 21
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FAX: 702-355-0406
1-800-283-1183



Las Vegas, Nevada
702-386-6747

Analytical Report

For The

Phase II National Primary Drinking Water Regulated and Unregulated Synthetic Organic Compounds

Client ID: Turney Well
Lab ID: WCU091394-01
Sampled: 09/12/94
Received: 09/13/94
Analyzed: 09/21-29/94

Washoe County Utilities
P.O. Box 11130
Reno NV 89520
Attn: Terri Svetich

Regulated Compounds	Concentration ug/L	Detection Limit ug/L	EPA Method
Dalapon	ND	1.0	515.1
1,2-Dibromoethane	ND	0.01	504
1,2-Dibromo-3-Chloropropane	ND	0.02	504
Dicamba	ND	1.0	515.1
Dinoseb	ND	0.20	515.1
Endothall	ND	9	548
Pentachlorophenol	ND	0.04	515.1
Picloram	ND	0.10	515.1
2,4-D	ND	0.10	515.1
2,4,5-TP (Silvex)	ND	0.20	515.1

ND - Not Detected

Approved By:

Roger L. Scholl Date: 10/17/94
Roger L. Scholl, Ph.D.
Laboratory Director



ENVIRONMENTAL

ANALYTICAL CHEMISTS

September 29, 1994

Alpha Analytical
255 Glendale Avenue, Suite 21
Sparks, NV 89431

Sampling Site: WCU091394-01
Sample Description: Turney Well
Sampled by : Client
Container : Amber Glass TFE-Cap
Preservatives:

LAB No: SP 405473-1

**RE: Organic Analysis
Matrix: Drinking Water**

A circular library stamp with a double-line border. The outer ring contains the numbers 1 through 12 in a clockwise sequence. The inner circle contains the text "WASHOE COUNTY UTILITY DIVISION" at the bottom, "RECEIVED" in the center, and "OCT 1994" above it.

EPA METHOD 525

CONSTITUENT	SAMPLE	SAMPLE	LAB	BLANK	
	DLR ug/L	MCL ug/L	RESULTS ug/L	DLR ug/L	RESULTS ug/L
Benzo(a)pyrene	0.02	0.2	ND	0.02	ND
Hexachlorocyclopentadiene	0.1	50	ND	0.1	ND
bis(2-Ethylhexyl)adipate	0.6	400	ND	0.6	ND
bis(2-Ethylhexyl)phthalate	0.6	4	ND	0.6	ND

SURROGATE	SAMPLE	LAB	BLANK	
	AR	% REC	AR	% REC.
Perylene-d12	50-150	71	50-150	101

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
ug/L = Micrograms Per Liter (ppb) ND = Not Detected at or above the DLR. AR = Acceptable Range
* = DLR adjusted because of dilutions, concentrations, or limited sample.

If you have any questions, please call.

FGI ENVIRONMENTAL

Kelly A. Dunnahoo, B.S.
Organic Laboratory Manager

KAD/DHN:vt

**Darrell H. Nelson, B.S.
Laboratory Director**

Corporate Offices & Laboratory
PO Box 272 / 853 Corporation Street
Santa Paula, CA 93061-0272
TEL: 805 659-0910
FAX: 805 525-4172

Office & Laboratory
2500 Stagecoach Road
Stockton, CA 95215
TEL: 209/942-0181
FAX: 209/942-0423

Field Office
Visalia, CA
TEL: 209/734-9473
FAX: 209/734-8435
Mobile: 209/737-2399

4 Nov 96

Mike:

Here is the information you requested about our well off military road in Lemmon Valley Nevada.

Peak Well Construction

8-inch diameter casing

445 feet deep

Perforated interval 180-445 feet

Hydraulic Characteristics

Transmissivity = 11,350 gpd/ft

Hydraulic Conductivity = 6 ft/day

Storage coefficient = 9.0×10^{-4} (dimensionless)

- We would equip the well to pump 500 gpm
- It may pump 500 gpm continuously for 30 days during the summer but the "average" pumping rate would probably be around 200 gpm

Please call me at 702 (856-7300) if you need more information.

