

**IMPLEMENTATION OF THE
WORK PLAN FOR
SHALLOW WELL INSTALLATION AND
ASSOCIATED SOIL SAMPLING
BMI COMMON AREA EASTSIDE
HENDERSON, NEVADA**

Project No. 83173.14

October 8, 2007

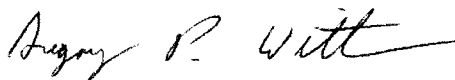
This document was prepared for use only by the client, only for the purposes stated, and within a reasonable time from issuance. Non-commercial, educational and scientific use of this report by regulatory agencies is regarded as a "fair use" and not a violation of copyright. Regulatory agencies may make additional copies of this document for internal use. Copies may also be made available to the public as required by law. The reprint must acknowledge the copyright and indicate that permission to reprint has been received.

A Report Prepared for:

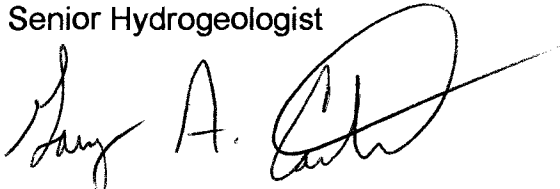
Ranajit (Ron) Sahu, Ph.D., CEM
Director of Environmental Services
Basic Remediation Company
875 West Warm Springs Road
Henderson, NV 89011

**IMPLEMENTATION OF THE
WORK PLAN FOR
SHALLOW WELL INSTALLATION AND
ASSOCIATED SOIL SAMPLING
BMI COMMON AREA EASTSIDE
HENDERSON, NEVADA**

Kleinfelder Job No.: 83173.14
October 8, 2007



Gregory P Wittman, P.G.
Senior Hydrogeologist



Gary A. Carter, P.E., C.E.M.
Environmental Group Manager

KLEINFELDER
6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936
Fax: (702) 361-9094
www.kleinfelder.com

TABLE OF CONTENTS

CHAPTER	PAGE
1 INTRODUCTION	1
2 SITE SETTING	2
2.1. SITE LOCATION	2
2.2. REGIONAL GEOLOGY AND HYDROGEOLOGY	2
3 FIELD ACTIVITIES.....	3
3.1. SOIL BORINGS AND MONITORING WELL INSTALLATION.....	3
3.2. MONITORING WELL DEVELOPMENT	4
3.3. WATER LEVEL MEASUREMENT	5
3.4. LABORATORY TESTING	6

TABLES

1	Soil Boring and New Monitoring Well Construction Details
2	Groundwater Elevations in New the Monitoring Wells
3	Hydraulic Conductivity
4	Moisture Content of Soil
5	Total Organic Carbon
6	Particle-Size Analysis of Soils
7	Specific Gravity of Coarse and Fine Aggregate
8	Specific Gravity of Soil
9	One-Dimensional Consolidation Properties of Soils

PLATES

1	Project Location
2	New Monitoring Well Locations

APPENDICES

A	Boring Logs
B	Soil Sample Physical Testing Reports

1 INTRODUCTION

Kleinfelder was retained to implement the scope of work described in the "Shallow Well Installation and Associated Soil Sampling, BMI Common Northeast Area," dated April 23, 2007, prepared for the Basic Remediation Company by Daniel B. Stephens & Associates, Inc. The goal of this investigation was to obtain data that characterizes the hydraulic parameters of the geologic materials that form the water-bearing zones at the site, with primary emphasis on the alluvial aquifer (Aa) and the upper portion of the Upper Muddy Creek Formation (TMCf). This was accomplished through Installation of 22 new monitoring wells as described in the scope of services presented in a proposal to BRC dated April 6, 2007. The procedures and results of this work are described herein.

2 SITE SETTING

2.1. SITE LOCATION

The BMI Common Area Eastside project site encompasses approximately 2,287 acres, and is located near the BMI Industrial Complex in Clark County, Nevada, approximately 13 miles southeast of Las Vegas and 2 miles northeast of the City of Henderson's downtown. The project location and boundaries are outlined in Plate 1.

2.2. REGIONAL GEOLOGY AND HYDROGEOLOGY

On the basis of drilling performed by others, the area is underlain by silt and clay layers interbedded with alluvial sandy units. According to published information, the predominant sediments found at the project site are Quaternary sediment and fan deposits that have been covered by settling ponds, many of which contain tailings derived from the Three Kids Magnesium Mine. The Quaternary sediments at surface elevations are generally described as an "anastomosing network of undifferentiated Holocene alluvium, occurring in low wash terraces and modern wash deposits" (Bell, 1980).

The Quaternary alluvial deposits set unconformably on silts and clays of the Tertiary Muddy Creek Formation. The Muddy Creek Formation sediments originate from extensive basin fill of lacustrine and subaerial origin (Longwell, 1965). The Muddy Creek Formation sediments in the project area are generally silts and clay interbedded with occasional thin sand units.

Groundwater in the alluvial aquifer is unconfined, and appears to be perched upon the upper fine-grained clays and silts of the underlying fine-grained facies of the Muddy Creek Formation. Groundwater is also found occurring as confined aquifers in several of the sand units of the Muddy Creek Formation.

3 FIELD ACTIVITIES

Preparatory and field activities were performed from July to August 2007 and consisted of the following tasks:

- Obtain new core samples for laboratory testing
- Install and develop monitoring wells

3.1. SOIL BORINGS AND MONITORING WELL INSTALLATION

Kleinfelder's subcontractor, Boart-Longyear of Mesa, Arizona, drilled 22 soil borings that were completed as wells under the oversight of our geologist. The 22 soil borings were drilled using the Rotosonic® method, which allowed us to obtain continuous core samples. This method uses variable high frequency vibration generated by a sonic drill head to advance the core barrel and drill casing. The four-inch diameter core barrel is vibrated and slowly rotated to obtain a continuous core of soil. The core barrel was also used to remove the drill cuttings from the borehole, leaving a relatively clean hole. Advancement of the sonic casing during drilling prevents caving of the hole and seals off upper water zones, reducing the potential for cross-contamination of different aquifer zones. During monitoring well construction, the sonic casing is slowly vibrated out of the hole as the filter pack sand, bentonite seal, and well grout fill the annulus. The vibration densifies the filter pack material during withdrawal of the drill casing, reducing or eliminating the usual surging required to set the filter pack.

Kleinfelder's geologist lithologically logged the cores as the borings were drilled. Soil boring and monitoring well logs are provided in Appendix A.

The soil borings were drilled in locations selected on the basis of the BRC work plan submitted to the NDEP. Soil samples from depths below the water table were selected for physical testing to obtain aquifer characteristics data.

Soil cuttings generated from the drilling operation were contained in 55-gallon drums and were properly labeled and left on the site near each well.

The monitoring wells were constructed as follows: screened sections of Schedule 40 PVC were lowered into the borings; the PVC sections were surrounded by and covered by silica sand filter packs (#3), 2-foot thick bentonite transition seals were installed above the filter packs; and the annuli were grouted to the surface with neat cement. The wells were finished with locking pressure caps situated within monument-style well vaults. The bottom cap of each well was threaded. Soil boring depths and new monitoring well construction details are presented in Table 1, below.

Table 1 - Soil Boring and New Monitoring Well Construction Details

Boring/Well	Date Finished	Depth bgs (ft)	Stickup of Casing ags (ft)	Screen Interval (ft)	Casing Diameter (in)	Slot Size (in)
DBMW-1	6/19/2007	50	2.42	19 to 49	4	0.020
DBMW-2	6/18/2007	50	2.45	20 to 50	4	0.020
DBMW-3	6/20/2007	40	2.91	19 to 39	4	0.020
DBMW-4	7/23/2007	40	2.83	10 to 30	4	0.020
DBMW-5	7/22/2007	35	3.10	15 to 35	4	0.020
DBMW-6	6/21/2007	50	2.99	30 to 50	4	0.020
DBMW-7	6/23/2007	70	3.08	50 to 70	4	0.020
DBMW-8	6/24/2007	70	3.10	47.5 to 67.5	4	0.020
DBMW-9	6/25/2007	75	3.09	54 to 74	4	0.020
DBMW-10	6/26/2007	75	2.95	54.5 to 74.5	4	0.020
DBMW-11	7/7/2007	75	3.00	45 to 75	4	0.020
DBMW-12	7/7/2007	75	2.97	45 to 75	4	0.020
DBMW-13	7/8/2007	75	2.77	45 to 75	4	0.020
DBMW-14	7/10/2007	65	3.12	35 to 65	4	0.020
DBMW-15	7/16/2007	65	2.71	40 to 65	4	0.020
DBMW-16	7/19/2007	110	2.83	85 to 110	4	0.020
DBMW-17	7/19/2007	75	2.77	52 to 72	4	0.020
DBMW-18	7/17/2007	65	3.04	45 to 65	4	0.020
DBMW-19	7/24/2007	40	2.99	15 to 40	4	0.020
DBMW-20	8/15/2005	70	3.00	20 to 70	4	0.020
DBMW-22	8/13/2007	55	3.00	35 to 55	4	0.020
AA-23R	6/2/2007	45	3.00	20 to 45	4	0.020

bags below ground surface
 ags above ground surface
 ft feet
 in inch

After the monitoring wells were installed, the top of each well was surveyed by a licensed land surveyor contracted directly to BRC, so that depth to groundwater measurements in the wells could be converted to groundwater elevations used to assess groundwater gradients.

A total of 26 new monitoring wells were scheduled for installation during this project. Four of the new monitoring wells could not be drilled due to access issues. Installation of the additional four wells is pending until a later date.

3.2. MONITORING WELL DEVELOPMENT

A minimum of 48 hours after installation Kleinfelder's subcontractor, Boart-Longyear, developed the monitoring wells using a Pulstar 20000 HD pumping/development rig. Before beginning development, the static water levels in the wells were measured and recorded. During development, surging along the screened intervals of the wells was performed to set the sand packs, and the wells were bailed using a stainless steel piston bailer to remove sediment. The discharge was periodically monitored for clarity, pH, temperature, and specific

conductance. Development was considered complete when the purged water was relatively clear, and the monitored parameters were relatively stable.

The well development purge water was contained and disposed of in a pond at the BMI site as designated by the client.

3.3. WATER LEVEL MEASUREMENT

Several days after the new wells were developed, Kleinfelder measured the depth to water in each of the site monitoring wells. The water depth measurements and calculated groundwater elevations are presented in Table 2, below:

Table 2
Groundwater Elevations in New the Monitoring Wells

Well	Date Measured	Top of Casing Elevation (ft)	Depth to Water (ft)	Static Water Level Elevation (ft)
DBMW-1	7/8/2007	1626.46	31.87	1594.59
DBMW-2	7/8/2007	1627.00	31.98	1595.02
DBMW-3	7/8/2007	1625.86	27.13	1598.73
DBMW-4	7/25/2007	1605.81	16.27	1589.54
DBMW-5	7/25/2007	1609.65	21.94	1587.71
DBMW-6	7/8/2007	1632.63	48.03	1584.60
DBMW-7	7/8/2007	1631.73	57.08	1574.65
DBMW-8	7/8/2007	1632.05	56.61	1575.44
DBMW-9	7/8/2007	1659.92	63.31	1596.61
DBMW-10	7/8/2007	1663.96	62.10	1601.86
DBMW-11	7/8/2007	1667.96	68.37	1599.59
DBMW-12	7/8/2007	1669.68	56.73	1612.95
DBMW-13	7/20/2007	1678.79	57.04	1621.75
DBMW-14	7/20/2007	1684.96	47.41	1637.55
DBMW-15	7/31/2007	1693.20	48.65	1644.55
DBMW-16	7/31/2007	1694.14	97.18	1596.96
DBMW-17	7/31/2007	1712.38	73.18	1639.20
DBMW-18	7/31/2007	1717.15	67.70	1649.45
DBMW-19	7/25/2007	1583.40	23.40	1560.00
DBMW-20	8/15/2007	NS	25.00	-
DBMW-22	8/13/2007	NS	39.00	-
AA-23R	6/2/2007	NS	23.00	-

bgs below ground surface
NS casing elevation not surveyed

3.4. LABORATORY TESTING

Kleinfelder oversaw drilling of 22 soil borings at locations within the Northeast area. The borings were continuously core sampled at depths through the water table, within the alluvium and upper portion of the TCMf. Kleinfelder lithologically logged the 3-inch diameter cores and selected samples for physical testing.

The depths for the monitoring wells and borings are listed in Table 1. The results of the soil testing are listed in Tables 3 to 9. Selected soil samples were tested using the following ASTM methods:

Analysis/Method

Initial volumetric and gravimetric water content
ASTM D2216/ D4643/D2974
Dry bulk density ASTM D2937/ MOSA1Chp.13
Calculated total porosity ASTM D2435/ MOSA1Chp.18

Saturated Hydraulic Conductivity

Flexible Wall ASTM D5084
Rigid Wall ASTM D2434

Specific Gravity (Particle Density)

Fine (< 4.75 mm diameter material) ASTM D854
Coarse (> 4.75 mm diameter material) ASTM C127

Particle size analysis (Wet)

Standard Sieves with Wash ASTM D422
Hydrometer (applicable when >5% fines) ASTM D422

Total or Fractional Organic Carbon

Analysis performed by Hall laboratory in Albuquerque, NM
The results for the various tests are listed in Tables 10 through 15. The soil sample physical testing reports are also presented in Appendix B.

References

Bell, J.W., and Smith, E.I., 1980, Geologic map, Henderson quadrangle: Nevada Bureau of Mines and Geology Map 67.

Longwell, C.R., Pampeyan, E.H., Bowyer, Ben and Roberts, R.J., 1965, Geology and mineral deposits of Clark County, Nevada: Nevada Bureau of Mines and Geology Bulletin, no. 62,

ADDITIONAL TABLES

TABLE 3
HYDRAULIC CONDUCTIVITY
Project Name: BMI Northeast Area
Henderson, Nevada
Project Number: 83173

<u>Sample Identification</u>	<u>Sample Depth (ft)</u>	<u>ASTM Test Method</u>	<u>Sample Type</u>	<u>Confining Stress, psi</u>	<u>Permeability, cm/sec</u>	<u>Average Hydraulic Gradient</u>	<u>Effective Cell Pressure, psi</u>	<u>Specimen Height, cm (Before/After Test)</u>	<u>Specimen Diameter, cm (Before/After Test)</u>	<u>Dry Unit Weight, pcf (Before/After Test)</u>	<u>Moisture Content, % (Before/After Test)</u>
DBMW-1	40-41.5	D5084 Method C	Sample Linear	15.3	2.77E-06	10.4	15.3	5.08/5.08	4.85/4.85	75.1/75.1	45.1/45.3
DBMW-1	50-51.5	D5084 Method C	Sample Linear	19.1	2.08E-06	11.5	19.1	5.08/5.08	4.85/4.85	55.0/55.6	76.5/76.8
DBMW-2	30-31.5	D5084 Method C	Sample Linear	11.5	1.37E-06	12.7	11.5	5.08/5.08	4.85/4.85	86.3/86.3	35.7/36.7
DBMW-2	50-51.5	D5856	Sample Linear	19.1	6.33E-06	9.1	19.1	5.08/5.08	4.85/4.85	63.8/64.5	51.4/82.1
DBMW-3	30-31.5	D5856	Sample Linear	11.5	3.71E-06	6.9	11.5	5.08/5.08	4.85/4.85	68.0/68.0	55.6/58.8
DBMW-3	40-41.5	D5084 Method C	Sample Linear	15.3	1.37E-06	10.3	15.3	5.08/5.08	4.85/4.85	94.5/94.5	29.8/29.8
DBMW-4	15-16.5	D5084 Method C	Sample Linear		1.55E-05	5.3	10.0	5.59/5.49	6.12/6.12	116.8/128.4	17.3/14.9
DBMW-4	40-41.5	D5084 Method C	Sample Linear		4.22E-04	4.6	10.0	6.10/5.87	6.10/6.10	104.0/109.9	20.6/21.4
DBMW-5	20-21.5	D5084 Method C	Sample Linear		1.73E-05	3.7	10.0	6.40/6.35	6.20/6.20	62.5/66.8	59.4/60.4
DBMW-5	35-36.5	D5084 Method C	Sample Linear		2.34E-07	4.6	10.0	6.27/6.17	6.20/6.20	90.5/94.3	25.6/26.9
DBMW-6	35-36.5	D5856	Sample Linear	13.4	6.03E-08	9.4	13.4	5.08/5.03	4.85/4.85	94.9/94.9	28.1/31.6
DBMW-6	50-51.5	D5084 Method C	Sample Linear	19.1	9.29E-06	5.7	19.1	5.08/4.88	4.85/4.85	85.7/88.3	32.5/37.8
DBMW-7	60-61.5	D5084 Method C	Sample Linear	22.9	9.52E-08	8.3	22.9	6.86/6.73	6.12/6.12	72.8/74.8	46.4/48.2
DBMW-7	70-71.5	D5084 Method C	Sample Linear	26.7	1.19E-08	9.4	26.7	6.68/6.68	6.12/6.12	78.7/78.7	41.4/41.9
DBMW-8	62.5-64.0	D5084 Method C	Sample Linear	23.9	1.01E-06	5.0	23.9	6.68/6.81	6.12/6.12	60.7/59.5	60.3/67.4
DBMW-8	70-71.5	D5084 Method C	Sample Linear	26.7	1.01E-07	9.0	26.7	6.65/6.60	6.12/6.12	77.9/79.2	42.2/44.2
DBMW-9	65-66.5	D5084 Method C	Sample Linear	24.8	1.96E-08	9.2	24.8	6.71/6.81	6.17/6.17	93.8/92.4	27.3/28.6
DBMW-9	75-76.5	D5084 Method C	Sample Linear	28.6	1.07E-07	5.7	28.6	6.35/6.35	6.12/6.12	83.8/83.8	40.0/40.4
DBMW-10	60-61.5	D5084 Method C	Sample Linear	22.9	1.60E-07	5.9	22.9	7.01/6.99	6.20/6.20	79.9/81.5	39.0/39.2
DBMW-10	75-76.5	D5084 Method C	Sample Linear	28.6	2.22E-07	5.4	28.6	6.25/6.35	6.17/6.17	75.1/73.9	41.5/44.4
DBMW-11	55-56.5	D5084 Method C	Sample Linear	21.0	2.96E-08	6.3	21.0	6.96/6.88	6.15/6.15	80.9/83.2	40.2/42.7
DBMW-11	70-71.5	D5084 Method C	Sample Linear	26.7	1.28E-08	7.6	26.7	7.04/6.99	6.17/6.17	87.0/86.2	31.3/32.8
DBMW-12	55-56.5	D5084 Method C	Sample Linear	21.0	8.05E-09	10.0	21.0	6.65/6.65	6.17/6.17	82.3/82.3	35.6/35.9
DBMW-12	75-76.5	D5084 Method C	Sample Linear	28.6	4.13E-08	5.9	28.6	7.14/7.19	6.15/6.15	91.3/89.9	29.7/31.8
DBMW-13	55-56.5	D5084 Method C	Sample Linear	21.0	3.79E-08	6.5	21.0	6.91/6.91	6.10/6.10	79.7/79.7	43.8/45.3

<u>Sample Identification</u>	<u>Sample Depth (ft)</u>	<u>ASTM Test Method</u>	<u>Sample Type</u>	<u>Confining Stress, psi</u>	<u>Permeability, cm/sec</u>	<u>Average Hydraulic Gradient</u>	<u>Effective Cell Pressure, psi</u>	<u>Specimen Height, cm (Before/After Test)</u>	<u>Specimen Diameter, cm (Before/After Test)</u>	<u>Dry Unit Weight, pcf (Before/After Test)</u>	<u>Moisture Content, % (Before/After Test)</u>
DBMW-13	75-76.5	D5084 Method C	Sample Linear	28.6	1.26E-08	8.5	28.6	7.04/7.04	6.20/6.20	91.2/94.3	33.3/33.8
DBMW-14	45-46.5	D5084 Method C	Sample Linear	17.2	3.69E-07	2.2	17.2	6.86/6.99	6.10/6.10	84.3/82.8	30.7/32.4
DBMW-14	65-66.5	D5084 Method C	Sample Linear	24.8	1.23E-08	6.8	24.8	6.65/6.65	6.12/6.12	83.7/83.0	40.7/42.1
DBMW-15	45-46.5	D5084 Method C	Sample Linear		4.38E-04	4.5	10.0	6.55/6.43	6.17/6.17	109.4/112.5	8.9/16.2
DBMW-15	65-66.5	D5084 Method C	Sample Linear		1.47E-04	4.0	10.0	7.62/7.70	6.22/6.22	68.0/68.4	50.0/53.1
DBMW-16	100-101.5	D5084 Method C	Sample Linear		1.65E-05	8.1	10.0	6.22/6.25	6.10/6.10	76.0/75.7	45.7/46.3
DBMW-16	110-111.5	D5084 Method C	Sample Linear		4.76E+06	3.6	10.0	6.65/6.65	6.22/6.22	64.5/66.7	55.5/56.7
DBMW-17	70-71.5	D5084 Method C	Sample Linear		1.01E-03	2.1	10.0	9.14/9.09	6.17/6.17	112.9/114.5	14.2/16.0
DBMW-17	75-76.5	D5084 Method C	Sample Linear		5.84E-06	3.2	10.0	7.24/7.11	6.10/6.10	79.5/80.3	41.8/43.5
DBMW-18	55-56.5	D5084 Method C	Sample Linear		2.75E-06	7.9	10.0	6.35/6.30	6.27/6.27	51.4/53.1	75.5/79.1
DBMW-18	65-66.5	D5084 Method C	Sample Linear		2.33E-05	4.3	10.0	6.27/6.35	6.17/6.17	64.4/65.2	45.9/47.6
DBMW-19	20-21.5	D5084 Method C	Sample Linear		1.43E-04	10.4	10.0	4.93/4.88	5.00/5.00	109.1/110.3	14.3/14.7
DBMW-19	40-41.5	D5084 Method C	Sample Linear		9.61E-06	9.4	10.0	6.10/5.94	6.15/6.15	82.2/85.8	37.4/34.6
DBMW-20	30 - 31.5	D5084 Method C	Sample Linear		1.60E-05	7.1	10.0	6.10/5.92	6.05/6.05	100.0/103.0	16.4/22.7
DBMW-20	70 - 71.5	D5084 Method C	Sample Linear		1.59E-04	6.5	10.0	7.37/7.42	5.97/5.97	107.2/106.5	24.2/23.2
DBMW-22	40 - 41.5	D5084 Method C	Sample Linear		1.64E-06	3.8	10.0	6.93/6.99	6.10/6.10	67.4/66.9	59.2/55.7
DBMW-22	50 - 56.5	D5084 Method C	Sample Linear		1.21E-06	6.3	10.0	7.32/7.14	6.05/6.05	58.5/60.4	61.7/55.3
AA-23R	25 - 26.5	D5084 Method C	Sample Linear		3.45E-06	2.0	10.0	6.35/6.12	6.10/6.10	120.7/129.5	15.2/12.2

TABLE 4
MOISTURE CONTENT OF SOIL
Project Name: BMI Northeast Area
Henderson, Nevada
Project Number: 83173

<u>Sample Number</u>	<u>Location</u>	<u>Sample Depth (ft)</u>	<u>ASTM Test Method</u>	<u>Tare Weight of Pan (grams)</u>	<u>Wet Weight of Sample & Tare (grams)</u>	<u>Dry Weight of Sample & Tare (grams)</u>	<u>Weight of Moisture (grams)</u>	<u>Dry Weight of Sample (grams)</u>	<u>Percent Moisture</u>
29446	DBMW-1	38.5 - 39	D-2216	360.2	1051.2	719.0	332.3	358.7	92.6
29446	DBMW-1	46.8 - 47.5	D-2216	524.1	1035.7	818.1	217.6	294.0	74.0
29444	DBMW-2	30 - 35	D-2216	387.5	978.0	792.1	185.9	404.6	45.9
29444	DBMW-2	45 - 50	D-2216	385.0	876.1	676.8	199.3	291.9	68.3
29447	DBMW-3	29 - 30	D-2216	252.0	701.4	555.7	145.7	303.7	48.0
29447	DBMW-3	39 - 39.5	D-2216	252.3	1171.8	975.2	196.7	722.9	27.2
29628	DBMW-4	17.5 - 20	D-2216	329.9	2251.1	2027.8	223.3	1697.9	13.2
29628	DBMW-4	32 - 32.5	D-2216	32.4	165.2	141.8	23.4	109.4	21.4
29629	DBMW-5	23.5 - 24	D-2216	190.5	402.5	355.1	47.4	164.6	28.8
29629	DBMW-5	30 - 31	D-2216	392.7	566.9	529.0	37.9	136.3	27.8
29450	DBMW-6	32.5 - 33	D-2216	253.6	845.1	733.9	111.2	480.3	23.1
29450	DBMW-6	45 - 46	D-2216	253.6	708.2	614.1	94.1	360.5	26.1
29451	DBMW-7	59 - 59.5	D-2216	252.3	923.7	742.6	181.1	490.3	36.9
29452	DBMW-7	67.5 - 68	D-2216	392.7	734.9	649.7	85.2	257.1	33.1
29453	DBMW-8	56 - 56.5	D-2216	392.7	1200.2	1043.5	156.7	650.8	24.1
29453	DBMW-8	68 - 68.5	D-2216	252.1	997.5	888.5	109.0	636.4	17.1
29470	DBMW-9	60 - 65	D-2216	387.5	966.5	843.3	123.3	455.7	27.0
29482	DBMW-10	63 - 63.5	D-2216	253.7	561.0	475.0	86.0	221.3	38.9
29497	DBMW-10	72 - 72.5	D-2216	253.7	851.6	665.1	186.5	411.4	45.3
29519	DBMW-11	56 - 57	D-2216	437.03	1095.16	958.49	136.7	521.46	26.2

<u>Sample Number</u>	<u>Location</u>	<u>Sample Depth (ft)</u>	<u>ASTM Test Method</u>	<u>Tare Weight of Pan (grams)</u>	<u>Wet Weight of Sample & Tare (grams)</u>	<u>Dry Weight of Sample & Tare (grams)</u>	<u>Weight of Moisture (grams)</u>	<u>Dry Weight of Sample (grams)</u>	<u>Percent Moisture</u>
29519	DBMW-11	69 - 69.5	D-2216	387.2	548.3	516.6	31.6	129.5	24.4
29520	DBMW-12	56 - 57	D-2216	384.9	852.4	775.2	77.3	390.3	19.8
29520	DBMW-12	70 - 70.5	D-2216	369.3	512.0	481.2	30.8	111.9	27.5
29524	DBMW-13	54.5 - 55	D-2216	369.3	512.0	481.2	30.8	111.9	27.5
29524	DBMW-13	74 - 74.5	D-2216	237.5	473.8	426.4	47.4	188.9	25.1
29525	DBMW-14	44 - 45	D-2216	254.2	888.2	646.3	241.9	392.1	61.7
29525	DBMW-14	57 - 57.5	D-2216	237.5	512.4	440.8	71.6	203.3	35.2
29616	DBMW-15	40 - 40.5	D-2216	198.4	914.8	704.9	209.9	506.5	41.4
29616	DBMW-15	64.5 - 65	D-2216	237.5	833.3	692.2	141.2	454.6	31.0
29617	DBMW-16	92.5 - 95	D-2216	384.4	2291.7	2173.7	118.0	1789.3	6.6
29617	DBMW-16	107.5 - 108	D-2216	233.7	573.5	448.9	124.6	215.2	57.9
29619	DBMW-17	66.5 - 67.5	D-2216	438.3	2493.7	1943.2	550.5	1504.9	36.6
29619	DBMW-17	72 - 72.5	D-2216	384.3	989.5	785.7	203.8	401.4	50.8
29621	DBMW-18	52 - 52.5	D-2216	196.4	424.4	312.7	111.7	116.3	96.1
29621	DBMW-18	62.5 - 63	D-2216	173.7	427.3	297.6	129.7	123.9	104.7
29622	DBMW-19	15 - 17.5	D-2216	536.2	3036.3	2894.2	142.1	2358.0	6.0
29622	DBMW-19	35.5 - 36.5	D-2216	254.1	1014.6	770.5	244.1	516.4	47.3
29661	DBMW-20	35 - 37.5	D-2216	201.34	1279.14	1190.08	89.1	988.74	9.0
29661	DBMW-20	67.5 - 70	D-2216	196.45	1488.17	1368.17	120.0	1171.72	10.2
29653	DBMW-22	41 - 41.5	D-2216	225.6	419.93	361.01	58.9	135.41	43.5
29653	DBMW-22	54 - 54.5	D-2216	184.92	419.16	316.48	102.7	131.56	78.0
29652	AA-23R	27.5 - 30	D-2216	194.8	1175.2	975.32	199.9	780.52	25.6
29652	AA-23R	40 - 41.3	D-2216	181.5	396.97	331.17	65.8	149.67	44.0

TABLE 5
TOTAL ORGANIC CARBON
Project Name: BMI Northeast Area
Henderson, Nevada
Project Number: 83173

<u>Sample Number</u>	<u>Location</u>	<u>Sample Type</u>	<u>ASTM Test Method</u>	<u>Depth (ft)</u>	<u>Organic Carbon</u>	<u>pH Value</u>
29446	DBMW-1	Soil	2974, AWWA 4500 H	38.5-39.0	5.00%	7.90
29446	DBMW-1	Soil	2974, AWWA 4500 H	46.8-47.5	3.90%	7.95
29444	DBMW-2	Soil	2974, AWWA 4500 H	30-35	1.60%	8.18
29444	DBMW-2	Soil	2974, AWWA 4500 H	45-50	3.20%	8.00
29447	DBMW-3	Soil	2974, AWWA 4500 H	29.0-30.0	3.00%	8.26
29447	DBMW-3	Soil	2974, AWWA 4500 H	39.0-39.5	1.90%	8.12
29628	DBMW-4	Soil	2974, AWWA 4500 H	17.5-20.0	0.02%	8.06
29628	DBMW-4	Soil	2974, AWWA 4500 H	32.0-32.5	0.20%	7.95
29629	DBMW-5	Soil	2974, AWWA 4500 H	23.5-24.0	0.06%	7.89
29629	DBMW-5	Soil	2974, AWWA 4500 H	30.0-31.0	0.07%	7.84
29450	DBMW-6	Soil	2974, AWWA 4500 H	32.5-33.0	5.50%	8.04
29450	DBMW-6	Soil	2974, AWWA 4500 H	45.0-46.0	7.50%	8.11
29451	DBMW-7	Soil	2974, AWWA 4500 H	59.0-59.5	1.60%	7.89
29452	DBMW-7	Soil	2974, AWWA 4500 H	67.5-68.0	3.10%	8.10
29453	DBMW-8	Soil	2974, AWWA 4500 H	56.0-56.5	2.50%	8.08
29453	DBMW-8	Soil	2974, AWWA 4500 H	68.0-68.5	10.80%	8.17
29470	DBMW-9	Soil	2974, AWWA 4500 H	61.0-61.5	2.70%	8.00
29470	DBMW-9	Soil	2974, AWWA 4500 H	70.5-71.0	7.00%	8.15
29482	DBMW-10	Soil	2974, AWWA 4500 H	63.0-63.5	0.40%	8.52
29497	DBMW-10	Soil	2974, AWWA 4500 H	72.0-72.5	1.40%	9.86
29519	DBMW-11	Soil	2974, AWWA 4500 H	56.0-57.0	3.00%	7.93
29519	DBMW-11	Soil	2974, AWWA 4500 H	69.0-69.5	2.00%	7.97
29520	DBMW-12	Soil	2974, AWWA 4500 H	56.0-57.0	2.20%	7.90
29520	DBMW-12	Soil	2974, AWWA 4500 H	69.5-70.0	1.80%	8.00
29524	DBMW-13	Soil	2974, AWWA 4500 H	54.5-55.0	0.60%	8.17
29524	DBMW-13	Soil	2974, AWWA 4500 H	74.0-74.5	1.90%	8.11

<u>Sample Number</u>	<u>Location</u>	<u>Sample Type</u>	<u>ASTM Test Method</u>	<u>Depth (ft)</u>	<u>Organic Carbon</u>	<u>pH Value</u>
29525	DBMW-14	Soil	2974, AWWA 4500 H	44.0-45.0	1.60%	8.30
29525	DBMW-14	Soil	2974, AWWA 4500 H	57.0-57.5	1.10%	8.29
29616	DBMW-15	Soil	2974, AWWA 4500 H	40.0-40.5	1.80%	7.77
29616	DBMW-15	Soil	2974, AWWA 4500 H	64.5-65.0	1.50%	8.31
29617	DBMW-16	Soil	2974, AWWA 4500 H	92.5-95.0	0.60%	9.67
29617	DBMW-16	Soil	2974, AWWA 4500 H	107.5-108.0	1.90%	8.66
29619	DBMW-17	Soil	2974, AWWA 4500 H	66.5-67.5	0.07%	8.72
29619	DBMW-17	Soil	2974, AWWA 4500 H	72.0-72.5	0.12%	8.67
29621	DBMW-18	Soil	2974, AWWA 4500 H	52.0-52.5	0.98%	7.99
29621	DBMW-18	Soil	2974, AWWA 4500 H	62.5-63.0	0.98%	8.31
29622	DBMW-19	Soil	2974, AWWA 4500 H	15.0-17.5	0.14%	8.12
29622	DBMW-19	Soil	2974, AWWA 4500 H	35.5-36.5	0.78%	8.28
29661	DBMW-20	Soil	2974, AWWA 4500 H	35.0-37.5	0.62%	9.34
29661	DBMW-20	Soil	2974, AWWA 4500 H	67.5-70.0	0.22%	9.34
29653	DBMW-22	Soil	2974, AWWA 4500 H	41.0-41.5	1.86%	8.18
29653	DBMW-22	Soil	2974, AWWA 4500 H	54.0-55.0	2.12%	8.16
29652	AA-23R	Soil	2974, AWWA 4500 H	27.5 - 30	0.10%	8.06
29652	AA-23R	Soil	2974, AWWA 4500 H	40 - 41.3	0.74%	8.29

TABLE 6
PARTICLE-SIZE ANALYSIS OF SOILS
Project Name: BMI Northeast Area
Henderson, Nevada
Project Number: 83173

<u>Sample Identification</u>	<u>ASTM Test Method</u>	<u>USCS</u>	<u>Specific Gravity</u>	<u>Gravel, %</u>	<u>Sand, %</u>	<u>Silt, %</u>	<u>Clay, %</u>
Boring DBMW-1 @ 38.5-39'; S-29446 @ 35.0-40.0'	D422-02	ML	2.74	0	5	70	25
Boring DBMW-1 @ 46.8-47.5'; S-29446 @ 45.0-50.0'	D422-02	ML	2.56	0	3	67	30
Boring DBMW-2 @ 30-35'; S-29444 @ 30.0-35.0'	D422-02	ML	2.68	0	13	77	10
Boring DBMW-2 @ 45-50'; S-29444 @ 45.0-50.0'	D422-02	ML	2.70	0	5	72	23
Boring DBMW-3 @ 29-30'; S-29447 @ 25.0-30.0'	D422-02	ML	2.60	0	3	74	23
Boring DBMW-3 @ 39-39.5'; S-29447 @ 35.0-40.0'	D422-02	SM	2.65	1	65	30	4
Boring DBMW-4 @ 17.5-20'; S-29628 @ 15.0-20.0'	D422-02	GM	2.57	46	25	28	1
Boring DBMW-4 @ 32-32.5'; S-29628 @ 30.0-35.0'	D422-02	ML	2.45	0	44	54	2
Boring DBMW-5 @ 23.5-24'; S-29629 @ 20.0-25.0'	D422-02	ML	2.48	0	23	75	2
Boring DBMW-5 @ 30-31'; S-29629 @ 30.0-35.0'	D422-02	ML	2.53	0	4	84	12
Boring DBMW-6 @ 32.5-33'; S-29450 @ 30.0-35.0'	D422-02	ML	2.82	14	13	70	3
Boring DBMW-6 @ 45-46'; S-29450 @ 45.0-50.0'	D422-02	ML	2.91	0	19	75	6
Boring DBMW-7 @ 59-59.5'; S-29451 @ 55.0-60.0'	D422-02	ML	2.69	8	36	34	22
Boring DBMW-7 @ 67.5-68'; S-29452 @ 65.0-70.0'	D422-02	ML	2.80	10	9	77	4

<u>Sample Identification</u>	<u>ASTM Test Method</u>	<u>USCS</u>	<u>Specific Gravity</u>	<u>Gravel, %</u>	<u>Sand, %</u>	<u>Silt, %</u>	<u>Clay, %</u>
Boring DBMW-8 @ 56-56.5'; S-29453 @ 55.0-60.0'	D422-02	ML	2.56	16	7	73	4
Boring DBMW-8 @ 68-68.5'; S-29453 @ 65.0-70.0'	D422-02	ML	2.96	0	17	78	5
Boring DBMW-9 @ 61-61.5'; S-29470 @ 60.0-65.0'	D422-02	ML	2.93	9	20	67	4
Boring DBMW-9 @ 70.5-71'; S-29470 @ 70.0-75.0'	D422-02	ML	2.93	0	23	71	6
Boring DBMW-10 @ 63-63.5'; S-29482 @ 60.0-65.0'	D422-02	ML	2.65	0	3	70	27
Boring DBMW-10 @ 72-72.5'; S-29497 @ 70.0-75.0'	D422-02	ML	2.76	0	3	57	40
Boring DBMW-11 @ 56-57'; S-29519 @ 55.0-60.0'	D422-02	ML	2.69	3	18	76	3
Boring DBMW-11 @ 69-69.5'; S-29519 @ 65.0-70.0'	D422-02	ML	2.62	0	5	88	7
Boring DBMW-12 @ 56-57'; S-29520 @ 55.0-60.0'	D422-02	ML	2.77	0	35	59	6
Boring DBMW-12 @ 70-70.5'; S-29520 @ 70.0-75.0'	D422-02	ML	2.76	0	28	66	6
Boring DBMW-13 @ 54.5-55'; S-29621 @ 50.0-55.0'	D422-02	ML	2.46	0	8	69	23
Boring DBMW-13 @ 54.5-55'; S-29524 @ 50.0-55.0'	D422-02	ML	2.61	4	12	60	24
Boring DBMW-13 @ 62.5-63'; S-29621 @ 60.0-65.0'	D422-02	ML	2.46	19	21	41	19
Boring DBMW-13 @ 74-74.5'; S-29524 @ 70.0-75.0'	D422-02	ML	2.46	19	21	41	19
Boring DBMW-14 @ 44-45'; S-29525 @ 40.0-45.0'	D422-02	ML	2.54	0	4	41	55
Boring DBMW-14 @ 57-57.5'; S-29525 @ 55.0-60.0'	D422-02	ML	2.59	0	1	50	49
Boring DBMW-15 @ 40-40.5'; S-29616 @ 40.0-45.0'	D422-02	ML	2.45	0	9	89	2
Boring DBMW-15 @ 64.5-65'; S-29616 @ 60.0-65.0'	D422-02	ML	2.59	0	15	66	19

<u>Sample Identification</u>	<u>ASTM Test Method</u>	<u>USCS</u>	<u>Specific Gravity</u>	<u>Gravel, %</u>	<u>Sand, %</u>	<u>Silt, %</u>	<u>Clay, %</u>
Boring DBMW-16 @ 92.5-95'; S-29617 @ 90.0-95.0'	D422-02	SM	2.61	24	41	31	4
Boring DBMW-16 @ 107.5-108'; S-29617 @ 90.0-95.0'	D422-02	ML	2.59	0	11	74	15
Boring DBMW-17 @ 66.5-67.5'; S-29619 @ 65.0-70.0'	D422-02	ML	2.61	0	7	74	19
Boring DBMW-17 @ 72-72.5'; S-29619 @ 70.0-75.0'	D422-02	ML	2.61	0	18	64	18
Boring DBMW-19 @ 15-17.5'; S-29622 @ 15.0-20.0'	D422-02	GM	2.65	46	26	27	1
Boring DBMW-19 @ 35.5-36.5'; S-29622 @ 35.0-40.0'	D422-02	ML	2.71	0	8	47	45
Boring DBMW-20 @ 67.5-70'; S-29661 @ 35.0-40.0'	D422-02	SM	2.57	24	43	31	2
Boring DBMW-20 @ 67.5-70'; S-29661 @ 65.0-70.0'	D422-02	SM	2.62	31	34	33	2
Boring DBMW-22 @ 41-41.5'; S-29653 @ 40.0-45.0'	D422-02	ML	2.66	0	4	51	45
Boring DBMW-22 @ 54-55'; S-29653 @ 50.0-55.0'	D422-02	ML	2.71	0	4	49	47
Boring AA-23R @ 27.5-30'; S-29652 @ 25.0-30.0'	D422-02	ML	2.71	0	4	49	47
Boring AA-23R @ 40-41.3'; S-29652 @ 40.0-45.0'	D422-02	ML	2.61	0	4	74	22

TABLE 7
SPECIFIC GRAVITY OF COARSE AND FINE AGGREGATE
Project Name: BMI Northeast Area
Henderson, Nevada
Project Number: 83173

<u>Sample Number</u>	<u>Location</u>	<u>Sample Depth (ft)</u>	<u>ASTM Test Method</u>	<u>Dry Weight of Sample</u>	<u>SSD Weight of Sample</u>	<u>Weight SSD Under Water</u>	<u>Bulk Specific Gravity</u>	<u>Bulk SSD</u>	<u>Apparent Specific Gravity</u>	<u>Absorption</u>
29628	DBMW-4	17.5 - 20	127 & 128	3384.5	3470.8	2086.2	2.444	2.507	2.607	2.5
29617	DBMW-16	92.5 - 95	127 & 128	3237.3	3443.7	1990.3	2.227	2.369	2.596	6.4
29622	DBMW-19	15 - 17.5	127 & 128	6404.9	6654	3818.5	2.259	2.347	2.476	3.9
29661	DBMW-20	37 - 37.5	127 & 128	2923.8	3032.6	1777.2	2.329	2.416	2.55	3.7
29661	DBMW-20	67.5 - 70	127 & 128	5087.4	5238.7	3118.5	2.399	2.471	2.584	3.0

TABLE 8
SPECIFIC GRAVITY OF SOIL
Project Name: BMI Northeast Area
Henderson, Nevada
Project Number: 83173

<u>Sample Number</u>	<u>Location</u>	<u>Sample Depth (ft)</u>	<u>ASTM Test Method</u>	<u>Water Density at Ta</u>	<u>Water Density at Tb</u>	<u>K Factor at Tb</u>	<u>Ma at Tb</u>	<u>Specific Gravity at Tb</u>	<u>Specific Gravity at 20 C</u>
29446	DBMW-1	38.5 - 39	D-854	0.99814	0.99841	1.0002	221.8143142	2.735733696	2.73680842
29446	DBMW-1	46.8 - 47.5	D-854	0.99812	0.99839	1.00018	224.5445896	2.562788314	2.563249616
29444	DBMW-2	30 - 35	D-854	0.99833	0.99829	1.00008		2.678753181	2.678967481
29444	DBMW-2	45 - 50	D-854	0.99812	0.99829	1.00008	221.0247382	2.695704779	2.695920436
29447	DBMW-3	29 - 30	D-854	0.99833	0.99841	1.0002	220.9298952	2.595890411	2.596409589
29447	DBMW-3	39 - 39.5	D-854	0.99812	0.99841	1.0002	224.5545592	2.651339989	2.651870257
29628	DBMW-4	17.5 - 20	D-854	0.99808	0.99825	1.00004	224.4947416	2.568926123	2.56902888
29628	DBMW-4	32 - 32.5	D-854	0.99837	0.99816	0.99996	224.2853507	2.411985019	2.411888539
29629	DBMW-5	23.5 - 24	D-854	0.99812	0.99821	1	220.9848614	2.47826087	2.47826087
29629	DBMW-5	30 - 31	D-854	0.99814	0.99816	0.99996	220.8999668	2.529088913	2.52898775
29450	DBMW-6	45 - 46	D-854	0.99814	0.99831	1.0001	221.7645682	2.912483912	2.912775161
29450	DBMW-6	32.5 - 33	D-854	0.99812	0.99827	1.00006	221.014724	2.816326531	2.81649551
29451	DBMW-7	59 - 59.5	D-854	0.99837	0.99837	1.00016	169.33	2.87569989	2.688
29451	DBMW-7	67.5 - 68	D-854	0.99812	0.99814	0.99994	220.9499692	2.798991808	2.798823869
29453	DBMW-8	56 - 56.5	D-854	0.99812	0.99831	1.0001	224.5047112	2.56003986	2.560295864
29453	DBMW-8	68 - 68.5	D-854	0.99812	0.99816	0.99996	220.9099476	2.962376238	2.962257743
29470	DBMW-9	60 - 65	D-854	0.99837	0.99747	0.99926	168.881467	2.803176796	2.801102445
29470	DBMW-9	70.5 - 71	D-854	0.99812	0.99831	1.0001	224.4947131	2.926111908	2.926404519
29482	DBMW-10	63 - 63.5	D-854	0.99812	0.99823	1.00002	220.9947976	2.645361991	2.645414898
29482	DBMW-10	72 - 72.5	D-854	0.99837	0.99825	1.00004	224.3302004	2.568077803	2.568180526
29519	DBMW-11	56 - 57	D-854	0.99814	0.99806	0.99985	220.900144	2.685185185	2.684782407
29519	DBMW-11	69 - 69.5	D-854	0.99814	0.99808	0.99987	220.850099	2.616996508	2.616656298
29520	DBMW-12	56 - 57'	D-854	0.99808	0.99808	0.99987	224.4	2.766093053	2.765733461
29520	DBMW-12	70 - 70.5'	D-854	0.99814	0.99814	0.99994	169.17	2.763385147	2.763219344
29444	DBMW-13	54.5 - 55	D-854	0.99814	0.99819	0.99998	220.96491	2.610247553	2.610195348
29524	DBMW-13	74 - 74.5	D-854	0.99814	0.99816	0.99996	169.2099668	2.549807375	2.549705382
29525	DBMW-14	44 - 45	D-854	0.99814	0.99821	1	169.2348838	2.538732394	2.538732394
29525	DBMW-14	57 - 57.5	D-854	0.99812	0.99821	1	220.9848614	2.588435374	2.588435374
29616	DBMW-15	40 - 40.5	D-854	0.99808	0.99816	0.99996	224.4498784	2.426989984	2.426892905

<u>Sample Number</u>	<u>Location</u>	<u>Sample Depth (ft)</u>	<u>ASTM Test Method</u>	<u>Water Density at Ta</u>	<u>Water Density at Tb</u>	<u>K Factor at Tb</u>	<u>Ma at Tb</u>	<u>Specific Gravity at Tb</u>	<u>Specific Gravity at 20 C</u>
29616	DBMW-15	64.5 - 65	D-854	0.99814	0.99814	0.99994	220.89	2.586652314	2.586497115
29617	DBMW-16	92.5 - 95	D-854	0.99812	0.99819	0.99998	220.9748922	2.611549385	2.611497154
29617	DBMW-16	107.5 - 108	D-854	0.99814	0.9981	0.9999	220.8700664	2.591463415	2.591204268
29619	DBMW-17	66.5 - 67.5	D-854	0.99814	0.99816	0.99996	220.9499632	2.60498615	2.60488195
29619	DBMW-17	72 - 72.5	D-854	0.99814	0.99816	0.99996	169.2099668	2.605438402	2.605334184
29621	DBMW-18	52 - 52.5	D-854	0.99814	0.99823	1.00002	220.9348506	2.4576706	2.457719754
29621	DBMW-18	62.5 - 63	D-854	0.99837	0.99823	1.00002	220.3196738	2.463120567	2.46316983
29622	DBMW-19	15 - 17.5	D-854	0.99808	0.9981	0.9999	224.4199696	2.647752193	2.647487418
29622	DBMW-19	35.5 - 36.5	D-854	0.99814	0.99821	1	169.2348838	2.70840682	2.70840682
29661	DBMW-20	35 - 37.5	D-854	0.99764	0.99816	0.99996	224.6491316	2.574103459	2.574000495
29661	DBMW-20	67.5 - 70	D-854	0.99814	0.99816	0.99996	220.8999668	2.624090542	2.623985578
29653	DBMW-22	41 - 41.5	D-854	0.99814	0.99823	1.00002	220.9348506	2.656323185	2.656376311
29653	DBMW-22	54 - 55	D-854	0.99814	0.99829	1.00008	169.274751	2.705513784	2.705730226
29652	AA-23R	27.5 - 30	D-854	0.99812	0.99823	1.00002	22.09948306	2.659467243	2.659520432
29652	AA-23R	40 - 41.3	D-854	0.99764	0.99823	1.00002	224.6941504	2.612527716	2.612579967

TABLE 9
ONE-DIMENSIONAL CONSOLIDATIUN PROPERTIES OF SOILS
Project Name: BMI Northeast Area
Henderson, Nevada
Project Number: 83173

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

<u>Sample Number</u>	<u>Sample Location</u>	<u>Sample Depth (ft)</u>	<u>ASTM Test Method</u>	<u>Load (psf)</u>	<u>Consolidation (%)</u>
29446	DBMW-1	38.5 - 39	D2435-04	100	0.00
				100	-0.16
				500	0.41
				1000	0.92
				2000	1.71
				4000	2.82
				8000	4.07
				16000	5.91
				32000	9.62
				16000	9.06
				8000	8.40
				4000	7.72
29446	DBMW-1	46.8 - 47.5	D2435-04	100	0.00
				100	-0.01
				500	0.79
				1000	1.48
				2000	2.43
				4000	3.61
				8000	5.02
				16000	7.52
				32000	11.74
				16000	11.36
				8000	10.92
				4000	10.41

<u>Sample Number</u>	<u>Sample Location</u>	<u>Sample Depth (ft)</u>	<u>ASTM Test Method</u>	<u>Load (psf)</u>	<u>Consolidation (%)</u>
29444	DBMW-2	30 - 35	D2435-04	100	0.00
				100	-0.06
				500	0.60
				1000	1.07
				2000	1.90
				4000	2.84
				8000	4.42
				16000	7.09
				32000	12.26
				64000	20.40
				32000	19.93
				16000	19.44
				8000	18.77
29444	DBMW-2	45 - 50	D2435-04	100	-0.01
				500	1.00
				1000	1.67
				2000	2.44
				4000	3.76
				8000	5.89
				16000	8.83
				32000	13.81
				64000	21.81
				32000	21.31
				16000	20.52
				8000	19.60
				4000	18.63
29447	DBMW-3	29 - 30	D2435-04	100	0.00
				100	-0.11
				500	0.33
				1000	0.74
				2000	1.43
				4000	2.30
				8000	3.61
				16000	5.61
				32000	10.57
				16000	10.27
				8000	9.85
				4000	9.40

Sample Number	Sample Location	Sample Depth (ft)	ASTM Test Method	Load (psf)	Consolidation (%)
29629	DBMW-5	23.5 - 24	D2435-04	100	0.00
				100	-0.94
				500	-0.53
				1000	-0.09
				2000	0.41
				4000	1.23
				8000	2.24
				16000	3.86
				32000	6.85
				16000	6.40
				8000	5.79
				4000	5.12
29629	DBMW-5	30 - 31	D2435-04	100	0.34
				500	0.82
				1000	1.34
				2000	2.05
				4000	3.09
				8000	4.53
				16000	6.34
				32000	9.00
				64000	13.01
				32000	12.61
				16000	12.02
				8000	11.28
				4000	10.77
29450	DBMW-6	45 - 46	D2435-04	100	0.00
				100	-0.22
				500	0.25
				1000	0.82
				2000	1.97
				4000	3.05
				8000	4.58
				16000	6.95
				32000	9.71
				16000	9.57
				8000	9.31
				4000	8.88
				2000	8.51

<u>Sample Number</u>	<u>Sample Location</u>	<u>Sample Depth (ft)</u>	<u>ASTM Test Method</u>	<u>Load (psf)</u>	<u>Consolidation (%)</u>
29452	DBMW-7	67.5 - 68	D2435-04	100	0.00
				100	-0.72
				500	-0.26
				1000	0.21
				2000	0.88
				4000	1.77
				8000	2.79
				16000	4.31
				32000	7.88
				16000	7.41
				8000	6.72
				4000	5.89
				2000	5.26
29482	DBMW-10	63 - 63.5	D2435-04	100	0.00
				100	-0.14
				500	0.38
				1000	0.99
				2000	1.72
				4000	3.01
				8000	4.47
				16000	6.58
				32000	10.04
				64000	16.71
				32000	16.16
				16000	15.30
				8000	14.17
29497	DBMW-10	72 - 72.5	D2435-04	100	0.00
				100	-2.96
				500	-2.47
				1000	-1.83
				2000	-0.99
				4000	0.27
				8000	1.48
				16000	3.70
				32000	7.40
				64000	13.67
				32000	13.00
				16000	11.90
				8000	10.52
				4000	9.39

Sample Number	Sample Location	Sample Depth (ft)	ASTM Test Method	Load (psf)	Consolidation (%)
29519	DBMW-11	56 - 57	D2435-04	100	0.00
				100	-0.65
				500	-0.33
				1000	0.09
				2000	0.52
				4000	1.27
				8000	2.40
				16000	3.90
				32000	6.69
				64000	11.09
				32000	10.61
				16000	9.97
				8000	9.34
				4000	8.60
29520	DBMW-11	69 - 69.5	D2435-04	100	4.55
				500	5.33
				1000	6.11
				2000	7.17
				4000	8.63
				8000	10.38
				16000	12.63
				32000	15.89
				16000	15.52
				8000	14.82
				4000	13.75
29520	DBMW-12	56 - 57	D2435-04	100	0.00
				100	-1.43
				500	-0.68
				1000	0.10
				2000	1.05
				4000	2.08
				8000	3.77
				16000	6.08
				32000	9.40
				16000	9.10
				8000	8.65
				4000	7.99

<u>Sample Number</u>	<u>Sample Location</u>	<u>Sample Depth (ft)</u>	<u>ASTM Test Method</u>	<u>Load (psf)</u>	<u>Consolidation (%)</u>
29520	DBMW-12	70 - 70.5	D2435-04	100	0.00
				100	-1.29
				500	-0.47
				1000	0.16
				2000	1.13
				4000	2.33
				8000	3.81
				16000	6.02
				32000	8.98
				16000	8.61
				8000	8.04
				4000	7.51
29525	DBMW-13	74 - 74.5	D2435-04	100	0.00
				100	-4.85
				500	-3.93
				1000	-3.13
				2000	-1.89
				4000	-0.37
				8000	1.22
				16000	3.53
				32000	6.51
				16000	6.06
				8000	5.25
				4000	4.40
29524	DBMW-14	44 - 45	D2435-04	100	0.00
				100	-0.28
				500	0.28
				1000	0.75
				2000	1.72
				4000	2.76
				8000	4.41
				16000	6.87
				32000	11.26
				16000	10.62
				8000	9.74
				4000	8.85
				2000	8.22

<u>Sample Number</u>	<u>Sample Location</u>	<u>Sample Depth (ft)</u>	<u>ASTM Test Method</u>	<u>Load (psf)</u>	<u>Consolidation (%)</u>
29619	DBMW-17	66.5 - 67.5	D2435-04	100	0.00
				100	0.10
				500	0.35
				1000	0.79
				2000	1.50
				4000	2.41
				8000	3.75
				16000	5.55
				32000	8.69
				16000	8.39
				8000	8.07
				4000	7.71
29619	DBMW-17	72 - 72.5	D2435-04	100	0.00
				100	-0.15
				500	0.48
				1000	1.39
				2000	2.44
				4000	4.40
				8000	6.83
				16000	11.75
				32000	19.74
				16000	19.40
				8000	18.69
				4000	18.31
29622	DBMW-19	35.5 - 36.5	D2435-04	100	0.00
				100	-0.31
				500	0.09
				1000	0.62
				2000	1.52
				4000	3.05
				8000	5.41
				16000	8.93
				32000	14.11
				64000	21.16
				32000	20.30
				16000	19.54
				8000	17.99
				4000	16.87

<u>Sample Number</u>	<u>Sample Location</u>	<u>Sample Depth (ft)</u>	<u>ASTM Test Method</u>	<u>Load (psf)</u>	<u>Consolidation (%)</u>
29653	DBMW-22	41 - 41.5	D2435-04	100	0.00
				100	-0.44
				500	0.16
				1000	0.74
				2000	1.91
				4000	3.59
				8000	5.85
				16000	9.20
				32000	13.78
				16000	13.24
				8000	12.44
				4000	11.49
29653	DBMW-22	54 - 55	D2435-04	100	0.00
				100	-0.61
				500	0.16
				1000	0.76
				2000	1.54
				4000	3.17
				8000	6.75
				16000	17.71
				32000	26.93
				16000	26.34
				8000	24.11
				4000	23.85
29652 AA-23R		40 -41.3		100	0.00
				100	-0.37
				500	0.41
				1000	1.03
				2000	1.74
				4000	2.98
				8000	4.63
				16000	6.97
				32000	10.49
				16000	10.20
				8000	9.71
				4000	9.20

PLATES



N Scale in Feet 0 500 1,000 2,000 3,000 4,000 Locations are Approximate		PROJECT LOCATION BRC AQUIFER TESTING HENDERSON, NEVADA		PLATE: 1
Drawn by: K. Hagan	Date: 10/05/07	Project No.: 83173.12	File Name: D:\GIS\Projects\83173-...\DBMW_Plate1.mxd	Aerial Imagery Source: Clark County Assessor's Office "OpenWeb Info Mapper" Spring 2007
Reviewed by: G. Wittman	Revision Date:			



N

Scale in Feet

0 500 1,000 2,000 3,000 4,000

Locations are Approximate

Kleinfelder Northeast Wells

Kleinfelder Soil Boring

Existing well locations

GES Groundwater Well

Site Boundary

KLEINFELDER 6380 South Polaris Avenue Las Vegas, NV 89118 Ph: (702) 736-2936 Fax: (702) 361-9094		NEW MONITORING WELL LOCATIONS BRC AQUIFER TESTING HENDERSON, NEVADA	PLATE: 2
Drawn by: K. Hagan	Date: 10/05/07	Project No.: 83173.12	Aerial Imagery Source: Clark County Assessor's Office "OpenWeb Info Mapper" Spring 2007
Reviewed by: G. Wittman	Revision Date:	File Name: D:\GIS\Projects\83173-...\DBMW_Plate2.mxd	

APPENDIX A

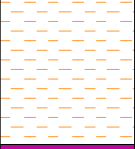
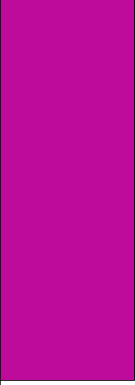
Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 6/19/07
End Date: 6/19/07
Total Hole Depth (ft): 50
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 21
Screen Length (ft): 19-49
Ground Surface Elev.: 1623.74 feet NAVD88

Logged By: Davis
Checked By: G. Carter
Permit No.:

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
0							Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 3' Stick-up
10		SILTY SAND (SM): Reddish Brown with Fine Grained Gravel, Fine to Medium Grained Sands, Trace Volcanic Rock (sub-rounded to rounded)					Bentonite chip seal
20							4" Diameter Schedule 40 PVC Casing, 0.020" Slot Well Screen
30		CLAYEY SAND (SC): Reddish Brown, Fine to Medium Grained Sand					#10/20 Colorado Silica Sand

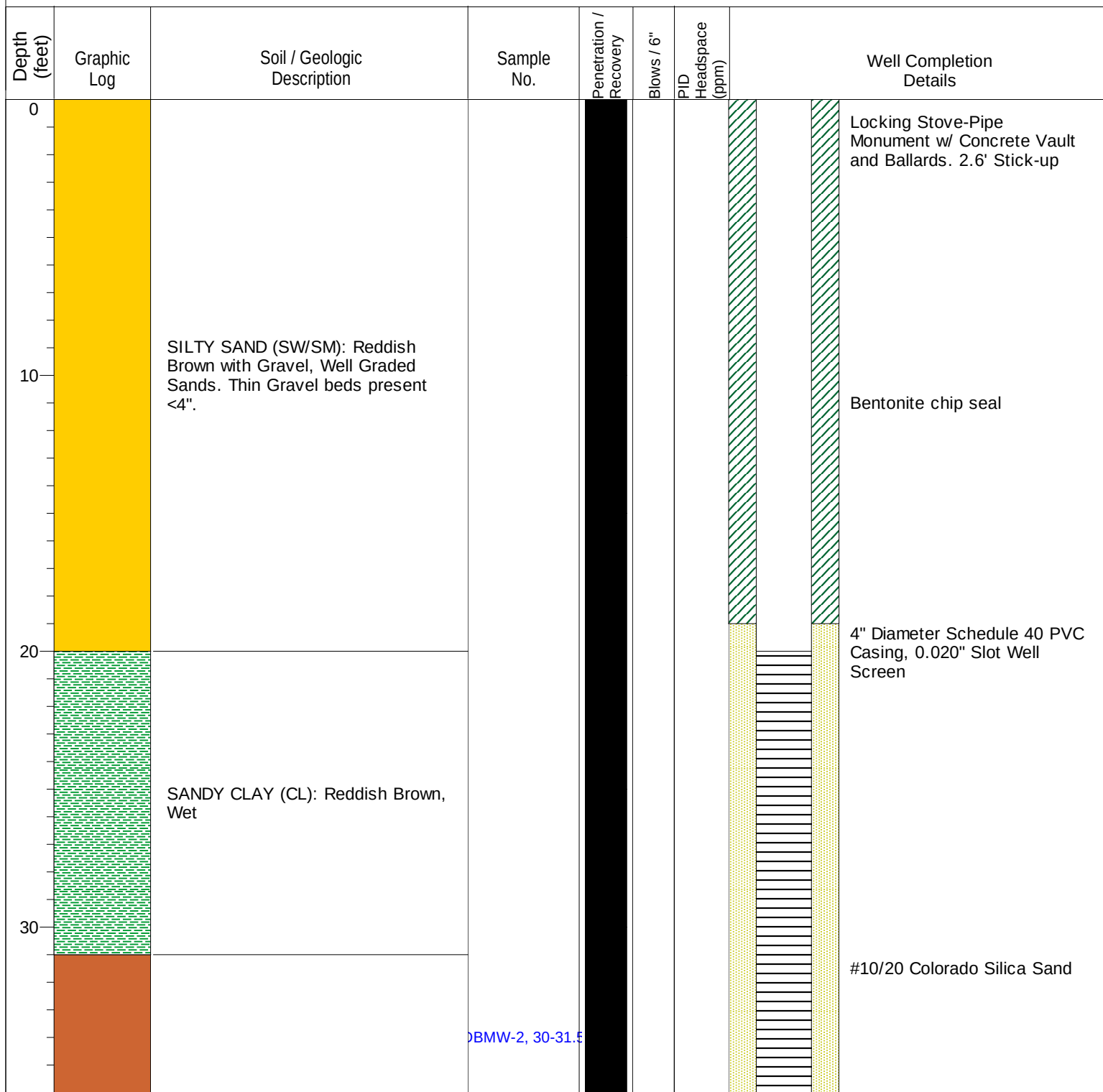
Project Name:	BRC Aquifer Testing	Start Date:	6/19/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	6/19/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	50	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	B.L. GP24-300RS	Water Level (Initial, Ft):	21		
Drilling Method:	Roto-Sonic	Screen Length (ft):	19-49		
Sampling Method:	Continuous Core	Ground Surface Elev.:	1623.74 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
40			DBMW-1, 40-41.5				4" Diameter, 0.020" Slot
50		MUDDY CREEK FORMATION (TMC): Silty Clayey Sandstone, Light Grayish Green, Fine to Medium Grained Sands, Trace Fine grained Gypsum	DBMW-1, 50-51.5				Stop sampling at 50 feet bgs.

Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. - GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 6/18/07
End Date: 6/18/07
Total Hole Depth (ft): 50
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 21
Screen Length (ft): 20-50
Ground Surface Elev.: 1625.16 feet NAVD88

Logged By: Davis
Checked By: G. Carter
Permit No.:



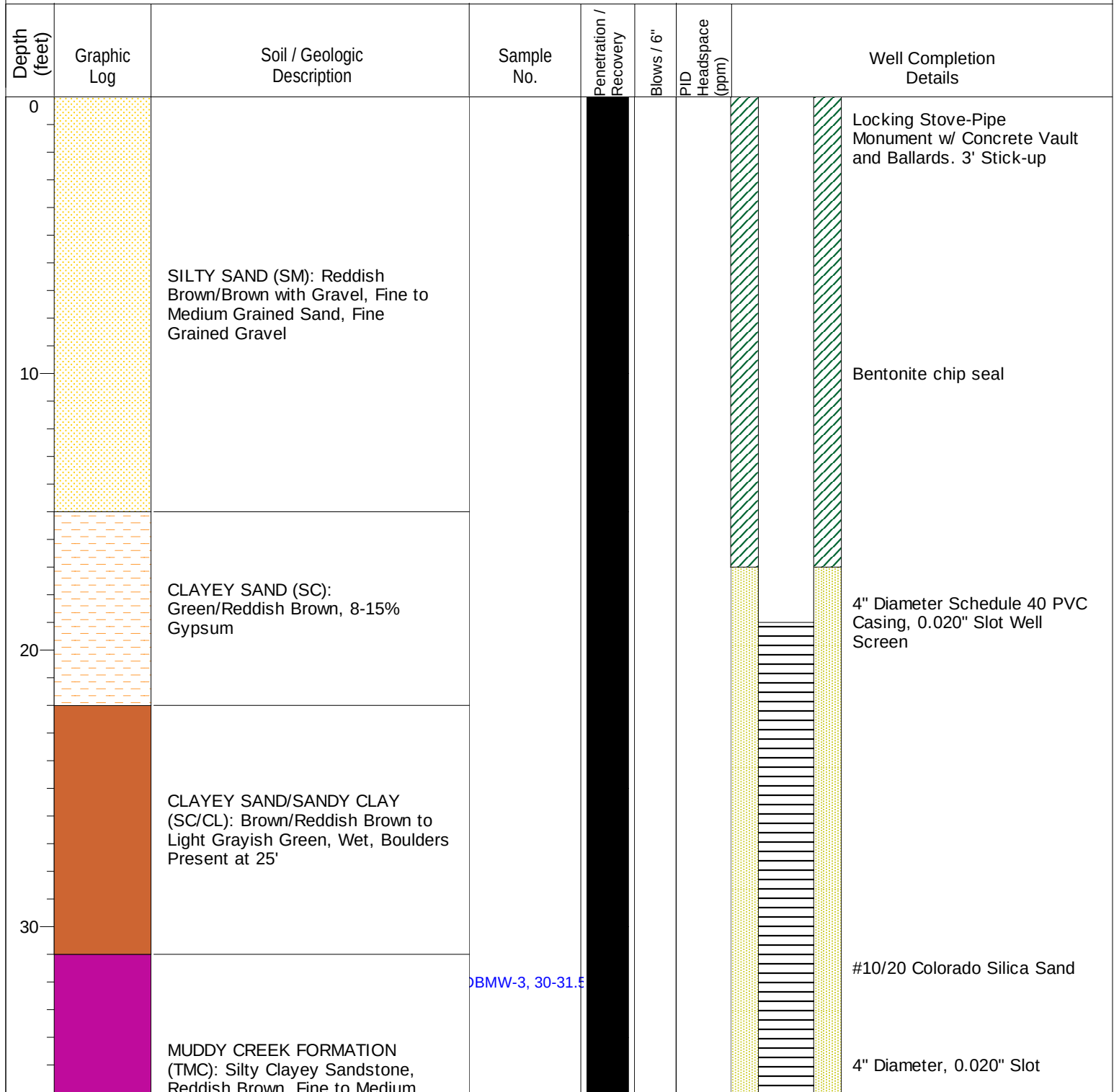
Project Name:	BRC Aquifer Testing	Start Date:	6/18/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	6/18/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	50	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	B.L. - GP24-300RS	Water Level (Initial, Ft):	21		
Drilling Method:	Roto-Sonic	Screen Length (ft):	20-50		
Sampling Method:	Continuous Core	Ground Surface Elev.:	1625.16 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
40		CLAYEY SAND/SANDY CLAY (SC/CL): Reddish Brown, Wet					4" Diameter, 0.020" Slot
50		MUDDY CREEK FORMATION (TMC): Silty Clayey Sandstone, Light Reddish Brown to Light Greenish Gray	DBMW-2, 50-51.5				Stop sampling at 50 feet bgs.

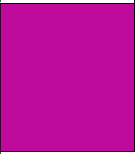
Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. - GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 6/20/07
End Date: 6/20/07
Total Hole Depth (ft): 40
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 22
Screen Length (ft): 19-39
Ground Surface Elev.: 1622.95 feet NAVD88

Logged By: Davis
Checked By: G. Carter
Permit No.:



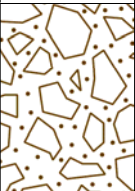
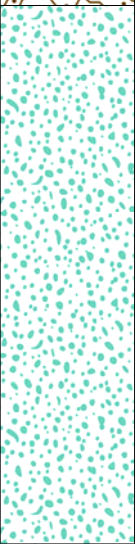
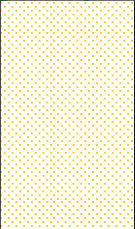
Project Name:	BRC Aquifer Testing	Start Date:	6/20/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	6/20/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	40	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	B.L. - GP24-300RS	Water Level (Initial, Ft):	22		
Drilling Method:	Roto-Sonic	Screen Length (ft):	19-39		
Sampling Method:	Continuous Core	Ground Surface Elev.:	1622.95 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
40		Grained Sand	DBMW-3, 4				Stop sampling at 40 feet bgs.

Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. - GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 7/23/07
End Date: 7/23/07
Total Hole Depth (ft): 40
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 11
Screen Length (ft): 10-30
Ground Surface Elev.: 1602.98 feet NAVD88

Logged By: Davis
Checked By: G. Carter
Permit No.:

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
0		FILL: Road Fill					Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 3' Stick-up
10		WELL GRADED SAND WITH GRAVEL (SW): Reddish Brown (5YR 4/4), Trace Silt, 75% fine to medium grained sand, 20% gravel <2" subrounded and volcanic, 5% silt, Dry, Non plastic					Bentonite chip seal
20		SILTY SAND WITH GRAVEL (SM): Reddish Brown (5YR 4/4), 65% fine to medium sand, 15% silt, 15% gravel <2" subangular to subrounded/volcanic, trace clay, Wet, Low to medium plasticity, Sandy Facies of Muddy Creek Fm.	DBMW-4, 15-16.5				4" Diameter Schedule 40 PVC Casing, 0.020" Slot Well Screen
30		CLAYEY SILT (ML): Muddy Creek Formation, Brown (7.5YR 4/4), Trace gypsum crystals, 75% silt, 25% clay, <2% gypsum crystals up to 2", Wet, Medium plasticity					#10/20 Colorado Silica Sand
							#10/20 Colorado Silica Sand

Project Name:	BRC Aquifer Testing	Start Date:	7/23/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	7/23/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	40	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	B.L. - GP24-300RS	Water Level (Initial, Ft):	11		
Drilling Method:	Roto-Sonic	Screen Length (ft):	10-30		
Sampling Method:	Continuous Core	Ground Surface Elev.:	1602.98 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
40			DBMW-4, 4C				4" Diameter, 0.020" Slot Stop sampling at 40 feet bgs.

Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. - GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 7/22/07
End Date: 7/22/07
Total Hole Depth (ft): 35
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 19
Screen Length (ft): 15-35
Ground Surface Elev.: 1606.55 feet NAVD88

Logged By: Davis
Checked By: G. Carter
Permit No.:

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
0		SANDY GRAVEL (GW): Reddish Brown (5YR 4/4), 60% gravel <2" subrounded/volcanic, 40% medium to coarse sand, Dry, Non plastic					Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 3' Stick-up
		WELL GRADED SAND WITH GRAVEL (SW): Reddish Brown (5YR 4/4), Trace silt, 75% fine to medium sand, 20% gravel <2" subrounded/volcanic, 5% silt, Dry, Non plastic					Bentonite chip seal
10		CLAY WITH SILT (CL): Pale Yellow (5Y 8/3), 85% Clay, 15% Silt, Slightly moist, Medium to high plasticity (Muddy Creek Formation)					4" Diameter Schedule 40 PVC Casing, 0.020" Slot Well Screen
		GYPSIFEROUS SILT WITH CLAY (ML): Light Brown (7.5YR 6/4), 50% Silt, 30% Gypsum crystals up to 2", 20% Clay, Moist/Wet, Low to medium plasticity	DBMW-5, 20-21.5				
20		CLAYEY SILT (ML): Light Brown (7.5YR 6/4), 60% Silt, 40% Clay, Moist/wet, Medium to high plasticity					#10/20 Colorado Silica Sand
		Gypsiferous, 25% fine to crystalline gypsum, crystals <2"					
30		CLAYEY SILT (ML): Light Brown (7.5YR 6/4), 60% Silt, 40% Clay, Moist/wet, Medium to high plasticity					#10/20 Colorado Silica Sand
							4" Diameter, 0.020" Slot
							Stop sampling at 35 feet bgs.

Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. - GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 6/21/07
End Date: 6/21/07
Total Hole Depth (ft): 50
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 31
Screen Length (ft): 30-50
Ground Surface Elev.: 1629.64 feet NAVD88

Logged By: Davis
Checked By: G. Carter
Permit No.:

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID	Headspace (ppm)	Well Completion Details
0								Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 3' Stick-up
		SILTY SAND (SM): Light Reddish Brown/Brown with Gravel, Fine to Medium Grained Sand, Fine Grained Gravel						
10								Bentonite chip seal
		WELL GRADED GRAVEL (GW/GM): Light Reddish Brown with Silt and Sand, Fine to Medium Grained Gravel, Fine to Medium Grained Sand						
		SILTY SAND (SM): Reddish Brown with Gravel						4" Diameter Schedule 40 PVC Casing
20								
		GYPSIFEROUS CLAYEY SAND (SC): Light Grayish Green, 8-30% Gypsum Bedded and Disseminated						
		SILTY SAND (SM): Reddish Brown, 1-3% Gypsum						
		GYPSIFEROUS CLAYEY SAND (SC): Light Grayish Green/Reddish Brown, 3-25% Gypsum						
30								4" Diameter Schedule 40 PVC Casing, 0.020" Slot Well Screen
		CLAYEY SAND/SANDY CLAY (SC/CL): Reddish Brown/Brown with 3-15% Gypsum, Large Gypsum Crystals <3" Wet	DBMW-6, 35-36.5					

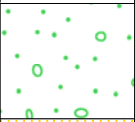
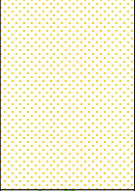
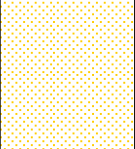
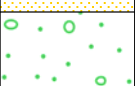
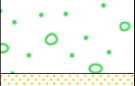
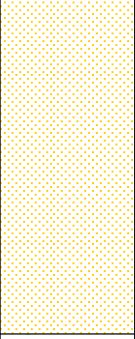
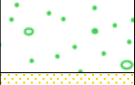
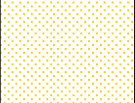
Project Name:	BRC Aquifer Testing	Start Date:	6/21/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	6/21/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	50	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	B.L. - GP24-300RS	Water Level (Initial, Ft):	31		
Drilling Method:	Roto-Sonic	Screen Length (ft):	30-50		
Sampling Method:	Continuous Core	Ground Surface Elev.:	1629.64 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID	Headspace (ppm)	Well Completion Details
		Crystals - 8, wet						
40								#10/20 Colorado Silica Sand
		MUDDY CREEK FORMATION (TMC): Reddish Brown/Brown Silty Clayey Sands. Light Grayish Green at 42-44', 15-30% Gypsum at 46-50'.						
			DBMW-6, 50-51.5					
50								Stop sampling at 50 feet bgs.

Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 6/22/07
End Date: 6/23/07
Total Hole Depth (ft): 70
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 57.5
Screen Length (ft): 50-70
Ground Surface Elev.: 1628.65 feet NAVD88

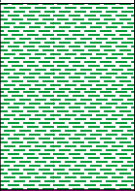
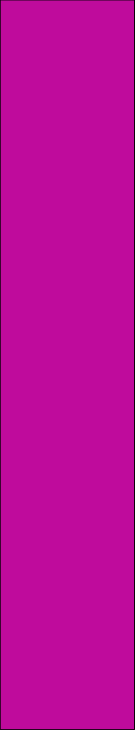
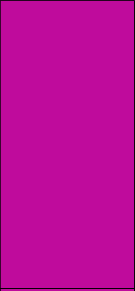
Logged By: Davis
Checked By: G. Carter
Permit No.:

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID	Headspace (ppm)	Well Completion Details
0		SILTY GRAVEL (GM): With Sand, Interbedded with Silty Sand with Gravel, Fine to Medium Grained Sand and Gravel						Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 3' Stick-up
		SILTY SAND (SM): Light Reddish Brown/Brown with Gravel, Fine to Medium Grained Sand						
		SILTY GRAVEL (GM): With Sand						
10		SILTY SAND (SM): With Gravel						Bentonite chip seal
		SILTY GRAVEL (GM): With Sand						
		SILTY SAND (SM): With Gravel						
		SILTY GRAVEL (GM): With Sand						
		SILTY SAND (SM): With Gravel						
20		SILTY GRAVEL (GM): With Sand						
		SILTY SAND (SM): With Gravel, Possible Poorly Preserved Gravel Beds						
30		SILTY GRAVEL (GM): With Sand						
		SILTY SAND (SM): With Gravel						Bentonite chip seal

Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 6/22/07
End Date: 6/23/07
Total Hole Depth (ft): 70
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 57.5
Screen Length (ft): 50-70
Ground Surface Elev.: 1628.65 feet NAVD88

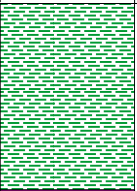
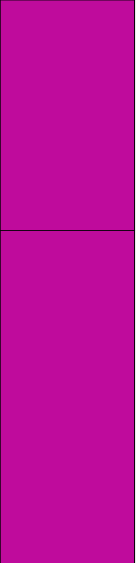
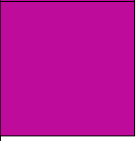
Logged By: Davis
Checked By: G. Carter
Permit No.:

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID	Headspace (ppm)	Well Completion Details
40		SANDY CLAY (CL): Light Grayish Green, Gypsiferous (3-20% Gypsum)						4" Diameter Schedule 40 PVC Casing
50		MUDDY CREEK FORMATION (TMC): Reddish Brown/Brown Silty Clayey Sand, Gypsiferous (3-25% Gypsum), Slightly Moist						4" Diameter Schedule 40 PVC Casing, 0.020" Slot Well Screen
60		Light Green Silty Sand with Clay, Low to Moderate Plasticity, 3-15% Fine Grained Gypsum	DBMW-7, 60-61.5					#10/20 Colorado Silica Sand
70		Reddish Brown	DBMW-7, 70-71					4" Diameter, 0.020" Slot
								Stop sampling at 70 feet bgs.

