WELL COMPLETION REPORT FOR NEARBY PRODUCTION WELL: APPLICABLE FOR STMGID 11 MWA

STMGID PRODUCTION WELL #11 AND TEST WELL #10 WELL CONTSTRUCTION AND TESTING FINAL REPORT

STMGID PRODUCTION WELL #11
and TEST WELL #10
WELL CONSTRUCTION AND TESTING
FINAL REPORT
SEPTEMBER 2001

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

Department of
Water Resources

STMGID PRODUCTION WELL #11
and TEST WELL #10
WELL CONSTRUCTION AND TESTING
FINAL REPORT
SEPTEMBER 2001

by
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Hydrogeologist

WASHOE COUNTY
DEPARTMENT OF WATER RESOURCES
4930 Energy Way
Reno, Nevada
89502

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STMGID TEST WELL #10

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1 Borehole lithology

Test well 10

SUMMARY AND CONCLUSIONS

During the months of June and August 2000, a production well was constructed and tested adjacent to the Fieldcreek and Thomas Creek subdivisions along Zolezzi Lane. The well was constructed to 720 feet with 280 feet of 80 slot, Johnson wire-wrapped screen. The well was tested for 72 hours at 708 gpm with 213 feet of drawdown. The specific capacity of the well is 4.1 gpm/ft of drawdown. It is recommended that the well be equipped at 500 gpm with the pump intake set at 570 feet.

INTRODUCTION

Location and purpose

The municipal water system of the South Truckee Meadows General Improvement District (STMGID) required an increase in groundwater pumping capacity due to system demand. A site was located in the Saddlehorn subdivision and an exploratory test well was drilled and completed. This well showed unfavorable hydrogeology and consequently a production well was not constructed. A production well was constructed two miles to the north. Figure 1 shows the location of the exploratory test well (STMGID 10) and the production well (STMGID 11). The exploratory test well is located in the Saddlehorn subdivision at Saddlehorn Drive (Assessor Parcel Number 150-03-013); and in the NW ¼ of the SE ¼ of section 25, T18N, R19E, MDM. The production well is adjacent to the Fieldcreek and Thomas Creek subdivisions along Zolezzi Lane (Assessor Parcel Number 049-280-01); and in the NE ¼ of the NW ¼ of section 19, T18N, R20E, MDM. A Global Positioning System survey located the well at 14828174E and 2285753N (Nevada state plane NAD 83) and at an elevation of 4827ft.

Hydrogeologic Setting

Both wells are located on an alluvial fan emanating from the Carson Range. The alluvial fan deposits can be considered a veneer atop a volcanic pediment. The near surface lithology consists of mafic volcanic and granodiorite colluvium and glacial outwash material. Below this unconsolidated material is andesitic or basalt-andesitic extrusive volcanic rock. Granodiorite of the Carson Range (Sierra Nevada) batholith forms the basement rock. Fault structures are mapped (Bonham and Rogers, 1983) on the pediment and trend north south.

DRILLING OPERATIONS

Through a low bid process, Lang Exploratory Drilling was awarded a contract for the drilling and construction of a test well and two production wells (see Appendix). A Washoe County District Health Well Construction permit was issued (006594). The well was drilled and constructed under State of Nevada Permit 65080. Drilling and construction for the production well began June 5, 2000 and was completed June 22, 2000. A DH-1 Drill Tech rig was used for drilling and construction. The drilling method was dual-tube, flooded reverse with shale shakers and de-sanders. The drilling fluid consisted of water mixed with "EZ mud" bentonite. A consistent mud viscosity was maintained and tested with frequent mud and funnel tests (approximately 45 seconds for funnel test).

DESCRIPTION OF LITHOLOGY

Borehole cuttings were sampled frequently and at least every ten feet. The lithology was generally a mixture of clays, silts, sands, and gravels. Table 1 lists the footage of lithology from the borehole. The State of Nevada Well Driller's Report is found in the Appendix.

Table 1
Borehole lithology

Footage	Description
0-235 feet	mixed colluvium
235-250	gravelly, silty sand
250-300	sands mixed with gravels
300-390	silty sand
390-440	distinct brown, silty clay
440-500	clayey, silty sand
500-570	sand and gravels
570-590	clay
590-660	well sorted gravels
660-670	sandy silt
670-710	clay
710-740	distinct green clay

Welenco provided geophysical logs of single point resistivity, long (64-inch) and short (16-inch) normal resistivity, spontaneous potential, caliper and gamma ray (see Appendix).

WELL CONSTRUCTION AND DEVELOPMENT

A 32-inch surface conductor was installed and grouted to a depth of 25 feet in a 38-inch borehole (June 7). A 26-inch borehole was then drilled to 100 feet, cased with 22-inch blank steel and pressure grouted (June 8-11). A borehole was then drilled with a 19-inch tri-cone drill-bit to 740 feet (June 15). The well was then cased with 14-inch blank steel well casing from +2 feet to 380 feet, from 560 feet to 580 feet and from 680 feet to 720 feet. The screen is 0.080-inch wire-wrap casing and is placed at 380 feet to 560 feet and 580 feet to 680 feet. Centering guides were placed at 60 feet intervals. "Silica Resources SRI Supreme" 1/4 x 1/8 gravel was installed via tremmie pipe throughout the entire depth of the borehole. The gravel was also installed with a sterilizing solution of 65-70% granulated calcium hypochlorite. Figure 2 illustrates the well construction.

The well screen was cleaned and developed by alternating air-lift and swabbing techniques for 32 hours. "NUWELL 220" a dispersing polymer was added to aid in well development (June 18-21). The well was then further developed via pumping and surging techniques. A plumbness and alignment test was conducted (September 8) by Welenco, Inc. and showed a closure distance of 0.58 feet. After the pumping tests were conducted the well was chlorinated. The well was then capped with a steel welded plate.

WELL TESTING

Well testing was conducted August 7 through August 11. The wellhead was fitted with a horizontal 8-inch discharge pipe, a 6-inch orifice plate weir and manometer. The discharge pipe was checked for level. The well was equipped with a line-shaft turbine pump and powered by a diesel engine. Hermit™ transducers were installed in both the production well and a nearby monitor well (STMGID MW#2) located a distance of 63 feet. During testing, the Hermits experienced frequent problems in recording accurate water level data. Both wells were frequently measured manually.

Step test and efficiency results

A three-step pumping test was performed August 7, 2000. The well was pumped at 807 gpm, 909 gpm, and 1000 gpm at 100-minute intervals. Figure 3 plots the drawdown from this test. Table 2 lists the percent of head loss due to laminar flow, not to be mistaken for well efficiencies at various flow rates.

Table 2
Laminar flow head loss at various flow rates

discharge rate (gpm)	% of head loss due to laminar flow
400	37
500	32
600	28
700	25
800	23

From this chart it can be seen that turbulent flow at the well screen and within the aquifer accounts for most of the head loss. Well efficiency could not be calculated accurately because the assumptions for the calculations do not apply in this instance (i.e. significant turbulent flow in the aquifer). The specific capacity at 708 gpm was calculated at 4.1 gpm/ft of drawdown.

Constant discharge and recovery results

During August 8-11, 2001 a constant discharge pumping test was conducted. The flow rate was consistently held at 708 gpm. Figure 4 plots the drawdown versus time for this test. You will note that problems occurred from the Hermit™ transducer at approximately 1000 minutes. Manual measurements were then recorded. The trend that developed after 1000 minutes is a partial result of the pumping level dropping below the top of the well screen. By the end of the test, the pumping level was 60 feet below the top of the screen. It can be seen that the slope of the drawdown response was changing with time after 200 minutes. It is concluded from this graph that a semi-impermeable boundary was reached at approximately 200 minutes. Delayed yield effects did not appear to be significant during the pumping test.

Figure 5 is a plot of the recovery test for the pumping well. At approximately 50 minutes, the late time (t/t') slope increases which may also indicate an impermeable boundary although not quite a doubling of the slope. Table 3 lists the calculated transmissivity using the Jacob Straight Line Method (where $u < 0.05$).

Table 3
Calculated Transmissivity
(gpd/ft of drawdown)

Graph	Transmissivity
Pumping, early time (0-200 min)	5000
Pumping, late time (200-1000 min)	3600
Recovery, early time (60-1000)	4900
Recovery, late time (4-60)	3300

STMGID MW#2 is located 63 feet to the north of the production well. It was drilled and completed in 1982 to a depth of 440 feet with slotted pipe at selected intervals from to 190-440 feet. The production well screens begin at 380 feet. Consequently, measured drawdown in the monitor well is more indicative of the vertical movement of water than horizontal movement. Figure 6 and 7 show the drawdown results of the monitor well. A transmissivity for the upper section of the aquifer was not calculated. The storage coefficient was calculated at 0.045.

A domestic well (Pepple) was measured before and during the pumping tests. This well was located approximately 2,500 feet from the production well. No discernable drawdown from the production well pumping was found at this domestic well during the testing.

PUMP RECOMMENDATION

It is recommended the well be equipped to pump 500 gpm. The pump intake should be set at 570 feet that is within a blank casing section. The pumping level after 2 days of pumping would be 386 feet and after 30 days of pumping, 424 feet.

WATER QUALITY

The water quality was sampled on August 10, 2000. The water can be characterized as a calcium-bicarbonate with a total dissolved solids content of 171 mg/l. The arsenic concentration is less than 3 parts per billion. Radon was reported at 1000 pCi/l. No organic compounds were found. The sand content of the water was less than 1 part per million. The results of the water analysis are found in the appendix.

REFERENCES

Bonham, H.F., Rogers, D.K., 1983. Mt. Rose NE Quadrangle Geologic Map. Nevada Bureau of Mines and Geology, Map 4Bg, scale 1:24,000, 1 sheet.

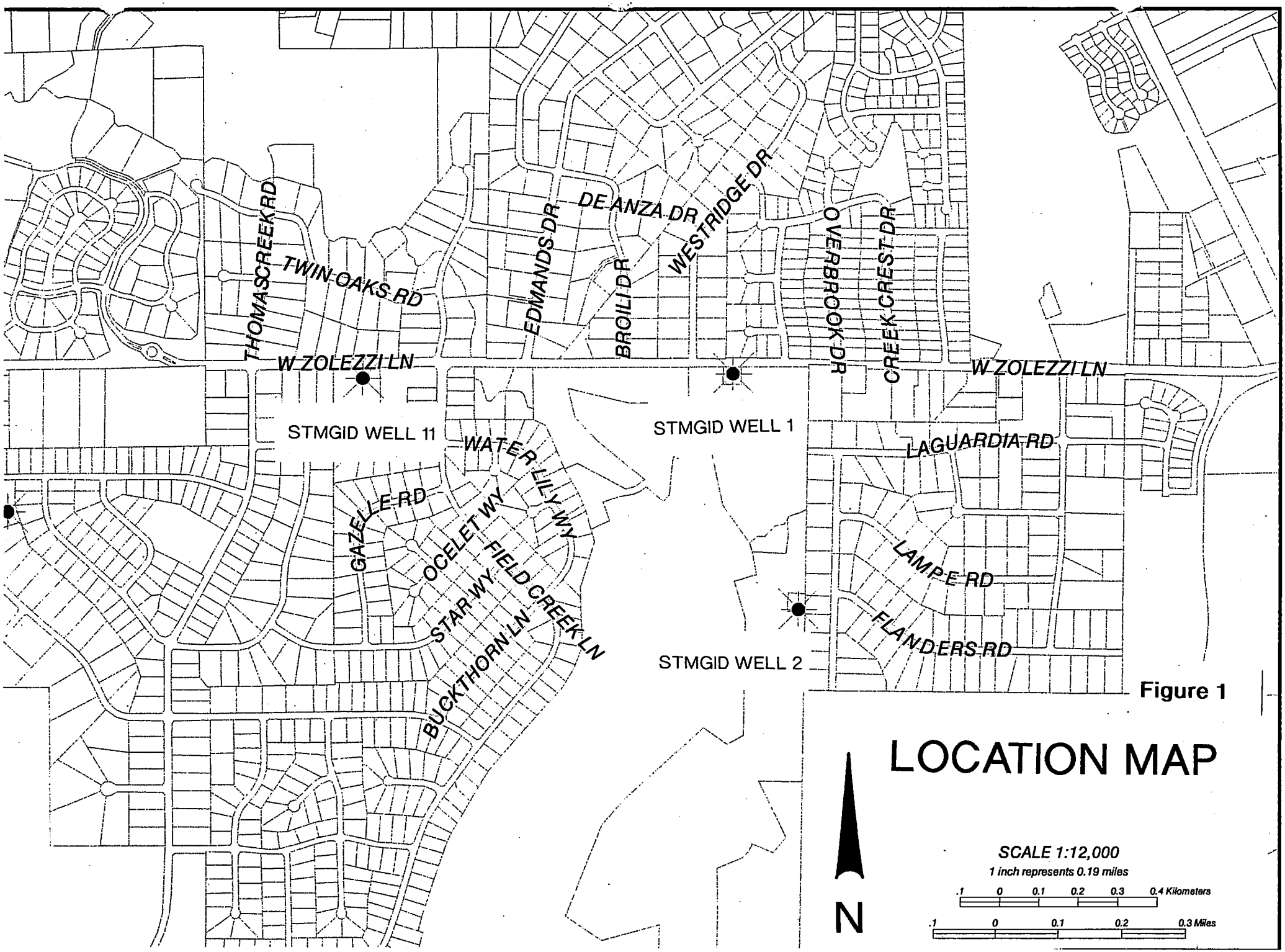
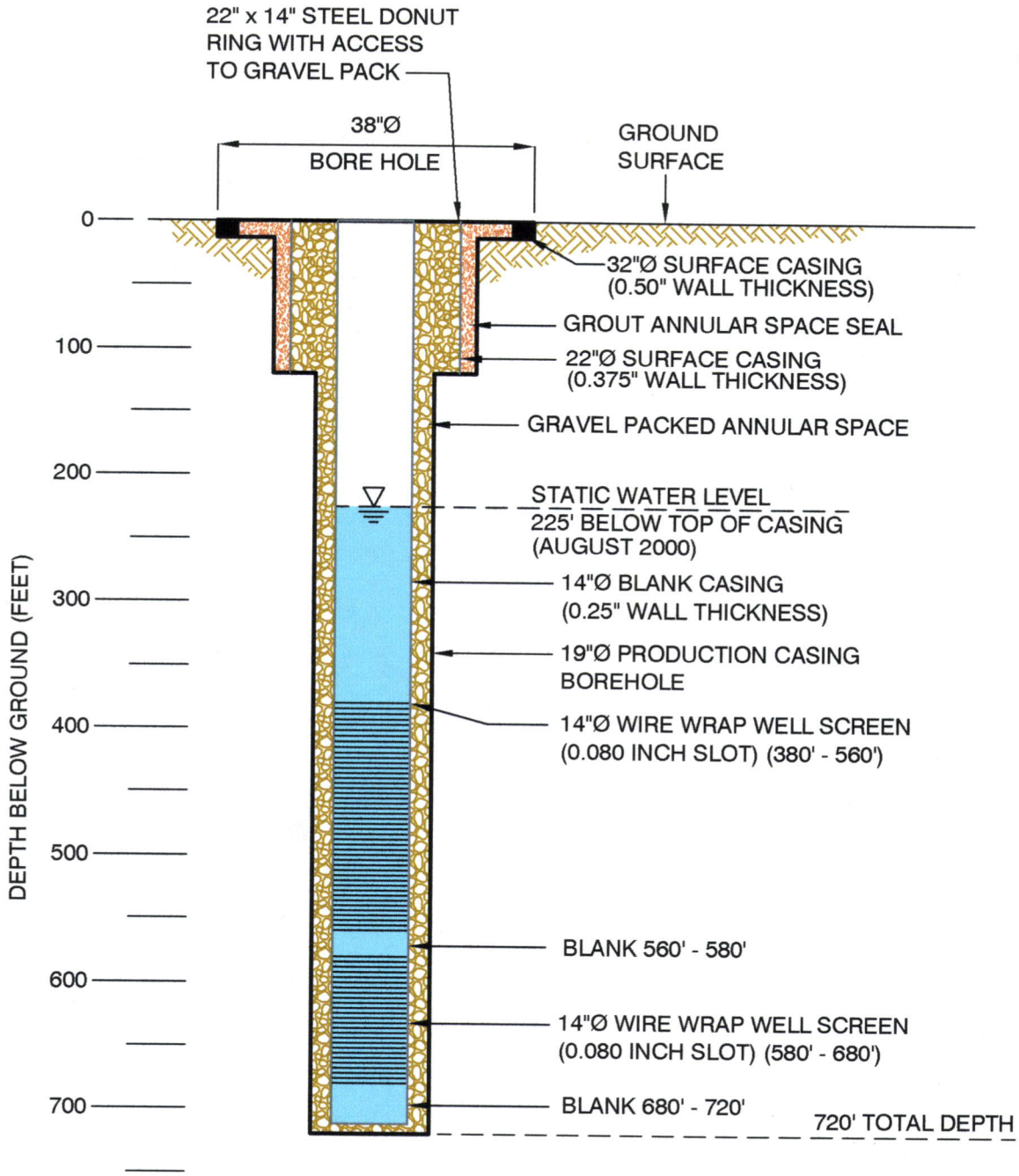


