

Mt. Rose Well No. 6  
Well Construction and Testing  
Final Report  
December 2000



**WASHOE COUNTY**  
DEPARTMENT OF WATER RESOURCES  
UTILITY SERVICES DIVISION  
4930 ENERGY WAY RENO, NEVADA 89502

Department of



Water Resources

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## SUMMARY AND CONCLUSIONS

1. The developers of the Montreux subdivision and golf course were required by Washoe County to provide adequate water rights, supply, and infrastructure for their development. As the Owner, Montreux contracted with Lang Exploratory Drilling from Elko, Nevada to drill, construct and test a well to meet the water supply portion of those needs. At an appropriate time, Montreaux will dedicate this well and appurtenant infrastructure to Washoe County for incorporation into the Mt. Rose water system.
2. While the drilling contract was between Montreaux and Lang Exploratory Drilling, Montreaux directed Lang to construct the well to meet Washoe County municipal well standards. As a result, Hydrology staff from the Washoe County Department of Water Resources provided design and inspection services during construction and testing of the well.
3. Drilling began January 19, 2000. Construction of the well, including air-lift development was completed on February 4, 2000. **The well has 14-inch diameter casing installed to a depth of 755 feet. Screens start at 540 feet and extend to the bottom of the hole.**
4. Pumping development and test pumping began on February 14, 2000. Test pumping included a 4-step, step drawdown test and a 10-day continuous discharge test. The 10-day constant discharge test ended on February 29, 2000.
5. **RECOMMENDED YIELD-**Based on the assumption that the well will not be pumped in conjunction with Mt. Rose No. 5 continuously for more than 30 days, the well could be equipped to pump 550 gallons per minute. The Maximum anticipated pumping level at 550 gallons per minute after 30 days of continuous pumping would be about 500 feet below ground surface. The well could be equipped to pump as much as 650 gallons per minute if not pumped continuously for periods longer than 10 days. **Our recommendation is a variable speed pump or a flow control device such that the pumping rate could be coordinated with a maximum pumping level of 500 feet below the ground surface.**
6. **RECOMMENDED PUMP SETTING-**The pump intake should be set to a minimum depth of 560 feet below ground surface. The setting would allow for long-term water level declines.

7. There will be some impacts on nearby domestic wells from pumping the two Mt. Rose production wells. These wells will have to be monitored at least quarterly and assessed for the amount of impact caused by the production wells. The County may provide financial assistance to the domestic well owner if the impact is determined to seriously affect the performance of the domestic well. Reimbursement will follow guidelines as currently written by Washoe County.
8. Sand content measured during the pumping tests showed the well meets County standards for sand production (less than 5 parts per million by volume).
9. Water quality analyses showed water from the well meet all current water quality standards. In general, the water quality is excellent, with total dissolved solids below 200 parts per million.
10. The well met standards for plumbness and alignment:

## **INTRODUCTION**

### **Location and Purpose**

**Figure 1** shows the location of the Montreux Subdivision and the production well. The well is located on the southeast corner of the intersection of Lake Geneva Dr. and Bordeaux Rd on Assessors Parcel No. 148-150-01. The Parcel is in the NW  $\frac{1}{4}$  of the SE  $\frac{1}{4}$  of section 3, T17N, R19E. A global Positioning System Survey placed the well at an altitude of 5749.7 feet above Mean Sea Level.

The purpose of the well is to provide additional supply into the Mt. Rose water system owned and operated by Washoe County. The additional source is to serve growth in the area, predominantly the Montreux Development. Once the well is equipped, the well and land will be dedicated to Washoe County. Washoe County will then own and operate the well.

### **Hydrogeologic Setting**

The Montreux Subdivision is located near the apex of an alluvial fan emanating from the mouth of the Galena Creek Canyon to the west. The Carson Range contains the upper Galena Creek watershed and provides the majority of groundwater recharge to the Galena Creek alluvial fan. Galena Creek also provides a source of recharge to the groundwater system. The well is located about 1,200 feet to the north of Galena Creek. It is assumed that an apparent east-west trending fault scarp forms the northern Galena Creek boundary and may influence groundwater flow as well.

In 1991, a nearby test well was drilled and constructed to a depth of 611 feet (Washoe County, 1991) and later (1999) abandoned. The near surface lithology consists of mafic volcanic and granodiorite colluvium and glacial outwash material. Below this unconsolidated material are volcanic mudflow (lahar) deposits as well as undifferentiated andesitic or basalt-andesitic extrusive volcanic rock. Granodiorite of the Carson Range (Sierra Nevada Batholith) forms the basement rock.

### **County Participation During Construction**

Because the well would eventually be dedicated to Washoe County, personnel from the County Department of Water Resources participated in the well design and construction supervision. Staff logged the borehole cuttings, evaluated the geophysical logs and provided design recommendations for well completion. Following well construction, County staff collected and evaluated all test pumping data, including data collected from nearby domestic wells. County staff coordinated with the domestic well owners to provide an evaluation of the impact the new production well is likely to have on their

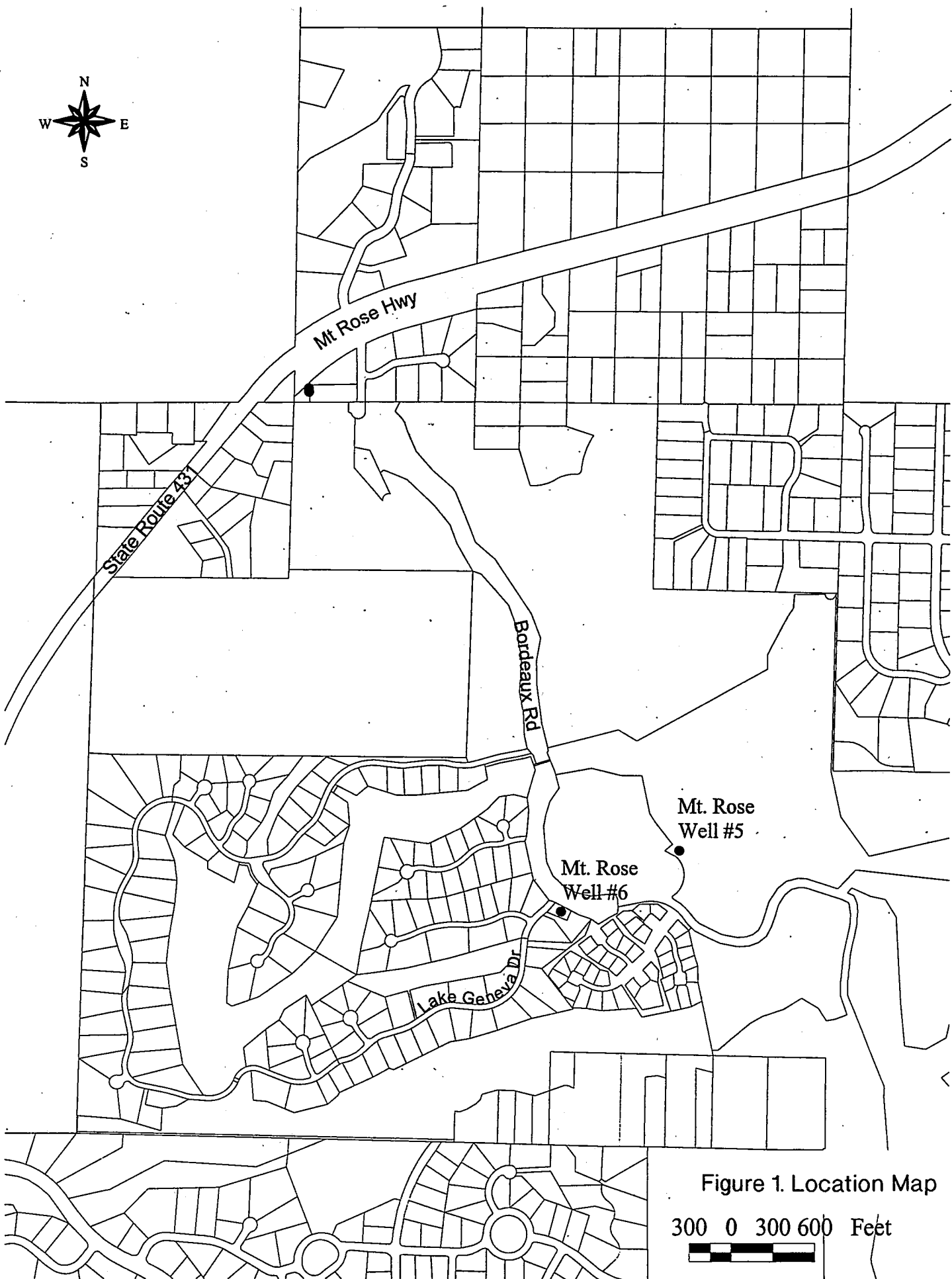


Figure 1. Location Map

300 0 300 600 Feet

domestic well. Coordination with domestic well owners included modifying 4 domestic wells with a "stilling well" to allow easy access to the wells for water level measurements. Washoe County will continue to monitor water levels in the domestic wells to verify the impact caused by the new municipal well.

## **DRILLING and COSTRUCTION OPERATIONS**

### **Contractor**

Lang Exploratory Drilling, a division of Boart Longyear contracted with Montreux Joint Venture, a Nevada General Partnership to construct and provide pumping test equipment for the well. Washoe County staff had originally intended to bid and manage the job but due to time constraints, Montreux Joint Venture wanted the well completed during the winter months and opted to directly contract with a driller. Lang Exploratory Drilling had done good quality work for the County in the past and happened to have equipment in the area finishing up a job for another client. The County recommended to Montreux that they contract with Lang with the understanding that Lang would construct the well to meet Washoe County municipal well standards. Lang accepted the contract and agreed to work closely with Washoe County during construction and testing.

### **Drilling and Construction**

Lang began moving equipment on site January 19, 2000. Set up took three days because heavy rains had made the site very muddy and hindered set up. Drilling using the dual tube flooded-reverse method started on January 22, 2000 and progressed as follows:

January 22, 2000	Drilled 40 feet of 29-inch diameter borehole for surface casing.
January 23 2000	Drilled 29-inch diameter borehole to 105 feet and installed 100 feet of 22-inch diameter surface casing.
January 24, 2000	Install 105 feet of cement grout for sanitary seal.
January 25 through January 30, 2000	Drill 655 feet of 19-inch diameter production casing borehole.
January 30, 2000	Conduct geophysical log of borehole.
January 31, 2000	Install 554 feet of blank 14-inch diameter well casing and 200 feet of 14-inch diameter wire wrap well screen.
	Install 10 cubic yards of design gravel pack.

February 1, 2000	Air-lift develop well for 9.5 hours
February 2 2000	Air-lift develop well for 24 hours.
February 3, 2000	Air lift develop well for 17 hours and "top off" gravel pack with 1.13 cubic yards of gravel.
	Treat well with chemicals to enhance development (Baroid NuWell 220®).
February 4, 2000	Demobilization from site.

Figure 2 shows a construction detail diagram for the completed well.

## GEOLOGY/HYDROLOGY

### Geology

The well is located near Galena Creek in the upper portion of an alluvial basin known and the Mount Rose Fan. Sedimentary units drilled through to a depth of about 360 feet consisted primarily of extrusive volcanic sands, gravels and cobbles, with occasional granitic outwash material. Volcanic mudflows (lahars) consisting of mixed andesitic, rhyolitic and dacitic fragments were encountered at a depth of 360 feet and extended to a depth of about 660 feet. Drilling encountered highly scoriated red cinder deposits from 660 feet to about 710 feet. Darker, occasionally fractured basalts were encountered from 710 feet to the bottom of the borehole at 760 feet. **Figure 2** also shows a lithologic summary of the geologist log. The detailed geologist log is included as Appendix A.

### Hydrology

The source of the water for the well is probably recharge that occurs from precipitation falling on the Carson Range to the west. Water infiltrates through the alluvium and fractured volcanics and flows eastward through the Mount Rose alluvial fan. Based on the geologist log and drillers log, it appears the major producing zone is a lense of red volcanic cinders from about 650 feet depth to 750 feet depth. The cinders were encountered in Mount Rose Well No. 5 which is located about 960 feet away from the new Mount Rose No. 6 well. Interference effects noted during test pumping indicate the cinder aquifers are hydraulically connected.

## WELL CONSTRUCTION

Lang Exploratory Drilling moved on site January 19, 2000. A series of recent storms had left the site a quagmire. For stability of the borehole, lang drilled a 38-inch diameter

borehole to 7 feet and cemented in a 7-foot length of 32-inch diameter surface casing. Table 1 is a summary of the construction details for the well.

Depth	Table 1.-Well Construction Details
0-7 ft	38-inch diameter borehole with 32-inch diameter surface casing with cemented annular space
0-100ft	29-inch diameter borehole (from 7 feet to 100 feet) with 22-inch diameter surface casing cemented in place.
0-750 ft	19-inch diameter borehole (from 100 feet to 750 feet) with 14-inch diameter blank casing (from 0 to 540feet) and wire wrap well screen (between 540 and 740).

#### WELL DEVELOPMENT

Immediately following well construction, the well was developed using air-lift through a double surge block. Development began at the top of the screens and moved gradually downward to the bottom of the well. Development was judged by Washoe County staff to be complete after about 50 hours of development time. Prior to the last air-lift development period the well was treated with a chemical product manufactured by Baroid called NuWell 220. NuWell 220 was added to the well and allowed to stand in the well overnight.

An additional 24-hours of pumping development occurred before conduction the aquifer stress tests (pumping tests). Sand testing during the pumping development showed the well produced less than 5 parts per million by volume of sand, within the specifications required by Washoe County.

#### WELL TESTING SUMMARY

A line-shaft turbine pump powered by a diesel engine was used for pump development and pumping tests. The testing program consisted of a step-drawdown test, where the well was pumped at 4 selected rates for a period of 100 minutes at each rate. The step test was followed by a 10-day constant discharge test at a rate selected by evaluating the data from the step-drawdown test.

### Step Drawdown Testing

The results of the step drawdown testing showed the well to be highly inefficient, with less than 10 percent efficiency at any pumping rate. We believe the inefficiency is related to the fact that the well produces from fractures in volcanic rocks, where turbulent flow in the fractures makes the formation itself generate inefficiencies that appear as well losses. Table 2 shows the pumping rates for the step-drawdown test and the calculated efficiency at that rate. Graphs from the step-drawdown testing are shown in Figures 3 and 4.

Table 2. Well Efficiency at various flow rates

Pumping rate (gpm)	Efficiency (percent)
448	9
576	7
749	6
880	5

### Constant Discharge Testing

The purpose of the constant discharge testing is to determine aquifer hydraulic properties that, once determined, allow predictions regarding the long-term performance of the well. Several circumstances related to Mount Rose No. 6 added to the complexity of the test pumping and data analysis. Following are the circumstances that needed to be considered and evaluated from the test pumping data:

1. The well produces from fractured volcanic rock and pyroclastic cinder zones, requiring a minimum 10-day constant discharge test for proper aquifer analysis.
2. The well is located within 1000 feet of another municipal production well (Mount Rose No. 5) that produces from the same aquifer. Analysis required an evaluation of the likely interference effects associated with pumping both wells.
3. The well is located within 2,500 feet of several individual domestic wells. The County is required to notify domestic well owners within 2,500 feet of a proposed municipal supply well. The County has adopted an unofficial policy to monitor the effects of County owned municipal wells within the 2,500 ft. radius and evaluate the impact on the domestic well caused by municipal well pumping. If the County determines that the impact from pumping of the municipal well significantly impacts the domestic well, the homeowner may be eligible for reimbursement under guidelines established by the County. Four individual domestic wells near Mount Rose No. 6 were modified to allow easy monitoring and were monitored during the constant discharge testing.

# LITHOLOGIC SUMMARY

COARSE SEDIMENTS  
CONSISTING PRIMARILY  
OF VOLCANIC OR GRANITIC  
SANDS, GRAVELS, AND  
COBBLES

VOLCANIC  
MUDFLOW  
DEPOSITS  
(LAHARS)

VOLCANIC  
CINDERS

FRACTURED  
BASALTS

DEPTH BELOW GROUND (FEET)

0  
100  
200  
300  
400  
500  
600  
700  
800

22" x 14" STEEL DONUT  
RING WITH ACCESS  
TO GRAVEL PACK

38"Ø

BORE HOLE

GROUND  
SURFACE

32"Ø SURFACE CASING  
(0.50" WALL THICKNESS)

GROUT ANNULAR SPACE SEAL

22"Ø SURFACE CASING  
(0.375" WALL THICKNESS)

GRAVEL PACKED ANNULAR SPACE

STATIC  
WATER LEVEL  
306' BELOW TOP  
OF CASING (FEB. 2000)

14"Ø BLANK CASING  
(0.25" WALL THICKNESS)

19"Ø PRODUCTION CASING  
BOREHOLE

540' TOP OF PERFORATIONS  
(540' - 740')

14"Ø WIRE WRAP WELL SCREEN  
(0.080 INCH SLOT)

755' TOTAL DEPTH



UTILITY SERVICES DIVISION  
4930 ENERGY WAY  
P.O. BOX 11130  
RENO, NEVADA 89520  
(702)954-4600



MT. ROSE PRODUCTION WELL #6

AS CONSTRUCTED

FIGURE 2

Figure 3  
Step Drawdown Test  
Mount Rose Well No. 6

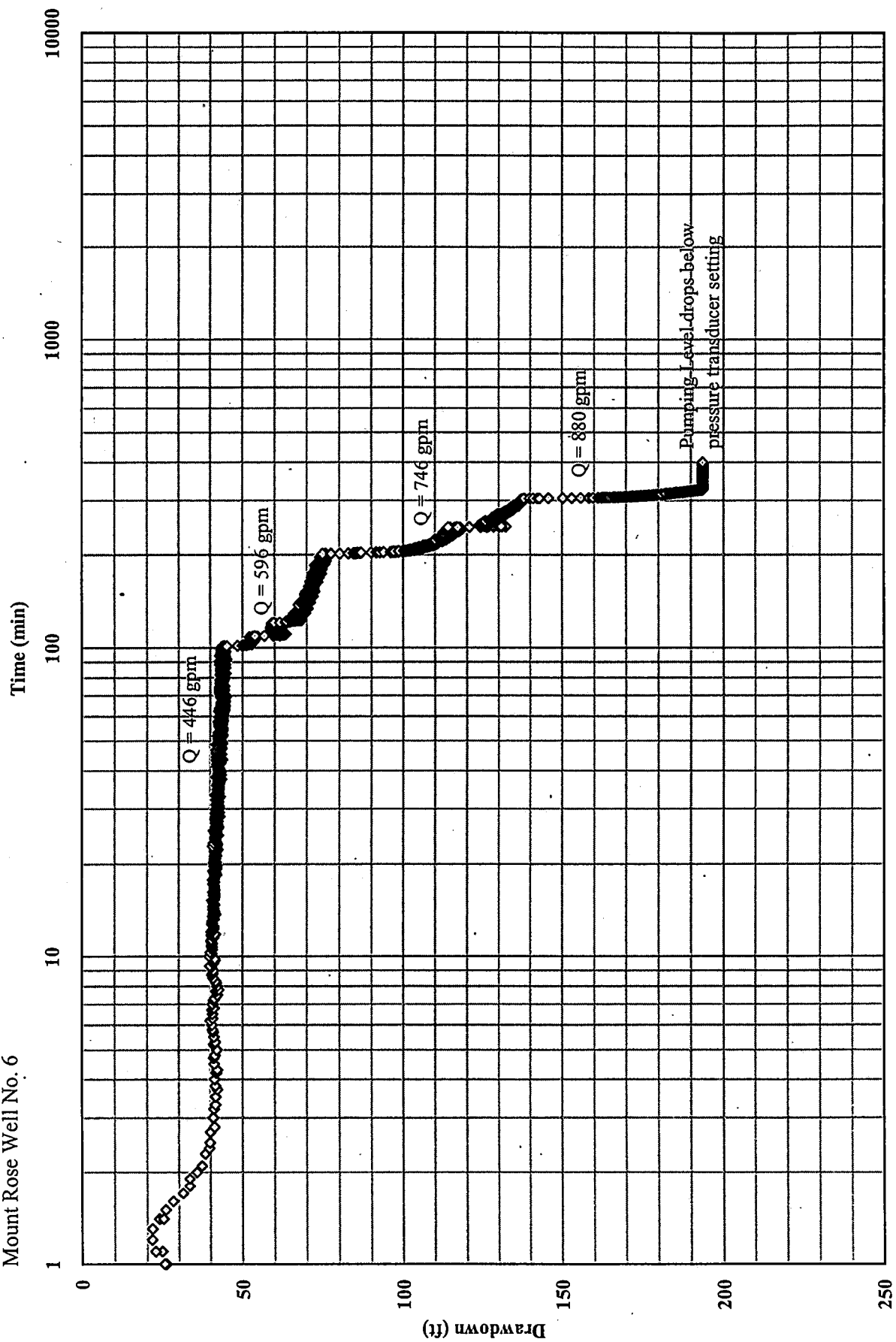
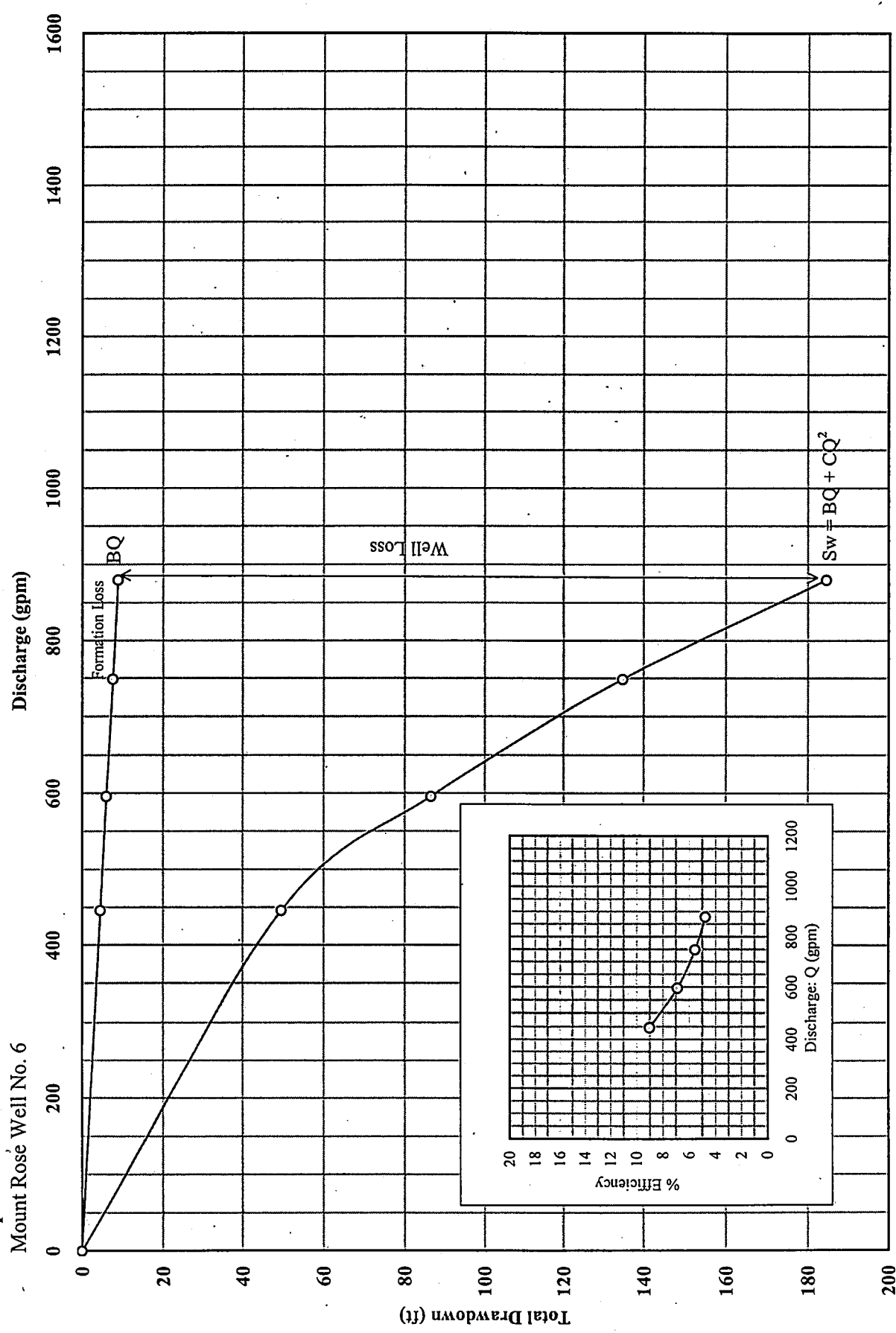


Figure 4  
Step Drawdown Test  
Mount Rose Well No. 6



The test data was analyzed by the computer program "Aquifer Win32" by Environmental Simulations, Inc and manual calculations using Jacob's equation for well interference. Aquifer Transmissivity in gallons per day per foot of aquifer width (gpd/ft.) were about 10,800 gpd/ft. Storage Coefficients based on drawdowns from nearby observation wells ranged from 0.0003 to 0.0008 (dimensionless term).

Data plots from the constant discharge testing are depicted in **Figure 5** (Drawdown Mt. Rose No. 6) **Figure 6** (Recovery Mt. Rose No. 6) **Figure 7** (Drawdown Mt. Rose No. 5) and **Figure 8** (Recovery Mt. Rose No. 5). Pumping rate for the constant discharge test was reduced from 750 gpm to 650 gpm after about 500 minutes of pumping. The rate was reduced because it became apparent that the test would not hold the 750 gpm rate without exceeding the maximum desired drawdown for the test.

**Figure 9** shows predicted drawdown in Mount Rose No. 6 at pumping rates ranging from 600 to 750 gpm. The figure also shows the top of the screened interval as related to drawdown. Continuous pumping periods of 10-days and 30-days are highlighted on the Figure. This figure does not take into account the well interference effects that would be caused if Mt. Rose No. 5 were pumped simultaneous with Well No. 6. **Figure 10** shows the additional drawdown that would be expected in Mt. Rose No. 6 if Mt. Rose No. 5 were pumping at the same time at a rate of about 800gpm and Mt. Rose No. 6 were pumping at 650 gpm.

Water levels were monitored in four nearby domestic wells during the constant discharge testing. **Figure 11** shows the results of that monitoring and plots of the projected drawdown that would occur in each well if Mt. Rose were pumped at 650 gpm continuously for 30 days or longer. Water levels in these wells will be monitored at least quarterly as a concession to the homeowner and to satisfy the State Engineer regarding the long-term impact on these domestic wells. Data from the pumping tests and summary letter reports on each domestic well monitored are included in the Appendix.

## WATER QUALITY

Samples were collected according to sample collection protocol outlined in Standard Methods for the Analysis of Water and Wastewater then submitted to State and/or Federally certified analytical laboratories for water quality analysis. The samples were analyzed for primary and secondary inorganic constituents, volatile and synthetic organic compounds, and radiochemistry. Results show water from the well meets all current primary and secondary standards for municipal supply. All analysis results are included in the Appendix.