Project Name:	BRC Aquifer Testing	Start Date:	6/23/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	6/24/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	70	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	B.L. - GP24-300RS	Water Level (Initial, Ft):	57		
Drilling Method:	Roto-sonic	Screen Length (ft):	47.5-67.5		
Sampling Method:	Continuous Core	Ground Surface Elev.:	1628.95 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
0		SILTY GRAVEL (GM): Reddish Brown with Sand, 60-80% Fine to Medium Grained Gravel, Fine to Medium Grained Sand, Dry, Non Plastic					Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 3' Stick-up
		SILTY SAND (SM): Reddish Brown with Gravel, 60-75% Fine to Medium Grained Sand, Dry, Very Low Plasticity					
10		WELL GRADED GRAVEL (GM): With Silt and Sand, 50-60% Medium to Coarse Gravel, 30-40% Sand, Non Plastic					
		WELL GRADED SILTY SAND (SM): Reddish Brown with Gravel, 60-80% Fine to Medium Grained Sand					
20		WELL GRADED GRAVEL (GM): Reddish Brown with Silt and Sand, 50-80% Gravel, Trace Coarse Gravel and Cobbles <4", Non to Very Low Plasticity, Poorly Defined Bedding 2-6" Thick					
		WELL GRADED SILTY SAND (SM): Reddish Brown with Gravel, 60-80% Sand, Dry, Very Low Plasticity					
		WELL GRADED GRAVEL (GM): Reddish Brown with Silt and Sand, 50-80% Gravel, Trace Coarse Gravel and Cobbles <4", Non to Very Low Plasticity, Poorly Defined Bedding 2-6" Thick					
		WELL GRADED SILTY SAND (SM): Reddish Brown with Gravel, 60-80% Sand, Dry, Very Low Plasticity					
30		WELL GRADED GRAVEL (GM): Reddish Brown with Silt and Sand, 50-80% Gravel, Trace Coarse Gravel and Cobbles <4", Non to Very Low Plasticity, Poorly Defined Bedding 2-6" Thick, Sands and Gravels Sub Angular to Sub Rounded and Volcanic Derived					
		WELL GRADED SILTY SAND (SM): Reddish Brown with Gravel, 60-80% Sand, Dry, Very Low Plasticity, Sand					
							Bentonite chip seal

Project Name:	BRC Aquifer Testing	Start Date:	6/23/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	6/24/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	70	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	B.L. - GP24-300RS	Water Level (Initial, Ft):	57		
Drilling Method:	Roto-sonic	Screen Length (ft):	47.5-67.5		
Sampling Method:	Continuous Core	Ground Surface Elev.:	1628.95 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
40		and Gravel Subangular to Subrounded and Volcanic Derived WELL GRADED GRAVEL (GM): Reddish Brown with Silt and Sand, 50-80% Gravel, Trace Coarse Gravel and Cobbles <4", Non to Very Low Plasticity, Poorly Defined Bedding 2-6" Thick					
		WELL GRADED SILTY SAND (SM): Reddish Brown with Gravel, 60-80% Sand, Dry, Very Low Plasticity, Sand and Gravel Subangular to Subrounded and Volcanic Derived CLAY (CL): Light Grayish Green Trace Silt, Moderate to High Plasticity, 15-30% Fine Gypsum <1/8" SANDY CLAY (CL): Mottled Reddish Brown and Pale Greenish Gray Trace Silt, Moderate to High Plasticity, 15-30% Fine Gypsum <1/8", Slightly Moist MUDDY CREEK FORMATION (TMC): Light Brown/Reddish Brown Silty Clayey Sand, 60-80% Fine Sand, Slightly Moist, Moderate to High Plasticity. Trace Fine Grained Gypsum Present.					
50							
60		Silty Sand with Clay, Mottled Reddish Brown and Pale Greenish Gray, 15-40% Fine Grained Gypsum <1/4" Present, Moist to Wet					
			DBMW-8, 62				Bentonite chip seal 4" Diameter Schedule 40 PVC Casing 4" Diameter Schedule 40 PVC Casing, 0.020" Slot Well Screen
		Silt with Clay, Trace Fine Sand, Light Greenish Gray, 80-90% Fines, 3-8% Fine Grained Gypsum, Low Plasticity.					#10/20 Colorado Silica Sand
							#10/20 Colorado Silica Sand
							4" Diameter, 0.020" Slot
70		Silty Sand with Clay, Light Brown/Reddish Brown, Low Plasticity, 15-25% Fine Grained Gypsum	DBMW-8, 70-71.5				Stop sampling at 70 feet bgs.

Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 6/25/07
End Date: 6/25/07
Total Hole Depth (ft): 75
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 62
Screen Length (ft): 54-74
Ground Surface Elev.: 1656.83 feet NAVD88

Logged By: Davis
Checked By: G. Carter
Permit No.:

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID	Headspace (ppm)	Well Completion Details
0		SILTY SAND (SM): Reddish Brown with Gravel, Dry, Non Plastic						Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 3' Stick-up
		GRAVEL (GW): With Silt and Sand, 60-80% Fine Grained Gravel						
		SILTY SAND (SM): With Gravel, 60-80% Fine to Coarse Grained Sands, Non to Low Plasticity						
		GRAVEL (GW): Reddish Brown with Silt and Sand						
10		SILTY SAND (SM): With Gravel, 60-80% Fine to Coarse Grained Sand, Non to Low Plasticity						Bentonite chip seal
		GRAVEL (GW): With Silt and Sand						
		SAND (SW/SM): Reddish Brown with Silt and Gravel, 60-75% Medium to Coarse Grained Sand, 10-12% Fine Gravel, Dry, Non Plastic						
		SILTY SAND (SM): Reddish Brown with Gravel, 60-80% Fine to Medium Grained Sands, Non to Low Plasticity.						
		GRAVEL (GW): With Silt and Sand, 50-75% Fine to Medium Gravel						
20								
		SILTY SAND (SM): With Gravel, 60-80% Fine to Medium Grained Sand, 8-15% Fine to Coarse Gravel <2", Dry, Non to Low Plasticity						
30								
		GRAVEL (GW): Reddish Brown with Silt and Sand, 8-12% Coarse Gravel <2", 40-50% Fine Gravel						
		SILTY SAND (SM): Reddish Brown with Trace Coarse Gravel, 60-80%						Bentonite chip seal

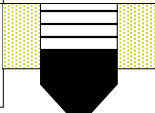
Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 6/25/07
End Date: 6/25/07
Total Hole Depth (ft): 75
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 62
Screen Length (ft): 54-74
Ground Surface Elev.: 1656.83 feet NAVD88

Logged By: Davis
Checked By: G. Carter
Permit No.:

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
40		with trace coarse gravel, 60-80% Fine to Coarse Sand, Dry, Non to Low Plasticity					4" Diameter Schedule 40 PVC Casing
		MUDDY CREEK FORMATION (TMC): Silty Clayey Sand, Light Yellowish Green, Trace Gravel, 60-80% Fine Sand, 20-40% Fines, Slightly Moist, Low Plasticity					
		Reddish Brown, 2-5% Fine Grained Gypsum, Trace Crystals <1"					
		Light Yellowish Green					
50		Reddish Brown, 8-15% Fine Grained Gypsum in Thin Beds <6"					
		Light Yellowish Green, 5-12% Gypsum, Thin Beds					4" Diameter Schedule 40 PVC Casing, 0.020" Slot Well Screen
60		Reddish Brown/Brown, Moist, Low Plasticity					#10/20 Colorado Silica Sand
		Light Yellowish Green, Wet					#10/20 Colorado Silica Sand
		Brown/Reddish Brown, 60-80% Fine Sand, 1-5% Fine Grained Gypsum, Low Plasticity					4" Diameter, 0.020" Slot

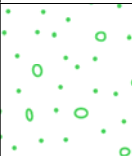
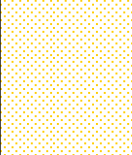
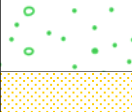
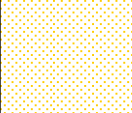
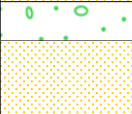
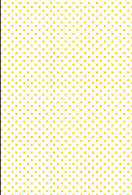
Project Name:	BRC Aquifer Testing	Start Date:	6/25/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	6/25/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	75	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	B.L. GP24-300RS	Water Level (Initial, Ft):	62		
Drilling Method:	Roto-Sonic	Screen Length (ft):	54-74		
Sampling Method:	Continuous Core	Ground Surface Elev.:	1656.83 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
		Mottled Brown and Yellowish Green	DBMW-9, 75-76.5				 Stop sampling at 75 feet bgs.

Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. - GP34-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 6/26/07
End Date: 7/3/07
Total Hole Depth (ft): 75
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 61
Screen Length (ft): 54.5-74.5
Ground Surface Elev.: 1661.01 feet NAVD88

Logged By: Davis
Checked By: G. Carter
Permit No.:

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
0		SILTY GRAVEL (GM): Reddish Brown (5YR 4/4) with Sand, 50-75% Fine to Coarse Gravel <2", Dry, Non Plastic					Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 3' Stick-up
		SILTY SAND (SM): With Gravel, 5-80% Sand, Non Plastic					
		SILTY GRAVEL (GW/GM): Reddish Brown (5YR 4/4) with Sand, 50-75% Fine to Coarse Gravel, Dry, Non Plastic. Sands and Gravel Derived from Volcanics.					
10		SILTY SAND (SM): With Gravel, Dry					Bentonite chip seal
		SANDY GRAVEL (GW/GM): Reddish Brown (5YR 4/4), 50-60% Fine to Coarse Gravel, Coarse Sands					
		SILTY SAND (SM): Reddish Brown (5YR 4/4) with Gravel, 50-75% Sand, Predominantly Medium Grained Sand, Dry, Non Plastic					
20		SANDY GRAVEL (GW/GM): Reddish Brown (5YR 4/4), 50-75% Gravel <2", Medium Grained Sand, Dry, Non Plastic					
		SILTY SAND (SM): Reddish Brown (5YR 4/4)					
		SILTY GRAVEL (GM): Reddish Brown (5YR 4/4) with Sand, 50-75% Fine to Coarse Gravel, 1-3% Cobbles <5"					
		SILTY SAND (SM): Reddish Brown (5YR 4/4) with Gravel, 60-80% Fine to Medium Grained Sand, Dry, Non to Low Plasticity					
30		SILTY GRAVEL (GM): Reddish Brown (5YR 4/4) with Sand, 1-2% Boulders, Non to Low Plasticity					
		SILTY SAND (SM): Brown (7.5YR 4/3) with Gravel, 60-80% Fine to Medium Grained Sand, Non to Low Plasticity					

Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. - GP34-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

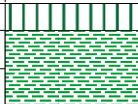
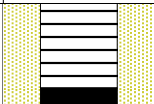
Start Date: 6/26/07
End Date: 7/3/07
Total Hole Depth (ft): 75
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 61
Screen Length (ft): 54.5-74.5
Ground Surface Elev.: 1661.01 feet NAVD88

Logged By: Davis
Checked By: G. Carter
Permit No.:

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
40		SILTY GRAVEL (GM): Reddish Brown (5YR 4/4) with Sand, 1-2% Boulders, Dry, Non to Low Plasticity SILTY SAND (SM): Brown (7.5YR 4/3) with Gravel, 60-80% Fine to Medium Grained Sand, Non to Low Plasticity					Bentonite chip seal 4" Diameter Schedule 40 PVC Casing
50		SAND (SM): Brown (7.5YR 4/3), Medium Grained Sand, Dry, Non to Very Low Plasticity					
60		SILTY SAND (SM): Brown/Reddish Brown (7.5YR 3/1) with Gravel, Fine to Medium Grained Sand, Slightly Moist, Low Plasticity					4" Diameter Schedule 40 PVC Casing, 0.020" Slot Well Screen
70		SILTY CLAY (CL): Reddish Brown (5YR 4/3), Trace Fine Sand, Wet, Moderate Plasticity Pale Yellow (5Y 7/3), 1-3% Fine Grained Gypsum					#10/20 Colorado Silica Sand 4" Diameter, 0.020" Slot
		CLAYEY SILT (ML): Reddish Brown (5YR 4/3), Wet, Low Plasticity					

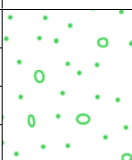
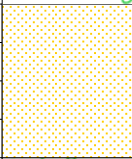
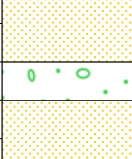
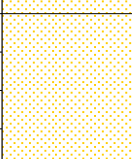
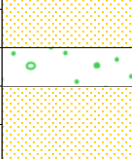
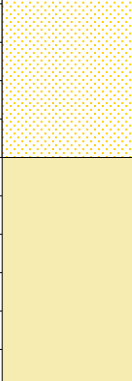
BMW-10, 60-61.1

Project Name:	BRC Aquifer Testing	Start Date:	6/26/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	7/3/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	75	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	B.L. - GP34-300RS	Water Level (Initial, Ft):	61		
Drilling Method:	Roto-Sonic	Screen Length (ft):	54.5-74.5		
Sampling Method:	Continuous Core	Ground Surface Elev.:	1661.01 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
		SILTY CLAY (CL): Pale Yellow (5Y 7/3), Trace Fine Sand, 1-3% Fine Grained Gypsum, Moderate Plasticity	DBMW-10, 75-78				

Stop sampling at 75 feet bgs.

Project Name:	BRC Aquifer Testing	Start Date:	7/5/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	7/6/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	70	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	B.L. - GP24-300RS	Water Level (Initial, Ft):	54		
Drilling Method:	Roto-Sonic	Screen Length (ft):	50-70		
Sampling Method:	Continuous Core	Ground Surface Elev.:	1664.46 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID	Headspace (ppm)	Well Completion Details
0		SILTY GRAVEL (GM): Brown (7.5YR 4/3) with Sand, 50-75% Fine to Coarse Gravel, Dry, Non Plastic						Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 3' Stick-up
		SILTY SAND (SM): Reddish Brown (5YR 5/4) Silty Sand with Gravel, 60-80% Fine to Medium Sand, 12-20% Fine to Coarse Grained Gravels <2", Dry, Non to Low Plasticity						
10		SILTY GRAVEL (GM): Brown (7.5YR 4/3) with Sand, 50-75% Fine to Coarse Gravel, Dry, Non Plastic						Bentonite chip seal
		SILTY SAND (SM): Reddish Brown (5YR 5/4) Silty Sand with Gravel, 60-80% Fine to Medium Sand, 12-20% Fine to Coarse Grained Gravels <2", Dry, Non to Low Plasticity						
		SILTY GRAVEL (GM): Brown (7.5YR 4/3) with Sand, 50-75% Fine to Coarse Gravel, Dry, Non Plastic						
20		SILTY SAND (SM): Reddish Brown (5YR 5/4) with Gravel, 60-80% Fine to Coarse Sand, 12-20% Fine to Coarse Grained Gravels <2", Dry, Non to Low Plasticity						4" Diameter Schedule 40 PVC Casing
		5YR 5/4 SILTY SAND (SM): Silty Sand with Gravel, 50-75% Fine to Medium Grained Sand, Dry, Non to Low Plasticity						
30		SILTY SAND (SM/ML): Reddish Brown/Yellowish Red (5YR 4/4 - 5YR 4/6), Trace Clay, 2-4% Fine Grained Gypsum, Low to Moderate Plasticity, Slightly Moist, Muddy Creek Formation						Bentonite chip seal

Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. - GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 7/5/07
End Date: 7/6/07
Total Hole Depth (ft): 70
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 54
Screen Length (ft): 50-70
Ground Surface Elev.: 1664.46 feet NAVD88

Logged By: Davis
Checked By: G. Carter
Permit No.:

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID	Headspace (ppm)	Well Completion Details
40		SANDY SILT (ML/CL): Pale Yellow (2.5Y 8/3), 5-8% Fine Grained Gypsum, Slightly Moist						
		SILTY SAND (SM/ML): Reddish Brown (5YR 4/4), 30-35% Fine Grained Gypsum						
		SANDY SILT (ML/CL): Pale Yellow (2.5YR 8/3), Increase Clay Content, Low to Moderate Plasticity						
		SILTY SAND (SM/ML): Reddish Brown (5YR 4/4), Trace Clay, 3-8% Fine to Medium Grained Gypsum						
50		CLAYEY SILT (ML/CL): Pale Yellow (2.5YR 8/3), Low to Moderate Plasticity, Slightly Moist, Fine Grained Gypsum Present						
		SILTY SAND (SM/ML): Reddish Brown (5YR 4/4), Trace Clay, 3-8% Fine to Medium Grained Gypsum <1/2", Moist, Low to Moderate Plasticity						
		CLAYEY SILT (ML/CL): Pale Yellow (2.5YR 8/5), Low to Moderate Plasticity, Moist, Fine Grained Gypsum Present						
60		SILTY SAND (SM/ML): Reddish Brown (5YR 4/4), Trace Clay, 3-8% Fine to Medium Grained Gypsum <1/2", Increase in Clay Content (Possible Thin Clay Beds), Wet, Moderate Plasticity						
		CLAYEY SILT (ML/CL): Reddish Brown (5YR 4/4), Increase in Clay, Wet, Moderate to High Plasticity						
70		SILTY SAND (SM/ML): Reddish Brown (5YR 4/4), Trace Clay, 2-5% Fine Grained Gypsum, Wet, Low to Moderate Plasticity						

BMW-11, 54-55.1

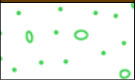
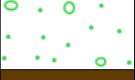
4" Diameter Schedule 40 PVC Casing, 0.020" Slot Well Screen

#10/20 Colorado Silica Sand

4" Diameter, 0.020" Slot

Stop sampling at 70 feet bgs.

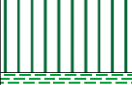
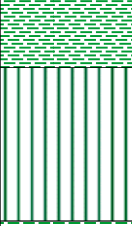
Project Name:	BRC Aquifer Testing	Start Date:	7/7/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	7/7/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	75	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	B.L. - GP24-300RS	Water Level (Initial, Ft):	54		
Drilling Method:	Roto-Sonic	Screen Length (ft):	45-75		
Sampling Method:	Continuous Core	Ground Surface Elev.:	1666.71 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
0		SILTY SAND (SM/SW): Brown (7.5YR 4/4) with Gravel, 60-80% Fine to Medium Grained Sand					Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 3.6' Stick-up
		SILTY GRAVEL (GM): Brown (7.5YR 4/4), With Sand, 50 - 75% Gravel <2", Dry, Non Plastic					
		SILTY SAND (SM/SW): Brown (7.5YR 4/4) With Gravel, Dry, Non Plastic					
		SILTY GRAVEL (GM): Brown (7.5YR 4/4) with Sand, 50 - 75% Gravel <2"					
10		SILTY SAND (SM/SW): Brown (7.5YR 4/4) with Gravel, 60 - 80% Fine to Medium Grained Sand, Sub-Rounded/Sub-Angular Gravels (Volcanic Derived)					Bentonite chip seal
		SILTY GRAVEL (GM): Brown (7.5YR 5/4) with 15 - 20% Coarse Sand, 50 - 60% Gravel <2", Non to Low Plasticity					
20		SILTY SAND (SM/SW): Brown (7.5YR 4/4) with Gravel, 60 - 80% Fine to Medium Grained Sand, Non to Low Plasticity					
		SILTY GRAVEL (GM): Brown (7.5YR 5/4) with 15 - 20% Coarse Sand, 50 - 60% Gravel <2", Non to Low Plasticity, !% Cobbles 2-4"					
		SILTY SAND (SM/SW): Brown (7.5YR 4/4) with Gravel, Fine to Medium Grained Sand, Non Plastic, Fine Grained Gypsum Present at 28 feet					
30		SILTY CLAY (CL): Pale Yellow (5Y 8/4), 5-15% Fine Grained Gypsum and Crystals <2", Dry, Moderate to High Plasticity					

Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. - GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 7/7/07
End Date: 7/7/07
Total Hole Depth (ft): 75
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 54
Screen Length (ft): 45-75
Ground Surface Elev.: 1666.71 feet NAVD88

Logged By: Davis
Checked By: G. Carter
Permit No.:

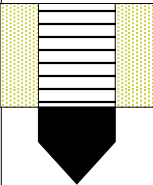
Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID	Headspace (ppm)	Well Completion Details
40								
		CLAYEY SILT (ML): Reddish Brown (5YR 4/4), Trace Fine Grained Sand, Moist, 3-8% Gypsum Crystals <1", Moderate Plasticity						
50		CLAYEY SILT/SILTY CLAY (ML/CL): Interbedded Reddish Brown Clayey Silt and Pale Yellow Silty Clay						
		CLAYEY SILT (ML): Reddish Brown (5YR 4/4), Trace Fine Sand, Low to Moderate Plasticity, First Water Encountered at 54'						
		SILTY CLAY (CL): Pale Yellow (5Y 8/4), Wet, Moderate to High Plasticity, Fine Grained Gypsum Present at 59 feet.						
60		CLAYEY SILT (ML): Reddish Brown (5YR 4/4), Trace Fine Sand, Trace Fine Grained Gypsum, Crystals Present <1", Moist/Wet, Moderate Plasticity						
		SILTY CLAY (CL): Pale Yellow (5Y 8/4), Wet, Moderate to High Plasticity						
70		CLAYEY SILT (ML): Reddish Brown (5YR 4/4), Trace Fine Sand, Moist/Wet						

BMW-12, 55-56'

4" diameter Schedule 40 PVC casing, 0.020" slot well screen

#10/20 Colorado Silica Sand

Project Name:	BRC Aquifer Testing	Start Date:	7/7/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	7/7/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	75	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	B.L. - GP24-300RS	Water Level (Initial, Ft):	54		
Drilling Method:	Roto-Sonic	Screen Length (ft):	45-75		
Sampling Method:	Continuous Core	Ground Surface Elev.:	1666.71 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
80			DBMW-12, 75-7				 4" diameter, 0.020" slot Stop sampling at 75 feet bgs.

Project Name:	BRC Aquifer Testing	Start Date:	7/8/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	7/9/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	75	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	B.L. - GP24-300RS	Water Level (Initial, Ft):	52		
Drilling Method:	Roto-Sonic	Screen Length (ft):	45-75		
Sampling Method:	Continuous Core	Ground Surface Elev.:	1676.02 feet NAVD88		

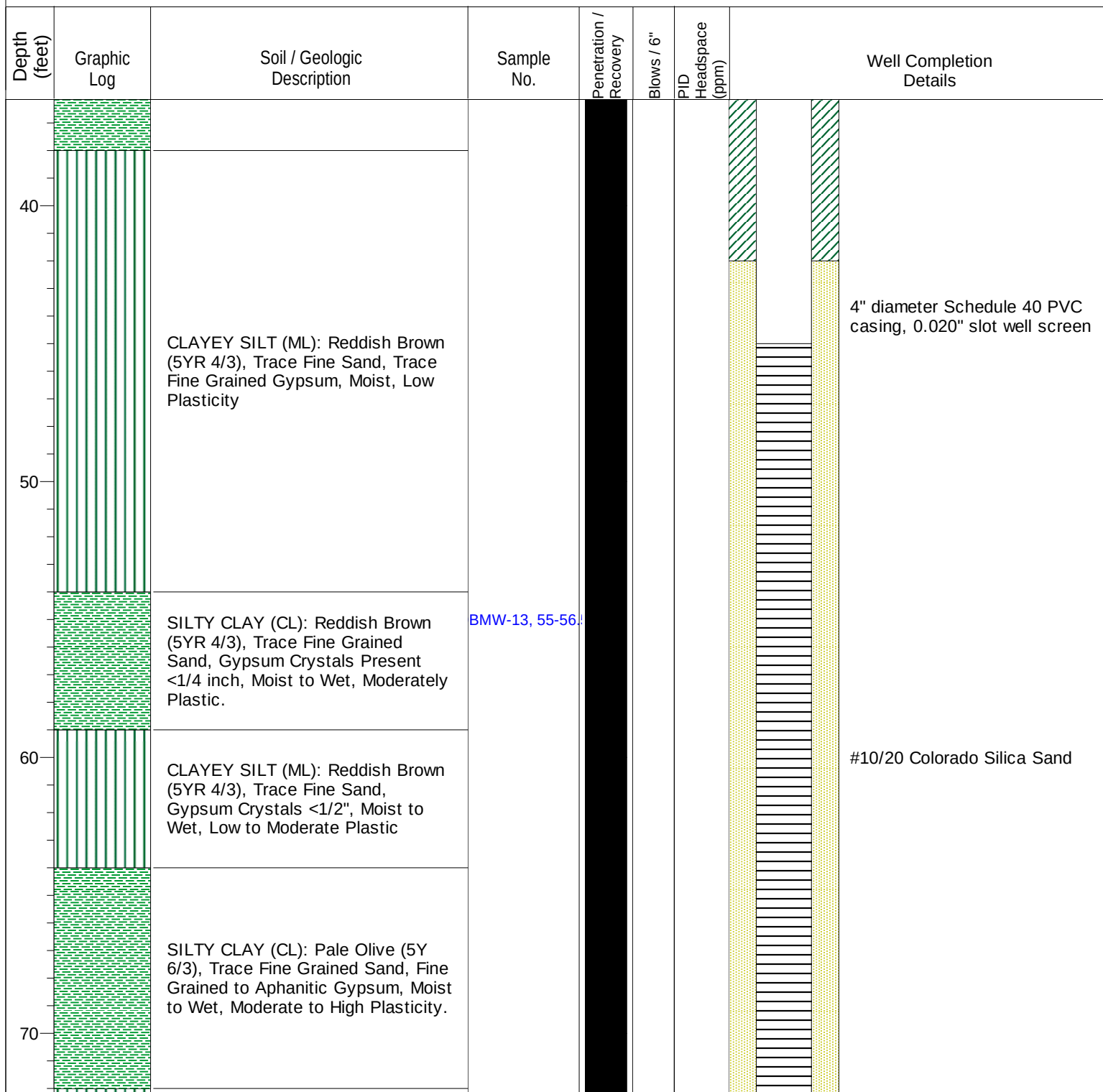
Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
0		GRAVEL (GW): Brown (7.5YR 5/4) Gravel with Sand and Silt					Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 2.9' Stick-up
		SILTY SAND (SM/SW): Brown (7.5YR 5/4) Sand with Silt and Gravel, 60-80% sand.					
		SILTY GRAVEL (GM): Brown (7.5YR 5/4) Silty Gravel with Sand, Subrounded to Subangular (volcanics)					
10							
		SILTY SAND (SM/SW): Brown (7.5YR 5/4) Silty Sand with Gravel, Fine to Coarse Grained Sand, Non-Plastic					
20							
		SILTY GRAVEL (GM): Brown (7.5YR 5/4) Silty Gravel with Sand, Medium Gravel <2"					
		SILTY SAND (SM): Silty Sand with Gravel, Fine to Medium Sand (60-80%)					
30							
		SILTY CLAY (CL): Pale Olive (5Y 6/3), Silty Clay, Moderately Plastic, Trace Fine Sand and Fine Grained Gypsum (Muddy Creek Formation)					

Bentonite chip seal

Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. - GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 7/8/07
End Date: 7/9/07
Total Hole Depth (ft): 75
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 52
Screen Length (ft): 45-75
Ground Surface Elev.: 1676.02 feet NAVD88

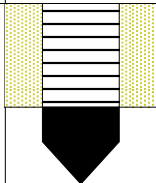
Logged By: Davis
Checked By: G. Carter
Permit No.:



Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. - GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 7/8/07
End Date: 7/9/07
Total Hole Depth (ft): 75
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 52
Screen Length (ft): 45-75
Ground Surface Elev.: 1676.02 feet NAVD88

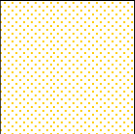
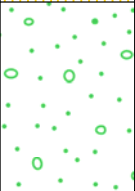
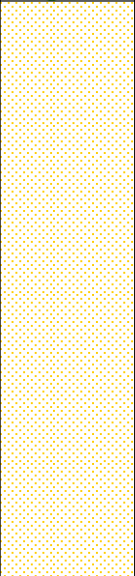
Logged By: Davis
Checked By: G. Carter
Permit No.:

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
80		CLAYEY SILT (ML): Reddish Brown (5YR 4/3), Moist to Wet, Low to Moderate Plasticity	DBMW-13, 75-				 4" diameter, 0.020" Slot Stop Sampling at 75 feet BGS

Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. - GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 7/10/07
End Date: 7/10/07
Total Hole Depth (ft): 65
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 40
Screen Length (ft): 35-65
Ground Surface Elev.: 1681.84 feet NAVD88

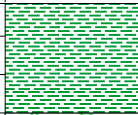
Logged By: Davis
Checked By: G. Carter
Permit No.:

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID	Headspace (ppm)	Well Completion Details
0		GRAVEL (GW): Brown (5 YR 5/4) Gravel with Sand						Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 3' Stick-up
		SILTY SAND (SM): Brown (5 YR 5/4) Silty Sand with Gravel, Medium to Coarse Sand Fine to Medium Grained Gravels						
		SILTY GRAVEL (GM): Brown (5 YR 5/4) Silty Gravel with Sand						
10		SILTY SAND (SM/SW): Brown (5 YR 5/4) Silty Sand with Gravel, Fine to Medium Grained sand, Fine to Medium grained Gravels						
		SILTY GRAVEL (GM): Silty Gravel with Sand, Coarse Gravel						
20		SILTY SAND (SM): Brown (5YR 5/3)/Reddish Brown (5YR 4/4) Silty Sand with Gravel						Bentonite chip seal
30								
								4" diameter Schedule 40 PVC casing, 0.020" slot well screen

Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. - GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 7/10/07
End Date: 7/10/07
Total Hole Depth (ft): 65
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 40
Screen Length (ft): 35-65
Ground Surface Elev.: 1681.84 feet NAVD88

Logged By: Davis
Checked By: G. Carter
Permit No.:

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID	Headspace (ppm)	Well Completion Details
40		SILTY CLAY (CL): Pale Yellow (2.5Y 7/4), mod plastic						
		SILTY GRAVEL (GM): Silty Gravel with Sand (cemented)						
		SILT (ML): Pale Olive (5Y 6/3) With Sand and Clay, Moist/Wet, Moderately Plastic	BMW-14, 45-46.1					
50								#10/20 Colorado Silica Sand
60		Reddish Brown (5YR 4/4)	BMW-14, 65-66.1					
								4" diameter, 0.020" slot Stop sampling at 65 feet bgs.

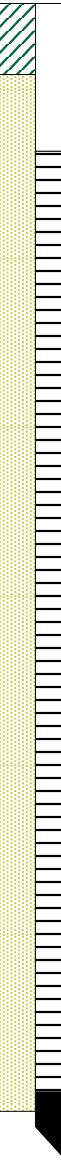
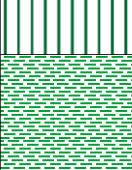
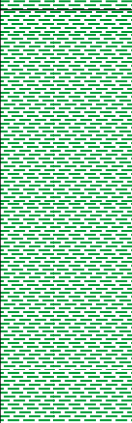
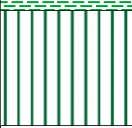
Project Name:	BRC Aquifer Testing	Start Date:	7/16/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	7/16/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	65	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	B.L. - GP24-300RS	Water Level (Initial, Ft):	42		
Drilling Method:	Roto-Sonic	Screen Length (ft):	40-65		
Sampling Method:	Continuous Core	Ground Surface Elev.:	1690.49 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID	Headspace (ppm)	Well Completion Details
0		WELL GRADED GRAVEL (GW): Brown (7.5YR 4/4) with Sand, 80% Coarse Gravel Subrounded/Subangular (Volcanic), 20% Sand, Dry						Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 3' Stick-up
		WELL GRADED SAND (SW): Brown (7.5YR 4/4) with Gravel Subrounded/Subangular (Volcanics), 70% Sand, 30% Gravel, Dry, Non Plastic						
		WELL GRADED SAND (SW/SM): Brown (7.5YR 4/4) with Silt and Gravel, 70% Sand, 20% Gravel, 10% Silt, Dry, Non Plastic						
10		WELL GRADED GRAVEL (GW): Brown (7.5YR 4/4) with Sand, 80% Coarse Gravel Subrounded/Subangular (Volcanic), 20% Sand, Dry, Non Plastic						Bentonite chip seal
		WELL GRADED SAND (SW/SM): Brown (7.5YR 4/4) with Silt and Gravel, 70% Sand, 20% Gravel, 10% Silt, Dry, Non to Low Plasticity						
		WELL GRADED GRAVEL (GW): Brown (7.5YR 4/4) with Sand, 80% Coarse Gravel Subrounded/Subangular (Volcanic), 20% Sand, Dry						
20		SILTY SAND (SM): Brown (7.5YR 4/4) with Gravel, 70% Sand, 15% Silt, 15% Gravel (Subrounded and Volcanic), Dry, Low Plasticity						
		WELL GRADED SAND (SW/SM): Brown (7.5YR 4/4) with Silt and Gravel, 70% Sand, 20% Gravel, 10% Silt, Dry, Non Plastic						
		WELL GRADED SAND (SW/SM): Brown (7.5YR 4/4) with Silt and Gravel, 50% Coarse Sand, 20% Fine to Medium Sand, 20% Fine to Coarse Gravel <2" Subrounded/Subangular Volcanics, 10% Silt, Dry						Bentonite chip seal
30		SILTY SAND (SM): Reddish Brown (5YR 5/3) with Gravel, Trace Gypsum, 60% Fine Sand, 25% Silt, 10% Fine Gravel Subrounded (Volcanics), 5% Fine Grained Gypsum, Dry, Low Plasticity						4" Diameter Schedule 40 PVC Casing

Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. - GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 7/16/07
End Date: 7/16/07
Total Hole Depth (ft): 65
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 42
Screen Length (ft): 40-65
Ground Surface Elev.: 1690.49 feet NAVD88

Logged By: Davis
Checked By: G. Carter
Permit No.:

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID	Headspace (ppm)	Well Completion Details
40		GYPSIFEROUS SILT (ML): Pale Yellow (5Y 8/3) with Sand, 60% Silt, 20% Fine Sand, 20% Fine Grained Gypsum, Trace Clay, Moist, Low to Moderate Plasticity	BMW-15, 45-46.1					4" Diameter Schedule 40 PVC Casing, 0.020" Slot Well Screen
		SILT (ML): Pale Olive (5Y 6/3) with Sand and Clay, 80% Silt, 10% Fine Sand, 10% Clay, Moist, Low to Moderate Plasticity						
		GYPSIFEROUS SILT (ML): Reddish Brown (5YR 5/4) with Sand and Clay, 60% Silt, 10% Sand, 10% Clay, 20% Fine Grained Gypsum, Moist/Wet, Low to Moderate Plasticity						
50		SILTY CLAY (CL): Pale Yellow/Reddish Brown (5Y 8/2 - 5YR 5/4) with Silty Sand Interbeds, Wet, Moderate to High Plasticity						
60		SILTY CLAY (CL): Pale Olive (5Y 8/3), 80% Clay, 20% Silty, Wet, Moderate to High Plasticity	BMW-15, 65-66.1					#10/20 Colorado Silica Sand #10/20 Colorado Silica Sand 4" Diameter, 0.020" Slot Stop sampling at 65 feet bgs.
		SILT (ML): Reddish Brown (5YR 5/4) with Sand and Clay, 70% Silt, 20% Clay, 10% Fine Sand, Wet, Moderate Plasticity						

Project Name:	BRC Aquifer Testing	Start Date:	7/19/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	7/22/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	110	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	B.L. - GP24-300RS	Water Level (Initial, Ft):	94		
Drilling Method:	Roto-Sonic	Screen Length (ft):	85-110		
Sampling Method:	Continuous Core	Ground Surface Elev.:	1691.31 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
0		WELL GRADED SAND (SW): Brown (7.5YR 5/4) with Gravel, Trace Silt, 50% Fine to Medium Sand, 15% Gravel Subangular to Subrounded <2" (Volcanic), Dry, Non Plastic					Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 3' Stick-up
10		INTERBEDDED WELL GRADED SAND (SW): Brown (7.5YR 5/4), Fine and Coarse Grained Sand with Gravel Beds <6" Thick, 80% Fine to Medium Grained Sand, Trace Medium to Coarse Sand, 15% Gravel, Trace Silt, Dry, Non Plastic					Bentonite chip seal
		WELL GRADED SANDY GRAVEL (GW): Brown (7.5YR 5/4), 60% Subangular/Subrounded Volcanic <2" Gravel, 40% Fine to Medium Sand, Dry, Non Plastic					
20		INTERBEDDED WELL GRADED SAND (SW): Brown (7.5YR 5/4), Fine and Medium Grained Sand, Trace Gravel and Silt, Beds <1' consist of 90% Sand, 5% Gravel Subrounded (Volcanic), 5% Silt, Dry, Non Plastic					
		WELL GRADED SANDY GRAVEL (GW): Brown (7.5YR 5/4), 60% Gravel <2" Subangular/Subrounded Volcanics, 40% Fine to Medium Sand, Dry, Non Plastic					
30		WELL GRADED SILTY SAND (SM): Brown (7.5YR 4/3), Trace Gravel, 75% Fine to Medium Sand, 20% Silt, 5% Gravel <1" Subrounded Volcanics, Dry, Non to Low Plasticity					Bentonite chip seal

Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. - GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 7/19/07
End Date: 7/22/07
Total Hole Depth (ft): 110
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 94
Screen Length (ft): 85-110
Ground Surface Elev.: 1691.31 feet NAVD88

Logged By: Davis
Checked By: G. Carter
Permit No.:

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID	Headspace (ppm)	Well Completion Details
40								
		WELL GRADED SAND (SW): Brown (7.5YR 4/3), Trace Gravel, 95% Fine to Coarse Sand; 40% Coarse Sand, 5% Gravel <1/2", Rounded Volcanics, Dry (Zone of Moisture 2" Thick at 46.8'), Non Plastic						
50		SILTY SAND (SM): Brown (7.5YR 5/4), Trace Gravel, 75% Fine to Medium Sand, 20% Silt, 5% Gravel, Dry, Low Plasticity						
		With Gravel, 70% Fine to Medium Sand, 15% Silt, 15% Gravel <2", Subangular/Subrounded (Volcanic), Dry, Low Plasticity						
60								
70		Reddish Brown (5YR 5/4), Trace Clay, 75% Fine to Medium Grained Sand, 20% Silt, 5% Clay, Moderate						
								Bentonite chip seal 4" Diameter Schedule 40 PVC Casing 4" Diameter Schedule 40 PVC Casing

Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. - GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

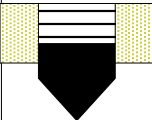
Start Date: 7/19/07
End Date: 7/22/07
Total Hole Depth (ft): 110
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 94
Screen Length (ft): 85-110
Ground Surface Elev.: 1691.31 feet NAVD88

Logged By: Davis
Checked By: G. Carter
Permit No.:

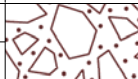
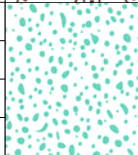
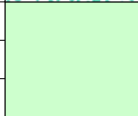
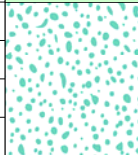
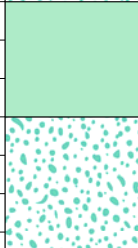
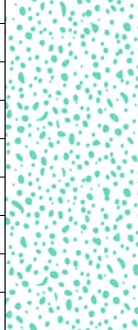
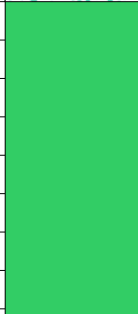
Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
80		Plasticity. Fine Grained Gypsum Present from 70 to 84'.					
90		Light Brown (7.5YR 6/4), Increase in Sands, 80% Fine to Medium Sands, 15% Silt and 5% Clay, Moist					4" Diameter Schedule 40 PVC Casing, 0.020" Slot Well Screen
		CLAY (CL): Pale Yellow (5Y 8/3) with Silt, 85% Clay and 15% Silt, Wet, Medium to High Plasticity. Muddy Creek Formation					#10/20 Colorado Silica Sand
100		CLAYEY SILT (ML): Reddish Brown (5YR 4/4), 60% Silt and 40% Clay, Trace Fine Sand, Wet, Medium Plasticity. Muddy Creek Formation					4" Diameter, 0.020" Slot
		CLAY (CL): Pale Yellow (5Y 8/3) with Silt, 85% Clay and 15% Silt, Wet, Medium to High Plasticity. Muddy Creek Formation					
		CLAYEY SILT (ML): Reddish Brown (5YR 4/4), 60% Silt and 40% Clay, Trace Fine Sand, Wet, Medium					

DBMW-1

Project Name:	BRC Aquifer Testing	Start Date:	7/19/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	7/22/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	110	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	B.L. - GP24-300RS	Water Level (Initial, Ft):	94		
Drilling Method:	Roto-Sonic	Screen Length (ft):	85-110		
Sampling Method:	Continuous Core	Ground Surface Elev.:	1691.31 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
110		Plasticity. Muddy Creek Formation	DBMW-16, 110-				 Stop sampling at 50 feet bgs.

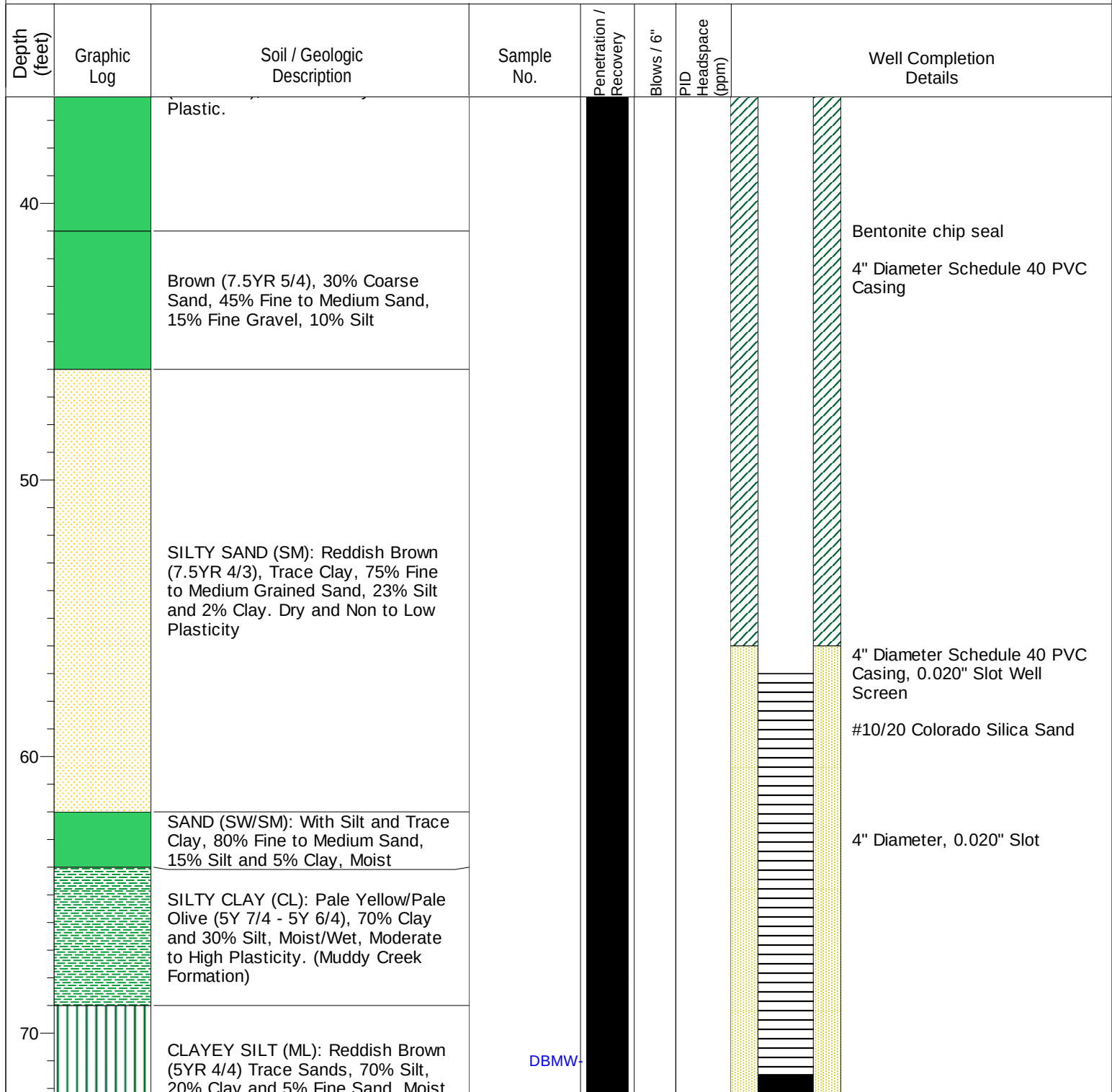
Project Name:	BRC Aquifer Testing	Start Date:	7/18/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	7/19/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	75	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	B.L. - GP24-300RS	Water Level (Initial, Ft):	64		
Drilling Method:	Roto-Sonic	Screen Length (ft):	52-72		
Sampling Method:	Continuous Core	Ground Surface Elev.:	1709.61 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID	Headspace (ppm)	Well Completion Details
0		ROAD FILL (FILL): Sand and Gravel						Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 2.8' Stick-up
		WELL GRADED SAND (SW): Light Brown (7.5YR 6/4) with Gravel, 80% Fine to Medium Grained Sand, 20% Fine to Coarse Gravel <2" Subrounded/Subangular Volcanics, Dry, Non Plastic						
		WELL GRADED SANDY GRAVEL (GW/SW): Light Brown (7.5YR 6/4), 5% Coarse Volcanic Gravel (Subangular), 50% Coarse Sand/Fine Gravel (Subrounded), 45% Fine to Medium Sand, Dry, Non Plastic						
10		WELL GRADED SAND (SW): Light Brown/Brown (7.5YR 6/4 - 7.5YR 4/3), Trace Gravel and Silt, 85% Fine to Medium Grained Sand, 10% Fine Gravel Subrounded and Volcanic, 5% Silt, Dry, Non to Low Plasticity						
		SANDY GRAVEL (GW): Light Brown (7.5YR 6/4), 60% Fine to Coarse Gravel <2" Subangular/Subrounded (Volcanics), 40% Fine to Medium Sand, Dry, Non Plastic						
20		INTERBEDDED/WELL GRADED SAND (SW): Brown (7.5YR 6/4) with Gravel, Beds <6" Thick Consist of 80% Fine to Medium Sand, 15% Fine Gravel <1" and 5% Silt. Also Consists of Beds with 90% Medium to Coarse Sand, 5% Fin Gravels <1" and 5% Silt. Dry and Non Plastic						
30		WELL GRADED SAND (SW/SM): Brown (7.5YR 5/4) with Gravel and Silt, 75% Fine to Medium Sand, 15% Fine Gravels Subangular/Subrounded (Volcanics), 10% Silt. Dry and Non Plastic						Bentonite chip seal

Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. - GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 7/18/07
End Date: 7/19/07
Total Hole Depth (ft): 75
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 64
Screen Length (ft): 52-72
Ground Surface Elev.: 1709.61 feet NAVD88

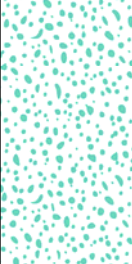
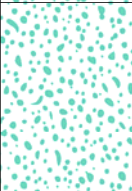
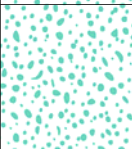
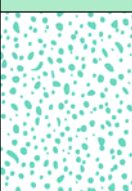
Logged By: Davis
Checked By: G. Carter
Permit No.:



Project Name:	BRC Aquifer Testing	Start Date:	7/18/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	7/19/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	75	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	B.L. - GP24-300RS	Water Level (Initial, Ft):	64		
Drilling Method:	Roto-Sonic	Screen Length (ft):	52-72		
Sampling Method:	Continuous Core	Ground Surface Elev.:	1709.61 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
		to Wet, Moderate Plasticity. (Muddy Creek Formation)	BMW-17, 75-76.1				 Stop sampling at 75 feet bgs.

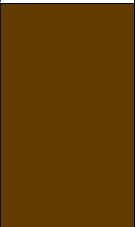
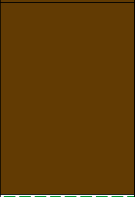
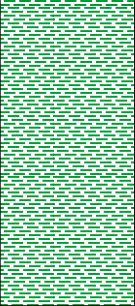
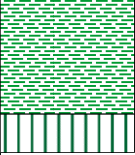
Project Name:	BRC Aquifer Testing	Start Date:	7/17/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	7/17/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	65	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	B.L. - GP24-300RS	Water Level (Initial, Ft):	47		
Drilling Method:	Roto-Sonic	Screen Length (ft):	45-65		
Sampling Method:	Continuous Core	Ground Surface Elev.:	1714.11 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
0		WELL GRADED SAND (SW): Brown (7.5YR 5/4) with Gravel, 85% Fine to Medium Grained Sand, 15% Fine Gravel Subangular/Subrounded (Volcanics), Dry, Non Plastic.					Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 3' Stick-up
10		Brown (7.5YR 5/4), 70% Fine to Coarse Sand, 30% Fine Gravel Subrounded/Subangular (Volcanics), Dry, Non Plastic. Coarse Sand 30% of Sand Fraction					Bentonite chip seal
20		WELL GRADED GRAVEL (GW): Reddish Brown (2.5YR 5/4) with Sand, 60% Fine to Coarse Gravel <1" Subangular/Subrounded (Volcanic), 40% Fine to Medium Sand, Dry, Non Plastic					
		WELL GRADED SAND (SW): Brown (7.5 YR 5/4) with Gravel, 75% Fine to Medium Grained Sand, 25% Fine to Coarse Gravel <1" Subrounded/Subangular (Volcanic), Dry, Non Plastic					
30		WELL GRADED GRAVEL (GW): Reddish Brown (2.5YR 5/4) with Sand, 60% Fine to Coarse Gravel <1", Subrounded/Subangular (Volcanics), 40% Fine to Medium Grained Sand, Dry, Non Plastic					
		WELL GRADED SAND (SW/SM):					Bentonite chip seal

Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. - GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 7/17/07
End Date: 7/17/07
Total Hole Depth (ft): 65
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 47
Screen Length (ft): 45-65
Ground Surface Elev.: 1714.11 feet NAVD88

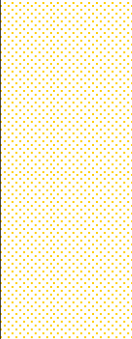
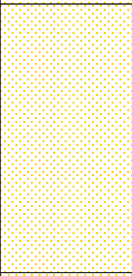
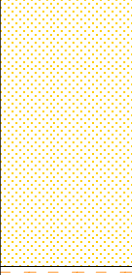
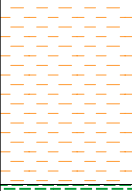
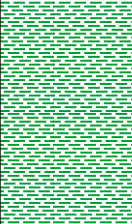
Logged By: Davis
Checked By: G. Carter
Permit No.:

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID	Headspace (ppm)	Well Completion Details
40		Reddish Brown (2.5YR 5/4) with Silt, Trace Fine Gravel, 88% Fine to Medium Grained Sand, 10% Silt, 2% Gravel, Dry, Non to Low Plasticity.						4" Diameter Schedule 40 PVC Casing
		WELL GRADED SAND (SW/SM): Reddish Brown (2.5YR 5/4) with Silt, Trace Gravel, 85% Fine to Medium Grained Sand, 10% Silt, 5% Fine to Coarse Gravel <2", Subrounded/Subangular (Volcanics), Dry, Non to Low Plasticity						4" Diameter Schedule 40 PVC Casing, 0.020" Slot Well Screen
50		SILTY CLAY (CL): Pale Olive (5Y 6/4), Trace Fine Grained Sand, 65% Clay, 30% Silt, 5% Fine Sand, Moist/Wet, Moderate to High Plasticity. (Muddy Creek Formation)						
60		CLAYEY SILT (ML): Reddish Brown (5YR 5/4), Trace Fine Grained Sand, 60% Silt, 35% Clay, 5% Sand, Moist/Wet, Moderate Plasticity (Muddy Creek Formation)	DBMW-18					#10/20 Colorado Silica Sand #10/20 Colorado Silica Sand 4" Diameter, 0.020" Slot
		SILTY CLAY (CL): Pale Olive (5Y 6/4), Trace Fine Grained Sand, 65% Clay, 30% Silt, 5% Fine Sand, Moist/Wet, Moderate to High Plasticity. (Muddy Creek Formation)	DBMW-18, 65-					Stop sampling at 65 feet bgs.
		CLAYEY SILT (ML): Reddish Brown (5YR 5/4), Trace Fine Grained Sand, 60% Silt, 35% Clay, 5% Sand, Moist/Wet, Moderate Plasticity (Muddy Creek Formation)						

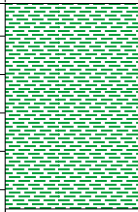
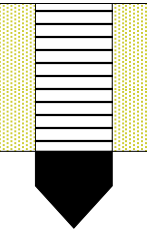
Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. - GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 7/24/07
End Date: 7/24/07
Total Hole Depth (ft): 40
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 18
Screen Length (ft): 15-40
Ground Surface Elev.: 1580.41 feet NAVD88

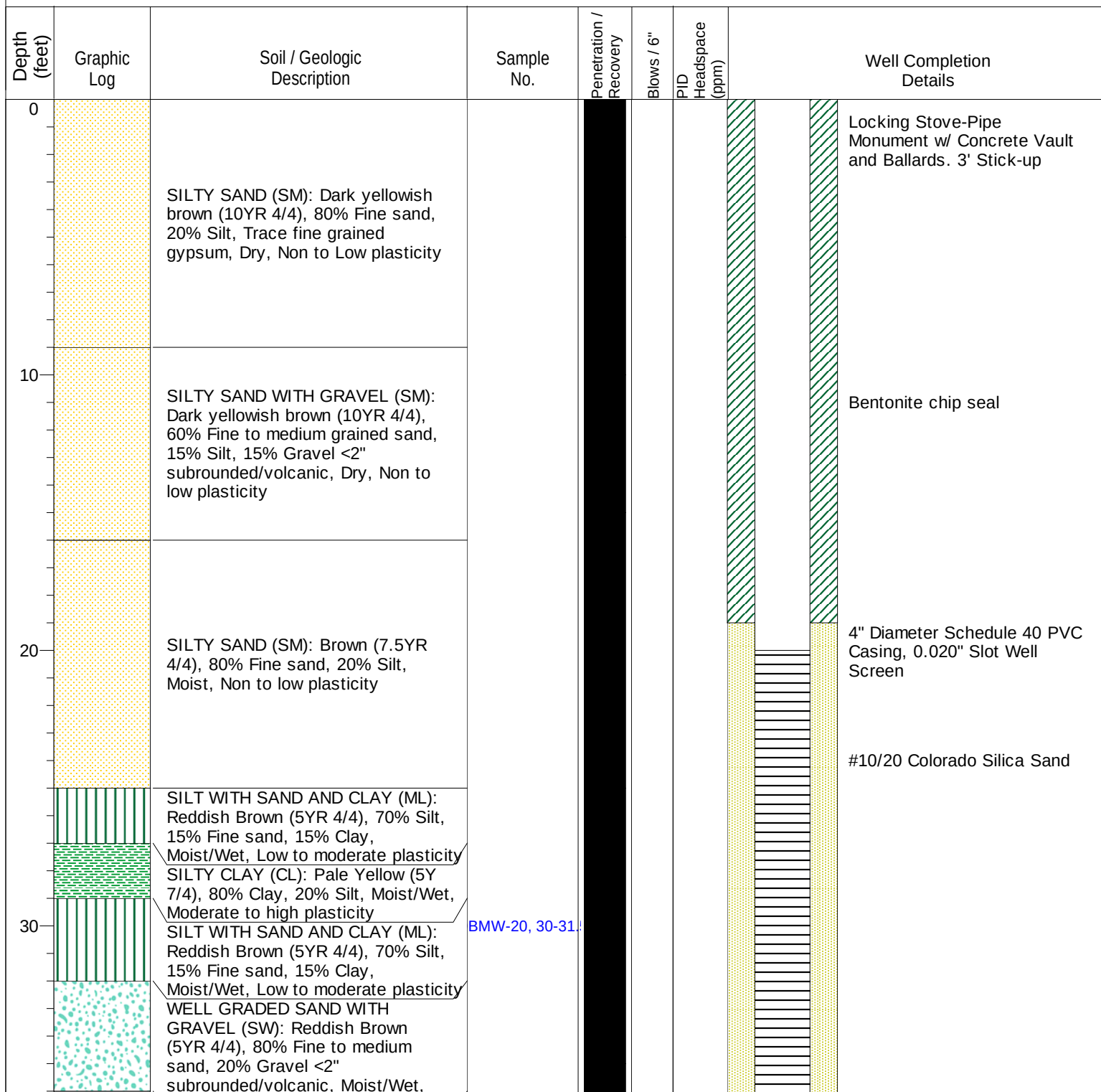
Logged By: Davis
Checked By: G. Carter
Permit No.:

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID	Headspace (ppm)	Well Completion Details
0		SILT (ML): Light Brown (7.5YR 6/4), Trace fine sand, 95% silt, 5% fine sand, Dry, Non to low plasticity	DBMW-19, 20-21					Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 3' Stick-up
		SILTY SAND (SM): Reddish Brown (2.5YR 4/4), 70% Fine sand, 20% Silt, 5% Fine gravel <1" subrounded/volcanic, Dry, Non to Low plasticity						Bentonite chip seal
10		Fine grained gypsum, Disseminated						4" Diameter Schedule 40 PVC Casing, 0.020" Slot Well Screen
20		Trace clay, Moist, Low to medium plasticity						#10/20 Colorado Silica Sand
		CLAYEY SAND (SC): Brown (7.5YR 4/4), 70% Fine to medium sand, 20% clay, 5% gravel <1" subrounded/volcanic, Wet, Low plasticity						#10/20 Colorado Silica Sand
30		CLAY WITH SILT (CL): Pale Olive (5Y 6/3), 90% Clay, 10% Silt, Wet, High plasticity (Muddy Creek)						4" Diameter, 0.020" Slot

Project Name:	BRC Aquifer Testing	Start Date:	7/24/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	7/24/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	40	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	B.L. - GP24-300RS	Water Level (Initial, Ft):	18		
Drilling Method:	Roto-Sonic	Screen Length (ft):	15-40		
Sampling Method:	Continuous Core	Ground Surface Elev.:	1580.41 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
40		High plasticity, (muddy Creek Formation)	DBMW-19, 40-				 Stop sampling at 40 feet bgs.

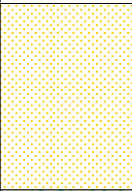
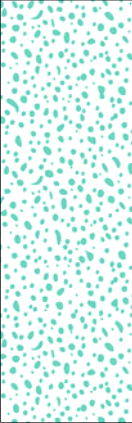
Project Name:	BRC Aquifer Testing	Start Date:	8/15/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	8/15/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	70	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	B.L. - GP24-300RS	Water Level (Initial, Ft):	25		
Drilling Method:	Roto-Sonic	Screen Length (ft):	20-70		
Sampling Method:	Continuous Core	Ground Surface Elev.:	UNK		



Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. - GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 8/15/07
End Date: 8/15/07
Total Hole Depth (ft): 70
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 25
Screen Length (ft): 20-70
Ground Surface Elev.: UNK

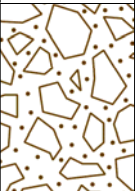
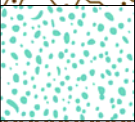
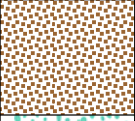
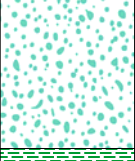
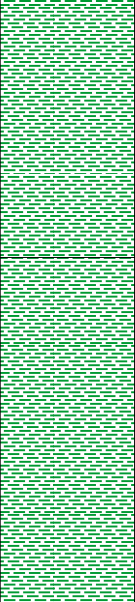
Logged By: Davis
Checked By: G. Carter
Permit No.:

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID	Headspace (ppm)	Well Completion Details
40		Non plastic SILTY SAND (SM): Reddish Brown (5YR 4/4), 70% Fine to medium sand, 25% Silt, 5% Clay, Wet, Non to low plasticity						
50		WELL GRADED SAND WITH GRAVEL (SW): Brown (7.5YR 4/3), 85% Fine to coarse grained sand, 15% Gravel <2" subrounded/volcanic, Wet, Non plastic						#10/20 Colorado Silica Sand
		SILT WITH SAND AND CLAY (ML): Reddish Brown (5YR 5/3), 65% Silt, 20% Fine sand, 15% Clay, Wet, Low to moderate plasticity (Muddy Creek Formation)						
60	 	WELL GRADED SAND WITH GRAVEL (SW): Brown (7.5YR 4/3), 85% Fine to coarse grained sand, 15% Gravel <2" subrounded/volcanic, Wet, Non plastic SILT WITH SAND AND CLAY (ML): Reddish Brown (5YR 5/3), 65% Silt, 20% Fine sand, 15% Clay, Wet, Low to moderate plasticity						#10/20 Colorado Silica Sand 4" Diameter, 0.020" Slot 4" Diameter, 0.020" Slot
70								Stop sampling at 70 feet bgs.

Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: B.L. - GP24-300RS
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 8/13/07
End Date: 8/13/07
Total Hole Depth (ft): 55
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 39
Screen Length (ft): 35-55
Ground Surface Elev.: UNK

Logged By: Davis
Checked By: G. Carter
Permit No.:

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID	Headspace (ppm)	Well Completion Details
0		COMPACTED FILL						Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 3' Stick-up
		WELL GRADED SAND WITH GRAVEL (SW): Brown (7.5YR 5/3), 80% Fine to medium sand, 20% Gravel <2" Subangular to subrounded/volcanic, Dry, Non plastic						
10		POORLY GRADED SAND (SP): Brown (7.5YR 5/4), 100% Fine grained sand, Dry, Non plastic						
		WELL GRADED SAND WITH GRAVEL (SW): Brown (7.5YR 5/3), 80% Fine to medium sand, 20% Gravel <2" Subangular to subrounded/volcanic, Dry, Non plastic						
20		SILTY CLAY (CL): Pale Olive (5Y 6/3), 80% Clay, 20% Silt, Dry/moist, Moderate to high plasticity. Gypsiferous between 17 and 22 ft.						
		Silty Lenses present, Mottled Light Reddish Brown (5YR 6/4) and Pale Olive (5Y 6/3), Dry/moist, Moderate to high plasticity						
30		SILT WITH SAND AND CLAY (ML): Light Reddish Brown (5YR 6/3), 70% Silt, 20% Fine sand, 10% Clay, Weakly cemented when gypsum equal or exceeds 5%. Dry/moist						
								Bentonite chip seal
								Bentonite chip seal
								4" Diameter Schedule 40 PVC Casing
								4" Diameter Schedule 40 PVC Casing
								0.020" Slot Well Screen

Project Name:	BRC Aquifer Testing	Start Date:	8/13/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	8/13/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	55	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	B.L. - GP24-300RS	Water Level (Initial, Ft):	39		
Drilling Method:	Roto-Sonic	Screen Length (ft):	35-55		
Sampling Method:	Continuous Core	Ground Surface Elev.:	UNK		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID	Headspace (ppm)	Well Completion Details
		equal or exceeds 5%, Dry-mold, Low plasticity						
40		Reddish Brown (5YR 5/4), 70% Silt, 20% Fine sand, 10% Clay, Wet, Low plasticity	BMW-22, 40-41.1					#10/20 Colorado Silica Sand
50		CLAY WITH SILT (CL): Pale Yellow (5Y 8/4), 85% Clay, 15% Silt, Wet, Moderate to high plasticity						
		SILT WITH SAND AND CLAY (ML): Reddish Brown (5YR 5/4), 70% Silt, 20% Fine sand, 10% Clay, Weakly cemented when gypsum equal or exceeds 5%, Wet, Moderate plasticity	DBMW-22, 55-56					Stop sampling at 55 feet bgs.

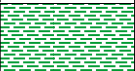
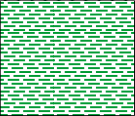
Project Name: BRC Aquifer Testing
Site Location: Henderson, NV
Project No: 83173
Client: BRC
Drilling Company: Boart Longyear
Drill Rig Type: Boart Longyear
Drilling Method: Roto-Sonic
Sampling Method: Continuous Core

Start Date: 6/02/07
End Date: 6/02/07
Total Hole Depth (ft): 45
Hole Diameter (in): 8
Well Diameter (in): 4
Water Level (Initial, Ft): 23
Screen Length (ft): 20 - 45
Ground Surface Elev.: UNK

Logged By: Davis
Checked By: G. Carter
Permit No.:

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
0		ASPHALT					
0 to 10		SILTY GRAVEL (GM): Reddish brown Silty Gravel (Fill Material)					Bentonite chip seal
10 to 20		SAND (SW): Reddish brown Well Graded Sand with Gravel, Fine to Medium Sand					
20 to 25		SAND (SW-SM): Reddish brown Sand with Gravel, Fine to Medium Grained sand, Trace silt					2" diameter Schedule 40 PVC casing, 0.020" slot well screen
25 to 28		SILTY SAND (SM): Reddish brown Silty Sand with Gravel, Fine to Medium Grained sand					
28 to 32		SAND (SW): Reddish brown Well Graded Sand with Gravel, Fine to Coarse Sand					
32 to 45		SILT (ML): Brown Silt with Sand and Clay (Top of Muddy Creek Fm.)					#10/20 Colorado Silica Sand

Project Name:	BRC Aquifer Testing	Start Date:	6/02/07	Logged By:	Davis
Site Location:	Henderson, NV	End Date:	6/02/07	Checked By:	G. Carter
Project No:	83173	Total Hole Depth (ft):	45	Permit No.:	
Client:	BRC	Hole Diameter (in):	8		
Drilling Company:	Boart Longyear	Well Diameter (in):	4		
Drill Rig Type:	Boart Longyear	Water Level (Initial, Ft):	23		
Drilling Method:	Roto-Sonic	Screen Length (ft):	20 - 45		
Sampling Method:	Continuous Core	Ground Surface Elev.:	UNK		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
		SILTY CLAY (CL): Pale Yellow High Plastic Clay					
40		SILT (ML): Brown Silt with Sand and Clay					
		SILTY CLAY (CL): Pale Yellow High Plastic Clay					

APPENDIX B

By: Doug Davis

Date Due:

Boring Number	Depth	Water Content (ASTM 2216)	Dry Bulk Density (ASTM D2937)	Total Porosity (ASTM D2435)	Flexible Wall (ASTM D5084) <u>OUTSIDE SERVICE</u>	Rigid Wall (ASTM D2434) <u>OUTSIDE SERVICE</u>	Specific Gravity (ASTM D698) ^{55.4}	Specific Gravity (ASTM C127)	Hydrometer (ASTM D422)	Sieve Anysis (ASTM D422)	Total Organic Carbon <u>OUTSIDE SERVICE (ATLAS)</u>	Soil pH	Remarks
D8AN-2	30-31.5'	X	X	X		X							Shipped 6/20/07
16 MW-2	30-35'	X	X	X			X		X	X	X	X	6/14/07 6 MW-2 30-35'
16 MW-2	45-50'	X	X	X			X		X	X	X	X	6/14/07 16 MW-2 45-50'
D8AN-2	50-51.5'					X	X						Shipped 6/20 uses ASTM D2434 only

LABORATORY NUMBER:

29444

LABORATORY WORK ORDER



KLEINFELDER

Project No: 03173 Phase: 4 #12
 Project Name: BRE Aquifer Test
 Client Name: BRE
 Client Ref./P.O.#: _____
 Special Instructions: _____

Sample Number:

DBW-2 30-31.5
" 30-35
" 45-50
" 50-51.5

SAMPLE STATUS

☒ Requested Test
☒ Test in Progress
☒ Test Completed

Date Sampled:

Date Received:

Date Needed:

Date Completed:

Verified By:

6-18-07

6/19/07

ASMP

7/2/07

[Signature]

ASPHALT TESTING

Usage	Qty.	99#	Status
C123 Li Wt Pieces/Agg		990715	
C127 Absorption/Gravity	<u>2</u>	990702	<u>X 990307</u>
CAL 205 Crushed Part		990712	
CAL 227 Cleaness TST		990711	
Clay Lumps/Friabl Part C-142		990714	
D2726 Weight/Absorption Core		991110	
Extract Bitumin D1856, 2172.310		991102	
Flat/Elong Part/Sieve 119, 120		990713	
Hveem Stability/Set of 3		991147	
Ignition Oven Calibration		996156	
Injurious Organic Matter C-40		990701	
LA Rattler CAL131		990706	
Lottman Test		991121	
Marshall Stab/Flow D-1599 (Set of 3)/Lab		991108	
Max Theoretical Specific Gravity D-2041		991112	
Methylene Blue Test		990132	
Microwave Asphalt Moist Content		996137	
Oil Content By Ignition Oven		996153	
Sand Equivalent C217		990308	
Specific Gravity C127/8 D854		990211	
Stabil Test/Premix Sample CAL 366		991104	
Unit Weight C29		990704	

MISC. OTHER

Usage	Qty.	99#	Status
Chloride Analysis		996020	
Corrosivity Analysis		991508	
Corrosivity, Resistivity, Sodium Sulfate, Solubility, p11*		990324	
pH Test		990319	
Sulfate Analysis		992090	
Unit Weight Fireproofing		991314	

CONCRETE & MASONRY TESTING

Usage	Qty.	99#	Status
C942 Grout Strength (cylinder/prism strength)		990119	
Compressive Test 12x8x16 Prisms (12" width)		991005	
Compressive Test 8x8x16 Prisms (8" width)		991003	
Compressive Test/Cored Spec		990809	
Concrete Compressive Test		990803	
Drying Shrinkage (Set Of 3) C-157, CAL-530		990811	
Flex and Strength/Concrete Beam		990806	
Mortar Strength C-109		990118	

SOILS TESTING

Usage	Qty.	99#	Status
ASTM D1557 6" Method B, C and D		990104	
CBR 100% Compaction D1883, T180		990209	
Check Point		990106	
Collapse Potential		990614	
Consolidation W/O time Rate/6 LD D2435	<u>2</u>	990613	<u>X</u>
Correct Oversize Material in Sample CAL301		990203	
Direct Shear 1 Point		990608	
Direct Shear 3 Point		990609	
Harvard Miniature		992191	
Hydrometer Only	<u>2</u>	990305	<u>XXX</u>
Moisture Determination Only	<u>2</u>	990317	<u>XXX</u>
Moisture Determination/Unit Weight	<u>2</u>	990316	<u>XXX</u>
Plasticity Index		990310	
Resistivity Analysis		990318	
R-Value/Untreated Material/Field Sample CAL 301		990201	
Sample Prep Materials		992508	
Sieve Analysis Wash #200 C117		990304	
Sieve Analysis/Course & Fine	<u>2</u>	990301	<u>X</u>
Sulfate Sound (5) Sieve SZ C88		990708	
Swell Test FHA Specification (60 psi)		990312	
Unconfined Comp/Inc Moist D2166		990601	

CCPW ☒ LWD ☐ JASHTO ☐ NDOT
 CSD ☐ UBC ☐
 CCPW ☒ ASTM ☐ Other ☐

Source: DBW-2
 Supplier: _____
 Sample Location: _____
 Type of Material: Soil
 Sampled by: Steve Davis
 Project Manager: G. Whitman/6-Cater

FOR ACCOUNTING USE ONLY
 Entered By: _____
 Date Entered: _____



KLEINFELDER

An employee owned company

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: June 20, 2007
File: _____
Copies: _____

Subject: **BRC Aquifer Testing: Flexible and Rigid Wall Testing**

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-2@30-31.5'	06/18/07	29444	06/20/07
DBMW-2@50-51.5'	06/18/07	29444	06/20/07
DBMW-1@40-41.5'	06/19/07	29446	06/20/07
DBMW-1@50-51.5'	06/19/07	29446	06/20/07

If you have any questions please don't hesitate to call.

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14482(c)

DATE: June 26, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29444

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29444	DBMW-2	30-35	1.60%	8.18
29444	DBMW-2	45-50	3.20%	8.00

A handwritten signature in cursive script, reading "Robert L. Summers".

LABORATORY MANAGER

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-2@30-35'; S-29444 @ 30.0 - 35.0'

June 22, 2007

Silt (ML)

Specific Gravity = 2.68

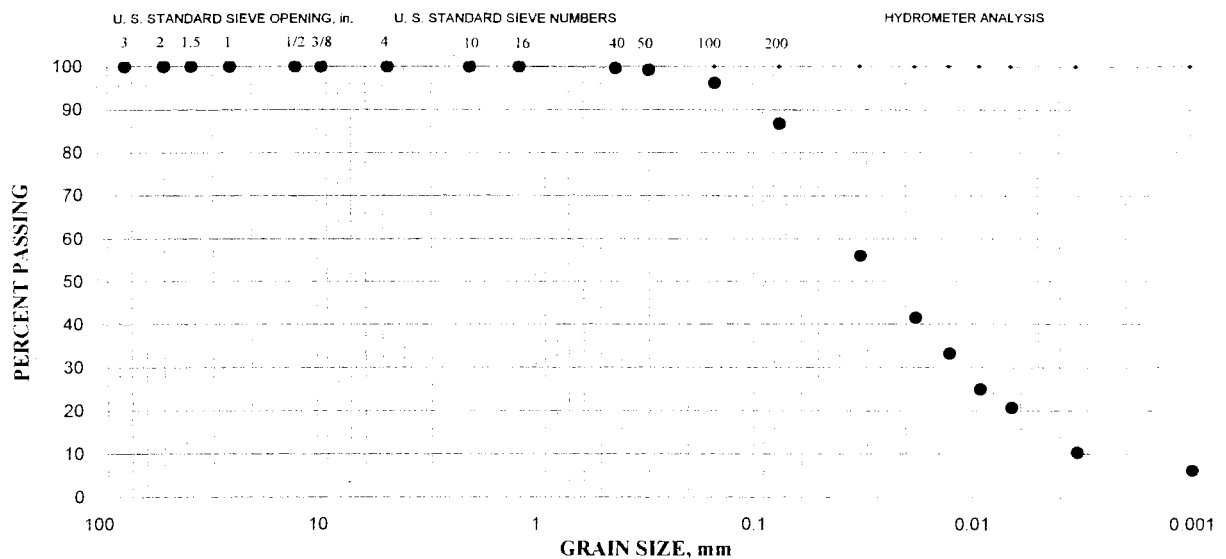
LL = ; PL = ; PI =

Gravel = 0%; Sand = 13%; Silt = 77%; Clay = 10%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425- μ m)	0	100
#50 (300- μ m)	1	99
#100 (150- μ m)	4	96
#200 (75- μ m)	13	87

Hydrometer Analysis

32- μ m	56
18- μ m	41
13- μ m	33
9- μ m	25
7- μ m	21
3.4- μ m	10
Colloids (<1- μ m)	6



Moisture Density							
Project Name	BRC AQUIFER TESTING				Date	06/20/07	
Project Number	83173	Phase No.	12	Tested By	JLW	Checked By	JH
Lab Number	29444						
Boring Number	DBMW-2						
Sample Depth	30 - 35'						
Height (inches)	5.21						
Diameter (inches)	4.94						
Volume	0.0578						
Wt. of Sample							
At Field Moisture	2663.39						
Wet Density (pcf)	101.6						
Dry Density (pcf)	69.6						
Container No.	2						
Wt. of Wet							
Sample Plus Tare	978.00						
Wt. of Dry							
Sample Plus Tare	792.10						
Tare (g)	387.50						
Dry Wt. Of							
Sample (g)	404.60						
Moisture Content, %	45.9%						

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29444
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW-2 @ 30 - 35'	Tested By =>	JLW
		Reviewed By =>	JH

Pan Label =>	#2	
Tare Weight of Pan =>	387.45	A
Wet Wt. of Sample & Tare =>	977.98	B
Dry Wt. of Sample & Tare =>	792.08	C
Weight of Moisture (B-C) =>	185.9	D
Dry Wt. of Sample (C-A) =>	404.63	E
Percent Moisture (D/E)*100 =>	45.9	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

Project No.: 83173-12

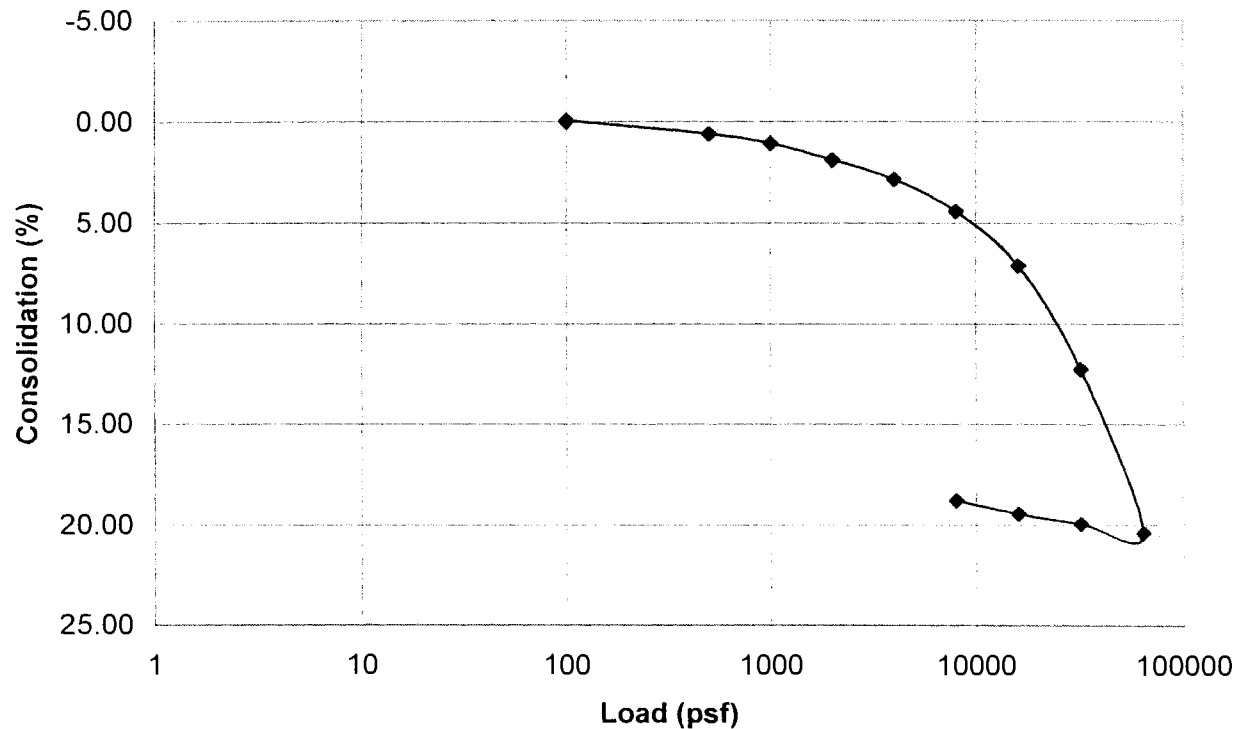
Report Date: 06/29/07

Sample No.: 29444
Sample Depth (ft.): DBMW-2 @ 30 - 35'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	0.00
100	-0.06
500	0.60
1000	1.07
2000	1.90
4000	2.84
8000	4.42
16000	7.09
32000	12.26
64000	20.40
32000	19.93
16000	19.44
8000	18.77

DBMW-2 @ 30 - 35'



PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29444
 BORING: DBMW-2
 DEPTH: 30-35
 DATE: 06/23/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	X
Mass of Pycnometer, Mf =>	220.89
Mass of Pycnometer & Water, Ma =>	719.58
Temperature of Water when Ma above was Taken, Ta =>	19.4
Mass of Speciman & Pycnometer =>	263.00
Mass of Pycnometer, Mf =>	220.89
Mass of Oven-Dry Specimen, Mo =>	42.11
Mass of Pycnometer, Soil & Water, Mb =>	745.97
Temperature of Water when Mb Above was Taken, Tb =>	19.6

Prodedure

Record the mass of a clean dry pycnometer, Mf
 Record the mass of the pyc. and distilled water at calibration mark, Ma
 Record the temperature of the water to the nearest .5° C, Ta
 Record Mass of Pyc & Water at Calibration Mark, Ma

Water Density at Ta	.998.33
Water Density at Tb	0.99829
K Factor at Tb	1.00008

Ma at Tb	#VALUE!
Sp Gr at Tb	2.678753181
Sp Gr at 20 C	2.678967481

SPECIFIC GRAVITY AT 20 C	2.678967481
--------------------------	-------------

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-2@45-50'; S-29444 @ 45.0 - 50.0'

June 22, 2007

Silt (ML)

Specific Gravity = 2.70

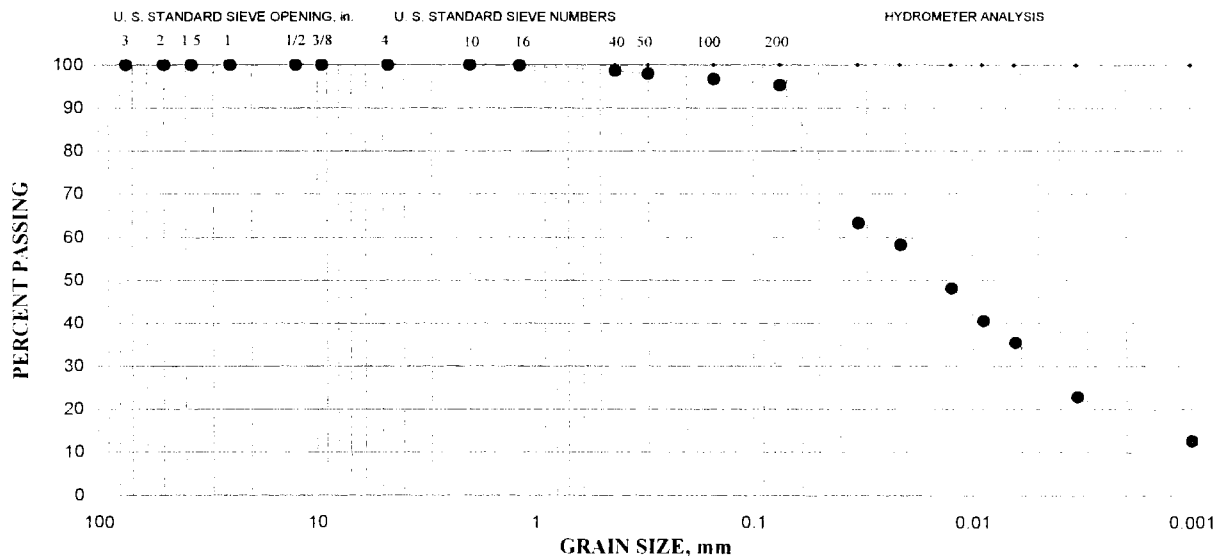
LL = ; PL = ; PI =

Gravel = 0%; Sand = 5%; Silt = 72%; Clay = 23%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425-μm)	1	99
#50 (300-μm)	2	98
#100 (150-μm)	3	97
#200 (75-μm)	5	95

Hydrometer Analysis

33-μm	63
21-μm	58
12-μm	48
9-μm	41
6-μm	35
3.3-μm	23
Colloids (<1-μm)	13



Moisture Density							
Project Name	BRC AQUIFER TESTING				Date	06/20/07	
Project Number	83173	Phase No.	12	Tested By	JLW	Checked By	JH
Lab Number	29444						
Boring Number	DBMW-2						
Sample Depth	45 - 50'						
Height (inches)	3.65						
Diameter (inches)	4.90						
Volume	0.0398						
Wt. of Sample							
At Field Moisture	1808.13						
Wet Density (pcf)	100.2						
Dry Density (pcf)	59.5						
Container No.	JOE						
Wt. of Wet							
Sample Plus Tare	876.09						
Wt. of Dry							
Sample Plus Tare	676.84						
Tare (g)	384.95						
Dry Wt. Of							
Sample (g)	291.89						
Moisture Content, %	68.3%						

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29444
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW - @ 45 - 50'	Tested By =>	JLW
		Reviewed By =>	JH

Pan Label =>	JOE	
Tare Weight of Pan =>	384.95	A
Wet Wt. of Sample & Tare =>	876.09	B
Dry Wt. of Sample & Tare =>	676.84	C
Weight of Moisture (B-C) =>	199.3	D
Dry Wt. of Sample (C-A) =>	291.89	E
Percent Moisture (D/E)*100 =>	68.3	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29444
 BORING: DBMW-2
 DEPTH: 45 - 50'
 DATE: 06/21/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Z
Mass of Pycnometer, Mf =>	220.94
Mass of Pycnometer & Water, Ma =>	719.4
Temperature of Water when Ma above was Taken, Ta =>	20.4
Mass of Speciman & Pycnometer =>	265.50
Mass of Pycnometer, Mf =>	220.94
Mass of Oven-Dry Specimen, Mo =>	44.56
Mass of Pycnometer, Soil & Water, Mb =>	747.43
Temperature of Water when Mb Above was Taken, Tb =>	19.6

Prodedure

Record the mass of a clean dry pycnometer, Mf
 Record the mass of the pyc. and distilled water at calibration mark, Ma
 Record the temperature of the water to the nearest .5° C, Ta
 Record Mass of Pyc & Water at Calibration Mark, Ma

Water Density at Ta	0.99812
Water Density at Tb	0.99829
K Factor at Tb	1.00008

Ma at Tb	221.0247382
Sp Gr at Tb	2.695704779
Sp Gr at 20 C	2.695920436

SPECIFIC GRAVITY AT 20 C	2.695920436
--------------------------	-------------

One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

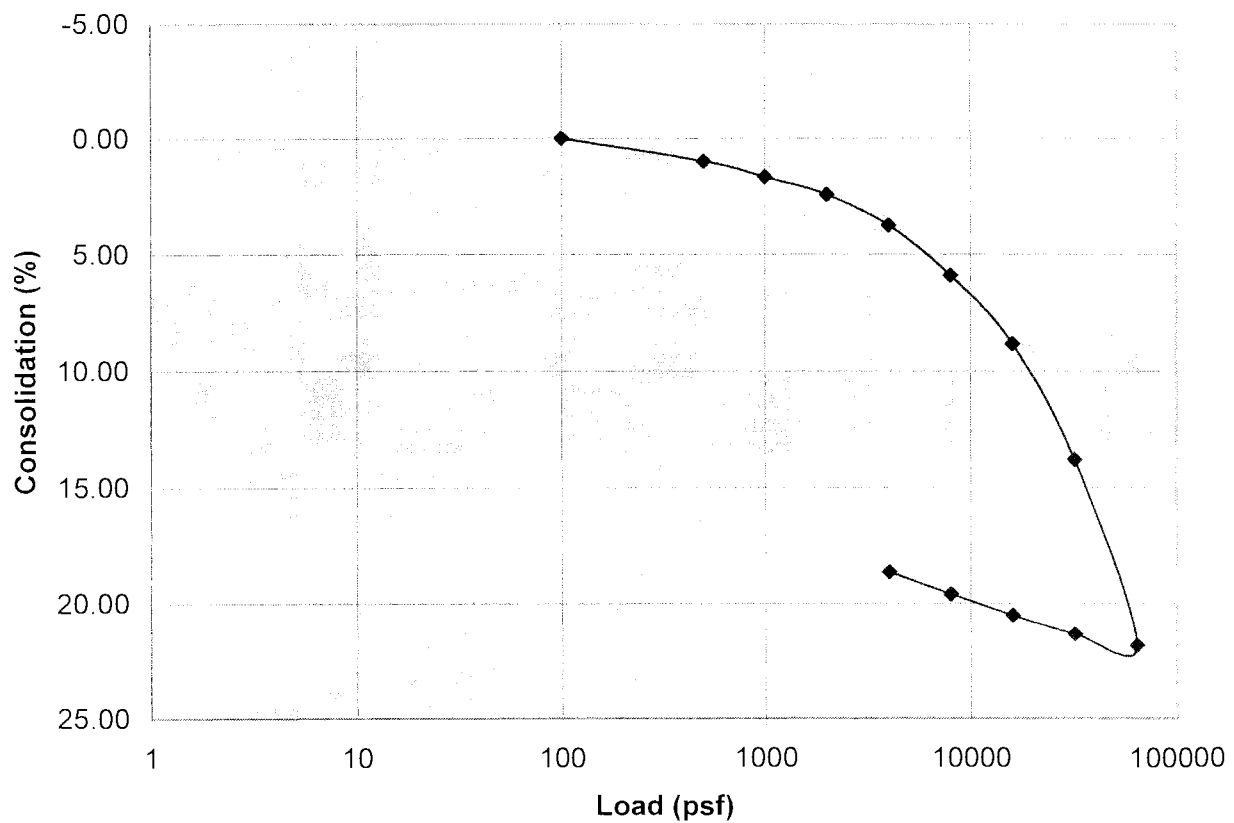
Project No.: 83173-12

Report Date: 06/29/07

Sample No.: 29444
Sample Depth (ft.): DBMW-2 @ 45 - 50'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	-0.01
500	1.00
1000	1.67
2000	2.44
4000	3.76
8000	5.89
16000	8.83
32000	13.81
64000	21.81
32000	21.31
16000	20.52
8000	19.60
4000	18.63



By: Doug Davis

Date Due:

[illegible]

LABORATORY NUMBER: 29446⁵



KLEINFELDER

An employee owned company

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: June 20, 2007
File: _____
Copies: _____

Subject: BRC Aquifer Testing: Flexible and Rigid Wall Testing

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-2@30-31.5'	06/18/07	29444	06/20/07
DBMW-2@50-51.5'	06/18/07	29444	06/20/07
DBMW-1@40-41.5'	06/19/07	29446	06/20/07
DBMW-1@50-51.5'	06/19/07	29446	06/20/07

If you have any questions please don't hesitate to call.