Figure 1

LOCATION MAP



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

STMGID PRODUCTION WELL #11
(AS CONSTRUCTED)

FIGURE 2

Figure 3
STMGID PW#11
Step Drawdown Test

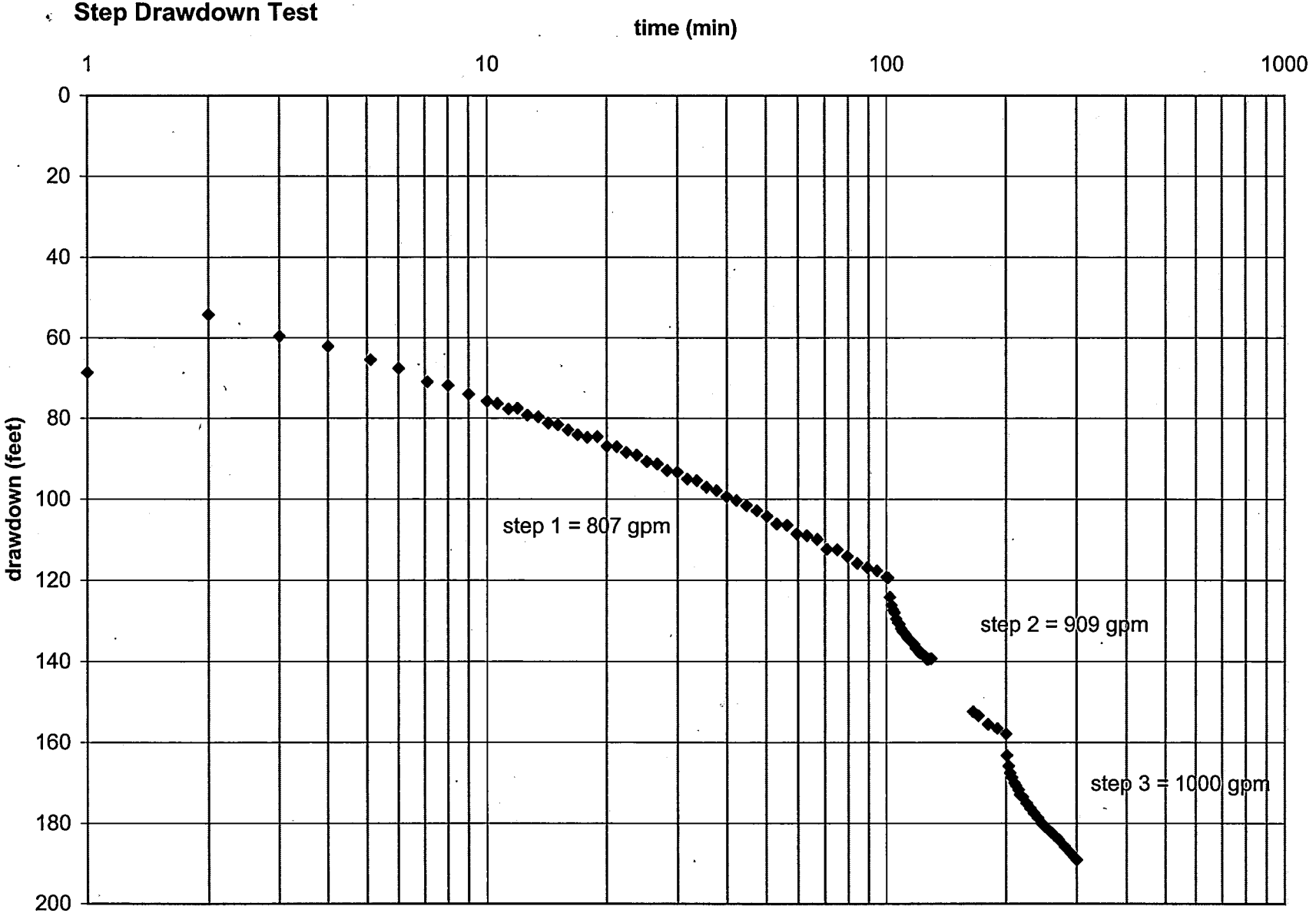


Figure 4
STMGID PW#11
Constant discharge test

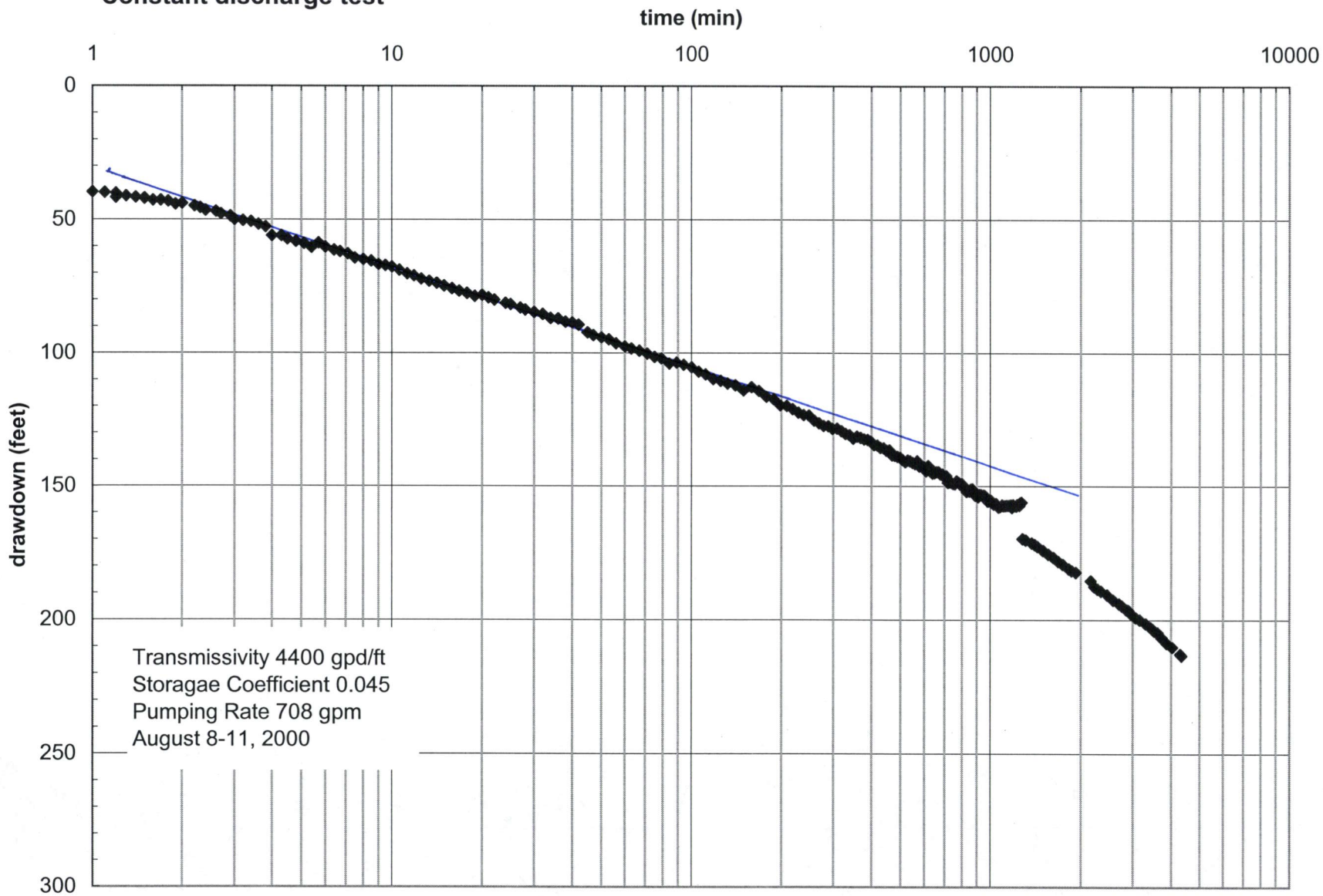


Figure 5
STMGID PW#11
Recovery Test
August 2000

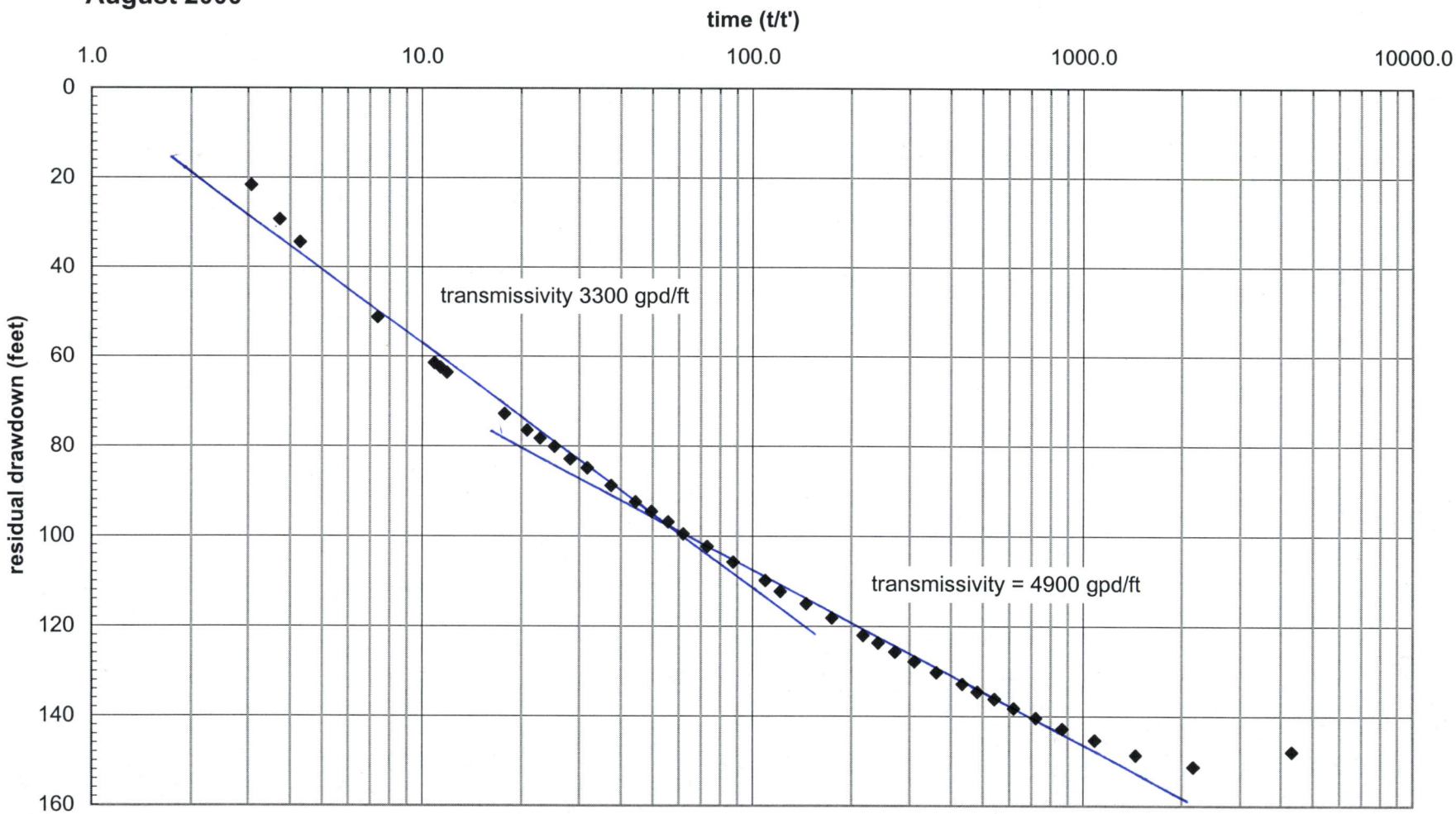


Figure 6
STMGID MW#2 drawdown from
STMGID PW#11 constant discharge test

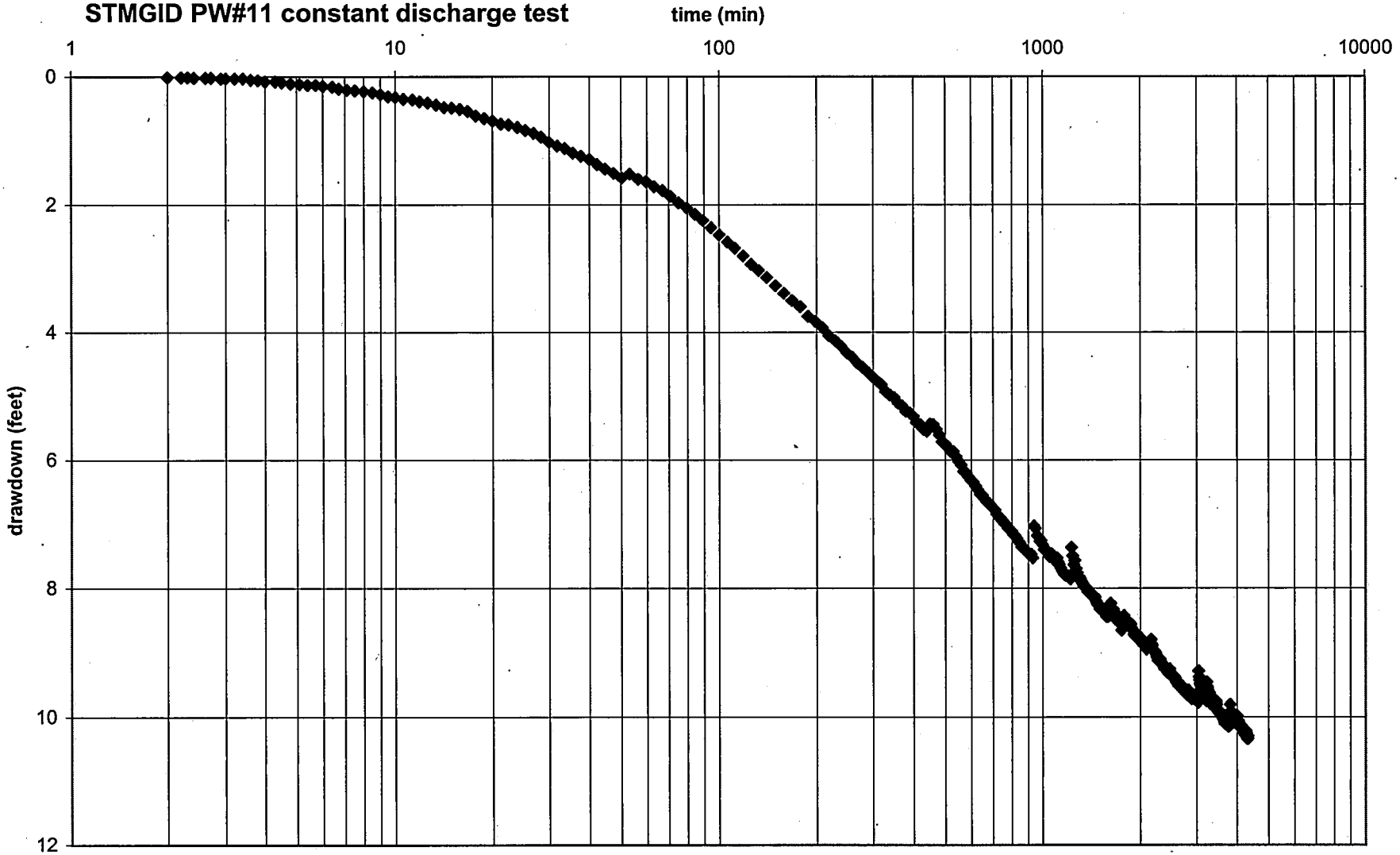
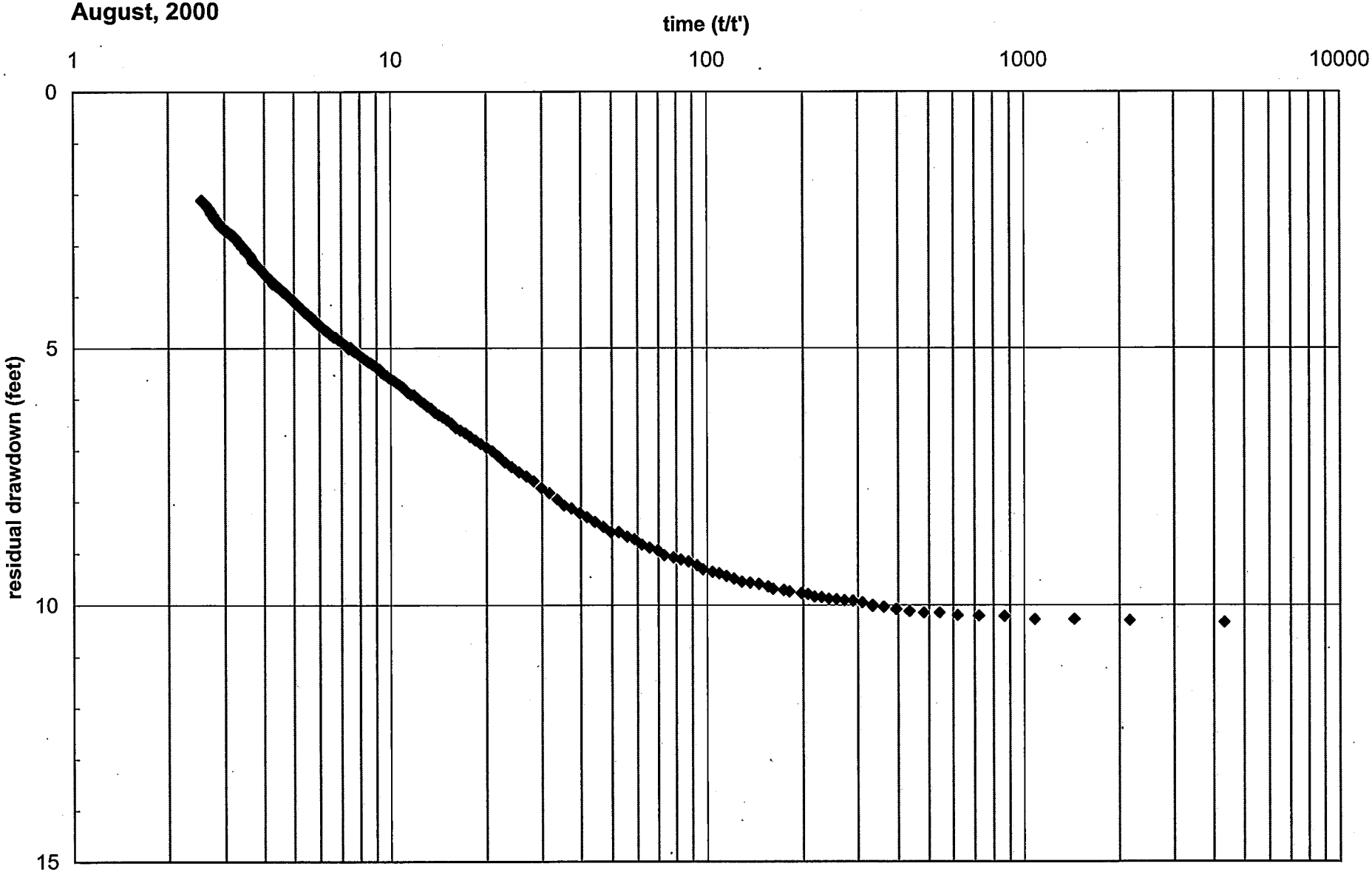


Figure 7
STMGID MW#2 results from
STMGID PW#11 Recovery Test
August, 2000



Production Well 11

INTRODUCTION

Location and purpose

The municipal water system of the South Truckee Meadows General Improvement District (STMGID) required an increase in groundwater pumping capacity due to system demand. A site was located in the Saddlehorn subdivision and an exploratory test well was drilled and completed. This well showed unfavorable hydrogeology and consequently a production well was not constructed. Figure 1 shows the location of the exploratory test well (STMGID 10). The exploratory test well is located in the Saddlehorn subdivision at Saddlehorn Drive (Assessor Parcel Number 150-03-013); and in the NW ¼ of the SE ¼ of section 25, T18N, R19E, MDM. A GPS survey located the well at 2282295E 14819978N (ground NAD 83 NV state plane coordinates) and at an elevation of 5268.58 (wellhead) feet. This site was chosen due to its location to water mains, its distance from other production wells and the need to support water supply demands of the commercial district near the Galena High School.

Hydrogeologic Setting

The well is located on an alluvial fan emanating from the Carson Range. The alluvial fan deposits can be considered a veneer atop a volcanic pediment. The near surface lithology consists of mafic volcanic and granodiorite colluvium and glacial outwash material. Below this unconsolidated material are andesitic or basalt-andesitic, extrusive rock. Granodiorite of the Carson Range (Sierra Nevada) batholith forms the basement rock.

Fault structures are mapped on the pediment and trend north south, however east west trending faults are evidenced that probably predate the north trending faults. The well location is midway between two fault structures. The Lancer Fault is located 4,000 feet to the east and is mapped as an east dipping normal fault. The Serendipity Fault is located 2,000 feet to the west and is mapped as a west dipping normal fault. A third fault is located 2,000 feet to the east and is also mapped as a west dipping normal fault (Bonham and Rogers, 1983). Low sun angle photography indicates that Whites Creek follows an apparent east west fault structure 1,500 feet to the south of the exploratory test well. There is no evidence for east west faulting to the north.

DRILLING OPERATIONS

Through a low bid process, Lang Exploratory Drilling was awarded a contract for the drilling and construction of a test well and production well (see Appendix). Washoe County District Health Well Construction permit was issued (006603) and State of Nevada Permit/Waiver (65194). Drilling and construction for the exploratory test well began May 13, 2000 and was completed May 31, 2000. During that period a borehole was drilled to 460 feet and abandoned after the drill bit and sub were lost in the bottom of the borehole. Prior to loosing the drill bit, the drill string had gotten stuck and was extracted after an overshoot drilling process was completed. Abandonment was in accordance with Washoe County District Health (Dan Alvarez) and Nevada State regulations. The second borehole commenced May 24, 2000.