Figure 5  
 Mount Rose Well No. 6  
 Constant Discharge Test, 2/19/00-2/29/00

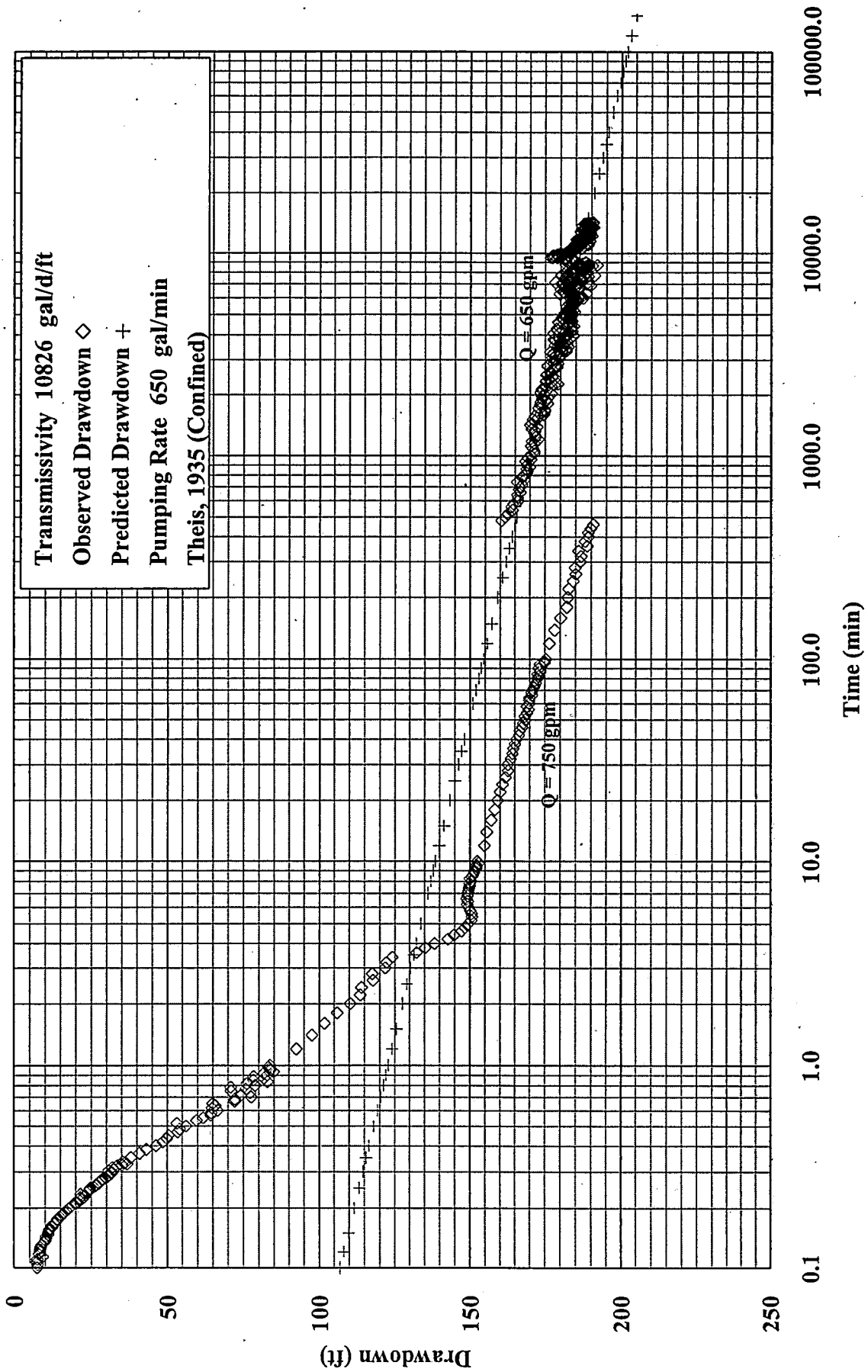


Figure 6  
 Mount Rose Well No. 6  
 Constant Discharge Test, Recovery Data

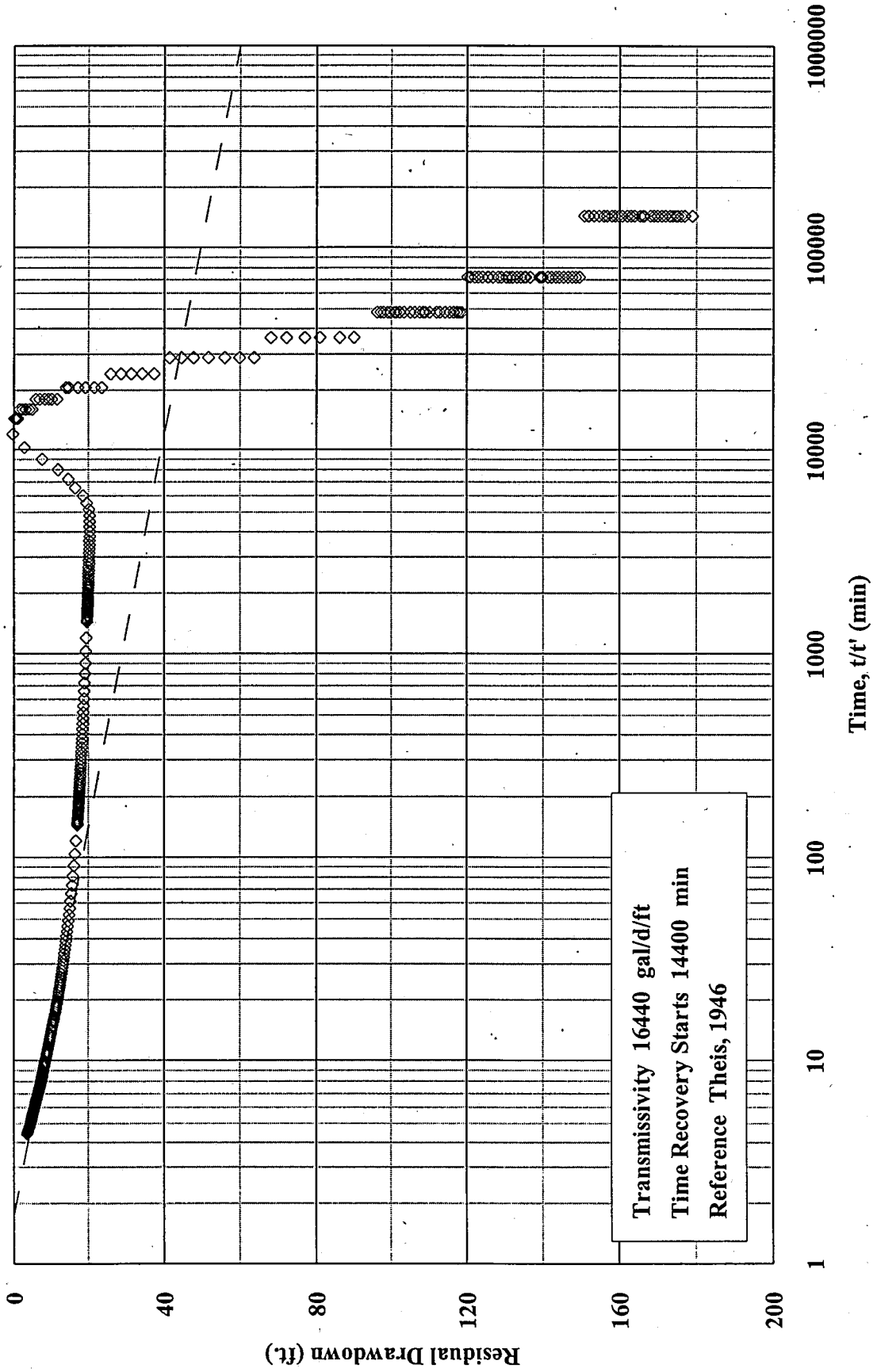


Figure 7

Mount Rose Well No. 6, Constant Discharge Test  
 Observation Well Drawdown, Mount Rose Well No. 5

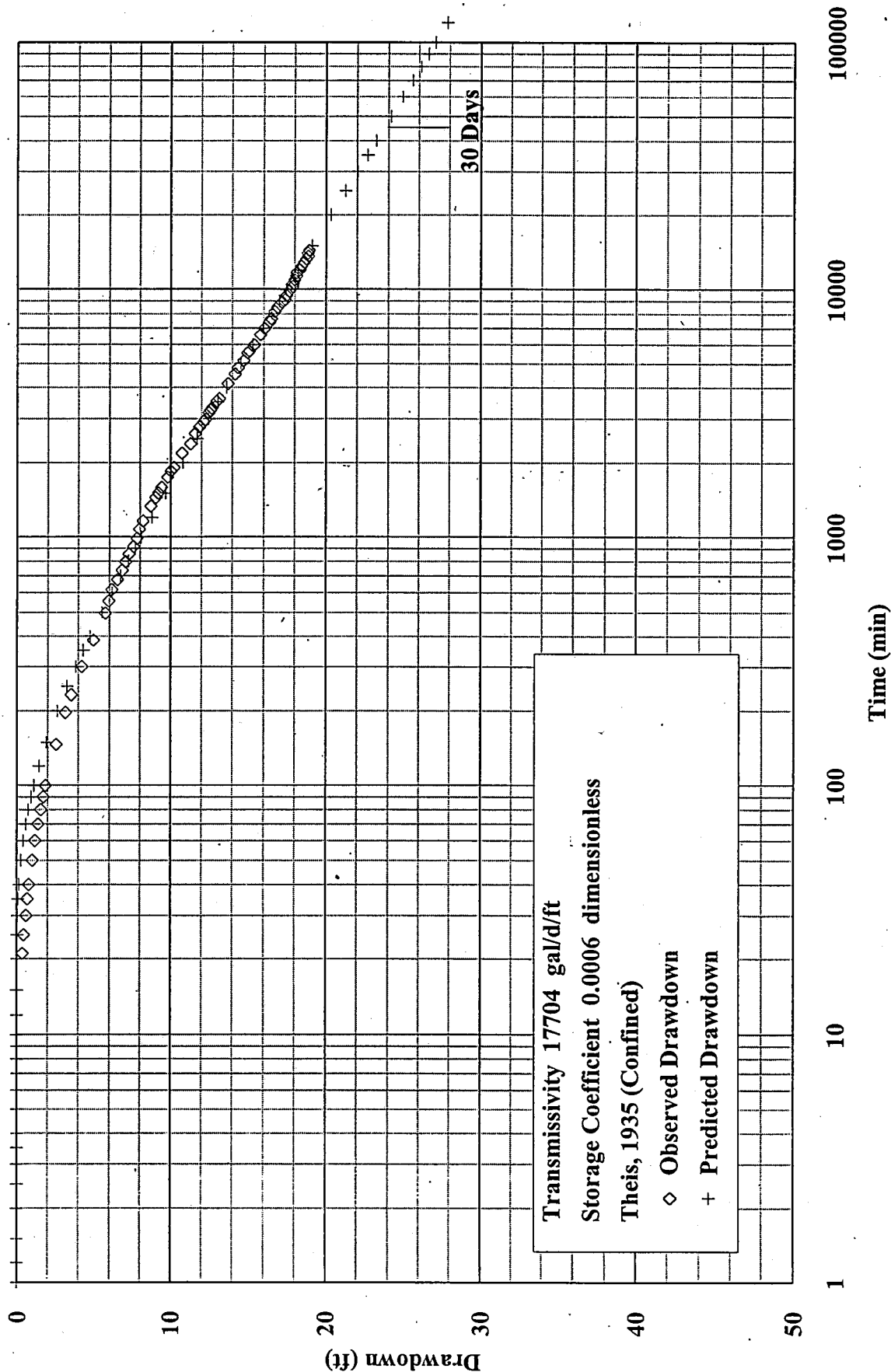


Figure 8  
 Mount Rose Well No. 6, Constant Discharge Test  
 Observation Well Recovery, Mount Rose Well No. 5

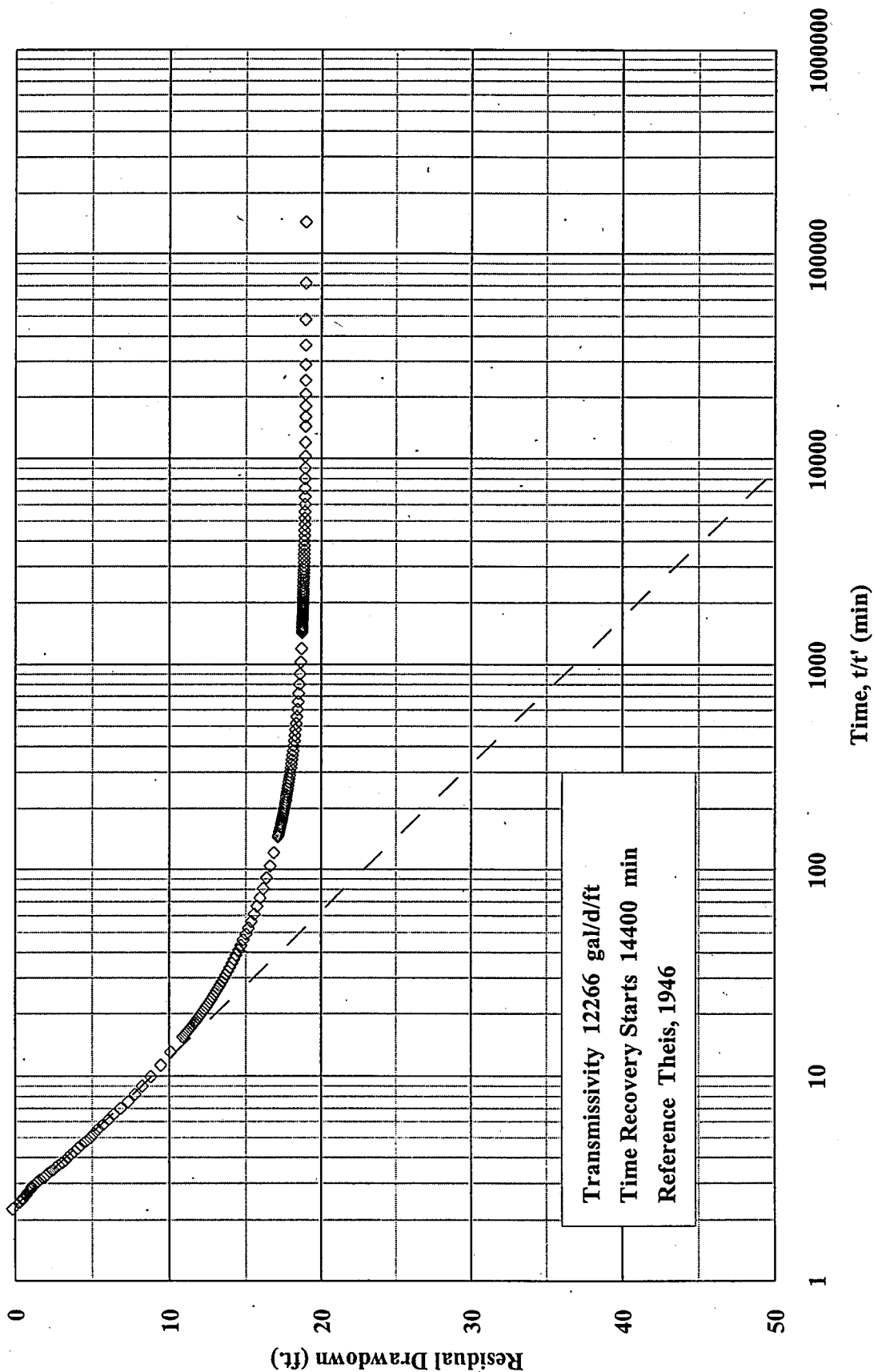
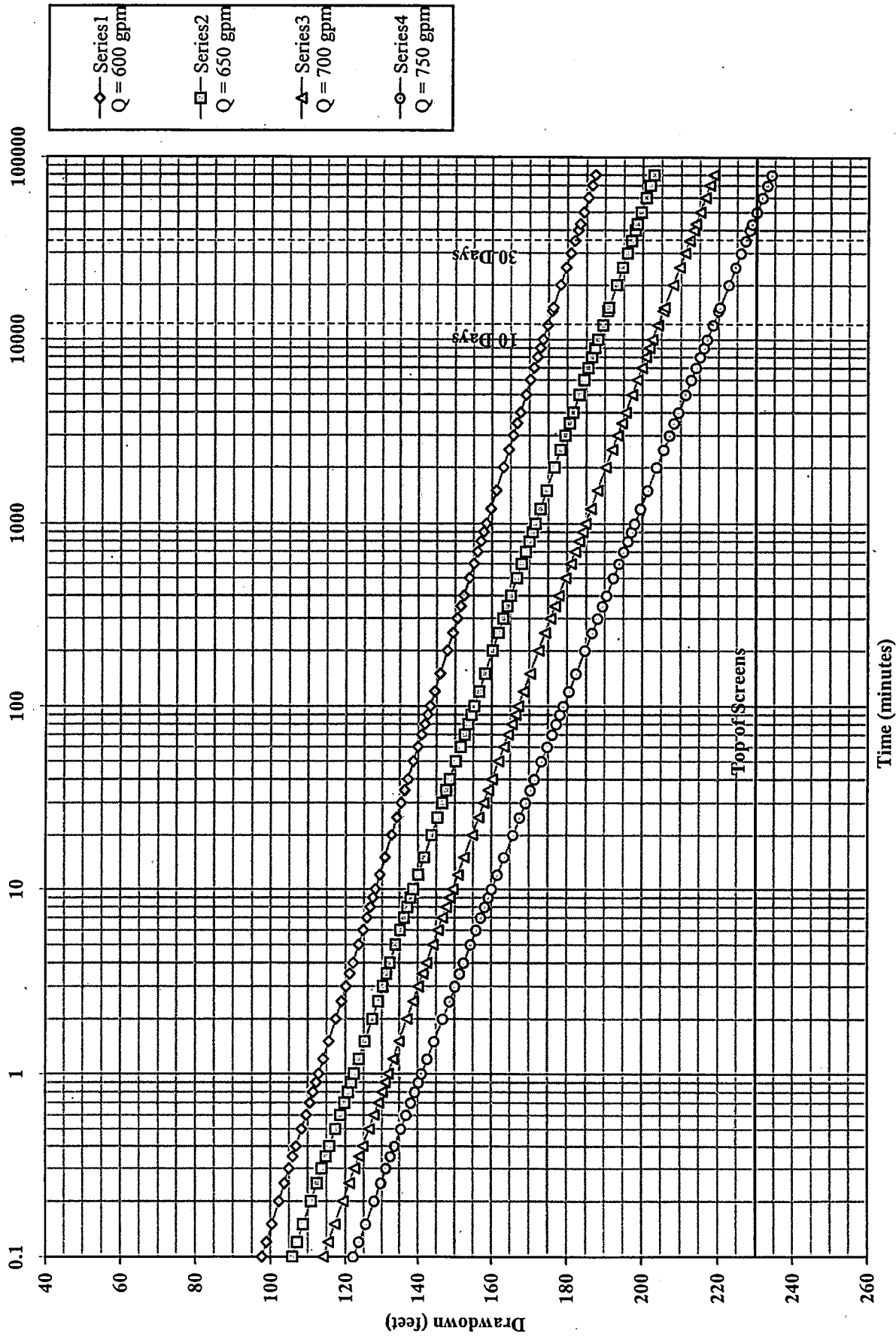
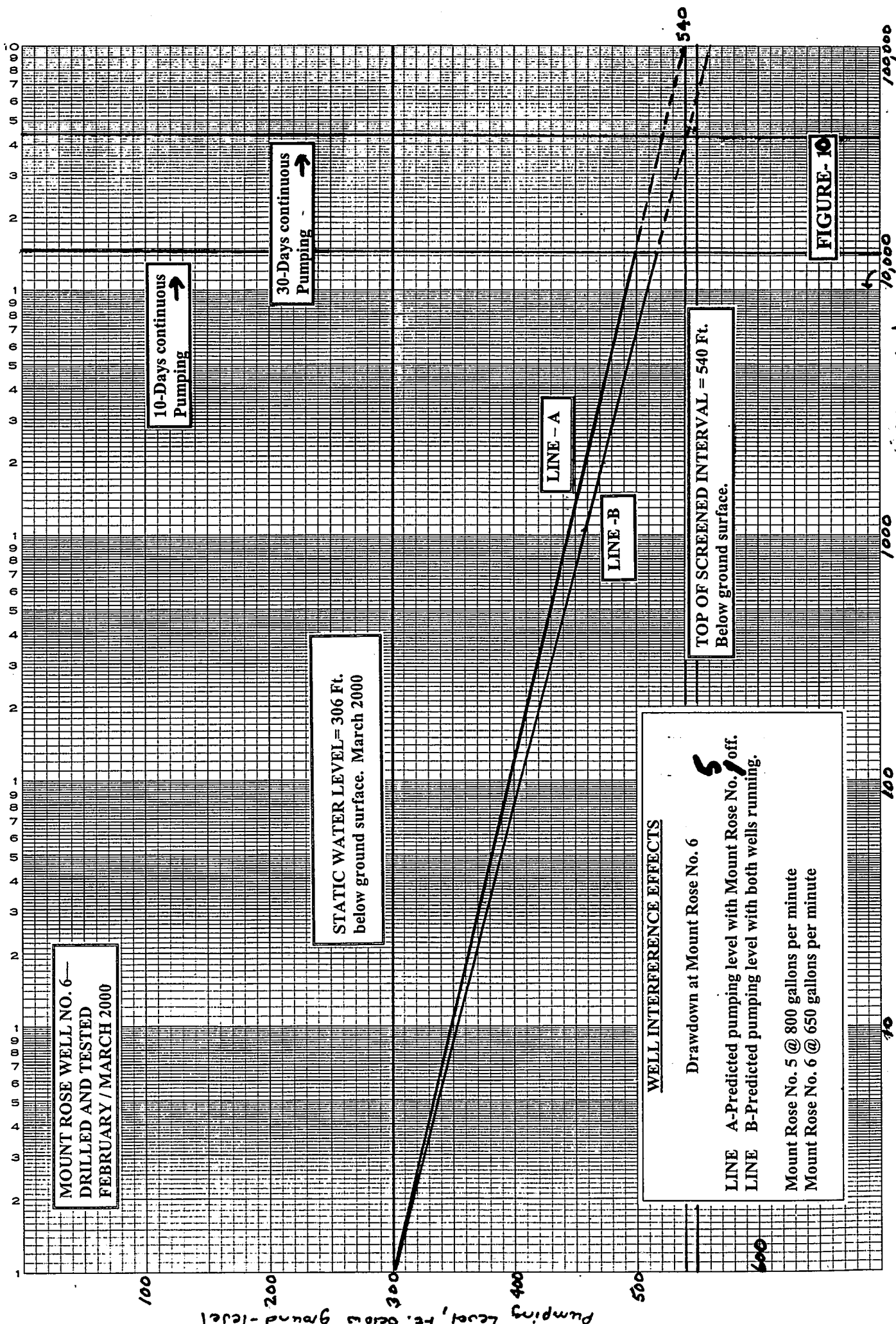


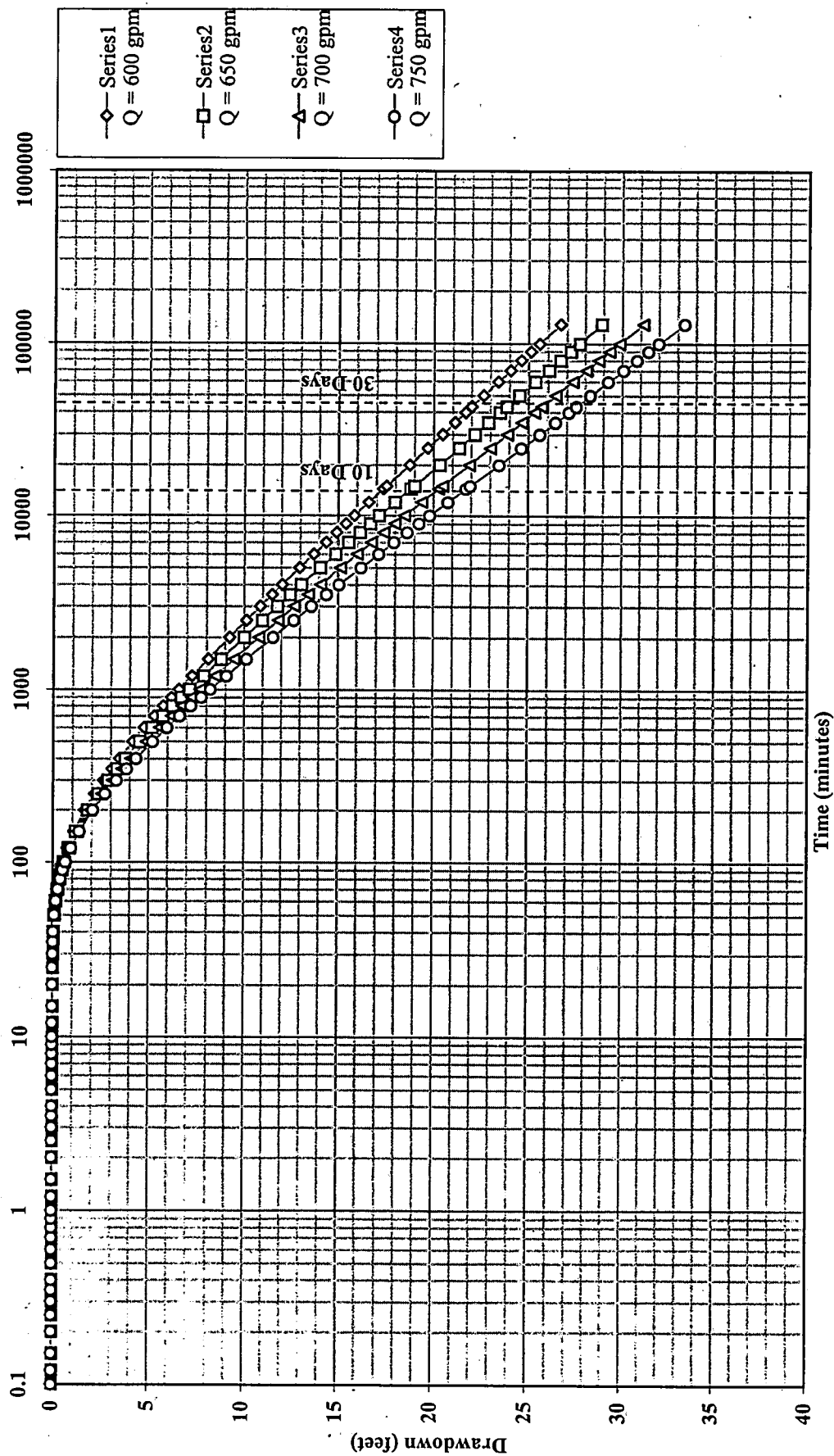
Figure 9  
Predicted Drawdown at Various Pumping Rates





Time, 10 minutes since pumping started

Figure 11  
Mount Rose Well 5  
Simulated Interference Drawdown from MR6



## **APPENDIX A.**

### **Drillers Log and Geologist Log**

DIVISION OF WATER RESOURCES

WELL DRILLER'S REPORT

Please complete this form in its entirety in  
accordance with NRS 534.170 and NAC 534.340

OFFICE USE ONLY

Log No. ....  
Permit No. ....  
Basin. ....

