

Stantec Consulting Inc.
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www.stantec.com



**SUMMARY OF WELL CONSTRUCTION
MT. ROSE SKI AREA
WASHOE COUNTY, NEVADA**

JANUARY 1999

Buildings

PREPARED FOR:

MT. ROSE DEVELOPMENT COMPANY

Environment

Industrial

Management Systems

Transportation

Urban Land

Stantec Consulting Inc.
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Stantec

January 6, 1999
Project No. 26100027

Paul Senft
MT. ROSE DEVELOPMENT COMPANY
22222 Mt. Rose Highway
Reno, Nevada 89511

RE: Water Well Construction and Testing

Dear Paul:

This report contains a summary of drilling, construction, pumping tests, and water quality testing for the new water well built at Mt. Rose Ski Area. In the appendices you will find the following information:

- Appendix A - Geologic and electric logs
- Appendix B - As-built drawing
- Appendix C - Pumping test results (plots)
- Appendix D - Water quality testing

It has been a pleasure working with you on this portion of the improvements at Mt. Rose Ski Area. Please do not hesitate to contact me, if you have any questions regarding equipping or operation of the well.

Buildings

Environment

Industrial

Management Systems

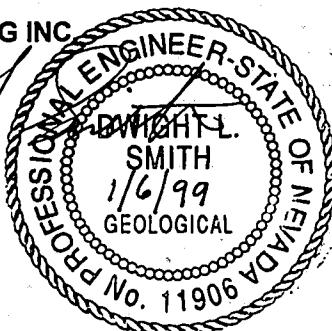
Transportation

Urban Land

Sincerely,

STANTEC CONSULTING INC.