A DH-1 Drill Tech rig was used for drilling and construction. The drilling crew consisted of David Haas (crew chief), Scott Belliston (driller), Dan Schooley and Fred Schumundie (helpers), and Jeff Goff (safety officer). The drilling method was standard rotary to a depth of 230 feet, then was switched to dual tube flooded reverse. Shale shakers and desanders were also used. The drilling fluid consisted of water mixed with "EZ mud" bentonite. Viscosity maintained from

frequent mud and funnel tests (approximately 45 seconds for funnel test). A 7 7/8-inch tricone drill-bit was used. The final borehole was drilled to 705 feet.

DESCRIPTION OF LITHOLOGY

Borehole cuttings were sampled frequently and at least every ten feet. Table 1 lists the lithology of the borehole. The State of Nevada Well Driller's Report is found in the Appendix.

Table 1
Borehole lithology

Footage	Description
0-90 feet	mixed colluvium
90-120	gravelly, silty sand
120-392	light gray competent volcanic rock mostly mafic volcanic rock with minor zones of dacite(?) and frequent alteration clays
392-560	distinct felsic alteration clay
560-705	granodiorite with frequent clay-altered fractures

Welenco provided geophysical logs of single point resistivity, long (64-inch) and short (16-inch) normal resistivity, spontaneous potential, caliper and gamma ray (see Appendix).

WELL CONSTRUCTION

After the borehole was conditioned with drilling fluids it was completed as a 4-inch test well. Johnson wire-wrap screen casing was implaced from 220 to 360 feet and 540 to 700 feet. Casing wall thickness was 0.188-inch. An 8-inch nominal conductor casing (0.25-inch wall thickness) was also installed and cemented to a depth of 39 feet during the initial drilling operations. The well was gravel packed with ¼ x 1/8-inch "Silica Resource SRI Supreme Gravel" and installed via two-inch tremmie pipe. Well development was by airlift and continued for 12 hours until the discharge was clear. During airlift operations, the maximum discharge was measured at 14 gpm. A static water level of 365 feet was measured. The well was disinfected and a locking cap was fitted to the wellhead.

WATER QUALITY

No water quality samples were taken from this well.

CONCLUSION

Due to the nature of the lithology and permeability of the aquifer, a production well was not constructed at this site. A production well under this contract was constructed (STMGID PW#11) at the STMGID MW#2 and Booster Pump site on Zolezzi Lane.

REFERENCES

Bonham, H.F., Rogers, D.K., 1983. Mt. Rose NE Quadrangle Geologic Map. Nevada Bureau of Mines and Geology, Map 4Bg, scale 1:24,000, 1 sheet.

FIGURE 1
STMGID WELL #10

- PARCELS
- SEWER LINES
- DRAINAGES
- STMGID WELL #10
- MONITORING WELLS
- PRODUCTION WELLS

SOURCE: WASHOE COUNTY DEPARTMENT OF WATER RESOURCES

DATE: DECEMBER 1999

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

0 600 1200

SCALE IN FEET

Department of Water Resources

WASHOE COUNTY NEVADA

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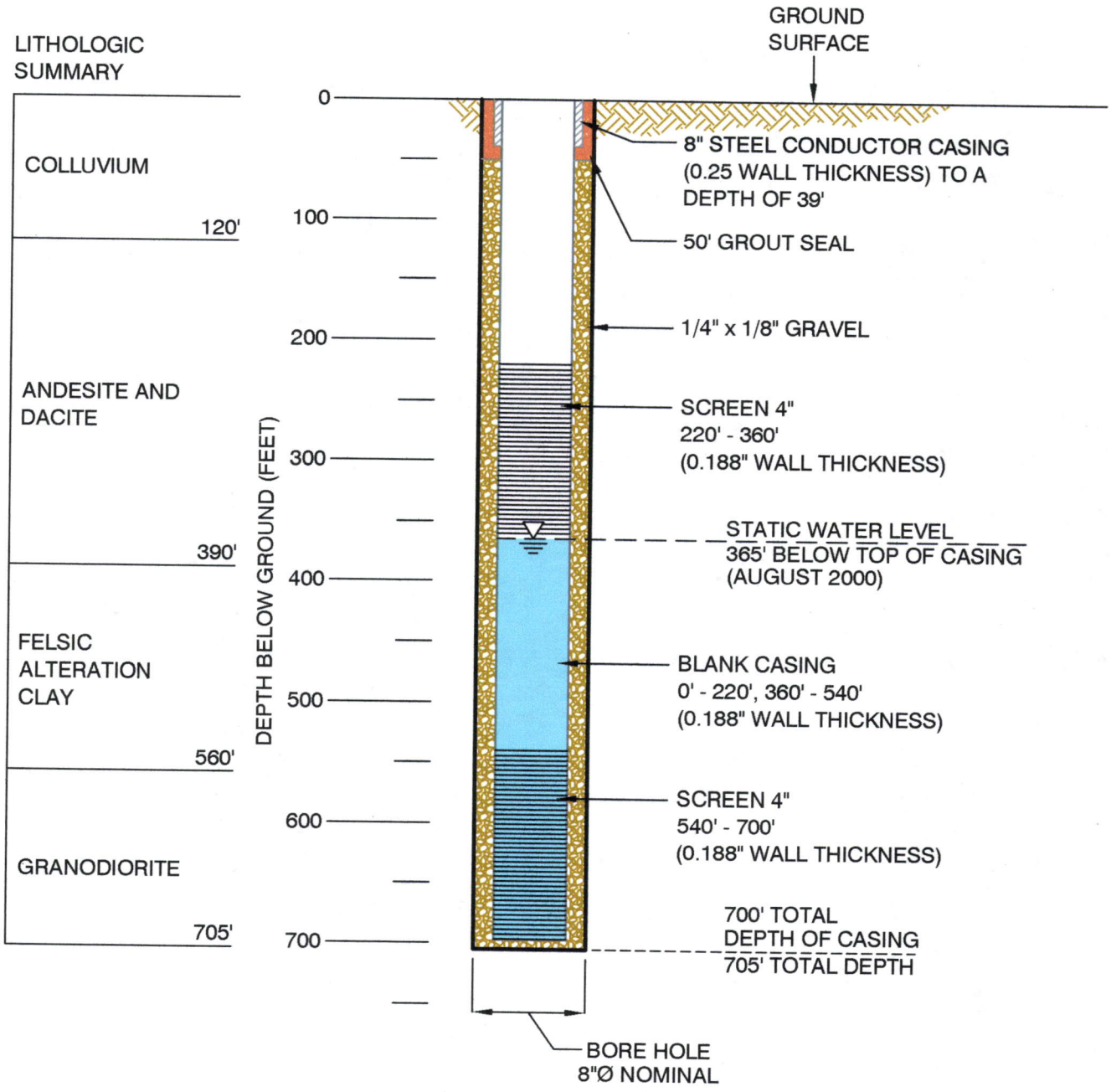
Reno, Nevada 89520
(775) 954-4600



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

STMGID TEST WELL #10 (AS CONSTRUCTED)

FIGURE 1

APPENDIX

Pump recommendation memorandum
Well Driller Reports
Bid Documents
Pumping Test Data
Plumbness and Alignment test results
Water Quality Data
Geophysical Logs

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

September 5; 2000

TO: Rick Warner, P.E.

FROM: Michael Widmer

SUBJECT: Pumping specifications for STMGID 11.

I have analyzed the results from the pumping test data for STMGID production well 11 and would like to report the findings. You have requested pumping levels given continuous pumping after 2 and 30 days at the recommended pump capacity. I have attached the well construction log for your records.