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14482(d)

DATE: June 26, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29446

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29446	DBMW-1	38.5-39.0	5.00%	7.90
29446	DBMW-1	46.8-47.5	3.90%	7.95


LABORATORY MANAGER

Moisture Density

Project Name	BRC AQUIFER TESTING			Date	06/22/07		
Project Number	83173	Phase No.	12	Tested By	JLW	Checked By	JH
Lab Number	29446						
Boring Number	DBMW-1	DBMW-1					
Sample Depth	38.5-39	46.8-47.5					
Height (inches)	3.49	7.25					
Diameter (inches)	5.11	5.12					
Volume	0.0414	0.09					
Wt. of Sample							
At Field Moisture	1612.86	3955.12					
Wet Density (pcf)	85.9	100.9					
Dry Density (pcf)	44.6	58.0					
Container No.							
Wt. of Wet							
Sample Plus Tare	1051.23	1035.69					
Wt. of Dry							
Sample Plus Tare	718.95	818.06					
Tare (g)	360.21	524.05					
Dry Wt. Of							
Sample (g)	358.74	294.01					
Moisture Content, %	92.6%	74.0%					

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-1 @ 38.5-39'; S-29446 @ 35.0 - 40.0'

June 19, 2007

Silt (ML)

Specific Gravity = 2.74

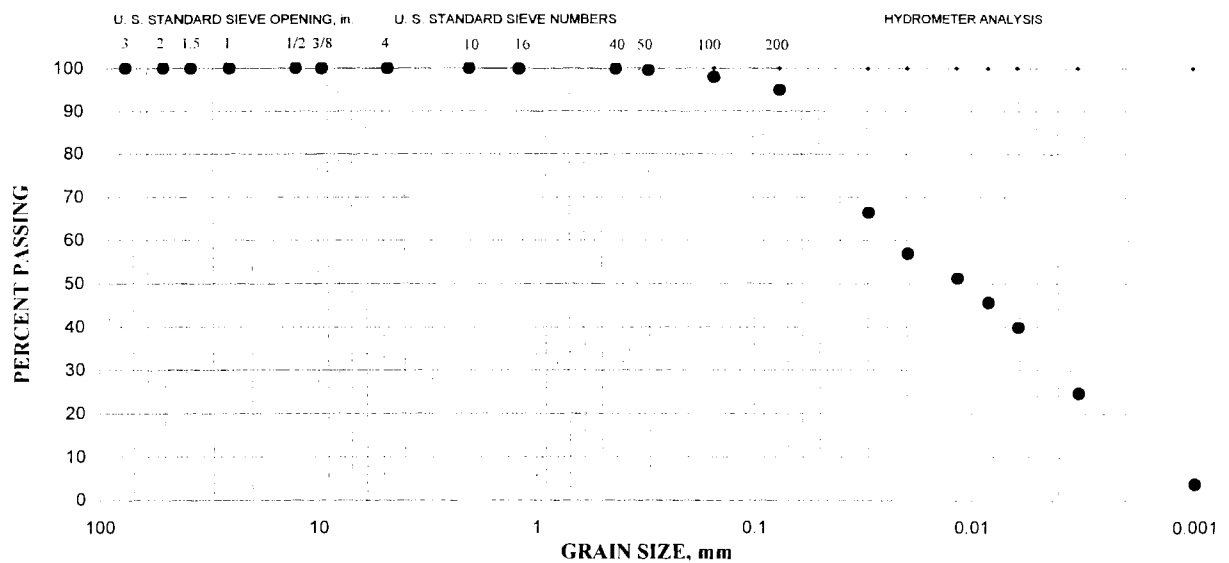
LL = ; PL = ; PI =

Gravel = 0%; Sand = 5%; Silt = 70%; Clay = 25%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425- μ m)	0	100
#50 (300- μ m)	0	100
#100 (150- μ m)	2	98
#200 (75- μ m)	5	95

Hydrometer Analysis

30- μ m	67
20- μ m	57
12- μ m	51
8- μ m	46
6- μ m	40
3.2- μ m	25
Colloids (<1- μ m)	4



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29446
Project =>	BRC AQUIFER TESTING	Date Sampled =>	06/19/07
Client =>	BRC	Date Received =>	06/20/07
Phase =>	12	Sampled By =>	DD
Sample Location =>	DBMW-1	Tested By =>	JLW
	38.5 - 39'	Reviewed By =>	JH

Pan Label =>	KLW	
Tare Weight of Pan =>	360.21	A
Wet Wt. of Sample & Tare =>	1051.23	B
Dry Wt. of Sample & Tare =>	718.95	C
Weight of Moisture (B-C) =>	332.3	D
Dry Wt. of Sample (C-A) =>	358.74	E
Percent Moisture (D/E)*100 =>	92.6	F

Sieve Retaining More Than About Recommended Minimum Mass

10% of Sample	of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29446
 BORING: DBMW -1
 DEPTH: 38.5 - 39'
 DATE:
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	X
Mass of Pycnometer, $M_f \Rightarrow$	221.68
Mass of Pycnometer & Water, $M_a \Rightarrow$	719.14
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	20.3
Mass of Speciman & Pycnometer $\Rightarrow$	261.37
Mass of Pycnometer, $M_f \Rightarrow$	221.1
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	40.27
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	744.69
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	19

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99814
Water Density at T_b	0.99841
K Factor at T_b	1.0002

Ma at T_b	221.8143142
Sp Gr at T_b	2.735733696
Sp Gr at 20 C	2.736280842

SPECIFIC GRAVITY AT 20 C	2.736280842
--------------------------	-------------

One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

Project No.: 83173-12

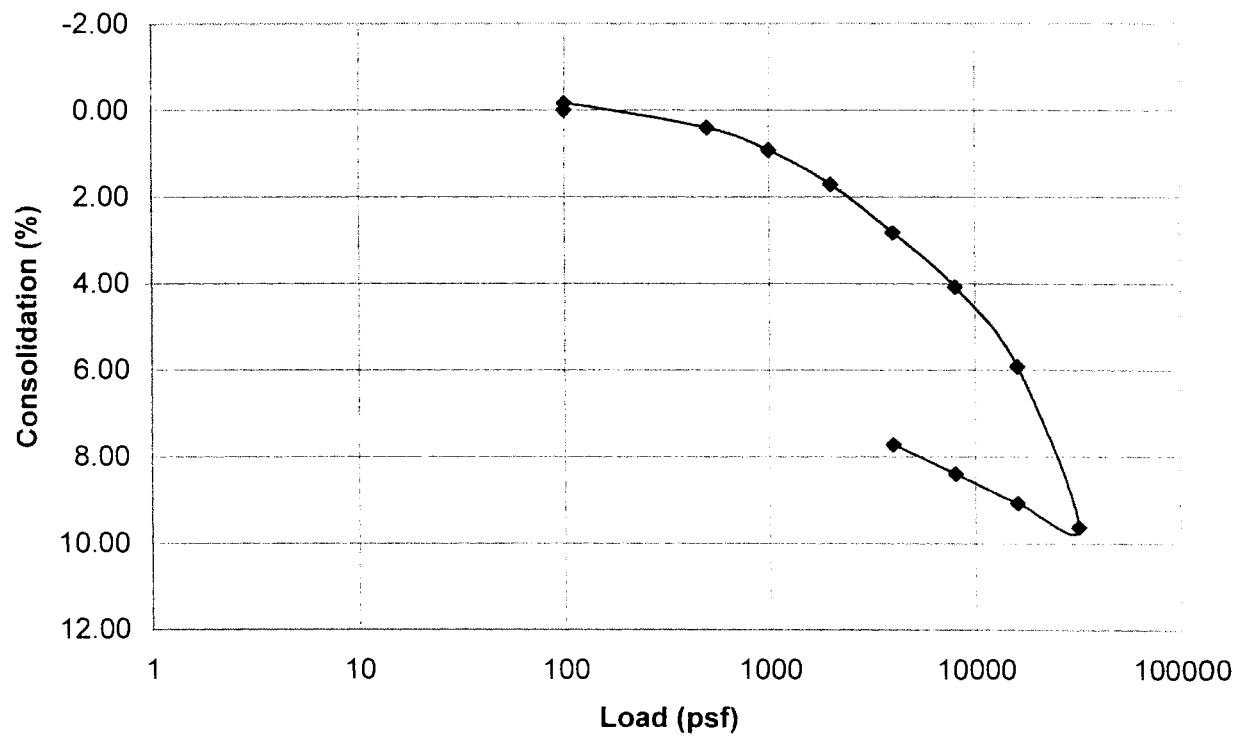
Report Date: 06/28/07

Sample No.: 29446
Sample Depth (ft.): DBMW-1 @ 38.5 - 39'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	0.00
100	-0.16
500	0.41
1000	0.92
2000	1.71
4000	2.82
8000	4.07
16000	5.91
32000	9.62
16000	9.06
8000	8.40
4000	7.72

DBMW-1 @ 38.5 - 39'



PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-1 @ 46.8-47.5'; S-29446 @ 45.0 - 50.0'

June 19, 2007

Silt (ML)

Specific Gravity = 2.56

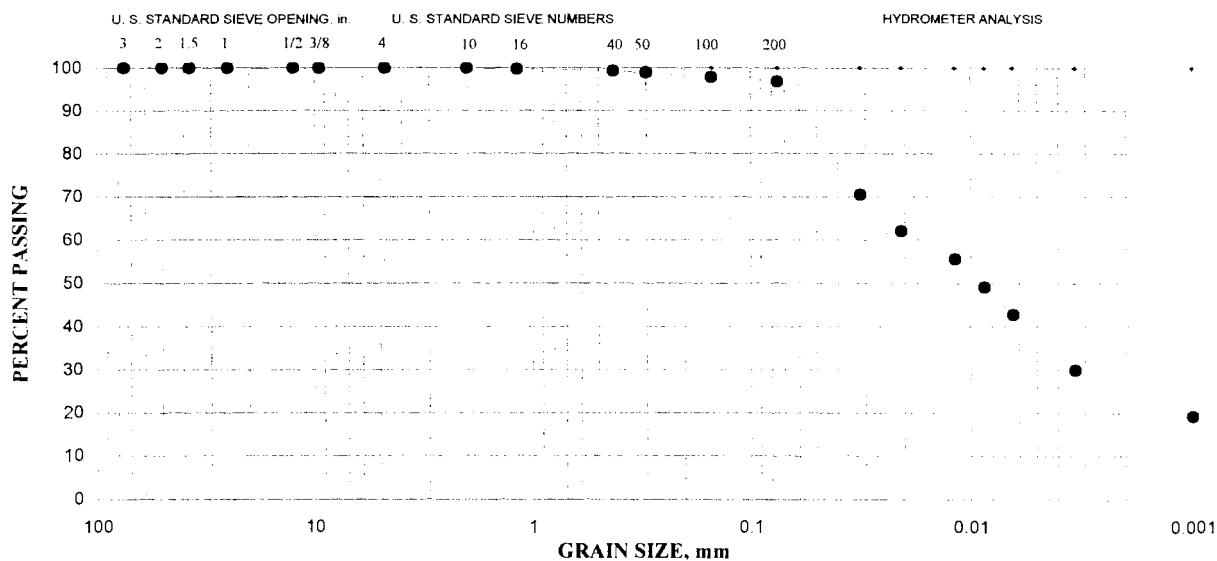
LL = ; PL = ; PI =

Gravel = 0%; Sand = 3%; Silt = 67%; Clay = 30%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425- μ m)	1	99
#50 (300- μ m)	1	99
#100 (150- μ m)	2	98
#200 (75- μ m)	3	97

Hydrometer Analysis

32- μ m	71
21- μ m	62
12- μ m	56
9- μ m	49
6- μ m	43
3.3- μ m	30
Colloids (<1- μ m)	19



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29446
Project =>	BRC AQUIFER TESTING	Date Sampled =>	06/19/07
Client =>	BRC	Date Received =>	06/20/07
Phase =>	12	Sampled By =>	Doug Davis
Sample Location =>	DBMW-1	Tested By =>	JLW
	46.8 - 47.5'	Reviewed By =>	JH

Pan Label =>	BUGS	
Tare Weight of Pan =>	524.05	A
Wet Wt. of Sample & Tare =>	1035.69	B
Dry Wt. of Sample & Tare =>	818.06	C
Weight of Moisture (B-C) =>	217.6	D
Dry Wt. of Sample (C-A) =>	294.01	E
Percent Moisture (D/E)*100 =>	74.0	F

Sieve Retaining More Than About Recommended Minimum Mass

10% of Sample	of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29446
 BORING: DBMW-1
 DEPTH: 46.8 - 47.5
 DATE:
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Y
Mass of Pycnometer, $M_f \Rightarrow$	224.41
Mass of Pycnometer & Water, $M_a \Rightarrow$	722.89
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	20.4
Mass of Speciman & Pycnometer $\Rightarrow$	274.40
Mass of Pycnometer, $M_f \Rightarrow$	224.4
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	50
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	753.38
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	19.1

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99812
Water Density at T_b	0.99839
K Factor at T_b	1.00018

Ma at T_b	224.5445896
Sp Gr at T_b	2.562788314
Sp Gr at 20 C	2.563249616

SPECIFIC GRAVITY AT 20 C	2.563249616
--------------------------	-------------

One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

Project No.: 83173-12

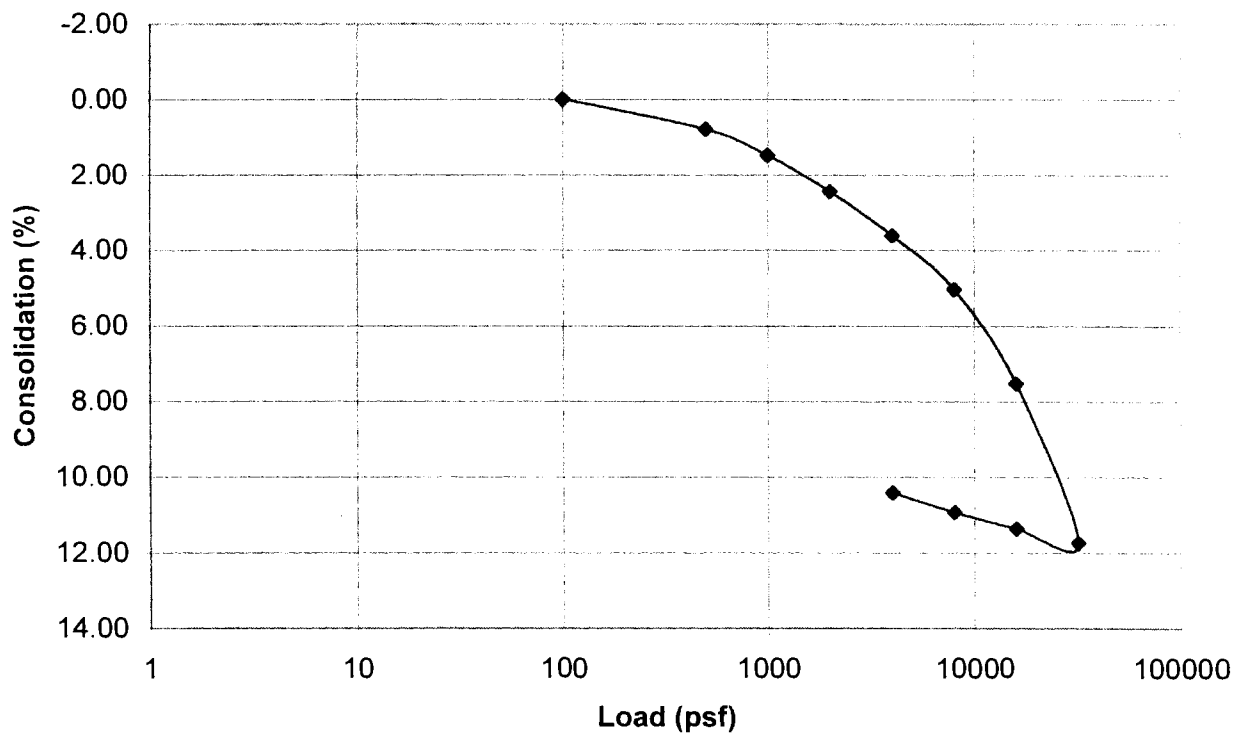
Report Date: 06/29/07

Sample No.: 29446
Sample Depth (ft.): DBMW-1 @ 46.8 - 47.5'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	0.00
100	-0.01
500	0.79
1000	1.48
2000	2.43
4000	3.61
8000	5.02
16000	7.52
32000	11.74
16000	11.36
8000	10.92
4000	10.41

DBMW-1 @ 46.8 - 47.5



By: Doug Davis

Date Due:

LABORATORY NUMBER: 29447

LABORATORY WORK ORDER



KLEINFELDER

Project No: 83173 Phase: 12
 Project Name: REC AQUICLUS TSD / NE WELLS
 Client Name: BRC
 Client Ref./P.O.#: _____
 Special Instructions: _____

291497
 Sample Number: DBW-3 30-31.5
" 25-30
" 35-40
" 40-41.5

SAMPLE STATUS

☒ Requested Test
☒ Test in Progress
☒ Test Completed

Date Sampled: 6-20-07
 Date Received: 6-21-07
 Date Needed: ASAP
 Date Completed: 6/25/07
 Verified By: DD

ASPHALT TESTING				
Usage	Qty.	99#	Status	
C123 Li Wt Pieces/Agg		990715		
C127 Absorption/Gravity	<u>2</u>	990702 <u>990307</u>		
CAL 205 Crushed Part		990712		
CAL 227 Cleaness TST		990711		
Clay Lumps/Friabl Part C-142		990714		
D2726 Weight/Absorption Core		991110		
Extract Bitumin D1856, 2172.310		991102		
Flat/Elong Part/Sieve 119, 120		990713		
Hveem Stability/Set of 3		991147		
Ignition Oven Calibration		996156		
Injurious Organic Matter C-40		990701		
LA Rattler CAL131		990706		
Lottman Test		991121		
Marshall Stab/Flow D-1599 (Set of 3)/Lab		991108		
Max Theoretical Specific Gravity D-2041		991112		
Methylene Blue Test		990132		
Microwave Asphalt Moist Content		996137		
Oil Content By Ignition Oven		996153		
Sand Equivalent C217		990308		
Specific Gravity C127/8 D854		990211		
Stabil Test/Premix Sample CAL 366		991104		
Unit Weight C29		990704		

MISC. OTHER				
Usage	Qty.	99#	Status	
Chloride Analysis		996020		
Corrosivity Analysis		991508		
Corrosivity, Resistivity, Sodium Sulfate, Solubility, p11*		990324		
pH Test		990319		
Sulfate Analysis		992090		
Unit Weight Fireproofing		991314		

CONCRETE & MASONRY TESTING				
Usage	Qty.	99#	Status	
C942 Grout Strength (cylinder/prism strength)		990119		
Compressive Test 12x8x16 Prisms (12" width)		991005		
Compressive Test 8x8x16 Prisms (8" width)		991003		
Compressive Test/Cored Spec		990809		
Concrete Compressive Test		990803		
Drying Shrinkage (Set OF 3) C-157, CAL-530		990811		
Flex and Strength/Concrete Beam		990806		
Mortar Strength C-109		990118		

SOILS TESTING				
Usage	Qty.	99#	Status	
ASTM D1557 6" Method B, C and D		990104		
CBR 100% Compaction D1883, T180		990209		
Check Point		990106		
Collapse Potential		990614		
Consolidation W/O time Rate/6 LD D2435	<u>1</u>	990613	<u>X</u>	
Correct Oversize Material in Sample CAL301		990203		
Direct Shear 1 Point		990608		
Direct Shear 3 Point		990609		
Harvard Miniature		992191		
Hydrometer Only	<u>2</u>	990305	<u>XXX</u>	
Moisture Determination Only	<u>2</u>	990317	<u>XXX</u>	
Moisture Determination/Unit Weight	<u>1</u>	990316	<u>XXX</u>	
Plasticity Index		990310		
Resistivity Analysis		990318		
R Value/Untreated Material/Field Sample CAL 301		990201		
Sample Prep Materials		992508		
Sieve Analysis Wash #200 C117		990304		
Sieve Analysis/Course & Fine	<u>2</u>	990301	<u>X</u>	
Sulfate Sound (S) Sieve SZ C88		990708		
Swell Test FHA Specification (60 psi)		990312		
Unconfined Comp/Inc Moist D2166		990601		

CCPW ☒ LWD ☒ NDOT
 CSD ☒ ASHTO
 UBC ☒
 ASTM ☒ Other

Source: Soil Bore Log
 Supplier: _____
 Sample Location: DBW-3
 Type of Material: Soil
 Sampled By: Soil Bore Log
 Project Manager: _____

FOR ACCOUNTING USE ONLY
 Entered By: _____
 Date Entered: _____



KLEINFELDER

An employee owned company

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: June 21, 2007
File: _____
Copies: _____

Subject: **BRC Aquifer Testing: Flexible and Rigid Wall Testing**

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-3@30-31.5'	06/20/07	29447	06/21/07
DBMW-3@40-41.5'	06/20/07	29447	06/21/07

If you have any questions please don't hesitate to call.

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14482(e)

DATE: June 27, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29447

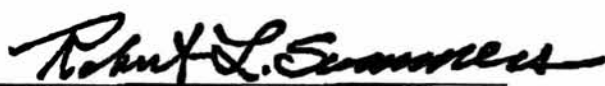
SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29447	DBMW-3	29.0-30.0	3.00%	8.26
29447	DBMW-3	39.0-39.5	1.90%	8.12


LABORATORY MANAGER

Moisture Density							
Project Name	BRC AQUIFER TESTING				Date	06/22/07	
Project Number	83173	Phase No.	12	Tested By	JLW	Checked By	JH
Lab Number	29447						
Boring Number	DBMW-3						
Sample Depth	29 - 30'						
Height (inches)	2.56						
Diameter (inches)	5.06						
Volume	0.0298						
Wt. of Sample							
At Field Moisture	1268.22						
Wet Density (pcf)	93.8						
Dry Density (pcf)	63.4						
Container No.	KOHEN						
Wt. of Wet							
Sample Plus Tare	701.40						
Wt. of Dry							
Sample Plus Tare	555.68						
Tare (g)	251.97						
Dry Wt. Of							
Sample (g)	303.71						
Moisture Content, %	48.0%						

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29447
Project =>	BRC AQUIFER TESTING	Date Sampled =>	06/20/07
Client =>	BRC	Date Received =>	06/21/07
Phase =>	12	Sampled By =>	Doug Davis
Sample Location =>	DBMW-3	Tested By =>	JLW
	29 - 30'	Reviewed By =>	JH

Pan Label =>	KOHEN	
Tare Weight of Pan =>	251.97	A
Wet Wt. of Sample & Tare =>	701.41	B
Dry Wt. of Sample & Tare =>	555.68	C
Weight of Moisture (B-C) =>	145.7	D
Dry Wt. of Sample (C-A) =>	303.71	E
Percent Moisture (D/E)*100 =>	48.0	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

Project No.: 83173-12

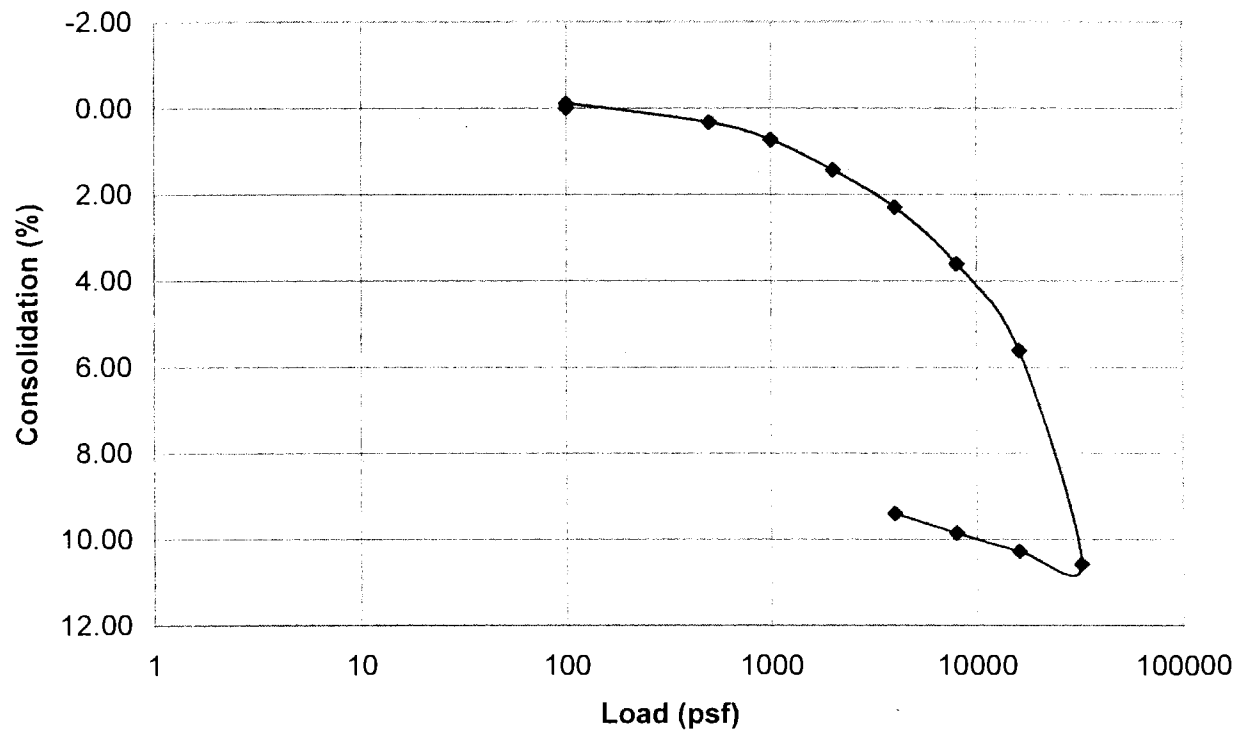
Report Date: 06/29/07

Sample No.: 29447
Sample Depth (ft.): DBMW-3 @ 29 - 30'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	0.00
100	-0.11
500	0.33
1000	0.74
2000	1.43
4000	2.30
8000	3.61
16000	5.61
32000	10.57
16000	10.27
8000	9.85
4000	9.40

DBMW-3 @ 29 - 30'



PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29447
 BORING: DBMW-3
 DEPTH: 29 - 30'
 DATE: 06/26/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	X
Mass of Pycnometer, $M_f \Rightarrow$	220.89
Mass of Pycnometer & Water, $M_a \Rightarrow$	719.58
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	19.4
Mass of Speciman & Pycnometer $\Rightarrow$	266.37
Mass of Pycnometer, $M_f \Rightarrow$	220.89
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	45.48
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	747.54
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	19

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99833
Water Density at T_b	0.99841
K Factor at T_b	1.0002

M_a at T_b	220.9298952
Sp Gr at T_b	2.595890411
Sp Gr at 20 C	2.596409589

SPECIFIC GRAVITY AT 20 C	2.596409589
--------------------------	-------------

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-3@29-30'; S-29447 @ 25.0 - 30.0'

June 20, 2007

Silt (ML)

Specific Gravity = 2.60

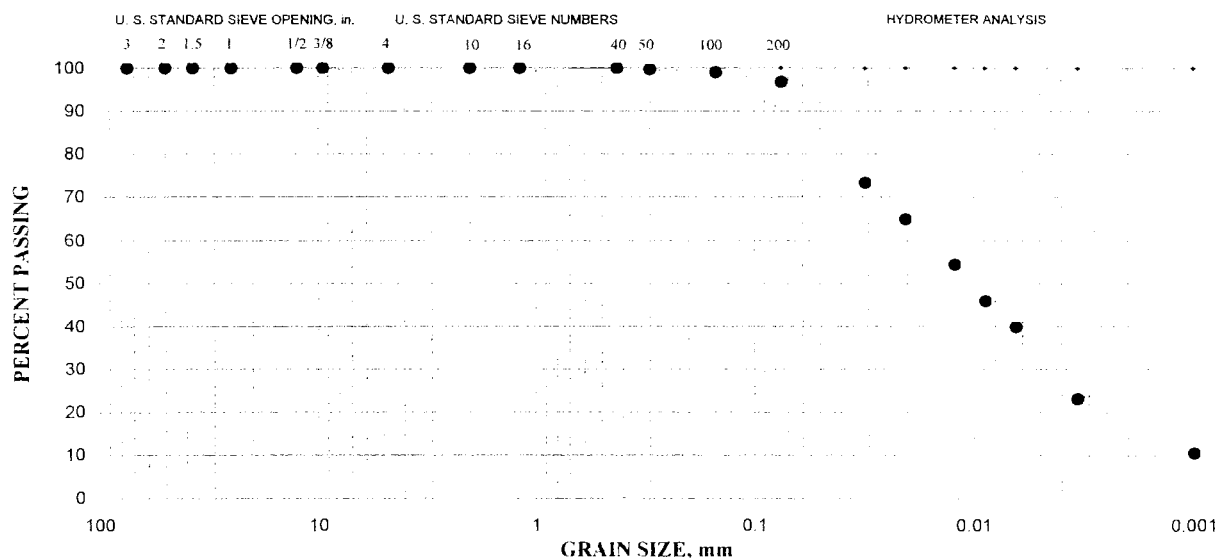
LL = ; PL = ; PI =

Gravel = 0%; Sand = 3%; Silt = 74%; Clay = 23%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425- μ m)	0	100
#50 (300- μ m)	0	100
#100 (150- μ m)	1	99
#200 (75- μ m)	3	97

Hydrometer Analysis

31- μ m	73
20- μ m	65
12- μ m	54
9- μ m	46
6- μ m	40
3.4- μ m	23
Colloids (<1- μ m)	10



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29447
Project =>	BRC AQUIFER TESTING	Date Sampled =>	06/20/07
Client =>	BRC	Date Received =>	06/21/07
Phase =>	12	Sampled By =>	Doug Davis
Sample Location =>	DBMW-3	Tested By =>	JLW
	39 - 39.5'	Reviewed By =>	JH

Pan Label =>	OLY	
Tare Weight of Pan =>	252.25	A
Wet Wt. of Sample & Tare =>	1171.83	B
Dry Wt. of Sample & Tare =>	975.17	C
Weight of Moisture (B-C) =>	196.7	D
Dry Wt. of Sample (C-A) =>	722.92	E
Percent Moisture (D/E)*100 =>	27.2	F

Sieve Retaining More Than About	Recommended Minimum Mass
10% of Sample	of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29447
 BORING: DBMW-3
 DEPTH: 39 - 39.5'
 DATE: 06/26/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Y
Mass of Pycnometer, Mf =>	224.41
Mass of Pycnometer & Water, Ma =>	722.89
Temperature of Water when Ma above was Taken, Ta =>	20.4
Mass of Speciman & Pycnometer =>	325.32
Mass of Pycnometer, Mf =>	224.41
Mass of Oven-Dry Specimen, Mo =>	100.91
Mass of Pycnometer, Soil & Water, Mb =>	785.74
Temperature of Water when Mb Above was Taken, Tb =>	19

Prodedure

Record the mass of a clean dry pycnometer, Mf
 Record the mass of the pyc. and distilled water at calibration mark, Ma
 Record the temperature of the water to the nearest .5° C, Ta
 Record Mass of Pyc & Water at Calibration Mark, Ma

Water Density at Ta	0.99812
Water Density at Tb	0.99841
K Factor at Tb	1.0002
Ma at Tb	224.5545592
Sp Gr at Tb	2.651339989
Sp Gr at 20 C	2.651870257
SPECIFIC GRAVITY AT 20 C	2.651870257

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-3@39-39.5'; S-29447 @ 35.0 - 40.0'

June 20, 2007

Silty Sand (SM)

Specific Gravity = 2.65

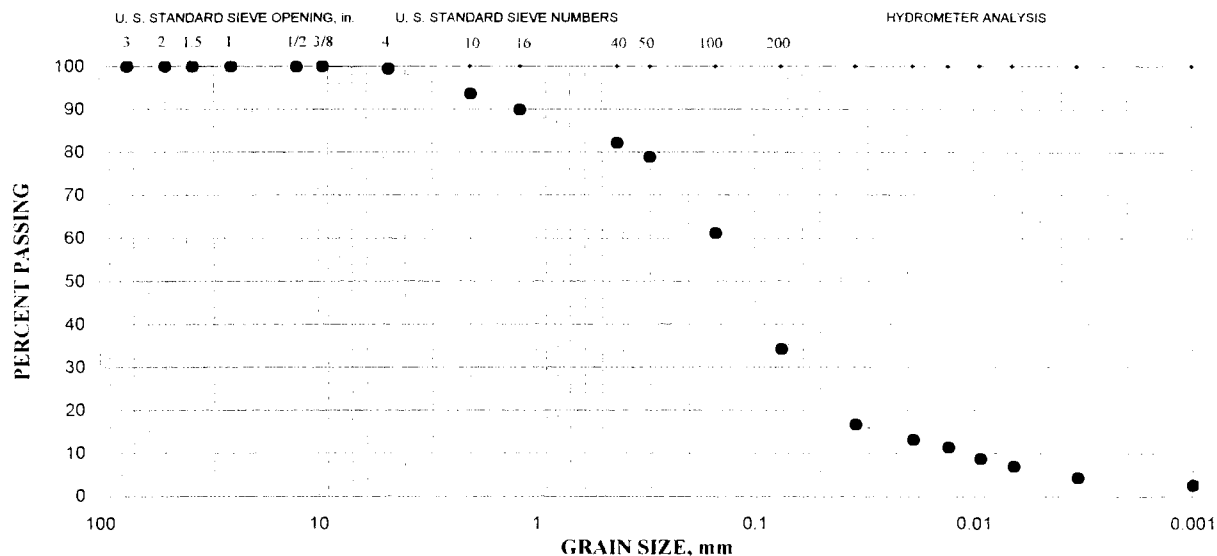
LL = ; PL = ; PI =

Gravel = 1%; Sand = 65%; Silt = 30%; Clay = 4%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	1	99
#10 (2.00-mm)	6	94
#16 (1.18-mm)	10	90
#40 (425- μ m)	18	82
#50 (300- μ m)	21	79
#100 (150- μ m)	39	61
#200 (75- μ m)	66	34

Hydrometer Analysis

34- μ m	17
19- μ m	13
13- μ m	11
9- μ m	9
7- μ m	7
3.4- μ m	4
Colloids (<1- μ m)	3



By: Doug Davis

Date Due: ASAPLABORATORY NUMBER:

29455

LABORATORY WORK ORDER



KLEINFELDER

Project No: 33173 Phase: 12
 Project Name: BRC Aquifer Test / NO Wells
 Client Name: BRC
 Client Ref./P.O.#: _____
 Special Instructions: _____

Sample Number: DBMW-6 30-35 ☒ Requested Test
" 35-36.5 ☒ Test in Progress
" 45-50 ☒ Test Completed
" 50-51.5

Date Sampled: 6-21-07
 Date Received: 6/21/07
 Date Needed: ASAP
 Date Completed: _____
 Verified By: _____

ASPHALT TESTING

Usage	Qty.	99#	Status
C123 Lt Wt Pieces/Agg		990715	
C127 Absorption/Gravity	<u>2</u>	<u>990702</u>	<u>990307</u>
CAL 205 Crushed Part		990712	
CAL 227 Cleaness TST		990711	
Clay Lumps/Friabl Part C-142		990714	
D2726 Weight/Absorption Core		991110	
Extract Bitumin D1856, 2172.310		991102	
Flat/Elong Part/Sieve 119, 120		990713	
Hveem Stability/Set of 3		991147	
Ignition Oven Calibration		996156	
Injurious Organic Matter C-40		990701	
LA Rattler CAL131		990706	
Lottman Test		991121	
Marshall Stab/Flow D-1599 (Set of 3)/Lab		991108	
Max Theoretical Specific Gravity D-2041		991112	
Methylene Blue Test		990132	
Microwave Asphalt Moist Content		996137	
Oil Content By Ignition Oven		996153	
Sand Equivalent C217		990308	
Specific Gravity C127/8 D854		990211	
Stabil Test/Premix Sample CAL 366		991104	
Unit Weight C29		990704	

MISC. OTHER

Usage	Qty.	99#	Status
Chloride Analysis		996020	
Corrosivity Analysis		991508	
Corrosivity, Resistivity, Sodium Sulfate, Solubility, p11		990324	
pH Test		990319	
Sulfate Analysis		992090	
Unit Weight Fireproofing		991314	

CONCRETE & MASONRY TESTING

Usage	Qty.	99#	Status
C942 Grout Strength (cylinder/prism strength)		990119	
Compressive Test 12x8x16 Prisms (12" width)		991005	
Compressive Test 8x8x16 Prisms (8" width)		991003	
Compressive Test/Cored Spec		990809	
Concrete Compressive Test		990803	
Drying Shrinkage (Set OF 3) C-157, CAL-530		990811	
Flex and Strength/Concrete Beam		990806	
Mortar Strength C-109		990118	

SOILS TESTING

Usage	Qty.	99#	Status
ASTM D1557 6" Method B, C and D		990104	
CBR 100% Compaction D1883, T180		990209	
Check Point		990106	
Collapse Potential		990614	
Consolidation W/O time Rate/6 LD D2435	<u>1</u>	990613	<u>X</u>
Correct Oversize Material in Sample CAL301		990203	
Direct Shear 1 Point		990608	
Direct Shear 3 Point		990609	
Harvard Miniature		992191	
Hydrometer Only	<u>2</u>	990305	<u>XXX</u>
Moisture Determination Only	<u>2</u>	990317	<u>XXX</u>
Moisture Determination/Unit Weight	<u>1</u>	990316	<u>XXX</u>
Plasticity Index		990310	
Resistivity Analysis		990318	
R-Value/Untreated Material/Field Sample CAL 301		990201	
Sample Prep Materials		992508	
Sieve Analysis Wash #200 C117		990304	
Sieve Analysis/Course & Fine	<u>2</u>	990301	<u>X</u>
Sulfate Sound (5) Sieve SZ C88		990708	
Swell Test FHA Specification (60 psi)		990312	
Unconfined Comp/Inc Moist D2166		990601	

Source: Soil borings
 Supplier: DBMW-6
 Sample Location: Soil
 Type of Material: D. Davis
 Sampled by: G. Carpenter / G. C. Timmer
 Project Manager: _____

CCPW ☒ LWD ☐ AASHTO ☐ MDOT
 CCSD ☐ UBC ☐
 ASTM ☒ Other ☐

FOR ACCOUNTING USE ONLY
 Date Entered: _____
 Entered By: _____



KLEINFELDER

An employee owned company

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: June 25, 2007
File: _____
Copies: _____

Subject: **BRC Aquifer Testing: Flexible and Rigid Wall Testing**

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-6@35-36.5'	06/21/07	29451	06/25/07
DBMW-6@50-51.5'	06/21/07	29451	06/25/07
DBMW-7@70-71.5'	06/23/07	29452	06/25/07
DBMW-7@60-61.5'	06/22/07	29451	06/25/07
DBMW-8@62.5-64'	06/24/07	29453	06/25/07
DBMW-8@70-71.5'	06/24/07	29453	06/25/07

If you have any questions please don't hesitate to call.

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14482(g)

DATE: June 28, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29450

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29450	DBMW-6	32.5-33.0	5.50%	8.04
29450	DBMW-6	45.0-46.0	7.50%	8.11

Robert L. Summers

LABORATORY MANAGER

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-6@45-46'; S-29450 @ 45.0 - 50.0'

June 21, 2007

Silt with Sand (ML)

Specific Gravity = 2.91

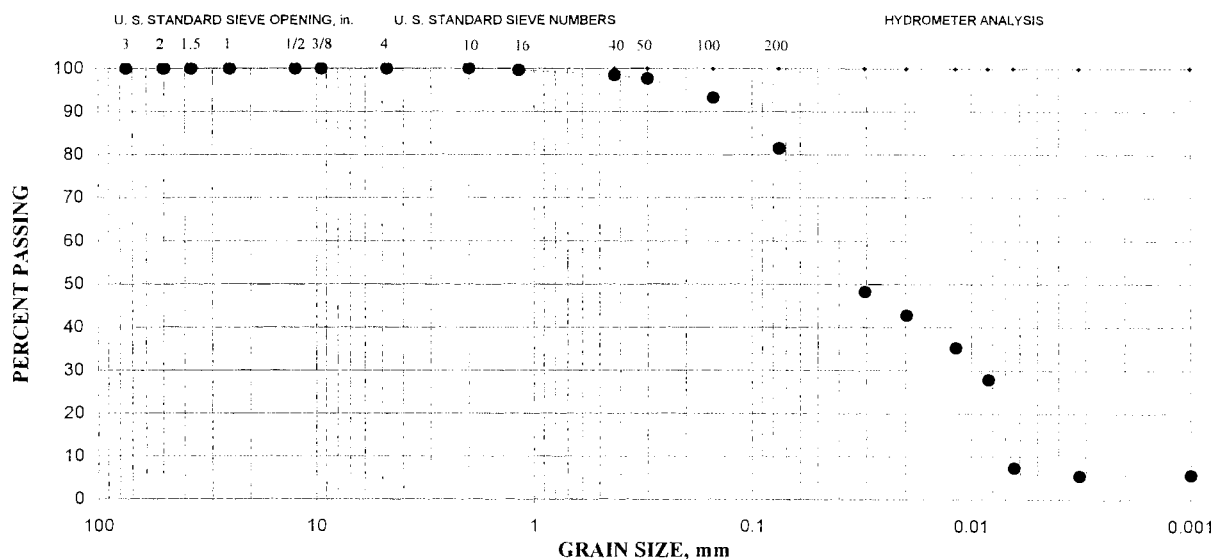
LL = ; PL = ; PI =

Gravel = 0%; Sand = 19%; Silt = 75%; Clay = 6%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425- μ m)	2	98
#50 (300- μ m)	2	98
#100 (150- μ m)	7	93
#200 (75- μ m)	19	81

Hydrometer Analysis

31- μ m	48
20- μ m	43
12- μ m	35
8- μ m	28
6- μ m	7
3.2- μ m	6
Colloids (<1- μ m)	6



One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

Project No.: 83173-12

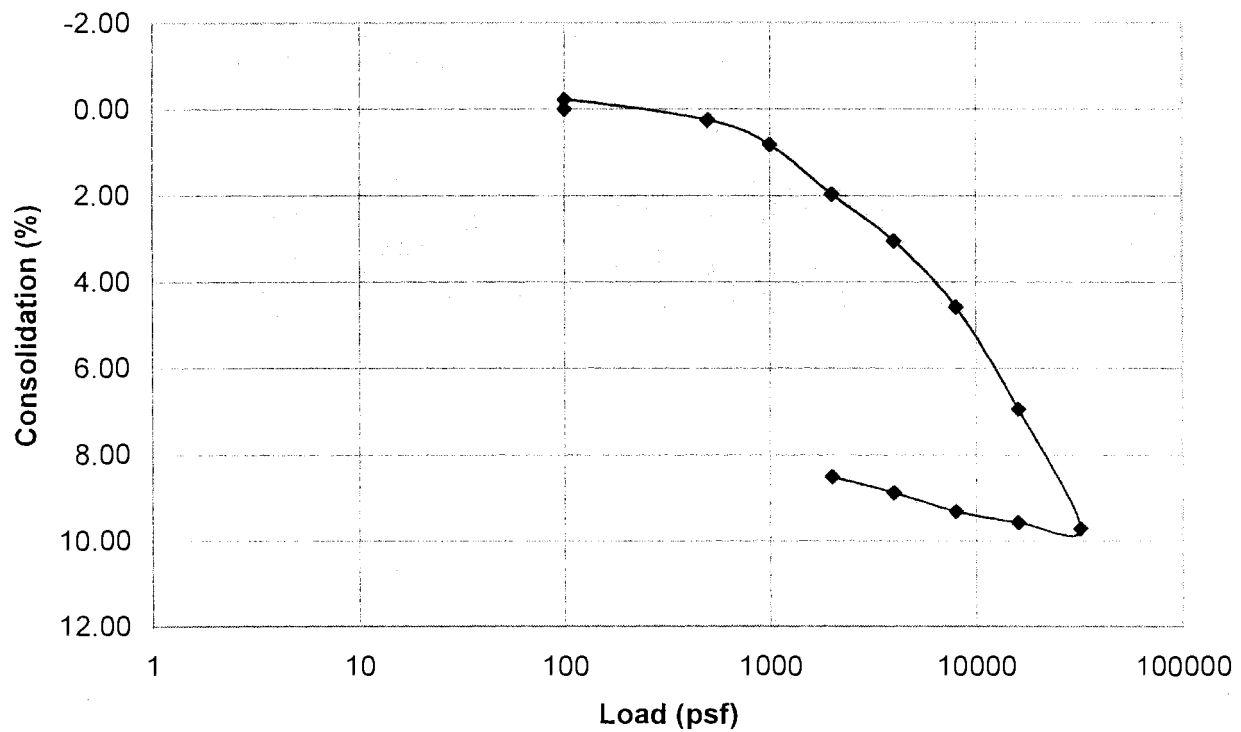
Report Date: 07/05/07

Sample No.: 29450
Sample Depth (ft.): DBMW-6 @ 45 - 46'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	0.00
100	-0.22
500	0.25
1000	0.82
2000	1.97
4000	3.05
8000	4.58
16000	6.95
32000	9.71
16000	9.57
8000	9.31
4000	8.88
2000	8.51

DBMW-6 @ 45 - 46'



PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29450
 BORING: DBMW-6
 DEPTH: 45 - 46'
 DATE: 06/27/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	X
Mass of Pycnometer, Mf =>	221.68
Mass of Pycnometer & Water, Ma =>	719.14
Temperature of Water when Ma above was Taken, Ta =>	20.3
Mass of Speciman & Pycnometer =>	266.22
Mass of Pycnometer, Mf =>	220.96
Mass of Oven-Dry Specimen, Mo =>	45.26
Mass of Pycnometer, Soil & Water, Mb =>	748.86
Temperature of Water when Mb Above was Taken, Tb =>	19.5

Prodedure

Record the mass of a clean dry pycnometer, Mf
 Record the mass of the pyc. and distilled water at calibration mark, Ma
 Record the temperature of the water to the nearest .5° C, Ta
 Record Mass of Pyc & Water at Calibration Mark, Ma

Water Density at Ta	0.99814
Water Density at Tb	0.99831
K Factor at Tb	1.0001

Ma at Tb	221.7645682
Sp Gr at Tb	2.912483912
Sp Gr at 20 C	2.912775161

SPECIFIC GRAVITY AT 20 C	2.912775161
--------------------------	-------------

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29450
Project =>	BRC AQUIFER TESTING	Date Sampled =>	06/21/07
Client =>	BRC	Date Received =>	06/22/07
Phase =>	12	Sampled By =>	Doug Davis
Sample Location =>	DBMW-6	Tested By =>	JLW
	45 - 46	Reviewed By =>	JH

Pan Label =>	49ers	
Tare Weight of Pan =>	253.62	A
Wet Wt. of Sample & Tare =>	708.19	B
Dry Wt. of Sample & Tare =>	614.12	C
Weight of Moisture (B-C) =>	94.1	D
Dry Wt. of Sample (C-A) =>	360.5	E
Percent Moisture (D/E)*100 =>	26.1	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

Moisture Density							
Project Name	BRC AQUIFER TESTING			Date	06/23/07		
Project Number	83173	Phase No.	12	Tested By	JLW	Checked By	JH
Lab Number	29450						
Boring Number	DBMW-6						
Sample Depth	45 - 46'						
Height (inches)	9.63						
Diameter (inches)	5.03						
Volume	0.1107						
Wt. of Sample At Field Moisture	5940.30						
Wet Density (pcf)	118.3						
Dry Density (pcf)	93.8						
Container No.	49ERS						
Wt. of Wet Sample Plus Tare	708.19						
Wt. of Dry Sample Plus Tare	614.12						
Tare (g)	253.62						
Dry Wt. Of Sample (g)	360.50						
Moisture Content, %	26.1%						

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-6@32.5-33'; S-29450 @ 30.0 - 35.0'

June 21, 2007

Silt with Gravel (ML)

Specific Gravity = 2.82

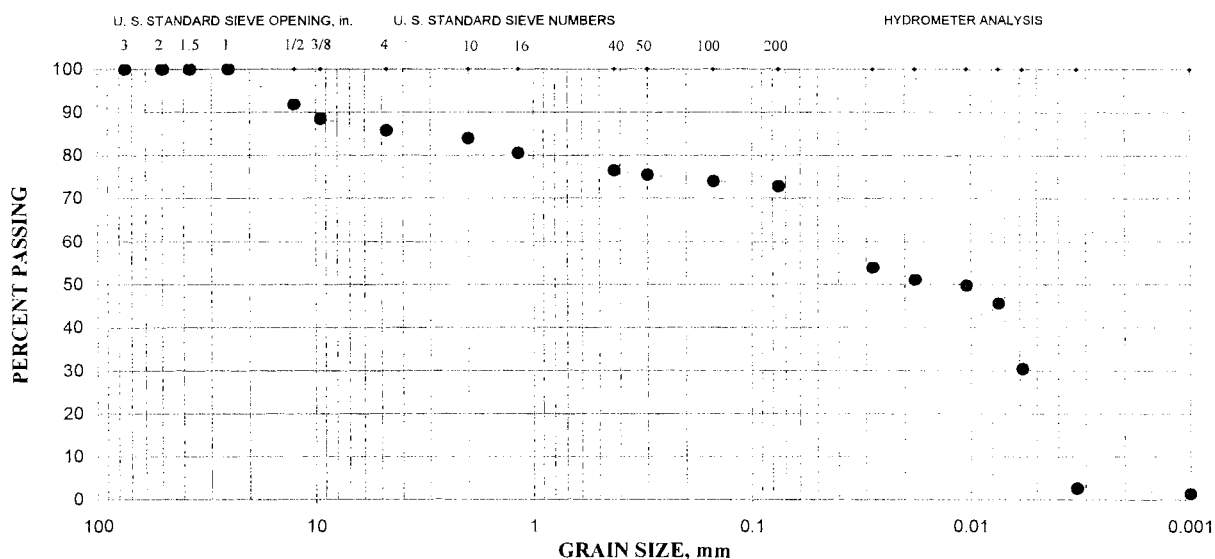
LL = ; PL = ; PI =

Gravel = 14%; Sand = 13%; Silt = 70%; Clay = 3%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	8	92
3/8" (9.5-mm)	11	89
#4 (4.75-mm)	14	86
#10 (2.00-mm)	16	84
#16 (1.18-mm)	19	81
#40 (425-μm)	24	76
#50 (300-μm)	25	75
#100 (150-μm)	26	74
#200 (75-μm)	27	73

Hydrometer Analysis

28-μm	54
18-μm	51
10-μm	50
7-μm	46
6-μm	30
3.3-μm	3
Colloids (<1-μm)	1



PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29450
 BORING: DBMW-6
 DEPTH: 32.5 - 33'
 DATE: 06/27/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	z
Mass of Pycnometer, Mf =>	220.94
Mass of Pycnometer & Water, Ma =>	719.1
Temperature of Water when Ma above was Taken, Ta =>	20.4
Mass of Speciman & Pycnometer =>	266.49
Mass of Pycnometer, Mf =>	220.95
Mass of Oven-Dry Specimen, Mo =>	45.54
Mass of Pycnometer, Soil & Water, Mb =>	748.47
Temperature of Water when Mb Above was Taken, Tb =>	19.7

Prodedure

Record the mass of a clean dry pycnometer, Mf
 Record the mass of the pyc. and distilled water at calibration mark, Ma
 Record the temperature of the water to the nearest .5° C, Ta
 Record Mass of Pyc & Water at Calibration Mark, Ma

Water Density at Ta	0.99812
Water Density at Tb	0.99827
K Factor at Tb	1.00006

Ma at Tb	221.014724
Sp Gr at Tb	2.816326531
Sp Gr at 20 C	2.81649551

SPECIFIC GRAVITY AT 20 C	2.81649551
--------------------------	------------

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29450
Project =>	BRC AQUIFER TESTING	Date Sampled =>	06/21/07
Client =>	BRC	Date Received =>	06/22/07
Phase =>	12	Sampled By =>	Doug Davis
Sample Location =>	DBMW-6	Tested By =>	JLW
	32.5 - 33'	Reviewed By =>	JH

Pan Label =>	ZONE	
Tare Weight of Pan =>	253.63	A
Wet Wt. of Sample & Tare =>	845.1	B
Dry Wt. of Sample & Tare =>	733.94	C
Weight of Moisture (B-C) =>	111.2	D
Dry Wt. of Sample (C-A) =>	480.31	E
Percent Moisture (D/E)*100 =>	23.1	F

Sieve Retaining More Than About	Recommended Minimum Mass
10% of Sample	of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

By: Doug Davis

Date Due:

[illegible]

LABORATORY NUMBER:

29451

LABORATORY WORK ORDER

29451



Project No: 03173 Phase: 12
 Project Name: BRC ADJ. FOR TEST / NO NEWS
 Client Name: BRC
 Client Ref./P.O.#: _____
 Special Instructions: _____

Sample Number: DBMW-7 55-60
" 60-61.5
 SAMPLE STATUS
☐ Requested Test
☒ Test in Progress
☒ Test Completed

Date Sampled: 6-22-07
 Date Received: 6/22/07
 Date Needed: ASAP
 Date Completed: 7/2/07
 Verified By: QA

ASPHALT TESTING				
Usage	Qty.	99#	Status	
C123 Lt Wt Pieces/Agg		990715		
C127 Absorption/Gravity	<u>1</u>	990707 <u>990307</u>		
CAL 205 Crushed Part		990712		
CAL 227 Cleanness TST		990711		
Clay Lumps/Friabl Part C-142		990714		
D2726 Weight/Absorption Core		991110		
Extract Bitumin D1856, 2172.310		991102		
Flat/Elong Part/Sieve 119, 120		990713		
Hveem Stability/Set of 3		991147		
Ignition Oven Calibration		996156		
Injurious Organic Matter C-40		990701		
LA Rattler CAL131		990706		
Lottman Test		991121		
Marshall Stab/Flow D-1599 (Set of 3)/Lab		991108		
Max Theoretical Specific Gravity D-2041		991112		
Methylene Blue Test		990132		
Microwave Asphalt Moist Content		996137		
Oil Content By Ignition Oven		996153		
Sand Equivalent C217		990308		
Specific Gravity C127/8 D854		990211		
Stabil Test/Premix Sample CAL 366		991104		
Unit Weight C29		990704		

CONCRETE & MASONRY TESTING				
Usage	Qty.	99#	Status	
C942 Grout Strength (cylinder/prism strength)		990119		
Compressive Test 12x8x16 Prisms (12" width)		991005		
Compressive Test 8x8x16 Prisms (8" width)		991003		
Compressive Test/Cored Spec		990809		
Concrete Compressive Test		990803		
Drying Shrinkage (Set OF 3) C-157, CAL-530		990811		
Flex and Strength/Concrete Beam		990806		
Mortar Strength C-109		990118		

SOILS TESTING				
Usage	Qty.	99#	Status	
ASTM D1557 6" Method B, C and D		990104		
CBR 100% Compaction D1883, T180		990209		
Check Point		990106		
Collapse Potential		990614		
Consolidation W/O time Rate/6 LD D2435		990613		
Correct Oversize Material in Sample CAL301		990203		
Direct Shear 1 Point		990608		
Direct Shear 3 Point		990609		
Harvard Miniature		992191		
Hydrometer Only	<u>1</u>	990305	☒	
Moisture Determination Only	<u>1</u>	990317	☒	
Moisture Determination/Unit Weight		990316		
Plasticity Index		990310		
Resistivity Analysis		990318		
R-Value/Untreated Material/Field Sample CAL 301		990201		
Sample Prep Materials		992508		
Sieve Analysis Wash #200 C117		990304		
Sieve Analysis/Course & Fine	<u>1</u>	990301	☒	
Sulfate Sound (S) Sieve SZ C88		990708		
Swell Test FHA Specification (60 psi)		990312		
Unconfined Comp/Inc Moist D2166		990601		

MISC. OTHER				
Usage	Qty.	99#	Status	
Chloride Analysis		996020		
Corrosivity Analysis		991508		
Corrosivity, Resistivity, Sodium Sulfate, Solubility, p11+		990324		
pH Test		990319		
Sulfate Analysis		992090		
Unit Weight Fireproofing		991314		

Source: Soil Boring DBMW-7
 Supplier: DBMW-7
 Sample Location: Soil
 Type of Material: DBMW-7
 Sampled by: G. Carver
 Project Manager: G. Carver

FOR ACCOUNTING USE ONLY
 Entered By: _____ Date Entered: _____



KLEINFELDER

An employee owned company

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: June 25, 2007
File: _____
Copies: _____

Subject: BRC Aquifer Testing: Flexible and Rigid Wall Testing

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
 ☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-6@35-36.5'	06/21/07	29451	06/25/07
DBMW-6@50-51.5'	06/21/07	29451	06/25/07
DBMW-7@70-71.5'	06/23/07	29452	06/25/07
DBMW-7@60-61.5'	06/22/07	29451	06/25/07
DBMW-8@62.5-64'	06/24/07	29453	06/25/07
DBMW-8@70-71.5'	06/24/07	29453	06/25/07

If you have any questions please don't hesitate to call.

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-7@59-59.5'; S-29451 @ 55.0 - 60.0'

June 22, 2007

Sandy Silt (ML)

Specific Gravity = 2.69

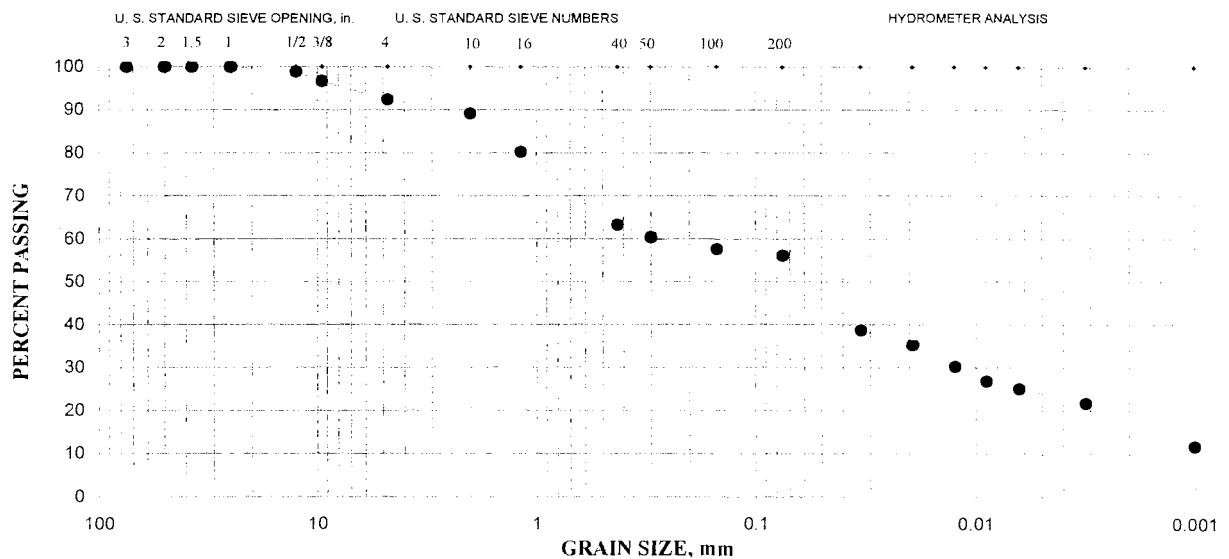
I.L. = ; PL = ; PI =

Gravel = 8%; Sand = 36%; Silt = 34%; Clay = 22%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	1	99
3/8" (9.5-mm)	3	97
#4 (4.75-mm)	8	92
#10 (2.00-mm)	11	89
#16 (1.18-mm)	20	80
#40 (425- μ m)	37	63
#50 (300- μ m)	40	60
#100 (150- μ m)	42	58
#200 (75- μ m)	44	56

Hydrometer Analysis

33- μ m	39
19- μ m	35
12- μ m	30
9- μ m	27
6- μ m	25
3.1- μ m	22
Colloids (<1- μ m)	12



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29451
Project =>	BRC AQUIFER TESTING	Date Sampled =>	06/22/07
Client =>	BRC	Date Received =>	06/25/07
Phase =>	12	Sampled By =>	Doug Davis
Sample Location =>	DBMW-7	Tested By =>	JLW
	59 - 59.5'	Reviewed By =>	JH

Pan Label =>	oly	
Tare Weight of Pan =>	252.3	A
Wet Wt. of Sample & Tare =>	923.67	B
Dry Wt. of Sample & Tare =>	742.56	C
Weight of Moisture (B-C) =>	181.1	D
Dry Wt. of Sample (C-A) =>	490.26	E
Percent Moisture (D/E)*100 =>	36.9	F

Sieve Retaining More Than About	Recommended Minimum Mass
10% of Sample	of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29451
 BORING: DBMW-7
 DEPTH: 59 - 59.5'
 DATE: 06/27/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	W
Mass of Pycnometer, Mf =>	169.33
Mass of Pycnometer & Water, Ma =>	667.7
Temperature of Water when Ma above was Taken, Ta =>	19.2
Mass of Speciman & Pycnometer =>	217.34
Mass of Pycnometer, Mf =>	169.33
Mass of Oven-Dry Specimen, Mo =>	48
Mass of Pycnometer, Soil & Water, Mb =>	697.84
Temperature of Water when Mb Above was Taken, Tb =>	19.2

Prodedure

Record the mass of a clean dry pycnometer, Mf
 Record the mass of the pyc. and distilled water at calibration mark, Ma
 Record the temperature of the water to the nearest .5° C, Ta
 Record Mass of Pyc & Water at Calibration Mark, Ma

Water Density at Ta	0.99837
Water Density at Tb	0.99837
K Factor at Tb	1.00016
Ma at Tb	169.33
Sp Gr at Tb	2.687569989
Sp Gr at 20 C	2.688
SPECIFIC GRAVITY AT 20 C	2.688

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14487(a)

DATE: June 30, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29451

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29451	DBMW-7	59.0-59.5	1.60%	7.89

Robert L. Summers

LABORATORY MANAGER

By: Doug Davis

Date Due:

29452

LABORATORY WORK ORDER



KLEINFELDER

Project No: 83173 Phase: 12
 Project Name: BRC A2.0.000 707 / NE WILLS
 Client Name: BRC
 Client Ref./P.O.#: _____
 Special Instructions: _____

Sample Number: DBMW-7 65-70
" 70-71.5
29452

SAMPLE STATUS
☐ Requested Test
☒ Test in Progress
☒ Test Completed

Date Sampled: 6-23-07
 Date Received: 6/23/07
 Date Needed: ASAP
 Date Completed: _____
 Verified By: _____

ASPHALT TESTING				
Usage	Qty.	99#	Status	
C123 Li Wt Pieces/Agg		990715		
C127 Absorption/Gravity	1	990702 990307		
CAL 205 Crushed Part		990712		
CAL 227 Cleanness TST		990711		
Clay Lumps/Friabl Part C-142		990714		
D2726 Weight/Absorption Core		991110		
Extract Bitumin D1856, 2172.310		991102		
Flat/Elong Part/Sieve 119, 120		990713		
Hveem Stability/Set of 3		991147		
Ignition Oven Calibration		996156		
Injurious Organic Matter C-40		990701		
LA Rattler CAL131		990706		
Lottman Test		991121		
Marshall Stab/Flow D-1599 (Set of 3)/Lab		991108		
Max Theoretical Specific Gravity D-2041		991112		
Methylene Blue Test		990132		
Microwave Asphalt Moist Content		996137		
Oil Content By Ignition Oven		996153		
Sand Equivalent C217		990308		
Specific Gravity C127/8 D854		990211		
Stabil Test/Premix Sample CAL 366		991104		
Unit Weight C29		990704		

CONCRETE & MASONRY TESTING				
Usage	Qty.	99#	Status	
C942 Grout Strength (cylinder/prism strength)		990119		
Compressive Test 12x8x16 Prisms (12" width)		991005		
Compressive Test 8x8x16 Prisms (8" width)		991003		
Compressive Test/Cored Spec		990809		
Concrete Compressive Test		990803		
Drying Shrinkage (Set OF 3) C-157, CAL-530		990811		
Flex and Strength/Concrete Beam		990806		
Mortar Strength C-109		990118		

SOILS TESTING				
Usage	Qty.	99#	Status	
ASTM D1557 6" Method B, C and D		990104		
CBR 100% Compaction D1883, T180		990209		
Check Point		990106		
Collapse Potential		990614		
Consolidation W/O time Rate/6 LD D2435	1	990613	X	
Correct Oversize Material in Sample CAL301		990203		
Direct Shear 1 Point		990608		
Direct Shear 3 Point		990609		
Harvard Miniature		992191		
Hydrometer Only	1	990305	X	
Moisture Determination Only	1	990317	X	
Moisture Determination/Unit Weight	1	990316	X	
Plasticity Index		990310		
Resistivity Analysis		990318		
R-Value/Untreated Material/Field Sample CAL 301		990201		
Sample Prep Materials		992508		
Sieve Analysis Wash #200 C117		990304		
Sieve Analysis/Course & Fine	1	990301	X	
Sulfate Sound (5) Sieve SZ C88		990708		
Swell Test FHA Specification (60 psi)		990312		
Unconfined Comp/Inc Moist D2166		990601		

MISC. OTHER				
Usage	Qty.	99#	Status	
Chloride Analysis		996020		
Corrosivity Analysis		991508		
Corrosivity, Resistivity, Sodium Sulfate, Solubility, p11*		990324		
pH Test		990319		
Sulfate Analysis		992090		
Unit Weight Fireproofing		991314		

Source: Soil Balm
 Supplier: DBMW-7
 Sample Location: Soil Davis
 Type of Material: Soil Davis
 Sampled by: G. C. Davis
 Project Manager: G. C. Davis

FOR ACCOUNTING USE ONLY
 Entered By: _____ Date Entered: _____

**KLEINFELDER***An employee owned company*

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: June 25, 2007
File: _____
Copies: _____

Subject: BRC Aquifer Testing: Flexible and Rigid Wall Testing

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-6@35-36.5'	06/21/07	29451	06/25/07
DBMW-6@50-51.5'	06/21/07	29451	06/25/07
DBMW-7@70-71.5'	06/23/07	29452	06/25/07
DBMW-7@60-61.5'	06/22/07	29451	06/25/07
DBMW-8@62.5-64'	06/24/07	29453	06/25/07
DBMW-8@70-71.5'	06/24/07	29453	06/25/07

If you have any questions please don't hesitate to call.

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14487(i)

DATE: June 30, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29452

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29452	DBMW-7	67.5-68.0	3.10%	8.10

Robert L. Summers

LABORATORY MANAGER

Moisture Density							
Project Name	BRC AQUIFER TESTING				Date	06/25/07	
Project Number	83173	Phase No.	12	Tested By	JLW	Checked By	JH
Lab Number	29452						
Boring Number	DBMW-7						
Sample Depth	67.5 - 68'						
Height (inches)	2.9						
Diameter (inches)	5.06						
Volume	0.0337						
Wt. of Sample At Field Moisture	1703.15						
Wet Density (pcf)	111.4						
Dry Density (pcf)	83.7						
Container No.	KL						
Wt. of Wet Sample Plus Tare	734.88						
Wt. of Dry Sample Plus Tare	649.73						
Tare (g)	392.66						
Dry Wt. Of Sample (g)	257.07						
Moisture Content, %	33.1%						

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29452
Project =>	BRC AQUIFER TESTING	Date Sampled =>	06/23/07
Client =>	BRC	Date Received =>	06/25/07
Phase =>	12	Sampled By =>	Doug Davis
Sample Location =>	DBMW-7	Tested By =>	JLW
	67.5 - 68'	Reviewed By =>	JH

Pan Label =>	kl	
Tare Weight of Pan =>	392.66	A
Wet Wt. of Sample & Tare =>	734.88	B
Dry Wt. of Sample & Tare =>	649.73	C
Weight of Moisture (B-C) =>	85.2	D
Dry Wt. of Sample (C-A) =>	257.07	E
Percent Moisture (D/E)*100 =>	33.1	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29451
 BORING: DBMW-7
 DEPTH: 67.5 - 68
 DATE: 06/28/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Z
Mass of Pycnometer, Mf =>	220.94
Mass of Pycnometer & Water, Ma =>	719.4
Temperature of Water when Ma above was Taken, Ta =>	20.4
Mass of Speciman & Pycnometer =>	265.35
Mass of Pycnometer, Mf =>	220.93
Mass of Oven-Dry Specimen, Mo =>	44.42
Mass of Pycnometer, Soil & Water, Mb =>	747.95
Temperature of Water when Mb Above was Taken, Tb =>	20.3

Prodedure

Record the mass of a clean dry pycnometer, Mf
 Record the mass of the pyc. and distilled water at calibration mark, Ma
 Record the temperature of the water to the nearest .5° C, Ta
 Record Mass of Pyc & Water at Calibration Mark, Ma

Water Density at Ta	0.99812
Water Density at Tb	0.99814
K Factor at Tb	0.99994

Ma at Tb	220.9499692
Sp Gr at Tb	2.798991808
Sp Gr at 20 C	2.798823869

SPECIFIC GRAVITY AT 20 C	2.798823869
--------------------------	-------------

One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

Project No.: 83173-12

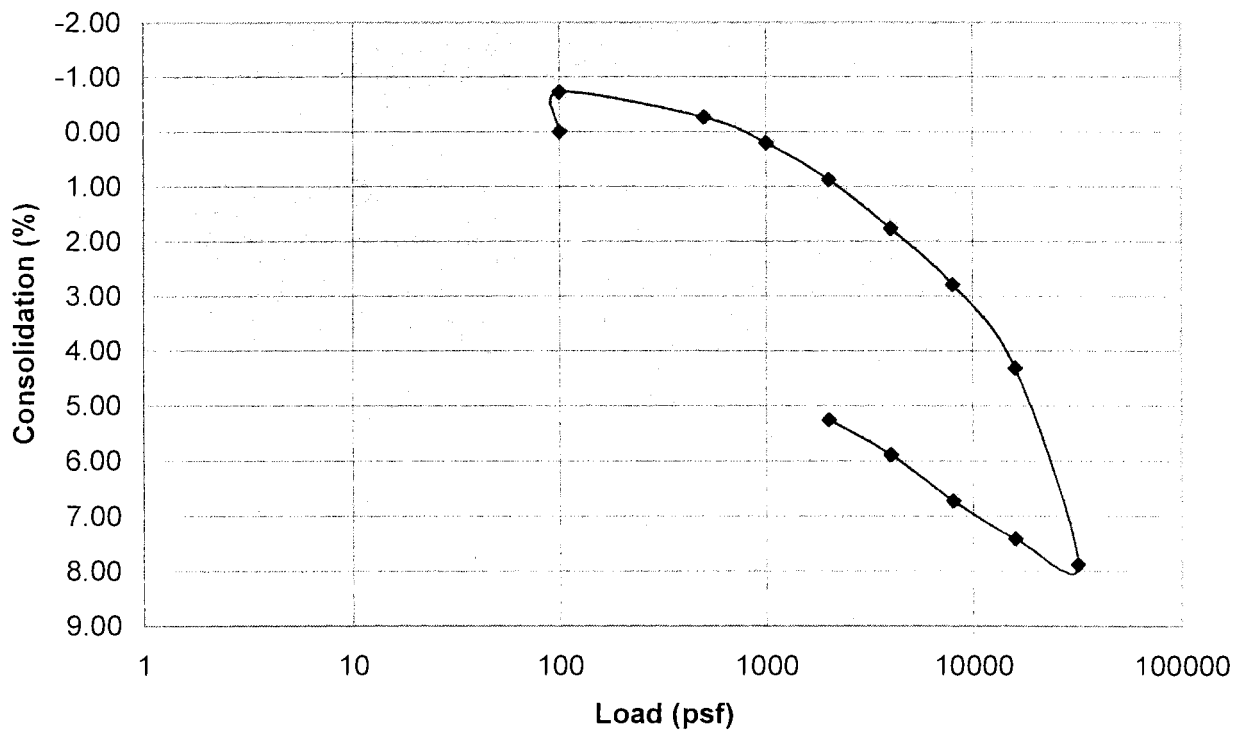
Report Date: 07/05/07

Sample No.: 29452
Sample Depth (ft.): DBMW-7 @ 67.5 - 68'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	0.00
100	-0.72
500	-0.26
1000	0.21
2000	0.88
4000	1.77
8000	2.79
16000	4.31
32000	7.88
16000	7.41
8000	6.72
4000	5.89
2000	5.26

DBMW-7 @ 67.5 - 68'



PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-7@67.5-68'; S-29452 @ 65.0 - 70.0'

June 23, 2007

Silt with Gravel (ML)

Specific Gravity = 2.80

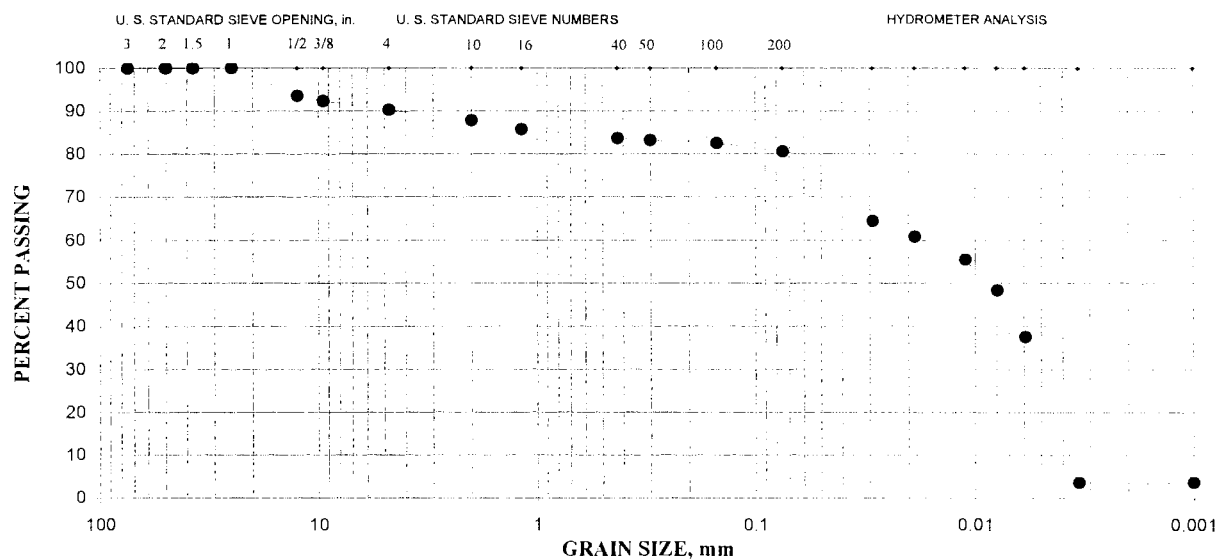
LL = ; PL = ; PI =

Gravel = 10%; Sand = 9%; Silt = 77%; Clay = 4%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	6	94
3/8" (9.5-mm)	8	92
#4 (4.75-mm)	10	90
#10 (2.00-mm)	12	88
#16 (1.18-mm)	14	86
#40 (425-μm)	16	84
#50 (300-μm)	17	83
#100 (150-μm)	17	83
#200 (75-μm)	19	81

Hydrometer Analysis

29-μm	64
19-μm	61
11-μm	55
8-μm	48
6-μm	38
3.4-μm	4
Colloids (<1-μm)	4



By: Doug Davis

Date Due:

29453

LABORATORY WORK ORDER



Project No: E3173 Phase: 12
 Project Name: BRC AQUIFER TEST/NE WELLS
 Client Name: BRC
 Client Ref./P.O.#: _____
 Special Instructions: _____

Sample Number: 29453

SAMPLE STATUS

- ☒ Requested Test
☒ Test in Progress
☒ Test Completed

Date Sampled: 6-24-07
 Date Received: 6/24/07
 Date Needed: ASAP
 Date Completed: 7/2/07
 Verified By: CPA

ASPHALT TESTING

Usage	Qty.	99#	Status
C123 Li Wt Pieces/Agg		990715	
C127 Absorption/Gravity	<u>2</u>	990712 <u>990307</u>	
CAL 205 Crushed Part		990712	
CAL 227 Cleaness TST		990711	
Clay Lumps/Friabl Part C-142		990714	
D2726 Weight/Absorption Core		991110	
Extract Bitumin D1856, 2172.310		991102	
Flat/Elong Part/Sieve 119, 120		990713	
Hveem Stability/Set of 3		991147	
Ignition Oven Calibration		996156	
Injurious Organic Matter C-40		990701	
LA Rattler CAL131		990706	
Lottman Test		991121	
Marshall Stab/Flow D-1599 (Set of 3)/Lab		991108	
Max Theoretical Specific Gravity D-2041		991112	
Methylene Blue Test		990132	
Microwave Asphalt Moist Content		996137	
Oil Content By Ignition Oven		996153	
Sand Equivalent C217		990308	
Specific Gravity C127/8 D854		990211	
Stabil Test/Premix Sample CAL 366		991104	
Unit Weight C29		990704	

MISC. OTHER

Usage	Qty	99#	Status
Chloride Analysis		996020	
Corrosivity Analysis		991508	
Corrosivity, Resistivity, Sodium Sulfate, Solubility, p11'		990324	
pH Test		990319	
Sulfate Analysis		992090	
Unit Weight Fireproofing		991314	

CONCRETE & MASONRY TESTING

Usage	Qty.	99#	Status
C942 Grout Strength (cylinder/prism strength)		990119	
Compressive Test 12x8x16 Prisms (12" width)		991005	
Compressive Test 8x8x16 Prisms (8" width)		991003	
Compressive Test/Cored Spec		990809	
Concrete Compressive Test		990803	
Drying Shrinkage (Set OF 3) C-157, CAL-530		990811	
Flex and Strength/Concrete Beam		990806	
Mortar Strength C-109		990118	

SOILS TESTING

Usage	Qty.	99#	Status
ASTM D1557 6" Method B, C and D		990104	
CBR 100% Compaction D1883, T180		990209	
Check Point		990106	
Collapse Potential		990614	
Consolidation W/O time Rate/6 LD D2435		990613	
Correct Oversize Material in Sample CAL301		990203	
Direct Shear 1 Point		990608	
Direct Shear 3 Point		990609	
Harvard Miniature		992191	
Hydrometer Only	<u>2</u>	990305	<u>XX</u>
Moisture Determination Only	<u>2</u>	990317	<u>XX</u>
Moisture Determination/Unit Weight		990316	
Plasticity Index		990310	
Resistivity Analysis		990318	
R-Value/Untreated Material/Field Sample CAL 301		990201	
Sample Prep Materials		992508	
Sieve Analysis Wash #200 C117		990304	
Sieve Analysis/Course & Fine	<u>2</u>	990301	<u>X</u>
Sulfate Sound (5) Sieve SZ C88		990708	
Swell Test FHA Specification (60 psi)		990312	
Unconfined Comp./Inc Moist D2166		990601	

CCPW ☒ ASTM ☒ Other ☐
 LWD ☐ AASHTO ☐ NGOT
 CSD ☐ UBC ☐

Source: San Bruno
 Supplier: Travis - B
 Sample Location: San Bruno
 Type of Material: Gravel
 Sampled by: G. Carlson / G. Williams
 Project Manager: _____



KLEINFELDER

An employee owned company

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: June 25, 2007
File: _____
Copies: _____

Subject: BRC Aquifer Testing: Flexible and Rigid Wall Testing

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-6@35-36.5'	06/21/07	29451	06/25/07
DBMW-6@50-51.5'	06/21/07	29451	06/25/07
DBMW-7@70-71.5'	06/23/07	29452	06/25/07
DBMW-7@60-61.5'	06/22/07	29451	06/25/07
DBMW-8@62.5-64'	06/24/07	29453	06/25/07
DBMW-8@70-71.5'	06/24/07	29453	06/25/07

If you have any questions please don't hesitate to call.