Dwight L. Smith, P.E.
Hydrogeologist

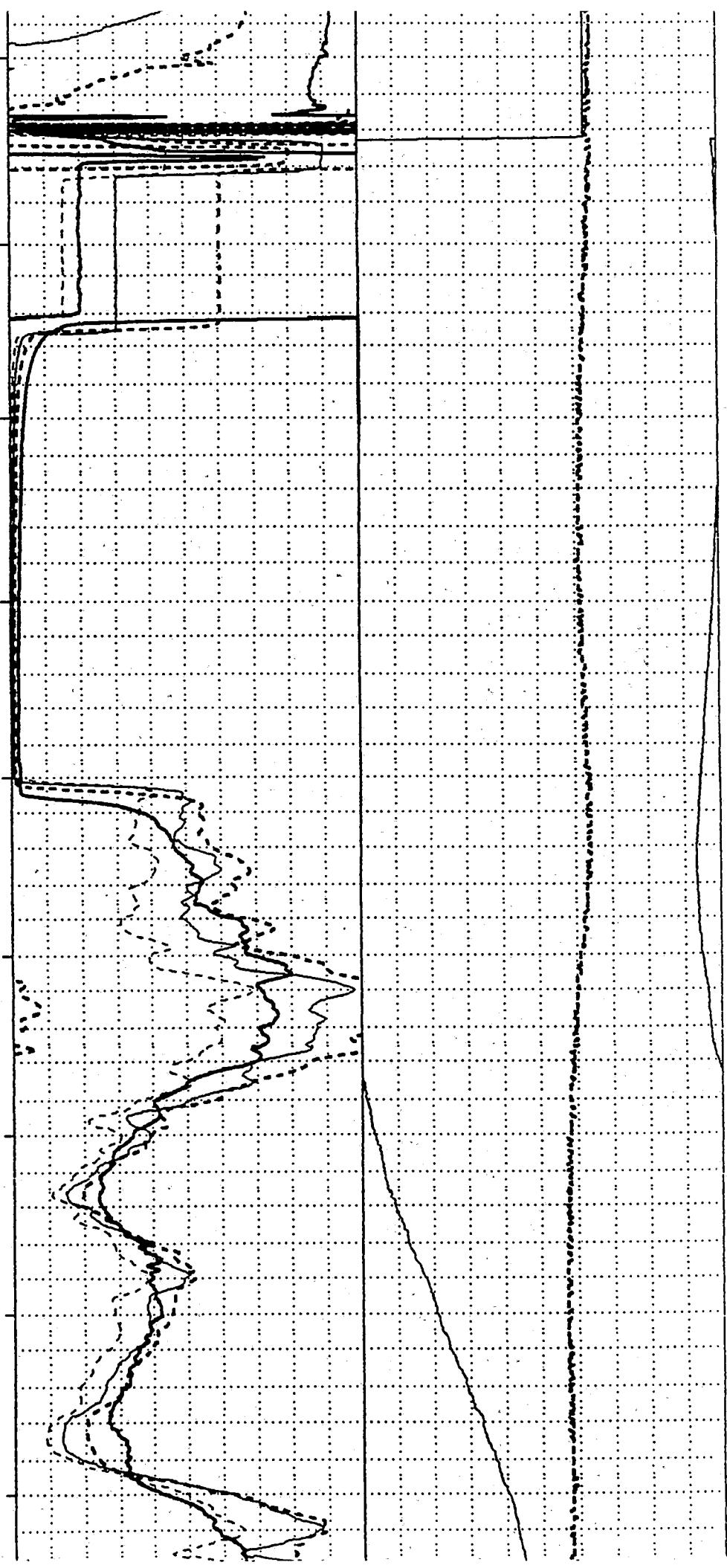


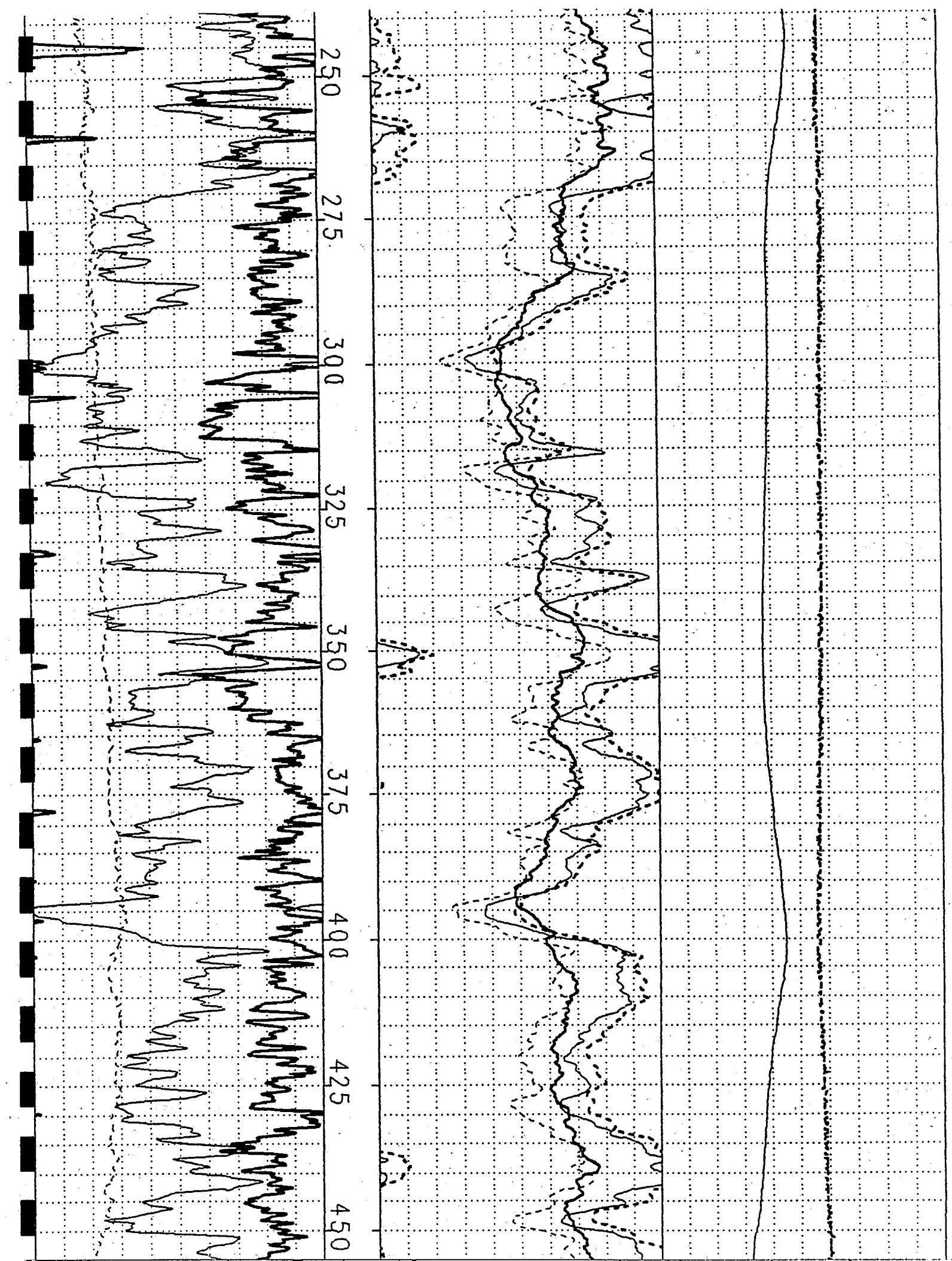
DLS:rw

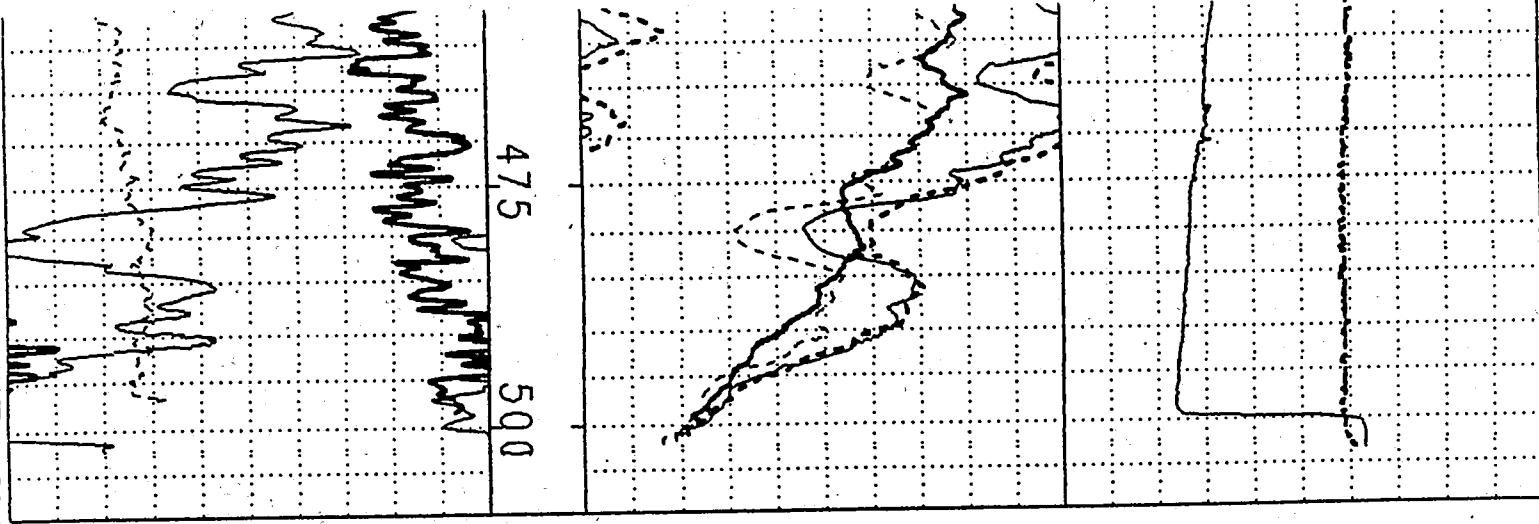
Enclosures

pigeotech6100027wpdocs/reports/well-as-built-report.doc

25 50 75 100 125 150 175 200 225







**SUMMARY OF WELL CONSTRUCTION
MT. ROSE SKI AREA
WASHOE COUNTY, NEVADA**

Drilling and Well Construction

Drilling was commenced by Nevada Drilling, Incorporated in August, 1998 and well construction and pumping tests were completed by mid-October, 1998. Drilling encountered alluvium (gravel and sands with boulders and cobbles) down to a depth of approximately 120 feet. Granite bedrock was encountered below the alluvium. The granite bedrock was moderately to highly fractured for most the depth drilled (505 feet). The rock between 170 to 225 feet was particularly fractured, and the rock between 290 to 500 feet was also consistently fractured. A regional fracture system was apparently encountered, as hoped for during the selection of the well location.

The well is constructed of 8-inch diameter casing (inside diameter), and consists of continuous-slot wire-wrap screen (0.10 inch slot size) from 165 to 225 feet, and 265 to 485 feet. A sanitary seal of Type II cement grout ~~seat~~ was placed from approximately 110 feet to within 10 feet of ground surface. Bentonite hole plug was place in the upper 10 feet of annular space between the well casing and the bore hole.

Well Pumping Tests

The well was pumped at rates up to 750 gallons per minute (maximum capacity of the pump) and the well can efficiently produce up to 750 gallons per minute. Water levels recorded for various pumping rates are as follows:

Static Water Level	41.1 feet below top of casing
Pumping Water Level at 150 gpm	44.3 feet
Pumping Water Level at 300 gpm	47.2 feet
Pumping Water Level at 450 gpm	52.5 feet
Pumping Water Level at 600 gpm	58.7 feet
Pumping Water Level at 750 gpm	65.8 feet

A constant rate pumping test was conducted at 700 gpm. Water level recovery measurements which followed this pumping test indicate that well will need recovery time (non-pumping time) in order to avoid detrimental long-term drawdown. The static water level following the pumping test was approximately 10 feet lower than when the test was started. If pumping at a high rate were to be sustained for a long period time, without non-pumping (recovery) periods, the pumping water level would constantly decline as portions of the fracture system are depleted of water quicker than water flows into the fracture system. Large volumes of water can be withdrawn from the fracture system, as long as recovery time is allowed so that water can be replenished.

Numerous scenarios of pumping and recovery could be successfully implemented. The well could be pumped intensively in the early winter for snow making supply and then pumping reduced until after the spring time recharge occurs. For example, the well could be pumped at 600 gpm for 14 hours a day for 6 to 8 weeks, followed by minimal pumping for the remainder of the year. We can review the sustainability of what ever scenario you may desire.

Equipping the well with a pump system will be dependant on several factors, including the horse-power of the pump needed to generate the desired flow rate and lift. The 8-inch diameter casing will limit the size of submersible pump motor and diameter of the drop pipe which can be installed in the well. The desired flow rate and lift will need to be reviewed for compatibility with the

diameter of the well. After periods of sustained pumping for snow making, the pumping water level of the well will be lower until recharge time is allowed, which will also need to be considered when selecting the size of the pump and motor.

Water Quality Testing

Complete State of Nevada drinking water testing was performed on samples of water collected from the well during pumping tests. All results are good, and well within federal and state drinking water standards. Radioactivity testing (gross alpha) results were slightly elevated, therefore, additional testing for Radium-226 was conducted. Radium-226 results are within the allowable standards.

Corrosivity testing was also conducted, with results indicating that the water has a high corrosion potential. This is not unusual for waters that are as low in dissolved solids as the ground water at Mt. Rose. Buffering can be accomplished to reduce the corrosion potential of piping and storage facilities.