Well depth	720 feet
Screen interval	380-560 feet
	580-680 feet
Well casing diameter	14 inch
Static water level	230 feet
Pump intake setting	570 feet
Recommended pump capacity	500 gpm
Pumping level @ 2 days	386 feet
@30 days	424 feet

Please contact me if you have any questions or need additional information.

attachment

MCW

c: Dan Dragan
Paul Orphan, P.E.
Juan Esparza, P.E.
Vahid Behmaram

WHITE - DIVISION OF WATER RESOURCES
CANARY - CLIENT'S COPY
PINK - WELL DRILLER'S COPY

RECEIVED
JUL 14 2000
WASHOE COUNTY
DEPT. OF WATER RESOURCES

STATE OF NEVADA
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

PRINT OR TYPE ONLY
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OFFICE USE ONLY
Log No
Permit No
Basin

NOTICE OF INTENT NO. 43622-

1. OWNER Washoe Co. Dept. of Water Resources STMGID#11
MAILING ADDRESS 4930 Energy Way
Reno, NV 89502

ADDRESS AT WELL LOCATION Zolezzi Lane, Washoe County

2. LOCATION NE 1/4 NW 1/4 Sec. 19 T 18N N/S R 20 E Washoe County
PERMIT NO 65080 (Issued by Water Resources)
49-281-01 (Parcel No)
Field Creek (Subdivision Name)

3. WORK PERFORMED
[X] New Well [ ] Replace [ ] Recondition
[ ] Deepen [ ] Abandon [ ] Other

4. PROPOSED USE
[ ] Domestic [ ] Irrigation [ ] Test
[X] Municipal/Industrial [ ] Monitor [ ] Stock

5. WELL TYPE
[ ] Cable [ ] Rotary [X] RVC
[ ] Air [ ] Other

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Gravels & boulders		0	150	150
Clays & gravels		150	200	50
Gravels		200	260	60
Clay & gravels		260	270	10
Gravels		270	290	20
Clay & gravels		290	380	90
Gravels		380	390	10
Clay & gravels		390	520	130
Large fracture		520		
volcanic rock			540	20
Clay & gravels		540	600	60
Large volcanic gravels		600	620	20
Gravels		620	630	10
Large volcanic gravels		630	660	30
Clay & gravels		660	710	50
Green clay		710	740	30
Steel plate welded between 22" and 14" casings at surface				

Date started 6/7/2000 , 19__
Date completed 6/21/2000 , 19__

7. WELL TEST DATA

TEST METHOD: [ ] Bailer [ ] Pump [X] Air Lift	GPM	Draw Down (Feet Below Static)	Time (Hours)
	344	270	1 hour

8. WELL CONSTRUCTION
Depth Drilled 740 Feet Depth Cased 720 Feet

HOLE DIAMETER (BIT SIZE)

	From	To
38 Inches	0 Feet	25 Feet
26 Inches	25 Feet	100 Feet
19 Inches	100 Feet	740 Feet

CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
32	126.6	0.375	0	25
22	86.61	0.375	0	100
14	36.71	0.250	+2.5	720

Perforations:
Type perforation Wire wrapped
Size perforation 0.080"
From 380 feet to 560 feet
From 580 feet to 680 feet
From ____ feet to ____ feet
From ____ feet to ____ feet
From ____ feet to ____ feet

Surface Seal [X] Yes [ ] No
Depth of Seal 100'
Placement Method [X] Pumped [ ] Poured
Seal Type: [X] Neat Cement [ ] Cement Grout [ ] Concrete Grout

Gravel Packed [X] Yes [ ] No
From 10 feet to 740 feet

9. WATER LEVEL
Static water level 209 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 89802-5279
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 (if on-site driller) 2144
Signed Paul Stoddard (By driller performing actual drilling on-site or contractor)
Date 7/12/00

USE ADDITIONAL SHEETS IF NECESSARY

B.ST-C

WHITE - DIVISION OF WATER RESOURCES
CANARY - CLIENT'S COPY
PINK - WELL DRILLER'S COPY

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STATE OF NEVADA
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

NOTICE OF INTENT NO. 43607-

OWNER Washoe County STM-10B
MAILING ADDRESS 4930 Energy Way
Reno, NV 89502

ADDRESS AT WELL LOCATION Saddlehorn Subdivision
Washoe County

2. LOCATION NW 1/4 SE 1/4 Sec. 25 T 18N N/S R 19E E Washoe County
PERMIT NO N/A (Issued by Water Resources) 150-03-013 (Parcel No) Saddlehorn (Subdivision Name)

3. WORK PERFORMED
[X] New Well [ ] Replace [ ] Recondition
[ ] Deepen [ ] Abandon [ ] Other

4. PROPOSED USE
[ ] Domestic [ ] Irrigation [ ] Test
[ ] Municipal/Industrial [X] Monitor [ ] Stock

5. WELL TYPE
[ ] Cable [ ] Rotary [X] RVC
[ ] Air [ ] Other

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Topsoil & boulders		0	5	5
Gravels & boulder		5	40	35
Gravels		40	170	130
Volcanic rock		170	400	230
Granite		400	430	30
Granite & clays		430	615	185
Granite		615	650	35
Clay		650	660	10
Granite		660	665	5
Clay		665	675	10
Granite		675	705	30
		100		
Hole plug		100	105	5

Date started 5/23/2000 19__
Date completed 5/31/2000 19__

7. WELL TEST DATA

TEST METHOD: [ ] Bailer [ ] Pump [X] Air Lift

GPM	Draw Down (Feet Below Static)	Time (Hours)
12		1 Hour

8. WELL CONSTRUCTION

Depth Drilled 705 Feet Depth Cased 700 Feet

HOLE DIAMETER (BIT SIZE)

		From		To	
14	Inches	0	Feet	39	Feet
7.875	Inches	39	Feet	705	Feet
	Inches		Feet		Feet

CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
8.625	22.36	0.250	+1	39
4.5	8.66	0.188	+1	700

Perforations:
Type perforation Mill Slot
Size perforation 0.080"

From	220	feet to	360	feet
From	540	feet to	700	feet
From		feet to		feet
From		feet to		feet
From		feet to		feet

Surface Seal: [X] Yes [ ] No
Depth of Seal 100'
Placement Method [X] Pumped [ ] Poured
Seal Type: [X] Neat Cement [ ] Cement Grout [ ] Concrete Grout

Gravel Packed: [X] Yes [ ] No
From 105 feet to 705 feet

9. WATER LEVEL

Static water level 365 feet below land surface
Artesian flow N/A G.P.M. N/A P.S.I
Water temperature 60 °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.

RECEIVED
JUN 12 2000
WASHOE COUNTY
DEPT. OF WATER RESOURCES

Name Lang Exploratory Drilling (Contractor)
Address P.O. Box 5279 (Contractor)
Elko, NV 89802-5279
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 Bellistor (By driller performing actual drilling on-site or contractor)
Date 6/2/2000

USE ADDITIONAL SHEETS IF NECESSARY

3.ST.L

STMGID WELL #10 & SPRING CREEK WELL #7

BID OPENING MARCH 31, 2000

ITEM		Quantity	Units	Engineers Estimate Price	Engineers Estimate Total	Humboldt Drilling Price	Humboldt Drilling Total	Lang Drilling Price	Lang Drilling Total
STMGID MON. WELL 10									
1	Mobilization-Demobilization	1	L.S.	4000.00	4000.00	19366.00	19366.00	4000.00	4000.00
2	Drill 6" Borehole	750	L.F.	28.00	21000.00	45.00	33750.00	26.00	19500.00
3	Geophysical Logs	1	L.S.	4500.00	4500.00	4000.00	4000.00	4050.00	4050.00
4	2 Inch Blank Steel Pipe	450	L.F.	16.00	7200.00	6.00	2700.00	8.50	3825.00
5	2 Inch Slotted Steel Pipe	300	L.F.	19.00	5700.00	9.59	2877.00	15.00	4500.00
6	Gravel Pack	6	Cu. Yds	390.00	2340.00	350.00	2100.00	345.00	2070.00
7	Grout Sanitary Seal	100	Feet	11.00	1100.00	10.00	1000.00	10.00	1000.00
8	Air Development	12	Hrs.	300.00	3600.00	300.00	3600.00	275.00	3300.00
9	Protective Well Cap	1	Each	560.00	560.00	475.00	475.00	500.00	500.00
				SUB-TOTAL	50000.00	SUB-TOTAL	69868.00	SUB-TOTAL	42745.00
STMGID WELL 10									
1	Mobilization-Demobilization	1	Each	23000.00	23000.00	29522.00	29522.00	18500.00	18500.00
2	Drill 28" Borehole	100	L.F.	175.00	17500.00	200.00	20000.00	188.00	18800.00
3	22" Conductor Casing	101	L.F.	65.00	6565.00	58.70	5928.70	69.00	6969.00
4	Grout Sanitary Seal	100	Feet	45.00	4500.00	93.60	9360.00	59.00	5900.00
5	Drill 20" Borehole	650	L.F.	90.00	58500.00	175.00	113750.00	92.00	59800.00
6	14" Blank Casing	430	L.F.	35.00	15050.00	26.50	11395.00	36.00	15480.00
7	14" Well Screen	320	L.F.	55.00	17600.00	47.50	15200.00	47.00	15040.00
8	Gravel Pack	33	Cu. Yds	400.00	13200.00	225.00	7425.00	345.00	11385.00
9	Air Development	36	Hrs.	375.00	13500.00	280.00	10080.00	375.00	13500.00
10	Install Pump	600	L.F.	18.00	10800.00	15.00	9000.00	18.00	10800.00
11	Pump Development	24	Hrs.	180.00	4320.00	350.00	8400.00	160.00	3840.00
12	Pumping Test	80	Hrs.	180.00	14400.00	350.00	28000.00	160.00	12800.00
13	Video Survey	1	L.S.	1225.00	1225.00	1200.00	1200.00	1200.00	1200.00
14	Plumbness Test	1	L.S.	1900.00	1900.00	2000.00	2000.00	1700.00	1700.00
15	Disinfect & Capping	1	L.S.	850.00	850.00	1000.00	1000.00	1125.00	1125.00
16	Standby	24	Hrs.	240.00	5760.00	200.00	4800.00	240.00	5760.00
				SUB-TOTAL	208670.00	SUB-TOTAL	277060.70	SUB-TOTAL	202599.00
SPRING CREEK #7									
1	Mobilization-Demobilization	1	Each	23000.00	23000.00	29610.00	29610.00	18500.00	18500.00
2	Drill 30" Borehole	100	L.F.	200.00	20000.00	150.00	15000.00	192.00	19200.00
3	24" Conductor Casing	101	L.F.	75.00	7575.00	60.00	6060.00	74.00	7474.00
4	Grout Sanitary Seal	100	Feet	45.00	4500.00	65.00	6500.00	59.00	5900.00
5	Drill 22" Borehole	600	L.F.	95.00	57000.00	95.00	57000.00	82.00	49200.00
6	16" Blank Casing	400	L.F.	46.00	18400.00	30.16	12064.00	39.60	15840.00
7	16" Well Screen	300	L.F.	57.00	17100.00	52.00	15600.00	54.00	16200.00
8	Gravel Pack	35	Cu. Yds	400.00	14000.00	225.00	7875.00	345.00	12075.00
9	Air Development	36	Hrs.	375.00	13500.00	250.00	9000.00	375.00	13500.00
10	Install Pump	400	L.F.	18.00	7200.00	15.00	6000.00	18.00	7200.00
11	Pump Development	24	Hrs.	180.00	4320.00	185.00	4440.00	160.00	3840.00
12	Pumping Test	250	Hrs.	180.00	45000.00	185.00	46250.00	160.00	40000.00
13	Video Survey	1	L.S.	1225.00	1225.00	1200.00	1200.00	1200.00	1200.00
14	Plumbness Test	1	L.S.	1900.00	1900.00	2000.00	2000.00	1700.00	1700.00
15	Disinfect & Capping	1	L.S.	850.00	850.00	1000.00	1000.00	1125.00	1125.00
16	Standby	24	Hrs.	240.00	5760.00	200.00	4800.00	240.00	5760.00
				SUB-TOTAL	241330.00	SUB-TOTAL	224399.00	SUB-TOTAL	218714.00
				TOTAL	500000.00	TOTAL	571327.70	TOTAL	464058.00

CONTRACTOR
LANG EXPLORATORY DRILLING
P.O. BOX 5279
ELKO, NEVADA 89802

STMGID WELL NO.10 & SPRING CREEK WELL NO. 7

PAYMENT ESTIMATE NO. 2

OCTOBER 20, 2000

STMGID CONTRACT	
WORK COMPLETED	$258,094.00
MATERIAL STORED	$0.00
CHANGE ORDERS	$0.00
TOTAL EARNED	$258,094.00
LESS RETENTION 0%	$0.00
PREVIOUS PAYMENTS	$232,284.60
TOTAL DUE	$25,809.40

SPRING CREEK CONTRACT	
WORK COMPLETED	$209,464.80
MATERIAL STORED	$0.00
CHANGE ORDERS	$0.00
TOTAL EARNED	$209,464.80
LESS RETENTION 0%	$0.00
PREVIOUS PAYMENTS	$188,518.32
TOTAL DUE	$20,946.48

STMGID MONITORING WELL

ITEM NO.	DESCRIPTION	UNITS	UNIT PRICE	CONTRACT AMOUNT	COMPLETED TO DATE UNITS	COMPLETED TO DATE AMOUNT	PREVIOUSLY BILLED UNITS	PREVIOUSLY BILLED AMOUNT	COMPLETED THIS PERIOD UNITS	COMPLETED THIS PERIOD AMOUNT	JOB COMPLETE	CONTRACT AMOUNT	MATERIAL STORED
1	MOBILIZATION	1 LS	$ 4,000.00	$4,000.00	1	$4,000.00	1	$4,000.00	0	$0.00	100%	100%	$0.00
2	DRILL 6" BOREHOLE	750 LF	$ 26.00	$19,500.00	705	$18,330.00	705	$18,330.00	0	$0.00	94%	94%	$0.00
3	GEOPHYSICAL LOG	1 LS	$ 4,050.00	$4,050.00	1	$4,050.00	1	$4,050.00	0	$0.00	100%	100%	$0.00
4	2" BLANK STEEL CASING	450 LF	$ 8.50	$3,825.00	300	$2,550.00	300	$2,550.00	0	$0.00	67%	67%	$0.00
5	2" SLOTTED STEEL	300 LF	$ 15.00	$4,500.00	300	$4,500.00	300	$4,500.00	0	$0.00	100%	100%	$0.00
6	GRAVEL PACK	6 CY	$ 345.00	$2,070.00	4.8	$1,656.00	4.8	$1,656.00	0	$0.00	80%	80%	$0.00
7	SANITARY SEAL	100 FT	$ 10.00	$1,000.00	105	$1,050.00	105	$1,050.00	0	$0.00	105%	105%	$0.00
8	AIR DEVELOPMENT	12 HR	$ 275.00	$3,300.00	10	$2,750.00	10	$2,750.00	0	$0.00	83%	83%	$0.00
9	WELL CAP	1 EA	$ 500.00	$500.00	1	$500.00	1	$500.00	0	$0.00	100%	100%	$0.00
CO 1	CHANGE ORDER NO. 1	1 LS	$ 13,650.00	$13,650.00	1	$13,650.00	1	$13,650.00	0	$0.00	100%	100%	
	SUBTOTAL MOMITORING WELL			$56,395.00		$53,036.00		$53,036.00		$0.00			$0.00