PRINT OR TYPE ONLY  
DO NOT WRITE ON BACK

NOTICE OF INTENT NO. 42862

1. OWNER MONTREUX  
MAILING ADDRESS 16475 BORDEAUX DRIVE  
RENO, NV 89511  
ADDRESS AT WELL LOCATION CROSS STREET LAKE  
GENEVA AND BORDEAUX

2. LOCATION NW 1/4 SE 1/4 Sec 3 T 17 S R 19 E WASHOE County  
PERMIT NO. 65364 148-150-01 MONTREUX  
Issued by Water Resources Parcel No. Subdivision Name

3. WORK PERFORMED  
☒ New Well ☐ Replace ☐ Recondition  
☐ Deepen ☐ Abandon ☐ Other  
4. PROPOSED USE  
☐ Domestic ☐ Irrigation ☐ Test  
☒ Municipal/Industrial ☐ Monitor ☐ Stock  
5. WELL TYPE  
☐ Cable ☐ Rotary ☒ RVC  
☒ Air ☐ Other

6. LITHOLOGIC LOG				
Material	Water Strata	From	To	Thick-ness
BROWN SAND, GREY & BLACK BOULDERS		0	20	20
BROWN SAND & GREY ROCK		20	40	20
BROWN SAND, GREY & WHITE ROCK		40	50	10
GREY ROCK		50	60	10
GREY & BROWN ROCK		60	90	30
GRANITIC SANDS & GRAVELS		90	100	10
BLACK & GREY ROCK		100	350	250
GREY VOLCANIC ROCK		350	660	310
MAROON VOLCANIC ROCK		660	710	50
MAROON & GREY ROCK		710	730	20
GREY ROCK, A LITTLE CLAY & GRAVEL		730	760	30

8. WELL CONSTRUCTION  
Depth Drilled 755 Feet Depth Cased 750 Feet

HOLE DIAMETER (BIT SIZE)			
	From	To	
38 Inches	0	7	Feet
29 Inches	7	105	Feet
19 Inches	105	755	Feet

CASING SCHEDULE				
Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
32	168.21	0.500	0	7
22	86.61	0.375	+1	100
14	36.71	0.250	+2	750

Perforations:  
Type perforation V-WIRE  
Size perforation 0.080"  
From 540 feet to 740 feet  
From feet to feet  
From feet to feet  
From feet to feet  
From feet to feet

Surface Seal: ☒ Yes ☐ No Seal Type:  
Depth of Seal 100' ☒ Neat Cement  
Placement Method: ☒ Pumped ☐ Cement Grout  
☐ Poured ☐ Concrete Grout  
Gravel Packed: ☒ Yes ☐ No  
From 755 feet to SURFACE feet

9. WATER LEVEL  
Static water level 309 feet below land surface  
Artesian flow N/A G.P.M. P.S.I.  
Water temperature COOL °F Quality GOOD

10. DRILLER'S CERTIFICATION  
This well was drilled under my supervision and the report is true to the best of my knowledge.

Name LANG EXPLORATORY DRILLING  
Contractor  
Address P.O. BOX 5279  
Contractor  
ELKO, NV 89802

Nevada contractor's license number issued by the State Contractor's Board: 0021976

Nevada driller's license number issued by the Division of Water Resources, the on-site driller: 2130

Signed Scott Belliston  
By driller performing actual drilling on site or contractor

Date FEBRUARY 4, 2000

Date started JANUARY 22, 2000  
Date completed FEBRUARY 3, 2000

7. WELL TEST DATA			
TEST METHOD: <input type="checkbox"/> Bailer <input type="checkbox"/> Pump <input checked="" type="checkbox"/> Air Lift			
G.P.M.	Draw Down (Feet Below Static)	Time (Hours)	
260	21'	1 1/2	

Feb 00

Log by Ed Evans

Well ID		MONTREUX WELL # 2 / MT ROSE WELL #6						Log by Ed Evans		
Depth	Drill Joint	Penetration Rate						Lithology Description	Stratigraphic Column	Well
		60	50	40	30	20	10			
10								ANGULAR - SUB ROUNDED DIORITE SAND WITH 5%-10% VOLCANIC SAND. COARSE		20" CONDUCTOR
20								VERY COARSE SAND WITH VOLCANIC PEBBLES 25% SAND		
30								COARSE, SUB-ROUND GRANITIC SAND		
40								COARSE SAND - FINE PEBBLES. EXTRUSIVE		
50								VERY COARSE VOLCANIC SAND SUB ANGULAR - SUB ROUND. 5-20% FINE VOLCANIC PEBBLES. CONTAINS DIORITE, TUFF AND ANDESITE.		
60										
70										
80										
90										
100										
110										
120										
130										
140										
150								NO SAMPLE RETURN	LC LC LC	
160								LOSS OF CIRCULATION	LC LC	
170									LC LC LC	
180								COARSE PEBBLES TO SMALL COBBLES MOSTLY MAFIC - PORPHYRITIC ANDESITE 30% GRANITIC / EXTRUSIVE VC SAND 180-190 COBBLE ZONE		
190										
200										
210										
220								VERY COARSE GRANITIC / EXTRUSIVE SAND. 10-35% SUB-ANGULAR		
230								PORPHYRITIC ANDESITE PEBBLES. GRANODIORITE AND COLORED EXTRUSIVE GRAVELS @ 220-230'		
240										
250										
260								COBBLE - PEBBLE ZONE MOSTLY ANDESITE. 25-50% COARSE LIGHT COLORED EXTRUSIVE AND MAFIC SAND		
270										
280										
290										
300								ANDESITE COBBLES AND BOULDERS		
310										
320										
330										
340								COARSE VOLCANIC AND GRANITIC SAND WITH PEBBLE LENSES. 50-75% COARSE SAND. PEBBLE LENSE 330-340		
350										
360										
370										
380								LAHAR FORMATION	COBBLES 1/2" - 1 1/4" PIECES. MIXED TUFF, ANDESITE, RHYOLITE. MINOR COARSE SAND - LAHAR FLOW?	
390										
400										
410										
420										
430										
440										
450										
460										

Log by Ed Evans

[illegible]

## **APPENDIX B**

### **Test Pumping Data and Graphs**



# WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES  
UTILITY SERVICES DIVISION

## PUMPING TEST DATA

Mount Rose #6

WELL MONTREUX #2  
(PUMPING) / OBSERVATION WELL  
(PUMPING) / RECOVERY DATA  
PAGE 1 OF 2

TYPE OF PUMPING TEST STEP TEST

HOW Q MEASURED 6" x 5" ORIFICE

HOW WL's MEASURED PRESSURE TRANSDUCER

PUMPED WELL NO. MONTREUX #2

RADIUS OF PUMPED WELL

DISTANCE FROM PUMPED WELL

M.P. for WL's TOP PVC (1") STILL WELL elev.

DEPTH OF PUMP/AIRLINE 539' wrt

% SUBMERGENCE: initial pumping

PUMP ON: date 2/18/00 time 0900

PUMP OFF: date 2/18/00 time

O = 9:00:57 TIME t = at t'=0					WATER LEVEL DATA STATIC WATER LEVEL 306.20					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME			t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or S'	Q/s	h	Q	(NOTE ANY CHANGES IN OBSERVERS)
	mins	hrs	t									
901			0			STEP I				13"	448	LOTS OF Q ↑ 0-10 min
902			1				24.65					
903			2				37.32					
904			3				41.10					
905			4				41.85					
906			5				41.01					
907			6				40.03					
908			7				40.97					
909			8				41.82					
910			9				40.39					
0911	10		10				40.46	11.1				
0913			12				40.70					
0915			14				40.81					
0917			16				40.85					
0919			18				41.39					
0921	20		20				41.03					
0926	25		25				41.72			13 1/4"		
0931	30		30				42.73					Q ↓
0936	35		35				42.50					
0941	40		40				42.40	10.6				
0946	45		45				42.65			13-13 1/4"		Q ↑
0951	50		50				43.03					
1001			60				43.10					
1011			70		349.59		43.39					
1021			80				44.05					
1031	30		90				43.35					
1041			100				43.59					
1051			110			STEP II	62.82			20"	556	
1101	2		120			Q ↑	59.16			23"	596	
1106			125				66.43	9.0				
1111			130		373.11		66.91					* PUMPING LEVEL WITH SAVINOCK
1121	20	2	140				67.90					379 METEX 650-700 gpm
1131			150				71.49					
1141	40	2	160				71.41					
1151			170				72.25	8.3				
1201	3		180				74.65					
1211			190				74.93					
1221	20	3	200			STEP III	75.75			36"	746	
1226			205				98.66					
1231			210				105.61			36 1/2"	750+	
1251			230				113.95					IRREGULAR FLOW INCREASE
1361	10	4	250				125.61			36"		ENTIRE RPM
1331	30	4	270				129.57					
1351	50	4	290				136.30	5.5		36"	746	FLOW STABLE
1401	5		300		443.6		137.38					



**DEPARTMENT OF WATER RESOURCES  
UTILITY SERVICES DIVISION**

WELL Montgomery #2  
 PUMPING / OBSERVATION WELL  
 PUMPING / RECOVERY DATA  
 PAGE 2 OF 2

TYPE OF PUMPING TEST STEP TEST

HOW Q MEASURED 6" x 5" ORIFICE

HOW WL'S MEASURED PRESSURE TRANSDUCER

PUMPED WELL NO. MONTREUX #2

RADIUS of PUMPED WELL

DISTANCE from PUMPED WELL

M.P. for WL's Top PVC 1"

DEPTH OF PUMP/AIRLINE 539 - wrt

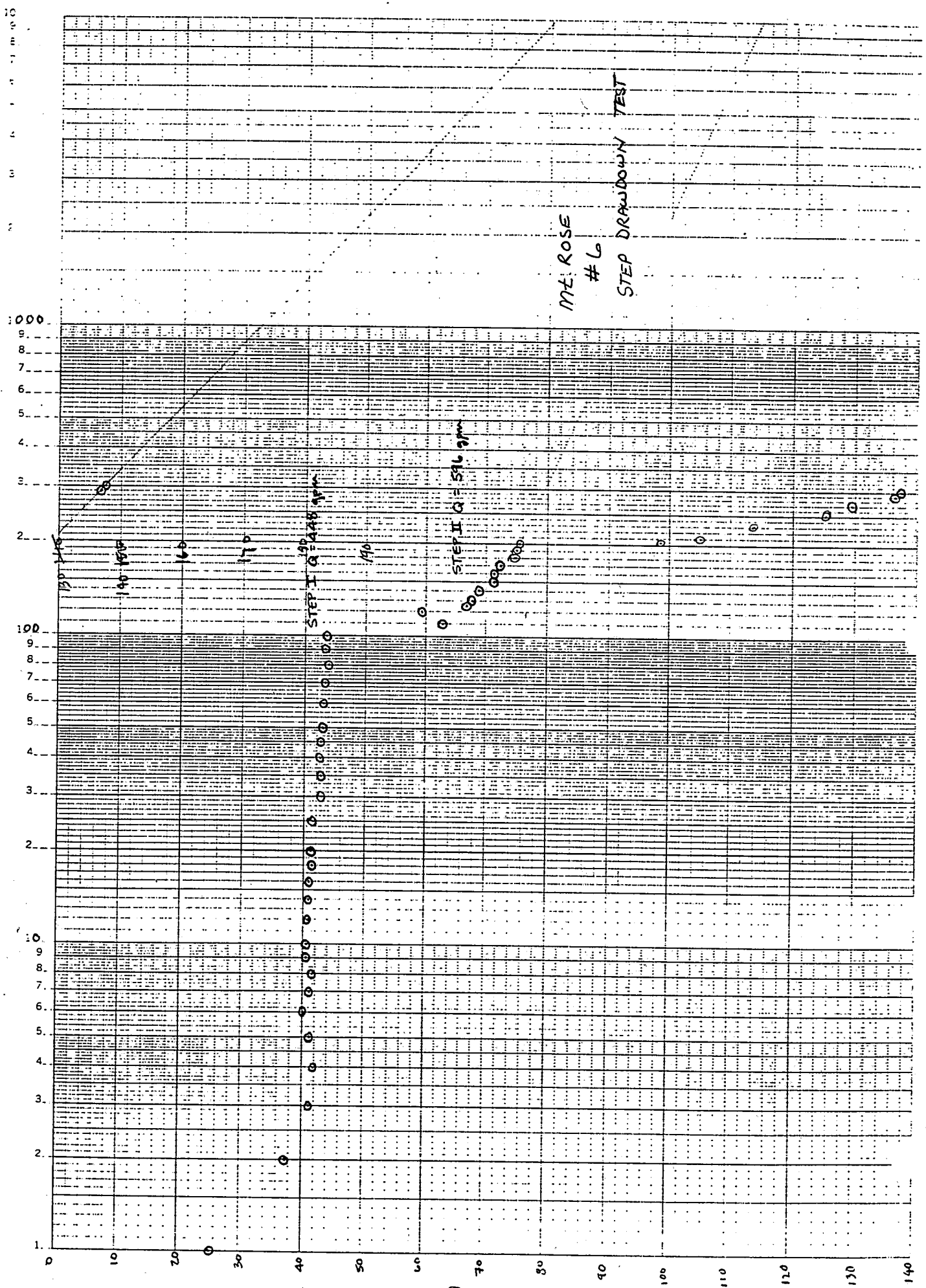
% SUBMERGENCE: initial \_\_\_\_\_ pumping \_\_\_\_\_

PUMP ON: date 2/18/00 time 0900

PUMP OFF: date 2/18/00 time

JUL-16

46 6010





# WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES  
UTILITY SERVICES DIVISION

## PUMPING TEST DATA

TYPE OF PUMPING TEST Constant Q

HOW Q MEASURED orifice

HOW WL's MEASURED Hermit Dope

PUMPED WELL NO. Montreux #2

RADIUS of PUMPED WELL \_\_\_\_\_

DISTANCE from PUMPED WELL \_\_\_\_\_

M.P. for WL's \_\_\_\_\_ elev. \_\_\_\_\_

DEPTH OF PUMP/AIRLINE \_\_\_\_\_ wrt \_\_\_\_\_

% SUBMERGENCE: initial \_\_\_\_\_ pumping \_\_\_\_\_

PUMP ON: date 2/19/00 time 1005

PUMP OFF: date \_\_\_\_\_ time \_\_\_\_\_

mt. Rose #6

WELL Montreux #2

☒ PUMPING ☐ OBSERVATION WELL

☒ PUMPING ☐ RECOVERY DATA

PAGE 1 OF 4

TIME					WATER LEVEL DATA				WATER PRODUCT		COMMENTS
t = at t'=0					STATIC WATER LEVEL 367.94						
CLOCK TIME	ELAPSED TIME			t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or S'	h	Q	(NOTE ANY CHANGES IN OBSERVERS)
	mins	hrs	t'								
1006	1		1		391.58			83.64	3	37"	
			2		418.22			110.28			
			3		429.70			121.76			
			4		446.26			138.32			
			5		457.30			149.36			
			6		457.34			149.40			
			7		457.21			149.27			
			8		458.28			150.34			
			9		459.37			151.43			
1015	10		10		460.38			152.44			
			12		462.76			154.82			
			14		463.55			155.61			
			16		464.96			157.02			
			18		466.18			158.24			
1025	25		20		467.15			159.21			
			22		467.94			160.00			
			24		468.72			160.78			
			26		469.72			161.78			
			28		470.57			162.63			
			30		470.54			162.60			
			32		471.45			163.51			
			34		472.08			164.14			
			36		472.33			164.39			
			38		472.89			164.95			
			40		473.39			165.45			
			42		474.27			166.33			
			44		474.55			166.61			
			46		475.40			167.46			
			48		475.74			167.80			
			50		476.34			168.40			
			52		476.31			168.37			
			54		477.00			169.06			
			56		477.53			169.59			
			58		477.03			169.09			
1105	1		60		477.72			169.78			
			62		477.75			169.81			
			64		477.85			169.91			
			66		478.63			170.69			
			68		478.57			170.63			
			70		478.98			170.94			
			72		479.29			171.35			
			74		479.51			171.57			
			76		479.88			171.94			
			78		479.57			171.63			
1125	20		80		480.48			172.54			



# WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES  
UTILITY SERVICES DIVISION

## PUMPING TEST DATA

TYPE OF PUMPING TEST Constant Q

HOW Q MEASURED Orifice

M.P. for WL's \_\_\_\_\_ elev. \_\_\_\_\_

HOW WL's MEASURED 100 psi pressure trans w/ Hermit 1000

DEPTH OF PUMP/AIRLINE \_\_\_\_\_ wrt \_\_\_\_\_

PUMPED WELL NO. Montreux #2

% SUBMERGENCE: initial \_\_\_\_\_ pumping \_\_\_\_\_

RADIUS of PUMPED WELL \_\_\_\_\_

PUMP ON: date 1/19/00 time 1005

DISTANCE from PUMPED WELL \_\_\_\_\_

PUMP OFF: date \_\_\_\_\_ time \_\_\_\_\_

Mount Rose #6

WELL Montreux #2

PUMPING / OBSERVATION WELL

PUMPING / RECOVERY DATA

PAGE 2 OF 4

TIME t = at t'=0				WATER LEVEL DATA STATIC WATER LEVEL 307.94				WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins hrs	t	t'	t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or S'	Q	(NOTE ANY CHANGES IN OBSERVERS)
		84			480.54			172.60		
		88			481.36			173.42		
		92			481.80			173.86		
		96			482.83			174.89		
		100			483.30			175.36		
		120			489.40			176.46		
		140			486.16			178.22		
		160			488.07			180.13		
1305		180			490.11			182.17		
1325		260			490.39			182.45		Q @ 36 - Adjust Q↑
1345		220			490.70			182.76		
1405	- 4	240			492.15			184.21		
1425		260			492.96			185.02		
1445		280			492.77			184.83		
1505	5	300			494.37			186.43		
1525		320			494.65			186.71	35 3/4	757 Q↑
1545		340			493.84			185.90		
1605	6	360			496.72			188.78	36 1/2	Q↓
1625	20 6	380			495.97			188.03		
1645	40 6	400			497.10			189.16		
1705	7	420			497.04			189.10		
1725		440			497.82			189.88		
1745		460			498.64			190.70		Q↓ = 26 = 646 gpm
1805		480			468.34			160.40		
1825		500			469.54			161.60		
1845		520			470.54			162.60		
1925		560			471.67			163.73		
1945		580			472.23			164.29		
2005		600			473.97			166.05		
2045		640			473.64			165.70		Q has been creeping up value on manometer was shut completely
2125		680			474.5			166.21		
2145		700			474.58			166.61	OK	making it appear slow at 1670 gpm
2225		740			473.52			165.53	Q↑	Adjusted @ 9150
2305		780			475.27			167.33		Fine flow adjustments
2325		800			475.68			167.74	OK	
0005		840			477.06			169.12	Q↓	DARREN LEFT for fuel
0045		880			477.81			169.87		
0105		900			476.81			168.87		
0225		980			477.12			169.18		
1245		1060			479.23			171.29		
0515		1150			479.35			171.41		
0645	40 20	1240			479.70			171.76		
0745	40 21	1300			479.29			171.35	25 3/4 - 26 1/8	165 - 330 Q↑
0915	10 23	1390			480.23			172.30		



Department of  
Water Resources

# WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES  
UTILITY SERVICES DIVISION

## PUMPING TEST DATA

TYPE OF PUMPING TEST Constant Q

HOW Q MEASURED Orifice

HOW WL's MEASURED 100 psi pressure transducer

PUMPED WELL NO. Montreux #2

RADIUS of PUMPED WELL \_\_\_\_\_

DISTANCE from PUMPED WELL \_\_\_\_\_

M.P. for WL's \_\_\_\_\_ elev. \_\_\_\_\_

DEPTH OF PUMP/AIRLINE \_\_\_\_\_ wrt \_\_\_\_\_

% SUBMERGENCE: initial \_\_\_\_\_ pumping \_\_\_\_\_

PUMP ON: date 2/19/00 time 1005

PUMP OFF: date \_\_\_\_\_ time \_\_\_\_\_

Mount Rose #6

WELL Montreux #2

PUMPING / OBSERVATION WELL

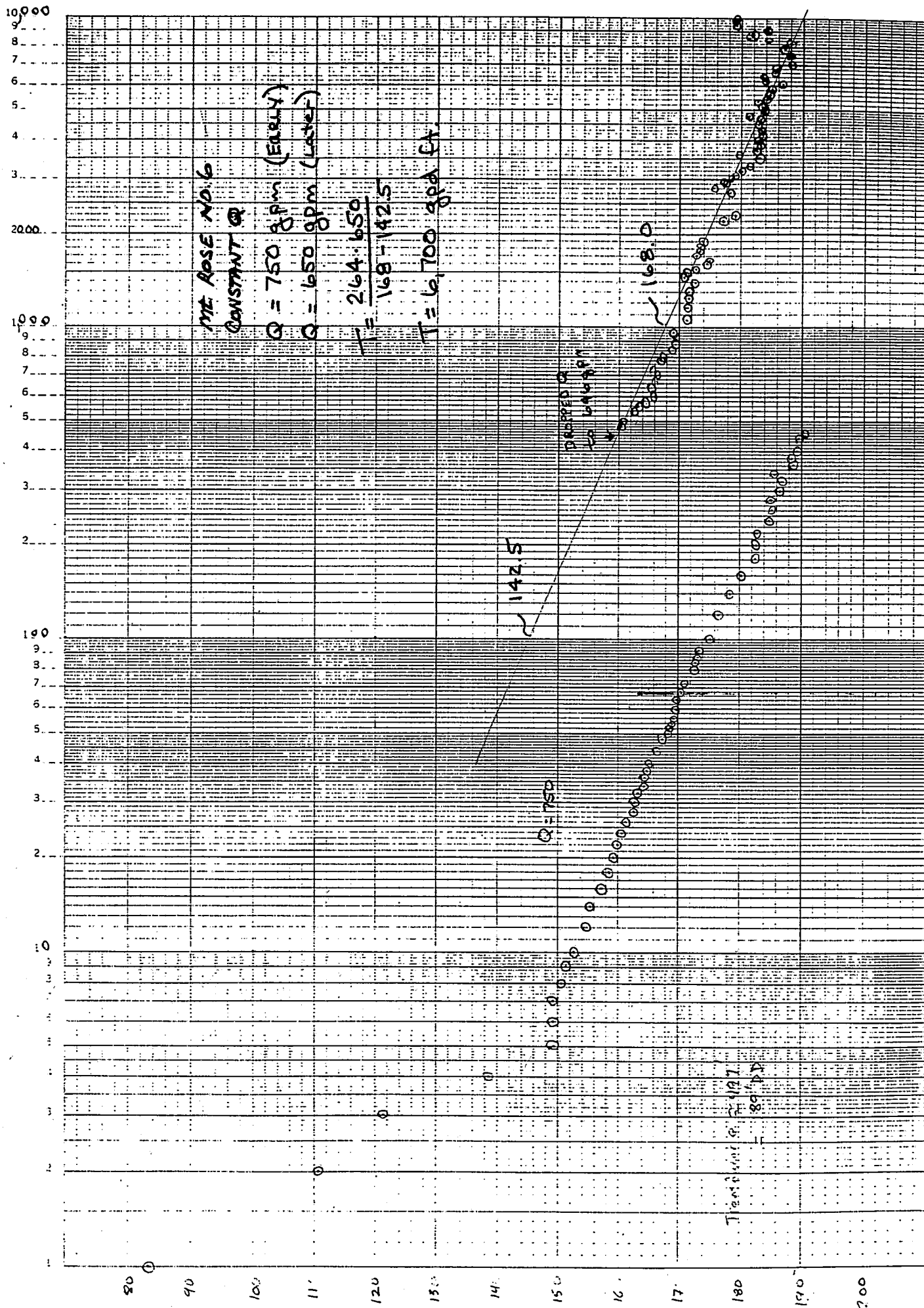
PUMPING / RECOVERY DATA

PAGE 3 OF 4

TIME t = at t'=0					WATER LEVEL DATA STATIC WATER LEVEL 307.94				WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins hrs	t	t'	t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or S'	h	Q	(NOTE ANY CHANGES IN OBSERVERS)
1015	10 24	1450			478.44			170.50			EE
1105	25	1500			478.88			170.94			Q↑ @ 1120
1145	40 25	1540			480.42			172.48	26"		
1245	40 26	1600			482.46			174.52			
1345	40 27	1660			482.80			174.86			
1445	40 28	1720			480.73			172.79			
1545	40 29	1780			481.26			173.32			
1645	40 30	1840			481.39			173.45			Q↑ @ 1730
1745	40 31	1900			481.89			173.95	26		
1815		1930			483.74			175.80	26		MW
2245		2200			484.81			176.84	26		Q↓ 2230 26 3/4"
2345		2260			487.07			179.13	26 1/2		Q↓ 26"
0145		2380			484.24			176.30	26		
0345		2500			483.30			175.36	26		
0545		2620			484.71			176.77	26		
0745		2740			486.78			178.04	26		Dam
0945		2800			483.69			175.73	26		
1015		2830			485.75			177.81			
1115		2950			486.22			178.28	26"		
1145		2980			485.56			177.62	26"		
1215		3010			486.38			178.44			EE
1345	40 51	3100			487.13			179.19			
1515	10 53	3190			488.07			180.13	25 3/4		Q↑ 26-26 1/3 @ 3:00
1715	10 55	3310			489.30			181.76	26		FLOW SMOOTH AT 4:00-5:00 26 1/2"
2015	10 58	3490			490.39			182.45	26		MW
2215	10 60	3610			487.35			179.44	26		
2345	40 61	3700			490.08			182.14			EE
0145	40 63	3820			490.86			182.42			
0445	40 66	4000			490.58			182.64			
0715	10 69	4150			491.61			183.67			
0945	40 71	4300			491.08			183.14			EE
1315	10 75	4510			490.48			182.54			"
1515	10 77	4630			490.83			182.89			"
1715	10 79	4750			489.04			181.10	26 1/6		" FLOW CONSTANT
1915	10 81	4870			491.30			183.36			
2115	10 83	4990			491.74			183.80			
2315	10 85	5110			491.46			183.53			
0245	10 87	5320			490.45			182.51			FLOW 25 1/2-26 1/2 4 30 AM+
2545	10 91	5500			492.02			184.08			DARKEN SAND 24:00-25:00 26 1/2"
0715	10 93	5590			492.49			184.55	26-26 1/4		Q↓ @ 0745
		5800			492.74			184.80			
		6010			494.50			186.56			
		6200			491.89			183.95			
		6400			491.24			183.30			
											MONTREUX 2