The total dissolved solids concentration of the water is 52 parts per million and the pH is 7.8 (slightly above neutral). The water temperature recorded during pumping tests ranged from 40.3 to 40.8 degrees Fahrenheit.

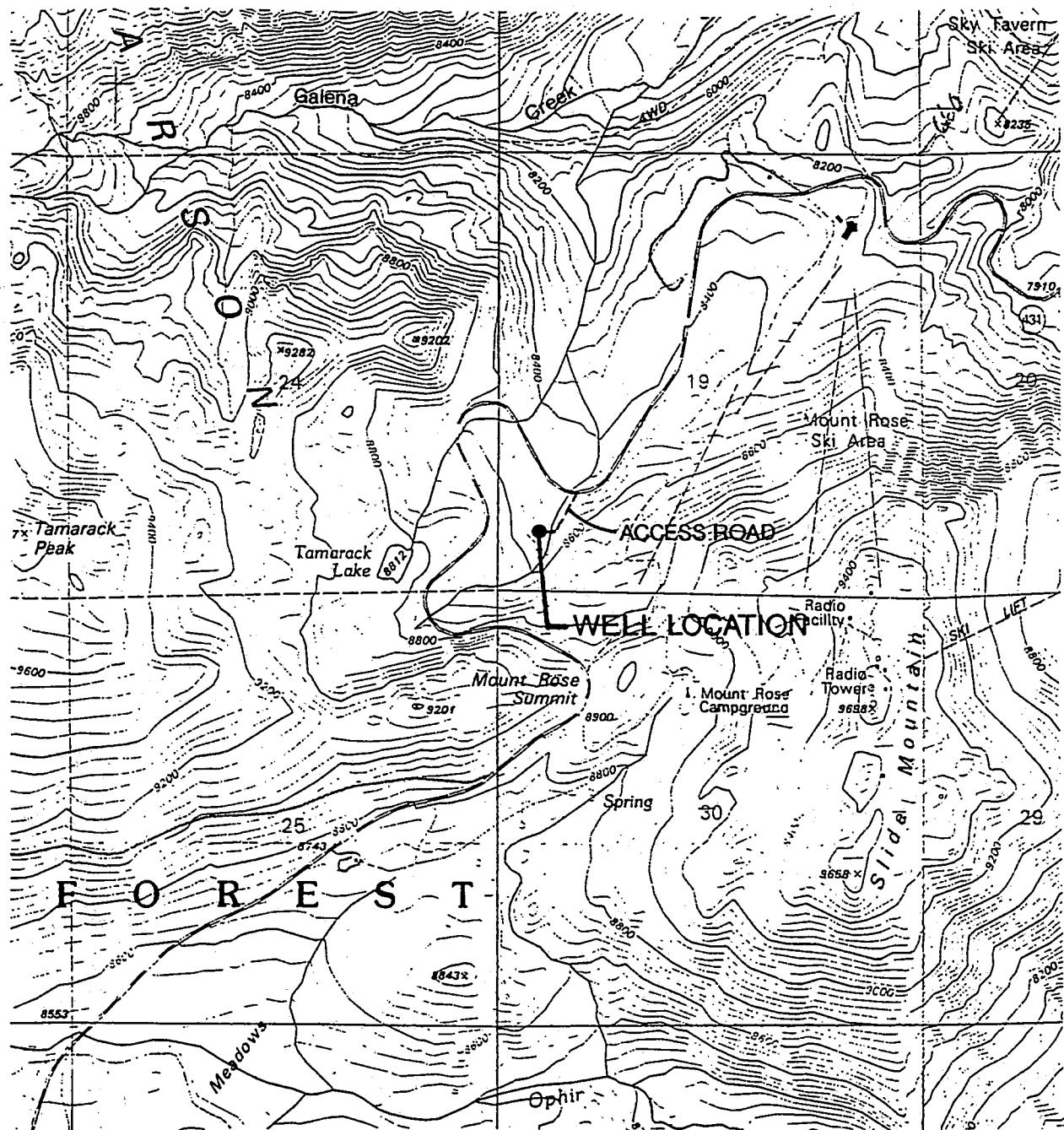
Recommended Long-term Monitoring

It is particularly important in fractured bedrock aquifer systems to monitor water levels both during pumping and non-pumping time periods. Fracture systems can become partially depleted by pumping, significantly reducing well yield. Because some water level depletion was detected during the pumping tests, monitoring of water levels and pumped quantities is strongly advised.

Record keeping of the pumped quantities of water is required by the State Engineer. Measurement of water levels in the well can be accomplished by installing a water level recording transducer when the pump is installed, or water levels can be physically measured with a sounding probe.



1° = 2000'



Stantech Consulting Inc.
950 Industrial Way
Sparks, Nevada 89431 USA
Phone: (702) 358-6931