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14482(h)

DATE: June 28, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29453

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29453	DBMW-8	56.0-56.5	2.50%	8.08
29453	DBMW-8	68.0-68.5	10.80%	8.17

A handwritten signature in black ink, reading "Robert L. Seaver".

LABORATORY MANAGER

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29453
Project =>	BRC AQUIFER TESTING	Date Sampled =>	06/24/07
Client =>	BRC	Date Received =>	06/25/07
Phase =>	12	Sampled By =>	Doug Davis
Sample Location =>	DBMW-8	Tested By =>	JLW
	56 - 56.5	Reviewed By =>	JH

Pan Label =>	kl	
Tare Weight of Pan =>	392.66	A
Wet Wt. of Sample & Tare =>	1200.16	B
Dry Wt. of Sample & Tare =>	1043.49	C
Weight of Moisture (B-C) =>	156.7	D
Dry Wt. of Sample (C-A) =>	650.83	E
Percent Moisture (D/E)*100 =>	24.1	F

Sieve Retaining More Than About	Recommended Minimum Mass
10% of Sample	of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29453
 BORING: DBMW-8
 DEPTH: 56 - 56.5'
 DATE: 06/27/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Y
Mass of Pycnometer, Mf =>	224.41
Mass of Pycnometer & Water, Ma =>	722.89
Temperature of Water when Ma above was Taken, Ta =>	20.4
Mass of Speciman & Pycnometer =>	275.76
Mass of Pycnometer, Mf =>	224.38
Mass of Oven-Dry Specimen, Mo =>	51.38
Mass of Pycnometer, Soil & Water, Mb =>	754.2
Temperature of Water when Mb Above was Taken, Tb =>	19.5

Prodedure

Record the mass of a clean dry pycnometer, Mf
 Record the mass of the pyc. and distilled water at calibration mark, Ma
 Record the temperature of the water to the nearest .5° C, Ta
 Record Mass of Pyc & Water at Calibration Mark, Ma

Water Density at Ta	0.99812
Water Density at Tb	0.99831
K Factor at Tb	1.0001

Ma at Tb	224.5047112
Sp Gr at Tb	2.56003986
Sp Gr at 20 C	2.560295864

SPECIFIC GRAVITY AT 20 C	2.560295864
--------------------------	-------------

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-8@56-56.5'; S-29453 @ 55.0 - 60.0'

June 24, 2007

Silt with Gravel (ML)

Specific Gravity = 2.56

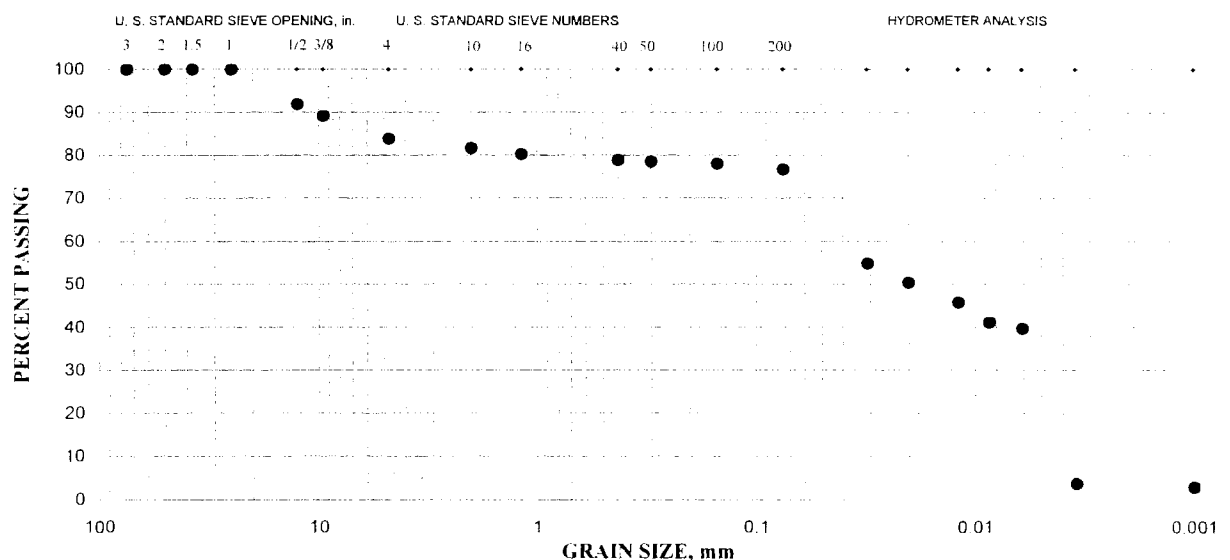
LL = ; PL = ; PI =

Gravel = 16%; Sand = 7%; Silt = 73%; Clay = 4%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	8	92
3/8" (9.5-mm)	11	89
#4 (4.75-mm)	16	84
#10 (2.00-mm)	18	82
#16 (1.18-mm)	20	80
#40 (425-μm)	21	79
#50 (300-μm)	21	79
#100 (150-μm)	22	78
#200 (75-μm)	23	77

Hydrometer Analysis

31-μm	55
20-μm	50
12-μm	46
9-μm	41
6-μm	40
3.5-μm	4
Colloids (<1-μm)	3



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29453
Project =>	BRC AQUIFER TESTING	Date Sampled =>	06/24/07
Client =>	BRC	Date Received =>	06/25/07
Phase =>	12	Sampled By =>	Doug Davis
Sample Location =>	DBMW-8	Tested By =>	JLW
	68 - 68.5'	Reviewed By =>	JH

Pan Label =>	KOHEN	
Tare Weight of Pan =>	252.08	A
Wet Wt. of Sample & Tare =>	997.47	B
Dry Wt. of Sample & Tare =>	888.45	C
Weight of Moisture (B-C) =>	109.0	D
Dry Wt. of Sample (C-A) =>	636.37	E
Percent Moisture (D/E)*100 =>	17.1	F

Sieve Retaining More Than About	Recommended Minimum Mass
10% of Sample	of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29453
 BORING: DBMW-8
 DEPTH: 68 - 68.5'
 DATE: 06/28/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	x
Mass of Pycnometer, Mf =>	220.89
Mass of Pycnometer & Water, Ma =>	719.58
Temperature of Water when Ma above was Taken, Ta =>	19.4
Mass of Speciman & Pycnometer =>	265.75
Mass of Pycnometer, Mf =>	220.87
Mass of Oven-Dry Specimen, Mo =>	44.88
Mass of Pycnometer, Soil & Water, Mb =>	749.31
Temperature of Water when Mb Above was Taken, Tb =>	19.2

Prodedure

Record the mass of a clean dry pycnometer, Mf
 Record the mass of the pyc. and distilled water at calibration mark, Ma
 Record the temperature of the water to the nearest .5° C, Ta
 Record Mass of Pyc & Water at Calibration Mark, Ma

Water Density at Ta	0.99812
Water Density at Tb	0.99816
K Factor at Tb	0.99996

Ma at Tb	220.9099476
Sp Gr at Tb	2.962376238
Sp Gr at 20 C	2.962257743

SPECIFIC GRAVITY AT 20 C	2.962257743
--------------------------	-------------

ASTM D 422-02

June 24, 2007

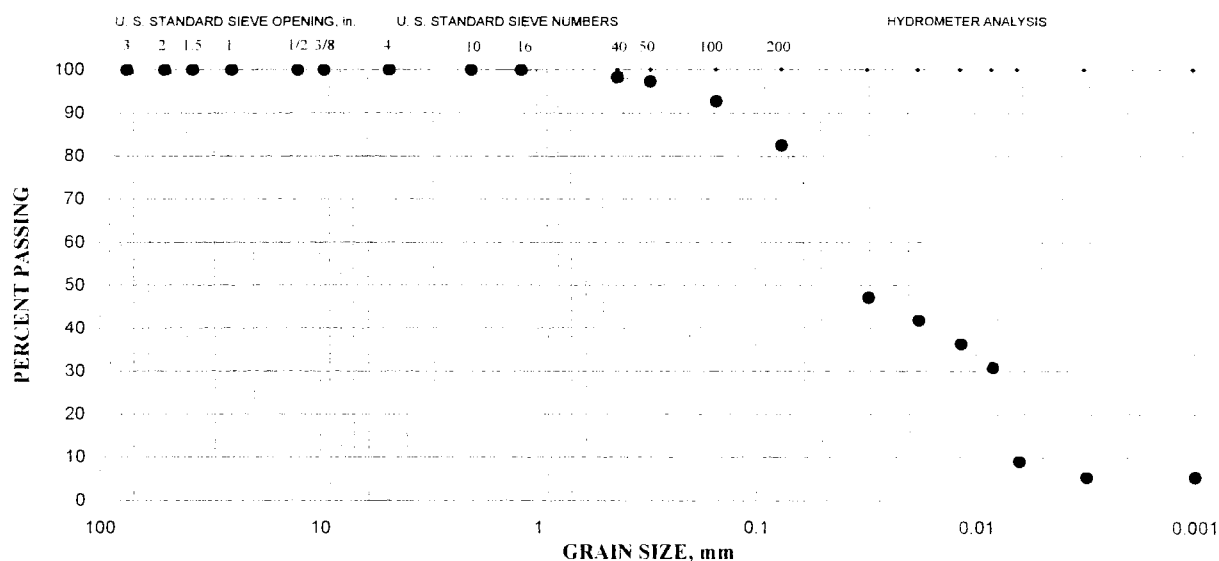
Specific Gravity = 2.96

Gravel = 0%; Sand = 17%; Silt = 78%; Clay = 5%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425-μm)	2	98
#50 (300-μm)	3	97
#100 (150-μm)	7	93
#200 (75-μm)	17	83

Hydrometer Analysis

31-μm	47
18-μm	42
12-μm	36
8-μm	31
6-μm	9
3.2-μm	5
Colloids (<1-μm)	5



By: Doug Davis

Date Due:

LABORATORY NUMBER: 29470

29470

LABORATORY WORK ORDER



Project No: 83173 Phase: 12
 Project Name: BRC ADJ. FORT 200 / NE WILKS
 Client Name: BRC
 Client Ref./P.O.#: _____
 Special Instructions: _____

Sample Number: DBMW-9 60-65
" 65-66.5
29470

SAMPLE STATUS
☒ Requested Test
☒ Test in Progress
☒ Test Completed

Date Sampled: 06/25/07
 Date Received: 6/25/07
 Date Needed: ASAP
 Date Completed: 7/2/07
 Verified By: [Signature]

ASPHALT TESTING				
Usage	Qty.	99#	Status	
C123 Lt Wt Pieces/Agg		990715		
C127 Absorption/Gravity	<u>2</u>	<u>990702</u>	<u>990307</u>	
CAL 205 Crushed Part		990712		
CAL 227 Cleaness TST		990711		
Clay Lumps/Friabl Part C-142		990714		
D2726 Weight/Absorption Core		991110		
Extract Bitumin D1856, 2172.310		991102		
Flat/Elong Part/Sieve 119, 120		990713		
Hveem Stability/Set of 3		991147		
Ignition Oven Calibration		996156		
Injurious Organic Matter C-40		990701		
LA Rattler CAL131		990706		
Lottman Test		991121		
Marshall Stab/Flow D-1599 (Set of 3)/Lab		991108		
Max Theoretical Specific Gravity D-2041		991112		
Methylene Blue Test		990132		
Microwave Asphalt Moist Content		996137		
Oil Content By Ignition Oven		996153		
Sand Equivalent C217		990308		
Specific Gravity C127/8 D854		990211		
Stabil Test/Premix Sample CAL 366		991104		
Unit Weight C29		990704		

MISC. OTHER				
Usage	Qty.	99#	Status	
Chloride Analysis		996020		
Corrosivity Analysis		991508		
Corrosivity, Resistivity, Sodium Sulfate, Solubility, p11*		990324		
pH Test		990319		
Sulfate Analysis		992090		
Unit Weight Fireproofing		991314		

CONCRETE & MASONRY TESTING				
Usage	Qty.	99#	Status	
C942 Grout Strength (cylinder/prism strength)		990119		
Compressive Test 12x8x16 Prisms (12" width)		991005		
Compressive Test 8x8x16 Prisms (8" width)		991003		
Compressive Test/Cored Spec		990809		
Concrete Compressive Test		990803		
Drying Shrinkage (Set OF 3) C-157, CAL 530		990811		
Flex and Strength/Concrete Beam		990806		
Mortar Strength C-109		990118		

SOILS TESTING				
Usage	Qty.	99#	Status	
ASTM D1557 6" Method B, C and D		990104		
CBR 100% Compaction D1883, T180		990209		
Check Point		990106		
Collapse Potential		990614		
Consolidation W/O time Rate/6 LD D2435		990613		
Correct Oversize Material in Sample CAL301		990203		
Direct Shear 1 Point		990608		
Direct Shear 3 Point		990609		
Harvard Miniature		992191		
Hydrometer Only	<u>2</u>	<u>990305</u>	<u>X</u>	
Moisture Determination Only	<u>2</u>	<u>990317</u>	<u>X</u>	
Moisture Determination/Unit Weight		990316		
Plasticity Index		990310		
Resistivity Analysis		990318		
R-Value/Untreated Material/Field Sample CAL 301		990201		
Sample Prep Materials		992508		
Sieve Analysis Wash #200 C117		990304		
Sieve Analysis/Course & Fine	<u>2</u>	<u>990301</u>	<u>X</u>	
Sulfate Sound (5) Sieve SZ C88		990708		
Swell Test FHA Specification (60 psi)		990312		
Unconfined Comp./Inc Moist D2166		990601		

Source: SOIL BORING
 Supplier: BOAL
 Sample Location: DBMW-9
 Type of Material: SOIL
 Sampled by: DAVIS
 Project Manager: G. GARDNER / G. WILKINSON

FOR ACCOUNTING USE ONLY
 Entered By: _____ Date Entered: _____

☐ CPW
☒ ASTM
☐ Other
☐ LIND
☐ AASHTO
☐ CSD
☐ UBC
☐ NDOT



KLEINFELDER

An employee owned company

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: June 26, 2007
File: _____
Copies: _____

Subject: **BRC Aquifer Testing: Flexible and Rigid Wall Testing**

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBAW-9@65-66.5'	06/25/07	29470	06/26/07
DBAW-9@75-76.5'	06/25/07	29470	06/26/07

If you have any questions please don't hesitate to call.

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-9@61-61.5'; S-29470 @ 60.0 - 65.0'

June 28, 2007

Silt with Sand (ML)

Specific Gravity = 2.93

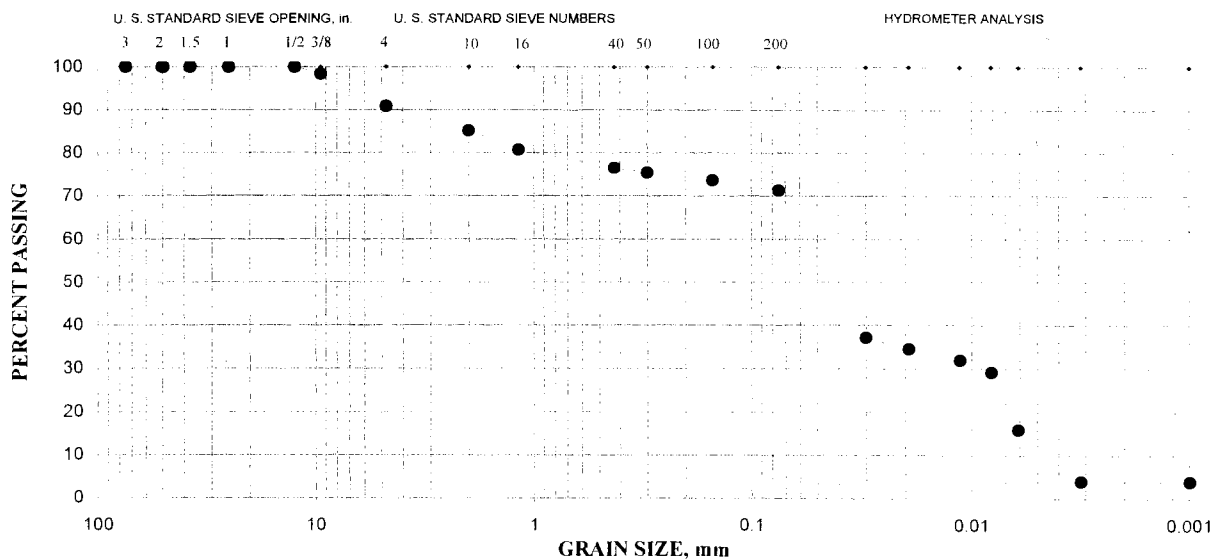
LL = ; PL = ; PI =

Gravel = 9%; Sand = 20%; Silt = 67%; Clay = 4%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	2	98
#4 (4.75-mm)	9	91
#10 (2.00-mm)	15	85
#16 (1.18-mm)	19	81
#40 (425- μ m)	23	77
#50 (300- μ m)	25	75
#100 (150- μ m)	26	74
#200 (75- μ m)	29	71

Hydrometer Analysis

30- μ m	37
19- μ m	35
11- μ m	32
8- μ m	29
6- μ m	16
3.2- μ m	4
Colloids (<1- μ m)	4



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29470
Project =>	BRC AQUIFER TESTING	Date Sampled =>	06/25/07
Client =>	BRC	Date Received =>	06/26/07
Phase =>	12	Sampled By =>	Doug Davis
Sample Location =>	DBMW-9	Tested By =>	JLW
	60 - 65'	Reviewed By =>	JH

Pan Label =>	#2	
Tare Weight of Pan =>	387.52	A
Wet Wt. of Sample & Tare =>	966.51	B
Dry Wt. of Sample & Tare =>	843.25	C
Weight of Moisture (B-C) =>	123.3	D
Dry Wt. of Sample (C-A) =>	455.73	E
Percent Moisture (D/E)*100 =>	27.0	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29470
 BORING: DBMW-9
 DEPTH: 60 - 65'
 DATE: 06/28/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	W
Mass of Pycnometer, Mf =>	169.33
Mass of Pycnometer & Water, Ma =>	667.7
Temperature of Water when Ma above was Taken, Ta =>	19.2
Mass of Speciman & Pycnometer =>	209.97
Mass of Pycnometer, Mf =>	169.38
Mass of Oven-Dry Specimen, Mo =>	40.59
Mass of Pycnometer, Soil & Water, Mb =>	693.81
Temperature of Water when Mb Above was Taken, Tb =>	19.3

Prodedure

Record the mass of a clean dry pycnometer, Mf
 Record the mass of the pyc. and distilled water at calibration mark, Ma
 Record the temperature of the water to the nearest .5° C, Ta
 Record Mass of Pyc & Water at Calibration Mark, Ma

Water Density at Ta	0.99837
Water Density at Tb	0.99747
K Factor at Tb	0.99926

Ma at Tb	168.881467
Sp Gr at Tb	2.803176796
Sp Gr at 20 C	2.801102445

SPECIFIC GRAVITY AT 20 C	2.801102445
--------------------------	-------------

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-9@70.5-71"; S-29470 @ 70.0 - 75.0'

June 28, 2007

Silt with Sand (ML)

Specific Gravity = 2.93

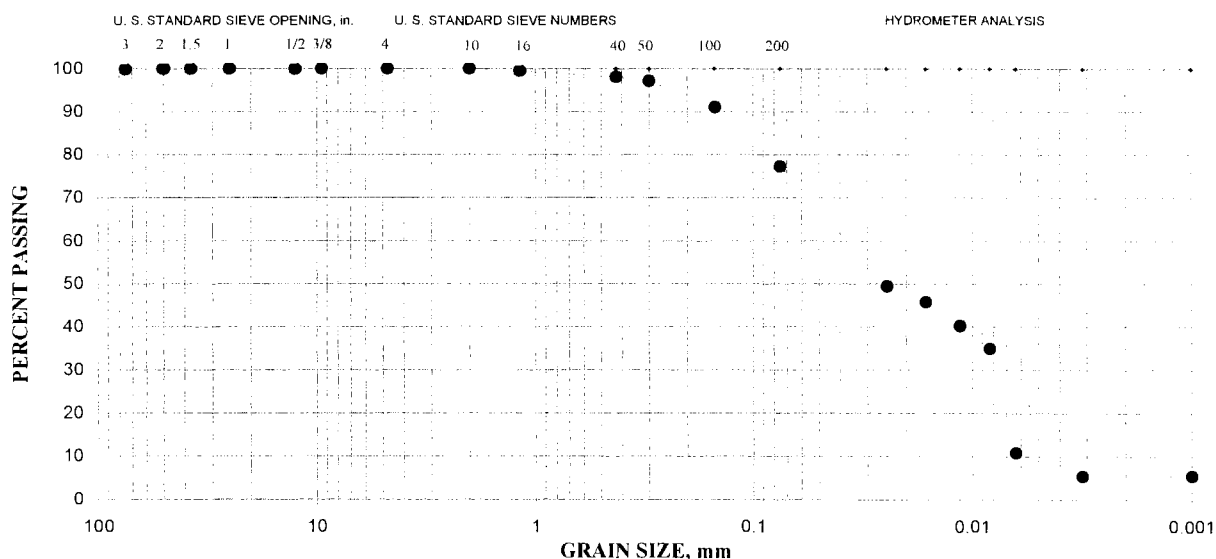
LL = ; PL = ; PI =

Gravel = 0%; Sand = 23%; Silt = 71%; Clay = 6%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	1	99
#40 (425-μm)	2	98
#50 (300-μm)	3	97
#100 (150-μm)	9	91
#200 (75-μm)	23	77

Hydrometer Analysis

24-μm	50
16-μm	46
11-μm	40
8-μm	35
6-μm	11
3.1-μm	6
Colloids (<1-μm)	6



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29470
Project =>	BRC AQUIFER TESTING	Date Sampled =>	06/25/07
Client =>	BRC	Date Received =>	06/26/07
Phase =>	12	Sampled By =>	Doug Davis
Sample Location =>	DBMW-9	Tested By =>	JLW
	70 - 71.5	Reviewed By =>	JH

Pan Label =>	ZONE	
Tare Weight of Pan =>	253.67	A
Wet Wt. of Sample & Tare =>	900.88	B
Dry Wt. of Sample & Tare =>	776.74	C
Weight of Moisture (B-C) =>	124.1	D
Dry Wt. of Sample (C-A) =>	523.07	E
Percent Moisture (D/E)*100 =>	23.7	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29470
 BORING: DBMW-9
 DEPTH: 70.5 - 71'
 DATE: 06/28/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Y
Mass of Pycnometer, Mf =>	224.4
Mass of Pycnometer & Water, Ma =>	722.89
Temperature of Water when Ma above was Taken, Ta =>	20.4
Mass of Speciman & Pycnometer =>	265.19
Mass of Pycnometer, Mf =>	224.4
Mass of Oven-Dry Specimen, Mo =>	40.79
Mass of Pycnometer, Soil & Water, Mb =>	749.74
Temperature of Water when Mb Above was Taken, Tb =>	19.5

Prodedure

Record the mass of a clean dry pycnometer, Mf
 Record the mass of the pyc. and distilled water at calibration mark, Ma
 Record the temperature of the water to the nearest .5° C, Ta
 Record Mass of Pyc & Water at Calibration Mark, Ma

Water Density at Ta	0.99812
Water Density at Tb	0.99831
K Factor at Tb	1.0001

Ma at Tb	224.4947131
Sp Gr at Tb	2.926111908
Sp Gr at 20 C	2.926404519

SPECIFIC GRAVITY AT 20 C	2.926404519
--------------------------	-------------

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14487(b)

DATE: June 30, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29470

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29470	DBMW-9	61.0-61.5	2.70%	8.00
29470	DBMW-9	70.5-71.0	7.00%	8.15

Robert L. Summers

LABORATORY MANAGER

By: Doug Davis

Date Due:

Soil Test Results														
Project: <i>60-61-5</i>														
Boring Number														
Depth														
Water Content (ASTM 2216)														
Dry Bulk Density (ASTM D2937)														
Consoilodation (ASTM D2435)														
Rigid Wall (ASTM D2434)														
<i>OUTSIDE SERVICE</i>														
Specific Gravity (ASTM D854)														
Specific Gravity (ASTM C127)														
Hydrometer (ASTM D422)														
Sieve Anysis (ASTM D422)														
Total Organic Carbon														
<i>OUTSIDE SERVICE (ATLAS)</i>														
pH														
<i>OUTSIDE SERVICE (ATLAS)</i>														
Remarks														
<i>Butted & concrete 7/12/07</i>														
<i>Shipped 6/27/07</i>														
<i>Removed 60-63 1/2 for testing</i>														

LABORATORY NUMBER:

29482

LABORATORY WORK ORDER



Project No: 83173 Phase: 12
 Project Name: BRL ADD. FOR TEST / NE WELLS
 Client Name: BRL
 Client Ref./P.O.#: _____
 Special Instructions: _____

Sample Number: DBMW-10 60-65
60-61.5
29482

SAMPLE STATUS
☒ Requested Test
☒ Test in Progress
☒ Test Completed

Date Sampled: 6-27-07
 Date Received: 6/27/07
 Date Needed: ASAP
 Date Completed: 7/12/07
 Verified By: OR

ASPHALT TESTING				
Usage	Qty.	99#	Status	
C123 Lt Wt Pieces/Agg		990715		
C127 Absorption/Gravity	<u>1</u>	990707 <u>990307</u>		
CAL 205 Crushed Part		990712		
CAL 227 Cleanness TST		990711		
Clay Lumps/Friabl Part C-142		990714		
D2726 Weight/Absorption Core		991110		
Extract Bitumin D1856, 2172.310		991102		
Flat/Elong Part/Sieve 119, 120		990713		
Hveem Stability/Set of 3		991147		
Ignition Oven Calibration		996156		
Injurious Organic Matter C-40		990701		
LA Rattler CAL131		990706		
Lottman Test		991121		
Marshall Stab/Flow D-1599 (Set of 3)/Lab		991108		
Max Theoretical Specific Gravity D-2041		991112		
Methylene Blue Test		990132		
Microwave Asphalt Moist Content		996137		
Oil Content By Ignition Oven		996153		
Sand Equivalent C217		990308		
Specific Gravity C127/8 D854		990211		
Stabil Test/Premix Sample CAL 366		991104		
Unit Weight C29		990704		

MISC. OTHER				
Usage	Qty.	99#	Status	
Chloride Analysis		996020		
Corrosivity Analysis		991508		
Corrosivity, Resistivity, Sodium Sulfate, Solubility, pH ⁶		990324		
pH Test <u>ORGANICS</u>	<u>1</u>	990314 <u>990314</u>		
Sulfate Analysis		992090		
Unit Weight Fireproofing		991314		

CONCRETE & MASONRY TESTING				
Usage	Qty.	99#	Status	
C942 Grout Strength (cylinder/prism strength)		990119		
Compressive Test 12x8x16 Prisms (12" width)		991005		
Compressive Test 8x8x16 Prisms (8" width)		991003		
Compressive Test/Cored Spec		990809		
Concrete Compressive Test		990803		
Drying Shrinkage (Set OF 3) C-157, CAL-530		990811		
Flex and Strength/Concrete Beam		990806		
Mortar Strength C-109		990118		

SOILS TESTING				
Usage	Qty.	99#	Status	
ASTM D1557 6" Method B, C and D		990104		
CBR 100% Compaction D1883, T180		990209		
Check Point		990106		
Collapse Potential		990614		
Consolidation W/O time Rate/6 LD D2435	<u>1</u>	990613	<u>X</u>	
Correct Oversize Material in Sample CAL301		990203		
Direct Shear 1 Point		990608		
Direct Shear 3 Point		990609		
Harvard Miniature		992191		
Hydrometer Only	<u>1</u>	990305	<u>X</u>	
Moisture Determination Only	<u>1</u>	990317	<u>X</u>	
Moisture Determination/Unit Weight	<u>1</u>	990316	<u>X</u>	
Plasticity Index		990310		
Resistivity Analysis		990318		
R-Value/Untreated Material/Field Sample CAL 301		990201		
Sample Prep Materials		992508		
Sieve Analysis Wash #200 C117		990304		
Sieve Analysis/Course & Fine	<u>1</u>	990301	<u>X</u>	
Sulfate Sound (5) Sieve SZ C88		990708		
Swell Test FHA Specification (60 psi)		990312		
Unconfined Comp/Inc Moist D2166		990601		

Source: SON BONNIE
 Supplier: BOAT
 Sample Location: DBMW-10
 Type of Material: SOIL
 Sampled by: DAVIS
 Project Manager: G. CARRILLO / C. WILSON

☐ CPW
☒ ASTM
☐ Other

☐ LWD
☐ CSD
☐ UBC

☐ NDOT
☐ AASHTO

FOR ACCOUNTING USE ONLY
 Entered By: _____ Date Entered: _____



KLEINFELDER

An employee owned company

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: June 27, 2007
File: _____
Copies: _____

Subject: BRC Aquifer Testing: Flexible and Rigid Wall Testing

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
 ☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-10@60-61.5'	06/27/07	29482	06/27/07

If you have any questions please don't hesitate to call.

Moisture Density							
Project Name	BRC AQUIFER TESTING				Date	06/28/07	
Project Number	83173	Phase No.	12	Tested By	JLW	Checked By	JH
Lab Number	29482						
Boring Number	DBMW-10						
Sample Depth	63-63.5'						
Height (inches)	1.67						
Diameter (inches)	5.12						
Volume	0.0199						
Wt. of Sample At Field Moisture	955.29						
Wet Density (pcf)	105.8						
Dry Density (pcf)	76.2						
Container No.	ZONE						
Wt. of Wet Sample Plus Tare	561.00						
Wt. of Dry Sample Plus Tare	474.99						
Tare (g)	253.72						
Dry Wt. Of Sample (g)	221.27						
Moisture Content, %	38.9%						

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29482
Project =>	BRC AQUIFER TESTING	Date Sampled =>	06/27/07
Client =>	BRC	Date Received =>	06/27/07
Phase =>	12	Sampled By =>	Doug Davis
Sample Location =>	DBMW-10	Tested By =>	JLW
	63 - 63.5'	Reviewed By =>	JH

Pan Label =>	ZONE	
Tare Weight of Pan =>	253.72	A
Wet Wt. of Sample & Tare =>	561	B
Dry Wt. of Sample & Tare =>	474.99	C
Weight of Moisture (B-C) =>	86.0	D
Dry Wt. of Sample (C-A) =>	221.27	E
Percent Moisture (D/E)*100 =>	38.9	F

Sieve Retaining More Than About Recommended Minimum Mass

10% of Sample	of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29482
 BORING: DBMW-10
 DEPTH: 63 - 63.5'
 DATE: 06/28/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Z
Mass of Pycnometer, Mf =>	220.94
Mass of Pycnometer & Water, Ma =>	719.1
Temperature of Water when Ma above was Taken, Ta =>	20.4
Mass of Speciman & Pycnometer =>	267.70
Mass of Pycnometer, Mf =>	220.93
Mass of Oven-Dry Specimen, Mo =>	46.77
Mass of Pycnometer, Soil & Water, Mb =>	748.19
Temperature of Water when Mb Above was Taken, Tb =>	19.9

Prodedure

Record the mass of a clean dry pycnometer, Mf
 Record the mass of the pyc. and distilled water at calibration mark, Ma
 Record the temperature of the water to the nearest .5° C, Ta
 Record Mass of Pyc & Water at Calibration Mark, Ma

Water Density at Ta	0.99812
Water Density at Tb	0.99823
K Factor at Tb	1.00002
Ma at Tb	220.9947976
Sp Gr at Tb	2.645361991
Sp Gr at 20 C	2.645414898
SPECIFIC GRAVITY AT 20 C	2.645414898

One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

Project No.: 83173-12

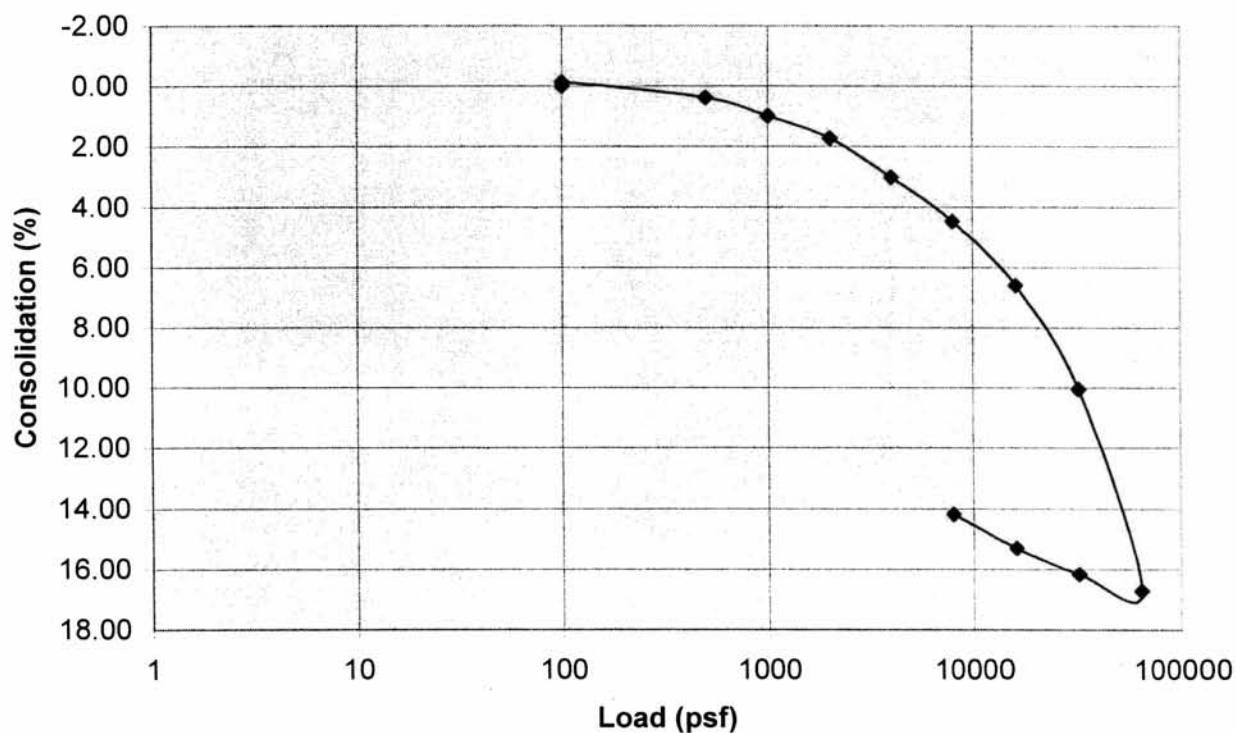
Report Date: 07/09/07

Sample No.: 29482
Sample Depth (ft.): DBMW-10 @ 63 - 63.5'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	0.00
100	-0.14
500	0.38
1000	0.99
2000	1.72
4000	3.01
8000	4.47
16000	6.58
32000	10.04
64000	16.71
32000	16.16
16000	15.30
8000	14.17

DBMW-10 @ 63 - 63.5'



Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14494(k)

DATE: July 3, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29482

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29482	DBMW-10	63.0-63.5	0.40%	8.52


LABORATORY MANAGER

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-10@63-63.5'; S-29482 @ 60.0 - 65.0'

June 27, 2007

Silt (ML)

Specific Gravity = 2.65

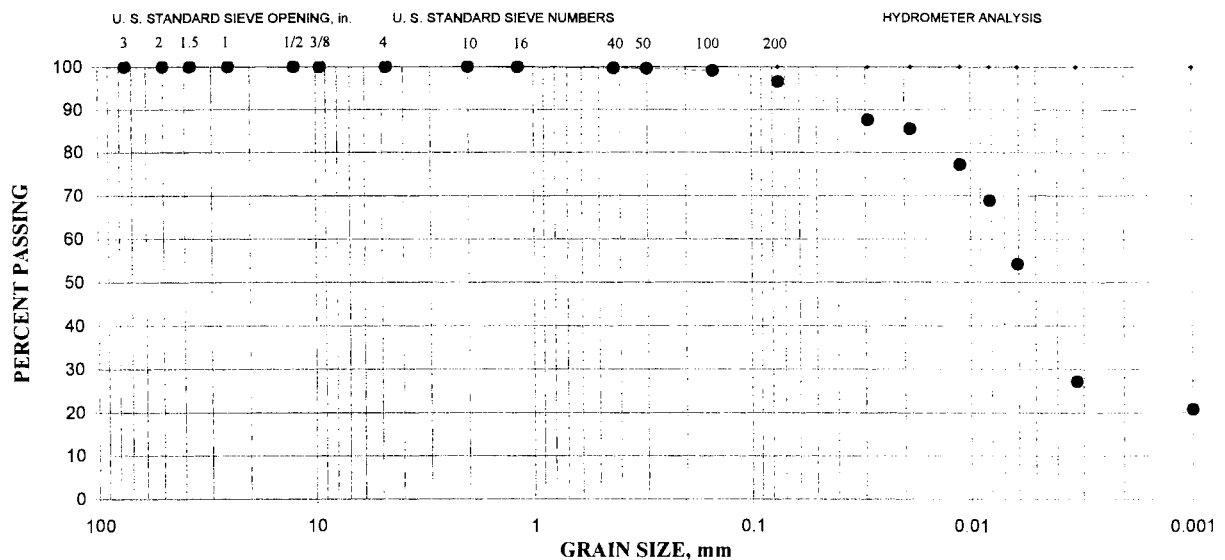
LL = ; PL = ; PI =

Gravel = 0%; Sand = 3%; Silt = 70%; Clay = 27%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425- μ m)	0	100
#50 (300- μ m)	0	100
#100 (150- μ m)	1	99
#200 (75- μ m)	3	97

Hydrometer Analysis

29- μ m	88
19- μ m	86
11- μ m	77
8- μ m	69
6- μ m	54
3.2- μ m	27
Colloids (<1- μ m)	21



By: Doug Davis

Date Due:

LABORATORY NUMBER:

29497

LABORATORY WORK ORDER



Project No: 83173 Phase: 12
 Project Name: BIRC Adu. for Test / NE walls
 Client Name: BRL
 Client Ref./P.O.#: _____
 Special Instructions: _____

Sample Number: DBMW-10 70-75
" 75-76.5
29494

SAMPLE STATUS

☐ Requested Test
☒ Test in Progress
☒ Test Completed

Date Sampled: 7-2-07
 Date Received: 7/03/07
 Date Needed: _____
 Date Completed: 7/19/07
 Verified By: _____

ASPHALT TESTING				
Usage	Qty.	99#	Status	
C123 Li Wt Pieces/Agg		990715		
C127 Absorption/Gravity	1	990709 <u>990307</u>		
CAL 205 Crushed Part		990712		
CAL 227 Cleanness TST		990711		
Clay Lumps/Friabl Part C-142		990714		
D2726 Weight/Absorption Core		991110		
Extract Bitumin D1856, 2172.310		991102		
Flat/Elong Part/Sieve 119, 120		990713		
Hveem Stability/Set of 3		991147		
Ignition Oven Calibration		996156		
Injurious Organic Matter C-40		990701		
LA Rattler CAL131		990706		
Lottman Test		991121		
Marshall Stab/Flow D-1599 (Set of 3)/Lab		991108		
Max Theoretical Specific Gravity D-2041		991112		
Methylene Blue Test		990132		
Microwave Asphalt Moist Content		996137		
Oil Content By Ignition Oven		996153		
Sand Equivalent C217		990308		
Specific Gravity C127/8 D854		990211		
Stabil Test/Premix Sample CAL 366		991104		
Unit Weight C29		990704		

MISC. OTHER				
Usage	Qty.	99#	Status	
Chloride Analysis		996020		
Corrosivity Analysis		991508		
Corrosivity, Resistivity, Sodium Sulfate, Solubility, pH ⁺	1	990319 <u>990319</u>		
pH Test		990319		
Sulfate Analysis		992090		
Unit Weight Fireproofing		991314		

CONCRETE & MASONRY TESTING				
Usage	Qty.	99#	Status	
C942 Grout Strength (cylinder/prism strength)		990119		
Compressive Test 12x8x16 Prisms (12" width)		991005		
Compressive Test 8x8x16 Prisms (8" width)		991003		
Compressive Test/Cored Spec		990809		
Concrete Compressive Test		990803		
Drying Shrinkage (Set OF 3) C-157, CAL-530		990811		
Flex and Strength/Concrete Beam		990806		
Mortar Strength C-109		990118		

SOILS TESTING				
Usage	Qty.	99#	Status	
ASTM D1557 6" Method B, C and D		990104		
CBR 100% Compaction D1883, T180		990209		
Check Point		990106		
Collapse Potential		990614		
Consolidation W/O time Rate/6 LD D2435	1	990613	X	
Correct Oversize Material in Sample CAL301		990203		
Direct Shear 1 Point		990608		
Direct Shear 3 Point		990609		
Harvard Miniature		992191		
Hydrometer Only	1	990305	X	
Moisture Determination Only	1	990317	X	
Moisture Determination/Unit Weight	1	990316	X	
Plasticity Index		990310		
Resistivity Analysis		990318		
R-Value/Untreated Material/Field Sample CAL 301		990201		
Sample Prep Materials		992508		
Sieve Analysis Wash #200 C117		990304		
Sieve Analysis/Course & Fine	1	990301	X	
Sulfate Sound (S) Sieve SZ C88		990708		
Swell Test FHA Specification (60 psi)		990312		
Unconfined Comp/Inc Moist D2166		990601		

Source: SOIL BORING
 Supplier: BIRCH
 Sample Location: DBMW-10
 Type of Material: SOIL
 Sampled by: DAVIS
 Project Manager: C. Carter / E. W. W. W.

FOR ACCOUNTING USE ONLY
 Date Entered: _____
 Entered By: _____



KLEINFELDER

An employee owned company

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: July 6, 2007
File: _____
Copies: _____

Subject: BRC Aquifer Testing: Flexible and Rigid Wall Testing

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-10@75-76.5'	07/02/07	29497	07/06/07

If you have any questions please don't hesitate to call.

One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

Project No.: 83173-12

07/05/07

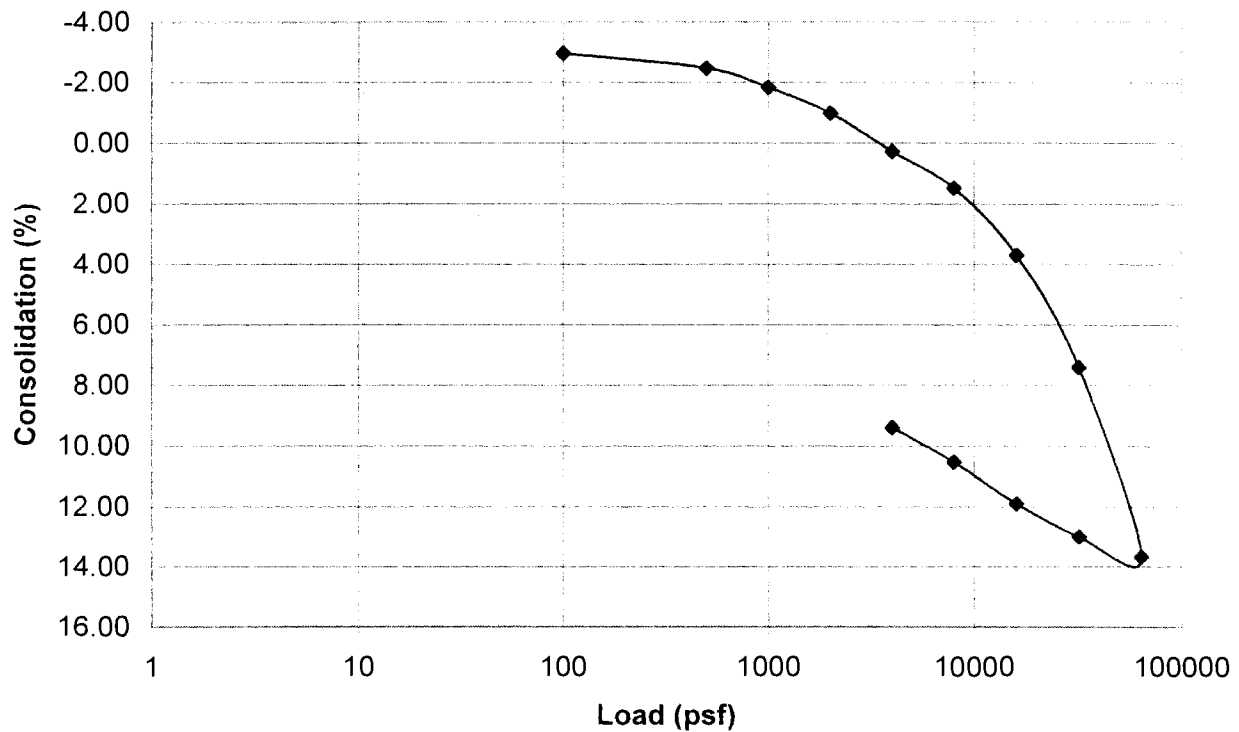
Sample No.: 29497

Tech.: jlw

Sample Depth (ft.): DBMW-10 @ 72 - 72.5'

Load (psf)	Consolidation (%)
100	0.00
100	-2.96
500	-2.47
1000	-1.83
2000	-0.99
4000	0.27
8000	1.48
16000	3.70
32000	7.40
64000	13.67
32000	13.00
16000	11.90
8000	10.52
4000	9.39

DBMW-10 @ 72 - 72.5'



Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119

(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14505(d)

DATE: July 9, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29497

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29497	DBMW-10	72.0-72.5	1.40%	9.86

Robert L. Summers

LABORATORY MANAGER

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29482
 BORING: DBMW-10
 DEPTH: 72 - 72.5'
 DATE: 06/28/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Y
Mass of Pycnometer, Mf =>	224.39
Mass of Pycnometer & Water, Ma =>	722.72
Temperature of Water when	
Ma above was Taken, Ta =>	19.2
Mass of Speciman & Pycnometer =>	269.28
Mass of Pycnometer, Mf =>	224.39
Mass of Oven-Dry Specimen, Mo =>	44.89
Mass of Pycnometer, Soil & Water, Mb =>	750.13
Temperature of Water when	
Mb Above was Taken, Tb =>	19.8

Prodedure

Record the mass of a clean dry pycnometer, Mf
 Record the mass of the pyc. and distilled water at calibration mark, Ma
 Record the temperature of the water to the nearest .5° C, Ta
 Record Mass of Pyc & Water at Calibration Mark, Ma

Water Density at Ta	0.99837
Water Density at Tb	0.99825
K Factor at Tb	1.00004

Ma at Tb	224.3302004
Sp Gr at Tb	2.568077803
Sp Gr at 20 C	2.568180526

SPECIFIC GRAVITY AT 20 C	2.568180526
--------------------------	-------------

Moisture Density							
Project Name	BRC AQUIFER TESTING				Date	06/28/07	
Project Number	83173	Phase No.	12	Tested By	JLW	Checked By	JH
Lab Number	29482						
Boring Number	DBMW-10	DBMW-10					
Sample Depth	63 - 63.5'	72 - 72.5'					
Height (inches)	1.67	1.39					
Diameter (inches)	5.12	5.07					
Volume	0.0199	0.0162					
Wt. of Sample At Field Moisture	955.29	757.38					
Wet Density (pcf)	105.8	103.1					
Dry Density (pcf)	76.2	74.4					
Container No.	ZONE	KOHEN					
Wt. of Wet Sample Plus Tare	561.00	485.76					
Wt. of Dry Sample Plus Tare	474.99	420.70					
Tare (g)	253.72	252.00					
Dry Wt. Of Sample (g)	221.27	168.70					
Moisture Content, %	38.9%	38.6%					

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29497
Project =>	BRC AQUIFER TESTING	Date Sampled =>	07/02/07
Client =>	BRC	Date Received =>	07/03/07
Phase =>	12	Sampled By =>	Doug Davis
Sample Location =>	DBMW-10	Tested By =>	JLW
	72 - 72.5'	Reviewed By =>	JH

Pan Label =>	ZONE	
Tare Weight of Pan =>	253.68	A
Wet Wt. of Sample & Tare =>	851.6	B
Dry Wt. of Sample & Tare =>	665.09	C
Weight of Moisture (B-C) =>	186.5	D
Dry Wt. of Sample (C-A) =>	411.41	E
Percent Moisture (D/E)*100 =>	45.3	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-10@72-72.5; S-29497 @ 70.0 - 75.0'

July 2, 2007

Silt (ML)

Specific Gravity = 2.76

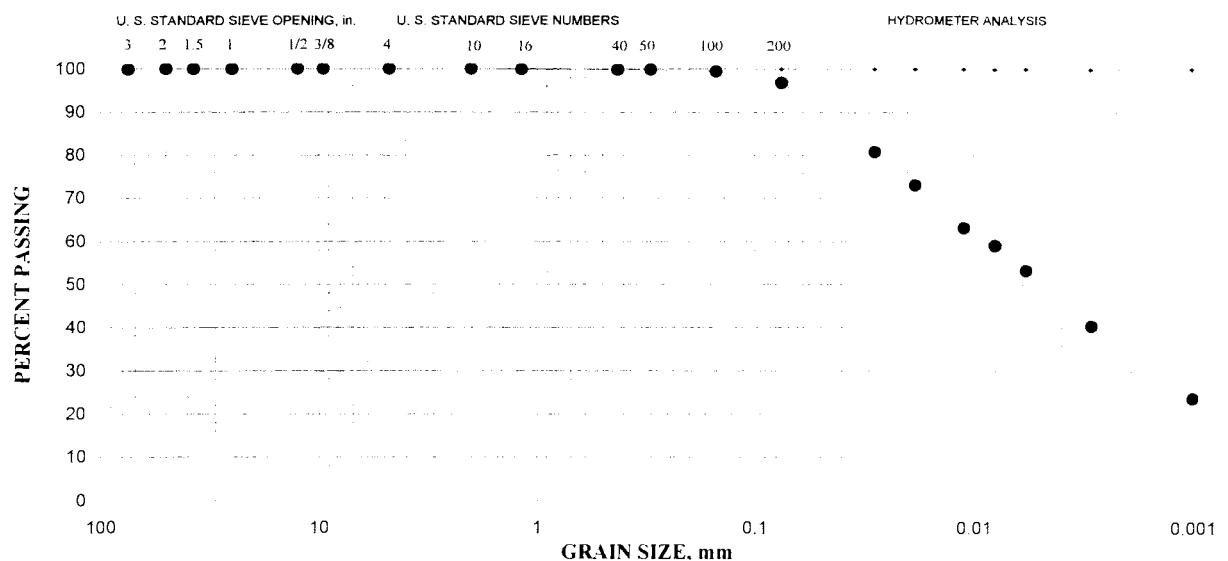
LL = ; PL = ; PI =

Gravel = 0%; Sand = 3%; Silt = 57%; Clay = 40%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425-μm)	0	100
#50 (300-μm)	0	100
#100 (150-μm)	1	99
#200 (75-μm)	3	97

Hydrometer Analysis

28-μm	81
18-μm	73
11-μm	63
8-μm	59
6-μm	53
2.9-μm	40
Colloids (<1-μm)	24



By: Doug Davis

Date Due:

29519

LABORATORY WORK ORDER



Project No: 83173 Phase: 12
 Project Name: BRC Add. for test / NO NOLS
 Client Name: BRC
 Client Ref./P.O.#: _____
 Special Instructions: _____

Sample Number: DBMw-11 SS-565 ☒ Requested Test
11 SS-60 ☒ Test in Progress
11 65-70 ☒ Test Completed
11 70-71.5
29519

Date Sampled: 7-6-07
 Date Received: 7/9/07
 Date Needed: _____
 Date Completed: 7/16/07
 Verified By: _____

ASPHALT TESTING				
Usage	Qty.	99#	Status	
C123 Lt Wt Pieces/Agg		990715		
C127 Absorption/Gravity	<u>2</u>	990702	<u>990307</u>	<u>C127/D854</u>
CAL 205 Crushed Part		990712		
CAL 227 Cleaness TST		990711		
Clay Lumps/Friabl Part C-142		990714		
D2726 Weight/Absorption Core		991110		
Extract Bitumin D1856, 2172.310		991102		
Flat/Elong Part/Sieve 119, 120		990713		
Hveem Stability/Set of 3		991147		
Ignition Oven Calibration		996156		
Injurious Organic Matter C-40		990701		
LA Rattler CAL131		990706		
Lottman Test		991121		
Marshall Slab/Flow D-1599 (Set of 3)/Lab		991108		
Max Theoretical Specific Gravity D-2041		991112		
Methylene Blue Test		990132		
Microwave Asphalt Moist Content		996137		
Oil Content By Ignition Oven		996153		
Sand Equivalent C217		990308		
Specific Gravity C127/8 D854		990211		
Stabil Test/Premix Sample CAL 366		991104		
Unit Weight C29		990704		

MISC. OTHER				
Usage	Qty.	99#	Status	
Chloride Analysis		996020		
Corrosivity Analysis		991508		
Corrosivity, Resistivity, Sodium Sulfate, Solubility, p1+	<u>2</u>	990004	<u>ATLAS</u>	
pH Test		990319		
Sulfate Analysis		992090		
Unit Weight Fireproofing		991314		

CONCRETE & MASONRY TESTING				
Usage	Qty.	99#	Status	
C942 Grout Strength (cylinder/prism strength)		990119		
Compressive Test 12x8x16 Prisms (12" width)		991005		
Compressive Test 8x8x16 Prisms (8" width)		991003		
Compressive Test/Cored Spec		990809		
Concrete Compressive Test		990803		
Drying Shrinkage (Set OF 3) C-157, CAL-530		990811		
Flex and Strength/Concrete Beam		990806		
Mortar Strength C-109		990118		

SOILS TESTING				
Usage	Qty.	99#	Status	
ASTM D1557 6" Method B, C and D		990104		
CBR 100% Compaction D1883, T180		990209		
Check Point		990106		
Collapse Potential		990614		
Consolidation W/O time Rate/6 LD D2435	<u>2</u>	990613	<u>X</u>	
Correct Oversize Material in Sample CAL301		990203		
Direct Shear 1 Point		990608		
Direct Shear 3 Point		990609		
Harvard Miniature		992191		
Hydrometer Only	<u>2</u>	990305	<u>XXX</u>	
Moisture Determination Only	<u>2</u>	990317	<u>XXX</u>	
Moisture Determination/Unit Weight	<u>2</u>	990316	<u>XXX</u>	
Plasticity Index		990310		
Resistivity Analysis		990318		
R-Value/Untreated Material/Field Sample CAL 301		990201		
Sample Prep Materials		992508		
Sieve Analysis Wash #200 C117		990304		
Sieve Analysis/Course & Fine	<u>2</u>	990301	<u>X</u>	
Sulfate Sound (5) Sieve SZ C88		990708		
Swell Test FHA Specification (60 psi)		990312		
Unconfined Comp/Inc Moist D2166		990601		

Source: SAL BOPHUR
 Supplier: Bohert
 Sample Location: DBMw-11
 Type of Material: Soil
 Sampled by: JANIS
 Project Manager: C. Carter / C. WITMAN

FOR ACCOUNTING USE ONLY
 Entered By: _____ Date Entered: _____

CCPW ☐ CCSD ☐ LLWD ☐ AASHTO ☐ NDOT ☐
 ASTM ☒ UBC ☐ Other ☐



KLEINFELDER

An employee owned company

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: July 11, 2007
File: _____
Copies: _____

Subject: **BRC Aquifer Testing: Flexible and Rigid Wall Testing**

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-12@ 55-56.5'	07/07/07	29520	07/11/07
DBMW-12@ 75-76.5'	07/07/07	29520	07/11/07
DBMW-11@ 55-56.5'	07/06/07	29519	07/11/07
DBMW-11@ 70-71.5'	07/06/07	29519	07/11/07
DBMW- 13@ 75-76.5'	07/09/07	29524	07/11/07
DBMW-13 @ 55-56.5'	07/09/07	29524	07/11/07
DBMW-14 @ 65-66.5	07/10/07	29525	07/11/07
DBMW- 14 @ 45-46.5	07/10/07	29525	07/11/07

If you have any questions please don't hesitate to call.

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14505(g)

DATE: July 13, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29519

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29519	DBMW-11	56.0-57.0	3.00%	7.93
29519	DBMW-11	69.0-69.5	2.00%	7.97

Robert L. Summers

LABORATORY MANAGER

Moisture Density							
Project Name	BRC AQUIFER TESTING			Date	07/09/07		
Project Number	83173	Phase No.	12	Tested By	JLW	Checked By	JH
Lab Number	29519						
Boring Number	DBMW-11	DBMW-11					
Sample Depth	56 - 57'	69 - 69.5'					
Height (inches)	3.64	2.86					
Diameter (inches)	5.13	5.07					
Volume	0.0435	0.03					
Wt. of Sample At Field Moisture	2219.46	1764.29					
Wet Density (pcf)	112.5	116.5					
Dry Density (pcf)	89.1	93.6					
Container No.							
Wt. of Wet Sample Plus Tare	1095.16	548.28					
Wt. of Dry Sample Plus Tare	958.49	516.64					
Tare (g)	437.03	387.15					
Dry Wt. Of Sample (g)	521.46	129.49					
Moisture Content, %	26.2%	24.4%					

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-11 @ 69-69.5'; S-29519 @ 65.0 - 70.0'

July 6, 2007

Silt (ML)

Specific Gravity = 2.62

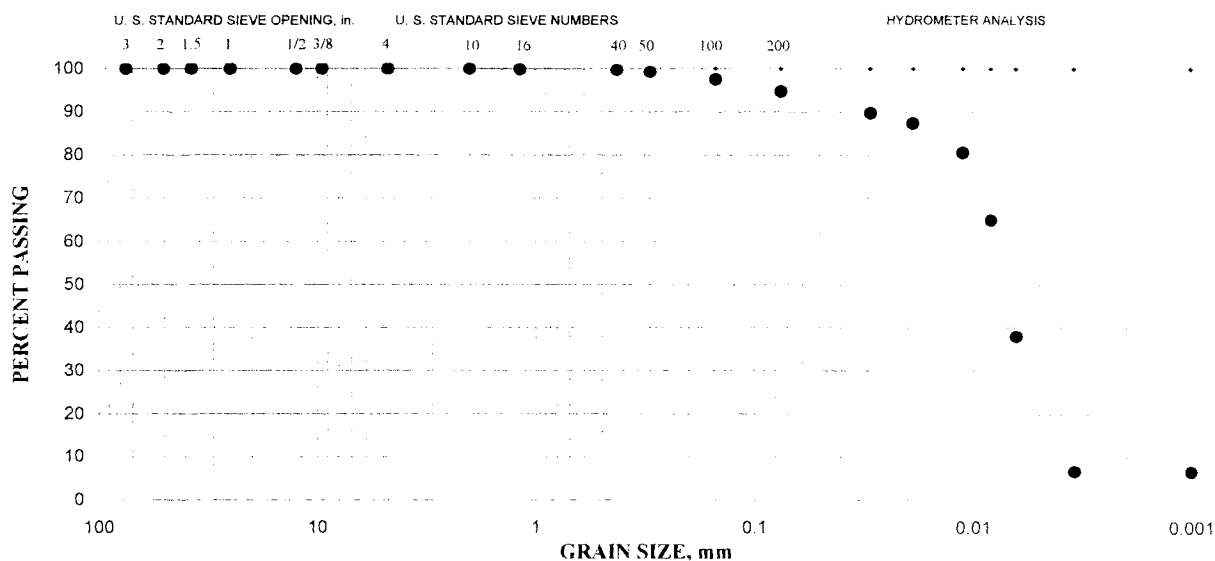
LL = ; PL = ; PI =

Gravel = 0%; Sand = 5%; Silt = 88%; Clay = 7%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425-μm)	0	100
#50 (300-μm)	1	99
#100 (150-μm)	3	97
#200 (75-μm)	5	95

Hydrometer Analysis

29-μm	90
19-μm	87
11-μm	81
8-μm	65
6-μm	38
3.5-μm	7
Colloids (<1-μm)	7



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29519
Project =>	BRC AQUIFER TESTING	Date Sampled =>	07/06/07
Client =>	BRC	Date Received =>	07/09/07
Phase =>	12	Sampled By =>	DD
Sample Location =>	DBMW-11	Tested By =>	JLW
	69 - 69.5'	Reviewed By =>	JH

Pan Label =>	LIL' DUDE	
Tare Weight of Pan =>	387.15	A
Wet Wt. of Sample & Tare =>	548.28	B
Dry Wt. of Sample & Tare =>	516.64	C
Weight of Moisture (B-C) =>	31.6	D
Dry Wt. of Sample (C-A) =>	129.49	E
Percent Moisture (D/E)*100 =>	24.4	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29519
 BORING: DBMW-11
 DEPTH: 69 - 69.5'
 DATE: 07/11/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	X
Mass of Pycnometer, Mf =>	220.88
Mass of Pycnometer & Water, Ma =>	719.23
Temperature of Water when Ma above was Taken, Ta =>	20.3
Mass of Speciman & Pycnometer =>	265.84
Mass of Pycnometer, Mf =>	220.88
Mass of Oven-Dry Specimen, Mo =>	44.96
Mass of Pycnometer, Soil & Water, Mb =>	747.01
Temperature of Water when Mb Above was Taken, Tb =>	20.6

Prodedure

Record the mass of a clean dry pycnometer, Mf
 Record the mass of the pyc. and distilled water at calibration mark, Ma
 Record the temperature of the water to the nearest .5° C, Ta
 Record Mass of Pyc & Water at Calibration Mark, Ma

Water Density at Ta	0.99814
Water Density at Tb	0.99808
K Factor at Tb	0.99987
Ma at Tb	220.850099
Sp Gr at Tb	2.616996508
Sp Gr at 20 C	2.616656298
SPECIFIC GRAVITY AT 20 C	2.616656298

One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

Project No.: 83173-12

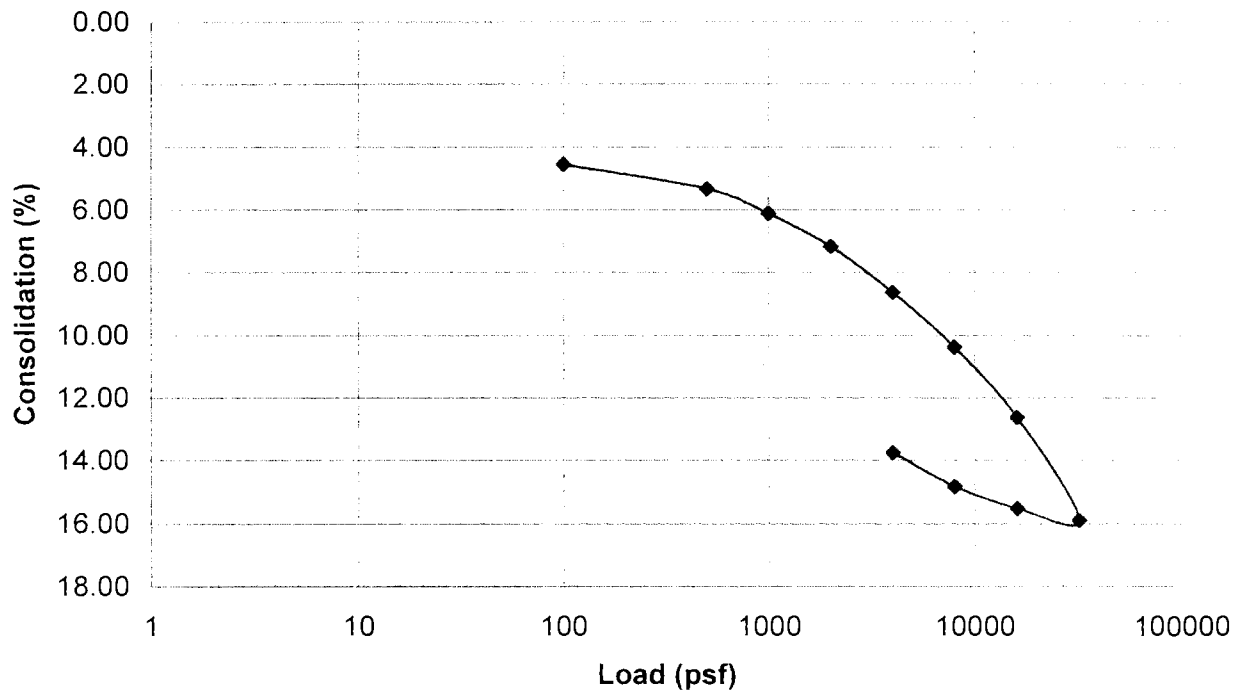
Report Date: 07/24/07

Sample No.: 29520
Sample Depth (ft.): DBMW-11 @ 69 - 69.5'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	4.55
500	5.33
1000	6.11
2000	7.17
4000	8.63
8000	10.38
16000	12.63
32000	15.89
16000	15.52
8000	14.82
4000	13.75

DBMW-11 @ 69 - 69.5'



PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-11 @ 56-57'; S-29519 @ 55.0 - 60.0'

July 6, 2007

Silt with Sand (ML)

Specific Gravity = 2.69

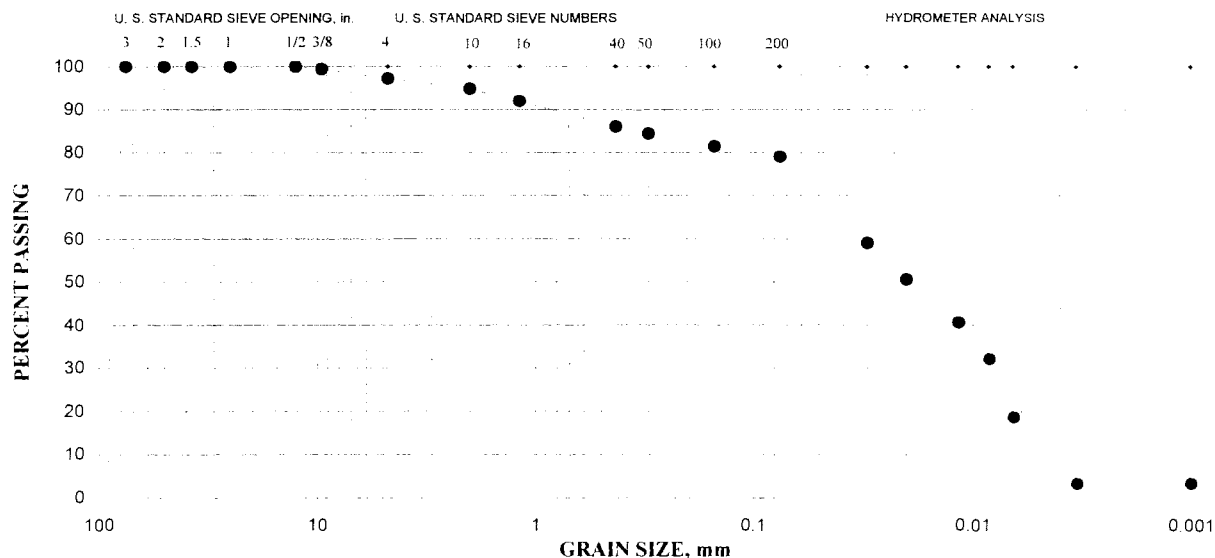
LL = ; PL = ; PI =

Gravel = 3%; Sand = 18%; Silt = 76%; Clay = 3%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	1	99
#4 (4.75-mm)	3	97
#10 (2.00-mm)	5	95
#16 (1.18-mm)	8	92
#40 (425-μm)	14	86
#50 (300-μm)	16	84
#100 (150-μm)	19	81
#200 (75-μm)	21	79

Hydrometer Analysis

30-μm	59
20-μm	51
12-μm	40
8-μm	32
7-μm	19
3.4-μm	3
Colloids (<1-μm)	3



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29519
Project =>	BRC AQUIFER TESTING	Date Sampled =>	07/06/07
Client =>	BRC	Date Received =>	07/09/07
Phase =>	12	Sampled By =>	DD
Sample Location =>	DBMW-11	Tested By =>	JLW
	56 - 57'	Reviewed By =>	JH

Pan Label =>	MAX	
Tare Weight of Pan =>	437.03	A
Wet Wt. of Sample & Tare =>	1095.16	B
Dry Wt. of Sample & Tare =>	958.49	C
Weight of Moisture (B-C) =>	136.7	D
Dry Wt. of Sample (C-A) =>	521.46	E
Percent Moisture (D/E)*100 =>	26.2	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

Project No.: 83173-12

07/09/07

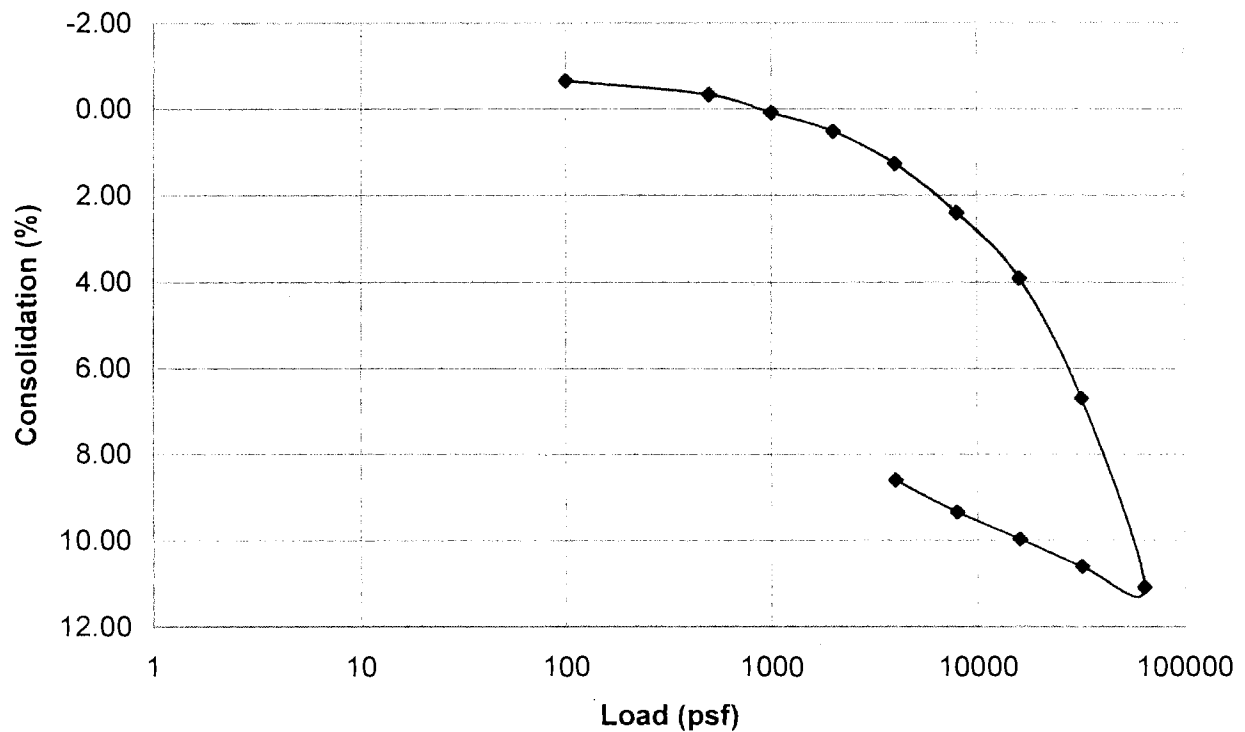
Sample No.: 29519

Tech.: jlw

Sample Depth (ft.): DBMW-11 @ 56 - 57'

Load (psf)	Consolidation (%)
100	0.00
100	-0.65
500	-0.33
1000	0.09
2000	0.52
4000	1.27
8000	2.40
16000	3.90
32000	6.69
64000	11.09
32000	10.61
16000	9.97
8000	9.34
4000	8.60

DBMW-11 @ 56 - 57'



PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29519
 BORING: DBMW-11
 DEPTH: 56 - 57'
 DATE: 07/11/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Z
Mass of Pycnometer, Mf =>	220.94
Mass of Pycnometer & Water, Ma =>	719.14
Temperature of Water when Ma above was Taken, Ta =>	20.3
Mass of Speciman & Pycnometer =>	262.98
Mass of Pycnometer, Mf =>	220.93
Mass of Oven-Dry Specimen, Mo =>	42.05
Mass of Pycnometer, Soil & Water, Mb =>	745.53
Temperature of Water when Mb Above was Taken, Tb =>	20.7

Prodedure

Record the mass of a clean dry pycnometer, Mf
 Record the mass of the pyc. and distilled water at calibration mark, Ma
 Record the temperature of the water to the nearest .5° C, Ta
 Record Mass of Pyc & Water at Calibration Mark, Ma

Water Density at Ta	0.99814
Water Density at Tb	0.99806
K Factor at Tb	0.99985
Ma at Tb	220.900144
Sp Gr at Tb	2.685185185
Sp Gr at 20 C	2.684782407
SPECIFIC GRAVITY AT 20 C	2.684782407

By: Doug Davis

Date Due:

Boring Number	Depth	Water Content (ASTM 2216)	Dry Bulk Density (ASTM D2937)	Consoilodation (ASTM D2435)	Rigid Wall (ASTM D2434) <u>OUTSIDE SERVICE</u>	Specific Gravity (ASTM D854)	Specific Gravity (ASTM C127)	Hydrometer (ASTM D422)	Sieve Anysis (ASTM D422)	Total Organic Carbon <u>OUTSIDE SERVICE (ATLAS)</u>	pH <u>OUTSIDE SERVICE (ATLAS)</u>	Remarks
D3Mw-12 55-56.5		X	X	X	X	X	X	X	X	X	X	Removed 56-57' for testing 70-70 1/2' Removed 69 1/2-70' for testing
D3Mw-12 70-75		X	X	X	X	X	X	X	X	X	X	
D3Mw-12 75-76.5					X							

29520

LABORATORY WORK ORDER



Project No: 03173 Phase: 12
 Project Name: BRL AQU. FOR TEST / NO WELLS
 Client Name: BRL
 Client Ref./P.O.#: _____
 Special Instructions: _____

Sample Number: DBMW-12 55-56.5 ☒ Requested Test
11 55-60 ☒ Test in Progress
" 70-75 ☒ Test Completed
" 75-76.5

Date Sampled: 7-7-07
 Date Received: 7/9/07
 Date Needed: _____
 Date Completed: 7/16/07
 Verified By: _____

29520

ASPHALT TESTING

Usage	Qty.	99#	Status
C123 Lt Wt Pieces/Agg		990715	
C127 Absorption/Gravity	<u>2</u>	990708 <u>990307</u>	
CAL 205 Crushed Part		990712	
CAL 227 Cleaness TST		990711	
Clay Lumps/Friabl Part C-142		990714	
D2726 Weight/Absorption Core		991110	
Extract Bitumin D1856, 2172.310		991102	
Flat/Elong Part/Sieve 119, 120		990713	
Hveem Stability/Set of 3		991147	
Ignition Oven Calibration		996156	
Injurious Organic Matter C-40		990701	
LA Rattler CAL131		990706	
Lottman Test		991121	
Marshall Stab/Flow D-1599 (Set of 3)/Lab		991108	
Max Theoretical Specific Gravity D-2041		991112	
Methylene Blue Test		990132	
Microwave Asphalt Moist Content		996137	
Oil Content By Ignition Oven		996153	
Sand Equivalent C217		990308	
Specific Gravity C127/8 D854		990211	
Stabil Test/Premix Sample CAL 366		991104	
Unit Weight C29		990704	

MISC. OTHER

Usage	Qty.	99#	Status
Chloride Analysis		996020	
Corrosivity Analysis		991508	
Corrosivity, Resistivity, Sodium Sulfate Solubility, p11*	<u>2</u>	990324 <u>ATLAB</u>	
pH Test		990319	
Sulfate Analysis		992090	
Unit Weight Fireproofing		991314	

CONCRETE & MASONRY TESTING

Usage	Qty.	99#	Status
C942 Grout Strength (cylinder/prism strength)		990119	
Compressive Test 12x8x16 Prisms (12" width)		991005	
Compressive Test 8x8x16 Prisms (8" width)		991003	
Compressive Test/Cored Spec		990809	
Concrete Compressive Test		990803	
Drying Shrinkage (Set OF 3) C-157, CAL-530		990811	
Flex and Strength/Concrete Beam		990806	
Mortar Strength C-109		990118	

SOILS TESTING

Usage	Qty.	99#	Status
ASTM D1557 6" Method B, C and D		990104	
CBR 100% Compaction D1883, T180		990209	
Check Point		990106	
Collapse Potential		990614	
Consolidation W/O time Rate/6 LD D2435	<u>2</u>	990613	<u>X</u>
Correct Oversize Material in Sample CAL301		990203	
Direct Shear 1 Point		990608	
Direct Shear 3 Point		990609	
Harvard Miniature		992191	
Hydrometer Only	<u>2</u>	990305	<u>X</u>
Moisture Determination Only	<u>2</u>	990317	<u>X</u>
Moisture Determination/Unit Weight	<u>2</u>	990316	<u>X</u>
Plasticity Index		990310	
Resistivity Analysis		990318	
R-Value/Untreated Material/Field Sample CAL 301		990201	
Sample Prep Materials		992508	
Sieve Analysis Wash #200 C117		990304	
Sieve Analysis/Course & Fine	<u>2</u>	990301	<u>X</u>
Sulfate Sound (5) Sieve SZ C88		990708	
Swell Test FHA Specification (60 psi)		990312	
Unconfined Comp/Inc Moist D2166		990601	

Source: SOIL BARN
 Supplier: BARN
 Sample Location: DBMW-12
 Type of Material: SOIL
 Sampled by: DAVIS
 Project Manager: G. CARTER / G. W. TUNNEY

FOR ACCOUNTING USE ONLY
 Entered By: _____ Date Entered: _____

☐ CCPW
☒ ASTM
☐ Other

☐ LWD
☐ AASHTO
☐ CSD
☐ UBC
☐ NDOT



An employee owned company

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: July 11, 2007
File: _____
Copies: _____

Subject: BRC Aquifer Testing: Flexible and Rigid Wall Testing

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
 ☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-12@ 55-56.5'	07/07/07	29520	07/11/07
DBMW-12@ 75-76.5'	07/07/07	29520	07/11/07
DBMW-11@ 55-56.5'	07/06/07	29519	07/11/07
DBMW-11@ 70-71.5'	07/06/07	29519	07/11/07
DBMW- 13@ 75-76.5'	07/09/07	29524	07/11/07
DBMW-13 @ 55-56.5'	07/09/07	29524	07/11/07
DBMW-14 @ 65-66.5'	07/10/07	29525	07/11/07
DBMW- 14 @ 45-46.5'	07/10/07	29525	07/11/07

If you have any questions please don't hesitate to call.