UTIL-16







# WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES  
UTILITY SERVICES DIVISION

WELL CINDER WELL (MOUNT ROSE 5)  
PUMPING OBSERVATION WELL  
PUMPING RECOVERY DATA  
PAGE 1 OF 2

## PUMPING TEST DATA

TYPE OF PUMPING TEST BACKGROUND/STEP/CONSTANT

HOW Q MEASURED \_\_\_\_\_

M.P. for WL's TOP PVC \_\_\_\_\_ elev. \_\_\_\_\_

HOW WL's MEASURED WATERLINE 300

DEPTH OF PUMP/AIRLINE \_\_\_\_\_ wrt \_\_\_\_\_

PUMPED WELL NO. MONTREUX #2 Q = 750 gpm

% SUBMERGENCE: initial \_\_\_\_\_ pumping \_\_\_\_\_

RADIUS of PUMPED WELL \_\_\_\_\_

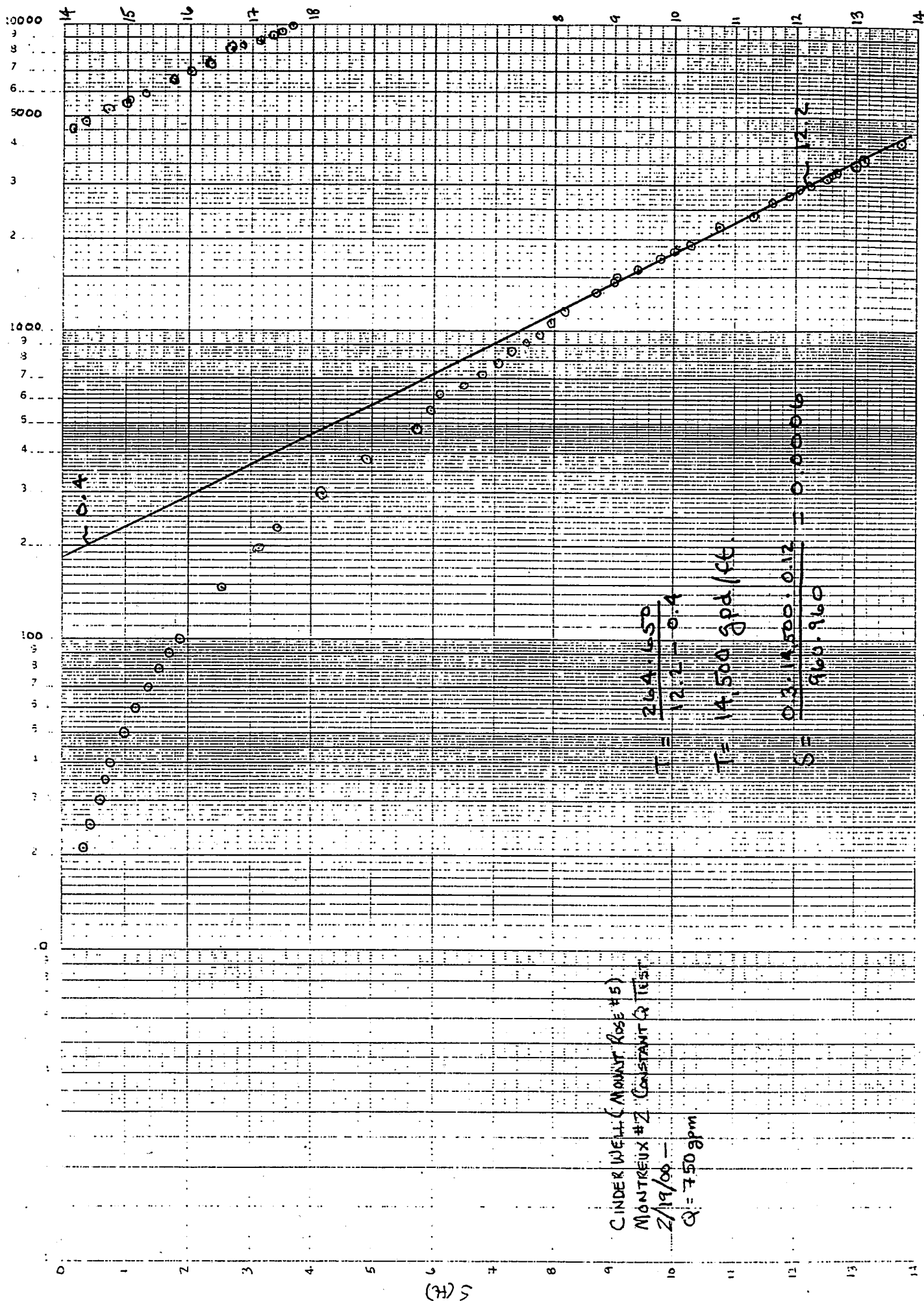
PUMP ON: date 2/19/00 time 1005

DISTANCE from PUMPED WELL \_\_\_\_\_

PUMP OFF: date \_\_\_\_\_ time \_\_\_\_\_

TIME t = at t'=0					WATER LEVEL DATA STATIC WATER LEVEL 244.95				WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME			t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or S'	Q		(NOTE ANY CHANGES IN OBSERVERS)
mins	hrs	t	t'								
1/7/00					249.65						
1/9/00					243.77						
1/17/00					244.20						
1/18/00					244.63						
2/18/00					249.85						
1/19/00					244.95						
730					244.95						RvH
1005		0			244.95	START CONSTANT Q					
1026	21				245.31			0.36			EE
1030	25				245.39			0.44			
1035	30				245.56			0.61			
1040	35				245.63			0.68			
1045		40			245.73			0.78			
1055		50			245.95			1.00			
1105		60			246.13			1.18			
1115	10	70			246.33			1.38			
1125	20	80			246.50			1.55			
1135	30	90			246.66			1.71			
1145	40	100			246.80			1.85			
1232		147			247.50			2.55			
1322	17	197			248.10			3.15			
1356		231			248.48			3.53			
1505		300			249.15			4.20			
1630	25	385			249.91			4.96			
1820		495			250.69			5.73			Q Reduced to 646 gpm
1920		555			250.90			5.95			@ 460 mins
2020		615			251.09			6.14			
2120		675			251.47			6.52			
2220		735			251.77			6.82			
2320		795			252.00			7.05			
0020		855			252.21			7.26			
0120		915			252.51			7.56			
0230		985			252.73			7.78			
0350		1075			252.90			7.95			
0525		1160			253.13			8.18			
0815	10	1330			253.65			8.70			EE
1005	0	1440			253.97			9.02			"
1105		1500			254.13			9.18			"
1230	25	1585			254.36			9.41			"
1505		1740			254.75			9.80			
1650	45	1845			254.97			10.02			
1755		1910			255.18			10.23			
1730		2185			255.71			10.76			
2155		2335			256.25			11.30			
0545		2620			256.56			11.61			
0725		2720			256.82			11.87			CINDER







# WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES  
UTILITY SERVICES DIVISION

## PUMPING TEST DATA

WELL Oney - Next door to  
PUMPING OBSERVATION WELL Nance  
PUMPING RECOVERY DATA  
PAGE 1 OF 1

Behind house toward back corner  
of lot, follow rock border

TYPE OF PUMPING TEST CONSTANT Q & RECOVERY

HOW Q MEASURED ELECTRIC SOUNDER

HOW WL's MEASURED \_\_\_\_\_

PUMPED WELL NO. MONTREUX WELL (MR6)

RADIUS of PUMPED WELL \_\_\_\_\_

DISTANCE from PUMPED WELL \_\_\_\_\_

M.P. for WL's \_\_\_\_\_ elev. \_\_\_\_\_

DEPTH OF PUMP/AIRLINE \_\_\_\_\_ wpt \_\_\_\_\_

% SUBMERGENCE: initial \_\_\_\_\_ pumping \_\_\_\_\_

PUMP ON: date 2/19/00 time 1005

PUMP OFF: date 2/29/00 time 1005

TIME					WATER LEVEL DATA				WATER PRODUCT		COMMENTS
t =                    at t'=0					STATIC WATER LEVEL 255.02						
CLOCK TIME	ELAPSED TIME			t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or S'		Q	(NOTE ANY CHANGES IN OBSERVERS)
	mins	hrs	t								
1700			415		255.02			0.00			NO SOUNDING Tub.
1040			1475		254.97			-0.05			
1545			3220		255.30			0.28			EE
1430			4585		256.15			1.13			EE
1435			6030		255.101			0.59			"
14130			7465		255.77			0.75			EM
13:30			8845		256.35			1.33			DD
1350			10305		256.30			1.28			JS stilling well Repaired
1250			11685		256.17			1.15			MW
1625			13340		256.75			1.73			RV
0930			14365		256.64			1.62			RV
1500			14815	415	256.51			1.49			DAN
1448			16123	1723	256.60			1.58			MARIO
105			17340	2940	256.41			1.39			MARIO
135			18990	4690	256.63			1.31			RV
1220			23175	8775	256.08			1.06			EM
1520			24795	10395	256.12			1.16			EE
1400			26155	11755	256.18			1.16			MARIO
1315			28990	14590	256.47			1.4			MARIO



# WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES

UTILITY SERVICES DIVISION

Department of



Water Resources

WELL Nance  
PUMPING / OBSERVATION WELL  
PUMPING / RECOVERY DATA  
PAGE 1 OF 1

## PUMPING TEST DATA

TYPE OF PUMPING TEST CONSTANT Q & Recovery

HOW Q MEASURED ELECTRIC SOUNDER

HOW WL's MEASURED \_\_\_\_\_

PUMPED WELL NO. MR6

RADIUS of PUMPED WELL \_\_\_\_\_

DISTANCE from PUMPED WELL \_\_\_\_\_

M.P. for WL's \_\_\_\_\_ elev. \_\_\_\_\_

DEPTH OF PUMP/AIRLINE \_\_\_\_\_ wrt \_\_\_\_\_

% SUBMERGENCE: initial \_\_\_\_\_ pumping \_\_\_\_\_

PUMP ON: date 2/14/00 time 1005

PUMP OFF: date 2/29/00 time 1005

6195 Philoree

Back of house, behind wire pen.

TIME t = at t'=0					WATER LEVEL DATA STATIC WATER LEVEL 273.45'				WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins hrs	t	t'	t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	Q or S'		Q	(NOTE ANY CHANGES IN OBSERVERS)
18/00							273.62				
19/00							273.45	0.00			
20/00		420					273.64	0.19			EE
21/00		1485					273.72	0.27			EE
22/00		3225					274.17	0.72			EE
23/00		4590					274.45	1.00			"
24/00		6040					274.54	1.09			EM
25/00		7435					274.81	1.36			PD
26/00		8825					275.23	1.78			85
27/00		10300					275.30	1.85			WV
28/00		11685					275.21	1.76			RV
29/00		13345					275.70	2.25			RV
30/00		14370					275.73	2.28			DAN
31/00		14810	410				275.55	2.1			MARIO
32/00		16110	1710				275.51	2.06			MARIO
33/00		17350	2950				275.28	1.83			RV Do we have loc
34/00		18995	4595				275.15	1.7			EM
35/00		23180	8780				274.80	1.35			EE
36/00		24785	10385				274.70	1.25			MARIO
37/00		26155	11755				274.82	1.37			MARIO
38/00		28980	14580				275.18	1.73			MARIO



# WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES

UTILITY SERVICES DIVISION



## PUMPING TEST DATA

TYPE OF PUMPING TEST CONSTANT Q & RECOVERY

HOW Q MEASURED \_\_\_\_\_

HOW WL's MEASURED \_\_\_\_\_

PUMPED WELL NO. MR6

RADIUS of PUMPED WELL \_\_\_\_\_

DISTANCE from PUMPED WELL \_\_\_\_\_

WELL Cunningham

PUMPING / OBSERVATION WELL

PUMPING / RECOVERY DATA

PAGE \_\_\_\_\_ OF \_\_\_\_\_

5900 Philoree

Take drive around house to garage pad, well is near edge of garage pad

M.P. for WL's \_\_\_\_\_ elev. \_\_\_\_\_

DEPTH OF PUMP/AIRLINE \_\_\_\_\_ wrt \_\_\_\_\_

% SUBMERGENCE: initial \_\_\_\_\_ pumping \_\_\_\_\_

PUMP ON: date 2/19/00 time 1005

PUMP OFF: date 2/29/00 time 1005

TIME t = at t'=0					WATER LEVEL DATA STATIC WATER LEVEL 207.92					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME		t	t'	t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or S'		Q	(NOTE ANY CHANGES IN OBSERVERS)
	mins	hrs										
1520								207.88			2/19 0730	Cinder #1 = 244.95
1644			399					207.92	0.00			
1020			1455					207.98	0.06			EE
1530			3205					208.65	0.73			EE
1400			4555					209.56	1.64			EE
1412			6008					210.12	2.20			
1416			7451					210.40	2.48			EM
1350			8866					210.85	2.93			DD
1410			10325					211.52	3.60			JS Well had been on
1240			11675					211.35	3.43			RV
1610			13325					211.46	3.54			RV
0910			14345					211.88	3.96			RV
519			14834	434				212.02	4.1			Dam
003			16138	1738				211.86	3.94			MARIO
1030			17305	2905				211.00	3.08			MARIO
1420			18975	4575				210.44	2.52			RV-GPS'd it, Too
1200			23155	8755				209.81	1.89			EM
1535			24810	10410				208.70	.98			RVH
1475			26180	1780				208.83	.91			MARIO
1330			29005	14605				203.77	8			MARIO
								209.17	1.25			MARIO
											</	



# WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES  
UTILITY SERVICES DIVISION

## PUMPING TEST DATA

TYPE OF PUMPING TEST CONSTANT Q & Recovery  
HOW Q MEASURED \_\_\_\_\_  
HOW WL's MEASURED \_\_\_\_\_  
PUMPED WELL NO. MR6  
RADIUS of PUMPED WELL \_\_\_\_\_  
DISTANCE from PUMPED WELL \_\_\_\_\_

M.P. for WL's \_\_\_\_\_ elev. \_\_\_\_\_  
DEPTH OF PUMP/AIRLINE \_\_\_\_\_ wrt \_\_\_\_\_  
% SUBMERGENCE: initial \_\_\_\_\_ pumping \_\_\_\_\_  
PUMP ON: date 2/19/00 time 1005  
PUMP OFF: date 2/29/00 time 1005

WELL Nessler  
PUMPING (OBSERVATION WELL)  
PUMPING / RECOVERY DATA  
PAGE 1 OF 1

Well is across fence in junk stb  
(just off main road, near meta  
shed)

TIME t = at t'=0					WATER LEVEL DATA STATIC WATER LEVEL 244.17				WATER PRODUCT		COMMENTS	
CLOCK TIME	ELAPSED TIME		t	t'	t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or S'		Q	(NOTE ANY CHANGES IN OBSERVERS)
	mins	hrs										
1530								249.05				
0920								249.17	0.00			
1650			405					249.17	0.00			EE
1030			1465					249.59	0.42			PUMP MAY BE ON, QUIET BUZZ
1540			3215					250.24	1.07			EE - SAME QUIET BUZZ
1415			4570					250.79	1.62			EE
1422			6017					250.99	1.82			EM
1410			7445					251.36	2.19			DD
1340			8855					251.85	2.68			JS
1400			10315					252.60	2.83			RV
1245			11680					251.98	2.81			RV
1620			13335					252.57	3.4			DAN
0920			14355					252.65	3.48			MARIO
930			14845	445				252.57	3.4			MARIO
1050			17325	2925				251.82	2.65			RV
1430			18985	4585				251.47	2.3			EM
1210			23165	8765				250.65	1.98			EE
1530			24805	10405				250.55	1.38			MARIO
1415			26170	11770				250.43	1.76			MARIO
1324			29000	14600				250.65	1.48			MARIO



**DEPARTMENT OF WATER RESOURCES  
UTILITY SERVICES DIVISION**

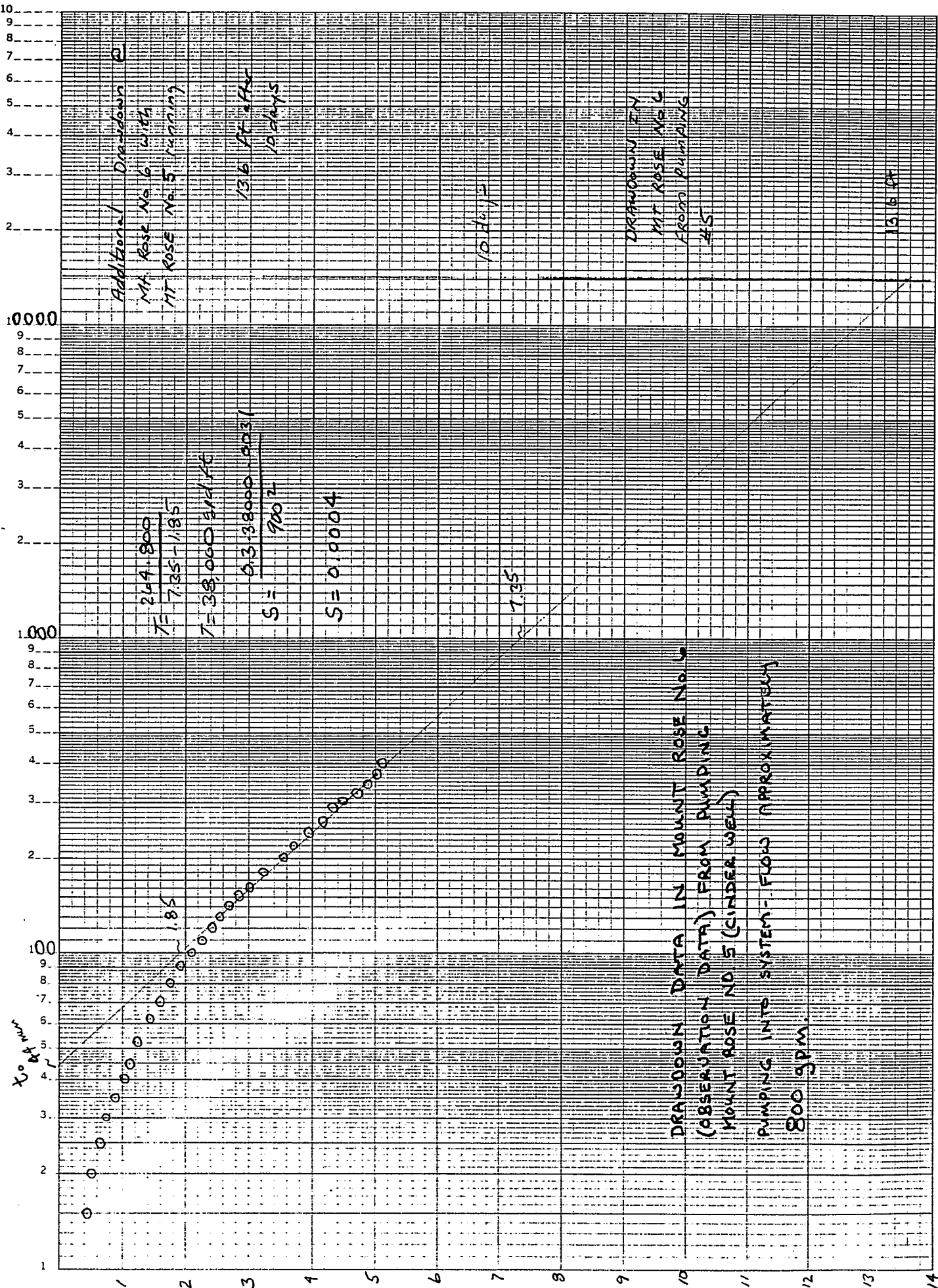
PAGE 1 OF 1

FOR INTERFERENCE EFFECTS  
CALCULATIONS.

DISTANCE from PUMPED WELL \_\_\_\_\_

PUMP OFF: date \_\_\_\_\_ time \_\_\_\_\_

[illegible]



Jacob's equation can be used for this calculation, namely:

$$s(r,t) = \frac{264 * Q}{T} * \log\left(\frac{0.3 * T * t}{r^2 * S}\right)$$

$$s(900 \text{ ft}, 90 \text{ days}) = \frac{264 * 1000}{79000} * \log\left(\frac{0.3 * 79000 * 90}{900^2 * 0.0025}\right) = 10.1 \text{ ft}$$

$$3.34 * 3.0$$

$$s(900 \text{ ft}, 10 \text{ days}) = \frac{264 * 650}{17000} * \log\left(\frac{0.3 * 17000 * 10}{900^2 * 0.0008}\right) = 7.0003$$

$$S = 0.0008 = 10.1 * 1.90 = 19.2 \text{ ft}$$

$$S = 0.0003 = 10.1 * 2.32 = 23.5 \text{ ft}$$

$$S = 0.0004 \quad \frac{264 * 800}{39000} * \log\left(\frac{0.3 * 39000 * 10}{900^2 * 0.0004}\right)$$

$$5.56 * 2.55 = 14.15 \text{ ft}$$

Additional Drawdowns @ #6 with #5 on @ 800 gpm

10 days with both wells on, #6 @ 650 gpm

Max pumping level @ #6

From 10-day test = 500 ft

$$+ s(900 \text{ ft}, 10 \text{ days}) = \frac{264.650}{17000} \cdot \log \left( \frac{0.3 \cdot 17,000 \cdot 10}{900^2 \cdot 0.00055} \right) \cdot \frac{5.12}{44}$$
$$10.1 \cdot 2.05 = 20.70$$

520 ft pumping level @ #6 after 10 days of continuous pumping @ 800 (#5) and 650 (#6).  
35.4 ac ft from #5  
28.7 ac ft from #6  
64.1 ac ft in 10 days

30 days

Extrapolated from 10-day test to 30 days = 520 ft

$$s(900 \text{ ft}, 30 \text{ days}) = \frac{264.650}{17000} \cdot \log \left( \frac{0.3 \cdot 17,000 \cdot 30}{900^2 \cdot 0.00055} \right) \cdot \frac{5.12}{44}$$
$$10.1 \cdot 2.65 = 26.8$$

547 ft pumping level No 6 after 30 days  
Continuous pumping

## **APPENDIX C**

### **Water Quality**

00 FEB 24 AM 11: 1

146397

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

**TYPE OF ANALYSIS:**

④ Check here for ROUTINE DOMESTIC ANALYSIS.  
Circle the constituents needed for PARTIAL ANALYSIS.

State **Nevada** County **Washoe**  
Township 17 Range 19 Section 3  
General Location Monte Vista  
Source Address Mt Rose #6 (Pump Test)

### 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 **2-24-00**  
Owner **Washoe County** Phone  
Address **P.O. Box 11130**  
City **Reno** State **Nevada**

**REPORT TO:**

Name **Terri Svetich (Washoe County)**  
Address **P.O. Box 11130**  
City **Reno**  
State **Nevada** Zip **89520-0027**

**REASON FOR ANALYSIS:**

☐ Loan  
☐ Personal health reasons  
☐ Purchase of the property  
☐ Rental or sale of property  
☐ Subdivision approval  
☒ Other Spouse

### 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 .....  
IN USE: ☐ Yes ☐ No  
Type .....  
Name Mt. Rose #6  
Surface .....  
Casing diameter ..... in.  
Casing depth ..... ft.

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

**FOR LABORATORY USE ONLY**

Constituent				PRINT OTHER DESIRED CONSTITUENTS BELOW			
Constituent		Constituent		Constituent		Constituent	
ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
187	28.9	0.0	0.0	307	S.U.		
T.D.S. @ 180° C.	Chloride	Iron	0.04	Color	3		
165	1						
Hardness	Nitrate -N	Manganese	0.00	Turbidity	1.0		
88	0.2						
Calcium	Alkalinity	Copper	0.00	pH	7.34		
17	112						
Magnesium	Bicarbonate	Zinc	0.01	EC	229		
11	137						
Sodium	Carbonate	Barium	0.07	SI@20C	-0.89		
13	0						
Potassium	Fluoride	Boron	0.0				
6	0.04						
Sulfate	Arsenic	Silica	62				
2	0.003						
Gross	MBAS	NO <sub>2</sub>	<0.01	CN <sup>-</sup>	<0.005		
3pg/L	<0.1						
Gross B							
5pg/L							

ee ..... 14 Remarks

Collected by .....

WS I.D. .... 5050

SDWA — Pri. .... Sec. ....

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

Date Rec'd ..... Init. ....

ppm = parts per million, milligrams per liter; S.U. = Standard Units

Remarks .....

AL 3/19/00

New Well - MH Rose #6

will be PWS 3030-04  
when equipped

Expedite



Alpha Analytical, Inc.  
255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778  
(775) 355-1044 • (775) 355-0106 FAX • 1-800-283-1183

### ANALYTICAL REPORT

Washoe County Utility Division  
P.O. Box 11130  
Reno, NV 895200027

Job#:  
Phone: (775) 954-4625  
Attn: Terri Svetich

Alpha Analytical Number: WCU00022429-01A  
Client I.D. Number: Mt. Rose #6

Sampled: 02/24/00  
Received: 02/24/00  
Analyzed: 02/24/00

#### SDWA Volatiles (plus Lists 1 & 3 Unregulated) EPA Method 524.2

Compound	Concentration µg/L	Reporting Limit	Compound	Concentration µg/L	Reporting Limit
1 Benzene	ND	0.500 µg/L	38 cis-1,3-Dichloropropene	ND	0.500 µg/L
2 Vinyl chloride	ND	0.500 µg/L	39 2,2-Dichloropropane	ND	0.500 µg/L
3 Carbon tetrachloride	ND	0.500 µg/L	40 1,1,1,2-Tetrachloroethane	ND	0.500 µg/L
4 1,2-Dichloroethane	ND	0.500 µg/L	41 1,1,2,2-Tetrachloroethane	ND	0.500 µg/L
5 Trichloroethene	ND	0.500 µg/L	42 1,2,3-Trichloropropane	ND	0.500 µg/L
6 1,4-Dichlorobenzene	ND	0.500 µg/L	43 Bromochloromethane	ND	0.500 µg/L
7 1,1-Dichloroethene	ND	0.500 µg/L	44 n-Butylbenzene	ND	0.500 µg/L
8 1,1,1-Trichloroethane	ND	0.500 µg/L	45 Dichlorodifluoromethane	ND	0.500 µg/L
9 cis-1,2-Dichloroethene	ND	0.500 µg/L	46 Trichlorofluoromethane	ND	0.500 µg/L
10 1,2-Dichloropropane	ND	0.500 µg/L	47 Hexachlorobutadiene	ND	0.500 µg/L
11 Ethylbenzene	ND	0.500 µg/L	48 Isopropylbenzene	ND	0.500 µg/L
12 Chlorobenzene	ND	0.500 µg/L	49 4-Isopropyltoluene	ND	0.500 µg/L
13 1,2-Dichlorobenzene	ND	0.500 µg/L	50 Naphthalene	ND	0.500 µg/L
14 Styrene	ND	0.500 µg/L	51 n-Propylbenzene	ND	0.500 µg/L
15 Tetrachloroethene	ND	0.500 µg/L	52 sec-Butylbenzene	ND	0.500 µg/L
16 Toluene	ND	0.500 µg/L	53 tert-Butylbenzene	ND	0.500 µg/L
17 trans-1,2-Dichloroethene	ND	0.500 µg/L	54 1,2,3-Trichlorobenzene	ND	0.500 µg/L
18 Xylenes, total	ND	0.500 µg/L	55 1,2,4-Trimethylbenzene	ND	0.500 µg/L
19 Dichloromethane	ND	0.500 µg/L	56 1,3,5-Trimethylbenzene	ND	0.500 µg/L
20 1,1,2-Trichloroethane	ND	0.500 µg/L	57 Methyl tert-butyl ether (MTBE)	ND	0.500 µg/L
21 1,2,4-Trichlorobenzene	ND	0.500 µg/L			
22 Bromobenzene	ND	0.500 µg/L			
23 Bromodichloromethane	ND	0.500 µg/L			
24 Bromoform	ND	0.500 µg/L			
25 Bromomethane	ND	0.500 µg/L			
26 Dibromochloromethane	ND	0.500 µg/L			
27 Chloroethane	ND	0.500 µg/L			
28 Chloroform	ND	0.500 µg/L			
29 Chloromethane	ND	0.500 µg/L			
30 2-Chlorotoluene	ND	0.500 µg/L			
31 4-Chlorotoluene	ND	0.500 µg/L			
32 Dibromomethane	ND	0.500 µg/L			
33 1,3-Dichlorobenzene	ND	0.500 µg/L			
34 1,1-Dichloroethane	ND	0.500 µg/L			
35 1,1-Dichloropropene	ND	0.500 µg/L			
36 1,3-Dichloropropane	ND	0.500 µg/L			
37 trans-1,3-Dichloropropene	ND	0.500 µg/L			

pH = 2

ND = Not Detected

Phase I Regulated Compounds (1-8); Phase II Regulated Compounds (9-18); Phase V Regulated Compounds (19-21); List 1 Unregulated Compounds (22-41); List 3 Unregulated Compounds (42-56); and, Additionally requested Compounds (57+)

Approved By:

Roger L. Scholl, Ph.D.  
Laboratory Director

Date:

3/7/00



Alpha Analytical, Inc.  
255 Glendale Ave. • Suite 21 • Sparks, Nevada 89131-5778  
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