RENO

LOCATION MAP
MT. ROSE DEVELOPMENT COMPANY
WELL CONSTRUCTION, MT. ROSE SKI AREA
WASHOE COUNTY

NEVADA

PROJECT NO.
26100027
PLATE NO. 1

APPENDIX A

LOG OF BORING

LOG NO.: MT. ROSE GALENA WELL

LOGGED BY: D. Smith

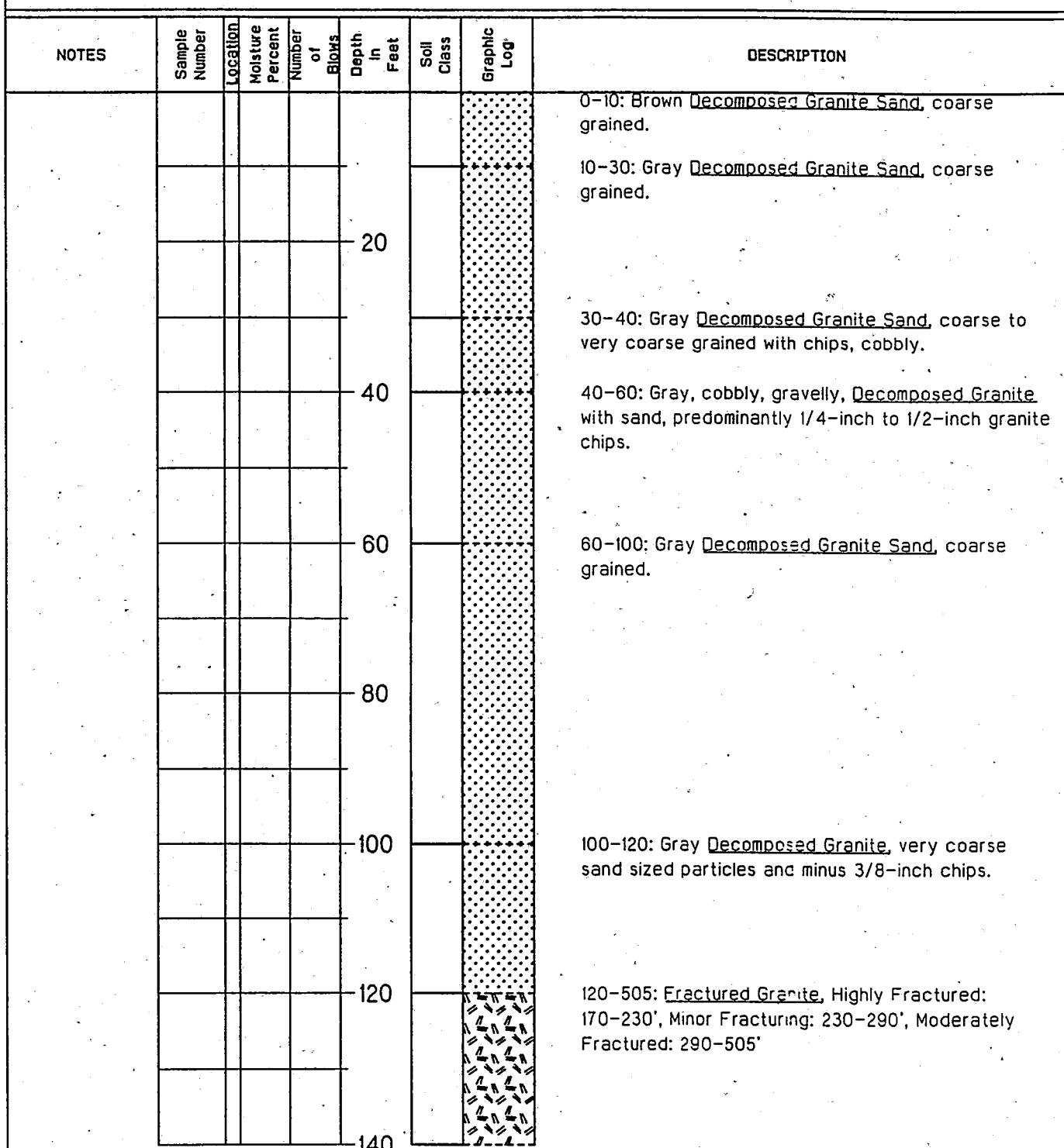
DATE: 9-1-98

TYPE OF BORING: Mud Rotary

GROUND ELEVATION: _____

GROUND WATER DEPTH: 41.1 feet

DATE MEASURED: Oct. 1998



EXPLANATION

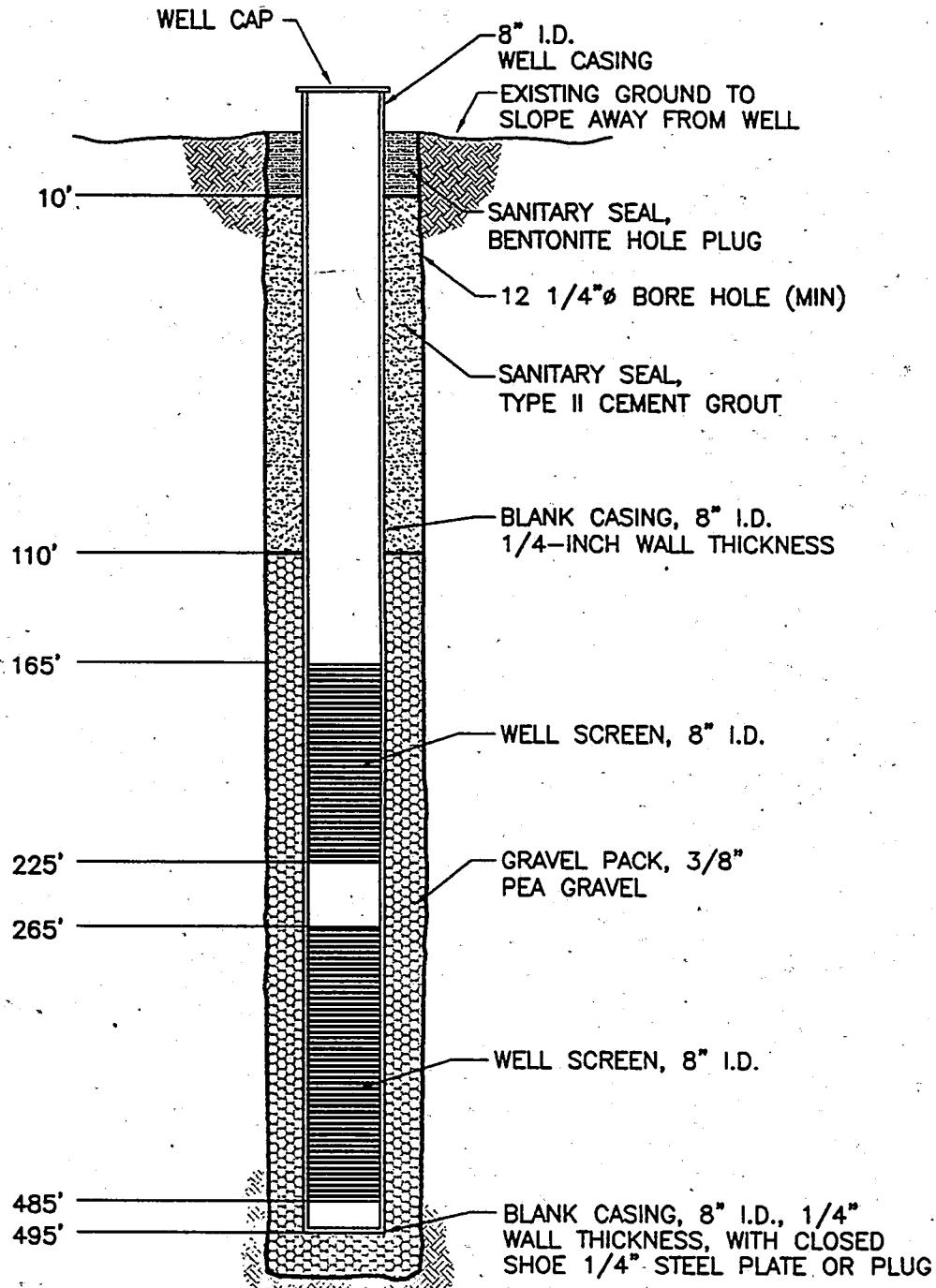
Number of Blows: Record number of blows for one foot penetration of sampler using 140 pound hammer falling 30 inches.

Description: Describe soil type by Unified Soil Classification System with emphasis on in-place or natural condition.

Splitspoon Sample Location 2-inch O.D., 1.5-inch I.D., 1.375-inch Shoe I.D.

Thin Wall Shelby Location 2.5-inch I.D.

APPENDIX B



NTS



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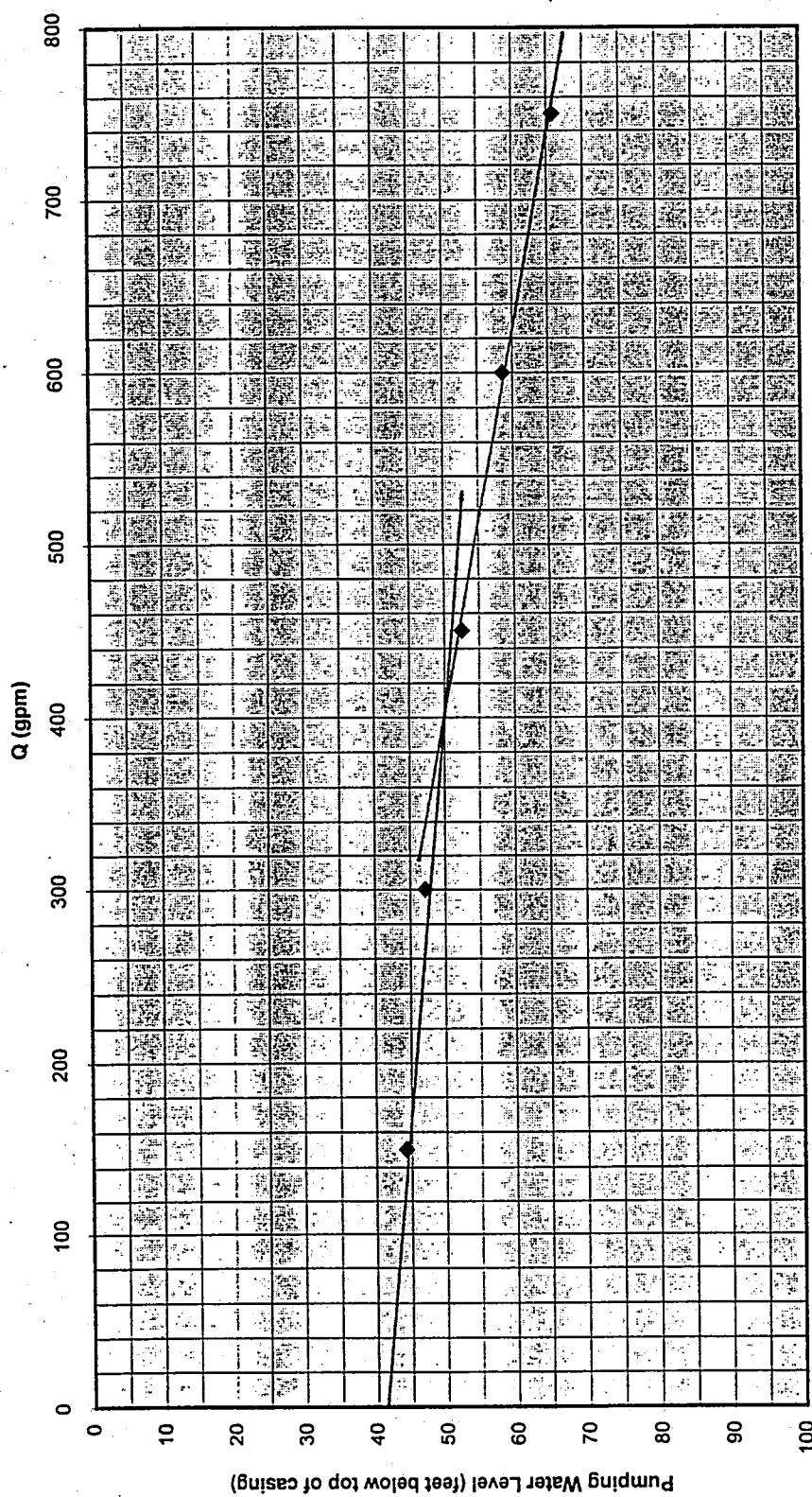
RENO