Post-It™ brand fax transmittal memo 7671 # of pages ▶ 1

To	Mike Pankiw	From	Dan Dragan
Co.	Sherwin Williams	Co.	Washoe County
Dept.		Phone #	702 856-7300
Fax #	216-566-2730	Fax #	702 856-7310



ENVIRONMENTAL

ANALYTICAL CHEMISTS

October 3, 1994

LAB No: SP 405473-1

Alpha Analytical
255 Glendale Avenue, Suite 21
Sparks , NV 89431

RE: Organic Analysis
Matrix: Drinking Water



Sampling Site: WCU091394-01
Sample Description: Turney Well
Sampled by : Client
Container : Amber Glass
Preservatives: Monochloroacetic Buf

Sampled : September 12, 1994
Received : September 14, 1994
Extracted : N/A
Analyzed : September 22, 1994
QA/QC ID# : SP 94092100A

EPA METHOD 531

CONSTITUENT	SAMPLE DLR ug/L	MCL ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Aldicarb Sulfone	0.8	3	ND	0.8	ND
Aldicarb Sulfoxide	0.5	3	ND	0.5	ND
Oxymal	2	200	ND	2	ND
Methomyl	5	---	ND	5	ND
3-Hydroxycarbofuran	10	---	ND	10	ND
Aldicarb	0.5	3	ND	0.5	ND
Carbofuran	0.9	18	ND	0.9	ND
Carbaryl	5	---	ND	5	ND

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
ug/L = Micrograms Per Liter (ppb) ND = Not Detected at or above the DLR.
♦ = DLR adjusted because of dilutions, concentrations, or limited sample.

If you have any questions, please call.

FGL ENVIRONMENTAL

Kelly A. Dunnahoo, B.S.
Organic Laboratory Manager

Darrell H. Nelson, B.S.

Laboratory Director

KAD/DHN:tld



ENVIRONMENTAL

ANALYTICAL CHEMISTS

September 29, 1994

Alpha Analytical
255 Glendale Avenue, Suite 21
Sparks , NV 89431

LAB No: SP 405473-1

RE: Organic Analysis
Matrix: Drinking Water

Sampling Site: WCU091394-01
Sample Description: Turney Well
Sampled by : Client
Container : Amber Glass
Preservatives:

Sampled : September 12, 1994
Received : September 14, 1994
Extracted : N/A
Analyzed : September 15, 1994
QA/QC ID# : SP 94091500A

EPA METHOD 547

CONSTITUENT	SAMPLE DLR ug/L	MCL ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Glyphosate	6	700.0	ND	6	ND

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
ug/L = Micrograms Per Liter (ppb) ND = Not Detected at or above the DLR.
* = DLR adjusted because of dilutions, concentrations, or limited sample.

If you have any questions, please call.

EGI ENVIRONMENTAL

Kelly A. Dunnahoo, B.S.
Organic Laboratory Manager

Danw. N.

**Darrell H. Nelson, B.S.
Laboratory Director**

KAD/DHN:vt



ENVIRONMENTAL

ANALYTICAL CHEMISTS

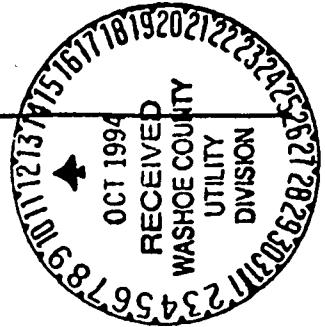
September 29, 1994

Alpha Analytical
255 Glendale Avenue, Suite 21
Sparks, NV 89431

Sampling Site: WCU091394-01
Sample Description: Turney Well
Sampled by : Client
Container : Amber Glass TFE-Cap
Preservatives:

LAB No: SP 405473-1

RE: Organic Analysis
Matrix: Drinking Water



Sampled : September 12, 1994
Received : September 14, 1994
Extracted : September 19, 1994
Analyzed : September 22, 1994
QA/QC ID# : SP 94091900A

EPA METHOD 549

CONSTITUENT	SAMPLE DLR ug/L	MCL ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Diquat	0.4	20	ND	0.4	ND
Paraquat	1	---	ND	1	ND

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
ug/L = Micrograms Per Liter (ppb) ND = Not Detected at or above the DLR.
♦ = DLR adjusted because of dilutions, concentrations, or limited sample.