## ANALYTICAL REPORT

Client: Washoe County Utility Division  
P.O. Box 11130  
Reno, NV, 895200027  
Attn: Terri Svetich

Client Sample ID: Mt. Rose #6

Lab Sample ID: 00022429-01A

Date Sampled: 2/24/00

Date Received: 2/24/00

Matrix: Aqueous

PWS/DWR#:

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
<b>E504.1 EDB AND DBCP</b>					<b>E525.2 SVOCs BY GCMS</b>				
1,2-Dibromoethane	ND	0.010	µg/L	3/2/00	Propachlor	ND	1.0	µg/L	3/10/00
1,2-Dibromo-3-chloropropane	ND	0.020	µg/L	3/2/00	Simazine	ND	0.070	µg/L	3/10/00
<b>E505 ORGANOHALIDE PESTICIDES AND PCBS</b>					Atrazine	ND	0.10	µg/L	3/10/00
Hexachlorocyclopentadiene	ND	0.10	µg/L	3/1/00	Metribuzin	ND	1.0	µg/L	3/10/00
Hexachlorobenzene	ND	0.10	µg/L	3/1/00	Alachlor	ND	0.20	µg/L	3/10/00
gamma-BHC	ND	0.020	µg/L	3/1/00	Metolachlor	ND	1.0	µg/L	3/10/00
Alachlor	ND	0.20	µg/L	3/1/00	Butachlor	ND	1.0	µg/L	3/10/00
Heptachlor	ND	0.040	µg/L	3/1/00	bis(2-Ethylhexyl)adipate	ND	0.60	µg/L	3/10/00
Aldrin	ND	0.20	µg/L	3/1/00	bis(2-Ethylhexyl)phthalate	ND	0.60	µg/L	3/10/00
Heptachlor epoxide	ND	0.020	µg/L	3/1/00	Benzo(a)pyrene	ND	0.020	µg/L	3/10/00
Dieldrin	ND	0.20	µg/L	3/1/00	<b>E531.1 CARBAMATES</b>				
Endrin	ND	0.010	µg/L	3/1/00	Aldicarb sulfoxide	ND	0.50	µg/L	3/8/00
Methoxychlor	ND	0.10	µg/L	3/1/00	Aldicarb sulfone	ND	0.80	µg/L	3/8/00
Chlordane	ND	0.20	µg/L	3/1/00	Oxamyl	ND	2.0	µg/L	3/8/00
Toxaphene	ND	1.0	µg/L	3/1/00	Methomyl	ND	1.0	µg/L	3/8/00
Aroclor 1016	ND	0.080	µg/L	3/1/00	3-Hydroxycarbofuran	ND	1.0	µg/L	3/8/00
Aroclor 1221	ND	20	µg/L	3/1/00	Aldicarb	ND	0.50	µg/L	3/8/00
Aroclor 1232	ND	0.50	µg/L	3/1/00	Carbofuran	ND	0.90	µg/L	3/8/00
Aroclor 1242	ND	0.30	µg/L	3/1/00	Carbaryl	ND	1.0	µg/L	3/8/00
Aroclor 1248	ND	0.10	µg/L	3/1/00	<b>E547 GLYPHOSATE</b>				
Aroclor 1254	ND	0.10	µg/L	3/1/00	Glyphosate	ND	6.0	µg/L	3/6/00
Aroclor 1260	ND	0.20	µg/L	3/1/00	<b>E548.1 ENDOTHALL</b>				
<b>E515.1 CHLORINATED ACID HERBICIDES</b>					Endothall	ND	9.0	µg/L	3/3/00
Dalapon	ND	1.0	µg/L	3/4/00	<b>E549.1 DIQUAT/PARAQUAT</b>				
Dicamba	ND	0.50	µg/L	3/4/00	Diquat	ND	0.40	µg/L	3/2/00
2,4-D	ND	0.10	µg/L	3/4/00					
PCP	ND	0.040	µg/L	3/4/00					
2,4,5-TP	ND	0.20	µg/L	3/4/00					
Dinoseb	ND	0.20	µg/L	3/4/00					
Pichloram	ND	0.10	µg/L	3/4/00					

ND = Not Detected

Approved By:

*Walter Hinchman*  
Walter Hinchman  
Quality Assurance Officer

Date: 3/15/00



Alpha Analytical,  
255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778  
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

RECEIVED

MAR 20 2000

WASHOE COUNTY  
DEPT OF WATER RESOURCES

**CASE NARRATIVE**  
**March 15, 2000**

One sample was received on 02/24/00 for the analyses of SOC compounds for source compliance monitoring in the state of Nevada. Sample containers were received in good condition.

Alpha Analytical ID	Client ID	Date	Time Collected
WCU00022429-01	Mt. Rose #6	02/24/00	08:45

**METHOD 504.1:**

Your sample was spiked as the batch Laboratory Fortified Matrix (LFM). All QC criteria were met with no abnormalities.

**METHOD 505:**

Your sample was spiked as the batch LFM. All QC criteria were met with no abnormalities.

**METHOD 515.1:**

Your sample was spiked as the batch LFM. All QC criteria were met with no abnormalities.

**METHOD 525.2:**

All QC criteria were met with no abnormalities.

**METHOD 531.1:**

All QC criteria were met with no abnormalities.

**METHOD 547:**

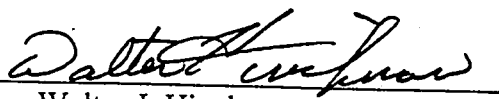
All QC criteria were met with no abnormalities.

**METHOD 548.1:**

All QC criteria were met with no abnormalities.

**METHOD 549.1:**

Your sample was spiked as the batch LFM. All QC criteria were met with no abnormalities.

  
Walter J. Hinchman  
Quality Assurance Officer

3/15/00  
Date



**MONTGOMERY WATSON LABORATORIES**

a Division of Montgomery Watson Americas, Inc.

555 East Walnut Street

Pasadena, California 91101

Tel: 626 568 6400 Fax: 626 568 6324

1 800 568 LABS (1 800 568 5227)

RECEIVED

MAR 09 2000

WASHOE COUNTY  
DEPT. OF WATER RESOURCES

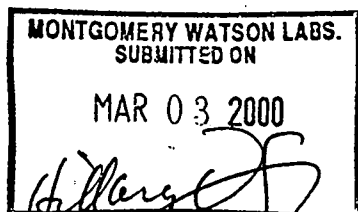
**Laboratory Report**

for

Washoe County Dept. of Water  
Resources  
4930 Energy Way

Reno , NV 89502-4106

Attention: John Hulett  
Fax: (775) 954-4610



HDS Hillary Strayer

Report#: 63231  
DRINKING

Montgomery Watson Laboratories  
555 E. Walnut St., Pasadena, CA 91101  
PHONE: 626-568-6400/FAX: 626-568-6324

ACKNOWLEDGMENT OF SAMPLES RECEIVED

Washoe County Dept. of Water Resources  
4930 Energy Way  
Reno, NV 89502-4106  
Attn: John Hulett

Customer Code: WASHOE

PO#: 179701

Group#: 63231

Project#: DRINKING

Proj Mgr: Hillary Strayer

The following samples were received from you on 02/25/00. They have been scheduled for the tests listed beside each sample. If this information is incorrect, please contact your service representative. Thank you for using Montgomery Watson Laboratories.

Sample#	Sample Id	Tests Scheduled	Matrix	Sample Date
2002250072	MT ROSE 6	@RN	Water	02/24/00

Test Acronym Description

Test Acronym	Description
@RN	Radon 222

## CHAIN OF CUSTODY RECORD

**MONTGOMERY WATSON LABORATORIES**

## CHAIN OF CUSTODY RECORD

555 E. Walnut St., Pasadena, CA 91101

(626) 568-6400 (800) 566-5227

**MWLABS USE ONLY:**

**LOGIN COMMENTS:**

**SAMPLES CHECKED/LOGGED IN BY:**

**SAMPLE TEMP, RECEIPT AT LAB:**

BLUE ICE:	FROZEN	PARTIALLY FROZEN	THAWED

**TO BE COMPLETED BY SAMPLER:**

[illegible]

**SIGNATURE**

**PRINT NAME**

COMPANY/TITLE

DATE \_\_\_\_\_ TIME \_\_\_\_\_

**RELINQUISHED BY:**

11/11

2.2.2

12.04

RECEIVED BY:

112-1-28

110117

100

RELINQUISHED BY:

0

---

---

RECEIVED BY:

\_\_\_\_\_

1000

\_\_\_\_\_

RELINQUISHED BY:

---

---

---

**RECEIVED BY:**

---

1

**\_\_\_\_\_**

**(H.)-(O-)**

PAGE 1 OF 1

**MONTGOMERY WATSON LABORATORIES**

a Division of Montgomery Watson Americas, Inc.  
555 East Walnut Street  
Pasadena, California 91101  
Tel: 626 568 6400 Fax: 626 568 6324  
1 800 568 LABS (1 800 568 5227)

**Laboratory  
Report  
#63231**

Washoe County Dept. of Water  
Resources  
John Hulett  
4930 Energy Way  
Reno, NV 89502-4106

Samples Received  
25-feb-2000 09:38:00

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MRL	Dilution
----------	----------	-----------	--------	---------	--------	-------	-----	----------

MT ROSE 6 (2002250072)      Sampled on 02/24/00

**Radon 222**

02/26/00	111557	( SM7500RN )	Radon 222	340	pCi/l	50	1
02/26/00	111557	( SM7500RN )	Radon 222, Two Sigma Error	19.1	pCi/l	0.0000	1

**MONTGOMERY WATSON LABORATORIES**

a Division of Montgomery Watson Americas, Inc.  
555 East Walnut Street  
Pasadena, California 91101  
Tel: 626 568 6400 Fax: 626 568 6324  
1 800 568 LABS (1 800 568 5227)

**Laboratory  
QC Report  
#63231**

Washoe County Dept. of Water  
Resources

QC Batch #111557

Radon 222

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Radon 222	1000	1130	113.0	( 80.00 - 120.00 )	
LCS2	Radon 222	1000	1100	110.0	( 80.00 - 120.00 )	2.7
MBLK	Radon 222	ND				

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.  
Criteria for MS and DUP are advisory only and not applicable for ICR monitoring.

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

Date: 3-28-2000

Company : LANG EXPLORATORY DRILLING  
Well No : MONTREUX #4  
Field : RENO  
State : NEVADA County: WASHOE  
Witnessed By: BONEY Rec. By: DAN IHDE  
Location : CORNER OF BORDEAUX & LAKE GENEVA  
Remarks : GYRO NO. 2444

Measured Depth, Feet	Incli- nation, Degrees	Direc- tion, Degrees True	Course Deviation, Feet	True Vertical Depth, Feet	Closure Distance, Feet	Closure Bearing, Degrees True
0	0.0	83	0.00	0.00	0.00	0.0
50	0.2	133	0.07	50.00	0.07	130.0
100	0.1	271	0.10	100.00	0.11	143.3
150	0.1	158	0.06	150.00	0.12	160.1
200	0.1	330	0.07	200.00	0.11	163.3
250	0.1	167	0.10	250.00	0.13	169.0
300	0.0	168	0.07	300.00	0.20	168.2
350	0.2	132	0.10	350.00	0.29	158.0
400	0.0	227	0.09	400.00	0.37	152.7
450	0.1	89	0.03	450.00	0.39	149.3
500	0.1	215	0.08	500.00	0.42	151.6
550	0.1	76	0.08	550.00	0.45	153.3
600	0.1	137	0.09	600.00	0.52	148.2
650	0.1	270	0.09	650.00	0.55	150.1
700	0.2	121	0.13	700.00	0.62	148.6
745	0.2	153	0.18	745.00	0.79	146.3

Equip.: L-18

Office: BFL

Job No.: 32437

Calculation Method: Balanced Tangential

**APPENDIX D**  
**Drilling Cost Invoices**

Lang Exploratory Drilling  
a division of Boart Longyear Company  
2745 West California Avenue  
Salt Lake City, Utah 84104-4579 USA  
Telephone: 801-973-6667  
Fax: 801-973-4572



## LANG EXPLORATORY DRILLING

INVOICE NO.

15313299

January 24, 2000

Montreux Joint Venture  
a Nevada General Partnership  
16475 Bordeaux Drive  
Reno, Nevada 89511  
Attention: Mr. Rob Nichols

Drilling at the Montreux Well #4 Project near Reno, Nevada. Driller: V. Hardie & A. Beaudoin. Rig: LK-13. Drilling Period: January 19, through January 22, 2000.

DATE	WELL	DESCRIPTION / WORK	
01/19/00	#4	Mobilization / Demobilization	\$ 23,000.00
01/22/00	#4	40 ft @ \$ 175.00/ft Drilling 29" hole	\$ 7,000.00
		Subtotal	\$ 30,000.00
		TOTAL	\$ 30,000.00

INVOICE TOTAL

\$235,002.20

PAYMENT DUE UPON RECEIPT

PLEASE REMIT TO : BOART LONGYEAR COMPANY, SDS 12-0734, P.O. BOX 86, MINNEAPOLIS, MINNESOTA 55486-0734

Lang Exploratory Drilling  
a division of Boart Longyear Company  
2745 West California Avenue  
Salt Lake City, Utah 84104-4579 USA  
Telephone: 801-973-6667  
Fax: 801-973-4572



## LANG EXPLORATORY DRILLING

INVOICE NO.

15313302

January 31, 2000

Montreux Joint Venture  
a Nevada General Partnership  
16475 Bordeaux Drive  
Reno, Nevada 89511  
Attention: Mr. Rob Nichols

Drilling at the Montreux Well #4 Project near Reno, Nevada. Driller: V. Hardie & A. Beaudoin. Rig: LK-13. Drilling Period: January 23, through January 29, 2000.

DATE	WELL	DESCRIPTION / WORK	
01/23/00	#4	65 ft @ \$ 175.00/ft Drilling 29" hole	\$ 11,375.00
		100 ft of 22 inch Casing furnished & installed @ \$65.00/ft	\$ 6,500.00
01/24/00	#4	105 ft @ \$ 45.00/ft Furnish & install sanitary seal	\$ 4,725.00
01/25/00	#4	15 ft @ \$ 90.00/ft Drilling 19" hole	\$ 1,350.00
01/26/00	#4	160 ft @ \$ 90.00/ft Drilling 19" hole	\$ 14,400.00
01/27/00	#4	190 ft @ \$ 90.00/ft Drilling 19" hole	\$ 17,100.00
01/28/00	#4	175 ft @ \$ 90.00/ft Drilling 19" hole	\$ 15,750.00
01/29/00	#4	98 ft @ \$ 90.00/ft Drilling 19" hole	\$ 8,820.00

PAYMENT DUE UPON RECEIPT

Subtotal \$ 80,020.00

TOTAL \$ 80,020.00

PLEASE REMIT TO : BOART LONGYEAR COMPANY, SDS 12-0734, P.O. BOX 86, MINNEAPOLIS, MINNESOTA 55486-0734

Lang Exploratory Drilling  
a division of Boart Longyear Company  
2745 West California Avenue  
Salt Lake City, Utah 84104-4579 USA  
Telephone: 801-973-6667  
Fax: 801-973-4572



## LANG EXPLORATORY DRILLING

INVOICE NO.

15313308  
February 7, 2000

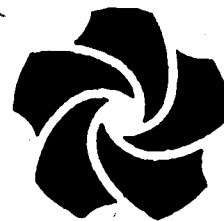
Montreux Joint Venture  
a Nevada General Partnership  
16475 Bordeaux Drive  
Reno, Nevada 89511  
Attention: Mr. Rob Nichols

Drilling at the Montreux Well #4 Project near Reno, Nevada. Driller: V. Hardie & S. Belliston. Rig: LK-13. Drilling Period: January 30, through February 4, 2000.

DATE	WELL	DESCRIPTION / WORK	
01/30/00	#4	17 ft @ \$ 90.00/ft Drilling 19" hole	\$ 1,530.00
		Charge for geophysical logs	\$ 4,200.00
01/31/00	#4	554 ft of 14 inch Casing furnished & installed @ \$35.00/ft	\$ 19,390.00
		200 ft of 14 inch Screen furnished & installed @ \$52.00/ft	\$ 10,400.00
		10 cubic yds of Gravel pack furnished & installed @ \$390.00/cu.yd	\$ 3,900.00
02/01/00	#4	17.75 cubic yds of Gravel pack furnished & installed @ \$390.00/cu.yd	\$ 6,922.50
		9.5 hrs @ \$ 375.00/hr Trip in & develop well	\$ 3,562.50
02/02/00	#4	24 hrs @ \$ 375.00/hr Developing well	\$ 9,000.00
02/03/00	#4	17 hrs @ \$ 375.00/hr Develop & clean out bottom of well	\$ 6,375.00
		1.13 cubic yds of Gravel pack furnished & installed @ \$390.00/cu.yd	\$ 440.70

PLEASE REMIT TO : BOART LONGYEAR COMPANY, SDS 12-0734, P.O. BOX 86, MINNEAPOLIS, MINNESOTA 55486-0734

Lang Exploratory Drilling  
a division of Boart Longyear Company  
2745 West California Avenue  
Salt Lake City, Utah 84104-4579 USA  
Telephone: 801-973-6667  
Fax: 801-973-4572



## LANG EXPLORATORY DRILLING

INVOICE NO.

15313308

February 7, 2000

DATE	WELL	DESCRIPTION / WORK	
		Charge for chemicals to treat well & for well head	\$ 800.00
02/04/00	#4	Demobilization	N/C
		Subtotal	\$ 66,520.70
		TOTAL	\$ 66,520.70

PAYMENT DUE UPON RECEIPT

PLEASE REMIT TO : BOART LONGYEAR COMPANY, SDS 12-0734, P.O. BOX 86, MINNEAPOLIS, MINNESOTA 55486-0734

Lang Exploratory Drilling  
a division of Boart Longyear Company  
2745 West California Avenue  
Salt Lake City, Utah 84104-4579 USA  
Telephone: 801-973-6667  
Fax: 801-973-4572



## LANG EXPLORATORY DRILLING

INVOICE NO.

15211860  
March 1, 2000

Montreux Joint Venture  
a Nevada General Partnership  
16475 Bordeaux Drive  
Reno, Nevada 89511  
Attention: Mr. Bob Nichols

Install Pump and Develop Well #4 near Reno, Nevada. Operators: D. Howard & E.Daren.  
Rig: LX-29. Work Period: February 11, through February 29, 2000.

DATE	WELL	DESCRIPTION / WORK	
02/12/00	#4	533 ft @ \$ 9.00/ft Furnish & install pump	\$ 4,797.00
02/13/00	#4	6 ft @ \$ 9.00/ft Finish installing pump	\$ 54.00
02/14/00	#4	9 hrs @ \$ 160.00/hr Test pumping well	\$ 1,440.00
02/15/00	#4	12 hrs @ \$ 160.00/hr Test pumping well	\$ 1,920.00
02/16/00	#4	3 hrs @ \$ 160.00/hr Test pumping well	\$ 480.00
02/17/00	#4	5.5 hrs @ \$ 110.00/hr Standby, wait for Hermitt Logger repair	\$ 605.00
02/18/00	#4	5.33 hrs @ \$ 110.00/hr Standby, wait for test to start & recovery after test	\$ 586.30
		6.67 hrs @ \$ 160.00/hr Test pumping well	\$ 1,067.20
02/19/00	#4	14 hrs @ \$ 160.00/hr Test pumping well	\$ 2,240.00
02/20/00	#4	24 hrs @ \$ 160.00/hr Test pumping well	\$ 3,840.00
02/21/00	#4	24 hrs @ \$ 160.00/hr Test pumping well	\$ 3,840.00
02/22/00	#4	24 hrs @ \$ 160.00/hr Test pumping well	\$ 3,840.00
02/23/00	#4	24 hrs @ \$ 160.00/hr Test pumping well	\$ 3,840.00

PLEASE REMIT TO : BOART LONGYEAR COMPANY, SDS 12-0734, P.O. BOX 86, MINNEAPOLIS, MINNESOTA 55486-0734

Lang Exploratory Drilling  
a division of Boart Longyear Company  
2745 West California Avenue  
Salt Lake City, Utah 84104-4579 USA  
Telephone: 801-973-6667  
Fax: 801-973-4572



## LANG EXPLORATORY DRILLING

INVOICE NO.

15211860  
March 1, 2000

DATE	WELL	DESCRIPTION / WORK	
02/24/00	#4	24 hrs @ \$ 160.00/hr Test pumping well	\$ 3,840.00
02/25/00	#4	24 hrs @ \$ 160.00/hr Test pumping well	\$ 3,840.00
02/26/00	#4	24 hrs @ \$ 160.00/hr Test pumping well	\$ 3,840.00
02/27/00	#4	24 hrs @ \$ 160.00/hr Test pumping well	\$ 3,840.00
02/28/00	#4	24 hrs @ \$ 160.00/hr Test pumping well	\$ 3,840.00
02/29/00	#4	10 hrs @ \$ 160.00/hr Test pumping well	\$ 1,600.00
Subtotal			\$ 49,345.50
TOTAL			\$ 49,345.50

PAYMENT DUE UPON RECEIPT

PLEASE REMIT TO : BOART LONGYEAR COMPANY, SDS 12-0734, P.O. BOX 86, MINNEAPOLIS, MINNESOTA 55486-0734

P. 7/8

JUN 30 00:00:00 2000 11:20 PM LANG EXPL DRILLING

Lang Exploratory Drilling  
a division of Boart Longyear Company  
2745 West California Avenue  
Salt Lake City, Utah 84104-4579 USA  
Telephone: 801-973-6667  
Fax: 801-973-4572



## LANG EXPLORATORY DRILLING

INVOICE NO.

15211880  
March 29, 2000

Montreux Joint Venture  
a Nevada General Partnership  
16475 Bordeaux Drive  
Reno, Nevada 89511  
Attention: Mr. Bob Nichols

Install, Remove Pump and Develop Well #4 near Reno, Nevada. Operator: Darren Howard.  
Rig: LX-29. Work Period: March 3, through March 28, 2000.

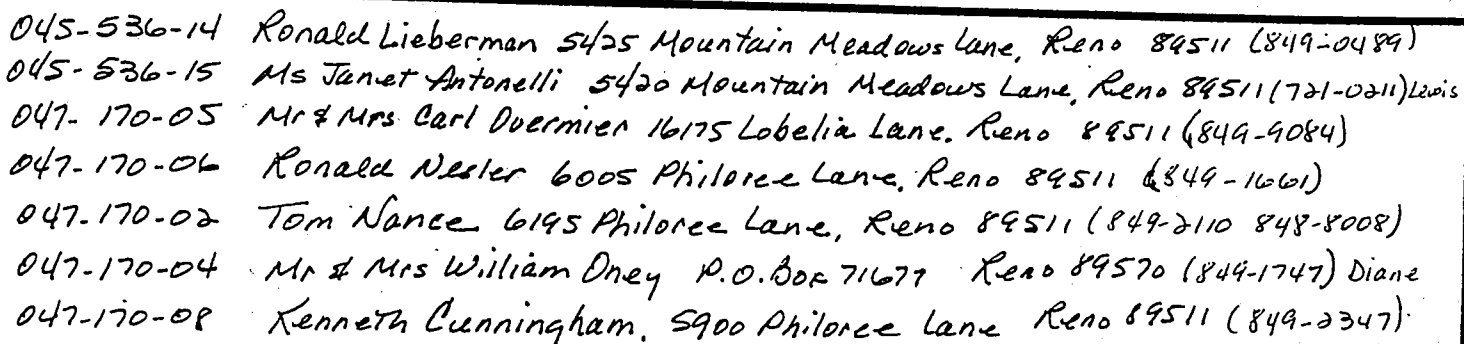
DATE	HOLE	DESCRIPTION / WORK	
03/03/00	#4	3.5 hrs @ \$ 110.00/hr Standby, wait for client to collect data	\$ 385.00
		Disinfect & surge well	\$ 800.00
03/04/00	#4	390 ft @ \$ 9.00/ft Pulling pump	\$ 3,510.00
03/05/00	#4	149 ft @ \$ 9.00/ft Finish pulling pump	\$ 1,341.00
03/28/00	#4	Video survey of well	\$ 1,200.00
		Gyroscopic deviation survey of well	\$ 1,880.00
Subtotal			\$ 9,116.00
TOTAL			\$ 9,116.00

PAYMENT DUE UPON RECEIPT

PLEASE REMIT TO : BOART LONGYEAR COMPANY, SDS 12-0734, P.O. BOX 86, MINNEAPOLIS, MINNESOTA 55486-0734

## **APPENDIX E**

### **Domestic Well Information and Data**





April 12, 2000

Tom Nance  
6195 Philoree Lane  
Reno, Nevada 89511

Washoe County  
Department of  
Water Resources  
4930 Energy Way  
Reno, NV 89502-4106  
Tel: (775) 954-4600  
Fax: (775) 954-4610

Subject: Results from the 10-day pumping test, Mt Rose #6

Dear Mr. Nance:

I would like to document the specifics of your domestic water well and discuss the preliminary results obtained from the ten-day pumping test of the Mt. Rose #6 well. Please find enclosed hydraulic diagrams of your well, a figure of pumping impacts on your well (drawdown) and a record of water level measurements taken during testing.

On February 3, 2000, at the County's request and expense, Bruce MacKay Pump and Well Service, Inc., installed a sounding tube in your well for long-term monitoring purposes. He also conducted a 30-minute pumping test in order to determine the drawdown in your well due to your domestic needs and the available drawdown in your well. Table 1 shows these results.

Well depth (ft)	Pump setting (ft)	Sounding tube depth (ft)	Static water level (ft)	Pumping level (ft)	Discharge (gpm)
356	320	320	262	287	20

The hydraulic diagram of your well illustrates these results. Pumping at 20 gpm for 30 minutes in your well results in 25 feet of drawdown. This is with open discharge, or at the full pumping rate, which is greater than when the well discharges to the pressure tank. There is currently 58 feet of total available drawdown in your well.

On February 19, Washoe County began a ten-day pumping test on the newly constructed Mt. Rose #6 well, located approximately 1,500 feet from your domestic well. Periodic water levels were measured in your well during this time and the ensuing ten-day recovery test. After accounting for barometric pressure effects, a water level decline of 2.5 feet was determined due to the pumping of the Mt. Rose #6. Barometric pressure effects groundwater levels in that as pressure decreases, water levels rise and therefore is an additive effect. This was the case during testing meaning that water levels measured in your well were decreased more than the manual measurements indicate. The levels were adjusted for barometric effects from NWS records taken at the Reno/Tahoe airport.

Ed Schmidt  
Director

John M. Collins  
Utility Services  
Manager

Leonard E. Crowe, Jr.  
Water Resources  
Planning Manager

A full analysis of the long-term effects due to production pumping has not been completed at this time. I expect this to be completed in approximately sixty days. At that time I would like to meet with you at your convenience to discuss the results of this analysis.



Water Resources

Page 2  
Tom Nance  
Mt. Rose #6  
April 12, 2000

If you have any questions, please do not hesitate to contact me at 954-4655.