STMGID WELL 11

ITEM NO.	DESCRIPTION	UNITS	UNIT PRICE	CONTRACT AMOUNT	COMPLETED TO DATE UNITS	COMPLETED TO DATE AMOUNT	PREVIOUSLY BILLED UNITS	PREVIOUSLY BILLED AMOUNT	COMPLETED THIS PERIOD UNITS	COMPLETED THIS PERIOD AMOUNT	JOB COMPLETE	CONTRACT AMOUNT	MATERIAL STORED
1	MOBILIZATION	1 LS	$ 18,500.00	$18,500.00	1	$18,500.00	1	$18,500.00	0	$0.00	100%	100%	$0.00
2	DRILL 28" BOREHOLE	100 LF	$ 188.00	$18,800.00	100	$18,800.00	100	$18,800.00	0	$0.00	100%	100%	$0.00
3	CONDUCTOR CASING	101 LF	$ 69.00	$6,969.00	101	$6,969.00	101	$6,969.00	0	$0.00	100%	100%	$0.00
4	SANITARY SEAL	100 LF	$ 59.00	$5,900.00	100	$5,900.00	100	$5,900.00	0	$0.00	100%	100%	$0.00
5	DRILL 20" BOREHOLE	650 LF	$ 92.00	$59,800.00	640	$58,880.00	640	$58,880.00	0	$0.00	98%	98%	$0.00
6	BLANK CASING	430 LF	$ 36.00	$15,480.00	442	$15,912.00	442	$15,912.00	0	$0.00	103%	103%	$0.00
7	WELL SCREEN	320 LF	$ 47.00	$15,040.00	280	$13,160.00	280	$13,160.00	0	$0.00	88%	88%	$0.00
8	GRAVEL PACK	33 CY	$ 345.00	$11,385.00	25.2	$8,694.00	25.2	$8,694.00	0	$0.00	76%	76%	$0.00
9	AIR DEVELOPMENT	36 HR	$ 375.00	$13,500.00	36	$13,500.00	36	$13,500.00	0	$0.00	100%	100%	$0.00
10	INSTALL PUMP	600 LF	$ 18.00	$10,800.00	561	$10,098.00	561	$10,098.00	0	$0.00	94%	94%	$0.00
11	PUMP DEVELOPMENT	24 HR	$ 160.00	$3,840.00	24	$3,840.00	24	$3,840.00	0	$0.00	100%	100%	$0.00
12	TEST PUMPING	80 HR	$ 160.00	$12,800.00	78.25	$12,520.00	78.25	$12,520.00	0	$0.00	98%	98%	$0.00
13	VIDEO SURVEY	1 LS	$ 1,200.00	$1,200.00	1	$1,200.00	1	$1,200.00	0	$0.00	100%	100%	$0.00
14	PLUMBNESS TEST	1 LS	$ 1,700.00	$1,700.00	1	$1,700.00	1	$1,700.00	0	$0.00	100%	100%	$0.00
15	DISINFECT AND CAP	1 LS	$ 1,125.00	$1,125.00	1	$1,125.00	1	$1,125.00	0	$0.00	100%	100%	$0.00
16	STANDBY	24 HR	$ 240.00	$5,760.00	24	$5,760.00	24	$5,760.00	0	$0.00	100%	100%	$0.00
CO 1	CHANGE ORDER NO. 1	1 LS	$ 8,500.00	$8,500.00	1	$8,500.00	1	$8,500.00	0	$0.00	100%	100%	
	SUBTOTAL WELL 11			$211,099.00		$205,058.00		$205,058.00		$0.00			$0.00
	TOTAL FOR STMGID CONTRACT			$267,494.00		$258,094.00		$258,094.00		$0.00			$0.00

SPRING CREEK WELL 7

ITEM NO.	DESCRIPTION	UNITS	UNIT PRICE	CONTRACT AMOUNT	COMPLETED TO DATE UNITS	COMPLETED TO DATE AMOUNT	PREVIOUSLY BILLED UNITS	PREVIOUSLY BILLED AMOUNT	COMPLETED THIS PERIOD UNITS	COMPLETED THIS PERIOD AMOUNT	JOB COMPLETE	CONTRACT AMOUNT	MATERIAL STORED
1	MOBILIZATION	1 LS	$ 18,500.00	$18,500.00	1	$18,500.00	1	$18,500.00	0	$0.00	100%	100%	$0.00
2	DRILL 30" BOREHOLE	100 LF	$ 192.00	$19,200.00	100	$19,200.00	100	$19,200.00	0	$0.00	100%	100%	$0.00
3	CONDUCTOR CASING	101 LF	$ 74.00	$7,474.00	101	$7,474.00	101	$7,474.00	0	$0.00	100%	100%	$0.00
4	SANITARY SEAL	100 LF	$ 59.00	$5,900.00	100	$5,900.00	100	$5,900.00	0	$0.00	100%	100%	$0.00
5	DRILL 22" BOREHOLE	600 LF	$ 82.00	$49,200.00	610	$50,020.00	610	$50,020.00	0	$0.00	102%	102%	$0.00
6	BLANK CASING	400 LF	$ 39.60	$15,840.00	413	$16,354.80	413	$16,354.80	0	$0.00	103%	103%	$0.00
7	WELL SCREEN	300 LF	$ 54.00	$16,200.00	300	$16,200.00	300	$16,200.00	0	$0.00	100%	100%	$0.00
8	GRAVEL PACK	35 CY	$ 345.00	$12,075.00	39.4	$13,593.00	39.4	$13,593.00	0	$0.00	113%	113%	$0.00
9	AIR DEVELOPMENT	36 HR	$ 375.00	$13,500.00	36	$13,500.00	36	$13,500.00	0	$0.00	100%	100%	$0.00
10	INSTALL PUMP	400 LF	$ 18.00	$7,200.00	381	$6,858.00	381	$6,858.00	0	$0.00	95%	95%	$0.00
11	PUMP DEVELOPMENT	24 HR	$ 160.00	$3,840.00	24	$3,840.00	24	$3,840.00	0	$0.00	100%	100%	$0.00
12	TEST PUMPING	250 HR	$ 160.00	$40,000.00	176.5	$28,240.00	176.5	$28,240.00	0	$0.00	71%	71%	$0.00
13	VIDEO SURVEY	1 LS	$ 1,200.00	$1,200.00	1	$1,200.00	1	$1,200.00	0	$0.00	100%	100%	$0.00
14	PLUMBNESS TEST	1 LS	$ 1,700.00	$1,700.00	1	$1,700.00	1	$1,700.00	0	$0.00	100%	100%	$0.00
15	DISINFECT AND CAP	1 LS	$ 1,125.00	$1,125.00	1	$1,125.00	1	$1,125.00	0	$0.00	100%	100%	$0.00
16	STANDBY	24 HR	$ 240.00	$5,760.00	24	$5,760.00	24	$5,760.00	0	$0.00	100%	100%	$0.00
	TOTAL WELL 7			$218,714.00		$209,464.80		$209,464.80		$0.00			$0.00

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL STMGID II
(PUMPING) / OBSERVATION WELL
(PUMPING) / RECOVERY DATA
PAGE 1 OF 2

PUMPING TEST DATA

TYPE OF PUMPING TEST STEP DRAWDOWN
HOW Q MEASURED 8" x 4" ORIFICE WEIR
HOW WL's MEASURED HERMIT 3000 PTX-1830 TRANSDUCER
PUMPED WELL NO. STMGID II
RADIUS of PUMPED WELL
DISTANCE from PUMPED WELL

M.P. for WL's TOP OF 1½" STILL WELL elev.
DEPTH OF PUMP/AIRLINE EST 367' wrt
% SUBMERGENCE: initial pumping
PUMP ON: date 8/7/00 time 0900
PUMP OFF: date time

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 278.35					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins/hrs	t	t'	t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(S) or S'	Q/s	H"	Q	(NOTE ANY CHANGES IN OBSERVERS)
0901		1			295.85	STEP I		67.50		26"	807	MW2 = 187.80
		2			282.17			53.82				163.56 PSI IN STMII
		3			287.98			59.63				156.60 PSI IN MW2
		4			290.48			62.13				
		5			293.82			65.47				
		6			295.96			67.61				
		7			299.32			70.97				
		8			300.24			71.89				
		9			304.15			75 80				
		10			306.06			77.71				MW2 @ 188.08
		12			307.58			79.23				
		14			309.55			81.20				
		16			311.24			82.89				
		18			313.08			84.73				
		20			315.30			86.95	9.3			
		22			316.82			88.47				
		25			319.04			90.69				
		30			321.69			93.34				
		35			325.40			97.05	8.3			
0940		40			327.80			99.45				MW2 189.24 @ 9:45
0945		45			329.99			101.64				
		50			332.65			104.30	7.7			
		55			334.84			106.50		26±½"		
1000	1	60			337.00			108.65				MW2 189.70 Q↑
1010		70			340.75			112.40				
1020		80			342.52			114.17	7.1			
1030		90			345.27			116.92				
1040	40 1	100			347.60			119.25				
		101	1		347.76	STEP II		119.41		33"	909	
		102	2		352.52			124.17				
		103	3		354.53			126.18				
		105	5		357.56			129.21				
		107	7		359.22			130.87				
1050	50 1	110	10		361.22			132.87				
1055		115	15		363.48			135.13				
1100	2	120	20		365.83			137.48				MW2 191.36 @ 1100
1105		125	25		367.80			139.45	6.5			
1110	10 2	130	30		367.88			139.53				BELOW TRANSDUCER
1115		135	35		367.99							
1145		165	65		380.74			152.39				SWITCH TO SOUNDER
1150		170	70		381.66			153.31				
1200		180	80		383.82			155.47	5.8			
1210		190	90		384 83			156 48				
1220		200	100		386.22			157.87				STM II

UTIL-16

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL STMGID II
PUMPING / OBSERVATION WELL
PUMPING / RECOVERY DATA
PAGE 2 OF 2

PUMPING TEST DATA

TYPE OF PUMPING TEST STEP TEST
HOW Q MEASURED 8" x 6" ORIFICE
HOW WL's MEASURED POST 160 MINUTES WITH SOUNDER
PUMPED WELL NO.
RADIUS of PUMPED WELL
DISTANCE from PUMPED WELL

M.P. for WL's TOP OF STILLWELL elev.
DEPTH OF PUMP/AIRLINE @ 367' wrt
% SUBMERGENCE: initial pumping
PUMP ON: date 8/7/00 time 0900
PUMP OFF: date time

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 228.35					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins / hrs	t	t'	t /t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or S'	Q/s	H	Q	(NOTE ANY CHANGES IN OBSERVERS)
1221		201	1		391.55	STEP III		163.20		40"	1000	
1223		203	3		394.20			165.85				
1225		205	5		395.88			167.53				
1227		207	7		397.03			168.68				
1230		210	10		398.39			170.04	5.9			
1232		212	12		399.07			170.72				
1235		215	15		400.10			171.75				
1238		217	18		401.32			172.97				
1240		220	20		401.86			173.51				
1245		225	25		403.40			175.05				
1250		230	30		404.68			176.33				
1255		235	35		405.92			177.57	5.6			
1300	— 4	240	40		407.00			178.65				
1305		245	45		408.34			179.99				
1310		250	50		409.23			180.88				
1320		260	60		410.77			182.42	5.5			
1330		270	70		412.40			184.05				
1340		280	80		414.23			185.88	5.4			
1350		290	90		415.89			187.54				
1400		300	100		417.50			189.15				MW = 191.42 @ 1358

UTIL-16

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL STMGID 11
(PUMPING) / OBSERVATION WELL
(PUMPING) RECOVERY DATA
PAGE 1 OF _____

PUMPING TEST DATA

TYPE OF PUMPING TEST Constant Q
HOW Q MEASURED 8" x 6" orifice
HOW WL's MEASURED pressure x 2 across = 100 psi
PUMPED WELL NO. STMGID 11
RADIUS of PUMPED WELL _____
DISTANCE from PUMPED WELL _____

M.P. for WL's TOP 2" STILL WELL elev. _____
DEPTH OF PUMP/AIRLINE TD 413' est to Xover wrt _____
% SUBMERGENCE: initial _____ pumping _____
PUMP ON: date 8/8/00 time 0900
PUMP OFF: date _____ time _____

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 228.55					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)
0901		1			268.22			39.67		20"	708a	pm ~1500 @ START
		2			272.85			44.30				Disch. clear after 1:3 min
		3			277.29			48.74				Q↓
		4			281.22			52.67				
		5			286.69			58.14				
		6			287.28			58.73				
		7			290.52			61.97				
		8			292.90			64.35				
		9			294.04			65.49				
		10			295.72			67.17				SC = 10.5 Sand = 2.2 ml
		12			298.85			70.30				START SAND @ 0912 - 0922
		14			301.62			73.07				= 0.1 ml
		16			303.38			74.83				
		18			305.29			76.74				SC = 9.2
0920	20 / —	20			307.31			78.76				
		25			309.88			81.33				
0930		30			312.36			83.81				
		35			315.55			87.00				
0940		40			316.90			88.35				
		45			318.01			89.46				
0950		50			321.95			93.40				
1000		60			324.94			96.39				
1010		70			327.76			99.21				
1020	20 / 1	80			330.08			101.53				
1030		90			332.58			104.03				
1040	40 / 1	100			333.04			104.49				
1050	50 / 1	110			335.62			107.07				
1100	— / 2	120			336.66			108.11				
1110		130			339.02			110.47				
1120		140			340.02			111.47				
1130		150			340.71			112.16				
1140		160			342.70			114.15				
1150		170			341.50			112.95				
1200	— / 3	180			342.80			114.25				
1210		190			345.08			116.53				
1220	20 / 3	200			346.03			117.48				
1240	40 / 3	220			348.46			119.91				Sand = .26 (2.6?)
1300	— / 4	240			351.03			122.48				
1320		260			352.14			123.59				
1340		280			354.94			126.39				
1400	— / 5	300			356.09			127.54				SC = 5.55
1430	30 / 5	330			357.98			129.43				
1500	— / 6	360			360.69			132.14				Sand = 0.30
1530	30 / 6	390			360.96			132.41			Q↑ @	1515 = 375 min.

UTIL-16

STMGID 11

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL STMGID 11
(PUMPING) / OBSERVATION WELL
(PUMPING) / RECOVERY DATA
PAGE 2 OF _____

PUMPING TEST DATA

TYPE OF PUMPING TEST Constant Q Test
HOW Q MEASURED 8" x 6" Orifice Weir
HOW WL's MEASURED Pressure Transducer / Hermit 3000
PUMPED WELL NO. _____
RADIUS of PUMPED WELL _____
DISTANCE from PUMPED WELL _____

M.P. for WL's Top 2" Stillwell elev. _____
DEPTH of PUMP/AIRLINE _____ wrt _____
% SUBMERGENCE: initial _____ pumping _____
PUMP ON: date 8/8/00 time 0900
PUMP OFF: date _____ time _____

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 228.55					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins / hrs	t	t'	t /t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(S)or S'	Q/s	H	Q	(NOTE ANY CHANGES IN OBSERVERS)
1600	— 7	420			363.11			134.56		20"	708	
1630	30 7	450			364.36			135.81				1647 START SAND — 1715 =
1700	— 8	480			366.97			138.52	5.1	20"		.05 mL
1730	30 8	510			367.83			139.28	5.08	20"		Q↑
1800	9	540			368.86			140.30	4.99	20"		.DD
1830	30 9	570			370.15			141.60				Q↑ |
1900	10	600			371.46			142 91				|
1930	30 10	630			370.94			142.39				|
2000	— 11	660			373 60			145.05				|
2030	30 11	690			374.01			145.46		20"		|
2100	— 12	720			374.75			146.20		20"		V
2130	30 12	750			377.21			148.66				Q↑
2200	— 13	780			376.64			148.09		20"		EM
2230	30 13	810			377.51			149.01		20"		
2300	— 14	840			380.54			151.99				Pressure in screen
2330	30 14	870			379.71			151.16		20"		
2400	— 15	900			381.01	[illegible]		153.46		20"		
2430	30 15	930			381.68	[illegible]		153.13		20"		
0100	— 16	960			381.92			153.37				
0130	30 16	990			384.13	[illegible]		155.58				Q↑
0200	— 17	1020			383.17			155.42				
0230	30 17	1050			385.25	393		156 70		20"		
0300	— 18	1080			386.48			157.93				
0330	30 18	1110			385.64			157.09				
0400	— 19	1140			385.89			157.34				
0430	30 19	1170			385.86			157.31				
0500	— 20	1200			386.69			158.14				
0530	30 20	1230			386.12	Sounder		157.47	4.5			
0600	— 21	1260			385.47			157.02				
0630	30 21	1290			384.62	398.30	169.75					26.23' Direct Read of probe
0700	— 22	1320			384.52	398.82	170.27					
0730	30 22	1350										
0800	— 23	1380				399.92	171.37					26.362
0830	30 23	1410			383.682	400.46	171.91					
0900	— 24	1440			385.15	401.19	172.64					
1000	25	1500				402.65	174.10					
1100	26	1560			381.146	404.03	175.48					
1200	27	1620				405.30	176.75					
1300	28	1680			379.33	406.71	178.16					
1400	29	1740			378.65	407.82	179.27					
1520	20 30	1820				409.50	180.95					
1600	31	1860				410.22	181.67					
1700	32	1920				410.79	182.24					
2100		2160				413.96	185.41			20"		MW noone at site