Moisture Density							
Project Name	BRC AQUIFER TESTING			Date	07/09/07		
Project Number	83173	Phase No.	12	Tested By	JLW	Checked By	JH
Lab Number	29519						
Boring Number	DBMW-12	DBMW-12					
Sample Depth	56 - 57'	70 - 70.5'					
Height (inches)	3.32	1.9					
Diameter (inches)	5.09	5.06					
Volume	0.0391	0.02					
Wt. of Sample At Field Moisture	2140.13	1122.72					
Wet Density (pcf)	120.7	112.0					
Dry Density (pcf)	100.7	87.8					
Container No.							
Wt. of Wet Sample Plus Tare	852.43	511.99					
Wt. of Dry Sample Plus Tare	775.18	481.22					
Tare (g)	384.91	369.28					
Dry Wt. Of Sample (g)	390.27	111.94					
Moisture Content, %	19.8%	27.5%					

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14505(h)

DATE: July 13, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29520

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29520	DBMW-12	56.0-57.0	2.20%	7.90
29520	DBMW-12	69.5-70.0	1.80%	8.00


LABORATORY MANAGER

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29520
Project =>	BRC AQUIFER TESTING	Date Sampled =>	07/07/07
Client =>	BRC	Date Received =>	07/09/07
Phase =>	12	Sampled By =>	DD
Sample Location =>	DBMW-12	Tested By =>	JLW
	56 - 57'	Reviewed By =>	JH

Pan Label =>	JOE	
Tare Weight of Pan =>	384.91	A
Wet Wt. of Sample & Tare =>	852.43	B
Dry Wt. of Sample & Tare =>	775.18	C
Weight of Moisture (B-C) =>	77.3	D
Dry Wt. of Sample (C-A) =>	390.27	E
Percent Moisture (D/E)*100 =>	19.8	F

Sieve Retaining More Than About	Recommended Minimum Mass
10% of Sample	of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29520
 BORING: DBMW-12
 DEPTH: 56 - 57'
 DATE: 07/11/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Y
Mass of Pycnometer, $M_f \Rightarrow$	224.4
Mass of Pycnometer & Water, $M_a \Rightarrow$	722.89
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	420.6
Mass of Speciman & Pycnometer $\Rightarrow$	267.80
Mass of Pycnometer, $M_f \Rightarrow$	224.4
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	43.4
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	750.6
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	20.6

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99808
Water Density at T_b	0.99808
K Factor at T_b	0.99987

Ma at T_b	224.4
Sp Gr at T_b	2.766093053
Sp Gr at 20 C	2.765733461

SPECIFIC GRAVITY AT 20 C	2.765733461
--------------------------	-------------

One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

Project No.: 83173-12

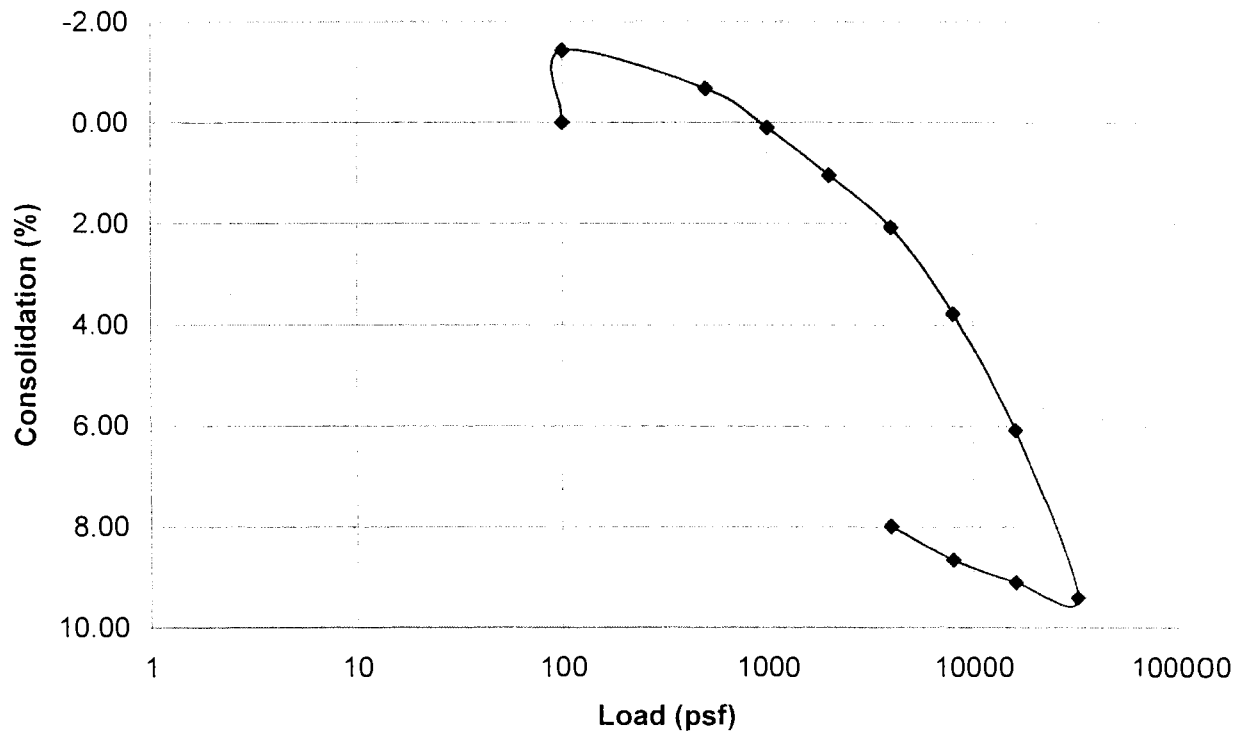
Report Date: 07/24/07

Sample No.: 29520
Sample Depth (ft.): DBMW-12 @ 56 - 57'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	0.00
100	-1.43
500	-0.68
1000	0.10
2000	1.05
4000	2.08
8000	3.77
16000	6.08
32000	9.40
16000	9.10
8000	8.65
4000	7.99

DBMW-12 @ 56 - 57'



PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-12@56-57"; S-29520 @ 55.0 - 60.0'

July 7, 2007

Sandy Silt (ML)

Specific Gravity = 2.77

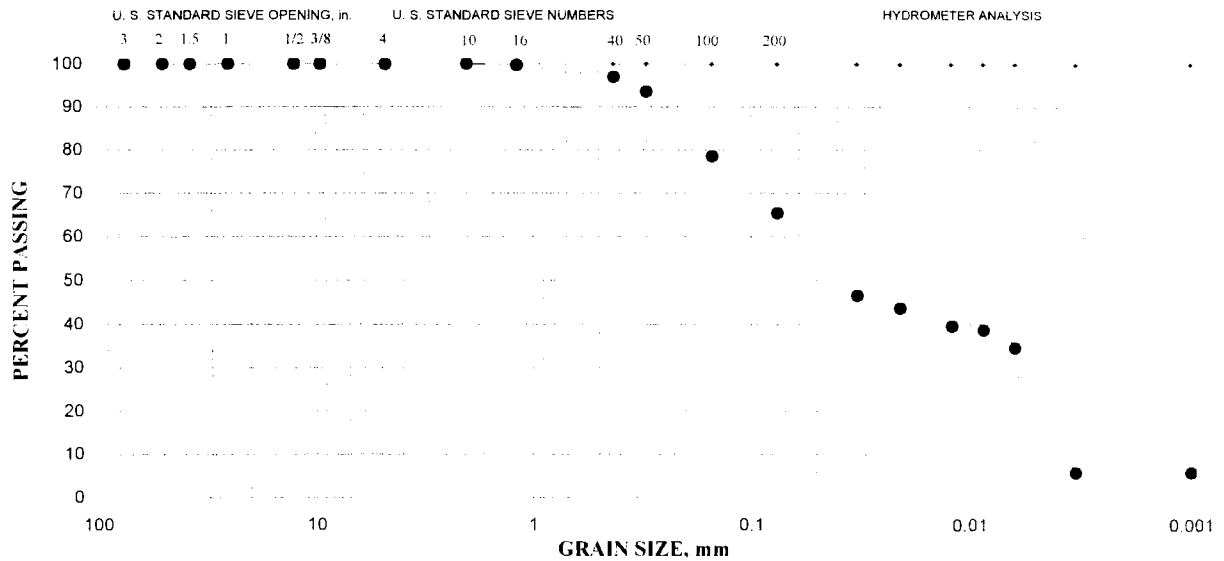
LL = ; PL = ; PI =

Gravel = 0%; Sand = 35%; Silt = 59%; Clay = 6%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425- μ m)	3	97
#50 (300- μ m)	6	94
#100 (150- μ m)	21	79
#200 (75- μ m)	35	65

Hydrometer Analysis

32- μ m	47
21- μ m	44
12- μ m	40
9- μ m	39
6- μ m	35
3.3- μ m	6
Colloids (<1- μ m)	6



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29520
Project =>	BRC AQUIFER TESTING	Date Sampled =>	07/07/07
Client =>	BRC	Date Received =>	07/09/07
Phase =>	12	Sampled By =>	DD
Sample Location =>	DBMW-12	Tested By =>	JLW
	70 - 70.5'	Reviewed By =>	JH

Pan Label =>	07-Jan	
Tare Weight of Pan =>	369.28	A
Wet Wt. of Sample & Tare =>	511.99	B
Dry Wt. of Sample & Tare =>	481.22	C
Weight of Moisture (B-C) =>	30.8	D
Dry Wt. of Sample (C-A) =>	111.94	E
Percent Moisture (D/E)*100 =>	27.5	F

Sieve Retaining More Than	About	Recommended Minimum Mass
10% of Sample		of Moist Sample
No. 10		100 to 200 gms
No. 4		300 to 500 gms
¾"		500 to 1000 gms
1½"		1500 to 3000 gms
3"		5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29520
 BORING: DBMW-12
 DEPTH: 70 - 70.5'
 DATE: 07/11/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	W
Mass of Pycnometer, Mf =>	169.17
Mass of Pycnometer & Water, Ma =>	667.54
Temperature of Water when Ma above was Taken, Ta =>	20.3
Mass of Speciman & Pycnometer =>	746.17
Mass of Pycnometer, Mf =>	220.88
Mass of Oven-Dry Specimen, Mo =>	48
Mass of Pycnometer, Soil & Water, Mb =>	698.17
Temperature of Water when Mb Above was Taken, Tb =>	20.3

Prodedure

Record the mass of a clean dry pycnometer, Mf
 Record the mass of the pyc. and distilled water at calibration mark, Ma
 Record the temperature of the water to the nearest .5° C, Ta
 Record Mass of Pyc & Water at Calibration Mark, Ma

Water Density at Ta	0.99814
Water Density at Tb	0.99814
K Factor at Tb	0.99994

Ma at Tb	169.17
Sp Gr at Tb	2.763385147
Sp Gr at 20 C	2.763219344

SPECIFIC GRAVITY AT 20 C	2.763219344
--------------------------	-------------

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29520
Project =>	BRC AQUIFER TESTING	Date Sampled =>	07/07/07
Client =>	BRC	Date Received =>	07/09/07
Phase =>	12	Sampled By =>	DD
Sample Location =>	DBMW-12	Tested By =>	JLW
	70 - 70.5'	Reviewed By =>	JH

Pan Label =>		
Tare Weight of Pan =>	369.28	A
Wet Wt. of Sample & Tare =>	511.99	B
Dry Wt. of Sample & Tare =>	481.22	C
Weight of Moisture (B-C) =>	30.8	D
Dry Wt. of Sample (C-A) =>	111.94	E
Percent Moisture (D/E)*100 =>	27.5	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

Project No.: 83173-12

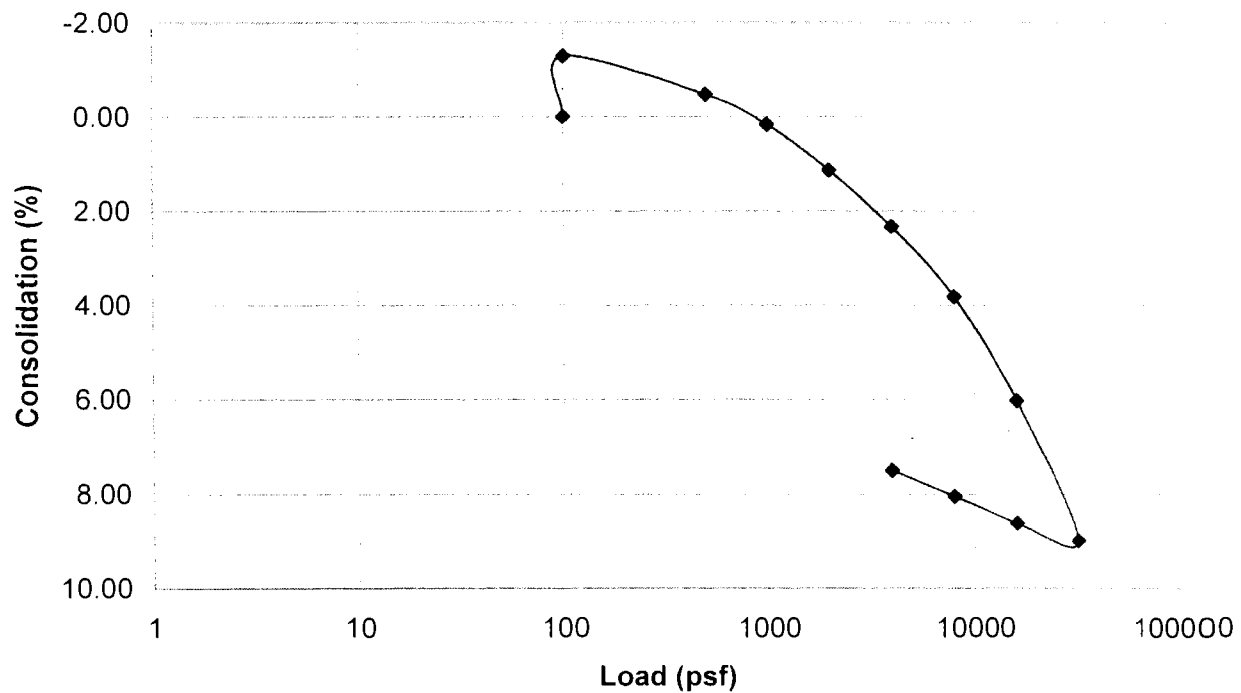
Report Date: 07/24/07

Sample No.: 29520
Sample Depth (ft.): DBMW-12 @ 70 - 70.5'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	0.00
100	-1.29
500	-0.47
1000	0.16
2000	1.13
4000	2.33
8000	3.81
16000	6.02
32000	8.98
16000	8.61
8000	8.04
4000	7.51

DBMW-12 @ 70 - 70.5'



PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-12@70-70.5; S-29520 @ 70.0 - 75.0'

July 7, 2007

Silt with Sand (ML)

Specific Gravity = 2.76

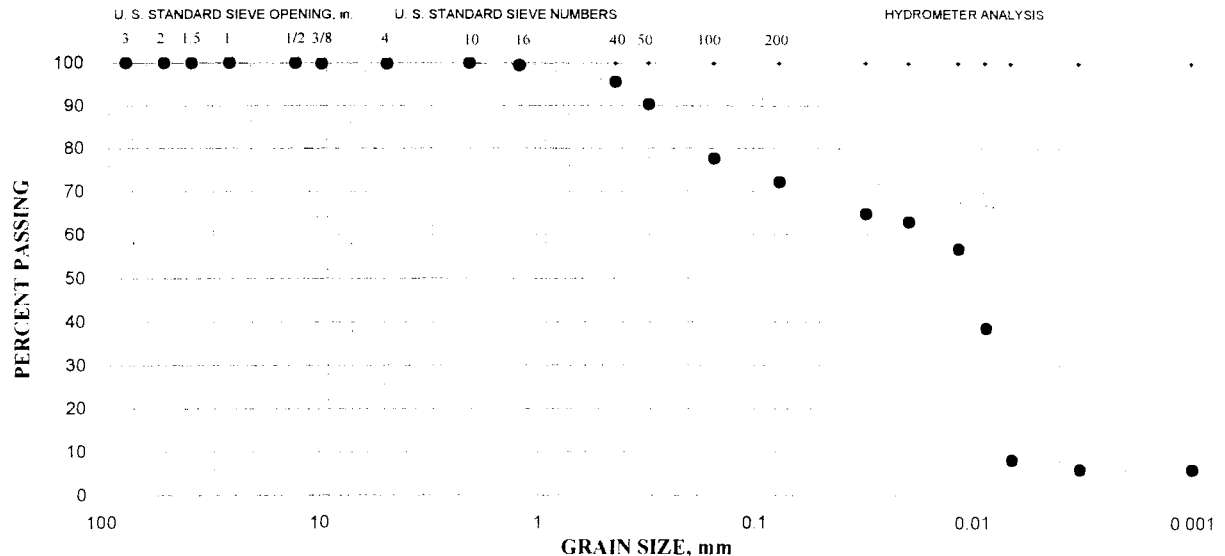
LL = ; PL = ; PI =

Gravel = 0%; Sand = 28%; Silt = 66%; Clay = 6%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425- μ m)	4	96
#50 (300- μ m)	10	90
#100 (150- μ m)	22	78
#200 (75- μ m)	28	72

Hydrometer Analysis

30- μ m	65
19- μ m	63
11- μ m	57
9- μ m	38
7- μ m	8
3.2- μ m	6
Colloids (<1- μ m)	6



By: Doug Davis

Date Due:

29524



KLEINFELDER

An employee owned company

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: July 11, 2007
File: _____
Copies: _____

Subject: BRC Aquifer Testing: Flexible and Rigid Wall Testing

We are sending: X Attached Under Separate Cover

Via: Messenger First Class Mail X United Parcel Air Freight

Transmitted: X As Requested For Approval For Your Use
 For Signatures For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-12@ 55-56.5'	07/07/07	29520	07/11/07
DBMW-12@ 75-76.5'	07/07/07	29520	07/11/07
DBMW-11@ 55-56.5'	07/06/07	29519	07/11/07
DBMW-11@ 70-71.5'	07/06/07	29519	07/11/07
DBMW- 13@ 75-76.5'	07/09/07	29524	07/11/07
DBMW-13 @ 55-56.5'	07/09/07	29524	07/11/07
DBMW-14 @ 65-66.5	07/10/07	29525	07/11/07
DBMW- 14 @ 45-46.5	07/10/07	29525	07/11/07

If you have any questions please don't hesitate to call.

Moisture Density							
Project Name	BRC AQUIFER TESTING			Date	07/11/07		
Project Number	83173	Phase No.	12	Tested By	JLW	Checked By	JH
Lab Number	29524						
Boring Number	DBMW-13	DBMW-13					
Sample Depth	54.5 - 55'	74 - 74.5'					
Height (inches)	1.45	2.44					
Diameter (inches)	5.00	5.04					
Volume	0.0165	0.03					
Wt. of Sample At Field Moisture	768.86	1442.40					
Wet Density (pcf)	102.7	112.8					
Dry Density (pcf)	80.4	90.1					
Container No.							
Wt. of Wet Sample Plus Tare	683.73	473.80					
Wt. of Dry Sample Plus Tare	577.50	426.40					
Tare (g)	194.66	237.50					
Dry Wt. Of Sample (g)	382.84	188.90					
Moisture Content, %	27.7%	25.1%					

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-13@54.5-55'; S-29524 @ 50.0 - 55.0'

August 27, 2007

Silt with Sand (ML)

Specific Gravity = 2.61

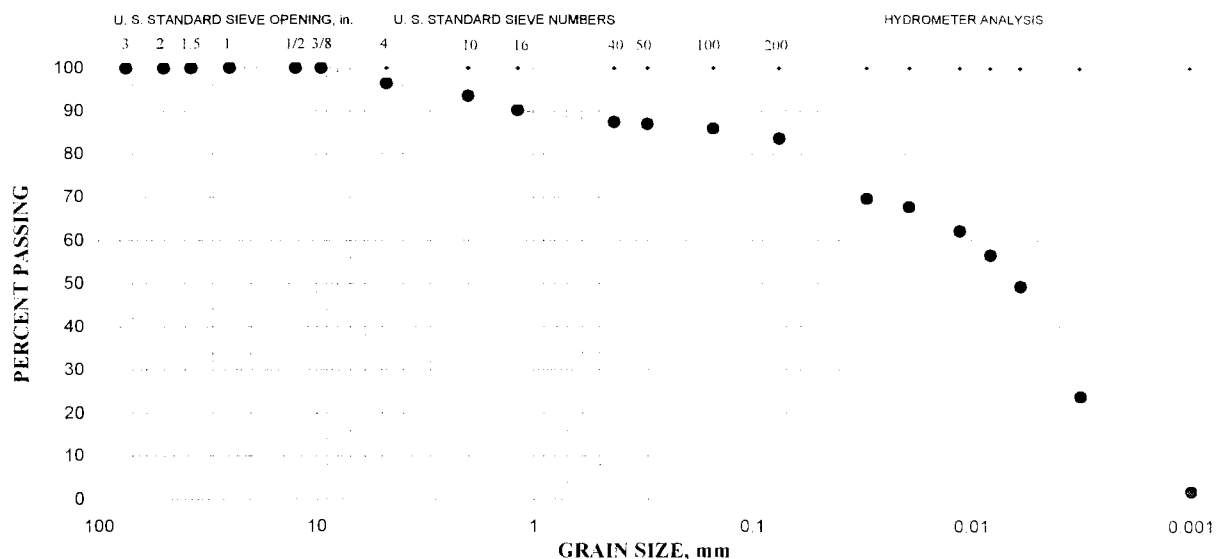
LL = ; PL = ; PI =

Gravel = 4%; Sand = 12%; Silt = 60%; Clay = 24%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	4	96
#10 (2.00-mm)	7	93
#16 (1.18-mm)	10	90
#40 (425-μm)	13	87
#50 (300-μm)	13	87
#100 (150-μm)	14	86
#200 (75-μm)	16	84

Hydrometer Analysis

30-μm	70
19-μm	68
11-μm	62
8-μm	57
6-μm	49
3.2-μm	24
Colloids (<1-μm)	2



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29524
Project =>	BRC AQUIFER TESTING	Date Sampled =>	07/09/07
Client =>	BRC	Date Received =>	07/10/07
Phase =>	12	Sampled By =>	DD
Sample Location =>	DBMW-13	Tested By =>	JLW
	54.5 - 55'	Reviewed By =>	JH

Pan Label =>		
Tare Weight of Pan =>	369.28	A
Wet Wt. of Sample & Tare =>	511.99	B
Dry Wt. of Sample & Tare =>	481.22	C
Weight of Moisture (B-C) =>	30.8	D
Dry Wt. of Sample (C-A) =>	111.94	E
Percent Moisture (D/E)*100 =>	27.5	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14520(h)

DATE: July 18, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29524

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29524	DBMW-13	54.5-55.0	0.60%	8.17

Robert L. Summers

LABORATORY MANAGER

PROJECT NAME: BRC Aquifer Testing
PROJECT NUMBER: 83173-12
LAB NUMBER: 29444
BORING: DBMW-13
DEPTH: 54.5 - 55'
DATE:
TECHNICIAN: JLW

ASTM D-854
SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label

Mass of Pycnometer, $M_f \Rightarrow$	220.94
Mass of Pycnometer & Water, $M_a \Rightarrow$	719.14
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	20.3
Mass of Speciman & Pycnometer $\Rightarrow$	266.26
Mass of Pycnometer, $M_f \Rightarrow$	220.94
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	45.34
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	747.11
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	20.1

Prodedure

Record the mass of a clean dry pycnometer, M_f
Record the mass of the pyc. and distilled water at calibration mark, M_a
Record the temperature of the water to the nearest .5° C, T_a
Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99814
Water Density at T_b	0.99819
K Factor at T_b	0.99998
 Ma at T_b	 220.96491
Sp Gr at T_b	2.610247553
Sp Gr at 20 C	2.610195348
 SPECIFIC GRAVITY AT 20 C	 2.610195348

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29524
Project =>	BRC AQUIFER TESTING	Date Sampled =>	07/09/07
Client =>	BRC	Date Received =>	07/10/07
Phase =>	12	Sampled By =>	DD
Sample Location =>	DBMW-13	Tested By =>	JLW
	54.5 - 55'	Reviewed By =>	JH

Pan Label =>		
Tare Weight of Pan =>	369.28	A
Wet Wt. of Sample & Tare =>	511.99	B
Dry Wt. of Sample & Tare =>	481.22	C
Weight of Moisture (B-C) =>	30.8	D
Dry Wt. of Sample (C-A) =>	111.94	E
Percent Moisture (D/E)*100 =>	27.5	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-13@74-74.5'; S-29524 @ 70.0 - 75.0'

August 27, 2007

Silt with Sand (ML)

Specific Gravity = 2.55

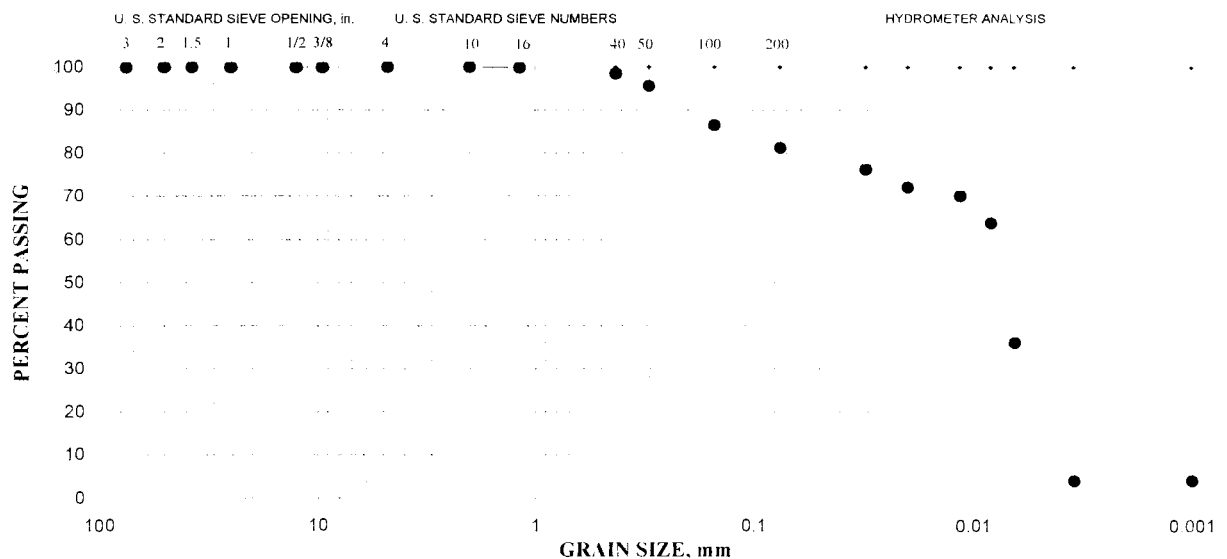
LL = ; PL = ; PI =

Gravel = 0%; Sand = 19%; Silt = 77%; Clay = 4%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425-μm)	2	98
#50 (300-μm)	5	95
#100 (150-μm)	14	86
#200 (75-μm)	19	81

Hydrometer Analysis

31-μm	76
20-μm	72
11-μm	70
8-μm	64
6-μm	36
3.5-μm	4
Colloids (<1-μm)	4



Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14553(e)

DATE: August 6, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29524

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29524	DBMW-13	74.0-74.5	1.90%	8.11

Robert L. Summers

LABORATORY MANAGER

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29524
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW-13	Tested By =>	JLW
	74 - 74.5'	Reviewed By =>	JH

Pan Label =>	WALK ON	
Tare Weight of Pan =>	237.5	A
Wet Wt. of Sample & Tare =>	473.8	B
Dry Wt. of Sample & Tare =>	426.4	C
Weight of Moisture (B-C) =>	47.4	D
Dry Wt. of Sample (C-A) =>	188.9	E
Percent Moisture (D/E)*100 =>	25.1	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29524
 BORING: DBMW-13
 DEPTH: 74 - 74.5'
 DATE: 08/06/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	W
Mass of Pycnometer, $M_f \Rightarrow$	169.2
Mass of Pycnometer & Water, $M_a \Rightarrow$	667.54
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	20.3
Mass of Speciman & Pycnometer $\Rightarrow$	215.52
Mass of Pycnometer, $M_f \Rightarrow$	169.19
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	46.33
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	695.7
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	20.2

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99814
Water Density at T_b	0.99816
K Factor at T_b	0.99996
 M_a at T_b	 169.2099668
Sp Gr at T_b	2.549807375
Sp Gr at 20 C	2.549705382
 SPECIFIC GRAVITY AT 20 C	 2.549705382

One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

Project No.: 83173-12

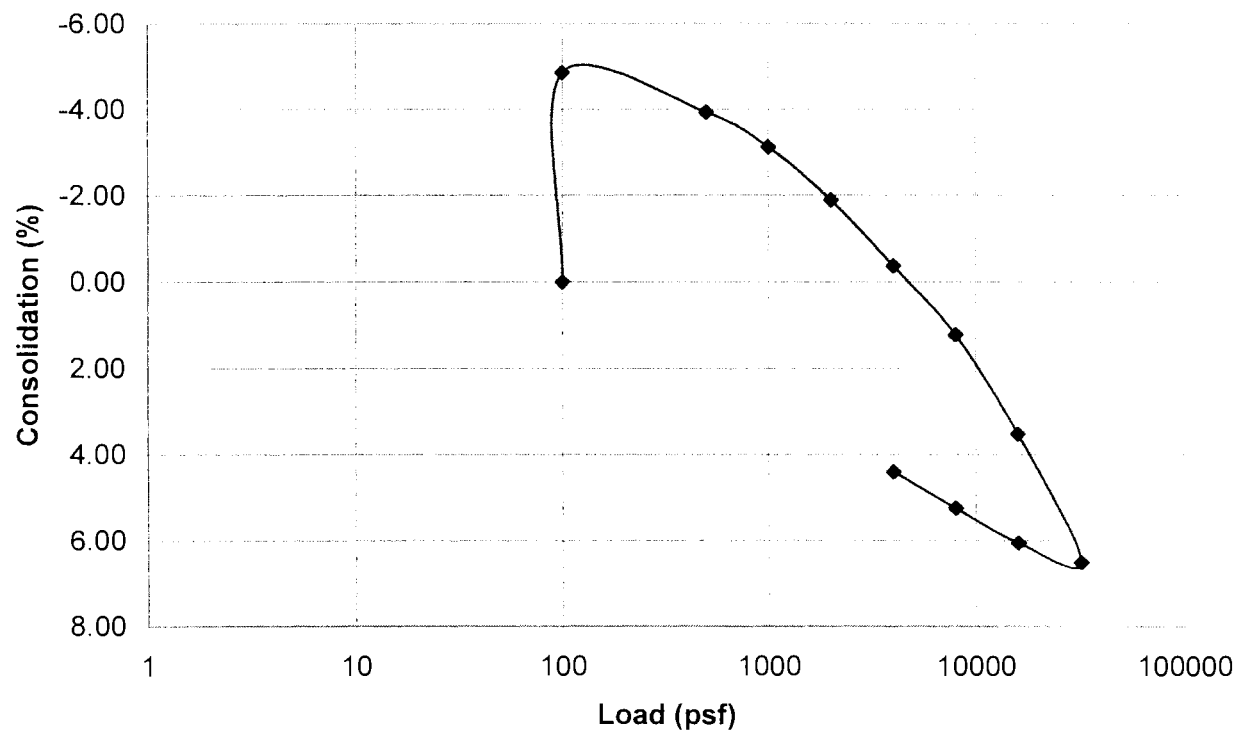
08/08/07

Sample No.: 29524
Sample Depth (ft.): DBMW-13 @ 74 - 74.5'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	0.00
100	-4.85
500	-3.93
1000	-3.13
2000	-1.89
4000	-0.37
8000	1.22
16000	3.53
32000	6.51
16000	6.06
8000	5.25
4000	4.40

DBMW-13 @ 74 - 74.5'



LABORATORY WORK ORDER



Project No: 3173 Phase: 12
 Project Name: BRC AVALON TST
 Client Name: BRC
 Client Ref./P.O.#: _____
 Special Instructions: _____

Sample Number: DBW-13 50-55
" 55-56.5
29524

SAMPLE STATUS
☒ Requested Test
☒ Test in Progress
☒ Test Completed

Date Sampled: 7-5-07
 Date Received: 7/10/07
 Date Needed: _____
 Date Completed: 8/13/07
 Verified By: _____

ASPHALT TESTING			
Usage	Qty.	99#	Status
C123 Lt Wt Pieces/Agg		990715	
C127 Absorption/Gravity	<u>2</u>	990715	X
CAL 205 Crushed Part		990712	
CAL 227 Cleaness TST		990711	
Clay Lumps/Friabl Part C-142		990714	
D2726 Weight/Absorption Core		991110	
Extract Bitumin D1856, 2172.310		991102	
Flat/Elong Part/Sieve 119, 120		990713	
Hveem Stability/Set of 3		991147	
Ignition Oven Calibration		996156	
Injurious Organic Matter C-40		990701	
LA Rattler CAL131		990706	
Lottman Test		991121	
Marshall Stab/Flow D-1599 (Set of 3)/Lab		991108	
Max Theoretical Specific Gravity D-2041		991112	
Methylene Blue Test		990132	
Microwave Asphalt Moist Content		996137	
Oil Content By Ignition Oven		996153	
Sand Equivalent C217		990308	
Specific Gravity C127/8 D854		990211	
Stabil Test/Premix Sample CAL 366		991104	
Unit Weight C29		990704	

MISC. OTHER			
Usage	Qty.	99#	Status
Chloride Analysis		996020	
Corrosivity Analysis		991508	
Corrosivity, Resistivity, Sodium Sulfate, Solubility, p11*		990324	
pH Test		990319	
Sulfate Analysis		992090	
Unit Weight Fireproofing		991314	

CONCRETE & MASONRY TESTING			
Usage	Qty.	99#	Status
C942 Grout Strength (cylinder/prism strength)		990119	
Compressive Test 12x8x16 Prisms (12" width)		991005	
Compressive Test 8x8x16 Prisms (8" width)		991003	
Compressive Test/Cored Spec		990809	
Concrete Compressive Test		990803	
Drying Shrinkage (Set OF 3) C-157, CAL-530		990811	
Flex and Strength/Concrete Beam		990806	
Mortar Strength C-109		990118	

SOILS TESTING			
Usage	Qty.	99#	Status
ASTM D1557 6" Method B, C and D		990104	
CBR 100% Compaction D1883, T180		990209	
Check Point		990106	
Collapse Potential		990614	
Consolidation W/O time Rate/6 LD D2435	<u>1</u>	990613	X
Correct Oversize Material in Sample CAL301		990203	
Direct Shear 1 Point		990608	
Direct Shear 3 Point		990609	
Harvard Miniature		992191	
Hydrometer Only	<u>2</u>	990305	X
Moisture Determination Only	<u>2</u>	990317	X
Moisture Determination/Unit Weight	<u>2</u>	990316	X
Plasticity Index		990310	
Resistivity Analysis		990318	
R-Value/Untreated Material/Field Sample CAL 301		990201	
Sample Prep Materials		992508	
Sieve Analysis Wash #200 C117		990304	
Sieve Analysis/Course & Fine	<u>2</u>	990301	X
Sulfate Sound (5) Sieve SZ C88		990708	
Swell Test FHA Specification (60 psi)		990312	
Unconfined Comp/Inc Moist D2166		990601	

Source: SOIL BORING
 Supplier: BUA-7
 Sample Location: DBW-13
 Type of Material: SOIL
 Sampled by: CT Davis
 Project Manager: G. Carter / G. Williams

☐ CCPW
☐ CSO
☐ LLWD
☐ AASHTO
☐ UBC
☒ ASTM
☐ Other

FOR ACCOUNTING USE ONLY
 Entered By: _____ Date Entered: _____

By: Doug Davis

Date Due:

LABORATORY NUMBER: 29525



6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: July 11, 2007
File: _____
Copies: _____

Subject: BRC Aquifer Testing: Flexible and Rigid Wall Testing

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-12@ 55-56.5'	07/07/07	29520	07/11/07
DBMW-12@ 75-76.5'	07/07/07	29520	07/11/07
DBMW-11@ 55-56.5'	07/06/07	29519	07/11/07
DBMW-11@ 70-71.5'	07/06/07	29519	07/11/07
DBMW- 13@ 75-76.5'	07/09/07	29524	07/11/07
DBMW-13 @ 55-56.5'	07/09/07	29524	07/11/07
DBMW-14 @ 65-66.5	07/10/07	29525	07/11/07
DBMW- 14 @ 45-46.5	07/10/07	29525	07/11/07

If you have any questions please don't hesitate to call.

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14553(f)

DATE: August 6, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29525

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29525	DBMW-14	44.0-45.0	1.60%	8.30
29525	DBMW-14	57.0-57.5	1.10%	8.29

A handwritten signature in black ink, reading "Robert L. Samuels".

LABORATORY MANAGER

Moisture Density							
Project Name	BRC AQUIFER TESTING			Date	07/11/07		
Project Number	83173	Phase No.	12	Tested By	JLW	Checked By	JH
Lab Number	29525						
Boring Number	DBMW-14	DBMW-14					
Sample Depth	44 - 45'	57 - 57.5'					
Height (inches)	3.51						
Diameter (inches)	5.07						
Volume	0.0410						
Wt. of Sample							
At Field Moisture	1843.20						
Wet Density (pcf)	99.1						
Dry Density (pcf)	61.3						
Container No.							
Wt. of Wet Sample Plus Tare	888.20	512.40					
Wt. of Dry Sample Plus Tare	646.30	440.80					
Tare (g)	254.20	237.50					
Dry Wt. Of Sample (g)	392.10	203.30					
Moisture Content, %	61.7%	35.2%					

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-14@44-45'; S-29525 @ 40.0 - 45.0'

August 27, 2007

Silt (ML)

Specific Gravity = 2.54

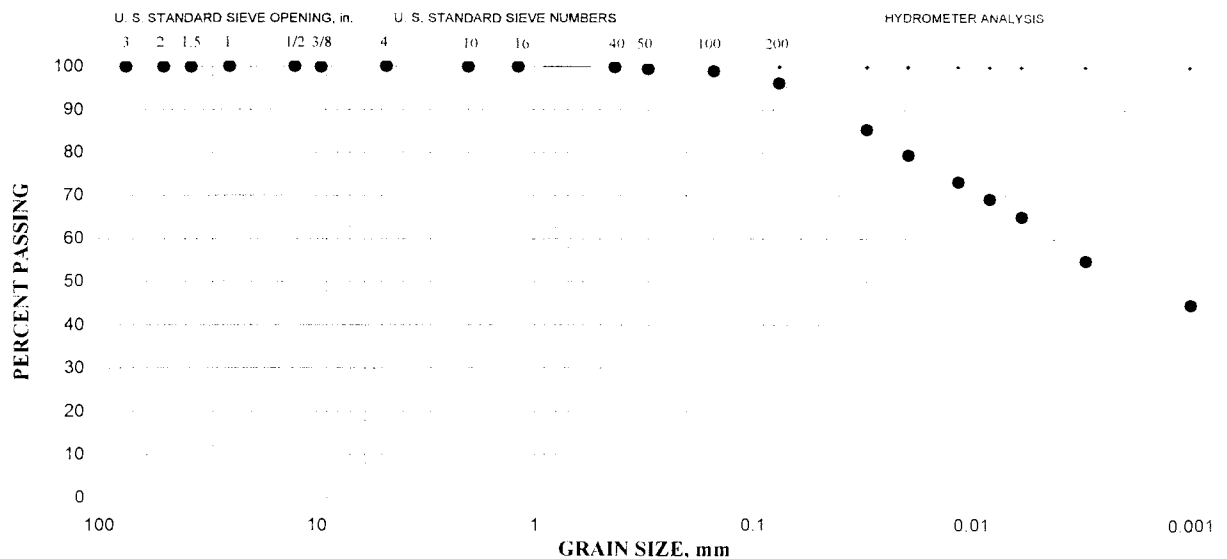
LL = ; PL = ; PI =

Gravel = 0%; Sand = 4%; Silt = 41%; Clay = 55%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425-μm)	0	100
#50 (300-μm)	1	99
#100 (150-μm)	1	99
#200 (75-μm)	4	96

Hydrometer Analysis

30-μm	85
19-μm	79
11-μm	73
8-μm	69
6-μm	65
3.0-μm	55
Colloids (<1-μm)	45



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29525
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW-14	Tested By =>	JLW
	44 - 45'	Reviewed By =>	JH

Pan Label =>	DEER	
Tare Weight of Pan =>	254.2	A
Wet Wt. of Sample & Tare =>	888.2	B
Dry Wt. of Sample & Tare =>	646.3	C
Weight of Moisture (B-C) =>	241.9	D
Dry Wt. of Sample (C-A) =>	392.1	E
Percent Moisture (D/E)*100 =>	61.7	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

Project No.: 83173-12

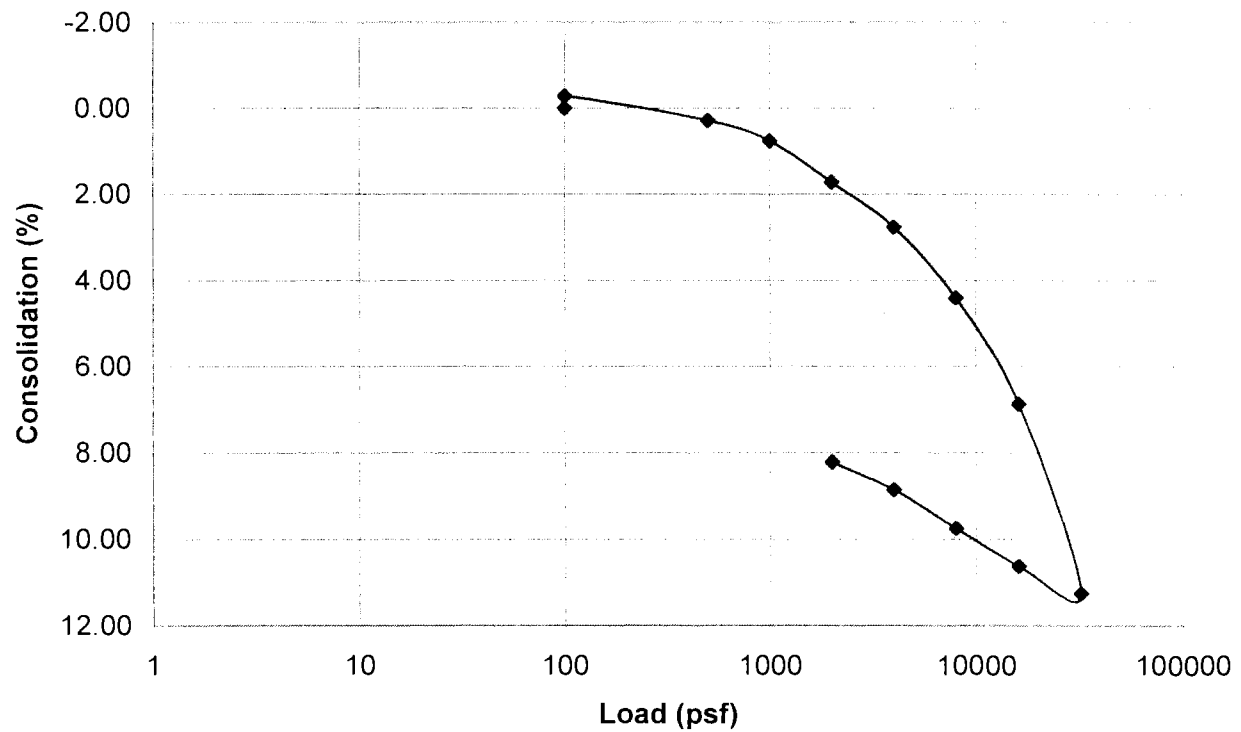
08/07/07

Sample No.: 29525
Sample Depth (ft.): DBMW-14 @ 44 - 45'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	0.00
100	-0.28
500	0.28
1000	0.75
2000	1.72
4000	2.76
8000	4.41
16000	6.87
32000	11.26
16000	10.62
8000	9.74
4000	8.85
2000	8.22

DBMW-14 @ 44 - 45'



PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29525
 BORING: DBMW-14
 DEPTH: 44 - 45'
 DATE: 08/07/08
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	W
Mass of Pycnometer, $M_f \Rightarrow$	169.2
Mass of Pycnometer & Water, $M_a \Rightarrow$	667.54
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	20.3
Mass of Speciman & Pycnometer $\Rightarrow$	219.67
Mass of Pycnometer, $M_f \Rightarrow$	169.2
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	50.47
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	698.13
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	20

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99814
Water Density at T_b	0.99821
K Factor at T_b	1
 M_a at T_b	 169.2348838
Sp Gr at T_b	2.538732394
Sp Gr at 20 C	2.538732394
 SPECIFIC GRAVITY AT 20 C	 2.538732394

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-14@57-57.5'; S-29525 @ 55.0 - 60.0'

August 27, 2007

Silt (ML)

Specific Gravity = 2.59

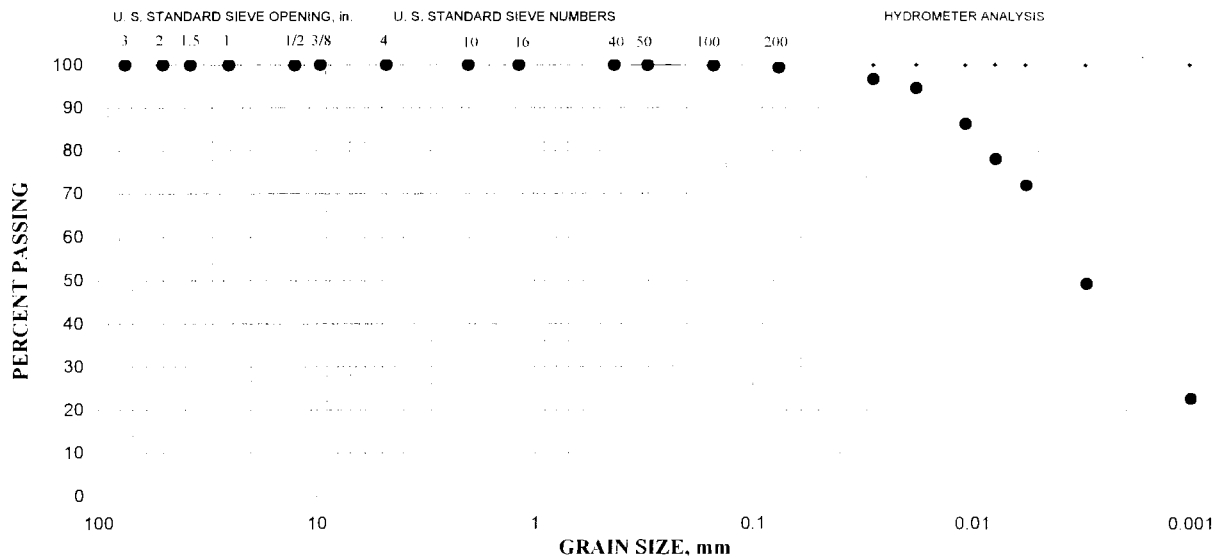
LL = ; PL = ; PI =

Gravel = 0%; Sand = 1%; Silt = 50%; Clay = 49%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425-μm)	0	100
#50 (300-μm)	0	100
#100 (150-μm)	0	100
#200 (75-μm)	1	99

Hydrometer Analysis

28-μm	97
18-μm	95
11-μm	86
8-μm	78
6-μm	72
3.0-μm	49
Colloids (<1-μm)	23



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29525
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW-14	Tested By =>	JLW
	57 - 57.5'	Reviewed By =>	JH

Pan Label =>	WALK ON	
Tare Weight of Pan =>	237.5	A
Wet Wt. of Sample & Tare =>	512.4	B
Dry Wt. of Sample & Tare =>	440.8	C
Weight of Moisture (B-C) =>	71.6	D
Dry Wt. of Sample (C-A) =>	203.3	E
Percent Moisture (D/E)*100 =>	35.2	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
3/4"	500 to 1000 gms
1 1/2"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29525
 BORING: DBMW-14
 DEPTH: 57 - 57.5'
 DATE: 08/07/08
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Z
Mass of Pycnometer, $M_f \Rightarrow$	220.94
Mass of Pycnometer & Water, $M_a \Rightarrow$	719.4
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	20.4
Mass of Speciman & Pycnometer $\Rightarrow$	266.57
Mass of Pycnometer, $M_f \Rightarrow$	220.91
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	45.66
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	747.42
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	20

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99812
Water Density at T_b	0.99821
K Factor at T_b	1

M_a at T_b	220.9848614
Sp Gr at T_b	2.588435374
Sp Gr at 20 C	2.588435374

SPECIFIC GRAVITY AT 20 C	2.588435374
--------------------------	-------------

LABORATORY WORK ORDER

29525



Project No: 03173 Phase: 12
 Project Name: BRL ADD. FOR TEST / NO WORK
 Client Name: BRL
 Client Ref./P.O.#: _____
 Special Instructions: _____

Sample Number: D3mw-14 ~~45-45~~ ☒ Requested Test
" 46-45 ☒ Test in Progress
" 45-46.5 ☒ Test Completed
" 55-60
" 65-66.5

Date Sampled: 7-10-07
 Date Received: 7/10/07
 Date Needed: _____
 Date Completed: 8/13/07
 Verified By: _____

ASPHALT TESTING				
Usage	Qty.	99#	Status	
C123 Lt Wt Pieces/Agg		990715		
C127 Absorption/Gravity	<u>2</u>	990712 <u>0307</u>	<u>X</u>	
CAL 205 Crushed Part		990712		
CAL 227 Cleaness TST		990711		
Clay Lumps/Friabl Part C-142		990714		
D2726 Weight/Absorption Core		991110		
Extract Bitumin D1856, 2172.310		991102		
Flat/Elong Part/Sieve 119, 120		990713		
Hveem Stability/Set of 3		991147		
Ignition Oven Calibration		996156		
Injurious Organic Matter C-40		990701		
LA Rattler CAL131		990706		
Lottman Test		991121		
Marshall Stab/Flow D-1599 (Set of 3)/Lab		991108		
Max Theoretical Specific Gravity D-2041		991112		
Methylene Blue Test		990132		
Microwave Asphalt Moist Content		996137		
Oil Content By Ignition Oven		996153		
Sand Equivalent C217		990308		
Specific Gravity C127/8 D854		990211		
Stabil Test/Premix Sample CAL 366		991104		
Unit Weight C29		990704		

MISC. OTHER				
Usage	Qty.	99#	Status	
Chloride Analysis		996020		
Corrosivity Analysis		991508		
Corrosivity, Resistivity, Sodium Sulfate, Solubility, p11*		990324		
pH Test		990319		
Sulfate Analysis		992090		
Unit Weight Fireproofing		991314		

CONCRETE & MASONRY TESTING				
Usage	Qty.	99#	Status	
C942 Grout Strength (cylinder/prism strength)		990119		
Compressive Test 12x8x16 Prisms (12" width)		991005		
Compressive Test 8x8x16 Prisms (8" width)		991003		
Compressive Test/Cored Spec		990809		
Concrete Compressive Test		990803		
Drying Shrinkage (Set OF 3) C-157, CAL-530		990811		
Flex and Strength/Concrete Beam		990806		
Mortar Strength C-109		990118		

SOILS TESTING				
Usage	Qty.	99#	Status	
ASTM D1557 6" Method B, C and D		990104		
CBR 100% Compaction D1883, T180		990209		
Check Point		990106		
Collapse Potential		990614		
Consolidation W/O time Rate/6 LD D2435	<u>1</u>	990613	<u>X</u>	
Correct Oversize Material in Sample CAL301		990203		
Direct Shear 1 Point		990608		
Direct Shear 3 Point		990609		
Harvard Miniature		992191		
Hydrometer Only	<u>2</u>	990305	<u>X</u>	
Moisture Determination Only	<u>2</u>	990317	<u>X</u>	
Moisture Determination/Unit Weight	<u>1</u>	990316	<u>X</u>	
Plasticity Index		990310		
Resistivity Analysis		990318		
R-Value/Untreated Material/Field Sample CAL 301		990201		
Sample Prep Materials		992508		
Sieve Analysis Wash #200 C117		990304		
Sieve Analysis/Course & Fine	<u>2</u>	990301	<u>X</u>	
Sulfate Sound (5) Sieve SZ C88		990708		
Swell Test FHA Specification (60 psi)		990312		
Unconfined Comp/Inc Moist D2166		990601		

Source: Soil Bureau
 Supplier: Burl
 Sample Location: D3mw-14
 Type of Material: Soil
 Sampled by: Davis
 Project Manager: C. Carter / E. Williams

FOR ACCOUNTING USE ONLY
 Entered By: _____ Date Entered: _____

☐ CCW ☐ CSD ☐ LWD ☐ AASHTO ☐ MDOT
☐ ASTM ☐ UBC



KLEINFELDER

An employee owned company

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: August 3, 2007
File: _____
Copies: _____

Subject: BRC Aquifer Testing: Flexible and Rigid Wall Testing

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
 ☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-16@ 110-111.5'	07/20/07	29617	08/03/07
DBMW-17@ 70-71.5'	07/18/07	29619	08/03/07
DBMW-17@ 75-76.5'	07/18/07	29619	08/03/07
DBMW-16@ 100-101.5'	07/20/07	29617	08/03/07
DBMW- 15@ 45-46.5'	07/16/07	29616	08/03/07
DBMW-15 @ 65-66.5'	07/16/07	29616	08/03/07

If you have any questions please don't hesitate to call.

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14560(b)

DATE: August 9, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29616

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29616	DBMW-15	40.0-40.5	1.80%	7.77
29616	DBMW-15	64.5-65.0	1.50%	8.31

A handwritten signature in black ink, reading "Robert L. Summers".
LABORATORY MANAGER

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-15@40-40.5'; S-29616 @ 40.0 - 45.0'

August 27, 2007

Silt (ML)

Specific Gravity = 2.45 (assumed)

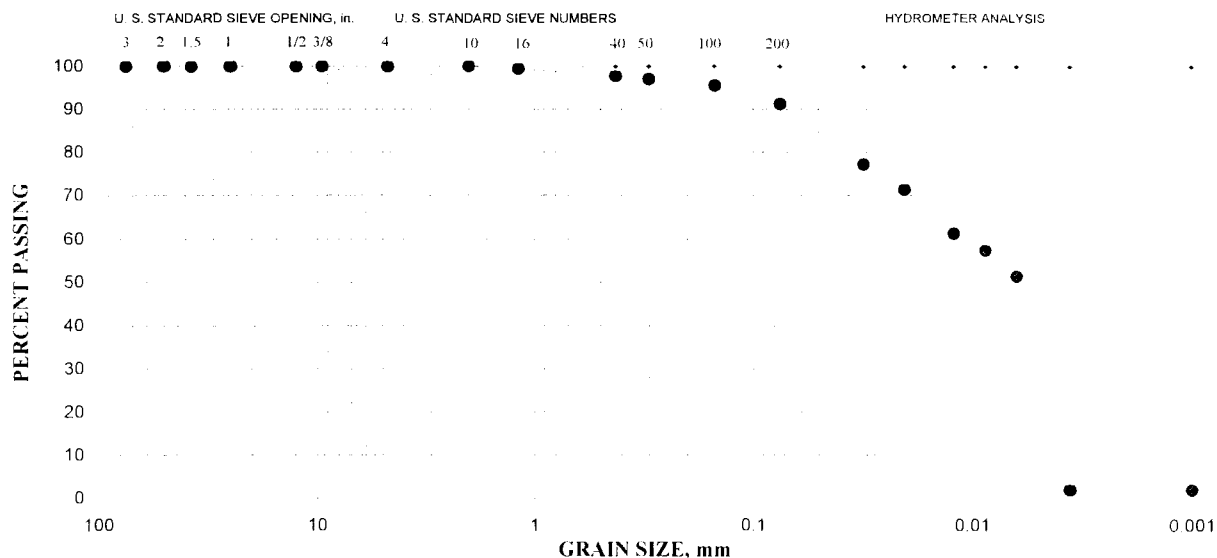
LL = ; PL = ; PI =

Gravel = 0%; Sand = 9%; Silt = 89%; Clay = 2%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	1	99
#40 (425- μ m)	2	98
#50 (300- μ m)	3	97
#100 (150- μ m)	5	95
#200 (75- μ m)	9	91

Hydrometer Analysis

31- μ m	77
20- μ m	71
12- μ m	61
9- μ m	57
6- μ m	51
3.6- μ m	2
Colloids (<1- μ m)	2



PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29616
 BORING: DBMW-15
 DEPTH: 40 - 40.5
 DATE: 08/07/08
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Y
Mass of Pycnometer, Mf =>	224.41
Mass of Pycnometer & Water, Ma =>	722.89
Temperature of Water when Ma above was Taken, Ta =>	20.6
Mass of Speciman & Pycnometer =>	270.44
Mass of Pycnometer, Mf =>	224.39
Mass of Oven-Dry Specimen, Mo =>	46.04
Mass of Pycnometer, Soil & Water, Mb =>	749.96
Temperature of Water when Mb Above was Taken, Tb =>	20.2

Prodedure

Record the mass of a clean dry pycnometer, Mf
 Record the mass of the pyc. and distilled water at calibration mark, Ma
 Record the temperature of the water to the nearest .5° C, Ta
 Record Mass of Pyc & Water at Calibration Mark, Ma

Water Density at Ta	0.99808
Water Density at Tb	0.99816
K Factor at Tb	0.99996
Ma at Tb	224.4498784
Sp Gr at Tb	2.426989984
Sp Gr at 20 C	2.426892905
SPECIFIC GRAVITY AT 20 C	2.426892905

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29616
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW-15	Tested By =>	JLW
	40 - 40.5'	Reviewed By =>	JH

Pan Label =>	911	
Tare Weight of Pan =>	198.39	A
Wet Wt. of Sample & Tare =>	914.84	B
Dry Wt. of Sample & Tare =>	704.92	C
Weight of Moisture (B-C) =>	209.9	D
Dry Wt. of Sample (C-A) =>	506.53	E
Percent Moisture (D/E)*100 =>	41.4	F

Sieve Retaining More Than About Recommended Minimum Mass

10% of Sample	of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-15@64.5-65'; S-29616 @ 60.0 - 65.0'

August 27, 2007

Silt (ML)

Specific Gravity = 2.59

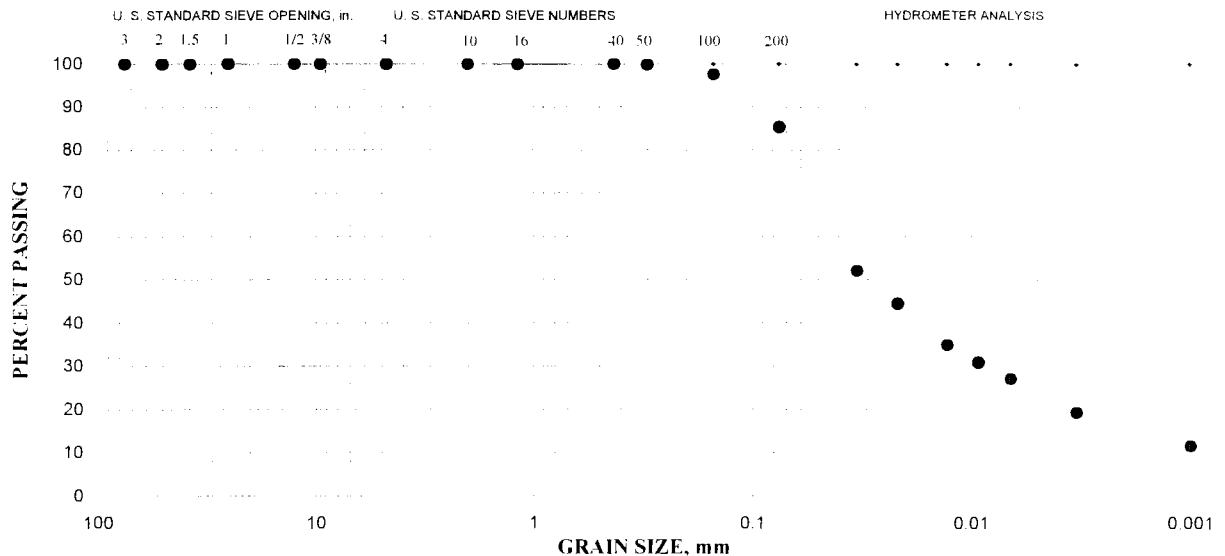
LL = ; PL = ; PI =

Gravel = 0%; Sand = 15%; Silt = 66%; Clay = 19%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425-μm)	0	100
#50 (300-μm)	0	100
#100 (150-μm)	2	98
#200 (75-μm)	15	85

Hydrometer Analysis

33-μm	52
22-μm	44
13-μm	35
9-μm	31
7-μm	27
3.3-μm	19
Colloids (<1-μm)	12



PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29616
 BORING: DBMW-15
 DEPTH: 64.5 - 65'
 DATE: 08/07/08
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	X
Mass of Pycnometer, Mf =>	220.89
Mass of Pycnometer & Water, Ma =>	719.22
Temperature of Water when Ma above was Taken, Ta =>	20.3
Mass of Speciman & Pycnometer =>	268.95
Mass of Pycnometer, Mf =>	220.89
Mass of Oven-Dry Specimen, Mo =>	48.06
Mass of Pycnometer, Soil & Water, Mb =>	748.7
Temperature of Water when Mb Above was Taken, Tb =>	20.3

Prodedure

Record the mass of a clean dry pycnometer, Mf
 Record the mass of the pyc. and distilled water at calibration mark, Ma
 Record the temperature of the water to the nearest .5° C, Ta
 Record Mass of Pyc & Water at Calibration Mark, Ma

Water Density at Ta	0.99814
Water Density at Tb	0.99814
K Factor at Tb	0.99994
Ma at Tb	220.89
Sp Gr at Tb	2.586652314
Sp Gr at 20 C	2.586497115
SPECIFIC GRAVITY AT 20 C	2.586497115

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29616
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW-15	Tested By =>	JLW
	64.5 - 65'	Reviewed By =>	JH

Pan Label =>	WALK ON	
Tare Weight of Pan =>	237.54	A
Wet Wt. of Sample & Tare =>	833.33	B
Dry Wt. of Sample & Tare =>	692.17	C
Weight of Moisture (B-C) =>	141.2	D
Dry Wt. of Sample (C-A) =>	454.63	E
Percent Moisture (D/E)*100 =>	31.0	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

LABORATORY WORK ORDER



Project No: 93173 Phase: 12
 Project Name: B2C ADJUTANT / NO WORKS
 Client Name: B2C
 Client Ref./P.O.#: _____
 Special Instructions: _____

Sample Number: DBM-15 40-45
" 45-46.5
" 60-65
" 65-66.5
29616

SAMPLE STATUS
☐ Requested Test
☒ Test in Progress
☒ Test Completed

Date Sampled: 7-16-07
 Date Received: 8/2/07
 Date Needed: _____
 Date Completed: 8/13/07
 Verified By: _____

ASPHALT TESTING				
Usage	Qty.	99#	Status	
C123 LI Wt Pieces/Agg		990715		
C127 Absorption/Gravity	<u>2</u>	<u>990702</u>	<u>990307</u>	<u>X</u>
CAL 205 Crushed Part		990712		
CAL 227 Cleanness TST		990711		
Clay Lumps/Friabl Part C-142		990714		
D2726 Weight/Absorption Core		991110		
Extract Bitumin D1856, 2172.310		991102		
Flat/Elong Part/Sieve 119, 120		990713		
Hveem Stability/Set of 3		991147		
Ignition Oven Calibration		996156		
Injurious Organic Matter C 40		990701		
LA Rattler CAL131		990706		
Lottman Test		991121		
Marshall Stab/Flow D-1599 (Set of 3)/Lab		991108		
Max Theoretical Specific Gravity D-2041		991112		
Methylene Blue Test		990132		
Microwave Asphalt Moist Content		996137		
Oil Content By Ignition Oven		996153		
Sand Equivalent C217		990308		
Specific Gravity C127/8 D854		990211		
Stabil Test/Premix Sample CAL 366		991104		
Unit Weight C29		990704		

MISC. OTHER				
Usage	Qty.	99#	Status	
Chloride Analysis		996020		
Corrosivity Analysis		991508		
Corrosivity, Resistivity, Sodium Sulfate, Solubility, p11*		990324		
pH Test		990319		
Sulfate Analysis		992090		
Unit Weight Fireproofing		991314		

CONCRETE & MASONRY TESTING				
Usage	Qty.	99#	Status	
C942 Grout Strength (cylinder/prism strength)		990119		
Compressive Test 12x8x16 Prisms (12" width)		991005		
Compressive Test 8x8x16 Prisms (8" width)		991003		
Compressive Test/Cored Spec		990809		
Concrete Compressive Test		990803		
Drying Shrinkage (Set OF 3) C-157, CAL-530		990811		
Flex and Strength/Concrete Beam		990806		
Mortar Strength C-109		990118		

SOILS TESTING				
Usage	Qty.	99#	Status	
ASTM D1557 6" Method B, C and D		990104		
CBR 100% Compaction D1883, T180		990209		
Check Point		990106		
Collapse Potential		990614		
Consolidation W/O time Rate/6 LD D2435		990613		
Correct Oversize Material in Sample CAL301		990203		
Direct Shear 1 Point		990608		
Direct Shear 3 Point		990609		
Harvard Miniature		992191		
Hydrometer Only	<u>2</u>	990305	<u>X</u>	
Moisture Determination Only	<u>2</u>	990317	<u>X</u>	
Moisture Determination/Unit Weight		990316		
Plasticity Index		990310		
Resistivity Analysis		990318		
R-Value/Untreated Material/Field Sample CAL 301		990201		
Sample Prep Materials		992508		
Sieve Analysis Wash #200 C117		990304		
Sieve Analysis/Course & Fine	<u>2</u>	990301	<u>X</u>	
Sulfate Sound (5) Sieve SZ C88		990708		
Swell Test FHA Specification (60 psi)		990312		
Unconfined Comp/Inc Moist D2166		990601		

Source: Soil Borehole
 Supplier: Boat
 Sample Location: DBM-15
 Type of Material: Soil
 Sampled by: DAVIS
 Project Manager: G. W. WILSON

FOR ACCOUNTING USE ONLY
 Entered By: _____ Date Entered: _____

CCPW ☐ CCSD ☐ LWD ☐ AASHTO ☐ NDOT ☐
 ASTM ☐ UBC ☐ Other ☐

By: Doug Davis

Date Due:

MOISTURES WERE LOW
TILTS
FOR VERIFICATION !!

2962



An employee owned company

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: August 3, 2007
File: _____
Copies: _____

Subject: BRC Aquifer Testing: Flexible and Rigid Wall Testing

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-5@ 20-21.5'	07/22/07	29629	08/09/07
DBMW-5@ 35-36.5'	07/22/07	29629	08/09/07
DBMW-18@ 55-56.5'	07/17/07	29621	08/09/07
DBMW-18@ 65-66.5'	07/17/07	29621	08/09/07
DBMW- 19@ 20-21.5'	07/24/07	29622	08/09/07
DBMW-19 @ 40-41.5'	07/24/07	29622	08/09/07
DBMW-4@15-16.5'	07/23/07	29628	08/09/07
DBMW-4@40-41.5'	07/23/07	29628	08/09/07

If you have any questions please don't hesitate to call.

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-13@62.5-63'; S-29621 @ 60.0 - 65.0'

August 27, 2007

Silt with Sand (ML)

Specific Gravity = 2.46

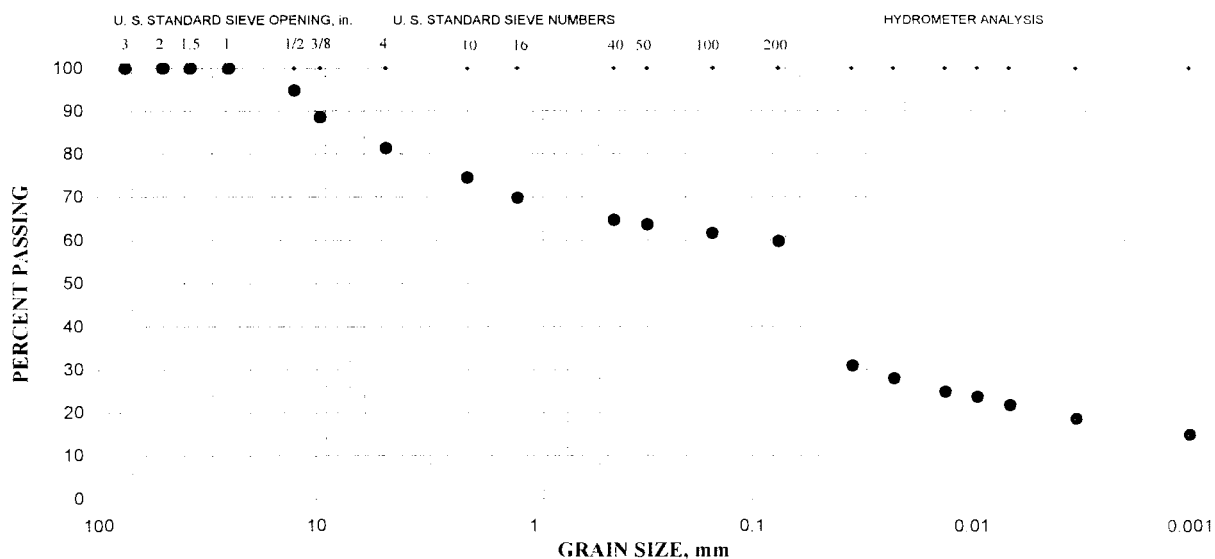
LL = ; PL = ; PI =

Gravel = 19%; Sand = 21%; Silt = 41%; Clay = 19%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	5	95
3/8" (9.5-mm)	11	89
#4 (4.75-mm)	19	81
#10 (2.00-mm)	26	74
#16 (1.18-mm)	30	70
#40 (425-μm)	35	65
#50 (300-μm)	36	64
#100 (150-μm)	38	62
#200 (75-μm)	40	60

Hydrometer Analysis

35-μm	31
22-μm	28
13-μm	25
9-μm	24
7-μm	22
3.3-μm	19
Colloids (<1-μm)	15



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29621
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW-18	Tested By =>	JLW
	62.5 - 63'	Reviewed By =>	JH

Pan Label =>	ASU	
Tare Weight of Pan =>	173.7	A
Wet Wt. of Sample & Tare =>	427.31	B
Dry Wt. of Sample & Tare =>	297.62	C
Weight of Moisture (B-C) =>	129.7	D
Dry Wt. of Sample (C-A) =>	123.92	E
Percent Moisture (D/E)*100 =>	104.7	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29621
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW-18	Tested By =>	JLW
	52 - 52.5'	Reviewed By =>	JH

Pan Label =>	12A	
Tare Weight of Pan =>	196.39	A
Wet Wt. of Sample & Tare =>	424.38	B
Dry Wt. of Sample & Tare =>	312.68	C
Weight of Moisture (B-C) =>	111.7	D
Dry Wt. of Sample (C-A) =>	116.29	E
Percent Moisture (D/E)*100 =>	96.1	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29621
 BORING: DBMW-18
 DEPTH: 62.5 - 63'
 DATE: 08/13/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Y
Mass of Pycnometer, $M_f \Rightarrow$	220.39
Mass of Pycnometer & Water, $M_a \Rightarrow$	722.72
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	19.2
Mass of Speciman & Pycnometer $\Rightarrow$	259.11
Mass of Pycnometer, $M_f \Rightarrow$	224.38
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	34.73
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	743.35
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	19.9

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99837
Water Density at T_b	0.99823
K Factor at T_b	1.00002
M_a at T_b	220.3196738
Sp Gr at T_b	2.463120567
Sp Gr at 20 C	2.46316983
SPECIFIC GRAVITY AT 20 C	2.46316983

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29621
 BORING: DBMW-18
 DEPTH: 52 - 52.5'
 DATE: 08/13/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	X
Mass of Pycnometer, Mf =>	220.89
Mass of Pycnometer & Water, Ma =>	719.23
Temperature of Water when Ma above was Taken, Ta =>	20.3
Mass of Speciman & Pycnometer =>	268.78
Mass of Pycnometer, Mf =>	220.88
Mass of Oven-Dry Specimen, Mo =>	47.9
Mass of Pycnometer, Soil & Water, Mb =>	747.64
Temperature of Water when Mb Above was Taken, Tb =>	19.9

Prodedure

Record the mass of a clean dry pycnometer, Mf
 Record the mass of the pyc. and distilled water at calibration mark, Ma
 Record the temperature of the water to the nearest .5° C, Ta
 Record Mass of Pyc & Water at Calibration Mark, Ma

Water Density at Ta	0.99814
Water Density at Tb	0.99823
K Factor at Tb	1.00002
Ma at Tb	220.9348506
Sp Gr at Tb	2.4576706
Sp Gr at 20 C	2.457719754
SPECIFIC GRAVITY AT 20 C	2.457719754

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14560(j)

DATE: August 14, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29621

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29621	DBMW-18	52.0-52.5	0.98%	7.99
29621	DBMW-18	62.5-63.0	0.98%	8.31


LABORATORY MANAGER

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-13@54.5-55'; S-29621 @ 50.0 - 55.0'

August 27, 2007

Silt (ML)

Specific Gravity = 2.46

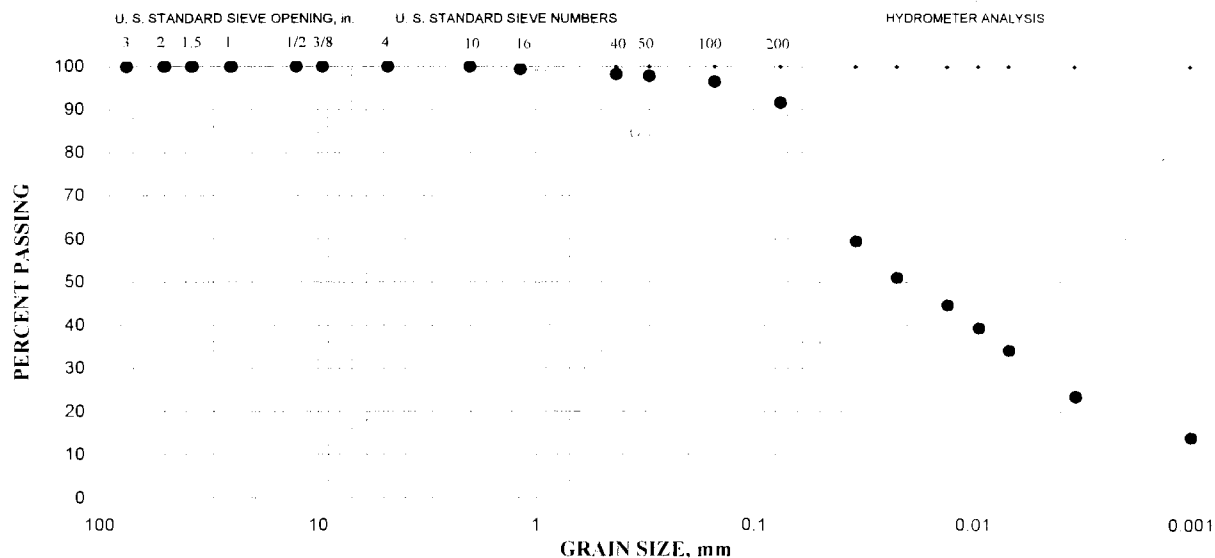
LL = ; PL = ; PI =

Gravel = 0%; Sand = 8%; Silt = 69%; Clay = 23%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	1	99
#40 (425-μm)	2	98
#50 (300-μm)	2	98
#100 (150-μm)	3	97
#200 (75-μm)	8	92

Hydrometer Analysis

34-μm	60
22-μm	51
13-μm	45
9-μm	39
7-μm	34
3.4-μm	23
Colloids (<1-μm)	14



LABORATORY WORK ORDER

29621



KLEINFELDER

Project No: 83173 Phase: 12
 Project Name: BRL AQU. FOR TEST / NEW WELLS
 Client Name: BRL
 Client Ref./P.O.#: _____
 Special Instructions: _____

Sample Number: DBMW-18 50-55 ☒ Requested Test
" 55-56.5 ☒ Test in Progress
DBMW-18 60-65 ☒ Test Completed
" 65-66.5

Date Sampled: 7-17-07, 7/19/07
 Date Received: 7/19/07
 Date Needed: ASAP
 Date Completed: 8/27/07
 Verified By: JA

ASPHALT TESTING				
Usage	Qty.	99#	Status	
C123 Lt Wt Pieces/Agg		990715		
C127 Absorption/Gravity	<u>2</u>	990702 <u>990307</u>		
CAL 205 Crushed Part		990712		
CAL 227 Cleaness TST		990711		
Clay Lumps/Friabl Part C-142		990714		
D2726 Weight/Absorption Core		991110		
Extract Bitumin D1856, 2172.310		991102		
Flat/Elong Part/Sieve 119, 120		990713		
Hveem Stability/Set of 3		991147		
Ignition Oven Calibration		996156		
Injurious Organic Matter C-40		990701		
LA Rattler CAL131		990706		
Lottman Test		991121		
Marshall Stab/Flow D-1599 (Set of 3)/Lab		991108		
Max Theoretical Specific Gravity D-2041		991112		
Methylene Blue Test		990132		
Microwave Asphalt Moist Content		996137		
Oil Content By Ignition Oven		996153		
Sand Equivalent C217		990308		
Specific Gravity C127/8 D854		990211		
Stabil Test/Premix Sample CAL 366		991104		
Unit Weight C29		990704		

MISC. OTHER				
Usage	Qty.	99#	Status	
Chloride Analysis		996020		
Corrosivity Analysis		991508		
Corrosivity Resistivity Sodium Sulfate, Solubility, p11*		990324		
pH Test		990319		
Sulfate Analysis		992090		
Unit Weight Fireproofing		991314		

CONCRETE & MASONRY TESTING				
Usage	Qty.	99#	Status	
C942 Grout Strength (cylinder/prism strength)		990119		
Compressive Test 12x8x16 Prisms (12" width)		991005		
Compressive Test 8x8x16 Prisms (8" width)		991003		
Compressive Test/Cored Spec		990809		
Concrete Compressive Test		990803		
Drying Shrinkage (Set OF 3) C-157, CAL-530		990811		
Flex and Strength/Concrete Beam		990806		
Mortar Strength C-109		990118		

SOILS TESTING				
Usage	Qty.	99#	Status	
ASTM D1557 6" Method B, C and D		990104		
CBR 100% Compaction D1883, T180		990209		
Check Point		990106		
Collapse Potential		990614		
Consolidation W/O time Rate/6 LD D2435		990613		
Correct Oversize Material in Sample CAL301		990203		
Direct Shear 1 Point		990608		
Direct Shear 3 Point		990609		
Harvard Miniature		992191		
Hydrometer Only	<u>2</u>	990305	<u>XX</u>	
Moisture Determination Only	<u>2</u>	990317	<u>XX</u>	
Moisture Determination/Unit Weight		990316		
Plasticity Index		990310		
Resistivity Analysis		990318		
R-Value/Untreated Material/Field Sample CAL 301		990201		
Sample Prep Materials		992508		
Sieve Analysis Wash #200 C117		990304		
Sieve Analysis/Course & Fine	<u>2</u>	990301	<u>XX</u>	
Sulfate Sound (5) Sieve SZ C88		990708		
Swell Test FHA Specification (60 psi)		990312		
Unconfined Comp/Inc Moist D2166		990601		

Source: SOIL BORING
 Supplier: BOART
 Sample Location: DBMW-18
 Type of Material: SOIL
 Sampled by: DAVIS
 Project Manager: CALTEX / W. R. MAN

FOR ACCOUNTING USE ONLY
 Date Entered: _____
 Entered By: _____

CCPW ☒ LLWD ☐ AASHTO ☐ NDOT
 CSD ☐ UBC ☐

By: Doug Davis

Date Due:

29/6/97



KLEINFELDER

An employee owned company

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: August 3, 2007
File: _____
Copies: _____

Subject: BRC Aquifer Testing: Flexible and Rigid Wall Testing

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-16@ 110-111.5'	07/20/07	29617	08/03/07
DBMW-17@ 70-71.5'	07/18/07	29619	08/03/07
DBMW-17@ 75-76.5'	07/18/07	29619	08/03/07
DBMW-16@ 100-101.5'	07/20/07	29617	08/03/07
DBMW- 15@ 45-46.5'	07/16/07	29616	08/03/07
DBMW-15 @ 65-66.5'	07/16/07	29616	08/03/07

If you have any questions please don't hesitate to call.