Sincerely,

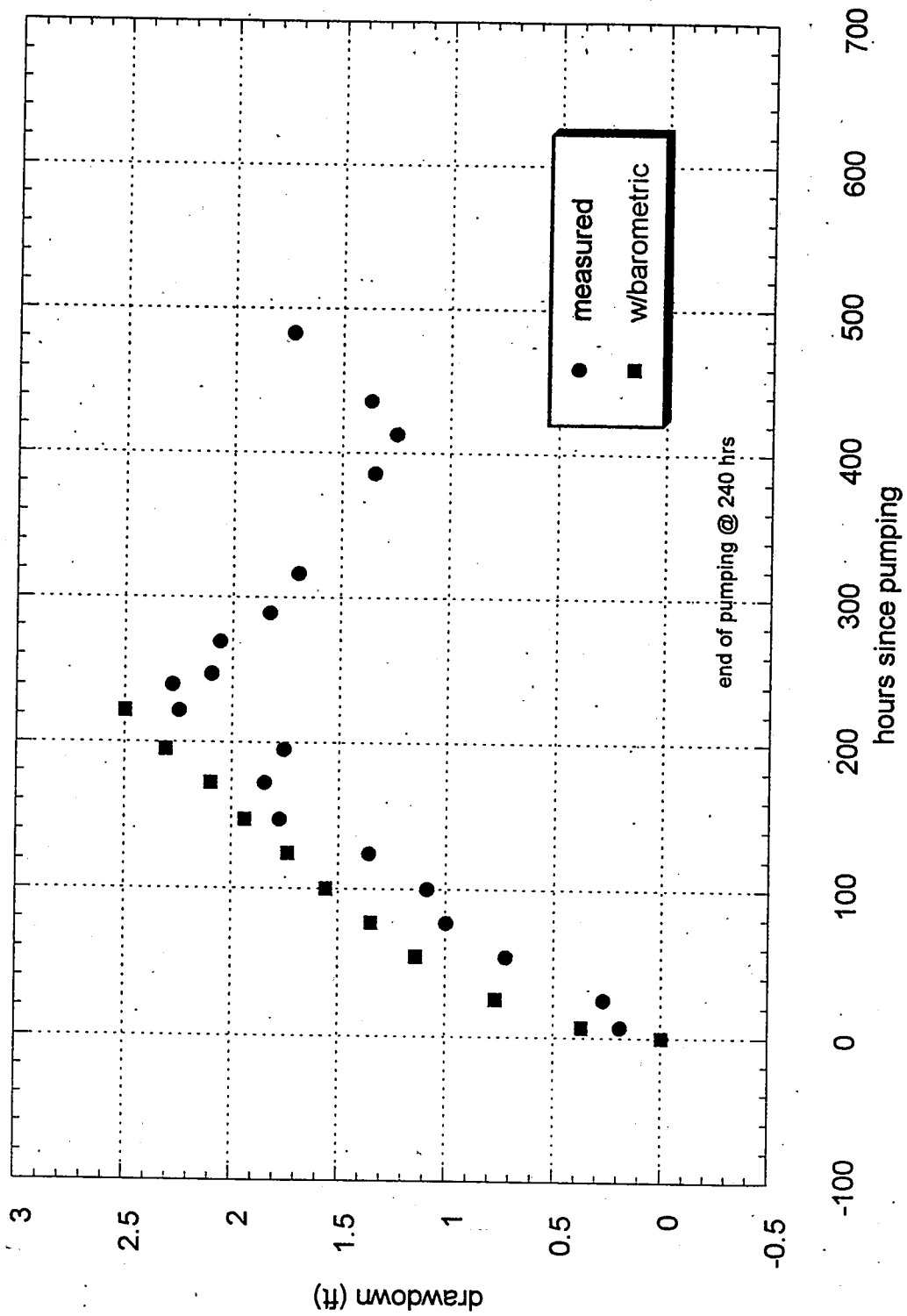
A handwritten signature in black ink, appearing to read "Michael C. Widmer", with a long horizontal flourish extending to the right.

Michael C. Widmer  
Hydrogeologist

Enclosures

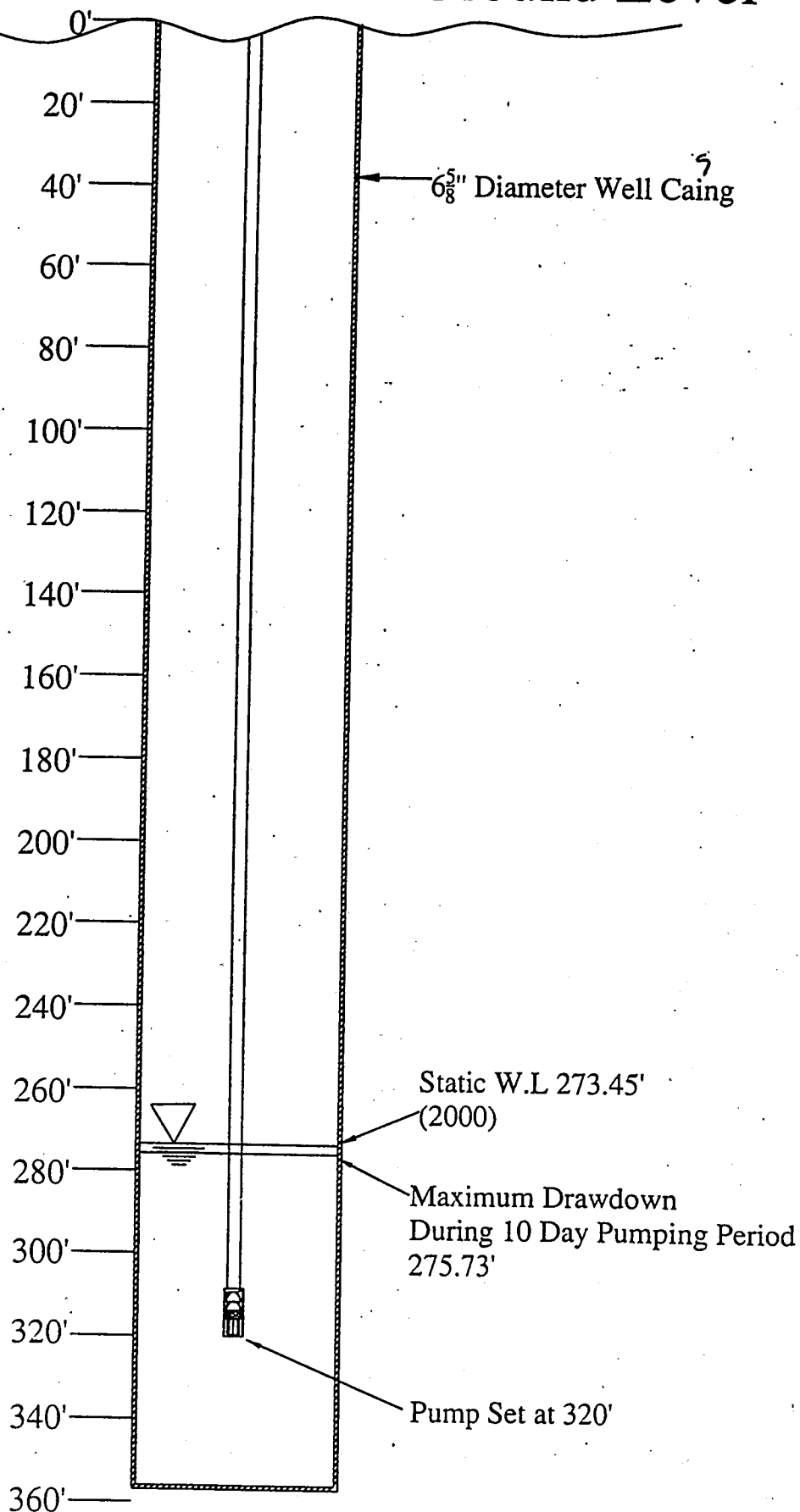
c: John Collins, P.E. Utility Services Manager  
Paul Orphan, P.E., Senior Engineer  
Dan Dragan, Senior Hydrogeologist  
Michael Turnipseed, P.E., State Engineer of Nevada

# **Mt. Rose #6 Pumping Test** **Effects on Nance domestic well**



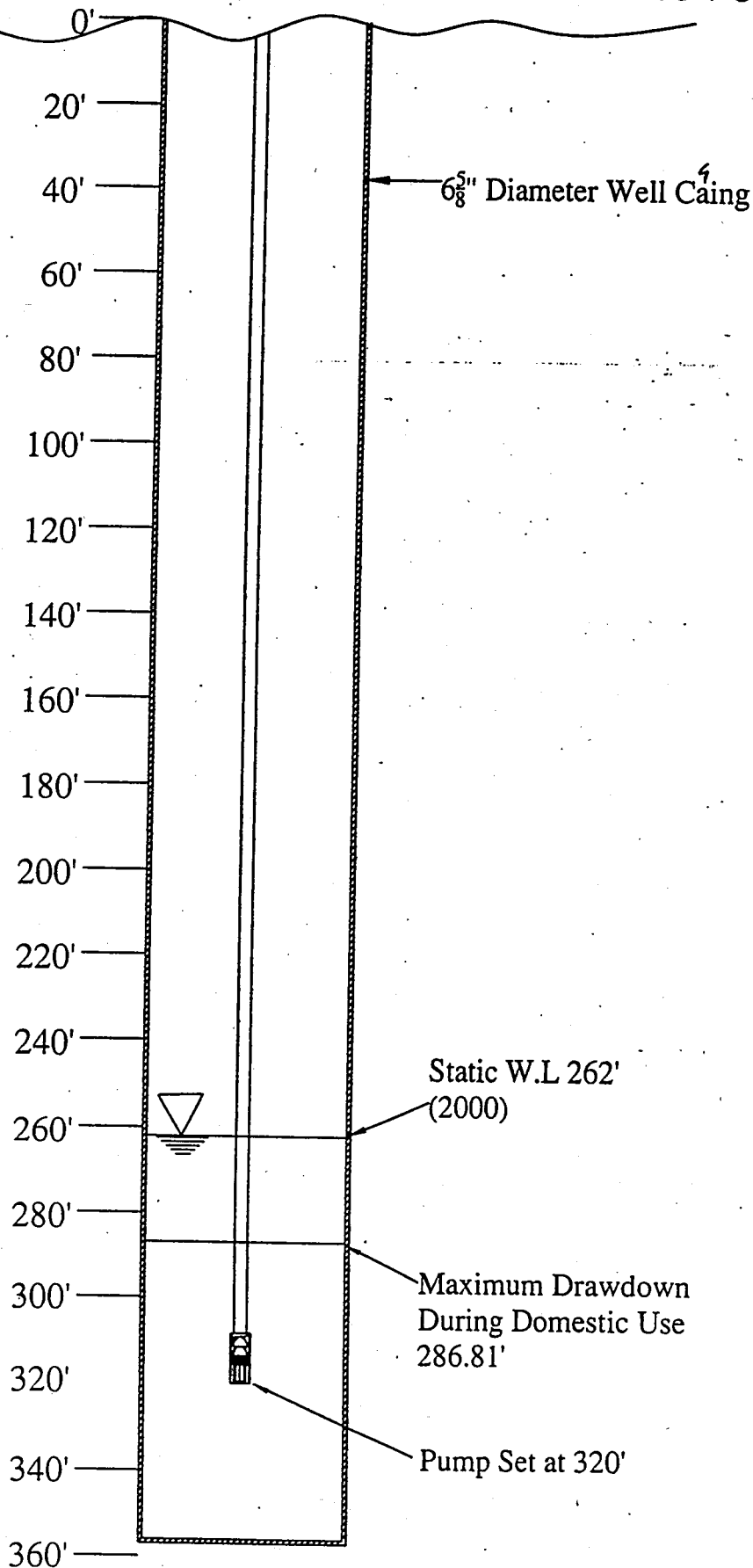
Tom Nance  
6195 Philoree  
Reno, NV 89511

## Ground Level



Tom Nance  
6195 Philoree  
Reno, NV 89511

# Ground Level







# WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES  
UTILITY SERVICES DIVISION

WELL Nance  
PUMPING OBSERVATION WELL  
PUMPING / RECOVERY DATA  
PAGE 1 OF 1

## PUMPING TEST DATA

TYPE OF PUMPING TEST CONSTANT Q & Recovery  
HOW Q MEASURED ELECTRIC SOUNDER  
HOW WL's MEASURED \_\_\_\_\_  
PUMPED WELL NO. MR6  
RADIUS of PUMPED WELL \_\_\_\_\_  
DISTANCE from PUMPED WELL \_\_\_\_\_

M.P. for WL's \_\_\_\_\_ elev. \_\_\_\_\_  
DEPTH OF PUMP/AIRLINE \_\_\_\_\_ wrt \_\_\_\_\_  
% SUBMERGENCE: initial \_\_\_\_\_ pumping \_\_\_\_\_  
PUMP ON: date 2/14/00 time 1005  
PUMP OFF: date 2/29/00 time 1005

6195 Philoree  
Back of house, behind wire pen

TIME t = at t'=0					WATER LEVEL DATA STATIC WATER LEVEL 273.45				WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME		t	t'	t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or S'	Q	(NOTE ANY CHANGES IN OBSERVERS)
	mins	hrs									
1500								273.62			
0930			0					273.45	0.00		
1705			420					273.64	0.19		EE
1050			1485					273.72	0.27		EE
1550			3225					274.17	0.72		EE
1435			4590					274.45	1.00		"
1245			6040					274.54	1.09		EM
1400			7435					274.81	1.36		PD
1310			8825					275.23	1.78		8S
1345			10300					275.30	1.85		WJ
1250			11605					275.21	1.76		RV
1630			13345					275.70	2.25		RV
0235			14370					275.73	2.28		DAN
1457			14810	410				275.55	2.1		MARIO
1435			16110	1710				275.51	2.06		MARIO
1115			17350	2950				275.28	1.83		RV Dave have to
1440			18995	4595				275.15	1.7		EM
1225			23180	8780				274.80	1.35		EE
1512			24785	10385				274.70	1.25		MARIO
1400			26155	11755				274.82	1.37		MARIO
1305			28980	14580				275.18	1.73		MARIO

# WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS  
UTILITY DIVISION**

## PUMPING TEST DATA

WELL Nance  
PUMPING/OBSERVATION WELL  
PUMPING/RECOVERY DATA  
PAGE \_\_\_\_\_ OF \_\_\_\_\_

TYPE of PUMPING TEST \_\_\_\_\_

HOW Q MEASURED 30 min pumping test

HOW WL's MEASURED w/ sounding tube

PUMPED WELL NO. \_\_\_\_\_

RADIUS of PUMPED WELL \_\_\_\_\_

DISTANCE from PUMPED WELL \_\_\_\_\_

M.P. for WL's \_\_\_\_\_ elev. \_\_\_\_\_

DEPTH of PUMP/AIRLINE 313 wrt \_\_\_\_\_

% SUBMERGENCE: initial \_\_\_\_\_; pumping \_\_\_\_\_

PUMP ON : date \_\_\_\_\_ time \_\_\_\_\_

PUMP OFF: date 2/1/00 time \_\_\_\_\_

[illegible]



April 12, 2000

Ken Cunningham  
5900 Philoree Lane  
Reno, Nevada 89511

Washoe County  
Department of  
Water Resources  
4930 Energy Way  
Reno, NV 89502-4106  
Tel: (775) 954-4600  
Fax: (775) 954-4610

Subject: Results from the 10-day pumping test, Mt Rose #6

Dear Mr. Cunningham:

I would like to document the specifics of your domestic water well and discuss the preliminary results obtained from the ten-day pumping test of the Mt. Rose #6 well. Please find enclosed hydraulic diagrams of your well, a figure of pumping impacts on your well (drawdown) and a record of water level measurements taken during testing.

On February 3, 2000, at the County's request and expense, Bruce MacKay Pump and Well Service, Inc., installed a sounding tube in your well for long-term monitoring purposes. He also conducted a 30-minute pumping test in order to determine the drawdown in your well due to your domestic needs and the available drawdown in your well. Table 1 shows these results.

Well depth (ft)	Pump setting (ft)	Sounding tube depth (ft)	Static water level (ft)	Pumping level (ft)	Discharge (gpm)
275	262	265	209	223	12

The hydraulic diagram of your well illustrates these results. Pumping at 12 gpm for 30 minutes in your well results in 14 feet of drawdown. This is with open discharge, or at the full pumping rate, which is greater than when the well discharges to the pressure tank. There is 50 feet of total available drawdown in your well.

On February 19, Washoe County began a ten-day pumping test on the newly constructed Mt. Rose #6 well, located approximately 1,500 feet from your domestic well. Periodic water levels were measured in your well during this time and the ensuing ten-day recovery test. After accounting for barometric pressure effects, a water level decline of 4.21 feet was determined due to the pumping of the Mt. Rose #6. Barometric pressure effects groundwater levels in that as pressure decreases, water levels rise and therefore is an additive effect. This was the case during testing meaning that water levels measured in your well were decreased more than the manual measurements indicate. The levels were adjusted for barometric effects from NWS records taken at the Reno/Tahoe airport.

Ed Schmidt  
Director

John M. Collins  
Utility Services  
Manager

Leonard E. Crowe, Jr.  
Water Resources  
Planning Manager

Department of



Water Resources

A full analysis of the long-term effects due to production pumping has not been completed at this time. I expect this to be completed in approximately sixty days. At that time I would like to meet with you at your convenience to discuss the results of this analysis.

Page 2  
Ken Cunningham  
Mt. Rose #6  
April 12, 2000

If you have any questions, please do not hesitate to contact me at 954-4655.

Sincerely,

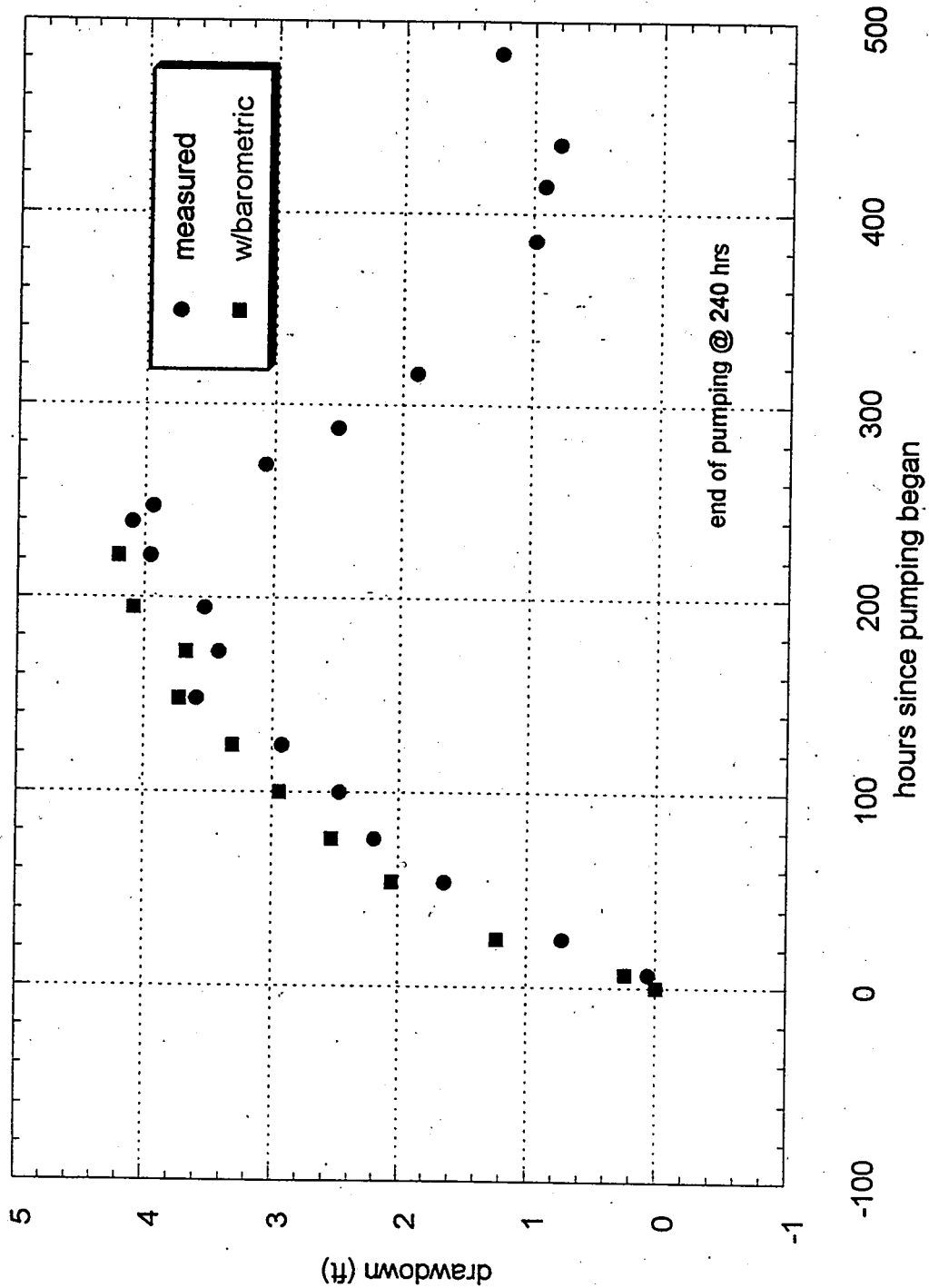
A handwritten signature in black ink, appearing to read "Michael C. Widmer", with a long horizontal flourish extending to the right.

Michael C. Widmer  
Hydrogeologist

Enclosures

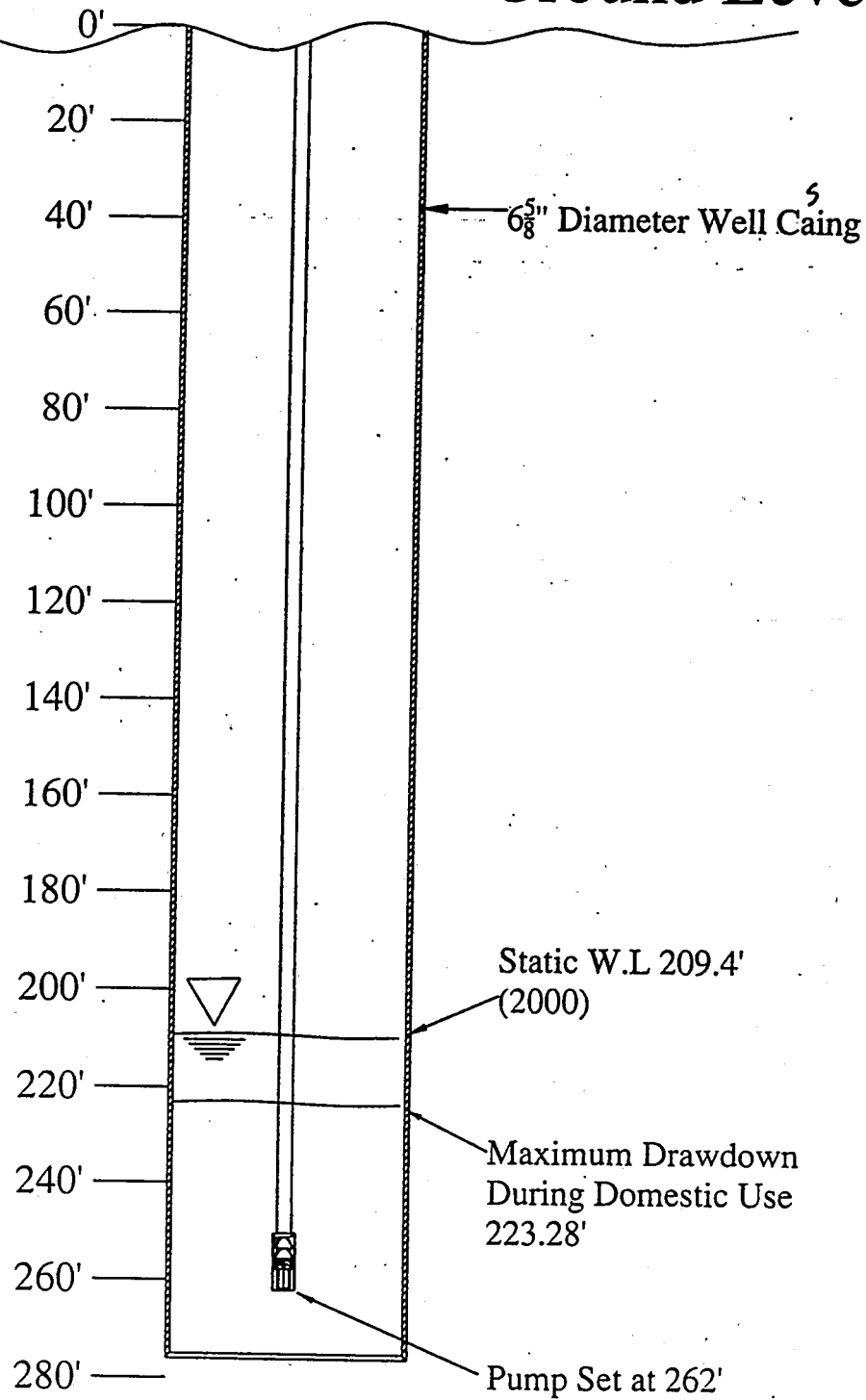
c: John Collins, P.E. Utility Services Manager  
Paul Orphan, P.E., Senior Engineer  
Dan Dragan, Senior Hydrogeologist  
Michael Turnipseed, P.E., State Engineer of Nevada