WELL ASBUILT SCHEMATIC
MT. ROSE DEVELOPMENT COMPANY
MT. ROSE SKI AREA
WASHOE COUNTY

NEVADA

PROJECT NO.
26100027
PLATE NO. 2

APPENDIX C



STEP-DRAWDOWN TEST RESULTS
MT. ROSE DEVELOPMENT COMPANY
PRODUCTION WELL



PROJECT NO.: 261000027

PLATE 3

Stantec

Bruce MacKay
Pump & Well Service, Inc.

PUMPING TEST DATA

WELL

PUMPING/OBSERVATION WELL
 PUMPING/RECOVERY DATA
 PAGE 4 OF

TYPE OF PUMPING TEST Step

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 10-15-98 time _____

PUMP OFF: date _____ time _____

CLOCK TIME	TIME		WATER LEVEL DATA				WATER PRODUCT.	(NOTE ANY CHANGES IN OBSERVERS)			
	ELAPSED TIME min hrs	at t=0	READING	STATIC WATER LEVEL Metres	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or S'	PSI	metre	ft	
700			ON	99273		41'0"	.8	128	150		
710	10	10				43'8"	.8	128	150		
715	15	5				43'10"	.03	128	150		
720	20	5				43'9"		128	150		
730	30	10				43'8½"	-	130	150		
745	45	15				43'9½"		128	150	Adj Pres,	
800	60	15	1 hr			44'					
815	75					44'		128			
830	90					44'1"		128	160	Adj Pres	
845	105					44'3"	SAND		160		
900	120		2 hr.			44'3"	Total 2.85 ft	112	300		Increase to 300
915	135					46'10"	2	112	300	240	
930	150					46'11"		114		245	
945	165					46'11"					
1000	180		3 hr	99647		47'0"	2.1				
1015	195					47'1"					
1030	210					47'2"					
1045	225					47'2"					
1100	240		4 hr			47'3"	2.3	95	450	400	Increase to 450
1145	255					51'2½"	2.4				
1130	270					51'4½"					
1145	285					51'6"					Adj. Pres.
1200	300		5 hr			51'8"	2.5				
1215	315					51'9"					
1230	330					51'10½"					
1245	345					52'0"	2.5	96			Adj. Pres.
1300	360		6 hr.			52'2½"					
1315	375					52'4"					
1330	390					52'4½"					
1345	405					52'6"					
1400	420		7 hr			52'7"	2.5	66	600	580	Increase to 600
1415	435					57'7½"					Adj. Pres.
1430	450					57'11"					
1445	465										
1500	480		8 hr			58'2½"					Adj. Pres.
1515	495										
1530	510					58'7"					
1545	525										
1600	540		9 hr			58'10½"	2.6	53	750	740	Increases to 750

**Bruce MacKay
Pump & Well Service, Inc.**

PUMPING TEST DATA

→ WELL —

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE _____ OF _____

TYPE OF PUMPING TEST

HOW D MEASURED

HOW WE MEASURED

NUMBER NELLING

PUMPED WELL NO. —

RADIUS OF PUMPED WELL _____

M.P. for WL's _____ elev.

108.