8/9/00

UTIL-16

STMGID 11

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL STMW6D 11
PUMPING / OBSERVATION WELL
PUMPING / RECOVERY DATA
PAGE 3 OF _____

PUMPING TEST DATA

TYPE OF PUMPING TEST Constant Q
HOW Q MEASURED 8"x6" Orifice
HOW WL's MEASURED Sounder
PUMPED WELL NO. _____
RADIUS of PUMPED WELL _____
DISTANCE from PUMPED WELL _____

M.P. for WL's top 2" steel pipe elev. _____
DEPTH OF PUMP/AIRLINE _____ wrt _____
% SUBMERGENCE: initial _____ pumping _____
PUMP ON: date 8/8/00 time 0900
PUMP OFF: date _____ time _____

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 228.55					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)
2100		2160				413.96	185.41			20"		
2200		2220				416.10	187.55			19¾		"
2300		2280				417.05	188.50			20"		
2400		2340				417.82	189.27			20"		
0200		2460				419.13	190.58			19¾		
0400		2580				421.08	192.53			19¾		MW left site
0600		2700				422.51	193.96			19¾		EM
0700		2760				423.20	194.65			20"		
0840		2820				424.75	196.15			20"		EM left site
0920		2900				424.95	196.40			20"		~~708~~
1100		3000				426.20	197.65			19¾"		
1240		3100				427.73	199.18			20"		
1420		3200				428.55	200.00			20"		
1600		3300				429.88	201.33			19⅞"		905 left site
1800		3420				431.32	202.77			20"		EM
1940		3520				432.67	204.12			20"		EM left site
2100		3600				433.31	204.76			20"		MW at site 8:15
2300		3720				435.30	206.75			20"		smooth run
0120		3860				437.19	208.64			20"		
0400		4020				438.70	210.15			20"		MW left
0820		4280				441.28	212.73			20"		EE
0859		4319				441.88	213.33					

UTIL-16

STMW6D 11

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL STMGID 11
(PUMPING) / OBSERVATION WELL
PUMPING / (RECOVERY DATA)
PAGE 1 OF _____

PUMPING TEST DATA

TYPE OF PUMPING TEST: CONSTANT Q RECOVERY
HOW Q MEASURED: _____
HOW WL's MEASURED: HERMIT 3000/TRANSDUCER & SOUNDER
PUMPED WELL NO.: _____
RADIUS of PUMPED WELL: _____
DISTANCE from PUMPED WELL: _____

M.P. for WL's: TOP OF STILLWELL elev. _____
DEPTH OF PUMP/AIRLINE _____ wrt _____
% SUBMERGENCE: initial _____ pumping _____
PUMP ON: date 8/8/00 time 0900
PUMP OFF: date 8/11/00 time 0900

TIME t = 4320 at t'=0					WATER LEVEL DATA STATIC WATER LEVEL 228.55 Sounder / Hermit / ④ Sounder − Hermit					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins / hrs	t	t'	t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or (S)	s'		Q	(NOTE ANY CHANGES IN OBSERVERS)
		4321	1	4321	376.50		360.67	147.95	- 132.12			Max s = 213.33
		4322	2	2161	379.88		368.16	151.33	- 139.61			
		4323	3	1441	377.26		367.99	148.71	- 139.44			
		4324	4	1081	373.94		366.10	145.39	- 137.55			
		4325	5	865	371.38		363.74	142.83	- 135.19			
		4326	6	721	368.96		362.01	140.41	133.16			
		4327	7	618	366.82		359.01	138.27	130.46			
		4328	8	541	364.75		358.29	136.20	129.74			
		4329	9	481	363.15		356.68	134.60	128.13			56.06' head
0910		4330	10	433	361.38		356.52	132.83	127.97			
		4332	12	361	358.81		353.18	130.26	124.63			
		4334	14	310	356.40		350.86	127.85	122.31			
		4336	16	271	354.23		348.41	125.68	-119.86			
		4338	18	241	352.24		347.28	123.69	- 118.73			
		4340	20	217	350.55		345.93	122.00	- 117.38			
		4345	25	174	346.76		342.76	118.21	- 114.21			
0930		4350	30	145	343.60		339.61	115.05	- 111.06			
		4355	35	124	340.88		337.42	112.33	- 108.87			
		4360	40	109	338.44		335.07	109.89	- 106.52			48.5%
0950	50 / 72	4370	50	87.4	334.36		330.69	105.81	-102.14			50.4%
1000	— / 73	4380	60	73	330.90		327.27	102.35	- 98.72			
		4390	70	63	328.08		324.22	99.53	- 95.67			
		4400	80	55	325.44		322.24	96.89	93.69			54.6%
1030	30 / 73	4410	90	49	323.11		320.48	94.56	91.93			
1040	40 / 73	4420	100	44	321.02		319.37	92.47	90.82			56.7%
1100	— / 74	4440	120	37	317.42		315.85	88.87	87.30			
1125	25 /	4465	145	31	313.47		—	84.92	—			Pressure=97.52' @ 1103
	40 /	4480	160	28	311.50		310.05	82.95	81.50			61%
1200	— / 75	4500	180	25	308.68		308.51	80.31	79.96			
1220	20 / 75	4520	200	22.6	306.84		306.66	78.30	78.11			
1240	40 / 75	4540	220	21	305.02	1238=Hermitt	305.12	76.47	76.57			
1320	20 / 76	4580	260	18	301.35	1248,	301.53	72.80	72.98			66%
1340	40 / 76	4600	280	16.4		1258,	300.42		71.87			
1400	— / 77	4620	300	15.4		1309, ...	298.49		69.94			
1430	30 / 77	4650	330	14.1			297.43		68.88			
1500	— / 78	4680	360	13			296.29		67.74			
1530	30 / 78	4710	390	12.1			296.00		67.45			292.14 @ 1540 for sounder
1540	40 / 78	4720	400	11.8	292.14		294.40	63.59	65.85			
1600	— / 79	4740	420	11.3	291.03		293.13	62.48	64.58			70.7%
1620	20 / 79	4760	440	10.8	290.00		292.99	61.45				
2020	20 / 83	5,000	680	7.4	279.75		282.59	51.20	54.04			76%
0700	— / 94	5,640	1,320	4.3	263.00		275.10	34.45				84%
1130	30 / 98	5,910	1,590	3.7	257.88		270.90	29.33				86%
2000	— / 107	6,420	2,100	3.1	250.18		267.25	21.63				90%

2/00

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WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL STMGID MW2
PUMPING / OBSERVATION WELL
(PUMPING) / RECOVERY DATA
PAGE 1 OF _____

PUMPING TEST DATA

TYPE OF PUMPING TEST Constant Q
HOW Q MEASURED 8" x 6" orifice
HOW WL's MEASURED Pressure Xducer
PUMPED WELL NO. STMGID 11
RADIUS of PUMPED WELL _____
DISTANCE from PUMPED WELL _____

M.P. for WL's TOC elev. _____
DEPTH of PUMP/AIRLINE _____ wrt _____
% SUBMERGENCE: initial _____ pumping _____
PUMP ON: date 8/8/00 time 0900
PUMP OFF: date _____ time _____

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 187.96					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)
		1			187.88			-.08				
		2			187.93			-.03				
		3			187.95			-.01				
		4			187.98			.02				
		5			188.03			.07				
		6			188.05			.09				
		7			188.11			.15				
		8			188.14			.18				
		9			188.17			.21				
		10			188.23			.27				
		12			188.28			.32				
		14			188.36			.40				
		16			188.41			.45				
		18			188.46			.50				
		20			188.57			.61				
		25			188.71			.75				
		30			188.86			.90				
		35			189.04			1.08				
		40			189.16			1.20				
		45			189.29			1.33				
		50			189.43			1.47				
1000		60			189.52			1.56				
		70			189.70			1.74				
1020		80			189.89			1.93				
1030		90			190.07			2.11				
1040		100			190.28			2.32				
1050		110			190.50			2.54				
1100	2	120			190.60			2.64				
1110		130			190.85			2.89				
1120		140			190.95			2.99				
1130		150			191.06			3.10				
1140		160			191.19			3.23				
1150		170			191.31			3.35				
1200	3	180			191.42			3.46				
		190			191.52			3.56				
1220	20 3	200			191.67			3.71				
1240	40 3	220			191.85			3.89				
1300	4	240			192.05			4.09				
1320		260			192.24			4.28				
1340		280			192.40			4.44				
1400	5	300			192.54			4.58				
1430	30 5	330			192.74			4.78				
1500	6	360			192.94			4.98				
1530	30 6	390			193.16			5.20				

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MW2

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL STM MW2
PUMPING (OBSERVATION WELL)
(PUMPING) RECOVERY DATA
PAGE 2 OF _____

PUMPING TEST DATA

TYPE OF PUMPING TEST Constant Q Test
HOW Q MEASURED _____
HOW WL's MEASURED Pressure Transducer
PUMPED WELL NO. STM 6ID 11
RADIUS of PUMPED WELL _____
DISTANCE from PUMPED WELL _____

M.P. for WL's Top of Casing elev. _____
DEPTH OF PUMP/AIRLINE _____ wrt _____
% SUBMERGENCE: initial _____ pumping _____
PUMP ON: date 8/8/00 time 0900
PUMP OFF: date _____ time _____

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 187.96						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)
1600	— 7	420			193.34			5.38				EE
1630	30 7	450			193.47			5.51				
1700	— 8	480			193.53			5.56				
1730	30 8	510			193.67			5.71				DD
1800	— 9	540			193.79			5.83				"
1830	30 9	570			194.00			6.04				"
1900	10	600			194.19			6.23				"
1930	30 10	630			194.33			6.37				"
2000	— 11	660			194.47			6.51				"
2030	30 11	690			194.58			6.62				"
2100	— 12	720			194.70			6.74				"
2130	30 12	750			194.83			6.87				"
2200	— 13	780			194.93			6.97				EM
2230	30 13	810			195.03			7.07				
2300	— 14	840			195.15			7.19				
2330	30 14	870			195.28			7.32				
2400	— 15	900			195.35			7.39				
0030	30 15	930			195 39			7.43				
0100	— 16	960			199.99			7.03				
0130	30 16	990			195 19			7.23				
0200	— 17	1020			195 32			7.36				
0230	30 17	1050			195,35			7.39				
0300	18	1080			195,35			7,39				
0330		1110			195,50			7.54				
0400	19	1140			195,56			7.60				
0430		1170			195,68			7.72				
0500	20	1200			195,72			7.76				
0530		1230			195,78			7.82				
0600	21	1260			195.56			7,60				
0630		1290			195.68			7.72				
0700	— 22	1320			195,78			7.82				
0730	30 22	1350			195,89			7.93				
0800		1380			195.93			7,97				
0830		1410			196,00			8,04				
0900		1440			196,06			8,10				
1000		1500			196,18			8,22				
1100	26	1560			196,26			8.30				
1200		1620			196.18			8,22				
1300	28	1680			196.36			8.40				
1400	29	1740			196.46			8.50				
1500	30	1800			196,41			8.45				
1600	31	1860			196.49	Sounder		8.53				
1700	32	1920			196.64			8.68				
2100		2160				193.07						MW

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MW2

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL 57m MW 2
PUMPING / OBSERVATION WELL
PUMPING / RECOVERY DATA
PAGE 3 OF _____

PUMPING TEST DATA

TYPE OF PUMPING TEST Constant Q
HOW Q MEASURED _____
HOW WL's MEASURED pressure transducer/sounder
PUMPED WELL NO. STMGID 11
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 8/2/00 time 0900
PUMP OFF: date _____ time _____

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 187.96					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)
1757					196.66							
1857					196.79	sounder						
1957					196.87							
2057		2157			196.81	193.67		8.85				
2157		2217			196.91	193.74						
2257		2277			197.05	193.78						
2357		2337			197.08	193.83		9.12				
0057		2397			197.18							
0157		2457			197.24	193.91						
0257		2517			197.27							
0357		2577			197.32	194.00		9.36				
0457					197.44							
0557		2697			197.45	194.10		9.49				
0657		2757			197.52	194.12		9.57				
0831		2857			197.58	194.18		9.62				
0922		2922			197.62	194.20		9.64				
1102		3002			197.62	194.23		9.67				
1242		3102			197.38	194.16		9.60				
1422		3202			197.61	194.25		9.69				
1602		3302			197.55	194.26		9.70				
1757		3417			197.77	194.34		9.81				
1937		3517			197.86	194.42		9.90				
2057		3597			197.90	194.44		9.94				
2357		3717			198.01	194.56		10.05				
0117		3857			197.94	194.58		9.98				
0357		4017			197.91	194.60		9.95				
0600		4140			198.06			10.10				
0840		4300			198.23	194.76		10.27				
0900												

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MW2

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL STM MW2
PUMPING / OBSERVATION WELL
PUMPING / RECOVERY DATA
PAGE 1 OF _____

PUMPING TEST DATA

TYPE OF PUMPING TEST CONSTANT Q RECOVERY
HOW Q MEASURED TRANSDUCER & SOUNDER
HOW WL's MEASURED _____
PUMPED WELL NO. STM GID 11
RADIUS of PUMPED WELL _____
DISTANCE from PUMPED WELL _____

M.P. for WL's TOP OF CASING elev. _____
DEPTH OF PUMP/AIRLINE _____ wrt _____
% SUBMERGENCE: initial _____ pumping _____
PUMP ON: date 8/8/00 time 0900
PUMP OFF: date 8/11/00 time 0900

TIME t = 4320 at t'=0				WATER LEVEL DATA STATIC WATER LEVEL 187.96 Hermit					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)
0901		4321			198.30						
2					198.26						
3					198.24						
4					198.24						
5					198.18						
6					198.17						
7					198.16						
8					198.11						
9					198.11						
10					198.08						
12					198.00						
14					197.91						
16					197.87						
18					197.84						
20					197.80						
25					197.67						
30					197.55						
35					197.45						
40					197.35						
45					197.27						
50					197.12						
0955					197.04						
1000		4380			197.00						
1010					196.79					8/11/00	
1020					196.64						WL=193.78 @ 1110
1030					196.55						vs. 195.91 on Hermit
1040					196.35						Δ = 2.13
1050					196.18						
1100		4440			196.09						
1120					195.79						
1140					195.56						
1200		4500			195.38						
1218					195.19						193.32 @ 1218
1228					195.08						195.19 Δ = 1.87
1238					194.97						
1248					194.90						193.19 @ 1238
1258		4558			194.83						195.08 Δ = 1.89
1308					194.76						
1318					194.69						193.14 @ 1248
1328					194.62						194.97 Δ = 1.83
1358		4618			194.43						
1428					194.27						192.98 @ 1328
1458		4678			194.10						194.62 Δ = 1.64
1528					193.94						
2008		4988			192.95						192.52 @ 1538
8/12 0710		5650			191.71	191.08					193.88 Δ = 1.36

UTIL-16

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL Pepple Domestic
PUMPING / OBSERVATION WELL
PUMPING / RECOVERY DATA
PAGE 1 OF _____

PUMPING TEST DATA

TYPE OF PUMPING TEST Constant Q
HOW Q MEASURED 8" 46" orifice
HOW WL's MEASURED Steel Tape
PUMPED WELL NO. STMGID 11
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 _____ time _____
PUMP OFF: date _____ time _____

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL					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)
8/09 0845					201.35							205 - 3.65 201.35
1500					207.50							[illegible]
8/10 0800					203.67							210 - 10.83 - [illegible]
8/11 0815					202.78							E.E.