Moisture Density							
Project Name	BRC AQUIFER TESTING			Date	08/03/07		
Project Number	83173	Phase No.	12	Tested By	JLW	Checked By	JH
Lab Number	29619						
Boring Number	DBMW-17	DBMW-17					
Sample Depth	72 - 72.5'	66.5 - 67.5					
Height (inches)	2.41	5.22					
Diameter (inches)	2.45	7.27					
Volume	0.0065	0.09					
Wt. of Sample At Field Moisture	261.50	4692.50					
Wet Density (pcf)	88.7	114.9					
Dry Density (pcf)	58.8	84.2					
Container No.							
Wt. of Wet Sample Plus Tare	989.50	2493.70					
Wt. of Dry Sample Plus Tare	785.70	1943.20					
Tare (g)	384.30	438.30					
Dry Wt. Of Sample (g)	401.40	1504.90					
Moisture Content, %	50.8%	36.6%					

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14560(d)

DATE: August 10, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29619

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29619	DBMW-17	66.5-67.5	0.07%	8.72
29619	DBMW-17	72.0-72.5	0.12%	8.67

Robert L. Saunders

LABORATORY MANAGER

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-17@66.5-67.5'; S-29619 @ 65.0 - 70.0'

July 2, 2007

Silt (ML)

Specific Gravity = 2.61

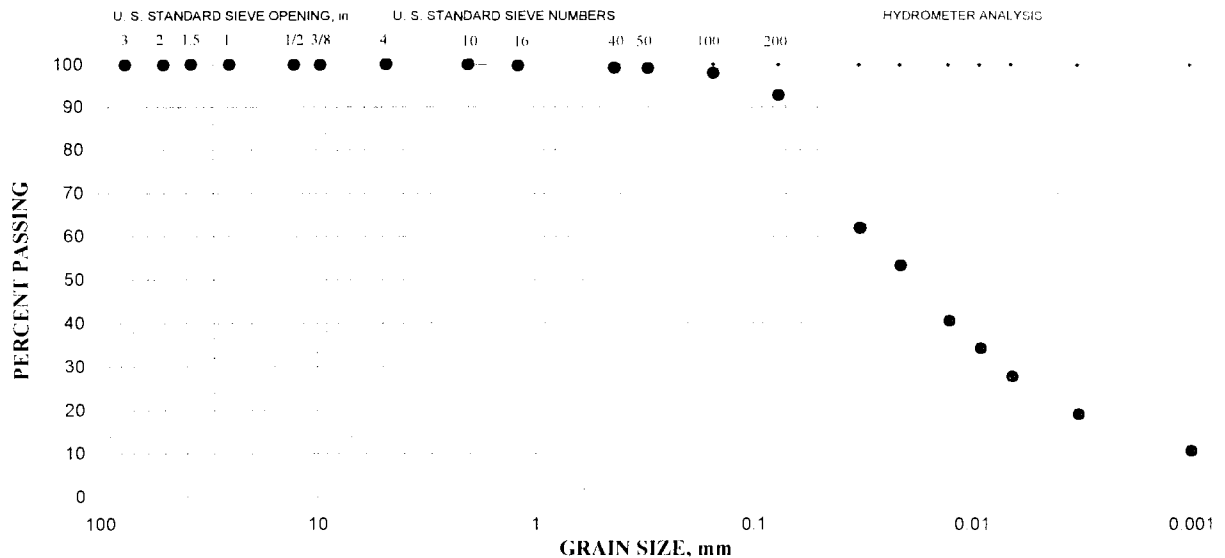
LL = ; PL = ; PI =

Gravel = 0%; Sand = 7%; Silt = 74%; Clay = 19%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425- μ m)	1	99
#50 (300- μ m)	1	99
#100 (150- μ m)	2	98
#200 (75- μ m)	7	93

Hydrometer Analysis

32- μ m	62
21- μ m	53
13- μ m	41
9- μ m	34
7- μ m	28
3.2- μ m	19
Colloids (<1- μ m)	11



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29619
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW-17	Tested By =>	JLW
	66.5 - 67.5'	Reviewed By =>	JH

Pan Label =>	23	
Tare Weight of Pan =>	438.28	A
Wet Wt. of Sample & Tare =>	2493.66	B
Dry Wt. of Sample & Tare =>	1943.2	C
Weight of Moisture (B-C) =>	550.5	D
Dry Wt. of Sample (C-A) =>	1504.92	E
Percent Moisture (D/E)*100 =>	36.6	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29619
 BORING: DBMW-17
 DEPTH: 66.5 - 67.5'
 DATE: 08/10/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Z
Mass of Pycnometer, Mf =>	220.94
Mass of Pycnometer & Water, Ma =>	719.1
Temperature of Water when Ma above was Taken, Ta =>	20.4
Mass of Speciman & Pycnometer =>	267.93
Mass of Pycnometer, Mf =>	220.91
Mass of Oven-Dry Specimen, Mo =>	47.02
Mass of Pycnometer, Soil & Water, Mb =>	748.07
Temperature of Water when Mb Above was Taken, Tb =>	20.2

Prodedure

Record the mass of a clean dry pycnometer, Mf
 Record the mass of the pyc. and distilled water at calibration mark, Ma
 Record the temperature of the water to the nearest .5° C, Ta
 Record Mass of Pyc & Water at Calibration Mark, Ma

Water Density at Ta	0.99814
Water Density at Tb	0.99816
K Factor at Tb	0.99996

Ma at Tb	220.9499632
Sp Gr at Tb	2.60498615
Sp Gr at 20 C	2.60488195

SPECIFIC GRAVITY AT 20 C	2.60488195
--------------------------	------------

One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

Project No.: 83173-12

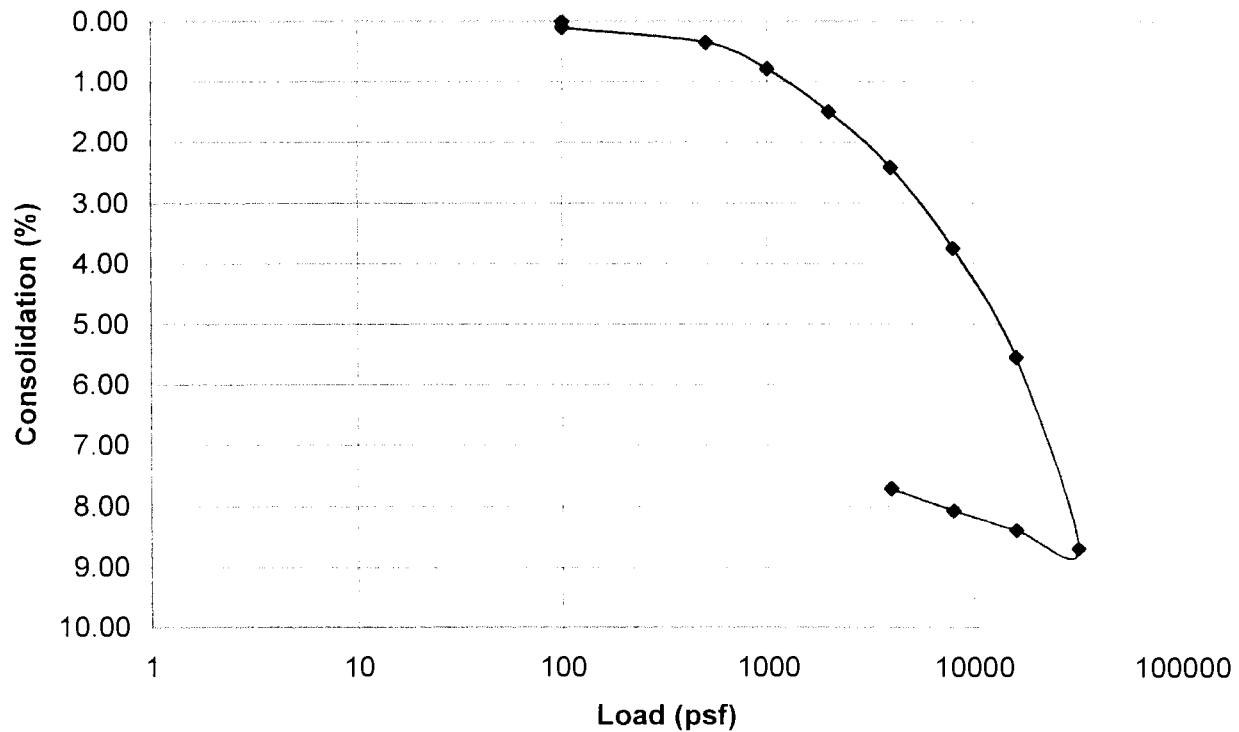
08/09/07

Sample No.: 29619
Sample Depth (ft.): DBMW-17 @ 66.5 - 67.5'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	0.00
100	0.10
500	0.35
1000	0.79
2000	1.50
4000	2.41
8000	3.75
16000	5.55
32000	8.69
16000	8.39
8000	8.07
4000	7.71

DBMW-17 @ 66.5 - 67.5'



PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-17@72-72.5'; S-29619 @ 70.0 - 75.0'

July 2, 2007

Silt with Sand (ML)

Specific Gravity = 2.61

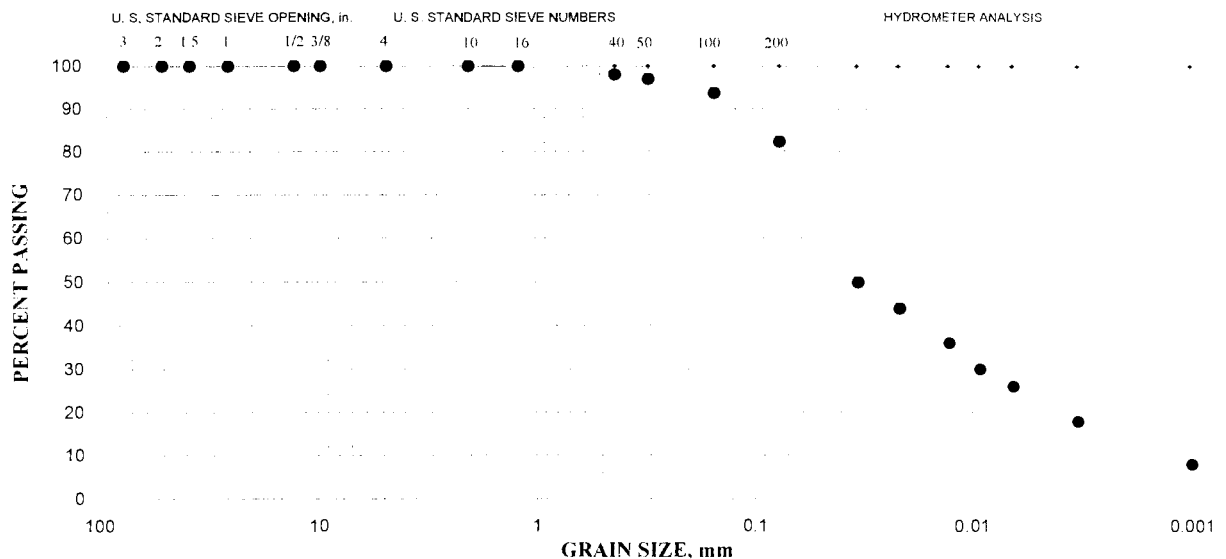
LL = ; PL = ; PI =

Gravel = 0%; Sand = 18%; Silt = 64%; Clay = 18%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425-μm)	2	98
#50 (300-μm)	3	97
#100 (150-μm)	6	94
#200 (75-μm)	18	82

Hydrometer Analysis

33-μm	50
21-μm	44
13-μm	36
9-μm	30
6-μm	26
3.2-μm	18
Colloids (<1-μm)	8



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29619
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW-17	Tested By =>	JLW
	72 - 72.5'	Reviewed By =>	JH

Pan Label =>	TRA	
Tare Weight of Pan =>	384.3	A
Wet Wt. of Sample & Tare =>	989.5	B
Dry Wt. of Sample & Tare =>	785.66	C
Weight of Moisture (B-C) =>	203.8	D
Dry Wt. of Sample (C-A) =>	401.36	E
Percent Moisture (D/E)*100 =>	50.8	F

Sieve Retaining More Than About	Recommended Minimum Mass
10% of Sample	of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29619
 BORING: DBMW-17
 DEPTH: 72 - 72.5'
 DATE: 08/10/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	W
Mass of Pycnometer, $M_f \Rightarrow$	169.2
Mass of Pycnometer & Water, $M_a \Rightarrow$	667.54
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	20.3
Mass of Speciman & Pycnometer $\Rightarrow$	216.13
Mass of Pycnometer, $M_f \Rightarrow$	169.18
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	46.95
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	696.47
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	20.2

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99814
Water Density at T_b	0.99816
K Factor at T_b	0.99996
 Ma at T_b	 169.2099668
Sp Gr at T_b	2.605438402
Sp Gr at 20 C	2.605334184
 SPECIFIC GRAVITY AT 20 C	 2.605334184

One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

Project No.: 83173-12

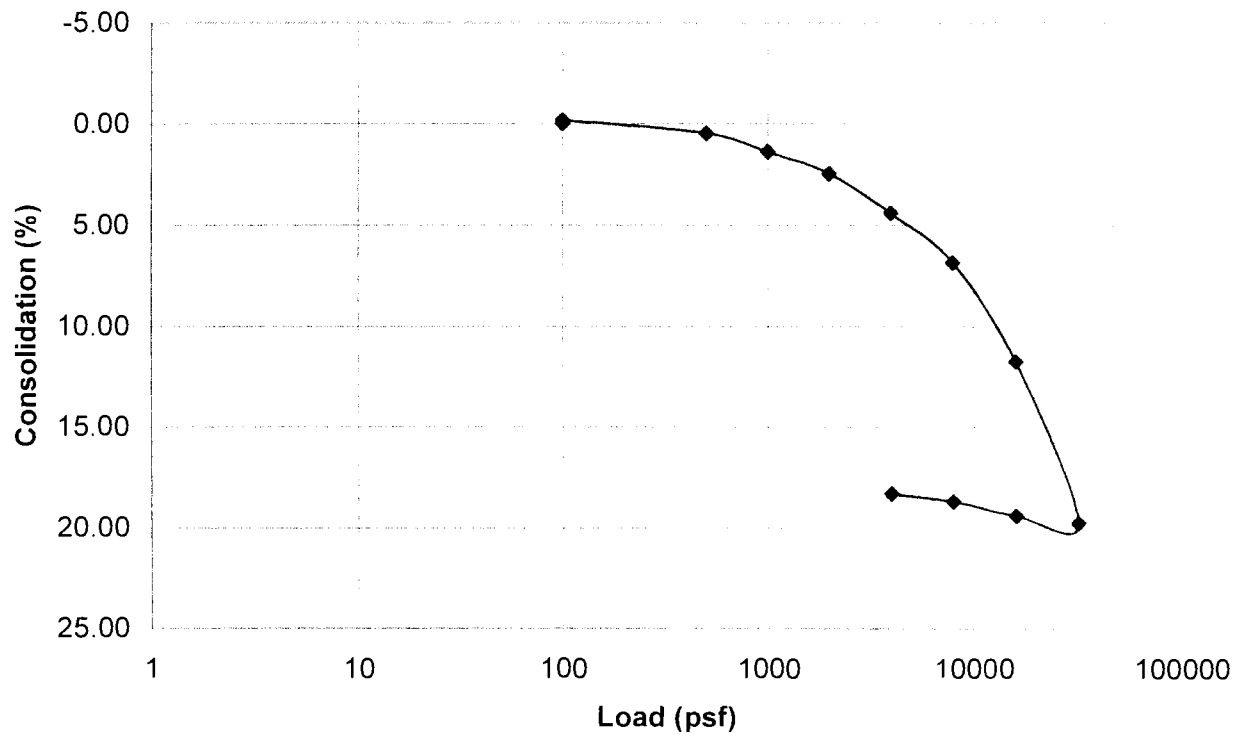
08/13/07

Sample No.: 29619
Sample Depth (ft.): DBMW-17 @ 72 - 72.5'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	0.00
100	-0.15
500	0.48
1000	1.39
2000	2.44
4000	4.40
8000	6.83
16000	11.75
32000	19.74
16000	19.40
8000	18.69
4000	18.31

DBMW-17 @ 72 - 72.5'



LABORATORY WORK ORDER

29619



Project No: 03173 Phase: 12
 Project Name: Bike Ave. for 7037 (No Walls)
 Client Name: _____
 Client Ref./P.O.#: _____
 Special Instructions: _____

Sample Number: DBMW-17 65-70
" 70-71.5
" 70-75
" 75-76.5

SAMPLE STATUS
☒ Requested Test
☒ Test in Progress
☒ Test Completed

Date Sampled: 7-18-07
 Date Received: (8/2/07)
 Date Needed: _____
 Date Completed: 8/13/07
 Verified By: _____

ASPHALT TESTING

Usage	Qty.	99#	Status
C123 Lt Wt Pieces/Agg		990715	
C127 Absorption/Gravity	<u>2</u>	<u>990702</u>	<u>PROG X</u>
CAL 205 Crushed Part		990712	
CAL 227 Cleaness TST		990711	
Clay Lumps/Friabl Part C-142		990714	
D2726 Weight/Absorption Core		991110	
Extract Bitumin D1856, 2172.310		991102	
Flat/Elong Part/Sieve 119, 120		990713	
Hveem Stability/Set of 3		991147	
Ignition Oven Calibration		996156	
Injurious Organic Matter C-40		990701	
LA Rattler CAL131		990706	
Lottman Test		991121	
Marshall Stab/Flow D-1599 (Set of 3)/Lab		991108	
Max Theoretical Specific Gravity D-2041		991112	
Methylene Blue Test		990132	
Microwave Asphalt Moist Content		996137	
Oil Content By Ignition Oven		996153	
Sand Equivalent C217		990308	
Specific Gravity C127/8 D854		990211	
Stabil Test/Premix Sample CAL 366		991104	
Unit Weight C29		990704	

MISC. OTHER

Usage	Qty.	99#	Status
Chloride Analysis		996020	
Corrosivity Analysis		991508	
Corrosivity, Resistivity, Sodium Sulfate, Solubility, p11 ^a		990324	
pH Test		990319	
Sulfate Analysis		992090	
Unit Weight Fireproofing		991314	

CONCRETE & MASONRY TESTING

Usage	Qty.	99#	Status
C942 Grout Strength (cylinder/prism strength)		990119	
Compressive Test 12x8x16 Prisms (12" width)		991005	
Compressive Test 8x8x16 Prisms (8" width)		991003	
Compressive Test/Cored Spec		990809	
Concrete Compressive Test		990803	
Drying Shrinkage (Set OF 3) C-157, CAL-530		990811	
Flex and Strength/Concrete Beam		990806	
Mortar Strength C-109		990118	

SOILS TESTING

Usage	Qty.	99#	Status
ASTM D1557 6" Method B, C and D		990104	
CBR 100% Compaction D1883, T180		990209	
Check Point		990106	
Collapse Potential		990614	
Consolidation W/O time Rate/6 LD D2435	<u>2</u>	<u>990613</u>	<u>X</u>
Correct Oversize Material in Sample CAL301		990203	
Direct Shear 1 Point		990608	
Direct Shear 3 Point		990609	
Harvard Miniature		992191	
Hydrometer Only	<u>2</u>	<u>990305</u>	<u>XX</u>
Moisture Determination Only	<u>2</u>	<u>990317</u>	<u>XX</u>
Moisture Determination/Unit Weight	<u>2</u>	<u>990316</u>	<u>XX</u>
Plasticity Index		990310	
Resistivity Analysis		990318	
R-Value/Untreated Material/Field Sample CAL 301		990201	
Sample Prep Materials		992508	
Sieve Analysis Wash #200 C117		990304	
Sieve Analysis/Course & Fine	<u>2</u>	<u>990301</u>	<u>X</u>
Sulfate Sound (5) Sieve SZ C88		990708	
Swell Test FHA Specification (60 psi)		990312	
Unconfined Comp/Inc Moist D2166		990601	

Source: SOIL BORING
 Supplier: BOAL7
 Sample Location: DBMW-17
 Type of Material: SOIL
 Sampled by: DAVIS
 Project Manager: CALTEX/W. TUMAN

FOR ACCOUNTING USE ONLY
 Entered By: _____ Date Entered: _____

NDOT
 LLWD
 AASHTO
 CCSD
 UBC
 CCPW
 ASTM
 Other

By: Doug Davis

Date Due:

LABORATORY NUMBER:

29617



KLEINFELDER

An employee owned company

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: August 3, 2007
File: _____
Copies: _____

Subject: **BRC Aquifer Testing: Flexible and Rigid Wall Testing**

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-16@ 110-111.5'	07/20/07	29617	08/03/07
DBMW-17@ 70-71.5'	07/18/07	29619	08/03/07
DBMW-17@ 75-76.5'	07/18/07	29619	08/03/07
DBMW-16@ 100-101.5'	07/20/07	29617	08/03/07
DBMW- 15@ 45-46.5'	07/16/07	29616	08/03/07
DBMW-15 @ 65-66.5'	07/16/07	29616	08/03/07

If you have any questions please don't hesitate to call.

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14560(c)

DATE: August 9, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29617

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29617	DBMW-16	92.5-95.0	0.60%	9.67
29617	DBMW-16	107.5-108.0	1.90%	8.66

A handwritten signature in black ink, reading "Robert L. Summers".

LABORATORY MANAGER

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-16@107.5-108'; S-29617 @ 105.0 - 110.0'

August 27, 2007

Silt (ML)

Specific Gravity = 2.59

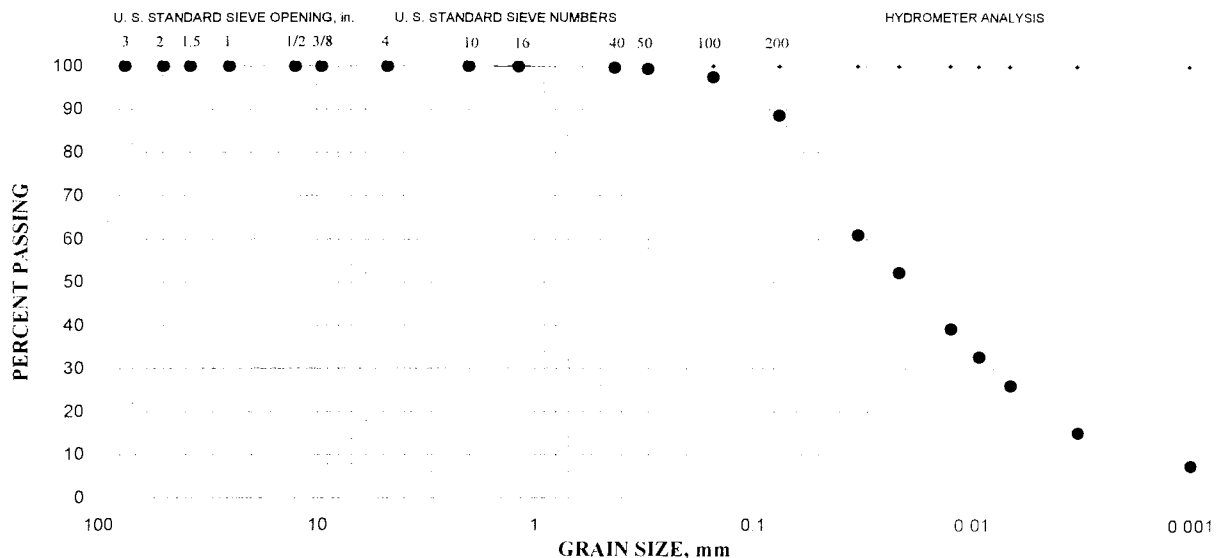
LL = ; PL = ; PI =

Gravel = 0%; Sand = 11%; Silt = 74%; Clay = 15%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425- μ m)	0	100
#50 (300- μ m)	1	99
#100 (150- μ m)	3	97
#200 (75- μ m)	11	89

Hydrometer Analysis

33- μ m	61
21- μ m	52
12- μ m	39
9- μ m	33
7- μ m	26
3.3- μ m	15
Colloids (<1- μ m)	8



Moisture Density							
Project Name	BRC AQUIFER TESTING				Date	08/03/07	
Project Number	83173	Phase No.	12	Tested By	JLW	Checked By	JH
Lab Number	29617						
Boring Number	DBMW-16						
Sample Depth	107.5 - 108'						
Height (inches)	1.83						
Diameter (inches)	5.01						
Volume	0.0209						
Wt. of Sample At Field Moisture	913.72						
Wet Density (pcf)	96.4						
Dry Density (pcf)	61.0						
Container No.							
Wt. of Wet Sample Plus Tare	573.50						
Wt. of Dry Sample Plus Tare	448.90						
Tare (g)	233.70						
Dry Wt. Of Sample (g)	215.20						
Moisture Content, %	57.9%						

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29617
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW-16	Tested By =>	JLW
	107.5 - 108'	Reviewed By =>	JH

Pan Label =>	PAC	
Tare Weight of Pan =>	233.65	A
Wet Wt. of Sample & Tare =>	573.46	B
Dry Wt. of Sample & Tare =>	448.88	C
Weight of Moisture (B-C) =>	124.6	D
Dry Wt. of Sample (C-A) =>	215.23	E
Percent Moisture (D/E)*100 =>	57.9	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29617
 BORING: DBMW-16
 DEPTH: 107.5 - 108'
 DATE: 08/08/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	X
Mass of Pycnometer, $M_f \Rightarrow$	220.89
Mass of Pycnometer & Water, $M_a \Rightarrow$	719.23
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	20.3
Mass of Speciman & Pycnometer $\Rightarrow$	267.63
Mass of Pycnometer, $M_f \Rightarrow$	220.88
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	46.75
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	747.94
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	20.5

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99814
Water Density at T_b	0.9981
K Factor at T_b	0.9999
M_a at T_b	220.8700664
Sp Gr at T_b	2.591463415
Sp Gr at 20 C	2.591204268
SPECIFIC GRAVITY AT 20 C	2.591204268

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-16@92.5-95'; S-29617 @ 90.0 - 95.0'

August 27, 2007

Silty Sand with Gravel (SM)

Specific Gravity = 2.61

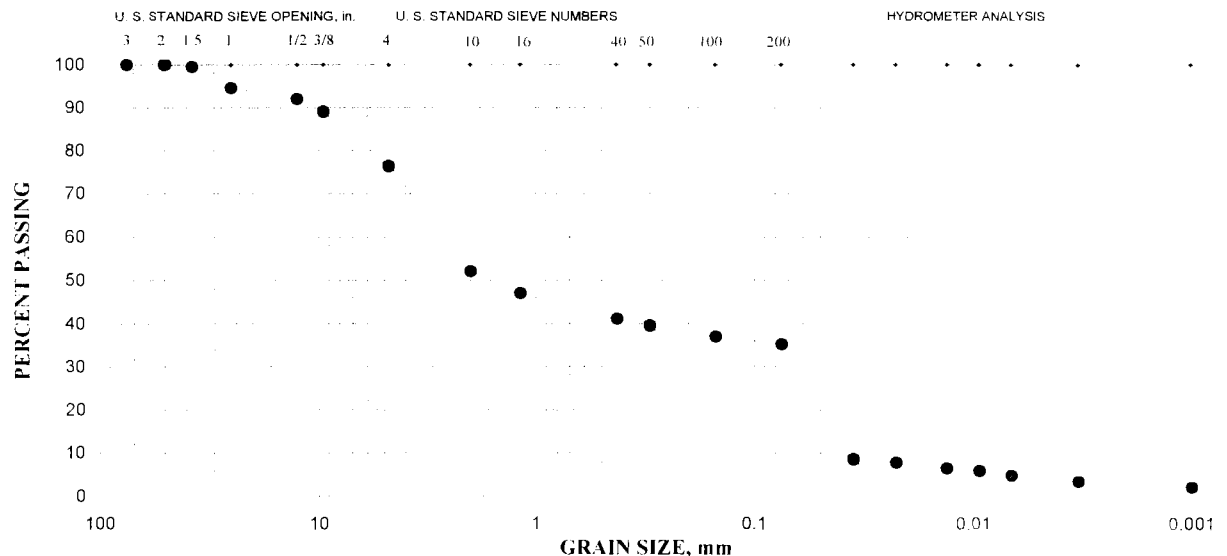
LL = ; PL = ; PI =

Gravel = 24%; Sand = 41%; Silt = 31%; Clay = 4%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	1	99
1" (25.0-mm)	5	95
1/2" (12.5-mm)	8	92
3/8" (9.5-mm)	11	89
#4 (4.75-mm)	24	76
#10 (2.00-mm)	48	52
#16 (1.18-mm)	53	47
#40 (425-μm)	59	41
#50 (300-μm)	60	40
#100 (150-μm)	63	37
#200 (75-μm)	65	35

Hydrometer Analysis

35-μm	9
23-μm	8
13-μm	6
9-μm	6
7-μm	5
3.3-μm	4
Colloids (<1-μm)	2



SPECIFIC GRAVITY OF COARSE AND FINE AGGREGATE ASTM 127 & 128

Job # =>	83173	Lab Number =>	29617
Project =>	BRC Aquifer Testing	Date Sampled =>	
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	
Sample Location =>	DBMW-16 @ 92.5 - 95'	Tested By =>	JLW
		Reviewed By =>	

COARSE AGGREGATE

Dry Wt. of Sample A=>	3237.3		
SSD Wt. of Sample B=>	3443.7		
Wt. SSD Under Water C=>	1990.3		Averages
Bulk Sp Gr. A/(B-C) =>	2.227		2.227
Bulk SSD B/(B-C) =>	2.369		2.369
Apparent Sp Gr A/(A-C) =>	2.596		2.596
Absorption ((B-A)/A)*100 =>	6.4		6.4

FINE AGGREGATE

Dry Wt. of Sample + Tare =>			X
Wt. of Tare =>			Y
Dry Wt. of Sample (X-Y) =>			A
Wt. of Pycnometer w/ Water =>			B
Wt. @ SSD (500 +/- 5 gms) =>			S
Wt. of Pycnometer w/ Sample =>			C Averages
Bulk Sp Gr. A/(B+S-C) =>			
Bulk SSD S/(B+S-C) =>			
Apparent Sp Gr A/(A+B-C) =>			
Absorption ((S-A)/A)*100 =>			
Pycnometer Label =>	A	B	

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29617
 BORING: DBMW-16
 DEPTH: 92.5 - 95'
 DATE: 08/07/08
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Z
Mass of Pycnometer, $M_f \Rightarrow$	220.94
Mass of Pycnometer & Water, $M_a \Rightarrow$	719.4
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	20.4
Mass of Speciman & Pycnometer $\Rightarrow$	303.65
Mass of Pycnometer, $M_f \Rightarrow$	220.89
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	82.76
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	770.47
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	20.1

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99812
Water Density at T_b	0.99819
K Factor at T_b	0.99998
 Ma at T_b	 220.9748922
Sp Gr at T_b	2.611549385
Sp Gr at 20 C	2.611497154
 SPECIFIC GRAVITY AT 20 C	 2.611497154

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29617
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW-16	Tested By =>	JLW
	92.5 - 95'	Reviewed By =>	JH

Pan Label =>	TRA	
Tare Weight of Pan =>	384.4	A
Wet Wt. of Sample & Tare =>	2291.7	B
Dry Wt. of Sample & Tare =>	2173.7	C
Weight of Moisture (B-C) =>	118.0	D
Dry Wt. of Sample (C-A) =>	1789.3	E
Percent Moisture (D/E)*100 =>	6.6	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

LABORATORY WORK ORDER



Project No: 03173 Phase: 12
 Project Name: BRL Aquifer Test / NO Wells
 Client Name: BRL
 Client Ref./P.O.#: _____
 Special Instructions: _____

Sample Number: DBMW-16 90-95
11 100-101.5
11 105-110
11 110-111.5

SAMPLE STATUS
☐ Requested Test
☒ Test in Progress
☒ Test Completed

Date Sampled: 1-20-07
 Date Received: (8/2/07)
 Date Needed: _____
 Date Completed: 8/15/07
 Verified By: _____

ASPHALT TESTING				
Usage	Qty.	99#	Status	
C123 Li Wt Pieces/Agg		990715		
C127 Absorption/Gravity	<u>3</u>	<u>990782</u>	<u>990307</u>	
CAL 205 Crushed Part		990712		
CAL 227 Cleanness TST		990711		
Clay Lumps/Friabl Part C-142		990714		
D2726 Weight/Absorption Core		991110		
Extract Bitumin D1856, 2172.310		991102		
Flat/Elong Part/Sieve 119, 120		990713		
Hveem Stability/Set of 3		991147		
Ignition Oven Calibration		996156		
Injurious Organic Matter C-40		990701		
LA Rattler CAL131		990706		
Lottman Test		991121		
Marshall Stab/Flow D-1599 (Set of 3)/Lab		991108		
Max Theoretical Specific Gravity D-2041		991112		
Methylene Blue Test		990132		
Microwave Asphalt Moist Content		996137		
Oil Content By Ignition Oven		996153		
Sand Equivalent C217		990308		
Specific Gravity C127/8 D854		990211		
Stabil Test/Premix Sample CAL 366		991104		
Unit Weight C29		990704		

MISC. OTHER				
Usage	Qty.	99#	Status	
Chloride Analysis		996020		
Corrosivity Analysis		991508		
Corrosivity, Resistivity, Sodium Sulfate, Solubility, p11 ⁺		990324		
pH Test		990319		
Sulfate Analysis		992090		
Unit Weight Fireproofing		991314		

CONCRETE & MASONRY TESTING				
Usage	Qty.	99#	Status	
C942 Grout Strength (cylinder/prism strength)		990119		
Compressive Test 12x8x16 Prisms (12" width)		991005		
Compressive Test 8x8x16 Prisms (8" width)		991003		
Compressive Test/Cored Spec		990809		
Concrete Compressive Test		990803		
Drying Shrinkage (Set OF 3) C-157, CAL-530		990811		
Flex and Strength/Concrete Beam		990806		
Mortar Strength C-109		990118		

SOILS TESTING				
Usage	Qty.	99#	Status	
ASTM D1557 6" Method B, C and D		990104		
CBR 100% Compaction D1883, T180		990209		
Check Point		990106		
Collapse Potential		990614		
Consolidation W/O time Rate/6 LD D2435		990613		
Correct Oversize Material in Sample CAL301		990203		
Direct Shear 1 Point		990608		
Direct Shear 3 Point		990609		
Harvard Miniature		992191		
Hydrometer Only	<u>2</u>	990305	<u>XX</u>	
Moisture Determination Only	<u>2</u>	990317	<u>XX</u>	
Moisture Determination/Unit Weight	<u>1</u>	990316	<u>XX</u>	
Plasticity Index		990310		
Resistivity Analysis		990318		
R-Value/Untreated Material/Field Sample CAL 301		990201		
Sample Prep Materials		992508		
Sieve Analysis Wash #200 C117		990304		
Sieve Analysis/Course & Fine	<u>2</u>	990301	<u>XX</u>	
Sulfate Sound (5) Sieve SZ C88		990708		
Swell Test FHA Specification (60 psi)		990312		
Unconfined Comp/Inc Moist D2166		990601		

Source: SOIL BORING
 Supplier: BOAL
 Sample Location: DBMW-16
 Type of Material: SOIL
 Sampled by: DAVIS
 Project Manager: CANTON, WILSON

FOR ACCOUNTING USE ONLY
 Entered By: _____ Date Entered: _____

☐ CPW
☒ ASTM
☐ Other
☐ CCSD
☐ UBC
☐ LLWD
☐ AASHTO
☐ NDOT

By: Doug Davis

Date Due:

29629

LABORATORY WORK ORDER

29629



Project No: 03173 Phase: 12
 Project Name: BRC Aquifer Test NE walls
 Client Name: BRC
 Client Ref./P.O.#: _____
 Special Instructions: _____

Sample Number: DBMW-S 20-21.5 ☐ Requested Test
" 20-25 ☒ Test in Progress
" 30-35 ☒ Test Completed
" 35-36.5

Date Sampled: 7-22-07
 Date Received: (8/8/07)
 Date Needed: _____
 Date Completed: _____
 Verified By: _____

ASPHALT TESTING				
Usage	Qty.	99#	Status	
C123 Lt Wt Pieces/Agg		990715		
C127 Absorption/Gravity	<u>2</u>	<u>990702</u>	<u>990307</u>	<u>(X)</u>
CAL 205 Crushed Part		990712		
CAL 227 Cleanness TST		990711		
Clay Lumps/Friabl Part C-142		990714		
D2726 Weight/Absorption Core		991110		
Extract Bitumin D1856, 2172.310		991102		
Flat/Elong Part/Sieve 119, 120		990713		
Hveem Stability/Set of 3		991147		
Ignition Oven Calibration		996156		
Injurious Organic Matter C-40		990701		
LA Rattler CAL131		990706		
Lottman Test		991121		
Marshall Stab/Flow D-1599 (Set of 3)/Lab		991108		
Max Theoretical Specific Gravity D-2041		991112		
Methylene Blue Test		990132		
Microwave Asphalt Moist Content		996137		
Oil Content By Ignition Oven		996153		
Sand Equivalent C217		990308		
Specific Gravity C127/8 D854		990211		
Stabil Test/Premix Sample CAL 366		991104		
Unit Weight C29		990704		

CONCRETE & MASONRY TESTING				
Usage	Qty.	99#	Status	
C942 Grout Strength (cylinder/prism strength)		990119		
Compressive Test 12x8x16 Prisms (12" width)		991005		
Compressive Test 8x8x16 Prisms (8" width)		991003		
Compressive Test/Cored Spec.		990809		
Concrete Compressive Test		990803		
Drying Shrinkage (Set OF 3) C-157, CAL-530		990811		
Flex and Strength/Concrete Beam		990806		
Mortar Strength C-109		990118		

SOILS TESTING				
Usage	Qty.	99#	Status	
ASTM D1557 6" Method B, C and D		990104		
CBR 100% Compaction D1883, T180		990209		
Check Point		990106		
Collapse Potential		990614		
Consolidation W/O time Rate/6 LD D2435	<u>2</u>	<u>990613</u>	<u>(X)</u>	
Correct Oversize Material in Sample CAL301		990203		
Direct Shear 1 Point		990608		
Direct Shear 3 Point		990609		
Harvard Miniature		992191		
Hydrometer Only	<u>2</u>	<u>990305</u>	<u>(X)</u>	
Moisture Determination Only	<u>2</u>	<u>990317</u>	<u>(X)</u>	
Moisture Determination/Unit Weight	<u>2</u>	<u>990316</u>	<u>(X)</u>	
Plasticity Index		990310		
Resistivity Analysis		990318		
R-Value/Untreated Material/Field Sample CAL 301		990201		
Sample Prep Materials		992508		
Sieve Analysis Wash #200 C117		990304		
Sieve Analysis/Course & Fine	<u>2</u>	<u>990301</u>	<u>(X)</u>	
Sulfate Sound (S) Sieve SZ C88		990708		
Swell Test FHA Specification (60 psi)		990312		
Unconfined Comp/Inc Moist D2166		990601		

MISC. OTHER				
Usage	Qty.	99#	Status	
Chloride Analysis		996020		
Corrosivity Analysis		991508		
Corrosivity, Resistivity, Sodium Sulfate, Solubility, p11 ⁺		990324		
pH Test		990319		
Sulfate Analysis		992090		
Unit Weight Fireproofing		991314		

Source: Soil BORING
 Supplier: BRAZ
 Sample Location: DBMW-S
 Type of Material: Soil
 Sampled by: DAVIS
 Project Manager: CHARTER/MITMAN

FOR ACCOUNTING USE ONLY
 Date Entered: _____
 Entered By: _____

CCPW ☒ LWD ☐ AASHTO ☐ NDOT
 CCSD ☐ UBC ☐
 ASTM ☒ Other ☐



KLEINFELDER

An employee owned company

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: August 3, 2007
File: _____
Copies: _____

Subject: **BRC Aquifer Testing: Flexible and Rigid Wall Testing**

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-5@ 20-21.5'	07/22/07	29629	08/09/07
DBMW-5@ 35-36.5'	07/22/07	29629	08/09/07
DBMW-18@ 55-56.5'	07/17/07	29621	08/09/07
DBMW-18@ 65-66.5'	07/17/07	29621	08/09/07
DBMW- 19@ 20-21.5'	07/24/07	29622	08/09/07
DBMW-19 @ 40-41.5'	07/24/07	29622	08/09/07
DBMW-4@15-16.5'	07/23/07	29628	08/09/07
DBMW-4@40-41.5'	07/23/07	29628	08/09/07

If you have any questions please don't hesitate to call.

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14572(m)

DATE: August 31, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29629

SUBMITTED BY: Kleinfelder, Inc.

Revision #1

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29629	DBMW-5	23.5-24.0	0.06%	7.89
29629	DBMW-5	30.0-31.0	0.07%	7.84

A handwritten signature in black ink, reading "Robert L. Summers", is positioned above the title "LABORATORY MANAGER".

LABORATORY MANAGER

Moisture Density							
Project Name	BRC AQUIFER TESTING			Date	08/10/07		
Project Number	83173	Phase No.	12	Tested By	JLW	Checked By	JH
Lab Number	29629						
Boring Number	DBMW-5		DBMW-5				
Sample Depth	30-31'		23.5 - 24'				
Height (inches)	3.1		2.68				
Diameter (inches)	5.05		5.18				
Volume	0.0359		0.03				
Wt. of Sample At Field Moisture	1905.61		1707.87				
Wet Density (pcf)	117.0		115.1				
Dry Density (pcf)	91.5		89.4				
Container No.							
Wt. of Wet Sample Plus Tare	566.91		402.51				
Wt. of Dry Sample Plus Tare	528.98		355.10				
Tare (g)	392.72		190.49				
Dry Wt. Of Sample (g)	136.26		164.61				
Moisture Content, %	27.8%		28.8%				

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-5@30-31'; S-29629 @ 30.0 - 35.0'

August 8, 2007

Silt (ML)

Specific Gravity = 2.53

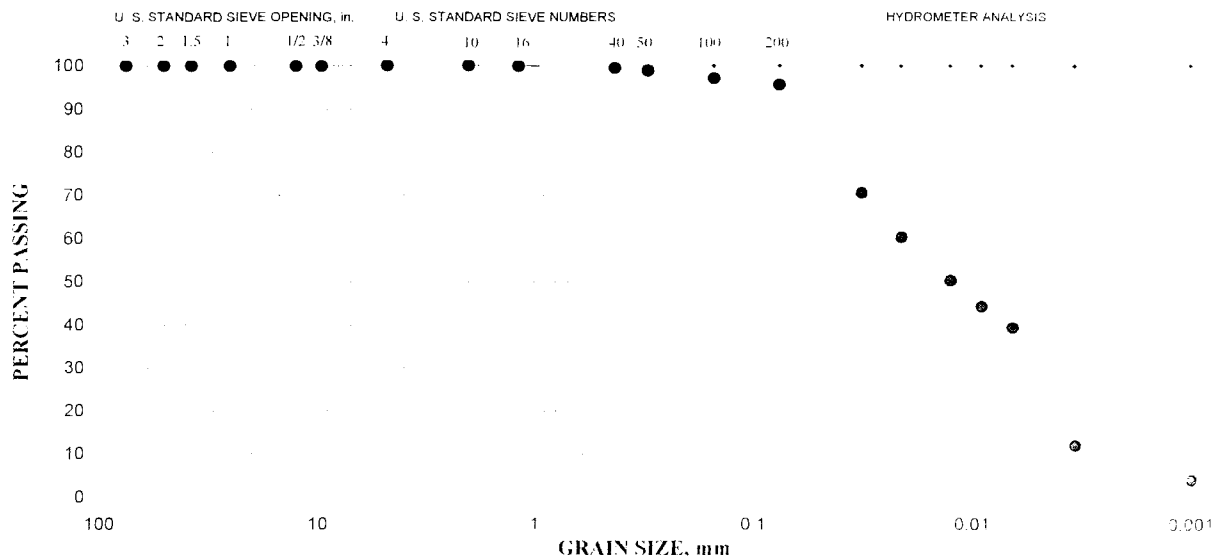
LL = ; PL = ; PI =

Gravel = 0%; Sand = 4%; Silt = 84%; Clay = 12%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425-μm)	0	100
#50 (300-μm)	1	99
#100 (150-μm)	3	97
#200 (75-μm)	4	96

Hydrometer Analysis

32-μm	71
21-μm	61
12-μm	50
9-μm	44
7-μm	39
3.4-μm	12
Colloids (<1-μm)	4



One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

Project No.: 83173-12

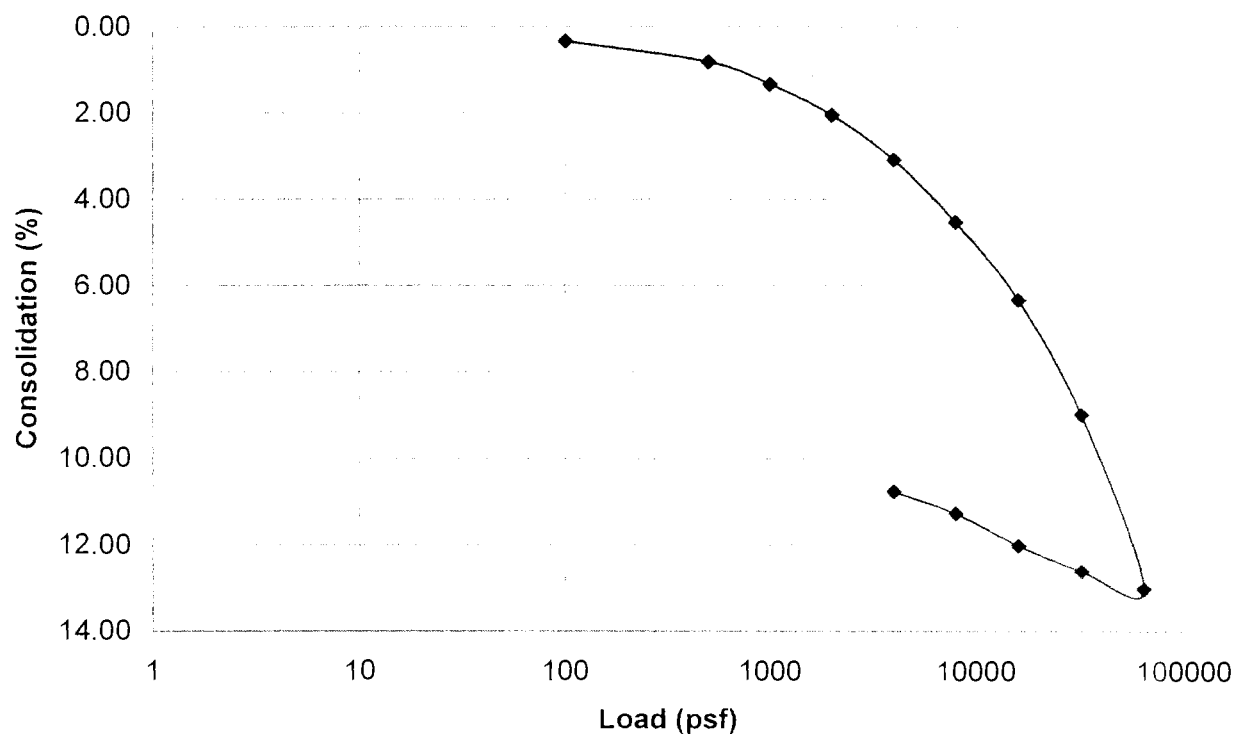
08/30/07

Sample No.: 29629
Sample Depth (ft.): DBMW- 5 @ 30-31'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	0.34
500	0.82
1000	1.34
2000	2.05
4000	3.09
8000	4.53
16000	6.34
32000	9.00
64000	13.01
32000	12.61
16000	12.02
8000	11.28
4000	10.77

DBMW- 5 @ 30-31'



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29629
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	08/08/07
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW-5	Tested By =>	JLW
	30-31'	Reviewed By =>	JH

Pan Label =>	KL	
Tare Weight of Pan =>	392.72	A
Wet Wt. of Sample & Tare =>	566.91	B
Dry Wt. of Sample & Tare =>	528.98	C
Weight of Moisture (B-C) =>	37.9	D
Dry Wt. of Sample (C-A) =>	136.26	E
Percent Moisture (D/E)*100 =>	27.8	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29629
 BORING: DBMW-5
 DEPTH: 30-31'
 DATE: 08/16/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	X
Mass of Pycnometer, $M_f \Rightarrow$	220.89
Mass of Pycnometer & Water, $M_a \Rightarrow$	719.23
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	20.3
Mass of Speciman & Pycnometer $\Rightarrow$	266.96
Mass of Pycnometer, $M_f \Rightarrow$	220.88
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	46.08
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	747.09
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	20.2

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99814
Water Density at T_b	0.99816
K Factor at T_b	0.99996
 M_a at T_b	 220.8999668
Sp Gr at T_b	2.529088913
Sp Gr at 20 C	2.52898775
 SPECIFIC GRAVITY AT 20 C	 2.52898775

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-5@23.5-24'; S-29629 @ 20.0 - 25.0'

August 8, 2007

Silt with Sand (ML)

Specific Gravity = 2.48

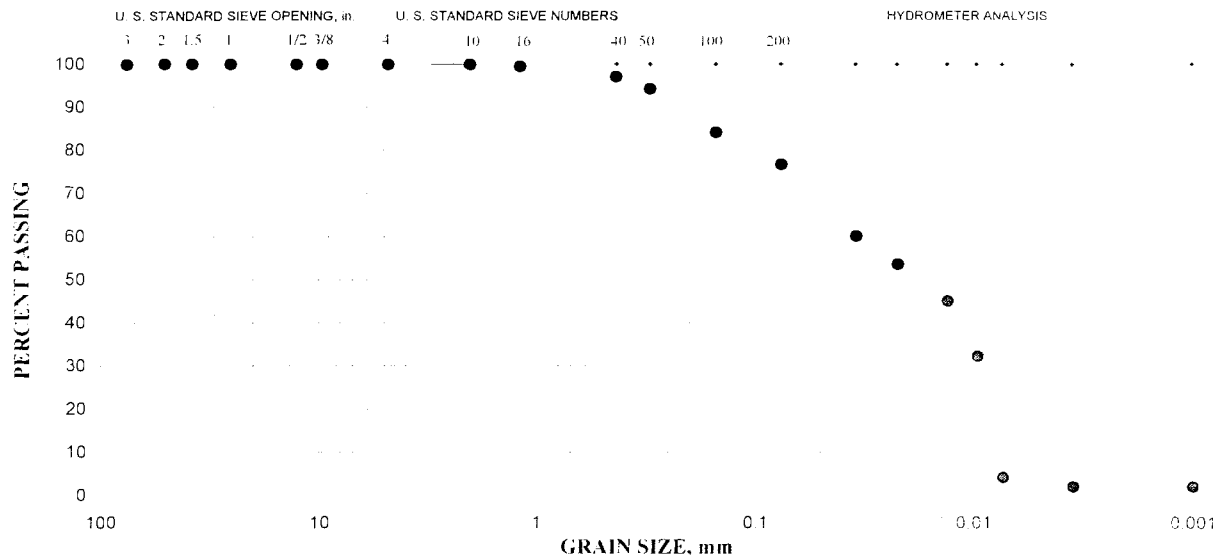
LL = ; PL = ; PI =

Gravel = 0%; Sand = 23%; Silt = 75%; Clay = 2%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	1	99
#40 (425- μ m)	3	97
#50 (300- μ m)	6	94
#100 (150- μ m)	16	84
#200 (75- μ m)	23	77

Hydrometer Analysis

34- μ m	60
22- μ m	54
13- μ m	45
10- μ m	32
7- μ m	4
3.5- μ m	2
Colloids (<1- μ m)	2



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29629
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	(3/8/07)
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW-5	Tested By =>	JLW
	23.5 - 24'	Reviewed By =>	JH

Pan Label =>	4	
Tare Weight of Pan =>	190.49	A
Wet Wt. of Sample & Tare =>	402.51	B
Dry Wt. of Sample & Tare =>	355.1	C
Weight of Moisture (B-C) =>	47.4	D
Dry Wt. of Sample (C-A) =>	164.61	E
Percent Moisture (D/E)*100 =>	28.8	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29629
 BORING: DBMW-5
 DEPTH: 23.5 - 24'
 DATE: 08/15/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Z
Mass of Pycnometer, $M_f \Rightarrow$	220.94
Mass of Pycnometer & Water, $M_a \Rightarrow$	719.4
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	20.4
Mass of Speciman & Pycnometer $\Rightarrow$	267.09
Mass of Pycnometer, $M_f \Rightarrow$	220.92
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	46.17
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	746.94
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	20

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99812
Water Density at T_b	0.99821
K Factor at T_b	1
 Ma at T_b	 220.9848614
Sp Gr at T_b	2.47826087
Sp Gr at 20 C	2.47826087
 SPECIFIC GRAVITY AT 20 C	 2.47826087

One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

Project No.: 83173-12

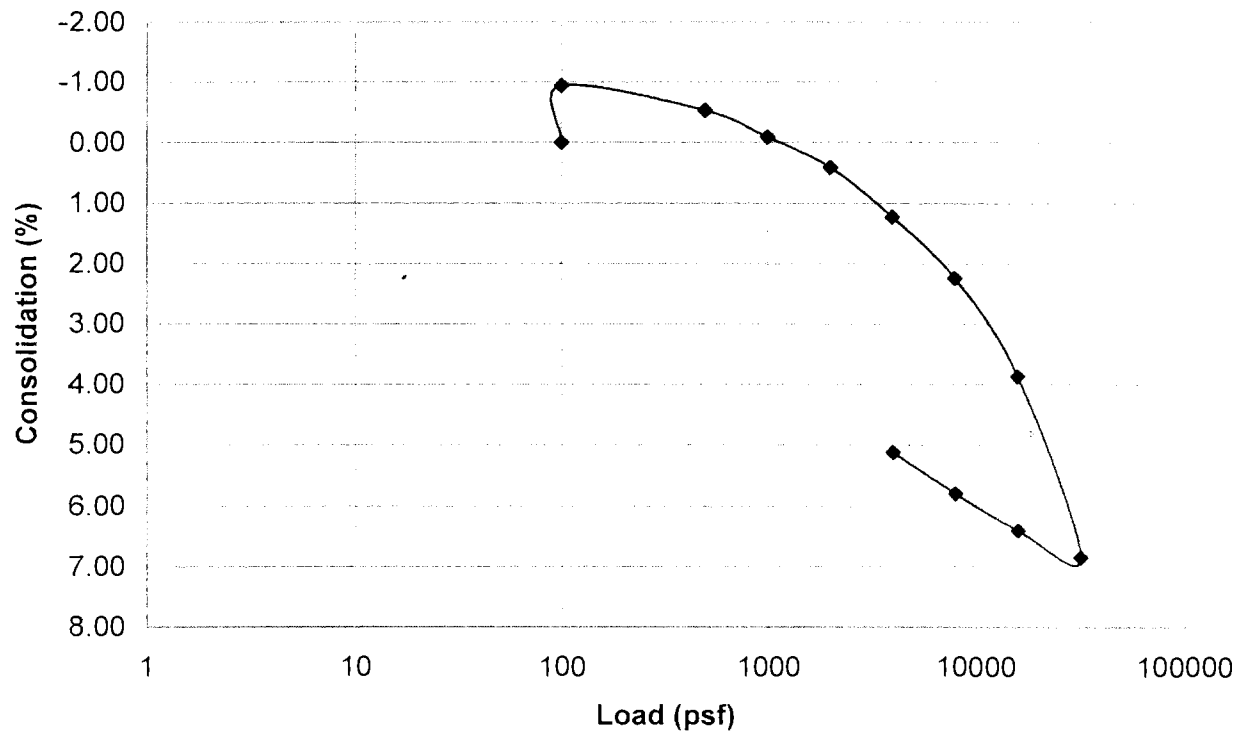
Report Date: 08/20/07

Sample No.: 29629
Sample Depth (ft.): DBMW-5 @ 23.5 - 24'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	0.00
100	-0.94
500	-0.53
1000	-0.09
2000	0.41
4000	1.23
8000	2.24
16000	3.86
32000	6.85
16000	6.40
8000	5.79
4000	5.12

DBMW-5 @ 23.5 - 24'



By: Doug Davis

Date Due:

2428

LABORATORY WORK ORDER



Project No: E3173 Phase: 12
 Project Name: BRL AQUA FM TEST / NE WALLS
 Client Name: BRL
 Client Ref./P.O.#: _____
 Special Instructions: _____

29628

Sample Number: DBMW-4 15-16.5 ☐ Requested Test
" 15-20 ☒ Test in Progress
" 30-35 ☒ Test Completed
" 40-41.5

Date Sampled: 7-23-07
 Date Received: (8/5/07)
 Date Needed: _____
 Date Completed: _____
 Verified By: _____

ASPHALT TESTING				
Usage	Qty.	99#	Status	
C123 1 1/2 Pieces/Agg		990715		
C127 Absorption/Gravity	<u>3</u>	990702 <u>0307</u>	<u>X</u>	
CAL 205 Crushed Part		990712		
CAL 227 Cleaness TST		990711		
Clay Lumps/Friabl Part C-142		990714		
D2726 Weight/Absorption Core		991110		
Extract Bitumin D1856, 2172.310		991102		
Flat/Elong Part/Sieve 119, 120		990713		
Hveem Stability/Set of 3		991147		
Ignition Oven Calibration		996156		
Injurious Organic Matter C-40		990701		
LA Rattler CAL131		990706		
Lottman Test		991121		
Marshall Stab/Flow D-1599 (Set of 3)/Lab		991108		
Max Theoretical Specific Gravity D-2041		991112		
Methylene Blue Test		990132		
Microwave Asphalt Moist Content		996137		
Oil Content By Ignition Oven		996153		
Sand Equivalent C217		990308		
Specific Gravity C127/8 D854		990211		
Stabil Test/Premix Sample CAL 366		991104		
Unit Weight C29		990704		

MISC. OTHER				
Usage	Qty.	99#	Status	
Chloride Analysis		996020		
Corrosivity Analysis		991508		
Corrosivity, Resistivity, Sodium Sulfate, Solubility, p11*		990324		
pH Test		990319		
Sulfate Analysis		992090		
Unit Weight Fireproofing		991314		

CONCRETE & MASONRY TESTING				
Usage	Qty.	99#	Status	
C942 Grout Strength (cylinder/prism strength)		990119		
Compressive Test 12x8x16 Prisms (12" width)		991005		
Compressive Test 8x8x16 Prisms (8" width)		991003		
Compressive Test/Cored Spec		990809		
Concrete Compressive Test		990803		
Drying Shrinkage (Set OF 3) C-157, CAL-530		990811		
Flex and Strength/Concrete Beam		990806		
Mortar Strength C-109		990118		

SOILS TESTING				
Usage	Qty.	99#	Status	
ASTM D1557 6" Method B, C and D		990104		
CBR 100% Compaction D1883, T180		990209		
Check Point		990106		
Collapse Potential		990614		
Consolidation W/O time Rate/6 LD D2435		990613		
Correct Oversize Material in Sample CAL301		990203		
Direct Shear 1 Point		990608		
Direct Shear 3 Point		990609		
Harvard Miniature		992191		
Hydrometer Only	<u>2</u>	990305	<u>X</u>	
Moisture Determination Only	<u>2</u>	990317	<u>X</u>	
Moisture Determination/Unit Weight	<u>1</u>	990316	<u>X</u>	
Plasticity Index		990310		
Resistivity Analysis		990318		
R-Value/Untreated Material/Field Sample CAL 301		990201		
Sample Prep Materials		992508		
Sieve Analysis Wash #200 C117		990304		
Sieve Analysis/Course & Fine	<u>2</u>	990301	<u>X</u>	
Sulfate Sound (5) Sieve SZ C88		990708		
Swell Test FHA Specification (60 psi)		990312		
Unconfined Comp./Inc Moist D2166		990601		

Source: SOIL BORING
 Supplier: BORING
 Sample Location: DBMW-4
 Type of Material: SOIL
 Sampled by: DAVID DAVIS
 Project Manager: CAROL WILSON

FOR ACCOUNTING USE ONLY
 Entered By: _____ Date Entered: _____

CPW ☒ LLWD ☐ NDOT
 CCSD ☐ AASHTO ☐
 UBC ☐



An employee owned company

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: August 3, 2007
File: _____
Copies: _____

Subject: BRC Aquifer Testing: Flexible and Rigid Wall Testing

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
 ☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-5@ 20-21.5'	07/22/07	29629	08/09/07
DBMW-5@ 35-36.5'	07/22/07	29629	08/09/07
DBMW-18@ 55-56.5'	07/17/07	29621	08/09/07
DBMW-18@ 65-66.5'	07/17/07	29621	08/09/07
DBMW- 19@ 20-21.5'	07/24/07	29622	08/09/07
DBMW-19 @ 40-41.5'	07/24/07	29622	08/09/07
DBMW-4@15-16.5'	07/23/07	29628	08/09/07
DBMW-4@40-41.5'	07/23/07	29628	08/09/07

If you have any questions please don't hesitate to call.

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14572(l)

DATE: August 22, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29628

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29628	DBMW-4	17.5-20.0	0.02%	8.06
29628	DBMW-4	32.0-32.5	0.20%	7.95

Robert L. Summers

LABORATORY MANAGER

ASTM D 422-02

July 2, 2007

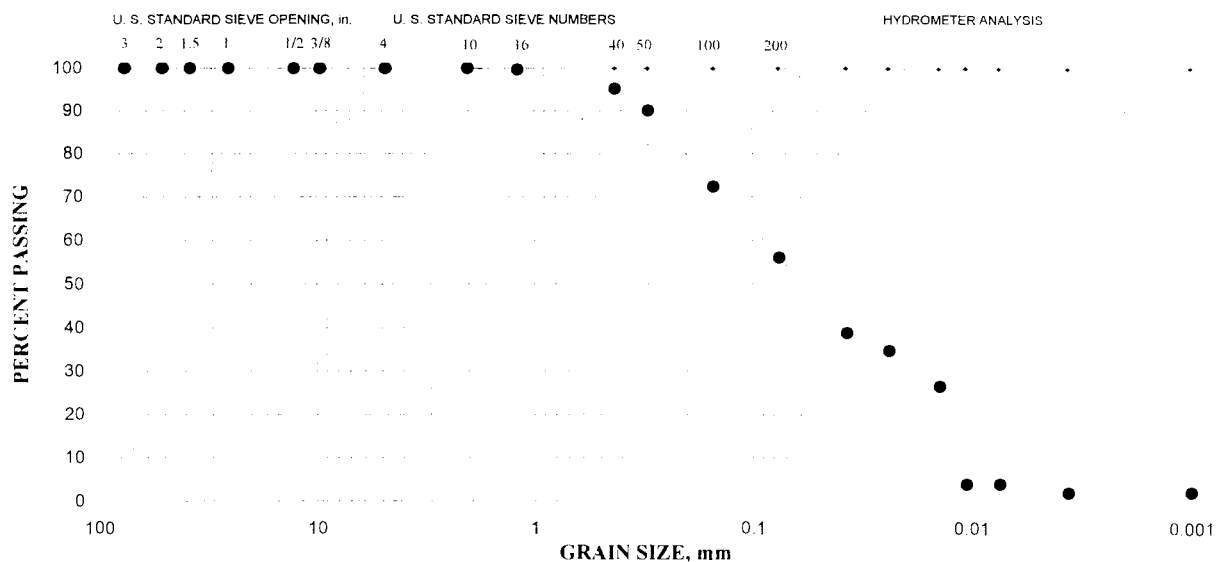
Specific Gravity = 2.45 (assumed)

Gravel = 0%; Sand = 44%; Silt = 54%; Clay = 2%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425-μm)	5	95
#50 (300-μm)	10	90
#100 (150-μm)	28	72
#200 (75-μm)	44	56

Hydrometer Analysis

37-μm	39
23-μm	35
14-μm	27
10-μm	4
7-μm	4
3.6-μm	2
Colloids (<1-μm)	2



PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29628
 BORING: DBMW-4
 DEPTH: 17.5 - 20'
 DATE: 08/21/08
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Y
Mass of Pycnometer, $M_f \Rightarrow$	224.41
Mass of Pycnometer & Water, $M_a \Rightarrow$	722.89
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	20.6
Mass of Speciman & Pycnometer $\Rightarrow$	325.57
Mass of Pycnometer, $M_f \Rightarrow$	224.39
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	101.19
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	784.69
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	19.8

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99808
Water Density at T_b	0.99825
K Factor at T_b	1.00004
 Ma at T_b	 224.4947416
Sp Gr at T_b	2.568926123
Sp Gr at 20 C	2.56902888
 SPECIFIC GRAVITY AT 20 C	 2.56902888

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29628
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW-4	Tested By =>	JLW
	17.5 - 20'	Reviewed By =>	JH

Pan Label =>	GHI	
Tare Weight of Pan =>	329.88	A
Wet Wt. of Sample & Tare =>	2251.07	B
Dry Wt. of Sample & Tare =>	2027.76	C
Weight of Moisture (B-C) =>	223.3	D
Dry Wt. of Sample (C-A) =>	1697.88	E
Percent Moisture (D/E)*100 =>	13.2	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

SPECIFIC GRAVITY OF COARSE AND FINE AGGREGATE ASTM 127 & 128

Job # =>	83173	Lab Number =>	29628
Project =>	BRC Aquifer Testing	Date Sampled =>	7/23/07
Client =>	BRC	Date Received =>	8/8/07
Phase =>	12	Sampled By =>	DD
Sample Location =>	DBMW-4 @ 17.5 - 20'	Tested By =>	JLW
		Reviewed By =>	JH

COARSE AGGREGATE

Dry Wt. of Sample A=>	3384.5		
SSD Wt. of Sample B=>	3470.8		
Wt. SSD Under Water C=>	2086.2		Averages
Bulk Sp Gr. A/(B-C) =>	2.444		2.444
Bulk SSD B/(B-C) =>	2.507		2.507
Apparent Sp Gr A/(A-C) =>	2.607		2.607
Absorption ((B-A)/A)*100 =>	2.5		2.5

FINE AGGREGATE

Dry Wt. of Sample + Tare =>			X
Wt. of Tare =>			Y
Dry Wt. of Sample (X-Y) =>			A
Wt. of Pycnometer w/ Water =>			B
Wt. @ SSD (500 +/- 5 gms) =>			S
Wt. of Pycnometer w/ Sample =>			C Averages
Bulk Sp Gr. A/(B+S-C) =>			
Bulk SSD S/(B+S-C) =>			
Apparent Sp Gr A/(A+B-C) =>			
Absorption ((S-A)/A)*100 =>			
Pycnometer Label =>	A	B	

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-4@17.5-20'; S-29628 @ 15.0 - 20.0'

July 2, 2007

Silty Gravel with Sand (GM)

Specific Gravity = 2.57

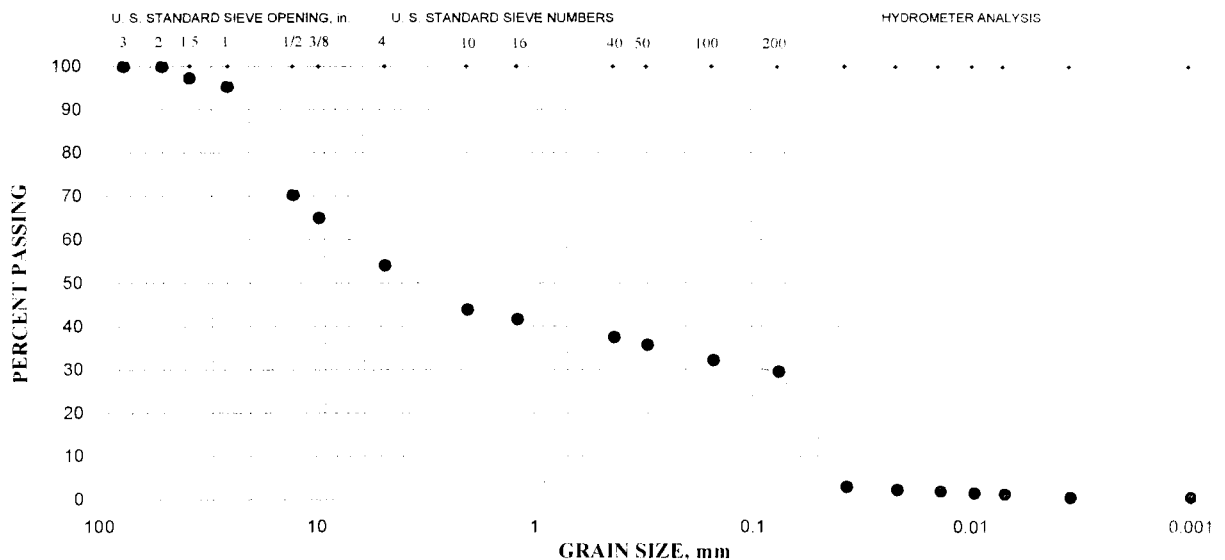
LL = ; PL = ; PI =

Gravel = 46%; Sand = 25%; Silt = 28%; Clay = 1%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	3	97
1" (25.0-mm)	5	95
1/2" (12.5-mm)	30	70
3/8" (9.5-mm)	35	65
#4 (4.75-mm)	46	54
#10 (2.00-mm)	56	44
#16 (1.18-mm)	58	42
#40 (425-μm)	63	37
#50 (300-μm)	64	36
#100 (150-μm)	68	32
#200 (75-μm)	71	29

Hydrometer Analysis

37-μm	3
22-μm	2
14-μm	2
10-μm	2
7-μm	1
3.5-μm	1
Colloids (<1-μm)	1



Moisture Density							
Project Name	BRC AQUIFER TESTING				Date	08/10/07	
Project Number	83173	Phase No.	12	Tested By	JLW	Checked By	JH
Lab Number	29628						
Boring Number	DBMW-4						
Sample Depth	32 - 32.5'						
Height (inches)	0.97						
Diameter (inches)	2.41						
Volume	0.0026						
Wt. of Sample At Field Moisture	132.78						
Wet Density (pcf)	112.6						
Dry Density (pcf)	92.7						
Container No.							
Wt. of Wet Sample Plus Tare	165.20						
Wt. of Dry Sample Plus Tare	141.80						
Tare (g)	32.40						
Dry Wt. Of Sample (g)	109.40						
Moisture Content, %	21.4%						

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29628
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW-4	Tested By =>	JLW
	32 - 32.5	Reviewed By =>	JH

Pan Label =>	SH	
Tare Weight of Pan =>	32.39	A
Wet Wt. of Sample & Tare =>	165.19	B
Dry Wt. of Sample & Tare =>	141.8	C
Weight of Moisture (B-C) =>	23.4	D
Dry Wt. of Sample (C-A) =>	109.41	E
Percent Moisture (D/E)*100 =>	21.4	F

Sieve Retaining More Than About Recommended Minimum Mass

10% of Sample	of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29628
 BORING: DBMW-4
 DEPTH: 32 - 32.5'
 DATE: 08/15/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Y
Mass of Pycnometer, $M_f \Rightarrow$	224.39
Mass of Pycnometer & Water, $M_a \Rightarrow$	722.72
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	19.2
Mass of Speciman & Pycnometer $\Rightarrow$	269.46
Mass of Pycnometer, $M_f \Rightarrow$	224.38
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	45.08
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	749.11
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	20.2

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99837
Water Density at T_b	0.99816
K Factor at T_b	0.99996
 Ma at T_b	 224.2853507
Sp Gr at T_b	2.411985019
Sp Gr at 20 C	2.411888539
 SPECIFIC GRAVITY AT 20 C	 2.411888539

By: Doug Davis

Date Due:

29622



KLEINFELDER

An employee owned company

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: August 3, 2007
File: _____
Copies: _____

Subject: BRC Aquifer Testing: Flexible and Rigid Wall Testing

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-5@ 20-21.5'	07/22/07	29629	08/09/07
DBMW-5@ 35-36.5'	07/22/07	29629	08/09/07
DBMW-18@ 55-56.5'	07/17/07	29621	08/09/07
DBMW-18@ 65-66.5'	07/17/07	29621	08/09/07
DBMW- 19@ 20-21.5'	07/24/07	29622	08/09/07
DBMW-19 @ 40-41.5'	07/24/07	29622	08/09/07
DBMW-4@15-16.5'	07/23/07	29628	08/09/07
DBMW-4@40-41.5'	07/23/07	29628	08/09/07

If you have any questions please don't hesitate to call.