DEPTH of PUMP/AIRLINE _____ wft _____

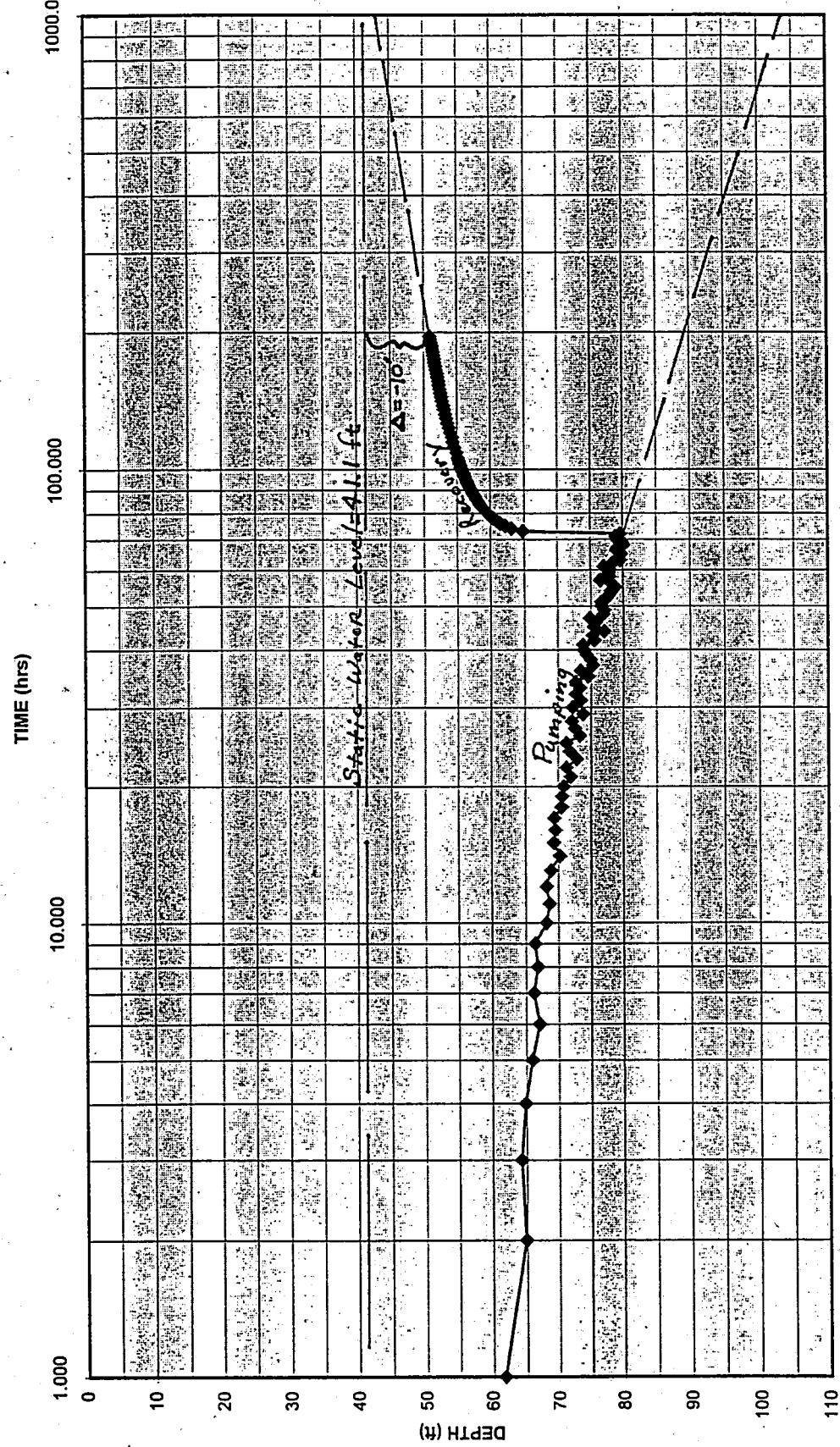
24. MISCELLANEOUS: Initial sampling

% SUBMERGENCE: initial _____; pumping _____

PUMP ON: date _____, time _____

PUMP OFF : date _____ time _____

FORM 5.1 Page _____



CONSTANT RATE PUMPING TEST @ 700 gpm
MT. ROSE DEVELOPMENT COMPANY
PRODUCTION WELL



PROJECT NO.: 26100027
PLATE 4

Stantec

Stantec

APPENDIX D

REVISED
Laboratory
Analysis Report



ALPHA ANALYTICAL
255 GLENDALE AVENUE, SUITE 21
SPARKS NV 89431

Sierra
Environmental
Monitoring, Inc.
Date : 12/04/98
Client : ALP-855
Taken by: CLIENT
Report : 25958
PO# :

Page: 1

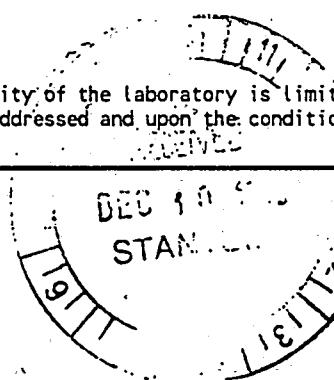
Sample	Collected Date Time	ALKALINITY MG/L CACO3	PH S.U.	COLOR APPARENT COLOR UNIT	TOTAL DISSOL. SOLIDS MG/L	NITRATE-N MG/L	NITRITE-N MG/L
SEA98102109-01-MT.ROSE/STANTEC	10/21/98 :	328	7.81	<5	52	0.1N	<0.1N
Sample	Collected Date Time	NO3 + NO2 MG/L N	CALCIUM ICP MG/L	MAGNESIUM ICP MG/L	CHLORIDE MG/L	CYANIDE, TOTAL MG/L	FLUORIDE MG/L
SEA98102109-01-MT.ROSE/STANTEC	10/21/98 :	<0.2	6.3	1.8	5.6	<0.005	<0.1
Sample	Collected Date Time	SULFATE MG/L	MBAS SURFACTANTS MG/L	CORROSIVITY CACO3 SATUR. PHM-PHS	ODOR T.O.N.	TOTAL COLIFORM P/A COLILERT	E. COLI P/A COLILERT
SEA98102109-01-MT.ROSE/STANTEC	10/21/98 :	0.7	<0.05	-3.10	0	ABSENT	ABSENT
Sample	Collected Date Time	ANTIMONY ICP-MS MG/L	ARSENIC ICP-MS MG/L	BARIUM ICP-MS MG/L	BERYLLIUM ICP-MS MG/L	CADMIUM ICP-MS MG/L	CHROMIUM ICP-MS MG/L
SEA98102109-01-MT.ROSE/STANTEC	10/21/98 :	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.004
Sample	Collected Date Time	COPPER ICP-MS MG/L	IRON ICP-OES MG/L	MANGANESE ICP-MS MG/L	MERCURY AA COLD VAPOR MG/L	NICKEL ICP-MS MG/L	SELENIUM ICP-MS MG/L
SEA98102109-01-MT.ROSE/STANTEC	10/21/98 :	0.007	0.08	0.001	<0.0005	0.002	< 0.001
Sample	Collected Date Time	THALLIUM ICP-MS MG/L	ZINC ICP-MS MG/L				
SEA98102109-01-MT.ROSE/STANTEC	10/21/98 :	< 0.001	0.01				

Approved By:

This report is applicable only to the sample received by the laboratory. The liability of the laboratory is limited to the amount paid for this report. This report is for the exclusive use of the client to whom it is addressed and upon the condition that the client assumes all liability for the further distribution of the report or its contents.

William F. Pillsbury
President

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Reno, NV 89502
Phone (702) 857-2400
FAX (702) 857-2404
sem@powernet.net



John Kobza, Ph.D.
John C. Seher
Managers



Alpha Analytical, Inc.

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Sparks, Nevada 89431-5778
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1-800-283-1183

e-mail: alpha@powernet.net
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Las Vegas, Nevada
702 498-8312
FAX: 702 786-7528
Sacramento, California
916 366-9089
FAX: 916 366-9138

CASE NARRATIVE

November 13, 1998

One sample was received on 10/21/98 for the analyses of SOC and VOC compounds for source compliance monitoring in the state of Nevada. All sample containers were received in good condition.

Alpha Analytical ID	Client ID	Date	Time	Collected
SEA98102109-01	Mt. Rose/Stantech	10/21/98		

METHOD 504.1:

Your sample was spiked as the batch Laboratory Fortified Matrix. All QA/QC criteria were met with no abnormalities.

METHOD 505:

All QA/QC criteria were met with no abnormalities.

METHOD 515.1

All QA/QC criteria were met with no abnormalities.

METHOD 525.2

All QA/QC criteria were met with no abnormalities.

METHOD 531.1:

All QA/QC criteria were met with no abnormalities.

METHOD 547:

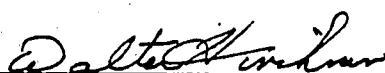
All QA/QC criteria were met with no abnormalities.

METHOD 548.1

All QA/QC criteria were met with no abnormalities.

METHOD 549.1

All QA/QC criteria were met with no abnormalities.


Walter J. Hinchman
Quality Assurance Officer


Date



Alpha Analytical, Inc.

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Las Vegas, Nevada
 702-488-3312
 FAX: 702-736-7523
 Sacramento, California
 (916) 366-9089
 FAX: (916) 366-9138