UTIL-16

Drift-Pac

Wellbore Deviation and Directional Interpretation

welenco

Company	Lang Exploratory Drilling	**County**	Washoe	**State**	NV
Well Number	STMGID #11	**Date of Survey**	Friday, September 8, 2000	**Declination Used**	16 East
Field	Thomas Creek Pumping Station	**Recorded By**	Dan Ihde		
Equipment No.	L-17 **Job Number** 32890	**welenco Office**	Bakersfield	**Witness**	Darrin Howard
Location	Off of Zelozzi Rd.				
Remarks	Gyro Zeroed at top of Casing	**Tool Type**	Gyroscopic	**Tool Number**	
Directional Calculation	Balanced Tangential Method	**Dogleg Calculation**	Lubinski Method		

Measured Information			Closure Calculations				Rectangular Coordinates				Dogleg Severity Calculations	
Measured Depth, Feet	Inclination, Degees	Azimuth Degrees, True	Course Deviation, Feet	True Vertical Depth, Feet	Closure Distance, Feet	Closure Bearing Degrees, True	Latitude, Feet	Departure, Feet	Total Latitude, Feet	Total Departure, Feet	Dogleg Severity, Degs/20 Feet	Dogleg Severity, Degs/100 Feet
0.00	0.00	23										
50.00	0.00	51	0.00	50.00	0.00	37.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.10	97	0.04	99.99	0.04	97.00	-0.01	0.04	-0.01	0.04	0.00	0.00
150.00	0.10	179	0.07	149.98	0.10	125.00	-0.05	0.04	-0.06	0.08	0.05	0.26
200.00	0.00	318	0.04	199.97	0.13	142.10	-0.04	0.00	-0.10	0.08	0.00	0.00
250.00	0.10	343	0.04	249.96	0.09	130.90	0.04	-0.01	-0.06	0.07	0.00	0.00
300.00	0.10	295	0.08	299.95	0.02	89.50	0.06	-0.05	0.00	0.02	0.03	0.16
350.00	0.00	309	0.04	349.94	0.03	313.30	0.02	-0.04	0.02	-0.02	0.00	0.00
400.00	0.10	337	0.04	399.93	0.07	328.40	0.04	-0.02	0.06	-0.04	0.00	0.00
450.00	0.10	337	0.09	449.92	0.16	332.20	0.08	-0.03	0.14	-0.07	0.00	0.00
500.00	0.00	7	0.04	499.91	0.20	334.20	0.04	-0.02	0.18	-0.09	0.00	0.00
550.00	0.00	5	0.00	549.91	0.20	333.40	0.00	0.00	0.18	-0.09	0.00	0.00
600.00	0.20	314	0.09	599.90	0.29	327.60	0.06	-0.06	0.24	-0.15	0.00	0.00
650.00	0.20	297	0.17	649.89	0.45	319.50	0.10	-0.14	0.34	-0.29	0.02	0.12
700.00	0.00	324	0.09	699.88	0.53	315.90	0.04	-0.08	0.38	-0.37	0.00	0.00
723.00	0.30	342	0.06	722.87	0.58	318.40	0.06	-0.02	0.44	-0.39	0.00	0.00

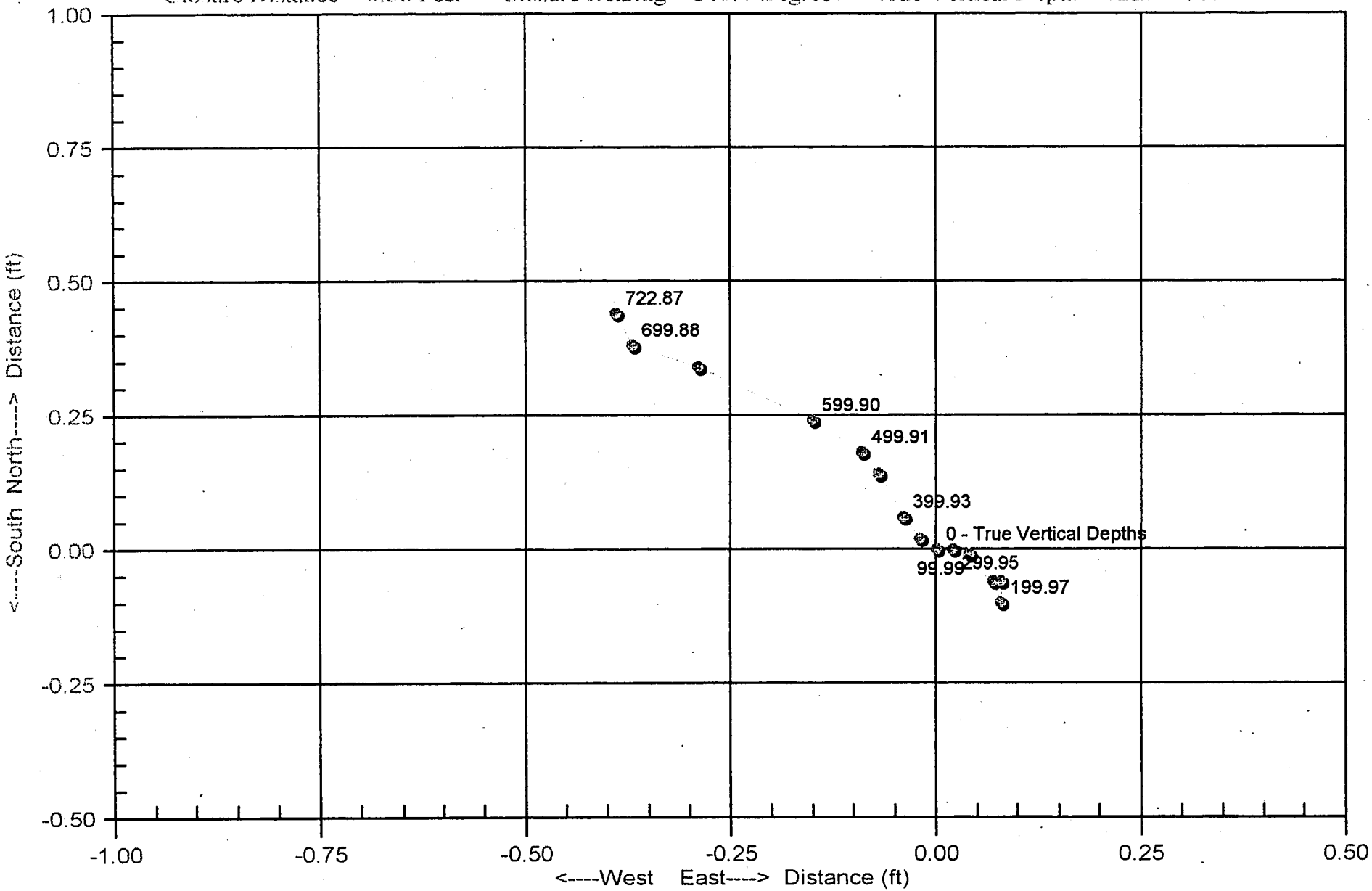
TVD in Feet 722.87 **Final Closure Distance Feet** 0.58 **Final Closure Bearing in Degrees** 31[illegible]

Lang Exploratory Drilling

STMGID #11

Drift-Pac Plan View

Closure Distance = 0.58 Feet Closure Bearing = 318.4 Degrees True Vertical Depth = 722.87 Feet



Date of Survey: Friday, September 8, 2000

Balanced Tangential Calculation Method

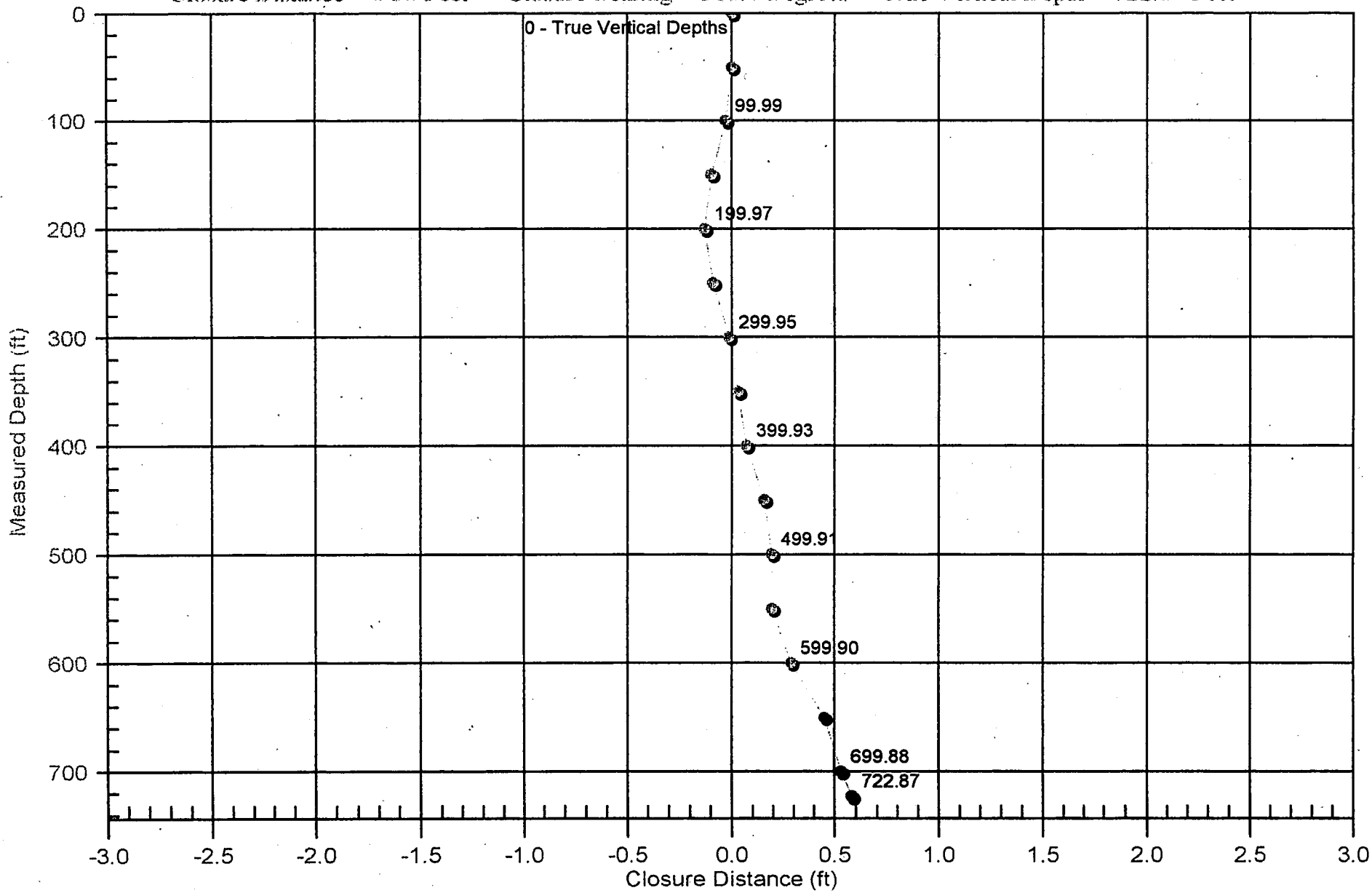
Welenco, Inc. (8[illegible]445-9914

Lang Exploratory Drilling

STMGID #11

Drift-Pac Plane of Closure View

Closure Distance = 0.58 Feet Closure Bearing = 318.4 Degrees True Vertical Depth = 722.87 Feet



Date of Survey: Friday, September 8, 2000

Balanced Tangential Calculation Method

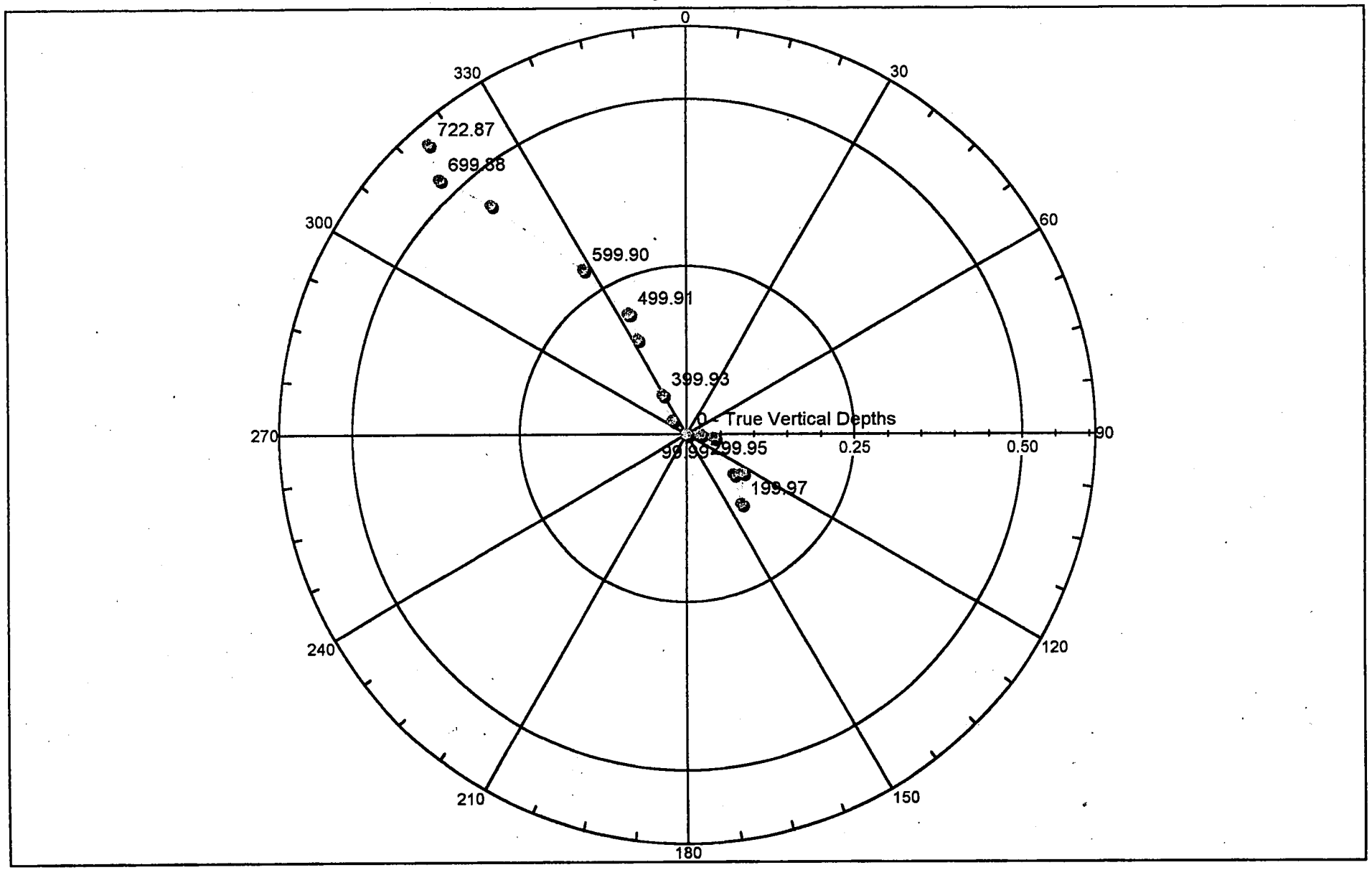
Welenco, Inc. (8[illegible]445-9914

Lang Exploratory Drilling

STMGID #11

Drift-Pac Polar View

Closure Distance = 0.58 Feet Closure Bearing = 318.4 Degrees True Vertical Depth = 722.87 Feet



Date of Survey: Friday, September 8, 2000

Balanced Tangential Calculation Method

Welenco, Inc. (8[illegible]445-9914

N TRIPLICATE
'LEASE PRINT OR TYPE)

NEVADA STATE HEALTH LABORATORY
University of Nevada School of Medicine/385
Reno, Nevada 89557
(775) 688-1335

146998

WATER CHEMISTRY ANALYSIS:

Attn: Fees may apply to some types of samples.