# **Mt. Rose #6 Pumping Test** **Effect on Cunningham domestic well**



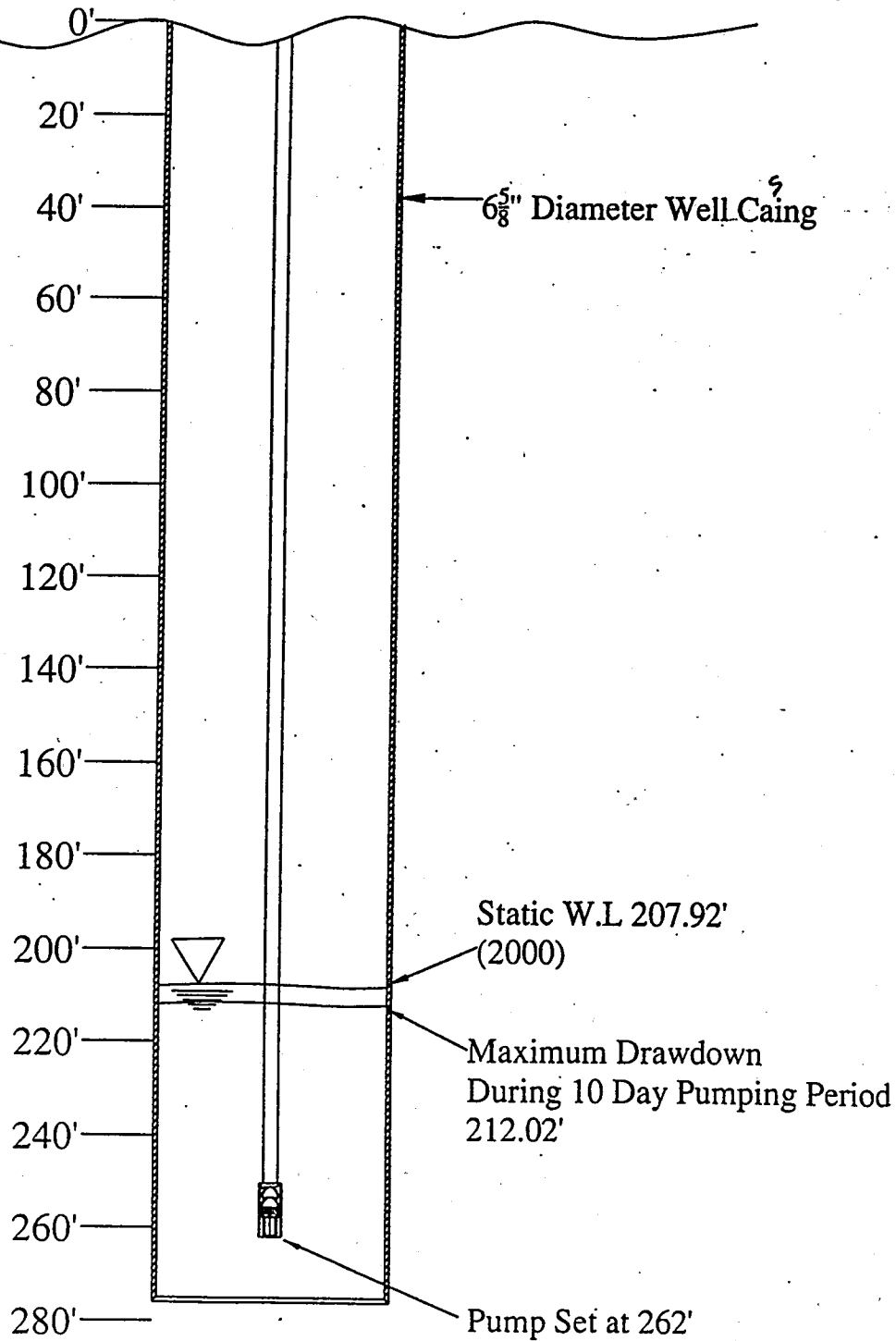
Cunningham  
5900 Philoree

## Ground Level



Cunningham  
5900 Philoree

## Ground Level





# WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES

UTILITY SERVICES DIVISION

## PUMPING TEST DATA

TYPE OF PUMPING TEST CONSTANT Q & RECOVERY

HOW Q MEASURED \_\_\_\_\_

HOW WL'S MEASURED \_\_\_\_\_

PUMPED WELL NO. MR6

RADIUS of PUMPED WELL \_\_\_\_\_

DISTANCE from PUMPED WELL \_\_\_\_\_

M.P. for WL's \_\_\_\_\_ elev. \_\_\_\_\_

DEPTH OF PUMP/AIRLINE \_\_\_\_\_ wrt \_\_\_\_\_

% SUBMERGENCE: initial \_\_\_\_\_ pumping \_\_\_\_\_

PUMP ON: date 7/19/00 time 1005

PUMP OFF: date 7/29/00 time 1005

WELL Cunningham

PUMPING / OBSERVATION WELL

PUMPING / RECOVERY DATA

PAGE \_\_\_\_\_ OF \_\_\_\_\_

5900 Philoree

Take drive around house to garage pad, well is near edge of garage. Pa 0

TIME t = at t'=0					WATER LEVEL DATA STATIC WATER LEVEL 207.92					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME			t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or S'		Q	(NOTE ANY CHANGES IN OBSERVERS)	
	mins	hrs	t'									
1520							207.88			2/19 0730	Cinder #1 = 244.95	
1644			399				207.92	0.00				
1020			1455				207.98	0.06			EE	
1530			3205				208.65	0.73			EE	
1400			4555				209.56	1.64			EE	
1413			6008				210.12	2.20			..	
1416			7451				210.43	2.43			EM	
1350			8865				210.85	2.93			DD	
1410			10325				211.52	3.60			US Well had been on	
1240			11675				211.35	3.43			RV	
1610			13325				211.46	3.54			RV	
0910			14345				211.88	3.96			RV	
1519			14834	434			212.02	4.1			Dem	
1503			16138	1738			211.86	3.94			MARIO	
1030			17305	2905			211.00	3.08			MARIO	
1420			18975	4575			210.44	2.52			RV-GPS'd it, TDC	
1200			23155	8755			209.81	1.89			EM	
1535			24810	10410			208.90	.98			RVH	
1425			26180	1780			208.83	.91			MARIO	
1330			29005	14605			203.77	.8			MARIO	
							209.17	1.25			MARIO	

**WASHOE COUNTY**

**DEPARTMENT OF PUBLIC WORKS  
UTILITY DIVISION**

## PUMPING TEST DATA

WELL Cunningham  
PUMPING/OBSERVATION WELL  
PUMPING/RECOVERY DATA  
PAGE \_\_\_\_ OF \_\_\_\_

TYPE of PUMPING TEST \_\_\_\_\_

HOW Q MEASURED \_\_\_\_\_

HOW WL's MEASURED \_\_\_\_\_

PUMPED WELL NO. \_\_\_\_\_

RADIUS of PUMPED WELL \_\_\_\_\_

DISTANCE from PUMPED WELL \_\_\_\_\_.

M.P. for WL's \_\_\_\_\_ elev. \_\_\_\_\_

DEPTH of PUMP/AIRLINE \_\_\_\_\_ wrt \_\_\_\_\_

% SUBMERGENCE: initial \_\_\_\_\_; pumping \_\_\_\_\_

PUMP ON : date 2/30/00 time \_\_\_\_\_

PUMP OFF : date \_\_\_\_\_ time \_\_\_\_\_

[illegible]



April 12, 2000

Diane Oney  
6085 Philoree Lane  
Reno, Nevada 89511

Washoe County  
Department of  
Water Resources  
4930 Energy Way  
Reno, NV 89502-4106  
Tel: (775) 954-4600  
Fax: (775) 954-4610

Subject: Results from the 10-day pumping test, Mt Rose #6

Dear Ms. Oney:

I would like to document the specifics of your domestic water well and discuss the preliminary results obtained from the ten-day pumping test of the Mt. Rose #6 well. Please find enclosed hydraulic diagrams of your well, a figure of pumping impacts on your well (drawdown) and a record of water level measurements taken during testing.

On February 1, 2000, at the County's request and expense, Bruce MacKay Pump and Well Service, Inc., installed a sounding tube in your well for long-term monitoring purposes. He also conducted a 30-minute pumping test in order to determine the drawdown in your well due to your domestic needs and the available drawdown in your well. Table 1 shows these results.

Well depth (ft)	Pump setting (ft)	Sounding tube depth (ft)	Static water level (ft)	Pumping level (ft)	Discharge (gpm)
320	300	300	255	296	21

The hydraulic diagram of your well illustrates these results. Pumping at 21 gpm for 30 minutes in your well results in 41 feet of drawdown. This is with open discharge, or at the full pumping rate, which is greater than when the well discharges to the pressure tank. There is currently 45 feet of total available drawdown in your well.

On February 19, Washoe County began a ten-day pumping test on the newly constructed Mt. Rose #6 well, located approximately 1,500 feet from your domestic well. Periodic water levels were measured in your well during this time and the ensuing ten-day recovery test. After accounting for barometric pressure effects, a water level decline of 2 feet was determined due to the pumping of the Mt. Rose #6. Barometric pressure effects groundwater levels in that as pressure decreases, water levels rise and therefore is an additive effect. This was the case during testing meaning that water levels measured in your well were decreased more than the manual measurements indicate. The levels were adjusted for barometric effects from NWS records taken at the Reno/Tahoe airport.

Ed Schmidt  
Director

John M. Collins  
Utility Services  
Manager

Leonard E. Crowe, Jr.  
Water Resources  
Planning Manager

Department of



Water Resources

A full analysis of the long-term effects due to production pumping has not been completed at this time. I expect this to be completed in approximately sixty days. At that time I would like to meet with you at your convenience to discuss the results of this analysis.

Page 2  
Diane Oney  
Mt. Rose #6  
April 12, 2000

If you have any questions, please do not hesitate to contact me at 954-4655.

Sincerely,

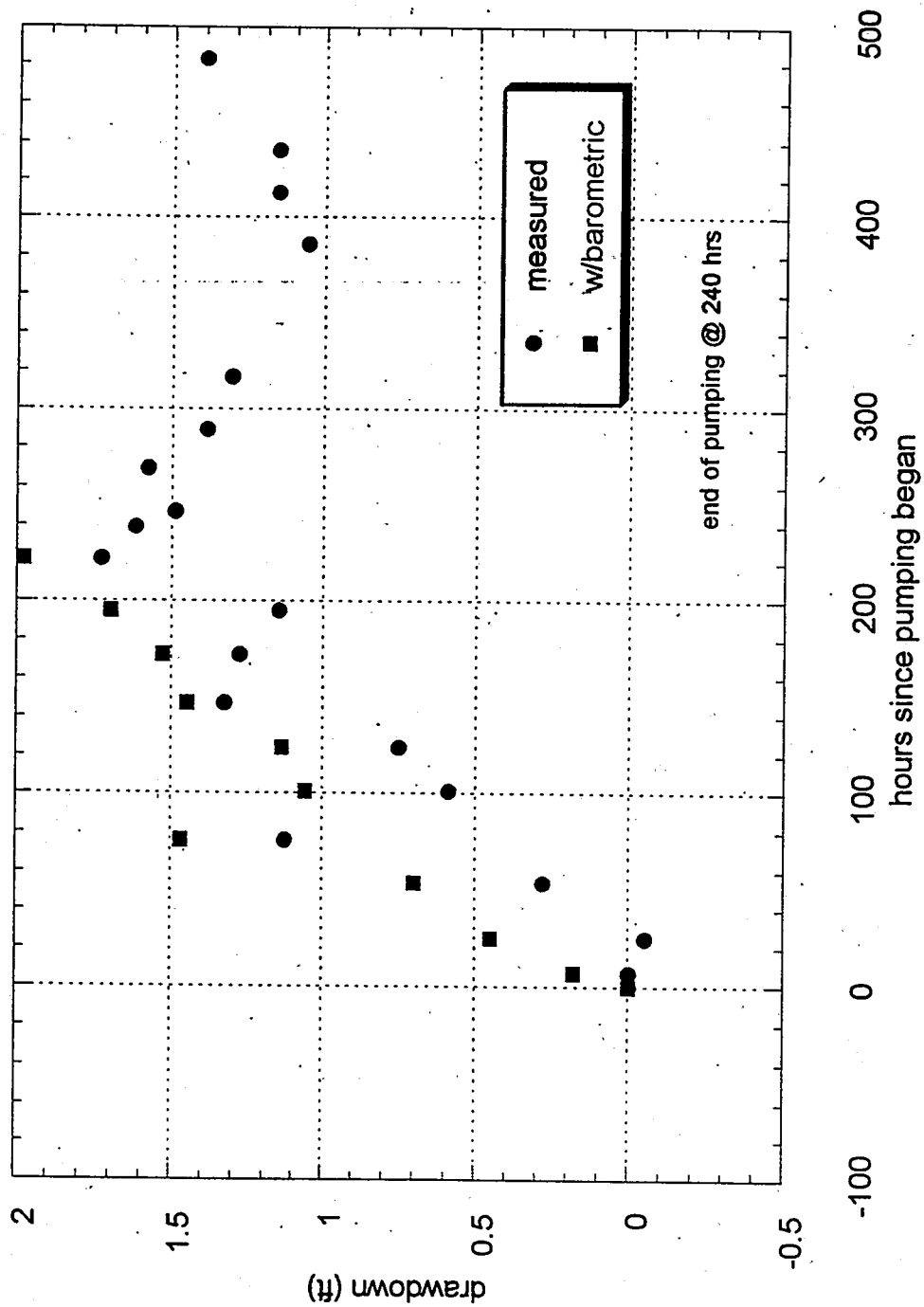
A handwritten signature in black ink, appearing to read "Michael C. Widmer", with a long horizontal flourish extending to the right.

Michael C. Widmer  
Hydrogeologist

Enclosures

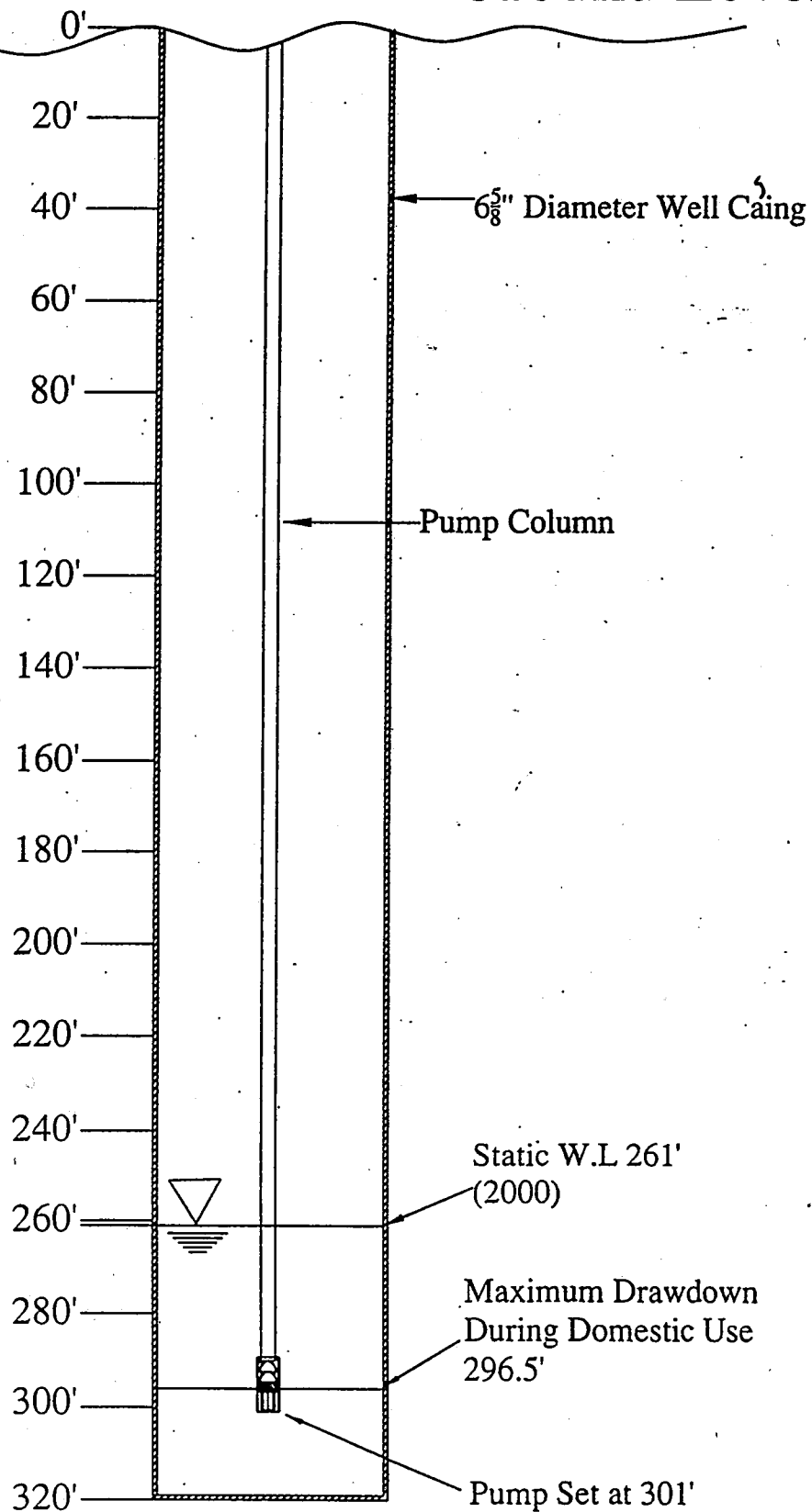
c: John Collins, P.E. Utility Services Manager  
Paul Orphan, P.E., Senior Engineer  
Dan Dragan, Senior Hydrogeologist  
Michael Turnipseed, P.E., State Engineer of Nevada

**Mt. Rose #6 Pumping Test  
Effects on Oney domestic well**



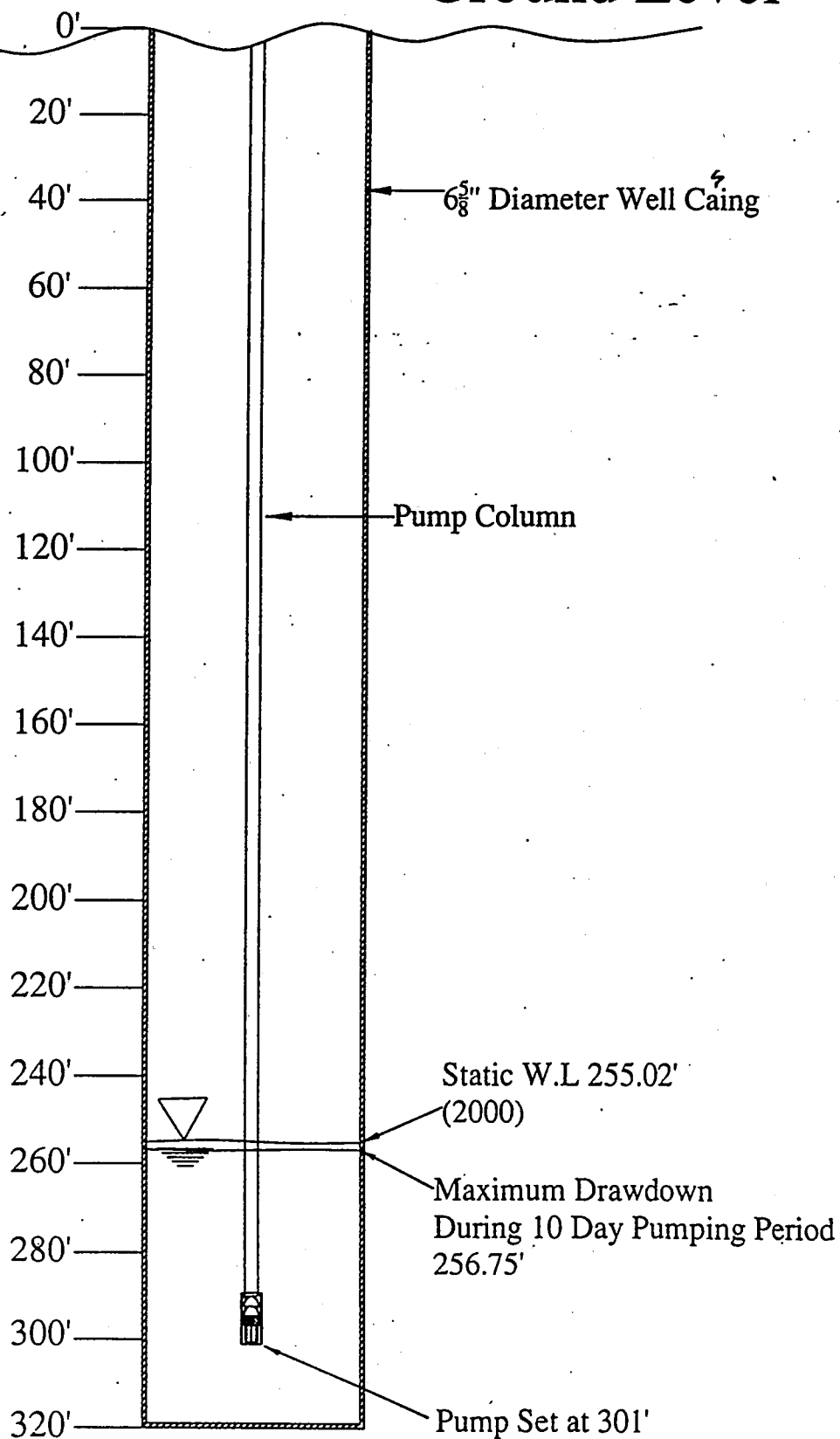
Bill and Diane Oney  
6085 Philoree

# Ground Level



Bill and Diane Oney  
6085 Philoree

## Ground Level





# WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES  
UTILITY SERVICES DIVISION



## PUMPING TEST DATA

TYPE OF PUMPING TEST CONSTANT Q & RECOVERY

HOW Q MEASURED ELECTRIC SOUNDER

HOW WL's MEASURED \_\_\_\_\_

PUMPED WELL NO. MONTEVUE WELL (MR6)

RADIUS OF PUMPED WELL \_\_\_\_\_

DISTANCE FROM PUMPED WELL \_\_\_\_\_

M.P. for WL's \_\_\_\_\_

elev. \_\_\_\_\_

DEPTH OF PUMP/AIRLINE \_\_\_\_\_

wrt \_\_\_\_\_

% SUBMERGENCE: initial \_\_\_\_\_

pumping \_\_\_\_\_

PUMP ON: date 2/19/00

time 1005

PUMP OFF: date 2/29/00

time 1005

WELL Oney - Next door to  
PUMPING OBSERVATION WELL Nance  
PUMPING RECOVERY DATA  
PAGE 1 OF 1  
Behind house toward back corner  
of lot, follow rock border

TIME t = at t'=0					WATER LEVEL DATA STATIC WATER LEVEL 255.02				WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME		t	t'	t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	Q or S'	Q	(NOTE ANY CHANGES IN OBSERVERS)
1700	mins	hrs	415			255.02			0.00		
1040			1475			254.97			-0.05		NO SOUNDING Tub
1545			3220			255.30			0.28		EE
1430			4585			256.15			1.13		EE
1435			6030			255.61			0.59		EM
14130			7465			255.77			0.75		DD
13130			8845			256.35			1.33		JS Stilling Well Repair
1350			10305			256.30			1.28		MR
1250			11685			256.17			1.15		RV
1625			13340			256.75			1.73		RV
2930			14365			256.64			1.62		DAN
1500			14815	415		256.51			1.49		MARIO
1448			16123	1723		256.60			1.58		MARIO
1105			17340	2940		256.41			1.39		RV
1435			18990	4590		256.33			1.31		EM
1220			23175	8775		256.08			1.06		EE
1320			24795	10395		256.18			1.16		MARIO
1356			26155	11755		256.18			1.16		MARIO
1315			28990	14590		256.47			1.4		MARIO



## PUMPING TEST DATA

WELL Oney  
PUMPING/OBSERVATION WELL  
PUMPING/RECOVERY DATA  
PAGE \_\_\_\_\_ OF \_\_\_\_\_

### TYPE of PUMPING TEST

HOW Q MEASURED 30 min pumping test

HOW WL's MEASURED w/ sounder tube

PUMPED WELL NO.                      *Installed*

RADIUS of PUMPED WELL

DISTANCE from PUMPED WELL

M.P. for WL's \_\_\_\_\_ elev. \_\_\_\_\_

DEPTH of PUMP/AIRLINE ~301 wrt \_\_\_\_\_

% SUBMERGENCE: initial \_\_\_\_\_; pumping \_\_\_\_\_

PUMP ON : date \_\_\_\_\_ time \_\_\_\_\_

PUMP OFF : date 2-1-00 time \_\_\_\_\_

[illegible]

**PRINT OR TYPE ONLY**

## WELL DRILLER'S REPORT

**Please complete this form in its entirety**

NOTICE OF INTENT NO. 13007

1. OWNER.....	Bill and Diane Oney	NOTICE OF INTENT NO. 15007
MAILING ADDRESS.....	P. O. Box 71677	ADDRESS AT WELL LOCATION.....
	Reno, Nv 89570	6085 Philoree

2. LOCATION		SW 1/4	se 1/4	Sec. 3	T. 17	N/S R. 19	E	Washoe	County
PERMIT NO.		47-040-23			-	Galena			
Issued by Water Resources		Parcel No.					Subdivision Name		

3.	TYPE OF WORK				4.	PROPOSED USE				5.	TYPE WELL				
	New Well	<input checked="" type="checkbox"/>	Recondition	<input type="checkbox"/>		Domestic	<input checked="" type="checkbox"/>	Irrigation	<input type="checkbox"/>	Test	<input type="checkbox"/>	Cable	<input type="checkbox"/>	Rotary	<input checked="" type="checkbox"/>
	Deepen	<input type="checkbox"/>	Other	<input type="checkbox"/>		Municipal	<input type="checkbox"/>	Industrial	<input type="checkbox"/>	Stock	<input type="checkbox"/>	Other	<input type="checkbox"/>	Mud	<input type="checkbox"/>

## 6. LITHOLOGIC LOG

[illegible]

Date started 7/3/89, 1989  
Date completed 7/6/89, 1989

## 7. WELL TEST DATA

Pump RPM	G.P.M.	Draw Down	After Hours Pump
Blew with air to clean and develop.			

## BAILER TEST

G.P.M. \_\_\_\_\_ Draw down \_\_\_\_\_ feet \_\_\_\_\_ hours  
G.P.M. \_\_\_\_\_ Draw down \_\_\_\_\_ feet \_\_\_\_\_ hours  
G.P.M. \_\_\_\_\_ Draw down \_\_\_\_\_ feet \_\_\_\_\_ hours

### 8. 10" - 50' WELL CONSTRUCTION

Diameter 8 1/2 inches      Total depth 319 feet  
 \_\_\_\_\_ inches  
 \_\_\_\_\_ inches

Casing record 6 5/8 inch  
Weight per foot 10.78 Thickness .156

[illegible]

Surface seal: Yes ☒ No ☐ Type grout  
Depth of seal 50 feet  
Gravel packed: Yes ☒ No ☐  
Gravel packed from 50 feet to 319 feet

**Perforations:**

factory

Type perforation \_\_\_\_\_

Size perforation 3/32 X 3

From 279 feet to 299 feet

From \_\_\_\_\_ feet to \_\_\_\_\_ feet

From \_\_\_\_\_ feet to \_\_\_\_\_ feet

From \_\_\_\_\_ feet to \_\_\_\_\_ feet

From \_\_\_\_\_ feet to \_\_\_\_\_ feet

9. WATER LEVEL

Static water level 150 feet below land surface  
Flow 20 G.P.M.          P.S.I.  
Water temperature cold °F Quality good

10. **DRILLER'S CERTIFICATION**

This well was drilled under my supervision and the report is true to the best of my knowledge.

Name Aqua Drilling & Well Service, Inc.  
Contractor  
Address 625 Spice Islands Dr Suite L Sparks, Nv  
Contractor 89431

Nevada contractor's license number  
issued by the State Contractor's Board 15291

Nevada contractor's driller's number issued by the Division of Water Resources.....1132

Nevada driller's license number issued by the Division of Water Resources, the on-site driller. 1509

Signed Roger M. Thrall  
By driller performing actual drilling on site or contractor  
Date Roger M. Thrall 7/7/89



April 12, 2000

Ron Nessler  
6005 Philoree Lane  
Reno, Nevada 89511

Washoe County  
Department of  
Water Resources  
4930 Energy Way  
Reno, NV 89502-4106  
Tel: (775) 954-4600  
Fax: (775) 954-4610

Subject: Results from the 10-day pumping test, Mt Rose #6

Dear Mr. Nessler:

I would like to document the specifics of your domestic water well and discuss the preliminary results obtained from the ten-day pumping test of the Mt. Rose #6 well. Please find enclosed hydraulic diagrams of your well, a figure of pumping impacts on your well (drawdown) and a record of water level measurements taken during testing.

On February 3, 2000, at the County's request and expense, Bruce MacKay Pump and Well Service, Inc., installed a sounding tube in your well for long-term monitoring purposes. He also conducted a 30-minute pumping test in order to determine the drawdown in your well due to your domestic needs and the available drawdown in your well. Table 1 shows these results.

Well depth (ft)	Pump setting (ft)	Sounding tube depth (ft)	Static water level (ft)	Pumping level (ft)	Discharge (gpm)
281	279	280	249	256	21

The hydraulic diagram of your well illustrates these results. Pumping at 21 gpm for 30 minutes in your well results in 7 feet of drawdown. This is with open discharge, or at the full pumping rate, which is greater than when the well discharges to the pressure tank. There is currently 30 feet of total available drawdown in your well.

On February 19, Washoe County began a ten-day pumping test on the newly constructed Mt. Rose #6 well, located approximately 1,500 feet from your domestic well. Periodic water levels were measured in your well during this time and the ensuing ten-day recovery test. After accounting for barometric pressure effects, a water level decline of 3.65 feet was determined due to the pumping of the Mt. Rose #6. Barometric pressure effects groundwater levels in that as pressure decreases, water levels rise and therefore is an additive effect. This was the case during testing meaning that water levels measured in your well were decreased more than the manual measurements indicate. The levels were adjusted for barometric effects from NWS records taken at the Reno/Tahoe airport.