ANALYTICAL REPORT

Client: Stantech

950 Industrial St.
 Sparks, NV 89431

Attn: Dwight Smith

Client Sample ID: Mt. Rose/Stantech

Lab Sample ID: 98102109-01A

Date Sampled: 10/21/1998

Date Received: 10/21/1998

Matrix: Drinking Water

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
E504.1 EDB AND DBCP									
1,2-Dibromo-3-chloropropane	ND	0.02	µg/L	10/29/1998	Alachlor	ND	0.2	µg/L	11/3/1998
1,2-Dibromoethane	ND	0.01	µg/L	10/29/1998	Atrazine	ND	0.1	µg/L	11/3/1998
E505 ORGANOHALIDE PESTICIDES AND PCBS									
Hexachlorocyclopentadiene	ND	0.1	µg/L	10/21/1998	Benz(a)pyrene	ND	0.02	µg/L	11/3/1998
Hexachlorobenzene	ND	0.1	µg/L	10/21/1998	bis(2-Ethylhexyl)phthalate	ND	0.6	µg/L	11/3/1998
gamma-BHC	ND	0.02	µg/L	10/21/1998	bis(2-Ethylhexyl)adipate	ND	0.6	µg/L	11/3/1998
Alachlor	ND	0.2	µg/L	10/21/1998	Butachlor	ND	1.0	µg/L	11/3/1998
Heptachlor	ND	0.04	µg/L	10/21/1998	Meclochlor	ND	1.0	µg/L	11/3/1998
Aldrin	ND	0.2	µg/L	10/21/1998	Mecabuzin	ND	1.0	µg/L	11/3/1998
Heptachlor epoxide	ND	0.02	µg/L	10/21/1998	Mebachlor	ND	1.0	µg/L	11/3/1998
Dieldrin	ND	0.2	µg/L	10/21/1998	Simazine	ND	0.07	µg/L	11/3/1998
Endrin	ND	0.01	µg/L	10/21/1998					
Methoxychlor	ND	0.1	µg/L	10/21/1998	E531.1 CARBAMATES				
Chlordane	ND	0.2	µg/L	10/21/1998	Aldicarb	ND	0.5	µg/L	10/24/1998
Toxaphene	ND	1.0	µg/L	10/21/1998	Aldicarb sulfoxide	ND	0.5	µg/L	10/24/1998
Aroclor 1016	ND	0.08	µg/L	10/21/1998	Aldicarb sulfone	ND	0.8	µg/L	10/24/1998
Aroclor 1221	ND	0.20	µg/L	10/21/1998	Carbaryl	ND	1.0	µg/L	10/24/1998
Aroclor 1232	ND	0.5	µg/L	10/21/1998	Carbofuran	ND	0.9	µg/L	10/24/1998
Aroclor 1242	ND	0.3	µg/L	10/21/1998	3-Hydroxycarbofuran	ND	1.0	µg/L	10/24/1998
Aroclor 1248	ND	0.1	µg/L	10/21/1998	Methomyl	ND	1.0	µg/L	10/24/1998
Aroclor 1254	ND	0.1	µg/L	10/21/1998	Oxamyl	ND	2.0	µg/L	10/24/1998
Aroclor 1260	ND	0.2	µg/L	10/21/1998	E547 GLYPHOSATE				
E515.1 CHLORINATED ACID HERBICIDES									
Dalapon	ND	1.0	µg/L	11/2/1998	Glyphosate	ND	6.0	µg/L	10/31/1998
Dicamba	ND	0.5	µg/L	11/2/1998					
2,4-D	ND	0.1	µg/L	11/2/1998	E548.1 ENDOTHALL				
PCP	ND	0.04	µg/L	11/2/1998	Endothall	ND	9.0	µg/L	10/26/1998
2,4,5-TP	ND	0.2	µg/L	11/2/1998	E549.1 DIQUAT/PARAQUAT				
Dinoseb	ND	0.2	µg/L	11/2/1998	Diquat	ND	0.4	µg/L	11/2/1998
Pichloram	ND	0.1	µg/L	11/2/1998					

ND = Not Detected

Approved By:

Walter Hinchman
 Quality Assurance Officer

Date: 11/17/98



Alpha Analytical, Inc.

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Stantech
 950 Industrial St.
 Sparks, NV 89431

Alpha Analytical Number: 98102109-01A
 Client I.D. Number: Mt. Rose/Stantech

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

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 Sacramento, California
 (916) 366-9089
 FAX: (916) 366-9138

ANALYTICAL REPORT

Job#: (702) 358-6931
 Attn: Dwight Smith

Sampled: 10/21/1998
 Analyzed: 10/23/1998
 Received: 10/21/1998

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

Compound	Concentration	Reporting	Compound	Concentration	Reporting
	µg/L	Limit		µg/L	Limit
1 Benzene	ND	0.500 µg/L	38 2,2-Dichloropropane	ND	0.500 µg/L
2 Vinyl chloride	ND	0.500 µg/L	39 1,1,1,2-Tetrachloroethane	ND	0.500 µg/L
3 Carbon tetrachloride	ND	0.500 µg/L	40 1,1,2,2-Tetrachloroethane	ND	0.500 µg/L
4 1,2-Dichloroethane	ND	0.500 µg/L	41 1,2,3-Trichloropropane	ND	0.500 µg/L
5 Trichloroethene	ND	0.500 µg/L	42 Bromochloromethane	ND	0.500 µg/L
6 1,3-Dichlorobenzene	ND	0.500 µg/L	43 n-Butylbenzene	ND	0.500 µg/L
7 1,1-Dichloroethene	ND	0.500 µg/L	44 Dichlorodifluoromethane	ND	0.500 µg/L
8 1,1,1-Trichloroethane	ND	0.500 µg/L	45 Trichlorofluoromethane	ND	0.500 µg/L
9 cis-1,2-Dichloroethene	ND	0.500 µg/L	46 Hexachlorobutadiene	ND	0.500 µg/L
10 1,2-Dichloropropane	ND	0.500 µg/L	47 Isopropylbenzene	ND	0.500 µg/L
11 Ethylbenzene	ND	0.500 µg/L	48 4-Isopropyltoluene	ND	0.500 µg/L
12 Chlorobenzene	ND	0.500 µg/L	49 Naphthalene	ND	0.500 µg/L
13 1,4-Dichlorobenzene	ND	0.500 µg/L	50 n-Propylbenzene	ND	0.500 µg/L
14 Styrene	ND	0.500 µg/L	51 sec-Butylbenzene	ND	0.500 µg/L
15 Tetrachloroethene	ND	0.500 µg/L	52 tert-Butylbenzene	ND	0.500 µg/L
16 Toluene	ND	0.500 µg/L	53 1,2,3-Trichlorobenzene	ND	0.500 µg/L
17 trans-1,2-Dichloroethene	ND	0.500 µg/L	54 1,2,4-Trimethylbenzene	ND	0.500 µg/L
18 Xylenes, total	ND	0.500 µg/L	55 1,3,5-Trimethylbenzene	ND	0.500 µg/L
19 Dichloromethane	ND	0.500 µg/L			
20 1,1,2-Trichloroethane	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 1,2-Dichlorobenzene	ND	0.500 µg/L			
34 1,1-Dichloroethane	ND	0.500 µg/L			
35 1,1-Dichloropropane	ND	0.500 µg/L			
36 1,3-Dichloropropane	ND	0.500 µg/L			
37 trans-1,3-Dichloropropene	ND	0.500 µg/L			

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 (42-55); and, Additionally requested Compounds (56+)

Approved By:



Walter Hinchman
 Quality Assurance Officer

Date:

11/17/98

Billing Information:
Name Stantech Consulting, Inc.

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431
Phone (702) 355-1044
Fax (702) 355-0406



Address 8520 Industrial Way
City, State, Zip Sparks, NV 89431
Phone Number (702) 358-6191 Fax (702) 358-6191

Client Name

Address

City, State, Zip

P.O. #

Job #

Date

Sampled

Matrix

Key

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BARRINGER LABORATORIES, INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

6-Nov-98

ALPHA ANALYTICAL, INC.
255 Glendale Ave., Ste. 21
Sparks, NV 89431

Attn: Received: 23-Oct-98 10:25
Project: PO #: SEA98102109

Job: 983820E Status: Final

ANALYTICAL REPORT PACKAGE

CASE NARRATIVE.....	i
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BARRINGER LABORATORIES, INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

6-Nov-98

Page: i

ALPHA ANALYTICAL, INC.
255 Glendale Ave., Ste. 21
Sparks, NV 89431

Attn: Received: 23-Oct-98 10:25
Project: PO #: SEA98102109

Job: 983820E Status: Final

CASE NARRATIVE

A total of 1 Water sample was received on 23-Oct-98. As stated in the chain of custody, the sample was run for the following analyses: Gross Alpha and Gross Beta. A table, to cross reference your sample ID to ours, is attached. Our procedures are summarized on the Quality Control Data Sheet.