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14572(k)

DATE: August 22, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29622

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29622	DBMW-19	35.5-36.5	0.78%	8.28

Robert L. Summers

LABORATORY MANAGER

Moisture Density							
Project Name	BRC AQUIFER TESTING			Date	08/10/07		
Project Number	83173	Phase No.	12	Tested By	JLW	Checked By	JH
Lab Number	29622						
Boring Number	DBMW-19						
Sample Depth	35.5 - 36.5'						
Height (inches)	3.8						
Diameter (inches)	5.05						
Volume	0.0440						
Wt. of Sample							
At Field Moisture	1989.32						
Wet Density (pcf)	99.7						
Dry Density (pcf)	67.7						
Container No.							
Wt. of Wet Sample Plus Tare	1014.60						
Wt. of Dry Sample Plus Tare	770.50						
Tare (g)	254.10						
Dry Wt. Of Sample (g)	516.40						
Moisture Content, %	47.3%						

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29622
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	8/7/07
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW-19	Tested By =>	JLW
	35.5 - 36.5'	Reviewed By =>	JH

Pan Label =>	DEER	
Tare Weight of Pan =>	254.13	A
Wet Wt. of Sample & Tare =>	1014.6	B
Dry Wt. of Sample & Tare =>	770.54	C
Weight of Moisture (B-C) =>	244.1	D
Dry Wt. of Sample (C-A) =>	516.41	E
Percent Moisture (D/E)*100 =>	47.3	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29622
 BORING: DBMW-19
 DEPTH: 35.5 - 36.5'
 DATE: 08/16/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	W
Mass of Pycnometer, $M_f \Rightarrow$	169.2
Mass of Pycnometer & Water, $M_a \Rightarrow$	667.54
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	20.3
Mass of Speciman & Pycnometer $\Rightarrow$	215.25
Mass of Pycnometer, $M_f \Rightarrow$	169.18
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	46.07
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	696.6
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	20

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99814
Water Density at T_b	0.99821
K Factor at T_b	1
 Ma at T_b	 169.2348838
Sp Gr at T_b	2.70840682
Sp Gr at 20 C	2.70840682
 SPECIFIC GRAVITY AT 20 C	 2.70840682

One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

Project No.: 83173-12

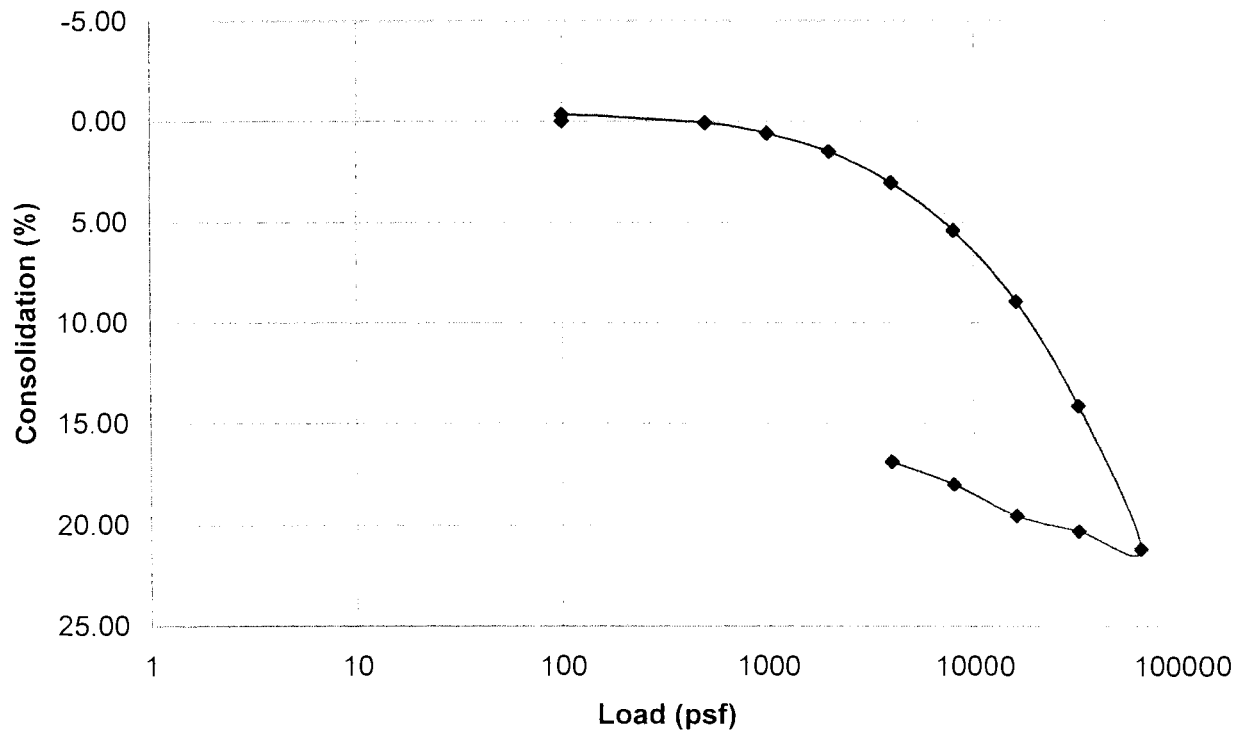
08/23/07

Sample No.: 29622
Sample Depth (ft.): DBMW-19 @ 35.5 - 36.5'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	0.00
100	-0.31
500	0.09
1000	0.62
2000	1.52
4000	3.05
8000	5.41
16000	8.93
32000	14.11
64000	21.16
32000	20.30
16000	19.54
8000	17.99
4000	16.87

DBMW-19 @ 35.5 - 36.5'



PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-19@35.5-36.5'; S-29622 @ 35.0 - 40.0'

July 2, 2007

Silt (ML)

Specific Gravity = 2.71

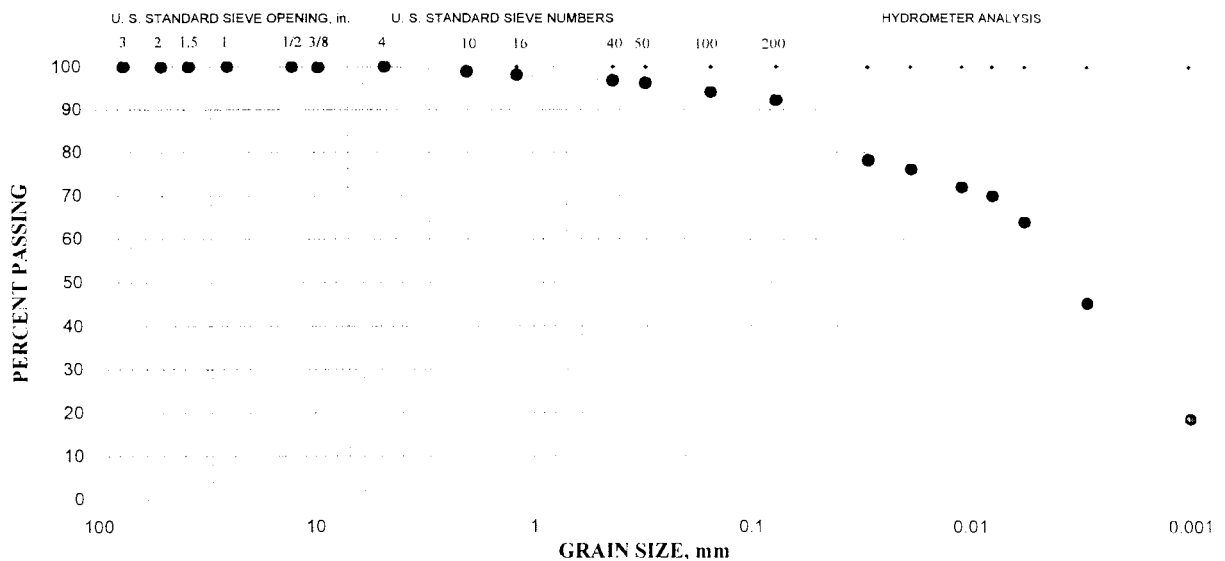
LL = ; PL = ; PI =

Gravel = 0%; Sand = 8%; Silt = 47%; Clay = 45%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	1	99
#16 (1.18-mm)	2	98
#40 (425-μm)	3	97
#50 (300-μm)	4	96
#100 (150-μm)	6	94
#200 (75-μm)	8	92

Hydrometer Analysis

29-μm	78
18-μm	76
11-μm	72
8-μm	70
6-μm	64
2.9-μm	45
Colloids (<1-μm)	19



Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14560(f)

DATE: August 10, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29622

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29622	DBMW-19	15.0-17.5	0.14%	8.12


LABORATORY MANAGER

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29622
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	8/2/07
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW-19	Tested By =>	JLW
	15 - 17.5'	Reviewed By =>	JH

Pan Label =>	COCO	
Tare Weight of Pan =>	536.2	A
Wet Wt. of Sample & Tare =>	3036.3	B
Dry Wt. of Sample & Tare =>	2894.2	C
Weight of Moisture (B-C) =>	142.1	D
Dry Wt. of Sample (C-A) =>	2358	E
Percent Moisture (D/E)*100 =>	6.0	F

Sieve Retaining More Than About Recommended Minimum Mass

10% of Sample	of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

SPECIFIC GRAVITY OF COARSE AND FINE AGGREGATE ASTM 127 & 128

Job # =>	83173	Lab Number =>	29622
Project =>	BRC Aquifer Testing	Date Sampled =>	7/24/07
Client =>	BRC	Date Received =>	8/7/07
Phase =>	12	Sampled By =>	DD
Sample Location =>	DBMW-19 @ 15 - 17.5'	Tested By =>	JLW
		Reviewed By =>	JH

COARSE AGGREGATE

Dry Wt. of Sample A=>	6404.9		
SSD Wt. of Sample B=>	6654		
Wt. SSD Under Water C=>	3818.5		Averages
Bulk Sp Gr. A/(B-C) =>	2.259		2.259
Bulk SSD B/(B-C) =>	2.347		2.347
Apparent Sp Gr A/(A-C) =>	2.476		2.476
Absorption ((B-A)/A)*100 =>	3.9		3.9

FINE AGGREGATE

Dry Wt. of Sample + Tare =>			X
Wt. of Tare =>			Y
Dry Wt. of Sample (X-Y) =>			A
Wt. of Pycnometer w/ Water =>			B
Wt. @ SSD (500 +/- 5 gms) =>			S
Wt. of Pycnometer w/ Sample =>			C Averages
Bulk Sp Gr. A/(B+S-C) =>			
Bulk SSD S/(B+S-C) =>			
Apparent Sp Gr A/(A+B-C) =>			
Absorption ((S-A)/A)*100 =>			
Pycnometer Label =>	A	B	

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29622
 BORING: DBMW-19
 DEPTH: 15 - 17.5'
 DATE: 08/08/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Y
Mass of Pycnometer, $M_f \Rightarrow$	224.41
Mass of Pycnometer & Water, $M_a \Rightarrow$	722.89
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	20.6
Mass of Speciman & Pycnometer $\Rightarrow$	320.97
Mass of Pycnometer, $M_f \Rightarrow$	224.38
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	96.59
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	783
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	20.5

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99808
Water Density at T_b	0.9981
K Factor at T_b	0.9999

Ma at T_b	224.4199696
Sp Gr at T_b	2.647752193
Sp Gr at 20 C	2.647487418

SPECIFIC GRAVITY AT 20 C	2.647487418
--------------------------	-------------

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-19@15-17.5'; S-29622 @ 15.0 - 20.0'

July 2, 2007

Silty Gravel with Sand (GM)

Specific Gravity = 2.65

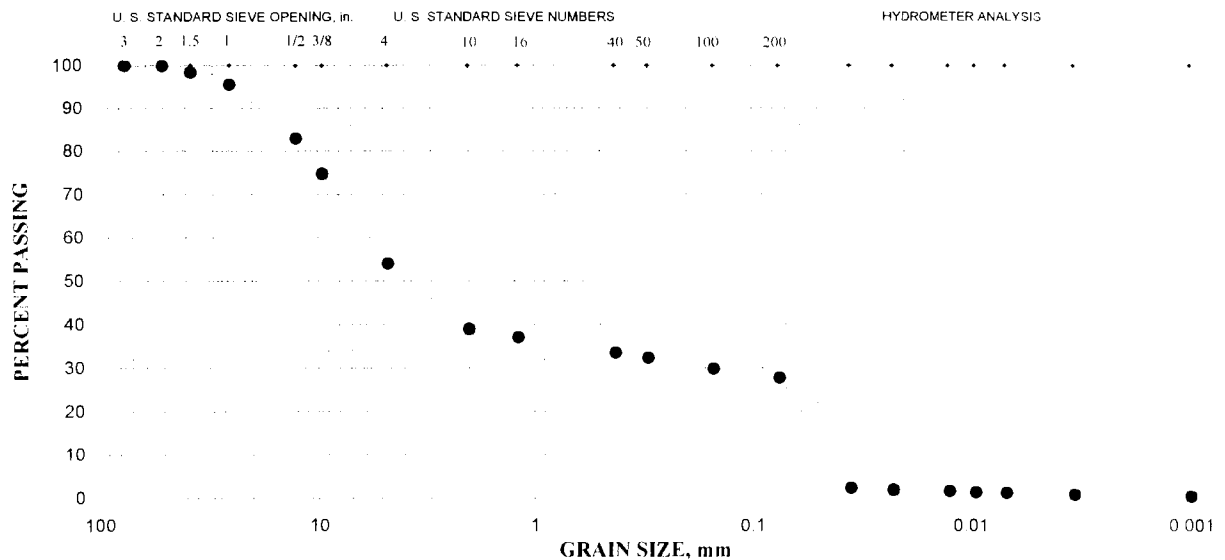
LL = ; PL = ; PI =

Gravel = 46%; Sand = 26%; Silt = 27%; Clay = 1%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	2	98
1" (25.0-mm)	5	95
1/2" (12.5-mm)	17	83
3/8" (9.5-mm)	25	75
#4 (4.75-mm)	46	54
#10 (2.00-mm)	61	39
#16 (1.18-mm)	63	37
#40 (425-μm)	66	34
#50 (300-μm)	68	32
#100 (150-μm)	70	30
#200 (75-μm)	72	28

Hydrometer Analysis

35-μm	2
23-μm	2
12-μm	2
9-μm	1
7-μm	1
3.3-μm	1
Colloids (<1-μm)	0



LABORATORY WORK ORDER

29622



Project No: 03173 Phase: 12
 Project Name: BBC ADD. FOR TEST / NO WALLS
 Client Name: _____
 Client Ref./P.O.#: _____
 Special Instructions: _____

Sample Number: DBMW-19 15-20 ☒ Requested Test
" 20-21.5 ☒ Test in Progress
" 35-40 ☒ Test Completed
" 40-41.5

Date Sampled: 7-24-07
 Date Received: _____
 Date Needed: _____
 Date Completed: _____
 Verified By: _____

ASPHALT TESTING				
Usage	Qty.	99#	Status	
C123 Li Wt Pieces/Agg		990715		
C127 Absorption/Gravity	3	990702 990307		
CAL 205 Crushed Part		990712		
CAL 227 Cleaness TST		990711		
Clay Lumps/Friabl Part C-142		990714		
D2726 Weight/Absorption Core		991110		
Extract Bitumin D1856, 2172.310		991102		
Flat/Elong Part/Sieve 119, 120		990713		
Hveem Stability/Set of 3		991147		
Ignition Oven Calibration		996156		
Injurious Organic Matter C-40		990701		
LA Rattler CAL131		990706		
Lottman Test		991121		
Marshall Stab/Flow D-1599 (Set of 3)/Lab		991108		
Max Theoretical Specific Gravity D-2041		991112		
Methylene Blue Test		990132		
Microwave Asphalt Moist Content		996137		
Oil Content By Ignition Oven		996153		
Sand Equivalent C217		990308		
Specific Gravity C127/8 D854		990211		
Stabil Test/Premix Sample CAL 366		991104		
Unit Weight C29		990704		

MISC. OTHER				
Usage	Qty.	99#	Status	
Chloride Analysis		996020		
Corrosivity Analysis		991508		
Corrosivity, Resistivity, Sodium Sulfate, Solubility, p11 ^h		990324		
pH Test		990319		
Sulfate Analysis		992090		
Unit Weight Fireproofing		991314		

CONCRETE & MASONRY TESTING				
Usage	Qty.	99#	Status	
C942 Grout Strength (cylinder/prism strength)		990119		
Compressive Test 12x8x16 Prisms (12" width)		991005		
Compressive Test 8x8x16 Prisms (8" width)		991003		
Compressive Test/Cored Spec		990809		
Concrete Compressive Test		990803		
Drying Shrinkage (Set OF 3) C-157, CAL-530		990811		
Flex and Strength/Concrete Beam		990806		
Mortar Strength C-109		990118		

SOILS TESTING				
Usage	Qty.	99#	Status	
ASTM D1557 6" Method B, C and D		990104		
CBR 100% Compaction D1883, T180		990209		
Check Point		990106		
Collapse Potential		990614		
Consolidation W/O time Rate/6 LD D2435	1	990613	X	
Correct Oversize Material in Sample CAL301		990203		
Direct Shear 1 Point		990608		
Direct Shear 3 Point		990609		
Harvard Miniature		992191		
Hydrometer Only	2	990305	X	
Moisture Determination Only	2	990317	X	
Moisture Determination/Unit Weight	1	990316	X	
Plasticity Index		990310		
Resistivity Analysis		990318		
R-Value/Untreated Material/Field Sample CAL 301		990201		
Sample Prep Materials		992508		
Sieve Analysis Wash #200 C117		990304		
Sieve Analysis/Course & Fine	2	990301	X	
Sulfate Sound (5) Sieve SZ C88		990708		
Swell Test FHA Specification (60 psi)		990312		
Unconfined Comp/Inc Moist D2166		990601		

Source: SOIL BORING
 Supplier: BOART
 Sample Location: DBMW-19
 Type of Material: SOIL
 Sampled by: DAVIS
 Project Manager: CARTER/WITMAN

FOR ACCOUNTING USE ONLY
 Entered By: _____ Date Entered: _____

☐ CCW
☒ ASTM
☐ Other
☐ LWD
☐ AASHTO
☐ NDOT
☐ CSD
☐ UBC

By: Doug Davis

Date Due:

LABORATORY NUMBER: 24653

LABORATORY WORK ORDER

29653



Project No: 23173 Phase: 12
 Project Name: BRL AQUICOR TEST / NEW NEWS
 Client Name: BRL
 Client Ref./P.O.#: _____
 Special Instructions: _____

Sample Number: DBMW-22 40-45 ☒ Requested Test
" 40-41.5 ☒ Test in Progress
" 50-55 ☒ Test Completed
" 55-56.5

Date Sampled: 8-13-07
 Date Received: 8/15/07
 Date Needed: ASAP
 Date Completed: 8/31/07
 Verified By: DA

ASPHALT TESTING

Usage	Qty.	99#	Status
C123 Lt Wt Pieces/Agg		990715	
C127 Absorption/Gravity	2	990702	99163071 ☒
CAL 205 Crushed Part		990712	
CAL 227 Cleaness TST		990711	
Clay Lumps/Friabl Part C-142		990714	
D2726 Weight/Absorption Core		991110	
Extract Bitumin D1856, 2172.310		991102	
Flat/Elong Part/Sieve 119, 120		990713	
Hveem Stability/Set of 3		991147	
Ignition Oven Calibration		996156	
Injurious Organic Matter C-40		990701	
LA Rattler CAL131		990706	
Lottman Test		991121	
Marshall Stab/Flow D-1599 (Set of 3)/Lab		991108	
Max Theoretical Specific Gravity D-2041		991112	
Methylene Blue Test		990132	
Microwave Asphalt Moist Content		996137	
Oil Content By Ignition Oven		996153	
Sand Equivalent C217		990308	
Specific Gravity C127/8 D854		990211	
Stabil Test/Premix Sample CAL 366		991104	
Unit Weight C29		990704	

MISC. OTHER

Usage	Qty.	99#	Status
Chloride Analysis		996020	
Corrosivity Analysis		991508	
Corrosivity, Resistivity, Sodium Sulfate, Solubility, p11*		990324	
pH Test		990319	
Sulfate Analysis		992090	
Unit Weight Fireproofing		991314	

CONCRETE & MASONRY TESTING

Usage	Qty.	99#	Status
C942 Grout Strength (cylinder/prism strength)		990119	
Compressive Test 12x8x16 Prisms (12" width)		991005	
Compressive Test 8x8x16 Prisms (8" width)		991003	
Compressive Test/Cored Spec		990809	
Concrete Compressive Test		990803	
Drying Shrinkage (Set OF 3) C-157, CAL-530		990811	
Flex and Strength/Concrete Beam		990806	
Mortar Strength C-109		990118	

SOILS TESTING

Usage	Qty.	99#	Status
ASTM D1557 6" Method B, C and D		990104	
CBR 100% Compaction D1883, T180		990209	
Check Point		990106	
Collapse Potential		990614	
Consolidation W/O time Rate/6 LD D2435	2	990613	☒
Correct Oversize Material in Sample CAL301		990203	
Direct Shear 1 Point		990608	
Direct Shear 3 Point		990609	
Harvard Miniature		992191	
Hydrometer Only	2	990305	☒
Moisture Determination Only	2	990317	☒
Moisture Determination/Unit Weight	2	990316	☒
Plasticity Index		990310	
Resistivity Analysis		990318	
R-Value/Untreated Material/Field Sample CAL 301		990201	
Sample Prep Materials		992508	
Sieve Analysis Wash #200 C117		990304	
Sieve Analysis/Course & Fine	2	990301	☒
Sulfate Sound (5) Sieve SZ C88		990708	
Swell Test FHA Specification (60 psi)		990312	
Unconfined Comp/Inc Moist D2166		990601	

CPW ☐ ASTM ☒ Other ☐
 LWD ☐ AASHTO ☐ NDOT ☐
 CSD ☐ UBC ☐

Source: SOIL BORING
 Supplier: BART
 Sample Location: DBMW-22
 Type of Material: SOIL
 Sampled by: ANIL
 Project Manager: W. T. JAMES

FOR ACCOUNTING USE ONLY
 Entered By: _____ Date Entered: _____



An employee owned company

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: August 16, 2007
File: _____
Copies: _____

Subject: BRC Aquifer Testing: Flexible and Rigid Wall Testing

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
 ☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-22@ 40-41.5'	08/13/07	29653	08/16/07
DBMW-22@ 55-56.5'	08/13/07	29653	08/16/07
AA-23R@ 25-26.5'	08/14/07	29652	08/16/07
AA-23R@ 45-46.5'	08/14/07	29652	08/16/07

If you have any questions please don't hesitate to call.

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14584(b)

DATE: August 28, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29653

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29653	DBMW-22	41.0-41.5	1.86%	8.18
29653	DBMW-22	54.0-55.0	2.12%	8.16

A handwritten signature in black ink, reading "Robert L. Swannick", is positioned above the title "LABORATORY MANAGER".

LABORATORY MANAGER

Moisture Density							
Project Name	BRC AQUIFER TESTING			Date	08/22/07		
Project Number	83173	Phase No.	12	Tested By	JLW	Checked By	JH
Lab Number	29653						
Boring Number	DBMW-22		DBMW-22				
Sample Depth	41 - 41.5'		54 - 55'				
Height (inches)	2.86		4.15				
Diameter (inches)	5.07		5.11				
Volume	0.0334		0.05				
Wt. of Sample At Field Moisture	1605.06		2054.20				
Wet Density (pcf)	105.9		91.9				
Dry Density (pcf)	73.8		51.6				
Container No.							
Wt. of Wet Sample Plus Tare	419.93		419.16				
Wt. of Dry Sample Plus Tare	361.01		316.48				
Tare (g)	225.60		184.92				
Dry Wt. Of Sample (g)	135.41		131.56				
Moisture Content, %	43.5%		78.0%				

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-22@41-41.5'; S-29653 @ 40.0 - 45.0'

August 13, 2007

Silt (ML)

Specific Gravity = 2.66

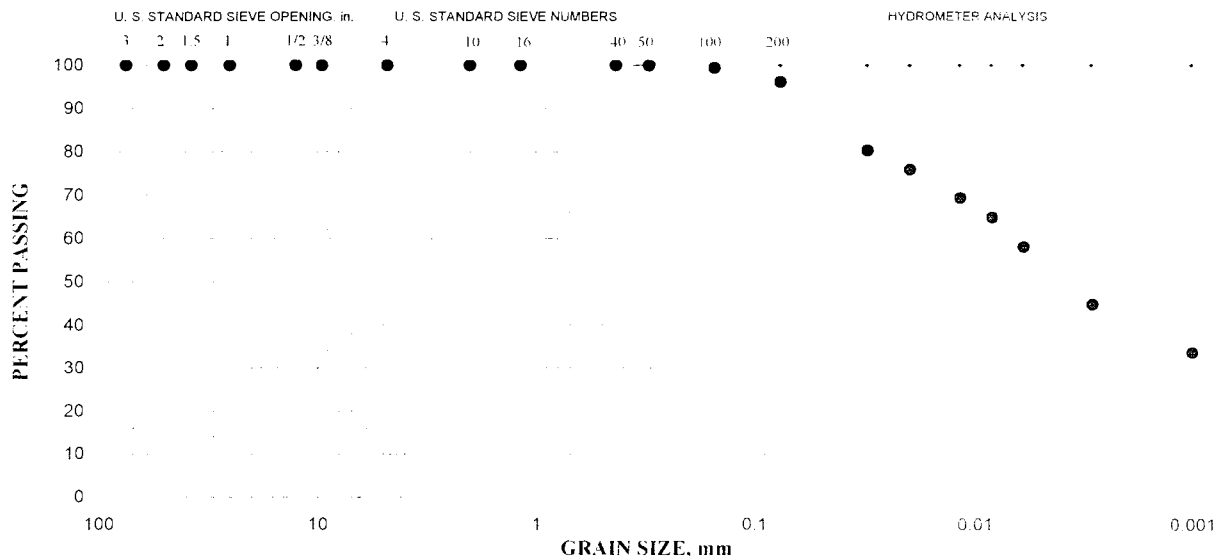
LL = ; PL = ; PI =

Gravel = 0%; Sand = 4%; Silt = 51%; Clay = 45%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425-μm)	0	100
#50 (300-μm)	0	100
#100 (150-μm)	1	99
#200 (75-μm)	4	96

Hydrometer Analysis

30-μm	80
19-μm	76
12-μm	69
8-μm	65
6-μm	58
2.9-μm	45
Colloids (<1-μm)	34



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29653
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW-22	Tested By =>	JLW
	41 - 41.5'	Reviewed By =>	JH

Pan Label =>	LAKERS	
Tare Weight of Pan =>	225.6	A
Wet Wt. of Sample & Tare =>	419.93	B
Dry Wt. of Sample & Tare =>	361.01	C
Weight of Moisture (B-C) =>	58.9	D
Dry Wt. of Sample (C-A) =>	135.41	E
Percent Moisture (D/E)*100 =>	43.5	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29653
 BORING: DBMW-22
 DEPTH: 41 - 41.5'
 DATE: 08/24/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	X
Mass of Pycnometer, $M_f \Rightarrow$	220.89
Mass of Pycnometer & Water, $M_a \Rightarrow$	719.23
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	20.3
Mass of Speciman & Pycnometer $\Rightarrow$	266.24
Mass of Pycnometer, $M_f \Rightarrow$	220.87
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	45.37
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	747.52
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	19.9

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99814
Water Density at T_b	0.99823
K Factor at T_b	1.00002
 M_a at T_b	 220.9348506
Sp Gr at T_b	2.656323185
Sp Gr at 20 C	2.656376311
 SPECIFIC GRAVITY AT 20 C	 2.656376311

One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

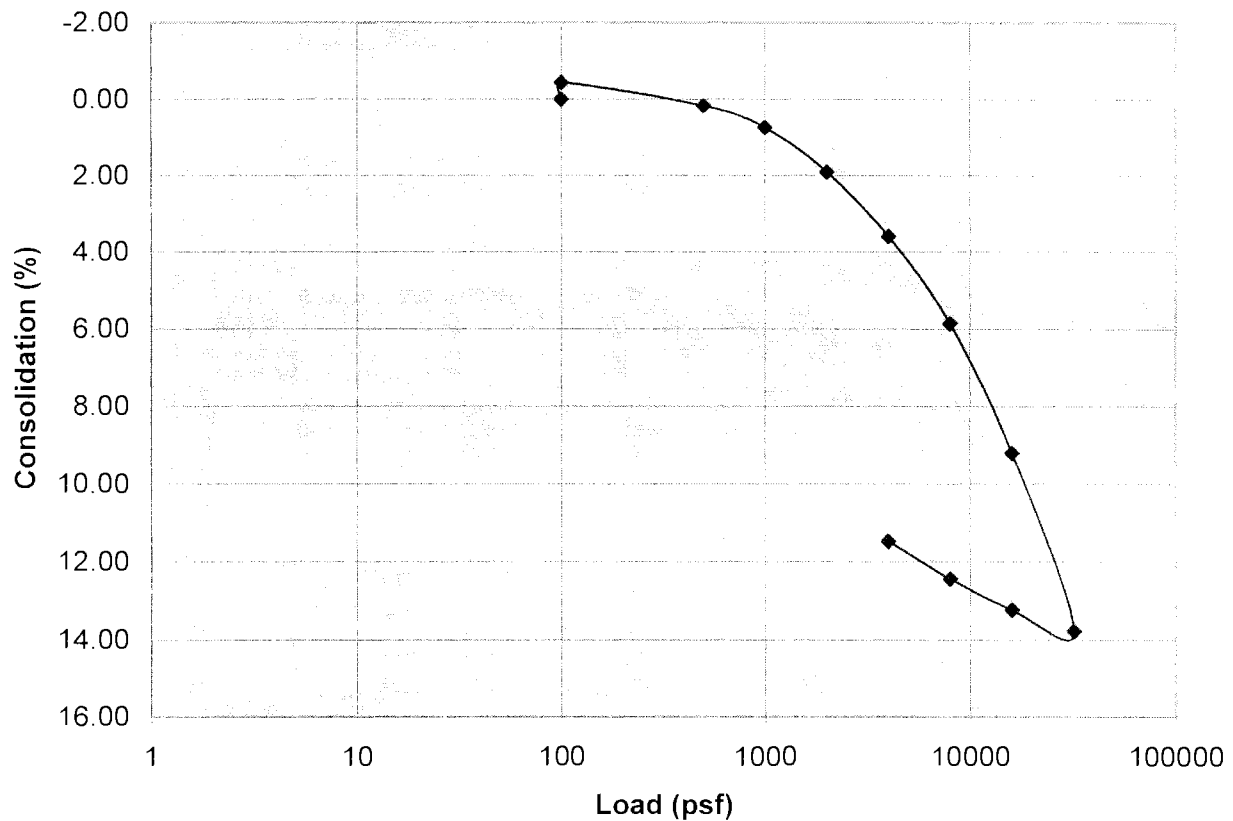
Project No.: 83173-12

08/30/07

Sample No.: 29653
Sample Depth (ft.): DBMW-22 @ 41 - 41.5'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	0.00
100	-0.44
500	0.16
1000	0.74
2000	1.91
4000	3.59
8000	5.85
16000	9.20
32000	13.78
16000	13.24
8000	12.44
4000	11.49



PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-22@54-55'; S-29653 @ 50.0 - 55.0'

August 13, 2007

Silt (ML)

Specific Gravity = 2.71

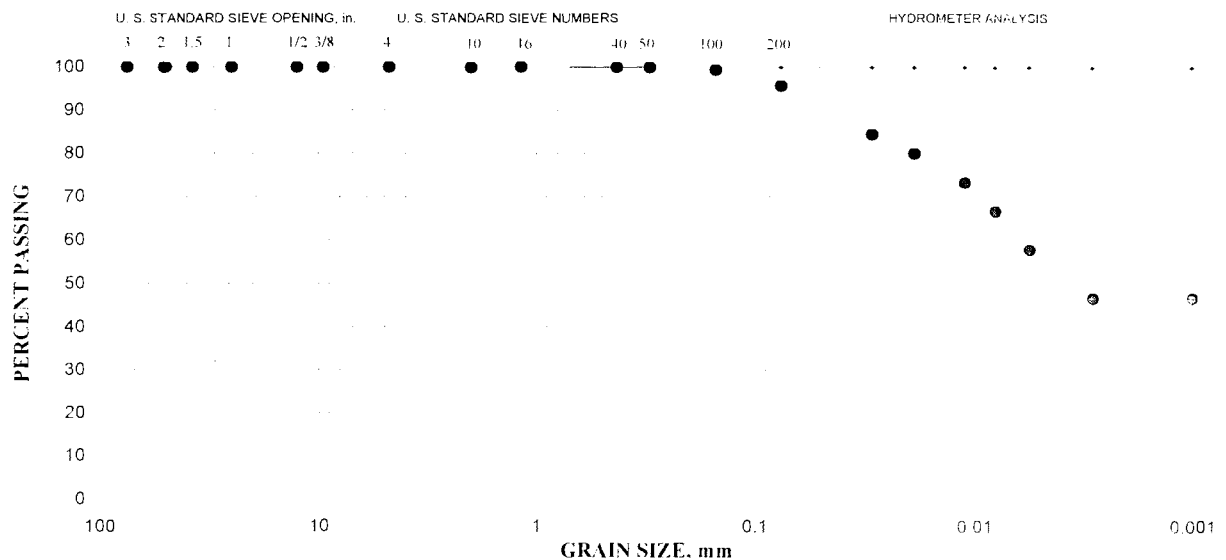
LL = ; PL = ; PI =

Gravel = 0%; Sand = 4%; Silt = 49%; Clay = 47%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425-μm)	0	100
#50 (300-μm)	0	100
#100 (150-μm)	1	99
#200 (75-μm)	4	96

Hydrometer Analysis

29-μm	84
19-μm	80
11-μm	73
8-μm	67
6-μm	58
2.9-μm	47
Colloids (<1-μm)	47



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29653
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW-22	Tested By =>	JLW
	54 - 54.5'	Reviewed By =>	JH

Pan Label =>	1	
Tare Weight of Pan =>	184.92	A
Wet Wt. of Sample & Tare =>	419.16	B
Dry Wt. of Sample & Tare =>	316.48	C
Weight of Moisture (B-C) =>	102.7	D
Dry Wt. of Sample (C-A) =>	131.56	E
Percent Moisture (D/E)*100 =>	78.0	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29653
 BORING: DBMW-22
 DEPTH: 54 - 55'
 DATE: 08/27/08
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	W
Mass of Pycnometer, $M_f \Rightarrow$	169.2
Mass of Pycnometer & Water, $M_a \Rightarrow$	667.54
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	20.3
Mass of Speciman & Pycnometer $\Rightarrow$	212.36
Mass of Pycnometer, $M_f \Rightarrow$	169.18
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	43.18
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	694.76
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	19.6

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99814
Water Density at T_b	0.99829
K Factor at T_b	1.00008
M_a at T_b	169.274751
Sp Gr at T_b	2.705513784
Sp Gr at 20 C	2.705730226
SPECIFIC GRAVITY AT 20 C	2.705730226

One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

Project No.: 83173-12

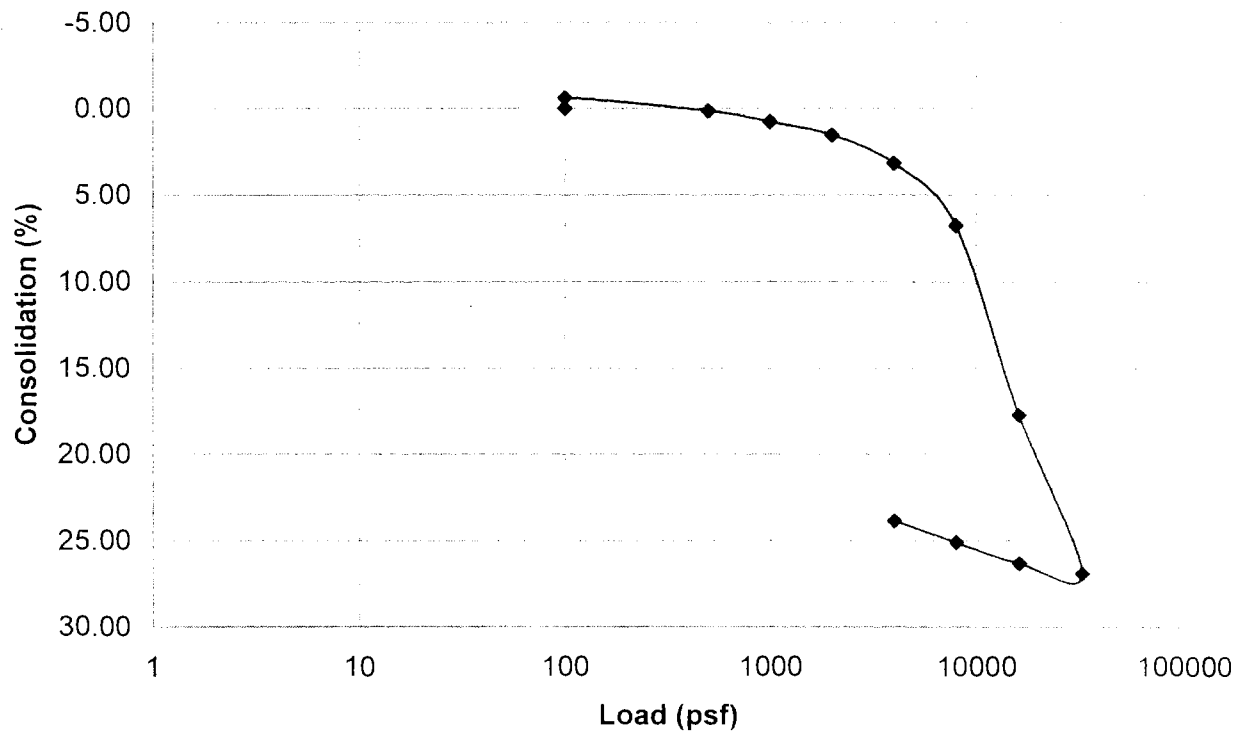
08/31/07

Sample No.: 29653
Sample Depth (ft.): DBMW-22 @ 54 - 55'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	0.00
100	-0.61
500	0.16
1000	0.76
2000	1.53
4000	3.17
8000	6.75
16000	17.71
32000	26.93
16000	26.34
8000	25.11
4000	23.85

DBMW-22 @ 54 - 55'



By: Doug Davis

Date Due:

LABORATORY NUMBER:

29652

LABORATORY WORK ORDER



Project No: 83173 Phase: 12
 Project Name: BRI AQUACER TEST/NO WELLS
 Client Name: BOART
 Client Ref./PO #: _____
 Special Instructions: _____

Sample Number: AA-23R 25-30
15 25-26.5
40-45
45-46.5

SAMPLE STATUS
☒ Requested Test
☒ Test in Progress
☒ Test Completed

Date Sampled: 8-14-07
 Date Received: 8/15/07
 Date Needed: ASAP
 Date Completed: 8/31/07
 Verified By: DA

ASPHALT TESTING				
Usage	Qty.	99#	Status	
C123 Lt Wt Pieces/Agg		990715		
C127 Absorption/Gravity	3	990707	FIG 37	☒
CAL 205 Crushed Part		990712		
CAL 227 Cleaness TST		990711		
Clay Lumps/Friabl Part C-142		990714		
D2726 Weight/Absorption Core		991110		
Extract Bitumin D1856, 2172.310		991102		
Flat/Elong Part/Sieve 119, 120		990713		
Hveem Stability/Set of 3		991147		
Ignition Oven Calibration		996156		
Injurious Organic Matter C-40		990701		
LA Rattler CAL131		990706		
Lottman Test		991121		
Marshall Stab/Flow D 1599 (Set of 3)/Lab		991108		
Max Theoretical Specific Gravity D-2041		991112		
Methylene Blue Test		990132		
Microwave Asphalt Moist Content		996137		
Oil Content By Ignition Oven		996153		
Sand Equivalent C217		990308		
Specific Gravity C127/8 D854		990211		
Stabil Test/Premix Sample CAL 366		991104		
Unit Weight C29		990704		

MISC. OTHER				
Usage	Qty.	99#	Status	
Chloride Analysis		996020		
Corrosivity Analysis		991508		
Corrosivity, Resistivity, Sodium Sulfate, Solubility, p11+		990324		
pH Test		990319		
Sulfate Analysis		992090		
Unit Weight Fireproofing		991314		

CONCRETE & MASONRY TESTING				
Usage	Qty.	99#	Status	
C942 Grout Strength (cylinder/prism strength)		990119		
Compressive Test 12x8x16 Prisms (12" width)		991005		
Compressive Test 8x8x16 Prisms (8" width)		991003		
Compressive Test/Cored Spec		990809		
Concrete Compressive Test		990803		
Drying Shrinkage (Set OF 3) C-157, CAL-530		990811		
Flex and Strength/Concrete Beam		990806		
Mortar Strength C-109		990118		

SOILS TESTING				
Usage	Qty.	99#	Status	
ASTM D1557 6" Method B, C and D		990104		
CBR 100% Compaction D1883, T180		990209		
Check Point		990106		
Collapse Potential		990614		
Consolidation W/O time Rate/6 LD D2435	1	990613	X	
Correct Oversize Material in Sample CAL301		990203		
Direct Shear 1 Point		990608		
Direct Shear 3 Point		990609		
Harvard Miniature		992191		
Hydrometer Only	2	990305	XX	
Moisture Determination Only	2	990317	XX	
Moisture Determination/Unit Weight	1	990316	XX	
Plasticity Index		990310		
Resistivity Analysis		990318		
R-Value/Untreated Material/Field Sample CAL 301		990201		
Sample Prep Materials		992508		
Sieve Analysis Wash #200 C117		990304		
Sieve Analysis/Course & Fine	2	990301	X	
Sulfate Sound (5) Sieve SZ C88		990708		
Swell Test FHA Specification (60 psi)		990312		
Unconfined Comp/Inc Moist D2166		990601		

Source: SOIL BOTANING
 Supplier: BOART
 Sample Location: AA-23R
 Type of Material: SOIL
 Sampled by: DAVIS
 Project Manager: CARLTON WILMAN

FOR ACCOUNTING USE ONLY
 Entered By: _____ Date Entered: _____

CCPW ☒ CCSD ☐ LLWD ☐ AASHTO ☐ NDOT ☐
 ASTM ☒ UBC ☐ Other ☐



An employee owned company

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: August 16, 2007
File: _____
Copies: _____

Subject: BRC Aquifer Testing: Flexible and Rigid Wall Testing

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
 ☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-22@ 40-41.5'	08/13/07	29653	08/16/07
DBMW-22@ 55-56.5'	08/13/07	29653	08/16/07
AA-23R@ 25-26.5'	08/14/07	29652	08/16/07
AA-23R@ 45-46.5'	08/14/07	29652	08/16/07

If you have any questions please don't hesitate to call.

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983



member of
AMERICAN SOCIETY FOR
TESTING MATERIALS

LABORATORY NO: 14584(c)

DATE: August 31, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29652

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29652	AA-23R	27.5-30.0	0.10%	8.06
29652	AA-23R	40.0-41.3	0.74%	8.29


LABORATORY MANAGER

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-23R@27.5-30"; S-29652 @ 25.0 - 30.0'

August 14, 2007

Silty Sand with Gravel (SM)

Specific Gravity 2.66

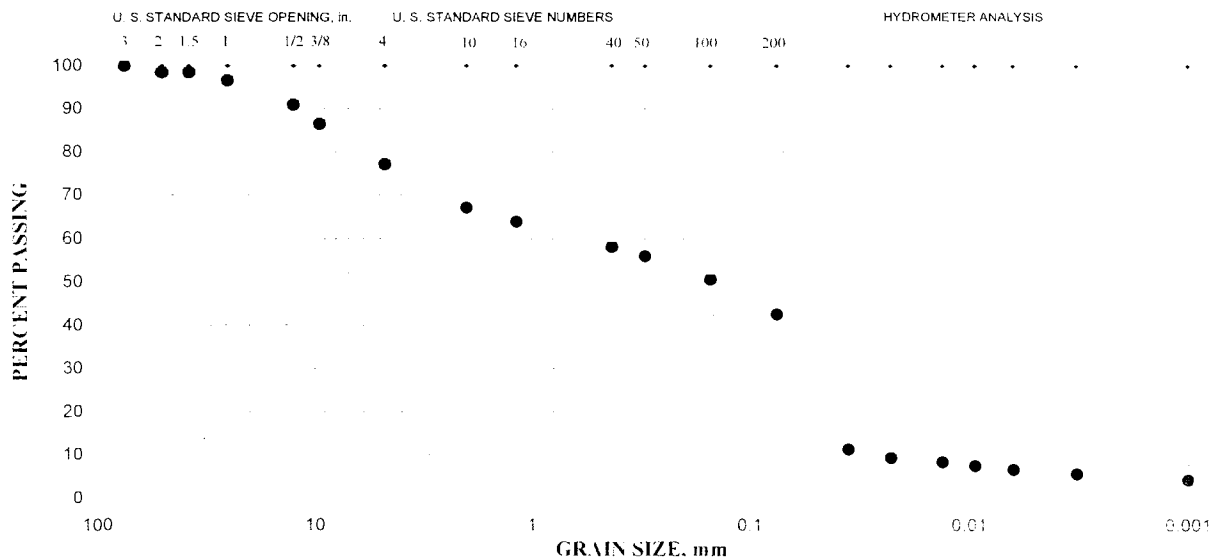
LL = ; PL = ; PI =

Gravel = 23%; Sand = 34%; Silt = 37%; Clay = 6%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	2	98
1-1/2" (37.5-mm)	2	98
1" (25.0-mm)	3	97
1/2" (12.5-mm)	9	91
3/8" (9.5-mm)	13	87
#4 (4.75-mm)	23	77
#10 (2.00-mm)	33	67
#16 (1.18-mm)	36	64
#40 (425-μm)	42	58
#50 (300-μm)	44	56
#100 (150-μm)	49	51
#200 (75-μm)	57	43

Hydrometer Analysis

35-μm	11
23-μm	9
13-μm	8
9-μm	7
6-μm	7
3.2-μm	6
Colloids (<1-μm)	4



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29652
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	NR
Sample Location =>	AA-23R	Tested By =>	JLW
	27.5 - 30'	Reviewed By =>	JH

Pan Label =>	SIM	
Tare Weight of Pan =>	194.8	A
Wet Wt. of Sample & Tare =>	1175.2	B
Dry Wt. of Sample & Tare =>	975.32	C
Weight of Moisture (B-C) =>	199.9	D
Dry Wt. of Sample (C-A) =>	780.52	E
Percent Moisture (D/E)*100 =>	25.6	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

SPECIFIC GRAVITY OF COARSE AND FINE AGGREGATE ASTM 127 & 128

Job # =>	83173	Lab Number =>	29652
Project =>	BRC Aquifer Testing	Date Sampled =>	
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	
Sample Location =>	AA-23R @ 27.5 - 30'	Tested By =>	JLW
		Reviewed By =>	

COARSE AGGREGATE

Dry Wt. of Sample A=>	3866.6		
SSD Wt. of Sample B=>	3998		
Wt. SSD Under Water C=>	2357.3		Averages
Bulk Sp Gr. A/(B-C) =>	2.357		2.357
Bulk SSD B/(B-C) =>	2.437		2.437
Apparent Sp Gr A/(A-C) =>	2.562		2.562
Absorption ((B-A)/A)*100 =>	3.4		3.4

FINE AGGREGATE

Dry Wt. of Sample + Tare =>			X
Wt. of Tare =>			Y
Dry Wt. of Sample (X-Y) =>			A
Wt. of Pycnometer w/ Water =>			B
Wt. @ SSD (500 +/- 5 gms) =>			S
Wt. of Pycnometer w/ Sample =>			C Averages
Bulk Sp Gr. A/(B+S-C) =>			
Bulk SSD S/(B+S-C) =>			
Apparent Sp Gr A/(A+B-C) =>			
Absorption ((S-A)/A)*100 =>			
Pycnometer Label =>	A	B	

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29652
 BORING: AA-23R
 DEPTH: 27.5 - 30'
 DATE: 08/29/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Z
Mass of Pycnometer, $M_f \Rightarrow$	220.94
Mass of Pycnometer & Water, $M_a \Rightarrow$	719.4
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	20.4
Mass of Speciman & Pycnometer $\Rightarrow$	294.79
Mass of Pycnometer, $M_f \Rightarrow$	220.91
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	73.88
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	765.5
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	19.9

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99812
Water Density at T_b	0.99823
K Factor at T_b	1.00002
 M_a at T_b	 220.9948306
Sp Gr at T_b	2.659467243
Sp Gr at 20 C	2.659520432
 SPECIFIC GRAVITY AT 20 C	 2.659520432

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-23R @ 40-41.3'; S-29652 @ 40.0 - 45.0'

August 14, 2007

Silt (ML)

Specific Gravity 2.61

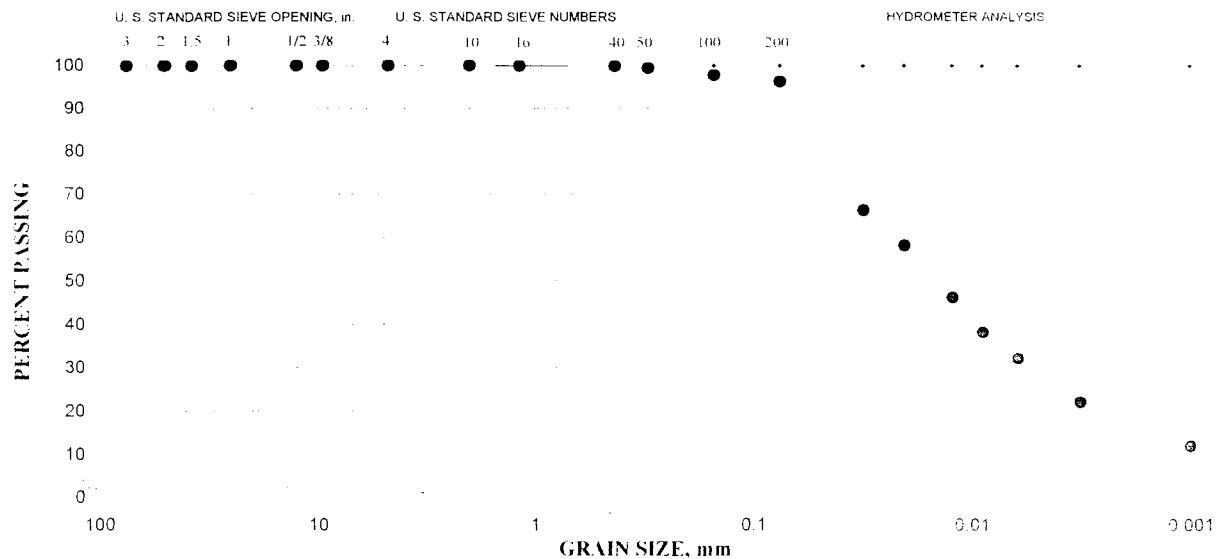
LL - ; PL - ; PI -

Gravel = 0%; Sand = 4%; Silt = 74%; Clay = 22%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	0	100
1" (25.0-mm)	0	100
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#10 (2.00-mm)	0	100
#16 (1.18-mm)	0	100
#40 (425-μm)	0	100
#50 (300-μm)	1	99
#100 (150-μm)	2	98
#200 (75-μm)	4	96

Hydrometer Analysis

31-μm	66
20-μm	58
12-μm	46
9-μm	38
6-μm	32
3.2-μm	22
Colloids (<1-μm)	12



Moisture Density							
Project Name	BRC AQUIFER TESTING				Date	08/22/07	
Project Number	83173	Phase No.	12	Tested By	JLW	Checked By	JH
Lab Number	29652						
Boring Number	AA-23R						
Sample Depth	40 - 41.3'						
Height (inches)	4.07						
Diameter (inches)	5.18						
Volume	0.0496						
Wt. of Sample							
At Field Moisture	2403.80						
Wet Density (pcf)	106.8						
Dry Density (pcf)	74.2						
Container No.							
Wt. of Wet							
Sample Plus Tare	396.97						
Wt. of Dry							
Sample Plus Tare	331.17						
Tare (g)	181.50						
Dry Wt. Of							
Sample (g)	149.67						
Moisture Content, %	44.0%						

MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29652
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	NR
Sample Location =>	AA-23R	Tested By =>	JLW
	40 - 41.3'	Reviewed By =>	JH

Pan Label =>	1	
Tare Weight of Pan =>	181.5	A
Wet Wt. of Sample & Tare =>	396.97	B
Dry Wt. of Sample & Tare =>	331.17	C
Weight of Moisture (B-C) =>	65.8	D
Dry Wt. of Sample (C-A) =>	149.67	E
Percent Moisture (D/E)*100 =>	44.0	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29652
 BORING: AA-23R
 DEPTH: 40 - 41.3'
 DATE: 08/24/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	X
Mass of Pycnometer, $M_f \Rightarrow$	224.4
Mass of Pycnometer & Water, $M_a \Rightarrow$	722.96
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	22.6
Mass of Speciman & Pycnometer $\Rightarrow$	271.51
Mass of Pycnometer, $M_f \Rightarrow$	224.38
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	47.13
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	752.05
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	19.9

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99764
Water Density at T_b	0.99823
K Factor at T_b	1.00002
M_a at T_b	224.6941504
Sp Gr at T_b	2.612527716
Sp Gr at 20 C	2.612579967
SPECIFIC GRAVITY AT 20 C	2.612579967

One-Dimensional Consolidation Properties of Soils ASTM D 2435-04

Project Name: BRC AQUIFER TESTING

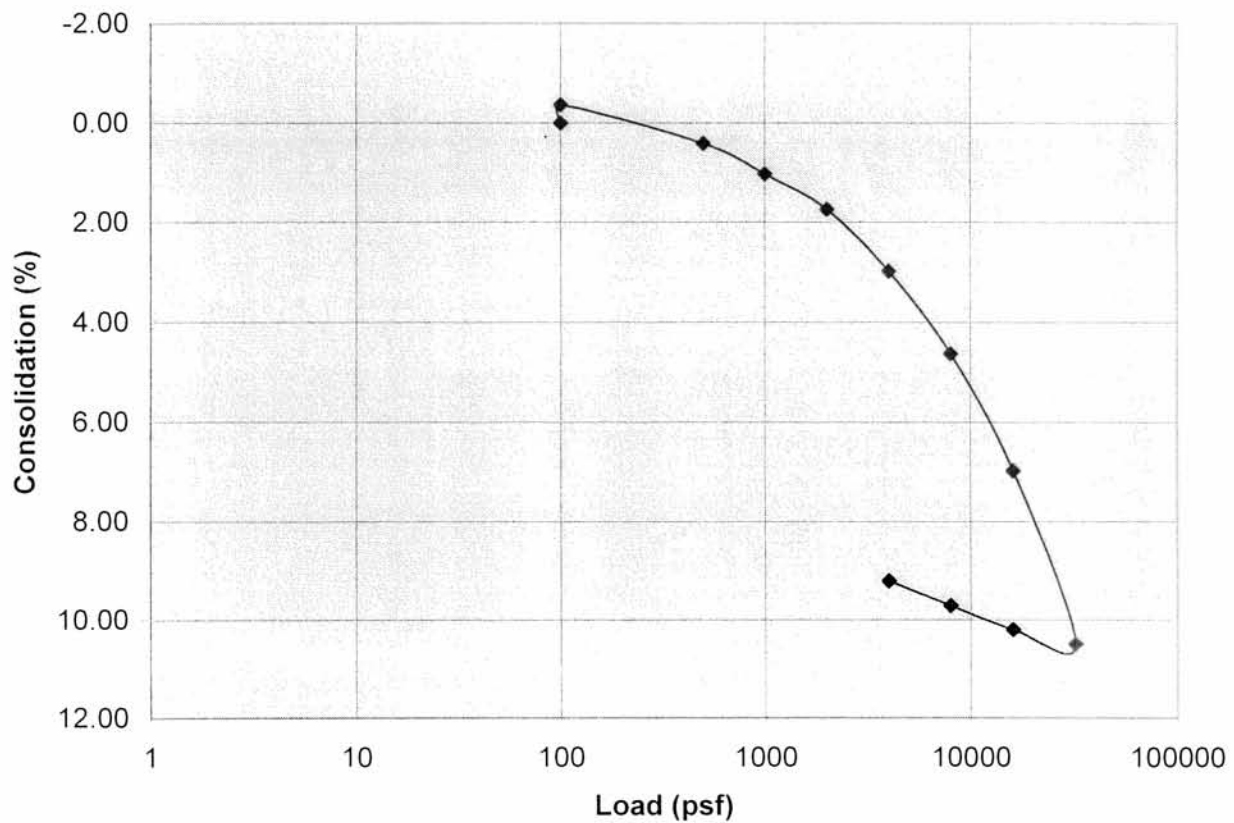
Project No.: 83173-12

Report Date: 08/22/07

Sample No.: 29652
Sample Depth (ft.): AA-23R @ 40 - 41.3'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	0.00
100	-0.37
500	0.41
1000	1.03
2000	1.74
4000	2.98
8000	4.63
16000	6.97
32000	10.49
16000	10.20
8000	9.71
4000	9.20



LABORATORY WORK ORDER



Project No: B3173 Phase: 12
 Project Name: BEL AGG. FOR TEST / NO WALLS
 Client Name: BEL
 Client Ref./P.O.#: _____
 Special Instructions: _____

29661

Sample Number: DBAW-20 30-31.5 ☒ Requested Test
1 35-40 ☒ Test in Progress
65-70 ☒ Test Completed
70-71.5

Date Sampled: 2/15/07
 Date Received: (8/22/07)
 Date Needed: ASAP
 Date Completed: 8/3/07
 Verified By: MS

ASPHALT TESTING				
Usage	Qty.	99#	Status	
C123 Li Wt Pieces/Agg		990715		
C127 Absorption/Gravity	<u>4</u>	<u>990702</u>	<u>990702</u>	☒
CAL 205 Crushed Part		990712		
CAL 227 Cleaness TST		990711		
Clay Lumps/Friabl Part C-142		990714		
D2726 Weight/Absorption Core		991110		
Extract Bitumin D1856, 2172.310		991102		
Flat/Elong Part/Sieve 119, 120		990713		
Hveem Stability/Set of 3		991147		
Ignition Oven Calibration		996156		
Injurious Organic Matter C-40		990701		
LA Rattler CAL131		990706		
Lottman Test		991121		
Marshall Stab/Flow D-1599 (Set of 3)/Lab		991108		
Max Theoretical Specific Gravity D-2041		991112		
Methylene Blue Test		990132		
Microwave Asphalt Moist Content		996137		
Oil Content By Ignition Oven		996153		
Sand Equivalent C217		990308		
Specific Gravity C127/8 D854		990211		
Stabil Test/Premix Sample CAL 366		991104		
Unit Weight C29		990704		

MISC. OTHER				
Usage	Qty.	99#	Status	
Chloride Analysis		996020		
Corrosivity Analysis		991508		
Corrosivity, Resistivity, Sodium Sulfate, Solubility, p11 ^h		990324		
pH Test		990319		
Sulfate Analysis		992090		
Unit Weight Fireproofing		991314		

CONCRETE & MASONRY TESTING				
Usage	Qty.	99#	Status	
C942 Grout Strength (cylinder/prism strength)		990119		
Compressive Test 12x8x16 Prisms (12" width)		991005		
Compressive Test 8x8x16 Prisms (8" width)		991003		
Compressive Test/Cored Spec		990809		
Concrete Compressive Test		990803		
Drying Shrinkage (Set OF 3) C-157, CAL-530		990811		
Flex and Strength/Concrete Beam		990806		
Mortar Strength C-109		990118		

SOILS TESTING				
Usage	Qty.	99#	Status	
ASTM D1557 6" Method B, C and D		990104		
CBR 100% Compaction D1883, T180		990209		
Check Point		990106		
Collapse Potential		990614		
Consolidation W/O time Rate/6 LD D2435		990613		
Correct Oversize Material in Sample CAL301		990203		
Direct Shear 1 Point		990608		
Direct Shear 3 Point		990609		
Harvard Miniature		992191		
Hydrometer Only	<u>2</u>	990305	☒	
Moisture Determination Only	<u>2</u>	990317	☒	
Moisture Determination/Unit Weight		990316		
Plasticity Index		990310		
Resistivity Analysis		990318		
R-Value/Untreated Material/Field Sample CAL 301		990201		
Sample Prep Materials		992508		
Sieve Analysis Wash #200 C117		990304		
Sieve Analysis/Course & Fine	<u>2</u>	990301	☒	
Sulfate Sound (5) Sieve SZ C88		990708		
Swell Test FHA Specification (60 psi)		990312		
Unconfined Comp/Inc Moist D2166		990601		

Source: SOIL BORING
 Supplier: BOART
 Sample Location: DBAW-20
 Type of Material: SOIL
 Sampled by: DAVIS
 Project Manager: CARTER/WITMAN

☐ CPW ☐ LLWD ☐ NDOT
☐ CSO ☐ AASHTO
☐ UBC
☐ ASTM
☐ Other

FOR ACCOUNTING USE ONLY
 Entered By: _____ Date Entered: _____



KLEINFELDER

An employee owned company

6380 South Polaris Avenue
Las Vegas, Nevada 89118
(702) 736-2936 phone
(702) 361-9094 fax

Transmittal Letter

To: Chad Walker
Sierra Testing Laboratories
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762

From: Jessi Henderson
Date: August 24, 2007
File: _____
Copies: _____

Subject: BRC Aquifer Testing: Flexible and Rigid Wall Testing

We are sending: ☒ Attached ☐ Under Separate Cover

Via: ☐ Messenger ☐ First Class Mail ☒ United Parcel ☐ Air Freight

Transmitted: ☒ As Requested ☐ For Approval ☐ For Your Use
☐ For Signatures ☐ For Review & Comment

REMARKS: Please run rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-12: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
DBMW-20@30-31.5'	08/15/07	29661	08/24/07
DBMW-20@70-71.5'	08/15/07	29661	08/24/07

If you have any questions please don't hesitate to call.

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983

member of
AMERICAN SOCIETY FOR
TESTING MATERIALS



LABORATORY NO: 14584(d)

DATE: August 30, 2007

SAMPLE: Soil

P.O.:

MARKED: 83173-12

LAB ID: 29661

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974, AWWA 4500 H

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>DEPTH (feet)</u>	<u>ORGANIC CARBON</u>	<u>pH VALUE</u>
29661	DBMW-20	35.0-37.5	0.62%	9.34
29661	DBMW-20	67.5-70.0	0.22%	9.34

Robert L. Saunders

LABORATORY MANAGER

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-20@67.5'-70'; S-29661 @ 35.0 - 40.0'

August 15, 2007

Silty Sand with Gravel (SM)

Specific Gravity = 2.57

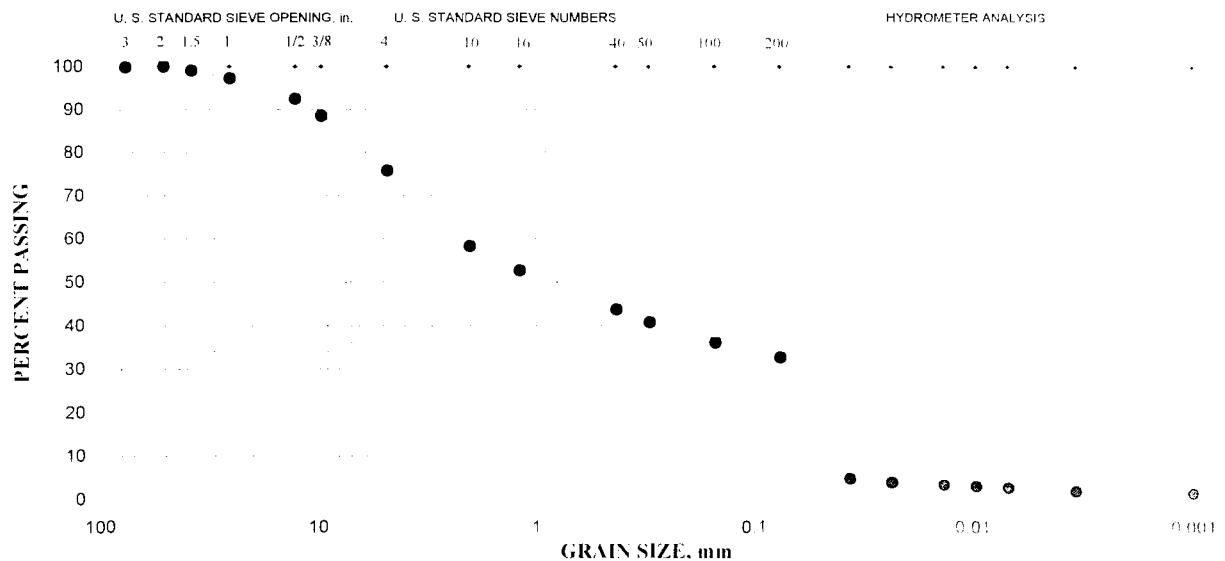
LL = ; PL = ; PI =

Gravel = 24%; Sand = 43%; Silt = 31%; Clay = 2%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	1	99
1" (25.0-mm)	3	97
1/2" (12.5-mm)	7	93
3/8" (9.5-mm)	11	89
#4 (4.75-mm)	24	76
#10 (2.00-mm)	42	58
#16 (1.18-mm)	47	53
#40 (425-μm)	56	44
#50 (300-μm)	59	41
#100 (150-μm)	64	36
#200 (75-μm)	67	33

Hydrometer Analysis

36-μm	5
23-μm	4
14-μm	3
10-μm	3
7-μm	3
3.4-μm	2
Colloids (<1-μm)	2



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29661
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW-20	Tested By =>	JLW
	35 - 37.5'	Reviewed By =>	JH

Pan Label =>	JL	
Tare Weight of Pan =>	201.34	A
Wet Wt. of Sample & Tare =>	1279.14	B
Dry Wt. of Sample & Tare =>	1190.08	C
Weight of Moisture (B-C) =>	89.1	D
Dry Wt. of Sample (C-A) =>	988.74	E
Percent Moisture (D/E)*100 =>	9.0	F

Sieve Retaining More Than About	Recommended Minimum Mass
10% of Sample	of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

SPECIFIC GRAVITY OF COARSE AND FINE AGGREGATE ASTM 127 & 128

Job # =>	83173	Lab Number =>	29661
Project =>	BRC Aquifer Testing	Date Sampled =>	
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	
Sample Location =>	DBMW-20 @ 37 - 37.5'	Tested By =>	JLW
		Reviewed By =>	

COARSE AGGREGATE

Dry Wt. of Sample A=>	2923.8		
SSD Wt. of Sample B=>	3032.6		
Wt. SSD Under Water C=>	1777.2		Averages
Bulk Sp Gr. A/(B-C) =>	2.329		2.329
Bulk SSD B/(B-C) =>	2.416		2.416
Apparent Sp Gr A/(A-C) =>	2.550		2.550
Absorption ((B-A)/A)*100 =>	3.7		3.7

FINE AGGREGATE

Dry Wt. of Sample + Tare =>			X
Wt. of Tare =>			Y
Dry Wt. of Sample (X-Y) =>			A
Wt. of Pycnometer w/ Water =>			B
Wt. @ SSD (500 +/- 5 gms) =>			S
Wt. of Pycnometer w/ Sample =>			C Averages
Bulk Sp Gr. A/(B+S-C) =>			
Bulk SSD S/(B+S-C) =>			
Apparent Sp Gr A/(A+B-C) =>			
Absorption ((S-A)/A)*100 =>			
Pycnometer Label =>	A	B	

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29661
 BORING: DBMW-20
 DEPTH: 35 - 37.5
 DATE: 08/27/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Y
Mass of Pycnometer, $M_f \Rightarrow$	224.39
Mass of Pycnometer & Water, $M_a \Rightarrow$	722.72
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	22.6
Mass of Speciman & Pycnometer $\Rightarrow$	305.48
Mass of Pycnometer, $M_f \Rightarrow$	224.37
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	81.11
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	772.32
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	20.2

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99764
Water Density at T_b	0.99816
K Factor at T_b	0.99996

M_a at T_b	224.6491316
Sp Gr at T_b	2.574103459
Sp Gr at 20 C	2.574000495

SPECIFIC GRAVITY AT 20 C	2.574000495
--------------------------	-------------

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #DBMW-20@67.5'-70'; S-29661 @ 65.0 - 70.0'

August 15, 2007

Silty Sand with Gravel (SM)

Specific Gravity = 2.62

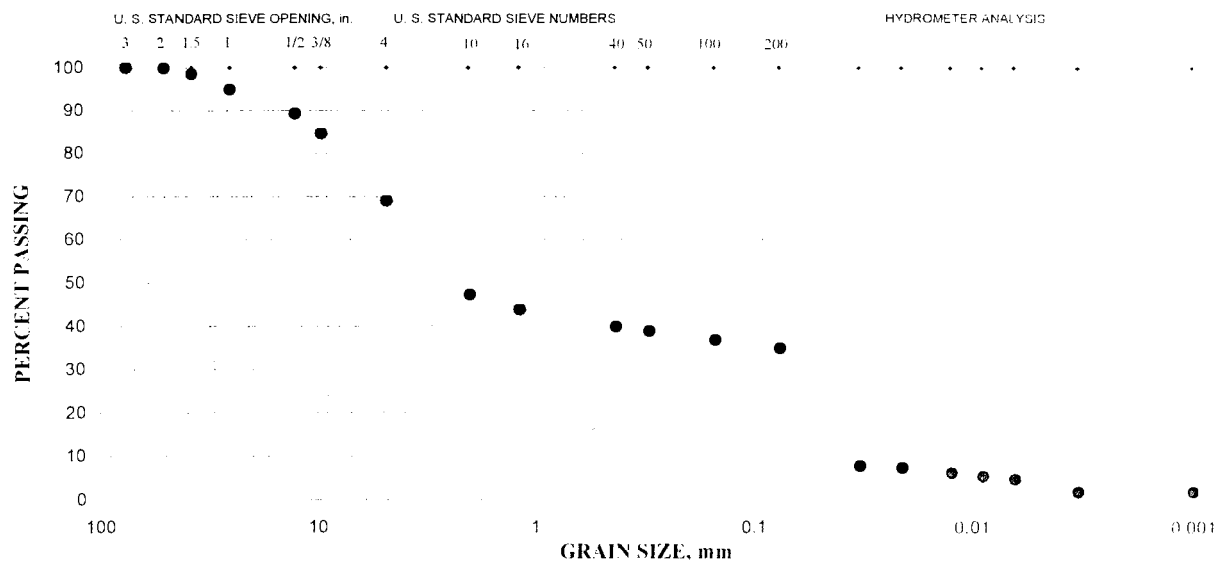
LL = ; PL = ; PI =

Gravel = 31%; Sand = 34%; Silt = 33%; Clay = 2%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	0	100
1-1/2" (37.5-mm)	2	98
1" (25.0-mm)	5	95
1/2" (12.5-mm)	11	89
3/8" (9.5-mm)	15	85
#4 (4.75-mm)	31	69
#10 (2.00-mm)	53	47
#16 (1.18-mm)	56	44
#40 (425- μ m)	60	40
#50 (300- μ m)	61	39
#100 (150- μ m)	63	37
#200 (75- μ m)	65	35

Hydrometer Analysis

32- μ m	8
21- μ m	7
12- μ m	6
9- μ m	5
6- μ m	5
3.3- μ m	2
Colloids (<1- μ m)	2



MOISTURE CONTENT OF SOIL, ROCK AND SOIL-AGGREGATE MIXTURES ASTM D-2216

Job # =>	83173	Lab Number =>	29661
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	NR
Sample Location =>	DBMW-20	Tested By =>	JLW
	67.5 - 70'	Reviewed By =>	JH

Pan Label =>	B-32	
Tare Weight of Pan =>	196.45	A
Wet Wt. of Sample & Tare =>	1488.17	B
Dry Wt. of Sample & Tare =>	1368.17	C
Weight of Moisture (B-C) =>	120.0	D
Dry Wt. of Sample (C-A) =>	1171.72	E
Percent Moisture (D/E)*100 =>	10.2	F

Sieve Retaining More Than About 10% of Sample	Recommended Minimum Mass of Moist Sample
No. 10	100 to 200 gms
No. 4	300 to 500 gms
¾"	500 to 1000 gms
1½"	1500 to 3000 gms
3"	5000 to 10000 gms

Dry @ 110 ± 5° C to a constant mass

If sample contains Gypsum or other materials having hydrated water

Then dry @ 60 ± 5°C

SPECIFIC GRAVITY OF COARSE AND FINE AGGREGATE ASTM 127 & 128

Job # =>	83173	Lab Number =>	29661
Project =>	BRC Aquifer Testing	Date Sampled =>	
Client =>	BRC	Date Received =>	
Phase =>	12	Sampled By =>	
Sample Location =>	DBMW-20 @ 67.5 - 70'	Tested By =>	JLW
		Reviewed By =>	

COARSE AGGREGATE

Dry Wt. of Sample A=>	5087.4		
SSD Wt. of Sample B=>	5238.7		
Wt. SSD Under Water C=>	3118.5		Averages
Bulk Sp Gr. A/(B-C) =>	2.399		2.399
Bulk SSD B/(B-C) =>	2.471		2.471
Apparent Sp Gr A/(A-C) =>	2.584		2.584
Absorption ((B-A)/A)*100 =>	3.0		3.0

FINE AGGREGATE

Dry Wt. of Sample + Tare =>			X
Wt. of Tare =>			Y
Dry Wt. of Sample (X-Y) =>			A
Wt. of Pycnometer w/ Water =>			B
Wt. @ SSD (500 +/- 5 gms) =>			S
Wt. of Pycnometer w/ Sample =>			C Averages
Bulk Sp Gr. A/(B+S-C) =>			
Bulk SSD S/(B+S-C) =>			
Apparent Sp Gr A/(A+B-C) =>			
Absorption ((S-A)/A)*100 =>			
Pycnometer Label =>	A	B	

PROJECT NAME: BRC Aquifer Testing
 PROJECT NUMBER: 83173-12
 LAB NUMBER: 29661
 BORING: DBMW-20
 DEPTH: 67.5 - 70'
 DATE: 08/27/07
 TECHNICIAN: JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	X
Mass of Pycnometer, $M_f \Rightarrow$	220.89
Mass of Pycnometer & Water, $M_a \Rightarrow$	719.23
Temperature of Water when Ma above was Taken, $T_a \Rightarrow$	20.3
Mass of Speciman & Pycnometer $\Rightarrow$	318.25
Mass of Pycnometer, $M_f \Rightarrow$	220.87
Mass of Oven-Dry Specimen, $M_o \Rightarrow$	97.38
Mass of Pycnometer, Soil & Water, $M_b \Rightarrow$	779.5
Temperature of Water when Mb Above was Taken, $T_b \Rightarrow$	20.2

Prodedure

Record the mass of a clean dry pycnometer, M_f
 Record the mass of the pyc. and distilled water at calibration mark, M_a
 Record the temperature of the water to the nearest .5° C, T_a
 Record Mass of Pyc & Water at Calibration Mark, M_a

Water Density at T_a	0.99814
Water Density at T_b	0.99816
K Factor at T_b	0.99996

M_a at T_b	220.8999668
Sp Gr at T_b	2.624090542
Sp Gr at 20 C	2.623985578

SPECIFIC GRAVITY AT 20 C	2.623985578
--------------------------	-------------



July 5, 2007

Kleinfelder, Inc.
Attn: G. Whittman
6380 Polaris Ave.
Las Vegas NV 89118

STL Project No: **07-220**
Subject: **BRC Aquifer**
Project No: **83173.4**
Invoice No: **4560**

LABORATORY TEST RESULTS

Dear Mr. Whittman:

As requested, Sierra Testing Laboratories, Inc. performed laboratory testing on **twelve samples** of material from the subject site. The samples were identified as:

- | | |
|--------------------------|---------------------------|
| 1. DBMW-2, 6/18: 30-31.5 | 7. DBMW-6, 6/21: 35-36.5 |
| 2. DBMW-2, 6/18: 50-51.5 | 8. DBMW-6, 6/21: 50-51.5 |
| 3. DBMW-1, 6/19: 40-41.5 | 9. DBMW-7, 6/21: 70-71.5 |
| 4. DBMW-1, 6/19: 50-51.5 | 10. DBMW-7, 6/21: 60-61.5 |
| 5. DBMW-3: 30-31.5 | 11. DBMW-8, 6/24: 62.5-64 |
| 6. DBMW-3: 40-41.5 | 12. DBMW-8, 6/24: 70-71.5 |

Our laboratory received the samples between **June 22, 2007 and June 27, 2007**. The test performed on the submitted samples was as follows:

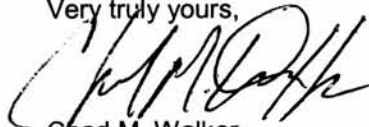
1) Flexible Wall Permeability (ASTM D5084)

The results of the above referenced testing are presented on the attached figure(s).

We appreciate the opportunity to be of service to you on this project and look forward to providing additional service, as needed, in the future.

Should you have any questions or require additional information, please contact our office at your convenience.