Ed Schmidt  
Director

John M. Collins  
Utility Services  
Manager

Leonard E. Crowe, Jr.  
Water Resources  
Planning Manager

Department of



Water Resources

A full analysis of the long-term effects due to production pumping has not been completed at this time. I expect this to be completed in approximately sixty days. At that time I would like to meet with you at your convenience to discuss the results of this analysis.

Page 2  
Ron Nessler  
Mt. Rose #6  
April 12, 2000

If you have any questions, please do not hesitate to contact me at 954-4655.

Sincerely,

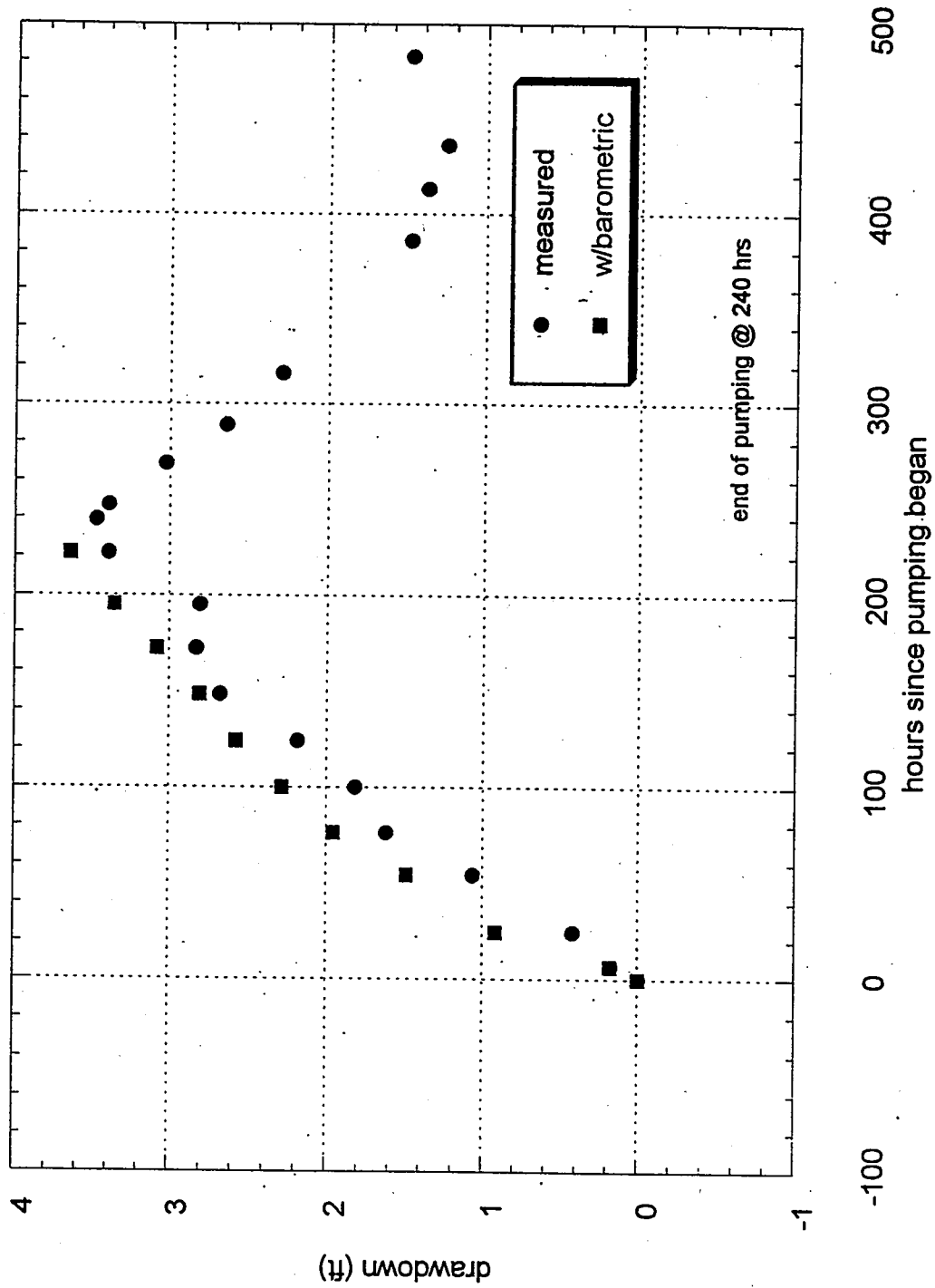
A handwritten signature in black ink, appearing to read "Michael C. Widmer". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Michael C. Widmer  
Hydrogeologist

Enclosures

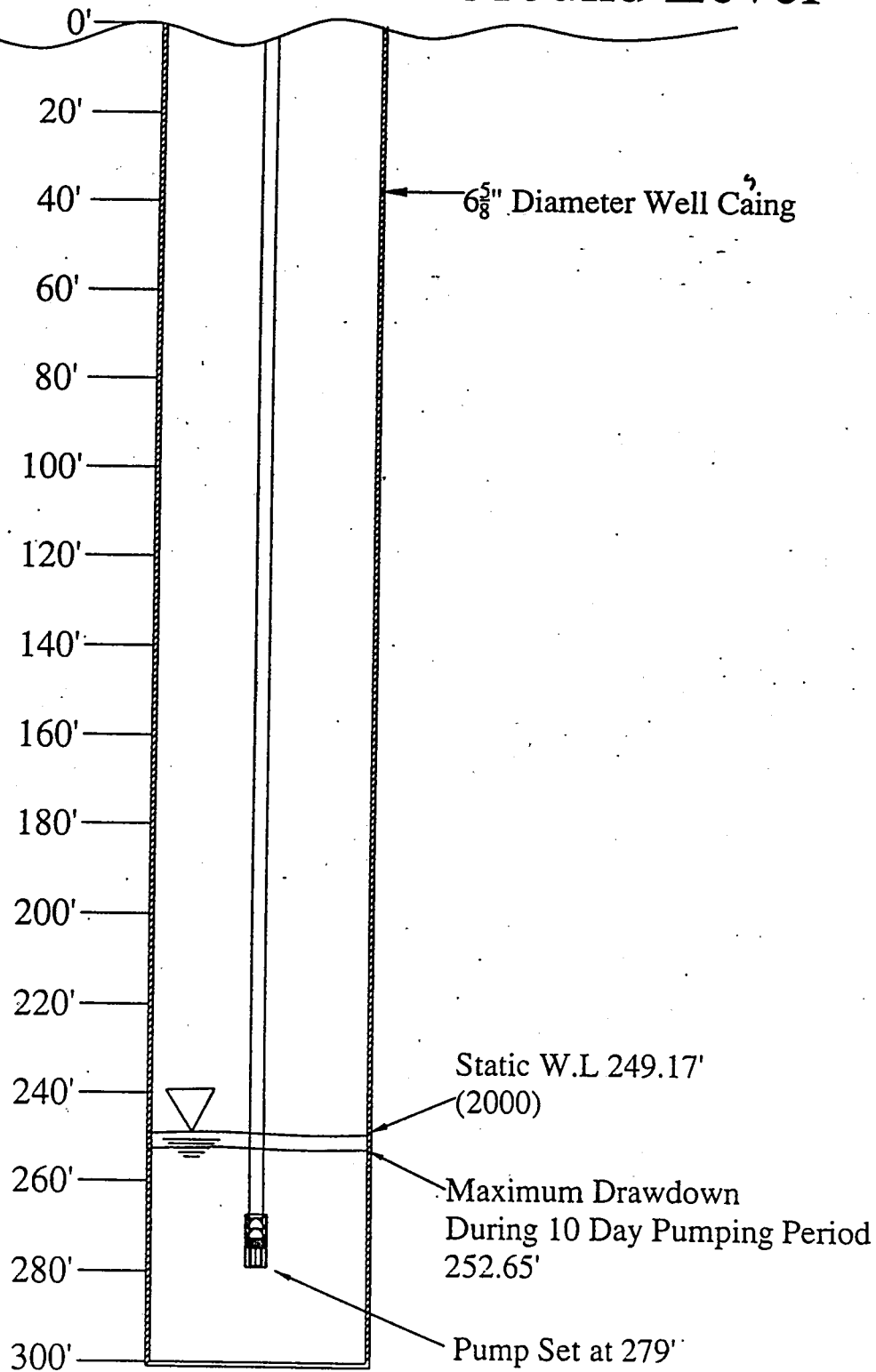
c: John Collins, P.E. Utility Services Manager  
Paul Orphan, P.E., Senior Engineer  
Dan Dragan, Senior Hydrogeologist  
Michael Turnipseed, P.E., State Engineer of Nevada

# **Mt. Rose #6 Pumping test Effects on Nessler domestic well**



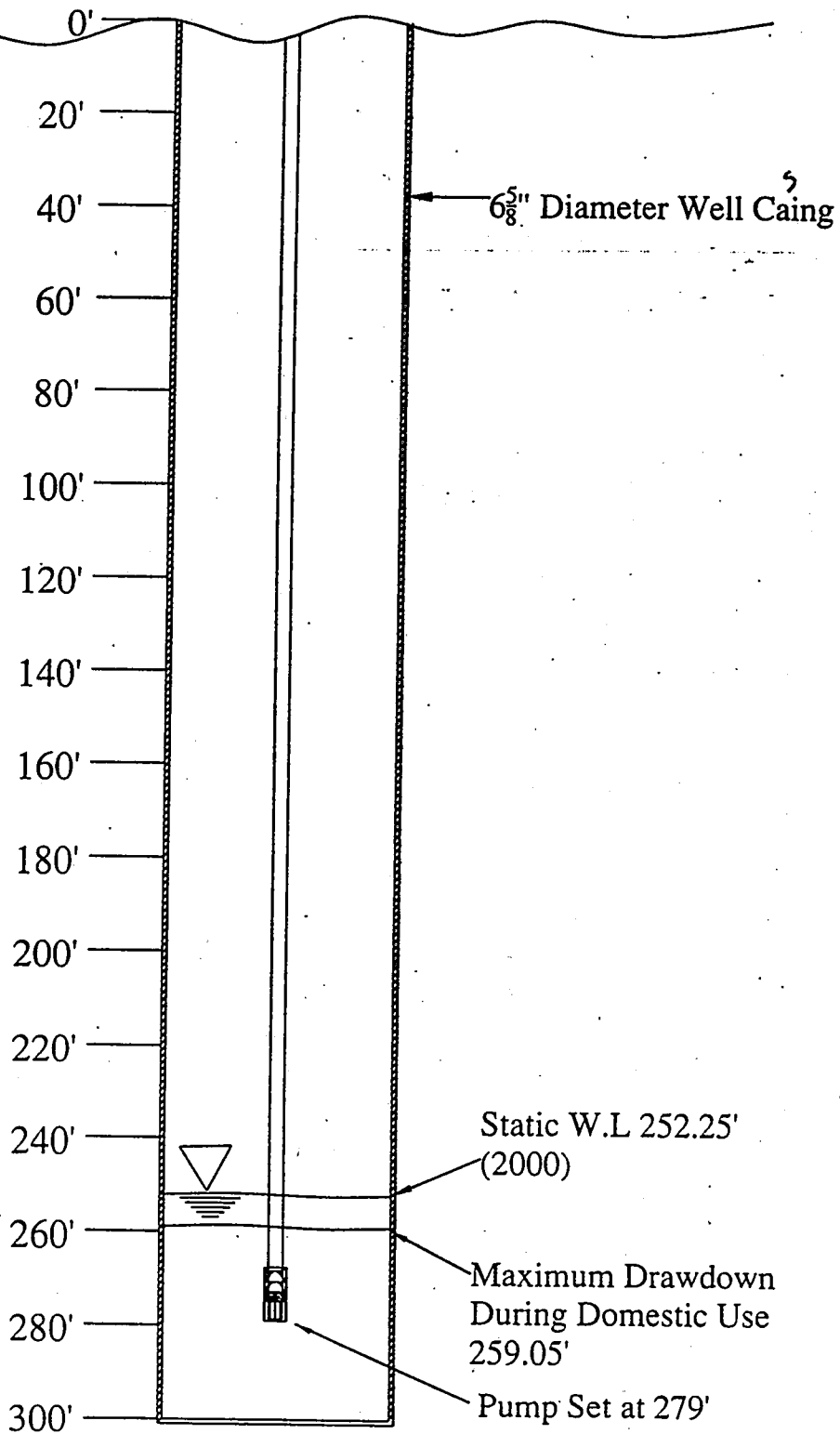
Ron & Tina Nessler

## Ground Level



Ron & Tina Nessler

# Ground Level





# WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES  
UTILITY SERVICES DIVISION

## PUMPING TEST DATA

TYPE OF PUMPING TEST Constant Q & Recovery  
HOW Q MEASURED \_\_\_\_\_  
HOW WL's MEASURED \_\_\_\_\_  
PUMPED WELL NO. MR6  
RADIUS of PUMPED WELL \_\_\_\_\_  
DISTANCE from PUMPED WELL \_\_\_\_\_

M.P. for WL's \_\_\_\_\_ elev. \_\_\_\_\_  
DEPTH OF PUMP/AIRLINE \_\_\_\_\_ wrt \_\_\_\_\_  
% SUBMERGENCE: initial \_\_\_\_\_ pumping \_\_\_\_\_  
PUMP ON: date 2/19/00 time 1005  
PUMP OFF: date 2/29/00 time 1005

WELL Nessler

PUMPING (OBSERVATION WELL)

PUMPING / RECOVERY DATA

PAGE 1 OF 1

Well is grass fence in junk stor  
(just off main road, near meta  
shed)

TIME t =            at t'=0					WATER LEVEL DATA STATIC WATER LEVEL 244.17					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME		t	t'	t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	Q or S'		Q	(NOTE ANY CHANGES IN OBSERVERS)
	mins	hrs										
1800 1530								249.05				
1900 0920								249.17	0.00			
2000 1650			405					249.17	0.00			GE
2100 1030			1465					249.59	0.42			PUMP MAY BE AN, QUIET BUZZ
2200 1540			3215					250.24	1.07			EE - SAME QUIET BUZZ
2300 1415			4570					250.79	1.62			EE
2400 1422			6017					250.99	1.82			EM
2500 1410			7445					251.36	2.19			DD
2600 1340			8855					251.85	2.68			JS
2700 1400			10315					252.60	2.83			MW
2800 1245			11680					251.98	2.81			RV
2900 1620			13336					252.57	3.4			RV
3000 0920			14355					252.65	3.48			DAN
3100 1530			14845	445				252.57	3.4			MARIO
3200 1100			16133	1733				251.70	3.03			MARIO
3300 1050			17325	2925				251.82	2.65			RV
3400 1450			18985	4585				251.47	2.3			EM
3500 1210			23165	8765				250.65	1.98			EE
3600 1530			24805	10405				250.53	1.38			MARIO
3700 1415			26170	11770				250.43	1.76			MARIO
3800 1324			29000	14600				250.65	1.48			MARIO

# WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS  
UTILITY DIVISION**

## PUMPING TEST DATA

WELL Nessler

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE \_\_\_\_\_ OF \_\_\_\_\_

TYPE of PUMPING TEST \_\_\_\_\_

HOW Q MEASURED \_\_\_\_\_

HOW WL's MEASURED \_\_\_\_\_

PUMPED WELL NO. \_\_\_\_\_

RADIUS of PUMPED WELL \_\_\_\_\_

DISTANCE from PUMPED WELL

M.P. for WL's \_\_\_\_\_ elev. \_\_\_\_\_

DEPTH of PUMP/AIRLINE \_\_\_\_\_ wrt \_\_\_\_\_

% SUBMERGENCE: initial \_\_\_\_\_; pumping \_\_\_\_\_

PUMP ON: date 2/3/00 time \_\_\_\_\_

PUMP OFF : date \_\_\_\_\_ ' time \_\_\_\_\_

[illegible]

Log No. 15914

Permit No. ....

Basin.....

## WELL DRILLERS REPORT

Please complete this form in its entirety

1. OWNER Ron & Tina Nessler ADDRESS 444 12 th Street  
Sparks, Nevada 894312. LOCATION SW 1/4 SE 1/4 Sec. 3 T. 17N N/S R. 19 E Washoe Count  
PERMIT NO. ....3. TYPE OF WORK  
New Well ☒ Recondition ☐  
Deepen ☐ Other ☐  
4. PROPOSED USE  
Domestic ☒ Irrigation ☐ Test ☐  
Municipal ☐ Industrial ☐ Stock ☐  
5. TYPE WELL  
Cable ☐ Rotary ☒  
Other ☐ air

## 6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Large boulders to 4' diameter mixed w/ decomposed granite sand & some brown clay		0	31	31
As above but fewer boulders (approx. 3%)		31	86	55
Fine to coarse decomposed granite sand w/ approx. 4% brown clay mixed		86	110	24
As above but more firm & less clay- possibly very weathered granite		110	120	10
As above but more clay		120	223	103
Inconsistently hard & soft but becoming more consistantly hard as depth increases. Picked up some water 260-270' depth. Formation appears to be granite from approx 270' depth.		223	300	77

## 8. WELL CONSTRUCTION

Diameter hole.....6.....inches Total depth.....300.....feet  
Casing record.....0-300' X 6 5/8" ID  
Weight per foot.....12.89.....Thickness.....188.....

Diameter	From	To
10 inches	0 feet	52 feet
8 1/2 inches	52 feet	300 feet
.....inches	.....feet	.....feet
.....inches	.....feet	.....feet
.....inches	.....feet	.....feet
.....inches	.....feet	.....feet

Surface seal: Yes ☒ No ☐ Type transit mix

Depth of seal.....50.....feet

Gravel packed: Yes ☐ No ☒

Gravel packed from.....feet to.....feet

## Perforations:

Type perforation factory mill slotSize perforation 1/8 X 2 1/2"

From.....260.....feet to.....300.....feet

From.....feet to.....feet

From.....feet to.....feet

From.....feet to.....feet

From.....feet to.....feet

From.....feet to.....feet

## 9. WATER LEVEL

Static water level.....230.....Feet below land surface.....

Flow.....G.P.M.....

Water temperature cold °F. Quality not tested

## 10. DRILLERS CERTIFICATION

This well was drilled under my supervision and the report is true to the best of my knowledge.

Name.....W.L. McDonald & Co......Address.....P.O. Box 404; Sparks, Nevada.....Nevada contractor's license number.....9767.....Nevada driller's license number.....805.....Signed Tony Betita by W.L. McDonaldDate.....9 August, 1976.....Date started.....8-2-76....., 19.....Date completed.....8-6-76....., 19.....

## 7. WELL TEST DATA

Pump RPM	G.P.M.	Draw Down	After Hours Pump
AIR BLOWN: 5GPM + @ 260' depth			
(Well appears to be capable of producing more water- loosing air in formation. To be pump tested at later date)			
<u>Pump tested 10-20-76: 24 GPM @ 268' depth</u>			

## BAILER TEST

G.P.M. .... Draw down.....feet .....hours

G.P.M. .... Draw down.....feet .....hours

G.P.M. .... Draw down.....feet .....hours

## **APPENDIX F**

### **Plumbness and Alignment Data**

Company: LANG EXPLORATORY DRILLING

Well #: MONTREUX #4

Date: 3-28-2000

CLOSURE

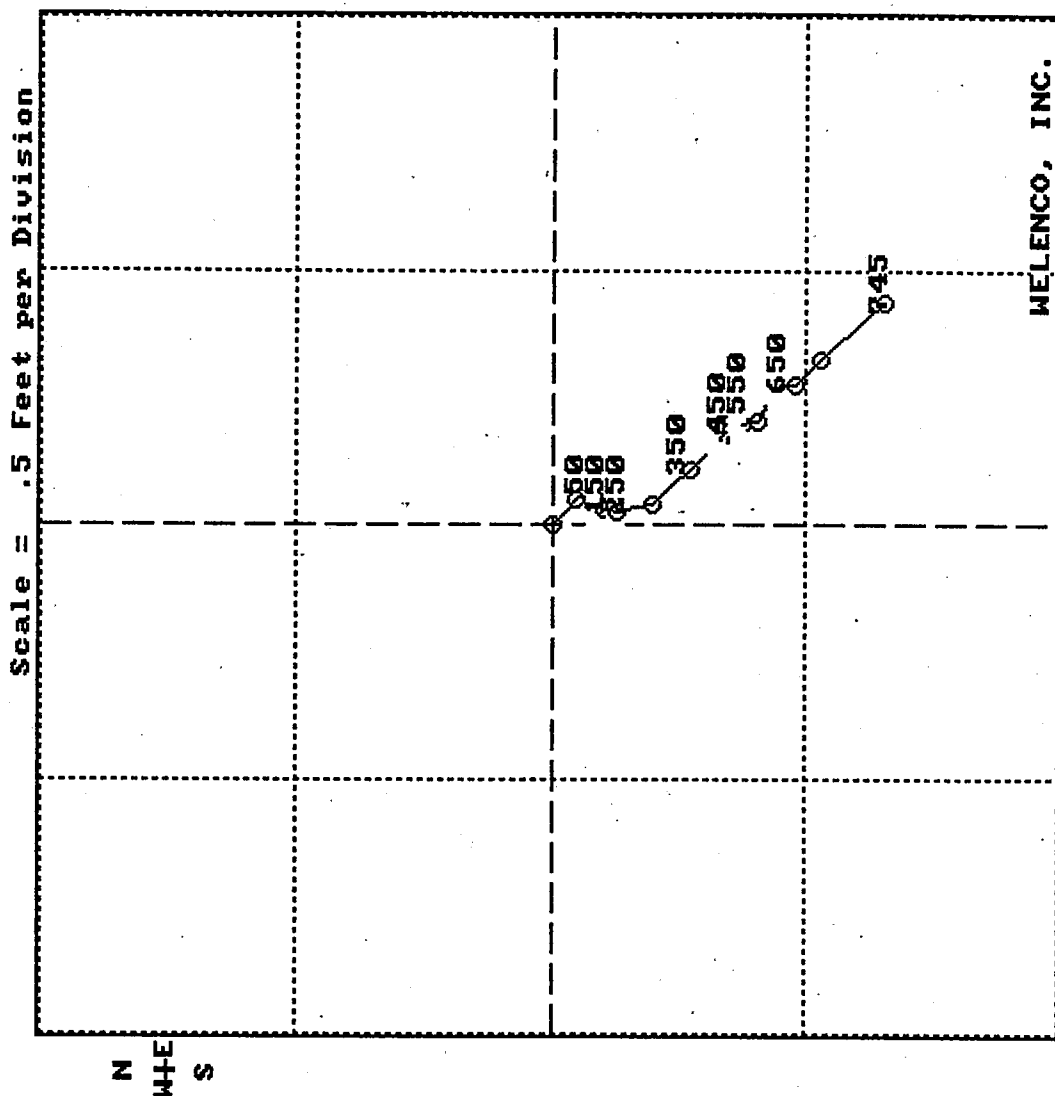
Distance: 0.79 FEET

Bearing: 146.3 DEGREES

T.V.D.: 745.00 FEET

Calc. Method  
Balanced Tangential

PLAN VIEW



Company:  
 LANG EXPLORATORY DRILLING  
 Well #:  
 MONTREUX #4

Date: 3-28-2000

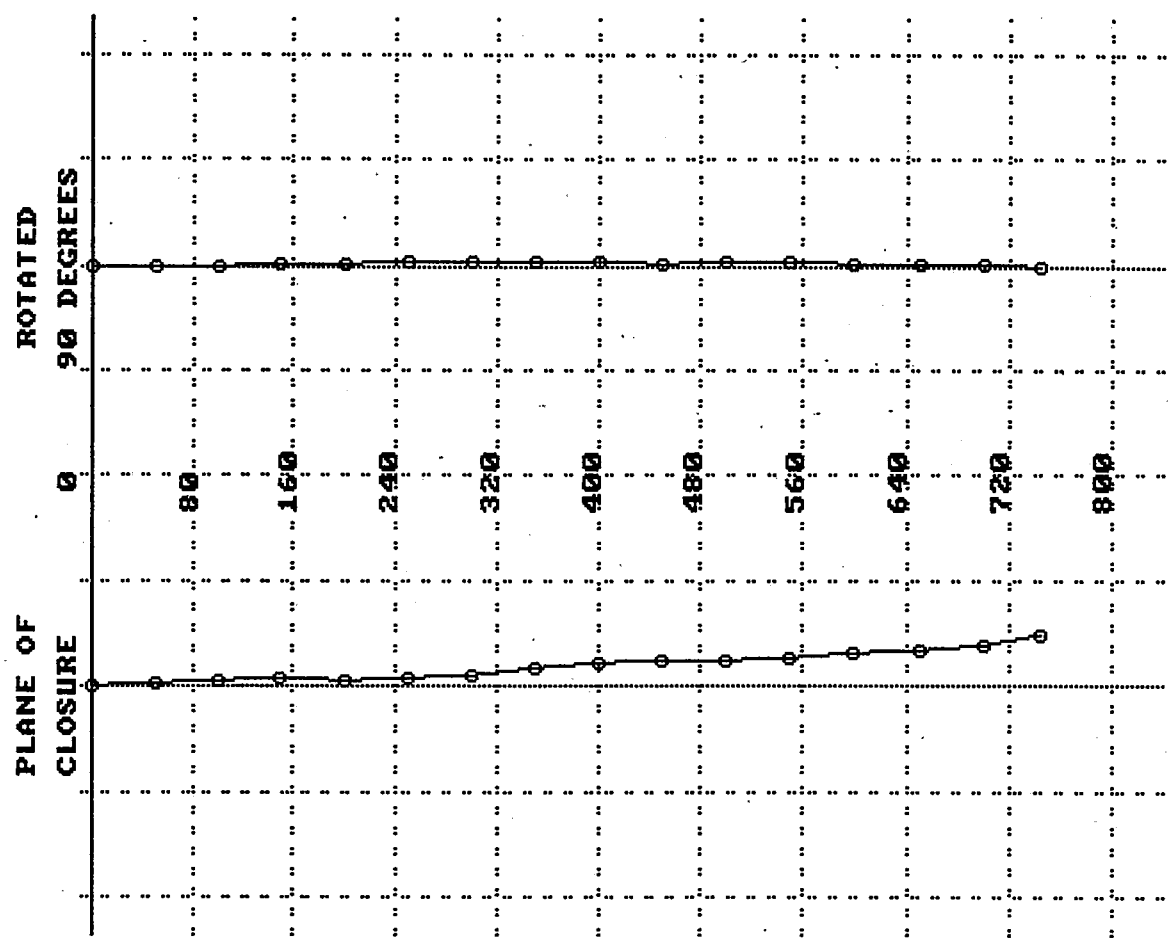
VERTICAL SECTION

Vert Scale = 80 Ft/Div  
 Horz Scale = 1.6 Ft/Div

CLOSURE

Distance: 0.79 FEET  
 Bearing: 146.3 DEGREES  
 T.V.D.: 745.00 FEET

Calc. Method:  
 Balanced Tangential



Mount Rose Well 6  
Well Coordinates

Well	N	E	Feet from MR6		x	y	Elevation
			graphic	calculated			
MR6	14805928.9	2271199.4	0	0	0	0	5749.7
MR5(Cinder)	14806384.2	2272059.8	974	973	860	455	5697.4
Nance	14804650.6	2270855.6	1325	1324	-344	-1278	5750.6
Oney	14804623.0	2271099.4	1314	1310	-100	-1306	5734.2
Nessler	14804382.4	2271371.3	1558	1557	172	-1547	5713.6
Cunningham	14804690.3	2271967.2	1463	1458	768	-1239	5674.7