Quality control standards for organic and inorganic analyses followed the appropriate SW-846 or EPA methodology. Quality control standards for radiochemistry followed our standard operating procedures or contractual requirements.

Signed: *K.L.W.* 11/9/98
Radiochemistry
Manager

Signed: *C.E.S.* 11/9/98
Project Review
11/9/98



BARRINGER LABORATORIES, INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

ALPHA ANALYTICAL, INC.
255 Glendale Ave., Ste. 21
Sparks, NV 89431

6-Nov-98

Page: ii

Attn: Received: 23-Oct-98 10:25
Project: PO #: SEA98102109

Job: 983820E Status: Final

Lab-ID	Matrix	Client Sample ID	Sampled
983820-1	Water	SEA98102109-01A	21-Oct-98



BARRINGER LABORATORIES, INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

6-Nov-98

Page: R-1

Job: 983820E

Status: Final

ALPHA ANALYTICAL, INC.

Analyte: Gross Alpha

Fraction: Total

Method: 900.0

Units: pCi/l

Project:

Date Analyzed: 10/30-11/06

LLD: 3

Date

Lab Id	Sampled	Matrix	Sample Id	Concentration+ 2 σ	LLD
983820-1	21-Oct-98	Water	SEA98102109-01A	10±2	3

Analyte: Gross Beta

Fraction: Total

Method: 900.0

Units: pCi/l

Project:

Date Analyzed: 10/30-11/06

LLD: 4

Date

Lab Id	Sampled	Matrix	Sample Id	Concentration+ 2 σ	LLD
983820-1	21-Oct-98	Water	SEA98102109-01A	4.2±2.4	4



BARRINGER LABORATORIES, INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

6-Nov-98

Page: Q-1

Job: 983820E

Status: Final

ALPHA ANALYTICAL, INC.

QUALITY CONTROL REPORT

Sample Id	Gross Alpha		Gross Beta	
	Total pCi/l	+ 2 σ	Total pCi/l	+ 2 σ
Duplicate	333	± 206	215	± 123
Duplicate	141	± 198	216	± 122
RER	0.47		0.01	
Std (found value)	93	± 4	86	± 2
Std (true value)	103		88	
Std % rec.	91		97	
Blank	1.2	± 0.7	0.9	± 0.5
Spike % rec.	115		103	



BARRINGER LABORATORIES, INC.

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ALPHA ANALYTICAL, INC.
255 Glendale Ave., Ste. 21
Sparks, NV 89431

6-Nov-98

Page: Q-2

Attn: Received: 23-Oct-98 10:25
Project: PO #: SEA98102109

Job: 983820E Status: Final

Abbreviations:

Units:
pCi/l : picoCuries per liter



BARRINGER LABORATORIES, INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

ALPHA ANALYTICAL, INC.
255 Glendale Ave., Ste. 21
Sparks, NV 89431

6-Nov-98

Page: Q-3

Attn: Received: 23-Oct-98 10:25
Project: PO #: SEA98102109

Job: 983820E Status: Final

QUALITY CONTROL DATA SHEET

Received by: kz Via: UPS

Sample Container Type: 1L gls
Additional Lab Preparation: None

Parameter	Method	Preservative	Init	Analysis Dates
Gross Alpha	900.0	HNO3	CWP	10/30-11/06
Gross Beta	900.0	HNO3	CWP	10/30-11/06

Barringer Laboratories, Inc. will return or dispose of your samples 30 days from the date your final report is mailed, unless otherwise specified by contract. Barringer Laboratories, Inc. reserves the right to return samples prior to the 30 days if radioactive levels exceed our license.



BARRINGER LABORATORIES, INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

14-Dec-98

ALPHA ANALYTICAL, INC.
255 Glendale Ave., Ste. 21
Sparks, NV 89431

Attn: Received: 1-Dec-98 09:50
Project: PO #: SEA98102109

Job: 984125E Status: Final

ANALYTICAL REPORT PACKAGE

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BARRINGER LABORATORIES, INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

ALPHA ANALYTICAL, INC.
255 Glendale Ave., Ste. 21
Sparks, NV 89431

14-Dec-98

Page: i

Attn: Received: 1-Dec-98 09:50
Project: PO #: SEA98102109

Job: 984125E Status: Final

CASE NARRATIVE

A total of 1 Water sample was received on 1-Dec-98. As stated in the chain of custody, the sample was run for the following analysis: Ra-226. A table, to cross reference your sample ID to ours, is attached. Our procedures are summarized on the Quality Control Data Sheet.

Quality control standards for organic and inorganic analyses followed the appropriate SW-846 or EPA methodology. Quality control standards for radiochemistry followed our standard operating procedures or contractual requirements.

Signed: *Kirkman 12/14/98*
Radiochemistry
Manager

Signed: *C. E. Scott, Jr.*
Project Review *12/14/98*



BARRINGER LABORATORIES, INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

14-Dec-98

Page: ii

ALPHA ANALYTICAL, INC.
255 Glendale Ave., Ste. 21
Sparks, NV 89431

Attn: Received: 1-Dec-98 09:50
Project: PO #: SEA98102109

Job: 984125E Status: Final

Lab-ID	Matrix	Client Sample ID	Sampled
984125-1	Water	SEA98102109-01A	21-Oct-98



BARRINGER LABORATORIES, INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

14-Dec-98

Page: R-1

Job: 984125E

Status: Final

ALPHA ANALYTICAL, INC.

Analyte: Ra-226

Project:

Fraction: Total

Date Analyzed: 12/10-12/11

Method: SM-705

LLD: 0.5

Units: pCi/l

Date

Lab Id	Sampled	Matrix	Sample Id	Concentration+ 2 σ	LLD
984125-1	21-Oct-98	Water	SEA98102109-01A	0.07±0.3	0.5



BARRINGER LABORATORIES, INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

14-Dec-98

Page: Q-1

Job: 984125E

Status: Final

ALPHA ANALYTICAL, INC.

QUALITY CONTROL REPORT

Sample Id	Ra-226	Total	
	pCi/l	+ 2 σ	
Duplicate	118	± 5.58	
Duplicate	90.3	± 4.70	
RER	0.84		
Std (found value)	98.1	± 6.20	
Std (true value)	99.0		
Std % rec.	99		
Blank	0	± 0.2	
Spike % rec.	112		



BARRINGER LABORATORIES, INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

14-Dec-98

Page: Q-2

ALPHA ANALYTICAL, INC.
255 Glendale Ave., Ste. 21
Sparks, NV 89431

Attn: Received: 1-Dec-98 09:50
Project: PO #: SEA98102109

Job: 984125E Status: Final

Abbreviations:

Parameters:
Ra-226 : Radium-226

Units:
pCi/l : picoCuries per liter



BARRINGER LABORATORIES, INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

ALPHA ANALYTICAL, INC.
255 Glendale Ave., Ste. 21
Sparks, NV 89431

14-Dec-98

Page: Q-3

Attn: Received: 1-Dec-98 09:50
Project: PO #: SEA98102109

Job: 984125E Status: Final

QUALITY CONTROL DATA SHEET

Received by: mp Via: Relog

Sample Container Type: 500ml pl
Additional Lab Preparation: None

Parameter	Method	Preservative	Init	Analysis Dates
Ra-226	SM-705	HNO3	AML	12/10-12/11

Barringer Laboratories, Inc. will return or dispose of your samples 30 days from the date your final report is mailed, unless otherwise specified by contract. Barringer Laboratories, Inc. reserves the right to return samples prior to the 30 days if radioactive levels exceed our license.