00 AUG 10 PM 12:02

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

TYPE OF ANALYSIS:

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

State Nevada County Washoe
Township 18 Range 20 Section 19
General Location Zolezz. Lane
Source Address STMGID #11 (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 8-10-00
Owner Washoe County Phone
Address P.O. Box 11130
City Reno State Nevada

REASON FOR ANALYSIS:

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

USE OF WATER:

- XX ☐ Domestic drinking water
- ☐ Geothermal
- ☐ Industrial or mining
- ☐ Irrigation
- ☐ Other
- Initials

REPORT TO:

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

SOURCE OF WATER:

Filter ☐ Yes ☐ No
Public ☒ Yes ☐ No
Spring
Well X Depth ft.
Hot Cold
IN USE: ☐ Yes ☒ No

Type
Name STMGID #11
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		Constituent		Constituent		Constituent	
9318	19 ppm	0.71	31.1 ppm	5.0	0.0 - 1309	146998	S.U.
T.D.S. @ 180° C.	171	Chloride	1	Iron	0.03	Color	3
Hardness	88	Nitrate -N	0.8	Manganese	0.00	Turbitity	0.8
Calcium	17	Alkalinity	120	Copper	0.01	pH	7.95
Magnesium	11	Bicarbonate	146	Zinc	0.01	EC	242
Sodium	14	Carbonate	0	Barium	0.08		
Potassium	6	Fluoride	0.05	Boron	0.0		
Sulfate	3	Arsenic	< 0.003	Silica	67		
MBAS	<0.1	NO_2	<0.01	Li	<0.20	gross α	4 pCi/L
CN	<0.005	Pb	<0.001	Ammonia	<0.1	gross β	8 pCi/L

PRINT OTHER DESIRED CONSTITUENTS BELOW

Constituent	ppm
Cd	<0.001
Cr	0.002
Hg	<0.0005
Se	<0.001
Sb	<0.001
Ni	<0.001
Tl	<0.0005
Be	<0.001

Fee
Collected by
PWS I.D. 215 C
SDWA — Pri. Sec.
1st 2nd 3rd
Date Rec'd Init.

Remarks
jm 8-29-00
* New Well
9-12-00
jm 8/30/00
RESULTS REPORTED
SEP 15 2000

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

(Rev. 6/99)

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
1 800 566 LABS (1 800 566 5227)

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
Project Manager

Report#: 68874
DRINKING

Laboratory certifies that the test results meet all QA/QC requirements unless noted in the Comments section or the Case Narrative. Following the cover page are QC Report,QC Summary,Data Report, totaling 3 page[s].

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: NR

SAMPLE TEMP, RECEIPT AT LAB: 6°C

BLUE ICE: FROZEN ___ PARTIALLY FROZEN ✓ THAWED ___

TO BE COMPLETED BY SAMPLER:

PROJECT NAME	PROJECT JOB # / P.O.#

SAMPLER(S): PRINTED NAME AND SIGNATURE

John Hulett

REFER TO ATTACHED BOTTLE ORDER FOR ANALYSES ☒ (check for yes)

ANALYSES REQUIRED (mark an 'X' in all tests required for each sample line)

TIME	DATE	LOCATION	IDENTIFIER	GRAB	COMP	X Radon	SAMPLER COMMENTS
11:30	8-10a	STMGID#	11	X		X	

	SIGNATURE	PRINT NAME	COMPANY/TITLE	DATE	TIME
RELINQUISHED BY:		John Hulett	WCDWR	8-10-00	12:30
RECEIVED BY:	NR	Nancy Rodriguez		8-11	9:46
RELINQUISHED BY:					
RECEIVED BY:					
RELINQUISHED BY:					
RECEIVED BY:					

C-O-C# _____

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
Phone: (775) 954-4625

Customer Code: WASHOE
PO#: 179701
Group#: 68874
Project#: DRINKING
Proj Mgr: Hillary Strayer
Phone: (626) 568-6412

The following samples were received from you on **08/11/00**. 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	Matrix	Sample Date
	Tests Scheduled		
2008110115	STMGID 11	Water	10-aug-2000 11:30:00
	@RN		

Test Acronym Description

Test Acronym	Description
@RN	Radon 222

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
1 800 566 LABS (1 800 566 5227)

Laboratory
Data Report
#68874

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

Samples Received

08/11/00

STMGID 11 (2008110115) Sampled on 08/10/00 11:30

Radon 222

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MRL	Dilution
08/11/00 12:00	121720	(SM7500RN	)	Radon 222	1000	pCi/l	50	1
08/11/00 12:00	121720	(SM7500RN	)	Radon 222, Two Sigma Error	27	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 (1 800 566 5227)

Laboratory
QC Summary
#68874

Washoe County Dept. of Water
Resources

QC Batch #121720 - Radon 222

Analysis Date: 08/11/2000

2008110115 STMGID 11

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
1 800 566 LABS (1 800 566 5227)

Laboratory
QC Report
#68874

Washoe County Dept. of Water Resources

QC Batch #121720 Radon 222

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Radon 222	1000	933	93.3	(80.00 - 120.00)	
LCS2	Radon 222	1000	967	96.7	(80.00 - 120.00)	3.6
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, batch control is based on LCS. Criteria for duplicates are advisory only, unless otherwise specified in the method.

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

CASE NARRATIVE
September 13, 2000

One sample was received on 08/10/00 for the analysis 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
WCW00081025-01	STMGID #11	08/10/00	11:10

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:
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 549.2:
All QC criteria were met with no abnormalities.

Walter J. Hinchman
Quality Assurance Officer

9/13/00
Date

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

ANALYTICAL REPORT

Client: Washoe County Water Resources
4930 Energy Way
Reno, NV, 89502
Attn: Terri Svetich
Client Sample ID: STMGID#11

Lab Sample ID: 00081025-01A
Date Sampled: 8/10/00
Date Received: 8/10/00
Matrix: Drinking Water
PWS/DWR#: 215

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

Analyte	Result	R.L.	Units	Date Analyzed
E504.1 EDB AND DBCP				
1,2-Dibromoethane	ND	0.010	µg/L	8/12/00
1,2-Dibromo-3-chloropropane	ND	0.020	µg/L	8/12/00
E505 ORGANOHALIDE PESTICIDES AND PCBS				
Hexachlorocyclopentadiene	ND	0.10	µg/L	8/16/00
Hexachlorobenzene	ND	0.10	µg/L	8/16/00
gamma-BHC	ND	0.020	µg/L	8/16/00
Alachlor	ND	0.20	µg/L	8/16/00
Heptachlor	ND	0.040	µg/L	8/16/00
Aldrin	ND	0.20	µg/L	8/16/00
Heptachlor epoxide	ND	0.020	µg/L	8/16/00
Dieldrin	ND	0.20	µg/L	8/16/00
Endrin	ND	0.010	µg/L	8/16/00
Methoxychlor	ND	0.10	µg/L	8/16/00
Chlordane	ND	0.20	µg/L	8/16/00
Toxaphene	ND	1.0	µg/L	8/16/00
Aroclor 1016	ND	0.080	µg/L	8/16/00
Aroclor 1221	ND	20	µg/L	8/16/00
Aroclor 1232	ND	0.50	µg/L	8/16/00
Aroclor 1242	ND	0.30	µg/L	8/16/00
Aroclor 1248	ND	0.10	µg/L	8/16/00
Aroclor 1254	ND	0.10	µg/L	8/16/00
Aroclor 1260	ND	0.20	µg/L	8/16/00
E515.1 CHLORINATED ACID HERBICIDES				
Dalapon	ND	1.0	µg/L	8/22/00
Dicamba	ND	0.50	µg/L	8/22/00
2,4-D	ND	0.10	µg/L	8/22/00
PCP	ND	0.040	µg/L	8/22/00
2,4,5-TP	ND	0.20	µg/L	8/22/00
Dinoseb	ND	0.20	µg/L	8/22/00
Pichloram	ND	0.10	µg/L	8/22/00

Analyte	Result	R.L.	Units	Date Analyzed
E525.2 SVOCS BY GCMS				
Propachlor	ND	1.0	µg/L	8/16/00
Simazine	ND	0.070	µg/L	8/16/00
Atrazine	ND	0.10	µg/L	8/16/00
Metribuzin	ND	1.0	µg/L	8/16/00
Alachlor	ND	0.20	µg/L	8/16/00
Metolachlor	ND	1.0	µg/L	8/16/00
Butachlor	ND	1.0	µg/L	8/16/00
bis(2-Ethylhexyl)adipate	ND	0.60	µg/L	8/16/00
bis(2-Ethylhexyl)phthalate	ND	0.60	µg/L	8/16/00
Benzo(a)pyrene	ND	0.020	µg/L	8/16/00
E531.1 CARBAMATES				
Aldicarb sulfoxide	ND	0.50	µg/L	8/23/00
Aldicarb sulfone	ND	0.80	µg/L	8/23/00
Oxamyl	ND	2.0	µg/L	8/23/00
Methomyl	ND	1.0	µg/L	8/23/00
3-Hydroxycarbofuran	ND	1.0	µg/L	8/23/00
Aldicarb	ND	0.50	µg/L	8/23/00
Carbofuran	ND	0.90	µg/L	8/23/00
Carbaryl	ND	1.0	µg/L	8/23/00
E547 GLYPHOSATE				
Glyphosate	ND	6.0	µg/L	8/21/00
E548.1 ENDOTHALL				
Endothall	ND	9.0	µg/L	8/16/00
E549.2 DIQUAT/PARAQUAT				
Diquat	ND	0.40	µg/L	8/15/00

ND = Not Detected

Approved By: Walter Hinchman Date: 9/13/00

Walter Hinchman
Quality Assurance Officer

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

ANALYTICAL REPORT

Washoe County Water Resources
4930 Energy Way
Reno, NV 89502

Job#:
Phone: (775) 954-4641
Attn: Terri Svetich

Alpha Analytical Number: WCW00081025-01A
Client I.D. Number: STMGID#11

Sampled: 08/10/00
Received: 08/10/00
Analyzed: 08/11/00

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	trans-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	cis-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: _____ Date: 8/22/00

Roger L. Scholl, Ph.D.
Laboratory Director

welenco

GAMMA RAY-CALIPER LOG

FILING NO.	COMPANY	LANG EXPLORATORY DRILLING
	WELL	MW-10
	FIELD	SADDLEHORN ADDITION
	COUNTY	WASHOE — STATE CALIFORNIA
JOB NO. 33002	LOCATION: SADDLEHORN DRIVE SEC 25 TWP 18 RGE ~~20~~ 19	OTHER SERV: E-LOG

PERMANENT DATUM: G.L. ELEV: 5600'

LOG MEASURED FROM G.L. FT ABOVE PERM DATUM

DRILLING MEASURED FROM G.L.

ELEVATION: KB. ___ DF. ___ GL. ___

DATE	MAY 30, 2000	MAY 30, 2000	
TYPE OF LOG	GAMMA RAY	CALIPER	
RUN NO.	ONE	ONE	
DEPTH - DRILLER	705'	705'	
DEPTH - LOGGER	705'	705'	
BOTTOM LOGGED INT	704'	704'	
TOP LOGGED INT	0'	0'	
T.PE FLUID IN HOLE	BENTONITE	BENTONITE	
FLUID LEVEL	FULL	FULL	
MAX TEMP DEG F	N/A	N/A	
OPERATING RIG TIME	1 HR.	.5 HR.	
EQUIP. LOCATION	L-22 SNS	L-22 SNS	
OPERATOR	SHARPLESS	SHARPLESS	
WITNESSED BY	WIDMER	WIDMER	

RUN	BORE HOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	TYPE	FROM	TO
ONE	7.25"	37'	TD	8" OD	STEEL	SURF	37'

EQUIPMENT DATA

LOG TYPE	GAMMA RAY	CALIPER	
RUN NO.	ONE	ONE	
TOOL MODEL NO.	MLS-GRGD	MLS-TAC	
TOOL SERIAL NO.	PT-1T	T-138	
DIAMETER	2 1/8"	1 3/8"	
DETECTOR TYPE	SCINT.	PULSE	
DETECTOR LENGTH	6"	6" ARMS	
UNITS/DIV.	10 API	.5 INCH	
SENSITIVITY	100/215	500/500	
TIME CONSTANT	3	1	
ZERO DIV L OR R	5-L	0-L	
SPEED-FPM	20	45	
FLUID LEVEL	FULL	FULL	
FORMATION FACTOR	N/A	N/A	
PUMP RATE-GPM	N/A	N/A	
PUMP RATE-GPM			
PUMP RATE-GPM			

SOURCE TYPE	STRENGTH	SPACING	MODEL NO	SERIAL NO.

PERFORATIONS:

REMARKS:

NOTICE:
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by one of our officers, agents or employees. These interpretations are also subject to our General Terms and Conditions as set out in our current Price Schedule.

WELENCO, INC.

Welenco

ELECTRIC LOG

FILING NO.

COMPANY LONG EXPLORATORY DRILLING

WELL 31-18

FIELD

COUNTY HUMBOLDT STATE NEVADA

LOCATION SHOULDHORN DRIVE

SEC. 25 TWP. 18 RGE. 38E

Elev.: 5680 K.B.

G.L. 5660

OTHER SERV. CALIPER

API NO. 2500900

Permanent Datum: G.L. Ft. Above Perm. Datum

Log Measured From G.L. Ft. Above Perm. Datum

Drilling Measured From K.B.

Date	MAY 30, 2008		
Run No.	ONE		
Depth - Driller	7265		
Depth - Logger	7265		
Btm. Log Interval	7264		
Top Log Interval	327		
Casing-Driller	8"	at 327	
Casing-Logger	8"	at 327	
Bit Size	7 7/8"		
Type Fluid in Hole	GEL CHEMICAL		
Dens. / Visc.	M/G		
pH / Fluid Loss	M/G		
Source of Sample	MUD PIT		
Rm at Meas. Temp.	1.05 @ 68 F		
Rmf at Meas. Temp.	M/G at F		
Rmc at Meas. Temp.	M/G at F		
Source: Rmf / Rmc	M/G		
Rm at BHT	M/G at F		
Rmf at BHT	M/G at F		
Rmc at BHT	M/G at F		
Time Since Circ.			
Max. Rec. Temp.	M/G at F		
Equip. Location	5-232		
Recorded By	SHARPLESS		
Witnessed By	WIDNER		

Fold Here

This Heading and Log Conform To API RP 31

Changes in Mud Type or Additional Samples

Date	Sample No.		
Depth-Driller			
Type Fluid in Hole			
Dens. / Visc.			
ph / Fluid Loss	ml		ml
Source of Sample			
Rm at Meas. Temp.	at F		at F
Rmf at Meas. Temp.	at F		at F
Rmc at Meas. Temp.	at F		at F
Source: Rmf / Rmc			
Rm at BHT	at F		at F
Rmf at BHT	at F		at F
Rmc at BHT	at F		at F

Scale Changes

Type Log	Depth	Scale Up Hole	Scale Down Hole

Equipment Data

Run No.	Tool Type	Pad Tube	Tool Pos.	Other
ONE	ELECTRIC		FREE	

REMARKS:

SPONTANEOUS POTENTIAL
millivolts

DEPTHS

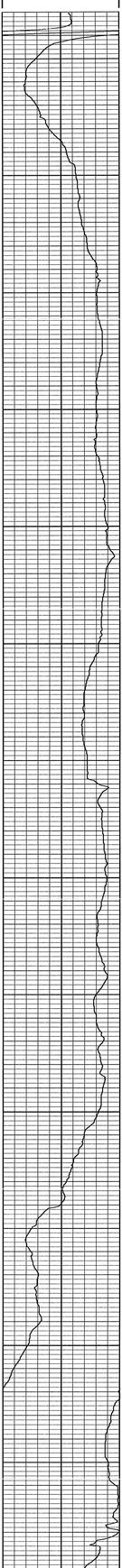
RESISTIVITY
ohmmeters2 /meter

SHORT NORMAL
16 Inch
0 — 500
x10 BACK UP
0 — 5000

LONG NORMAL
64 Inch
0 — 500
x10 BACK UP
0 — 5000

RESISTANCE
ohms

SINGLE POINT
Detail Curve



millivolts
SPONTANEOUS POTENTIAL

DEPTHS

ohmmeters2/meter
RESISTIVITY

ohms
RESISTANCE

SINGLE POINT
Detail Curve

LONG NORMAL
64 Inch
SHORT NORMAL
16 Inch