See attached report for QA/QC data. If you have any questions, please call.

FGL ENVIRONMENTAL

Kelly A. Dunnahoo, B.S.
Organic Laboratory Manager

Darrell H. Nelson, B.S.
Laboratory Director

KAD/DHN:vt

LEMMON VALLEY WELL REHABILITATION AND PUMP TEST

11-19-'94 Remove 200' x 6" turbine pump & demo pump house and remove.

11-16-'94 Demob equipment.

11-19-'94 Add 20# of Calcium Hypochlorite to well. 1 hr.

11-21-'94 10:30-11:30 Video Log

Mon. 11:30-4:30 Brush well from 185'-250' w/#1 new brush
4:30-5:30 Bail well from bottom 6 hrs.

11-22-'94 7:00-10:00 Brush well from 250'-300' w/#1 brush.

Tues. 10:00-1:00 Brush well from 300'-350' w/#1 brush.
1:00-4:00 Brush well from 350'-400' w/#2 new brush.
4:00-5:00 Bail well from bottom. 10 hrs.

11-23-'94 7:30-10:00 Brush well from 400'-bottom w/#1 brush.

Wed 10:00-12:30 Brush well from 400'-bottom w/ #1 & #2 dbl brush.
12:30-2:00 Take time off.
2:00-6:00 Brush from 185'-bottom w/ #1 & #2 dbl brush. 9 hrs.

11-25-'94 8:00-11:00 Brush well from 185'-bottom w/ #1 & #2 dbl brush.

Fri. 11:00-5:00 Bail well from bottom. 9 hrs.

11-26-'94 8:00-11:00 Bail well from bottom. 3 hrs.

11-26-'94 Add 20# Calcium Hypoclorite to well. 1 hr.

TOTAL TIME BRUSH AND BAIL 37 hrs.

Add Calcium Hypoclorite twice 2 hrs.

Weld 2' x 8 5/8" casing to well head 1 hr.

TOTAL HOURS FOR BRUSH-BAIL-WELD 40 HRS.

Static water level prior to brush and bail 45'. Total debth-497'
Static water level after brush and bail 39'. Total debth-442'

11-28-'94 Video Log.

11-28-'94 Install 30 hp submersible pump on 168' x 4" galv. pipe.

11-29-'94 Install still well and orifice tube/plate and valves.

Start development test 0930 - 1730. 8 Hrs.

11-30-'94 Development 0845 - 1645. 8 Hrs.

12-01-'94 Development 0745 - 1545. 8 Hrs.

TOTAL DEVELOPMENT 24 Hrs.

12-02-'94 Step test by County. 0900 - 1600 7 Hrs.

12-03 until 12-06-'94 Test Pumping- 0845 - 0845 72 Hrs.

11-29-'94 Cement in 1 1/4" access pipe to well head. 1 Hr.

TOTAL Test Pumping 80 HRS.

Recap of charges:

1. Mobilization & Demobilization		\$ 2,500.00
2. Removal and disposal of well house		2,500.00
3. Two video logs		1,100.00
4. Well development by brushing-	36 hours	4,500.00
Additional hours for other work-	4 hours	500.00
5. Development of well-	16 hours	640.00
Additional hours approved by County-	8 hours	320.00
6. 3/4 pvc sounding tube-		n/c
7. Test pumping and cement access pipe	80 hours-	3,200.00
8. Well disinfection and capping-		n/c
	TOTAL CHARGES	<u>\$15,260.00</u>

Optional- Weld 10" casing onto other well and cement base- \$125.00 (one hour additional to development).