Very truly yours,



Chad M. Walker
Project Manager

Enclosures
sm

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-2, 6/18/07

Sample Depth, ft.: 30-31.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 11.5 psi

TEST RESULTS

Permeability, cm/sec.: 1.37E-06

Average Hydraulic Gradient: 12.7

Effective Cell Pressure, psi: 11.5

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 5.08

Specimen Diameter, cm: 4.85

Dry Unit Weight, pcf: 86.3

Moisture Content, % 35.7

Specific Gravity, Assumed

Percent Saturation:

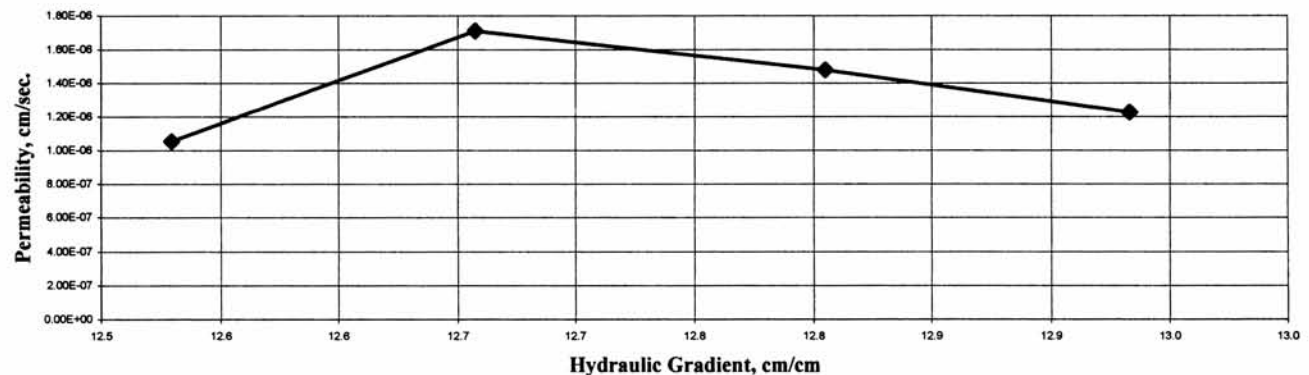
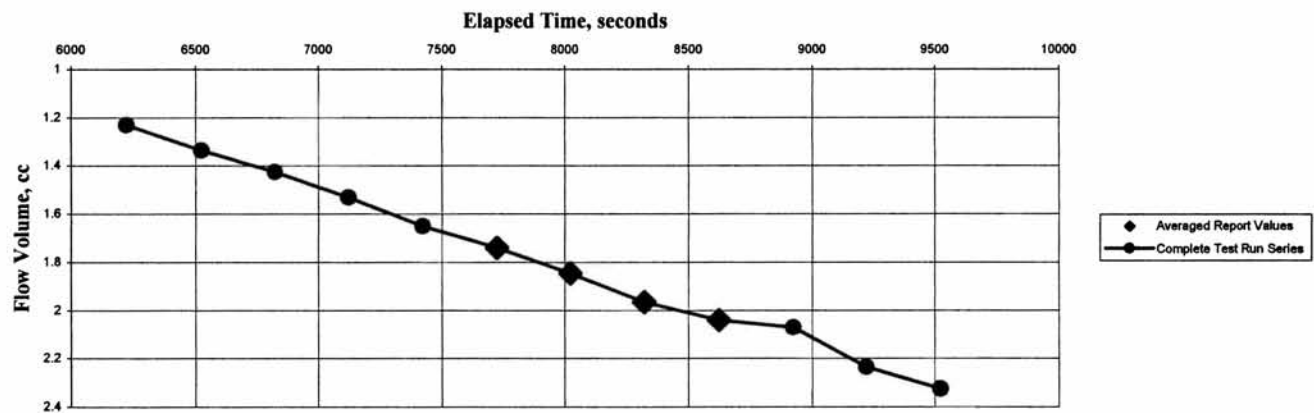
After Test

Specimen Height, cm: 5.08

Specimen Diameter, cm: 4.85

Dry Unit Weight, pcf: 86.3

Moisture Content, % 36.5



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

June 22, 2007

BRC Aquifer Testing


SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-1, 6/19/07

Sample Depth, ft.: 50-51.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 19.1 psi

TEST RESULTS

Permeability, cm/sec.: 2.08E-06

Average Hydraulic Gradient: 11.5

Effective Cell Pressure, psi: 19.1

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 5.08

Specimen Diameter, cm: 4.85

Dry Unit Weight, pcf: 55.0

Moisture Content, % 76.5

Specific Gravity, Assumed

Percent Saturation:

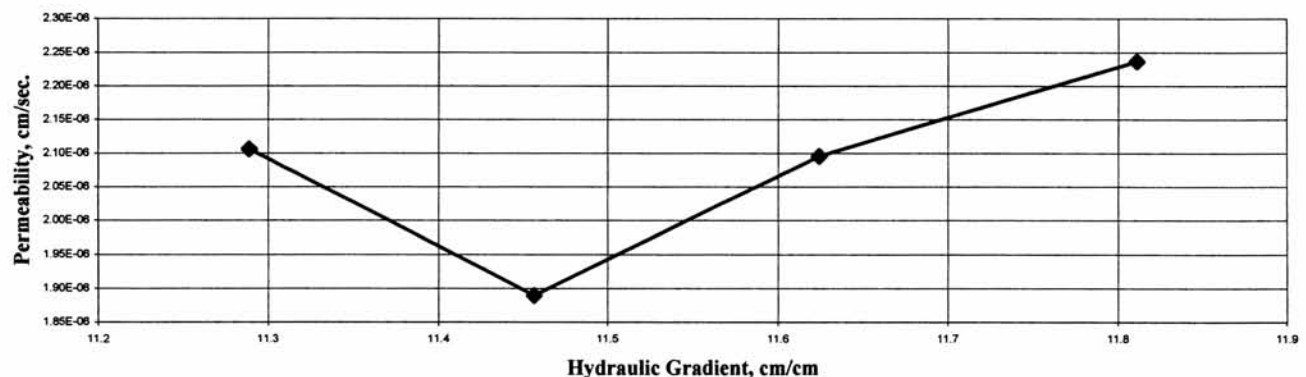
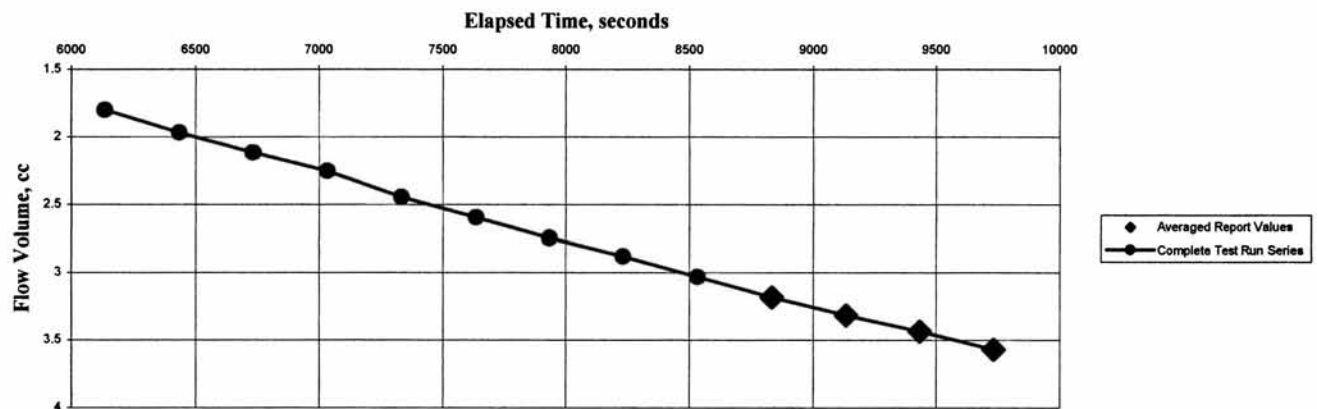
After Test

Specimen Height, cm: 5.08

Specimen Diameter, cm: 4.85

Dry Unit Weight, pcf: 55.6

Moisture Content, % 76.8



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

June 22, 2007

BRC Aquifer Testing



5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-1, 6/19/07

Sample Depth, ft.: 40-41.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 15.3 psi

TEST RESULTS

Permeability, cm/sec.: 2.77E-06

Average Hydraulic Gradient: 10.4

Effective Cell Pressure, psi: 15.3

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 5.08

Specimen Diameter, cm: 4.85

Dry Unit Weight, pcf: 75.1

Moisture Content, % 45.1

Specific Gravity, Assumed

Percent Saturation:

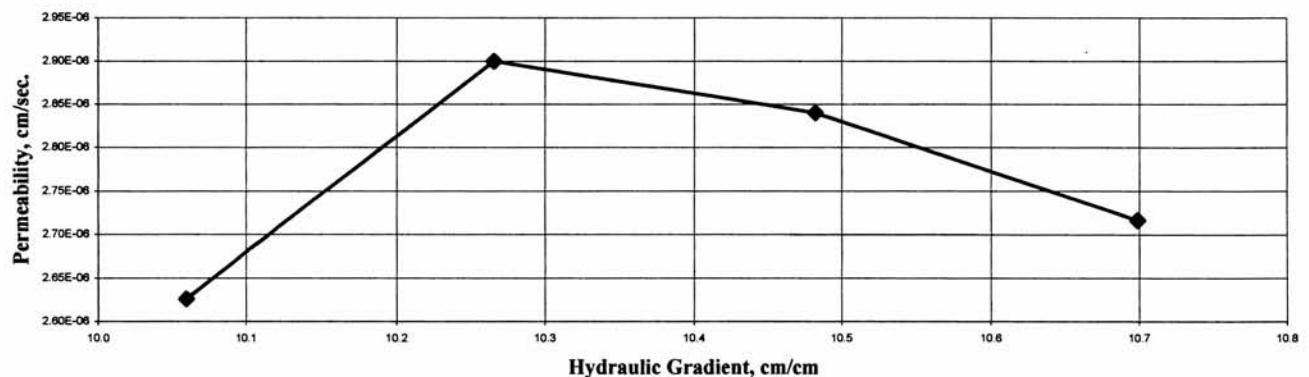
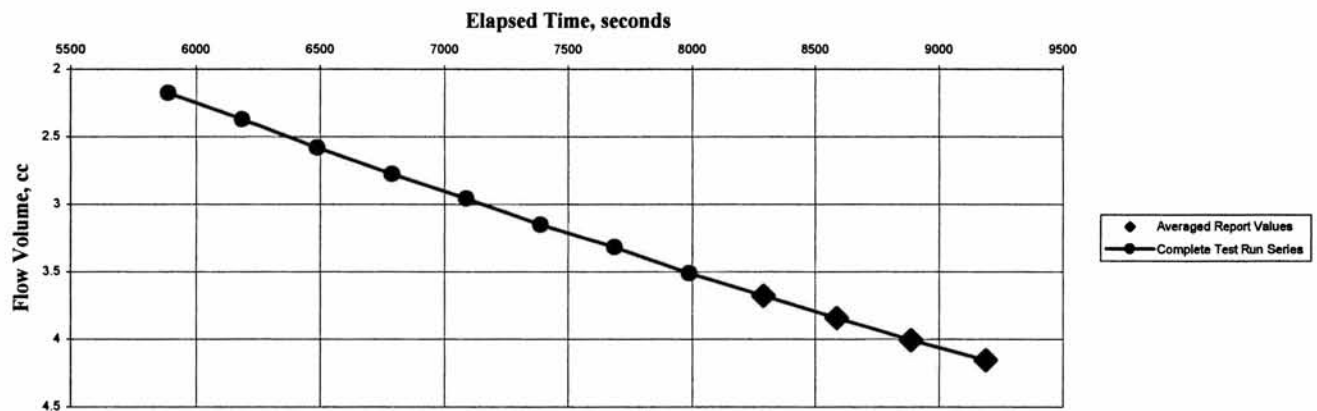
After Test

Specimen Height, cm: 5.08

Specimen Diameter, cm: 4.85

Dry Unit Weight, pcf: 75.1

Moisture Content, % 45.3



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

June 22, 2007

BRC Aquifer Testing



5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-2, 6/18/07

Sample Depth, ft.: 50-51.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confinin Stress = 19.1 psi

TEST RESULTS

Permeability, cm/sec.: 6.33E-06

Average Hydraulic Gradient: 9.1

Effective Cell Pressure, psi: 19.1

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 5.08

Specimen Diameter, cm: 4.85

Dry Unit Weight, pcf: 63.8

Moisture Content, % 51.4

Specific Gravity, Assumed

Percent Saturation:

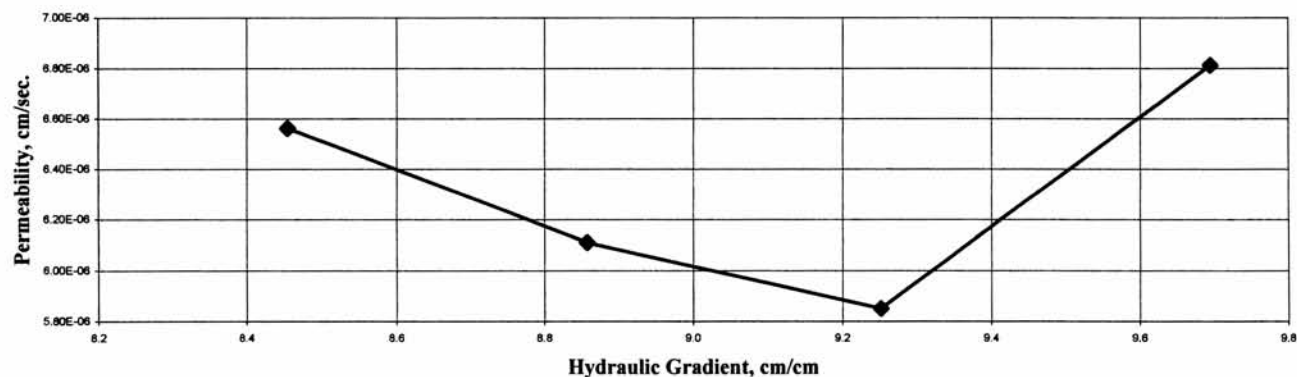
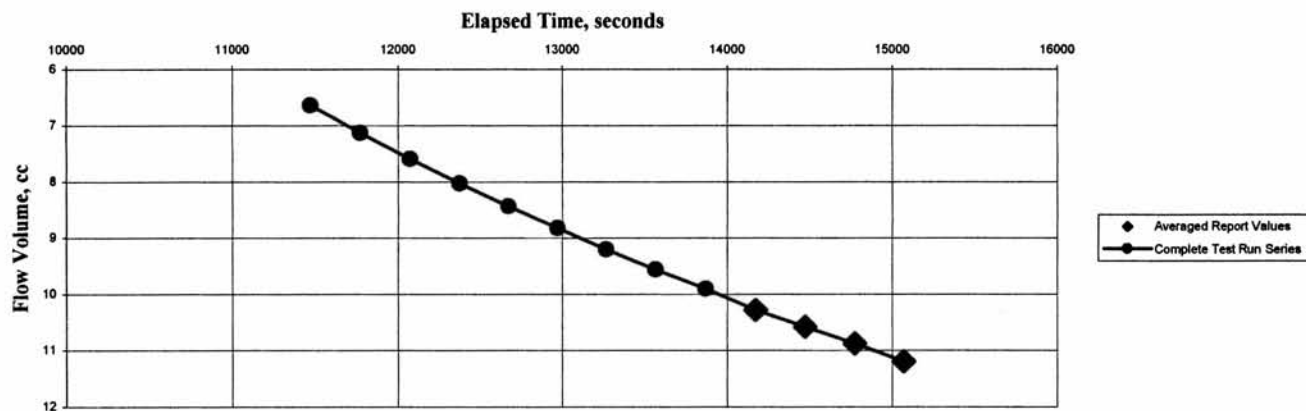
After Test

Specimen Height, cm: 5.08

Specimen Diameter, cm: 4.85

Dry Unit Weight, pcf: 64.5

Moisture Content, % 82.1



Test Method: ASTM D5856

PROJECT NUMBER: 07-220

June 22, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-3, 6/20/07

Sample Depth, ft.: 30-31.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 11.5 psi

TEST RESULTS

Permeability, cm/sec.: $3.71\text{E-}06$

Average Hydraulic Gradient: 6.9

Effective Cell Pressure, psi: 11.5

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 5.08

Specimen Diameter, cm: 4.85

Dry Unit Weight, pcf: 68.0

Moisture Content, % 55.6

Specific Gravity, Assumed

Percent Saturation:

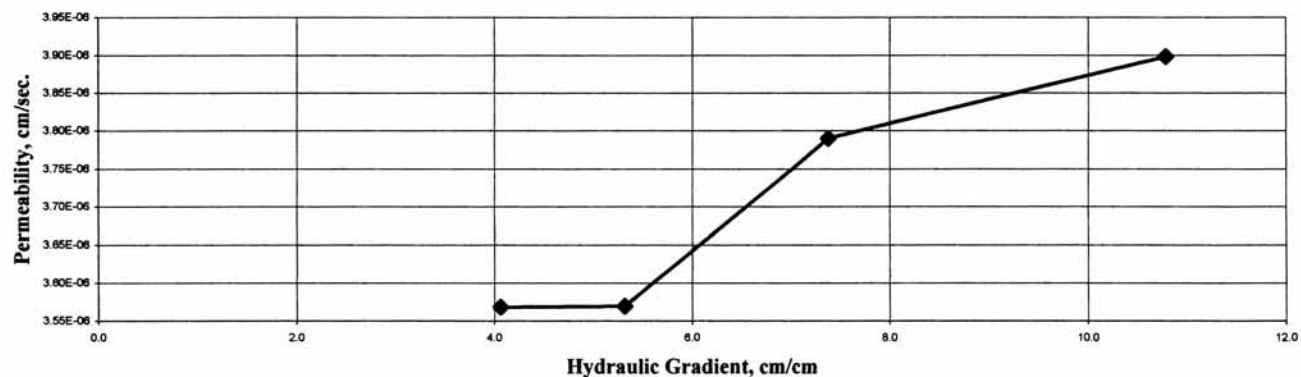
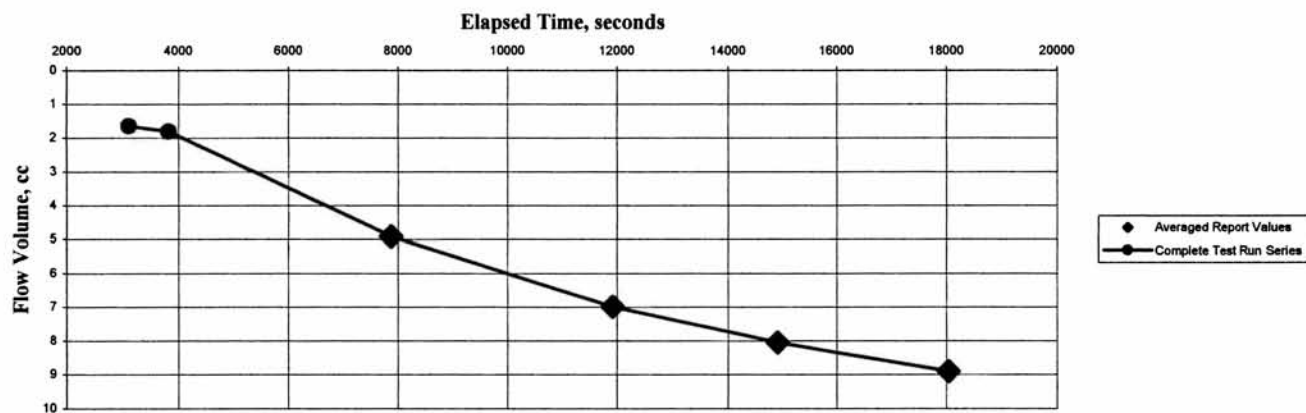
After Test

Specimen Height, cm: 5.08

Specimen Diameter, cm: 4.85

Dry Unit Weight, pcf: 68.0

Moisture Content, % 58.8



Test Method: ASTM D5856

PROJECT NUMBER: 07-220

June 25, 2007

BRC Aquifer Testing



5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-3, 6/20/07

Sample Depth, ft.: 40-41.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 15.3 psi

TEST RESULTS

Permeability, cm/sec.: 1.37E-06

Average Hydraulic Gradient: 10.3

Effective Cell Pressure, psi: 15.3

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 5.08

Specimen Diameter, cm: 4.85

Dry Unit Weight, pcf: 94.5

Moisture Content, % 29.8

Specific Gravity, Assumed

Percent Saturation:

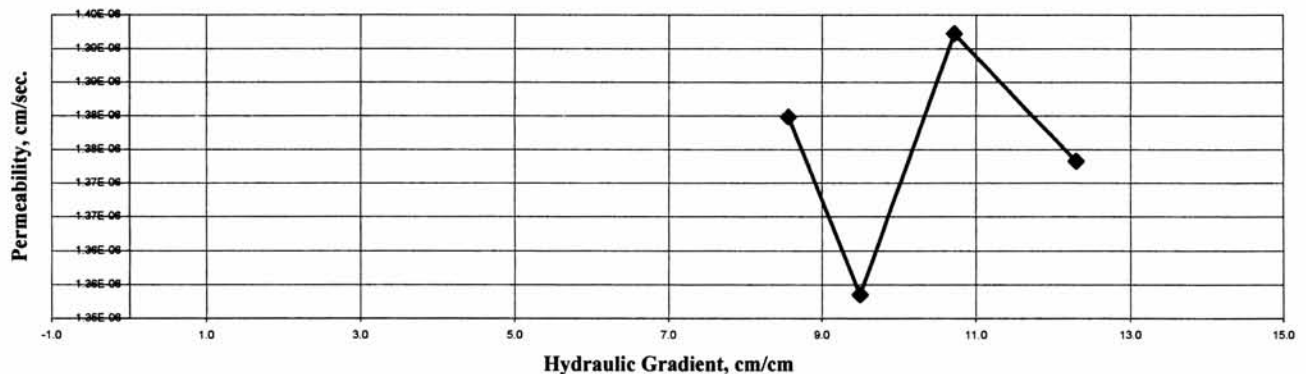
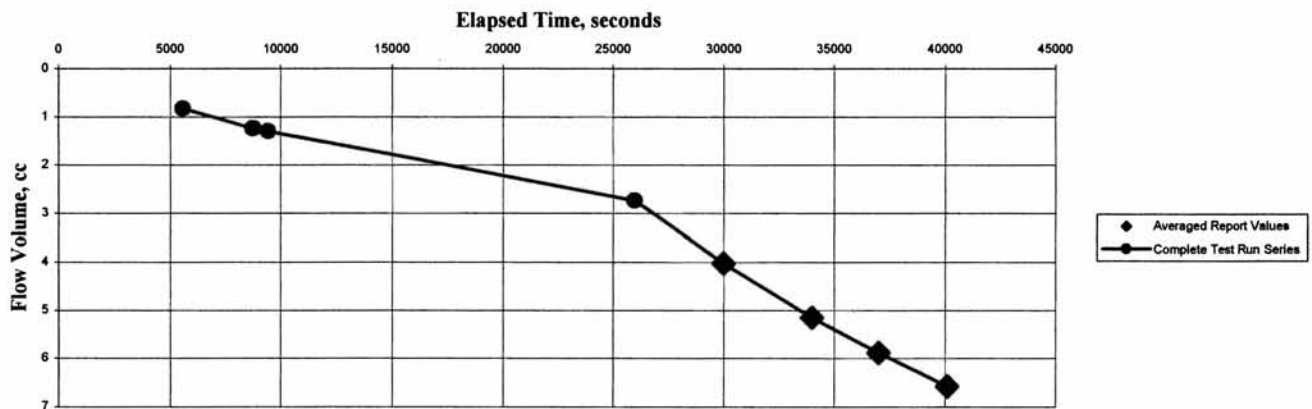
After Test

Specimen Height, cm: 5.08

Specimen Diameter, cm: 4.85

Dry Unit Weight, pcf: 94.5

Moisture Content, % 29.8



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

June 25, 2007

BRC Aquifer Testing



5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-6, 6/21/07

Sample Depth, ft.: 35-36.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 13.4 psi

TEST RESULTS

Permeability, cm/sec.: 6.03E-08

Average Hydraulic Gradient: 9.4

Effective Cell Pressure, psi: 13.4

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 5.08

Specimen Diameter, cm: 4.85

Dry Unit Weight, pcf: 94.9

Moisture Content, % 28.1

Specific Gravity, Assumed

Percent Saturation:

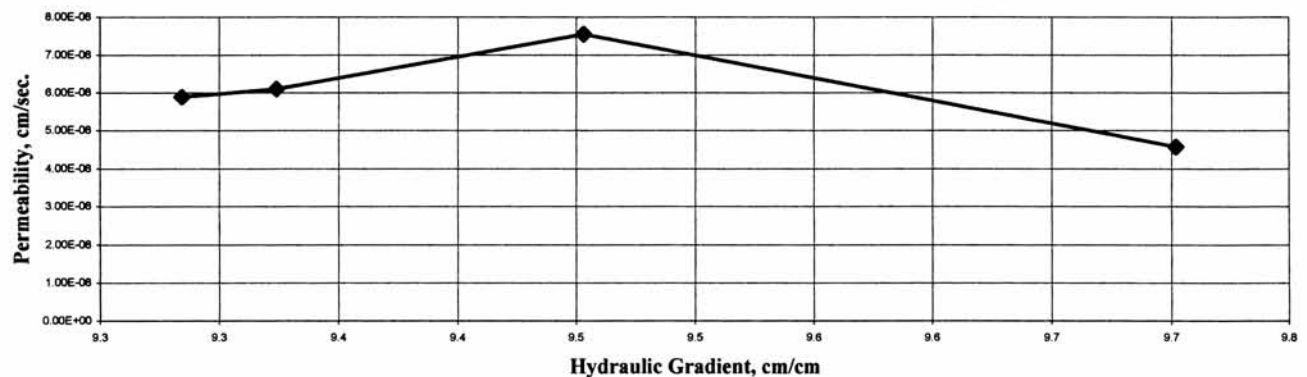
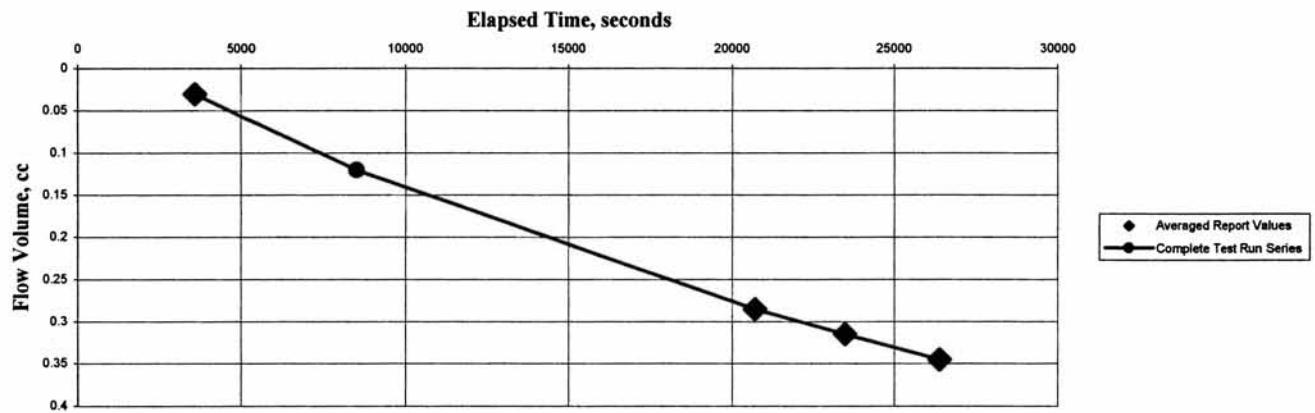
After Test

Specimen Height, cm: 5.03

Specimen Diameter, cm: 4.85

Dry Unit Weight, pcf: 94.9

Moisture Content, % 31.6



Test Method: ASTM D5856

PROJECT NUMBER: 07-220

June 27, 2007

BRC Aquifer Testing



5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-6, 6/21/07

Sample Depth, ft.: 50-51.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 19.1 psi

TEST RESULTS

Permeability, cm/sec.: 9.29E-06

Average Hydraulic Gradient: 5.7

Effective Cell Pressure, psi: 19.1

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 5.08

Specimen Diameter, cm: 4.85

Dry Unit Weight, pcf: 85.7

Moisture Content, % 32.5

Specific Gravity, Assumed

Percent Saturation:

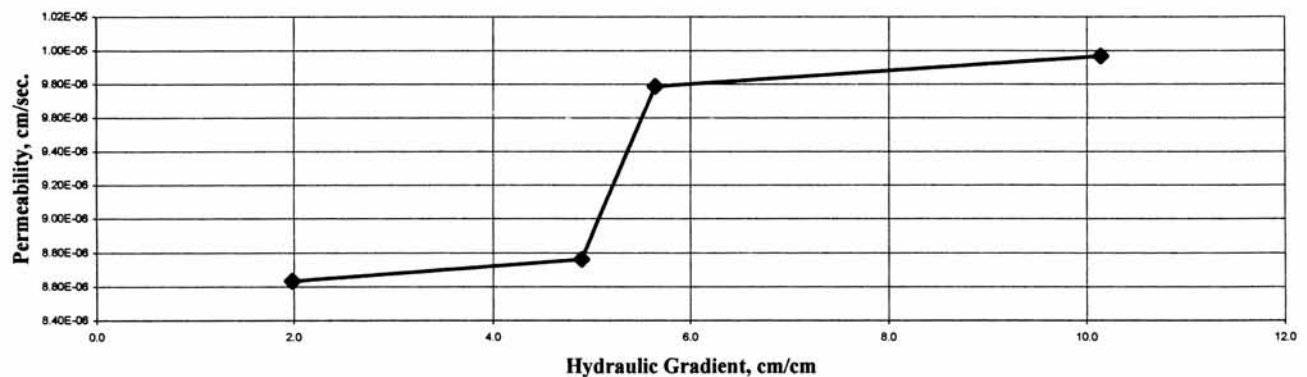
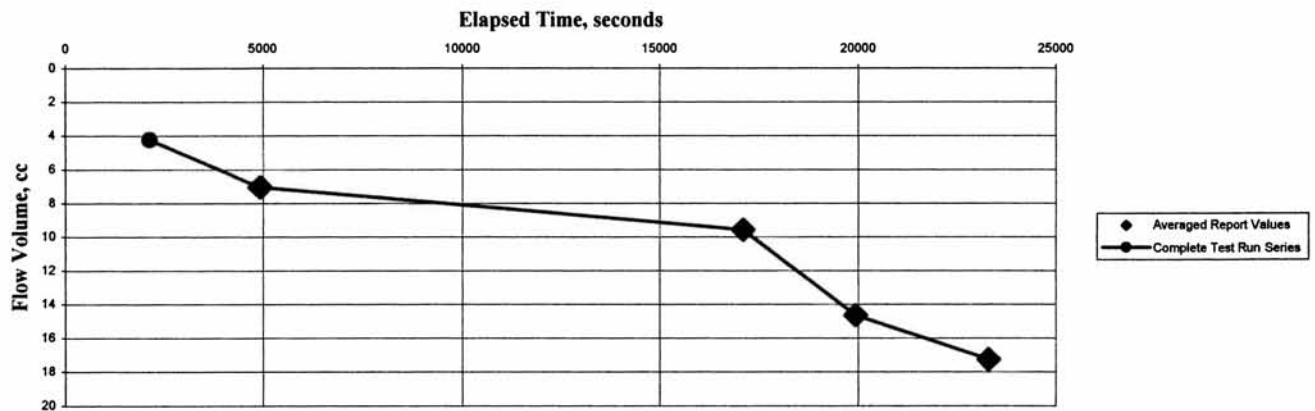
After Test

Specimen Height, cm: 4.88

Specimen Diameter, cm: 4.85

Dry Unit Weight, pcf: 88.3

Moisture Content, % 37.8



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

June 27, 2007

BRC Aquifer Testing



5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-7, 6/22/07

Sample Depth, ft.: 60-61.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 22.9 psi

TEST RESULTS

Permeability, cm/sec.: 9.52E-08

Average Hydraulic Gradient: 8.3

Effective Cell Pressure, psi: 22.9

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.86

Specimen Diameter, cm: 6.12

Dry Unit Weight, pcf: 72.8

Moisture Content, % 46.4

Specific Gravity, Assumed

Percent Saturation:

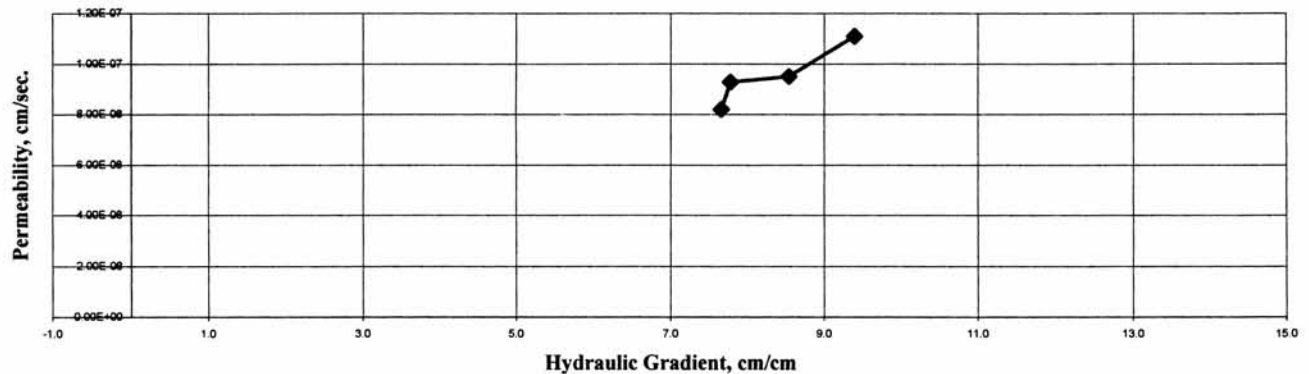
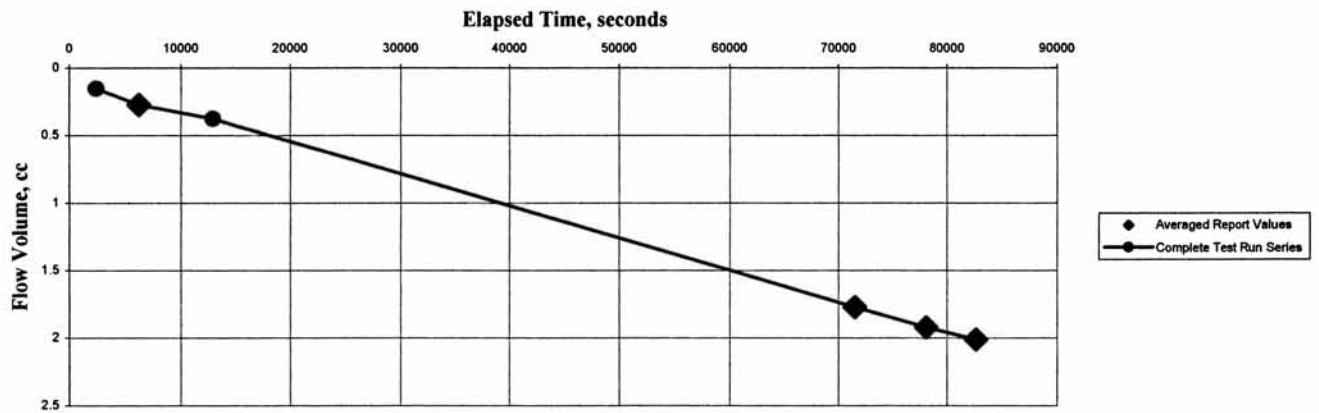
After Test

Specimen Height, cm: 6.73

Specimen Diameter, cm: 6.12

Dry Unit Weight, pcf: 74.8

Moisture Content, % 48.2



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

June 27, 2007

BRC Aquifer Testing



5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-7, 6/23/07

Sample Depth, ft.: 70-71.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 26.7psi

TEST RESULTS

Permeability, cm/sec.: 1.19E-08

Average Hydraulic Gradient: 9.4

Effective Cell Pressure, psi: 26.7

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.68

Specimen Diameter, cm: 6.12

Dry Unit Weight, pcf: 78.7

Moisture Content, % 41.4

Specific Gravity, Assumed

Percent Saturation:

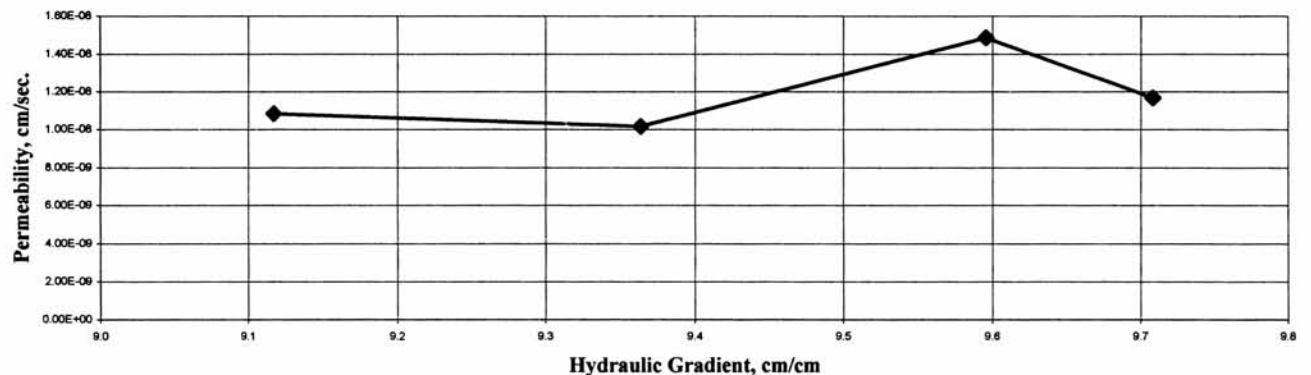
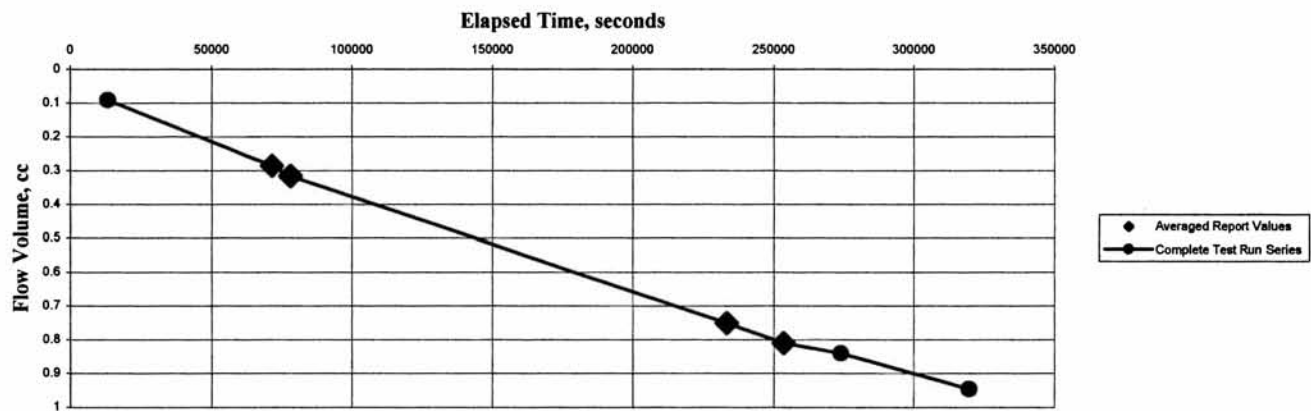
After Test

Specimen Height, cm: 6.68

Specimen Diameter, cm: 6.12

Dry Unit Weight, pcf: 78.7

Moisture Content, % 41.9



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

June 27, 2007

BRC Aquifer Testing



5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-8, 6/24/07

Sample Depth, ft.: 62.5-64.0

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 23.9 psi

TEST RESULTS

Permeability, cm/sec.: $1.01\text{E-}06$

Average Hydraulic Gradient: 5.0

Effective Cell Pressure, psi: 23.9

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.68

Specimen Diameter, cm: 6.12

Dry Unit Weight, pcf: 60.7

Moisture Content, % 60.3

Specific Gravity, Assumed

Percent Saturation:

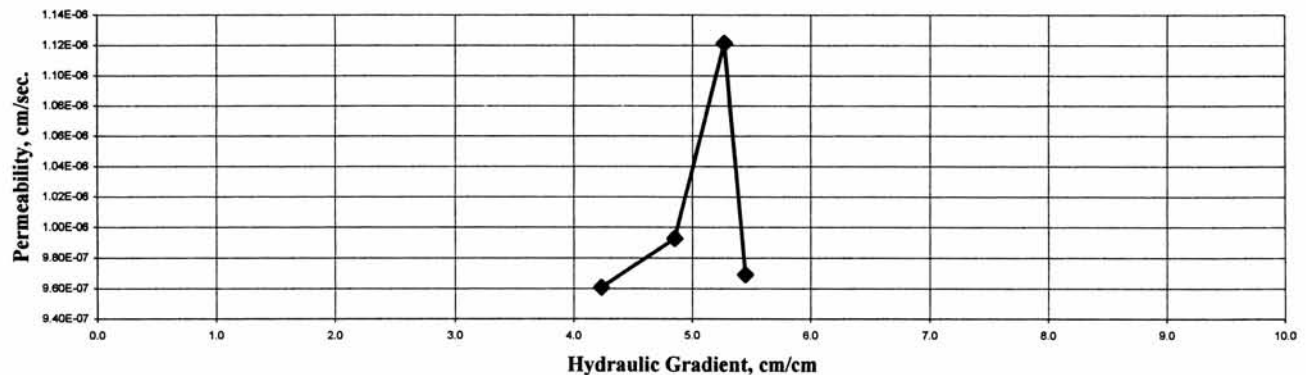
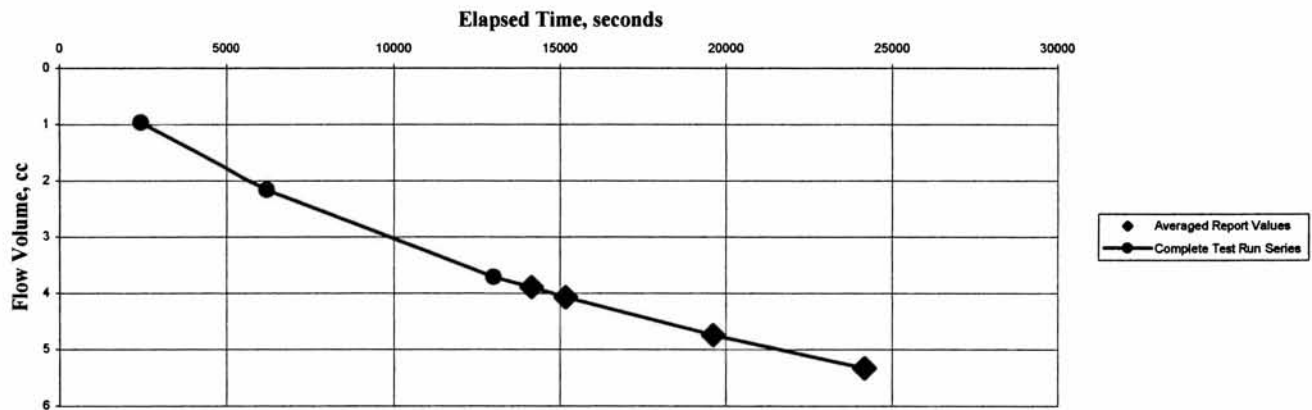
After Test

Specimen Height, cm: 6.81

Specimen Diameter, cm: 6.12

Dry Unit Weight, pcf: 59.5

Moisture Content, % 67.4



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

June 27, 2007

BRC Aquifer Testing



5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-8, 6/24/07

Sample Depth, ft.: 70-71.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 26.7 psi

TEST RESULTS

Permeability, cm/sec.: $1.01\text{E-}07$

Average Hydraulic Gradient: 9.0

Effective Cell Pressure, psi: 26.7

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.65

Specimen Diameter, cm: 6.12

Dry Unit Weight, pcf: 77.9

Moisture Content, % 42.2

Specific Gravity, Assumed

Percent Saturation:

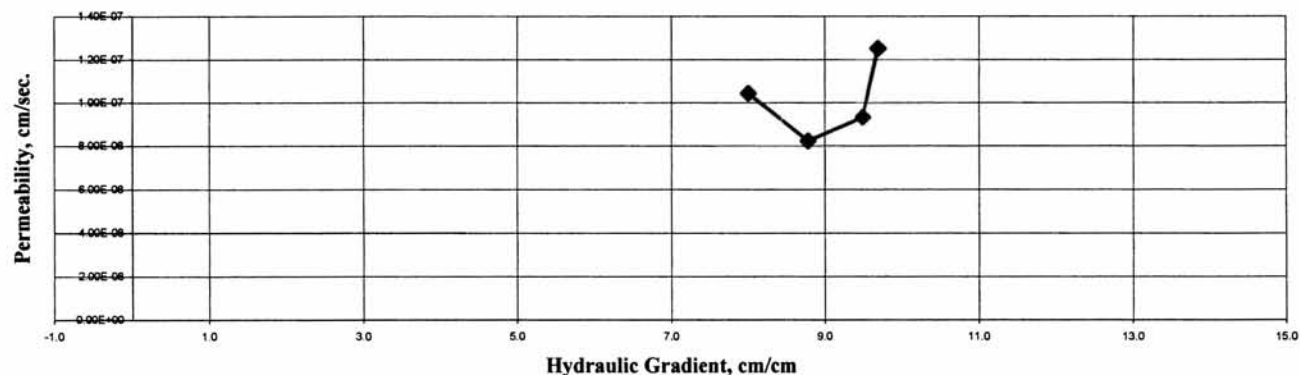
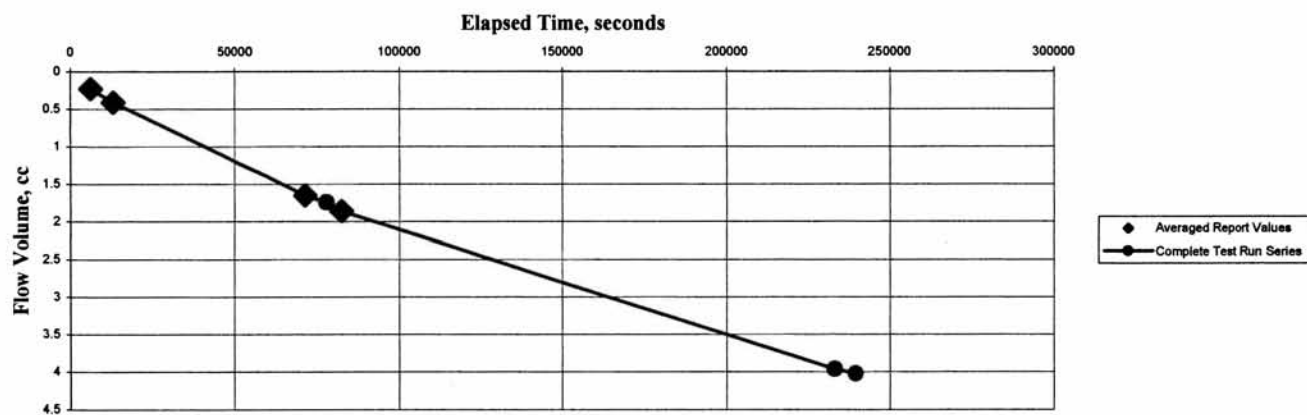
After Test

Specimen Height, cm: 6.60

Specimen Diameter, cm: 6.12

Dry Unit Weight, pcf: 79.2

Moisture Content, % 44.2



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

June 27, 2007

BRC Aquifer Testing



5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507



July 10, 2007

Kleinfelder, Inc.
Attn: Jessi Henderson
6380 Polaris Ave.
Las Vegas NV 89118

STL Project No: **07-220**
Subject: **BRC Aquifer**
Project No: **83173.4**
Invoice No: **4568**

LABORATORY TEST RESULTS

Dear Mr. Henderson:

As requested, Sierra Testing Laboratories, Inc. performed laboratory testing on **three samples** of material from the subject site. The samples were identified as:

1. **DBAW-9, 6/25/07, 65-66.5**
2. **DBAW-9, 6/25/07, 75-76.5**
3. **DBAW-10, 6/27/07, 60-61.5**

Our laboratory received the samples on **June 28, 2007 and June 29, 2007**. The test performed on the submitted samples was as follows:

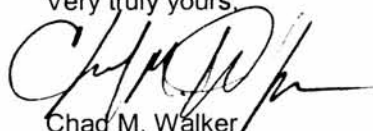
1) Flexible Wall Permeability (ASTM D5084)

The results of the above referenced testing are presented on the attached figure(s).

We appreciate the opportunity to be of service to you on this project and look forward to providing additional service, as needed, in the future.

Should you have any questions or require additional information, please contact our office at your convenience.

Very truly yours,



Chad M. Walker
Project Manager

Enclosures
sm

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-10, 6/27/07

Sample Depth, ft.: 60-61.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 22.9 psi

TEST RESULTS

Permeability, cm/sec.: $1.60\text{E-}07$

Average Hydraulic Gradient: 5.9

Effective Cell Pressure, psi: 22.9

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 7.01

Specimen Diameter, cm: 6.20

Dry Unit Weight, pcf: 79.9

Moisture Content, % 39.0

Specific Gravity, Assumed

Percent Saturation:

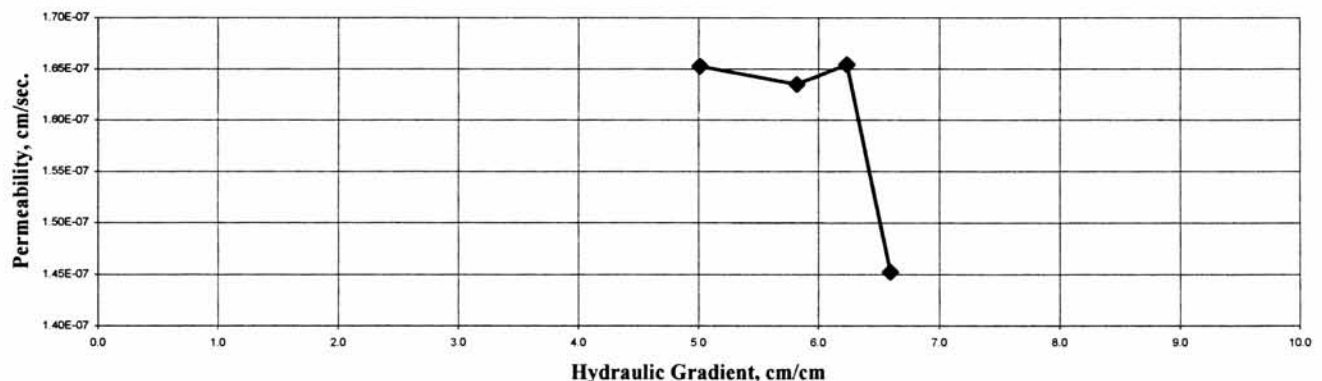
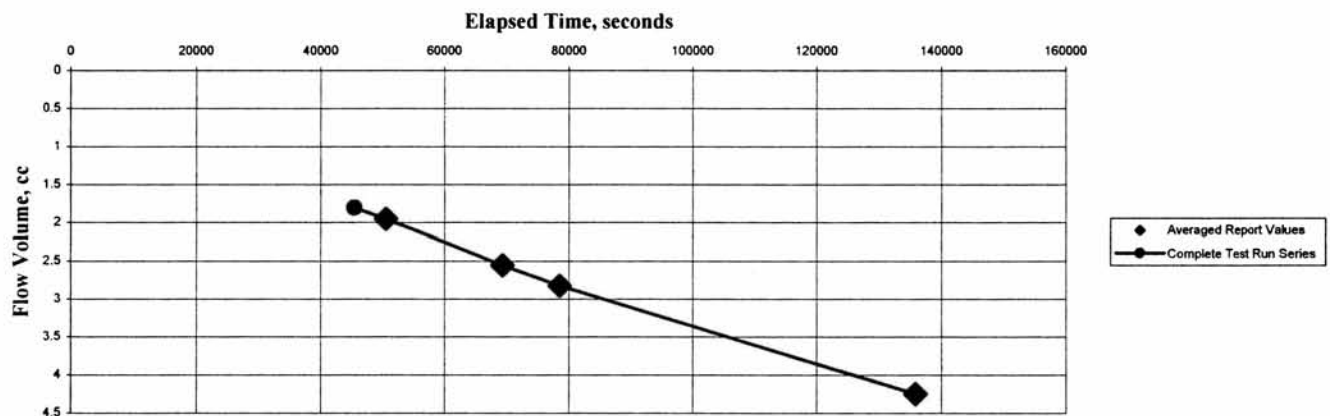
After Test

Specimen Height, cm: 6.99

Specimen Diameter, cm: 6.20

Dry Unit Weight, pcf: 81.5

Moisture Content, % 39.2



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

June 29, 2007

BRC Aquifer Testing



5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBAW-9, 6/25/07

Sample Depth, ft.: 65-66.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 24.8 psi

TEST RESULTS

Permeability, cm/sec.: 1.96E-08

Average Hydraulic Gradient: 9.2

Effective Cell Pressure, psi: 24.8

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.71

Specimen Diameter, cm: 6.17

Dry Unit Weight, pcf: 93.8

Moisture Content, % 27.3

Specific Gravity, Assumed

Percent Saturation:

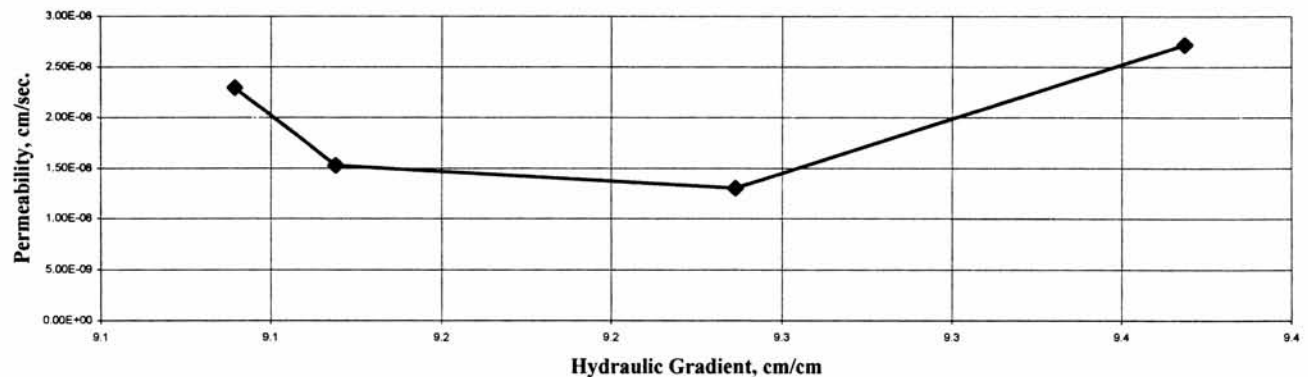
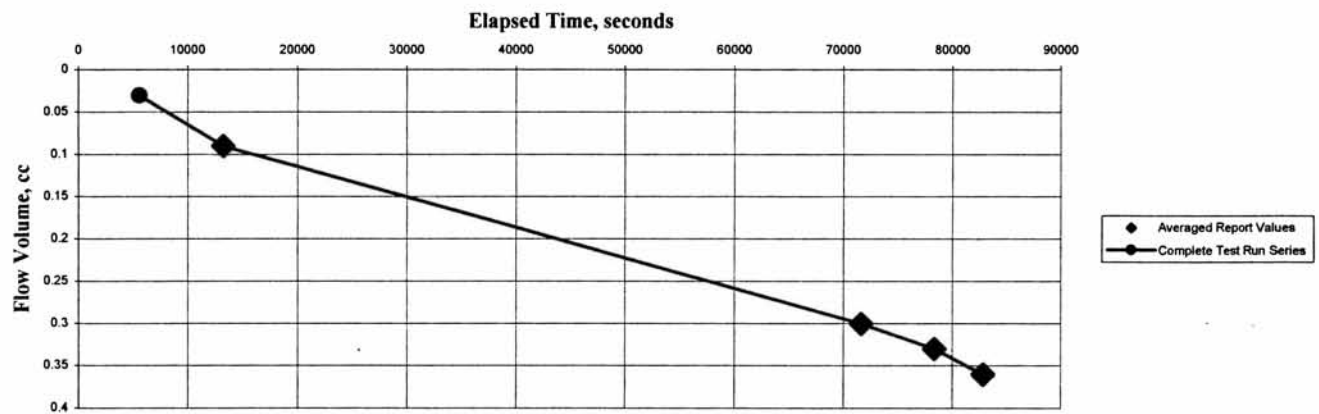
After Test

Specimen Height, cm: 6.81

Specimen Diameter, cm: 6.17

Dry Unit Weight, pcf: 92.4

Moisture Content, % 28.6



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

June 28, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBAW-9, 6/25/07

Sample Depth, ft.: 75-76.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 28.6 psi

TEST RESULTS

Permeability, cm/sec.: $1.07\text{E-}07$

Average Hydraulic Gradient: 5.7

Effective Cell Pressure, psi: 28.6

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.35

Specimen Diameter, cm: 6.12

Dry Unit Weight, pcf: 83.8

Moisture Content, % 40.0

Specific Gravity, Assumed

Percent Saturation:

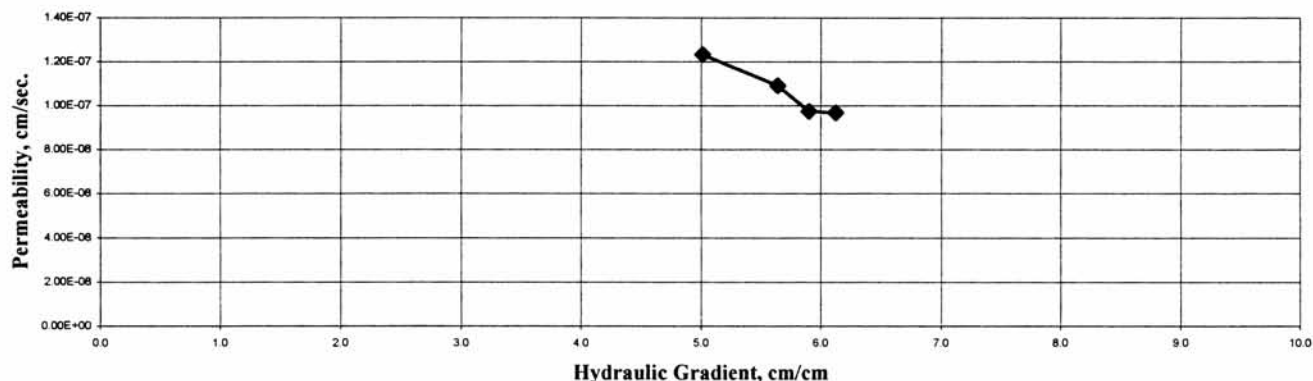
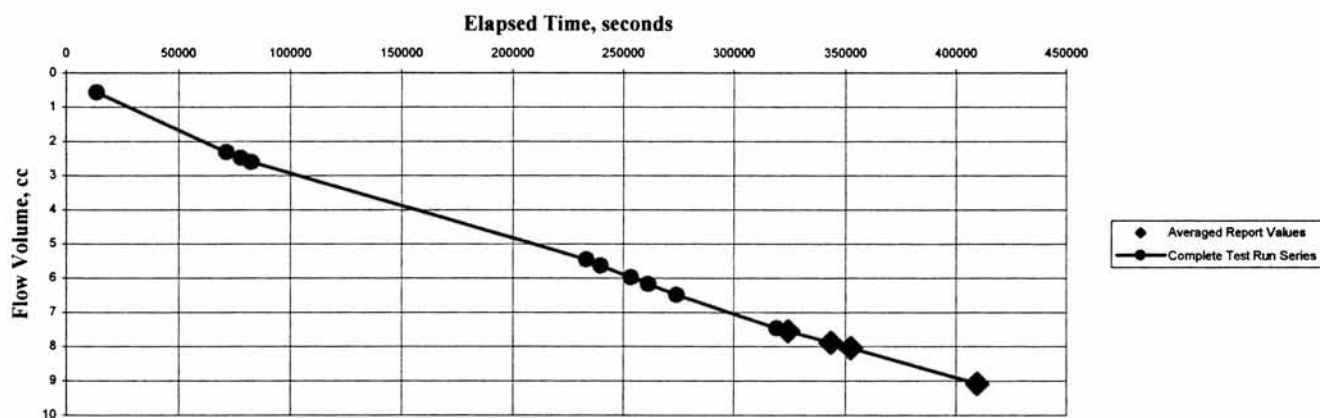
After Test

Specimen Height, cm: 6.35

Specimen Diameter, cm: 6.12

Dry Unit Weight, pcf: 83.8

Moisture Content, % 40.4



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

June 28, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507



July 18, 2007

Kleinfelder, Inc.
Attn: Jessi Henderson
6380 Polaris Ave.
Las Vegas NV 89118

STL Project No: **07-220**
Subject: **BRC Aquifer**
Project No: **83173.4**
Invoice No: **4606**

LABORATORY TEST RESULTS

Dear Mr. Henderson:

As requested, Sierra Testing Laboratories, Inc. performed laboratory testing on **one sample** of material from the subject site. The sample was identified as:

1. DBMW-10

Our laboratory received the sample on **July 10, 2007**. The test performed on the submitted samples was as follows:

1) Flexible Wall Permeability (ASTM D5084)

The results of the above referenced testing are presented on the attached figure(s).

We appreciate the opportunity to be of service to you on this project and look forward to providing additional service, as needed, in the future.

Should you have any questions or require additional information, please contact our office at your convenience.

Very truly yours,

Chad M. Walker
Project Manager

Enclosures
sm

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-10

Sample Depth, ft.: 75-76.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 28.6 psi

TEST RESULTS

Permeability, cm/sec.: 2.22E-07

Average Hydraulic Gradient: 5.4

Effective Cell Pressure, psi: 28.6

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.25

Specimen Diameter, cm: 6.17

Dry Unit Weight, pcf: 75.1

Moisture Content, % 41.5

Specific Gravity, Assumed

Percent Saturation:

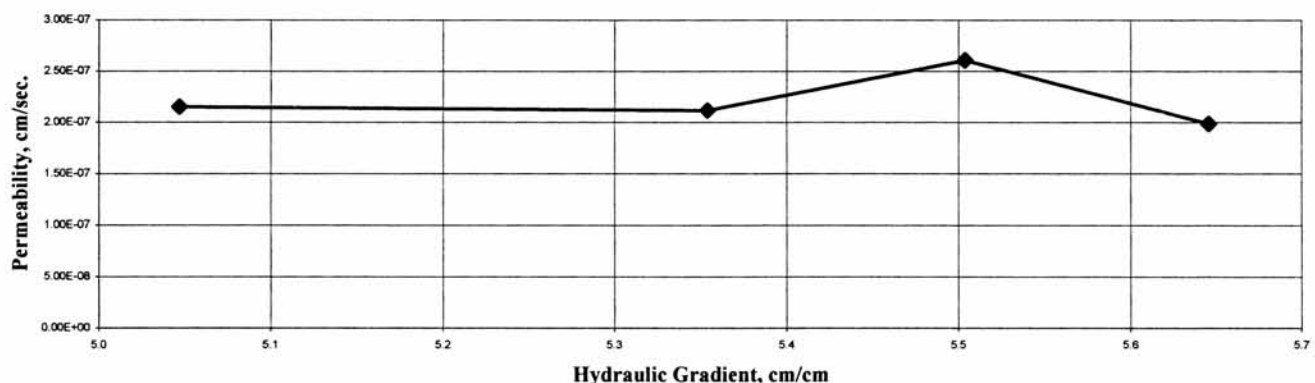
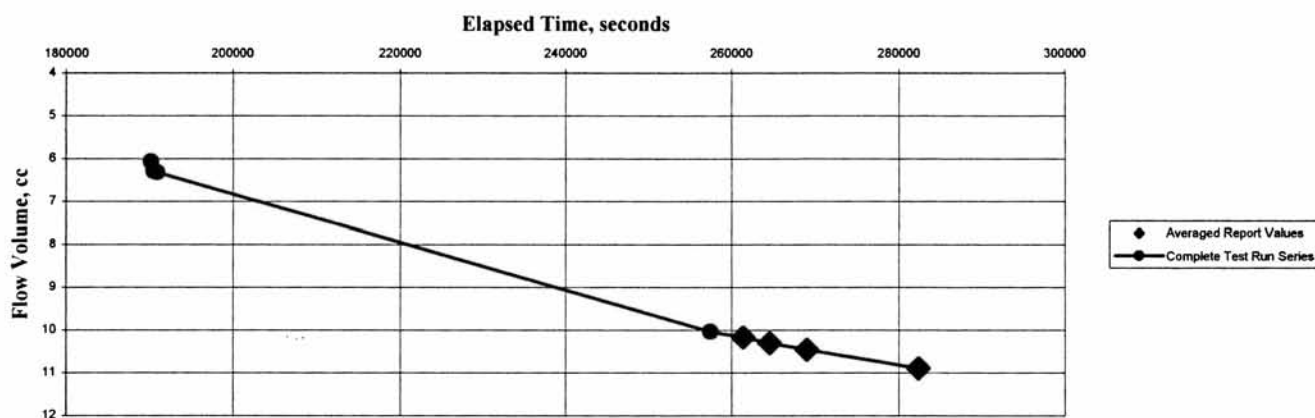
After Test

Specimen Height, cm: 6.35

Specimen Diameter, cm: 6.17

Dry Unit Weight, pcf: 73.9

Moisture Content, % 44.4



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

July 10, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

Invoice

COPY

Invoice Date	Invoice #:
8/9/2007	4683

Bill To:

Kleinfelder Attn: Accounts Payable 6380 Polaris Ave Las Vegas, NV 89118
--

Customer Job:

BRC: Aquifer Testing	
STL Job #:	Customer Job#:
07-220	83173-4

Samples Tested	Test Method	Description	Qty	Rate	Amount
DBMW-12, 55-56.5	ASTM D5084 -3"	Flexible Wall Permeability 1.4"-3.0" sample diameter	1	210.00	210.00
Holds	HOLDS	ALL HOLDS WILL BE DESTROYED 30 DAYS FROM INVOICE DATE.	2	0.00	0.00
DBMW-12, 75-76.5	ASTM D5084 -3"	Flexible Wall Permeability 1.4"-3.0" sample diameter	1	210.00	210.00
Holds	HOLDS	ALL HOLDS WILL BE DESTROYED 30 DAYS FROM INVOICE DATE.	2	0.00	0.00
DBMW-11, 55-56.5	ASTM D5084 -3"	Flexible Wall Permeability 1.4"-3.0" sample diameter	1	210.00	210.00
Holds	HOLDS	ALL HOLDS WILL BE DESTROYED 30 DAYS FROM INVOICE DATE.	2	0.00	0.00
DBMW-11, 70-71.5	ASTM D5084 -3"	Flexible Wall Permeability 1.4"-3.0" sample diameter	1	210.00	210.00
Holds	HOLDS	ALL HOLDS WILL BE DESTROYED 30 DAYS FROM INVOICE DATE.	2	0.00	0.00
DBMW-13, 75-76.5	ASTM D5084 -3"	Flexible Wall Permeability 1.4"-3.0" sample diameter	1	210.00	210.00
				Total	

Conditions:

The invoice is due on presentation and is past due 30 days from the invoice date. A finance charge of 1.5% per month or the maximum rate allowed by law will be charged on all past due accounts.



Invoice

Invoice Date	Invoice #:
8/9/2007	4683

Bill To:

Kleinfelder Attn: Accounts Payable 6380 Polaris Ave Las Vegas, NV 89118
--

Customer Job:

<i>BRC: Aquifer Testing</i>	
STL Job #:	Customer Job#:
07-220	83173-4

Samples Tested	Test Method	Description	Qty	Rate	Amount
Holds	HOLDS	ALL HOLDS WILL BE DESTROYED 30 DAYS FROM INVOICE DATE.	2	0.00	0.00
DBMW-13, 55-56.5	ASTM D5084 -3"	Flexible Wall Permeability 1.4"-3.0" sample diameter	1	210.00	210.00
Holds	HOLDS	ALL HOLDS WILL BE DESTROYED 30 DAYS FROM INVOICE DATE.	2	0.00	0.00
DBMW-14, 65-66.5	ASTM D5084 -3"	Flexible Wall Permeability 1.4"-3.0" sample diameter	1	210.00	210.00
Holds	HOLDS	ALL HOLDS WILL BE DESTROYED 30 DAYS FROM INVOICE DATE.	2	0.00	0.00
DBMW-14, 45-46.5	ASTM D5084 -3"	Flexible Wall Permeability 1.4"-3.0" sample diameter	1	210.00	210.00
Holds	HOLDS	ALL HOLDS WILL BE DESTROYED 30 DAYS FROM INVOICE DATE.	2	0.00	0.00
Total					\$1,680.00

Conditions:

The invoice is due on presentation and is past due 30 days from the invoice date. A finance charge of 1.5% per month or the maximum rate allowed by law will be charged on all past due accounts.



August 9, 2007

Kleinfelder, Inc.
Attn: Jessi Henderson
6380 Polaris Ave.
Las Vegas NV 89118

STL Project No: **07-220**
Subject: **BRC Aquifer**
Project No: **83173.4**
Invoice No: **4683**

LABORATORY TEST RESULTS

Dear Mr. Henderson:

As requested, Sierra Testing Laboratories, Inc. performed laboratory testing on **eight samples** of material from the subject site. The samples were identified as:

- | | |
|---------------------|---------------------|
| 1. DBMW-12, 55-56.5 | 5. DBMW-13, 75-76.5 |
| 2. DBMW-12, 75-76.5 | 6. DBMW-13, 55-56.5 |
| 3. DBMW-11, 55-56.5 | 7. DBMW-14, 65-66.5 |
| 4. DBMW-11, 70-71.5 | 8. DBMW-14, 45-46.5 |

Our laboratory received the sample on **July 16, 2007**. The test performed on the submitted samples was as follows:

1) Flexible Wall Permeability (ASTM D5084)

The results of the above referenced testing are presented on the attached figure(s).

We appreciate the opportunity to be of service to you on this project and look forward to providing additional service, as needed, in the future.

Should you have any questions or require additional information, please contact our office at your convenience.

Very truly yours,

Chad M. Walker
Project Manager

Enclosures
sm

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-11

Sample Depth, ft.: 55-56.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 21 psi

TEST RESULTS

Permeability, cm/sec.: 2.96E-08

Average Hydraulic Gradient: 6.3

Effective Cell Pressure, psi: 21

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.96

Specimen Diameter, cm: 6.15

Dry Unit Weight, pcf: 80.9

Moisture Content, % 40.2

Specific Gravity, Assumed

Percent Saturation:

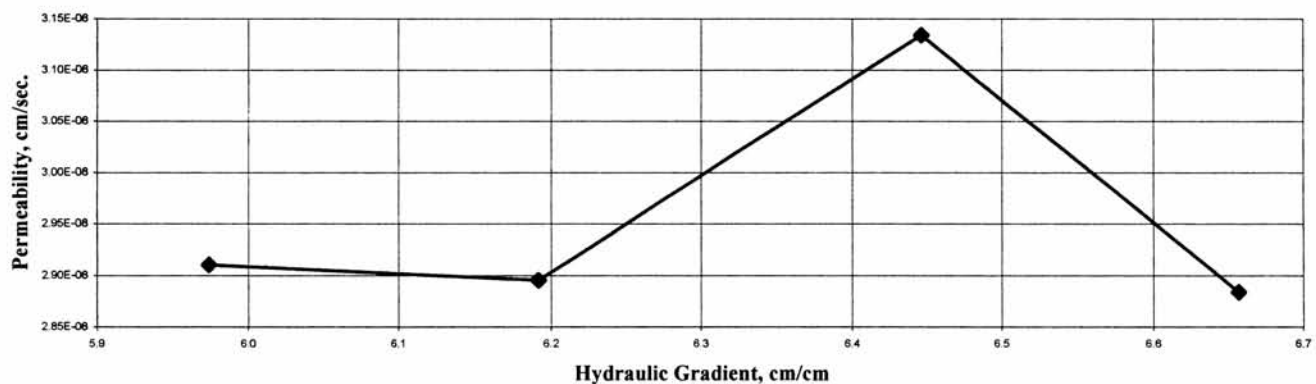
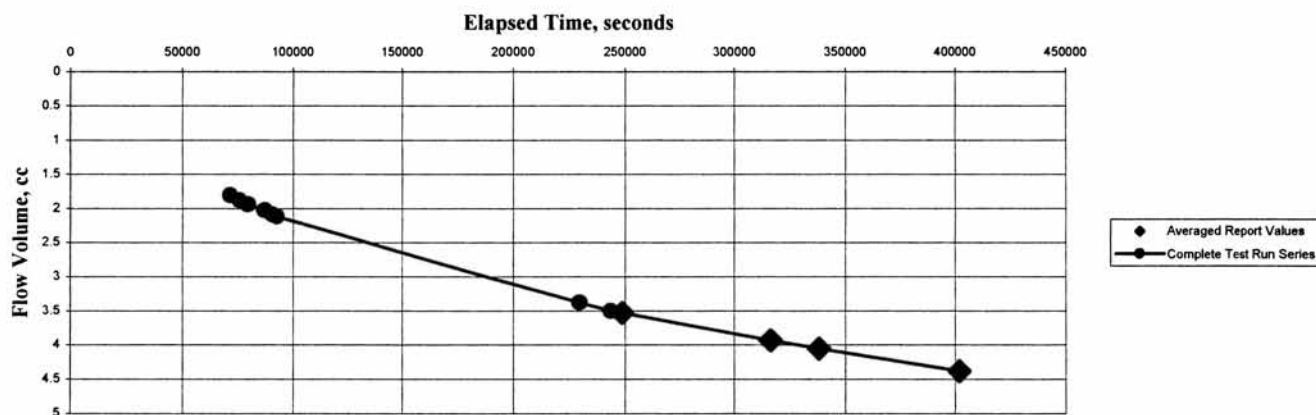
After Test

Specimen Height, cm: 6.88

Specimen Diameter, cm: 6.15

Dry Unit Weight, pcf: 83.2

Moisture Content, % 42.7



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

July 16, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-11

Sample Depth, ft.: 70-71.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 26.7 psi

TEST RESULTS

Permeability, cm/sec.: 1.28E-08

Average Hydraulic Gradient: 7.6

Effective Cell Pressure, psi: 26.7

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 7.04

Specimen Diameter, cm: 6.17

Dry Unit Weight, pcf: 87.0

Moisture Content, % 31.3

Specific Gravity, Assumed

Percent Saturation:

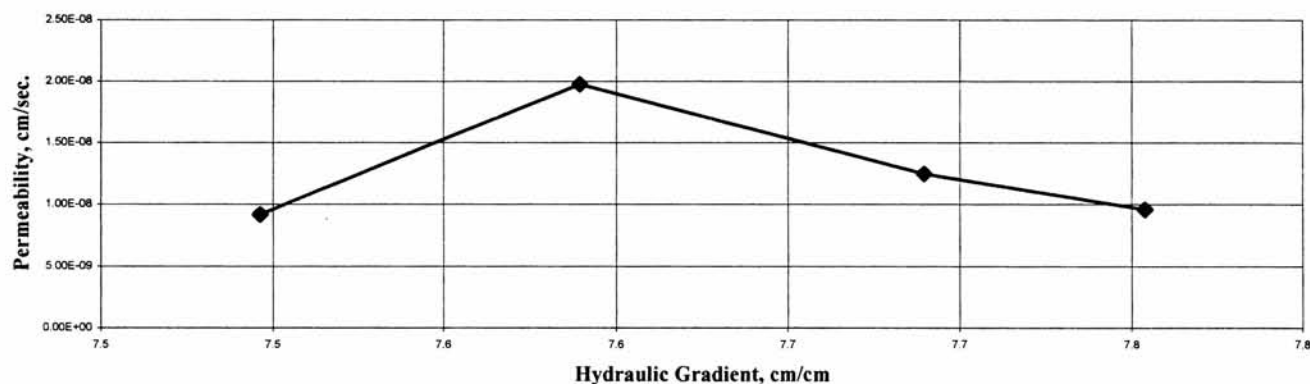
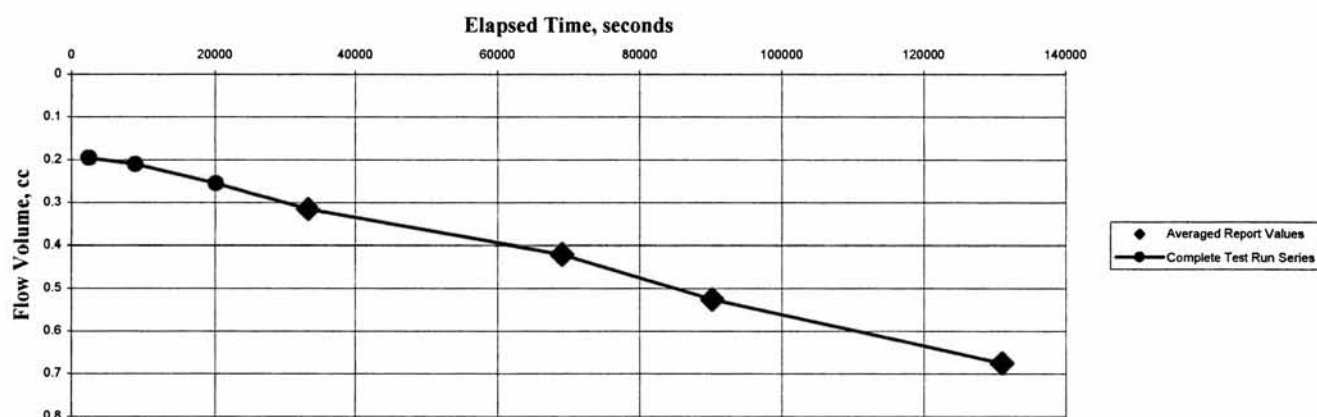
After Test

Specimen Height, cm: 6.99

Specimen Diameter, cm: 6.17

Dry Unit Weight, pcf: 86.2

Moisture Content, % 32.8



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

July 16, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-12

Sample Depth, ft.: 55-56.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 21.0 psi

TEST RESULTS

Permeability, cm/sec.: 8.05E-09

Average Hydraulic Gradient: 10.0

Effective Cell Pressure, psi: 21

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.65

Specimen Diameter, cm: 6.17

Dry Unit Weight, pcf: 82.3

Moisture Content, % 35.6

Specific Gravity, Assumed

Percent Saturation:

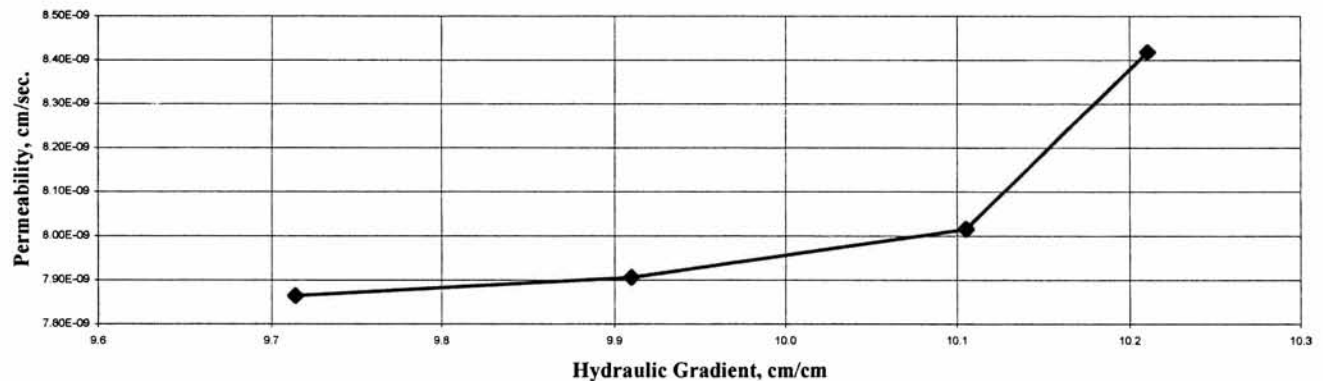
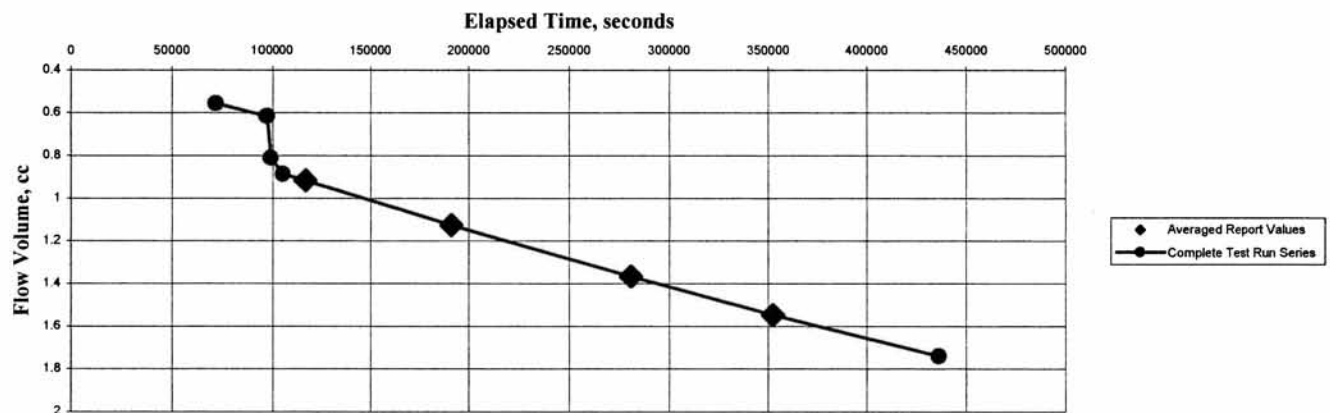
After Test

Specimen Height, cm: 6.65

Specimen Diameter, cm: 6.17

Dry Unit Weight, pcf: 82.3

Moisture Content, % 35.9



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

July 16, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-12

Sample Depth, ft.: 75-76.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 28.6 psi

TEST RESULTS

Permeability, cm/sec.: $4.13\text{E-}08$

Average Hydraulic Gradient: 5.9

Effective Cell Pressure, psi: 28.6

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 7.14

Specimen Diameter, cm: 6.15

Dry Unit Weight, pcf: 91.3

Moisture Content, % 29.7

Specific Gravity, Assumed

Percent Saturation:

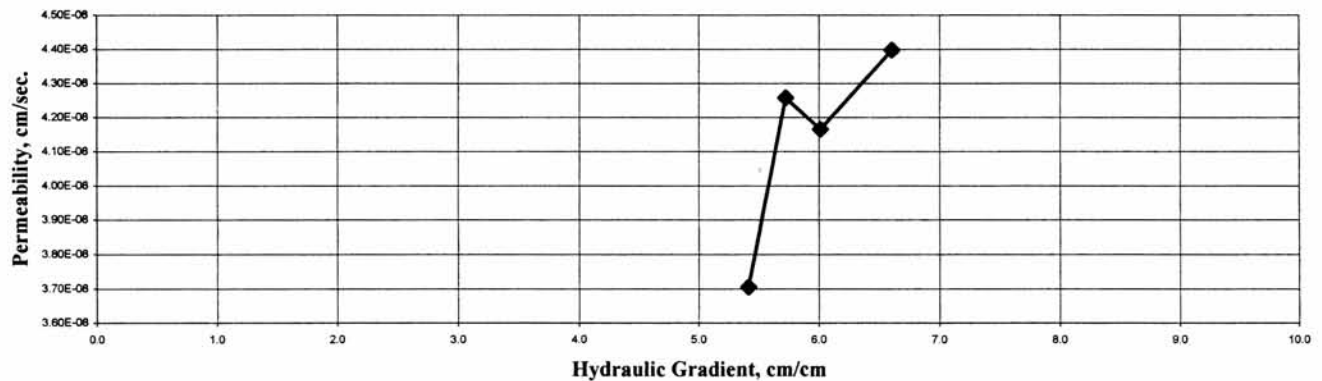
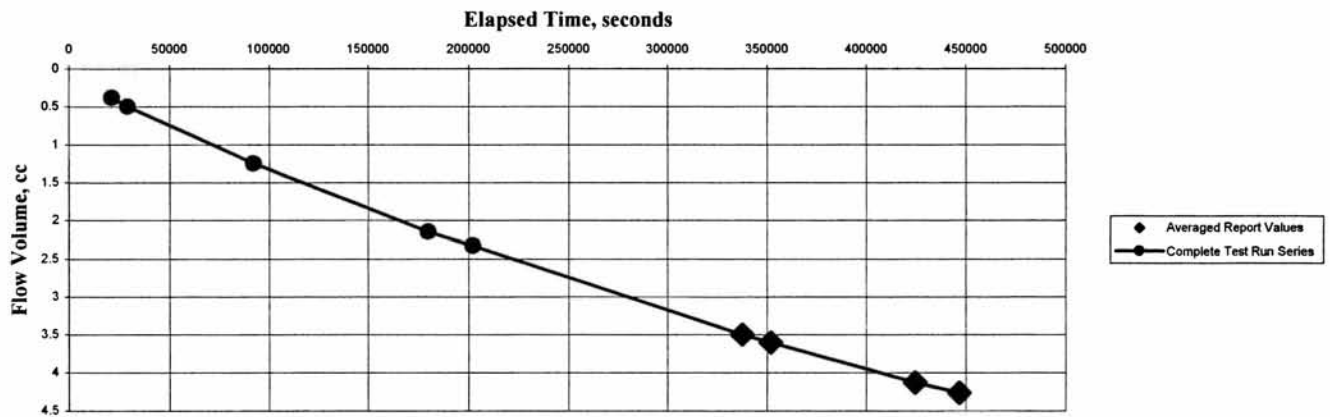
After Test

Specimen Height, cm: 7.19

Specimen Diameter, cm: 6.15

Dry Unit Weight, pcf: 89.9

Moisture Content, % 31.8



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

July 16, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-13

Sample Depth, ft.: 55-56.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 21 psi

TEST RESULTS

Permeability, cm/sec.: $3.79\text{E-}08$

Average Hydraulic Gradient: 6.5

Effective Cell Pressure, psi: 21

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.91

Specimen Diameter, cm: 6.10

Dry Unit Weight, pcf: 79.7

Moisture Content, % 43.8

Specific Gravity, Assumed

Percent Saturation:

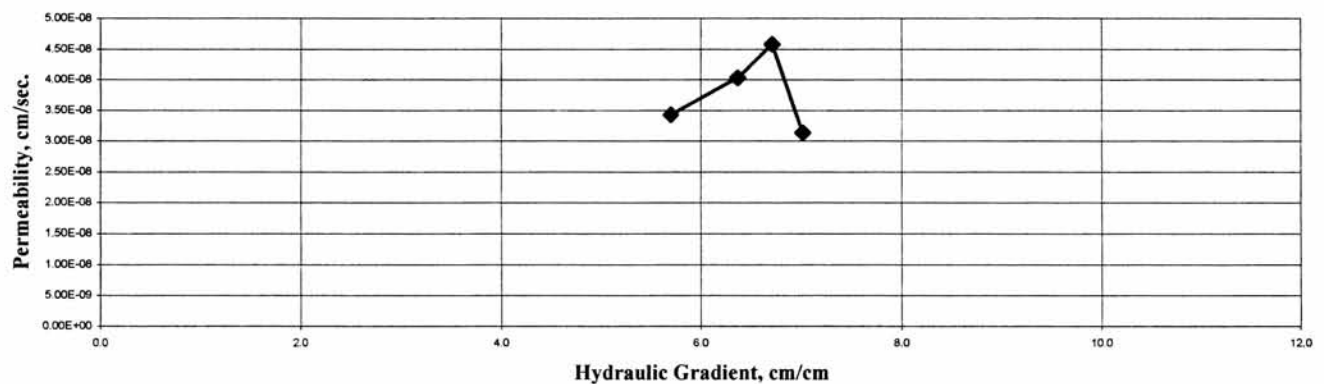
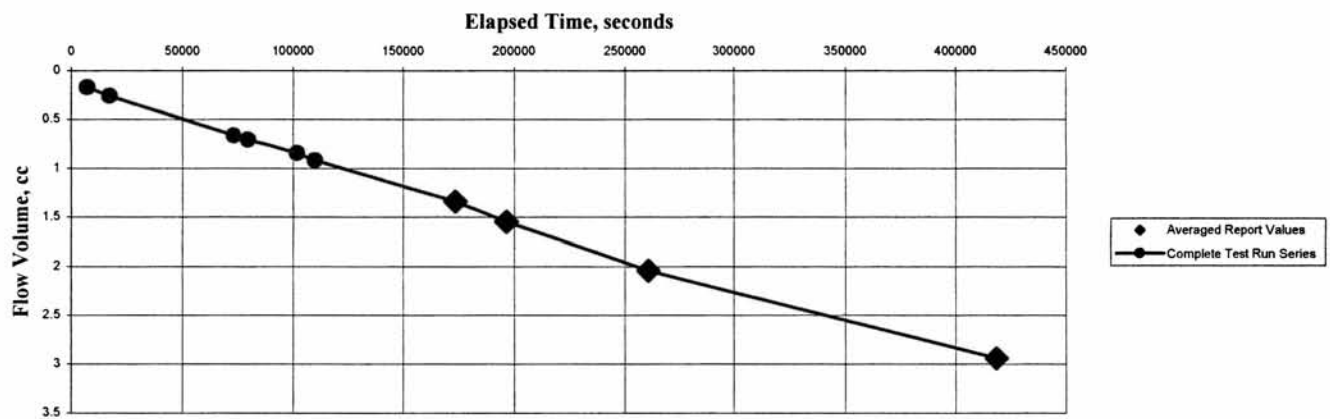
After Test

Specimen Height, cm: 6.91

Specimen Diameter, cm: 6.10

Dry Unit Weight, pcf: 79.7

Moisture Content, % 45.3



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

July 16, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-13

Sample Depth, ft.: 75-76.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 28.6 psi

TEST RESULTS

Permeability, cm/sec.: 1.26E-08

Average Hydraulic Gradient: 8.5

Effective Cell Pressure, psi: 28.6

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 7.04

Specimen Diameter, cm: 6.20

Dry Unit Weight, pcf: 91.2

Moisture Content, % 33.3

Specific Gravity, Assumed

Percent Saturation:

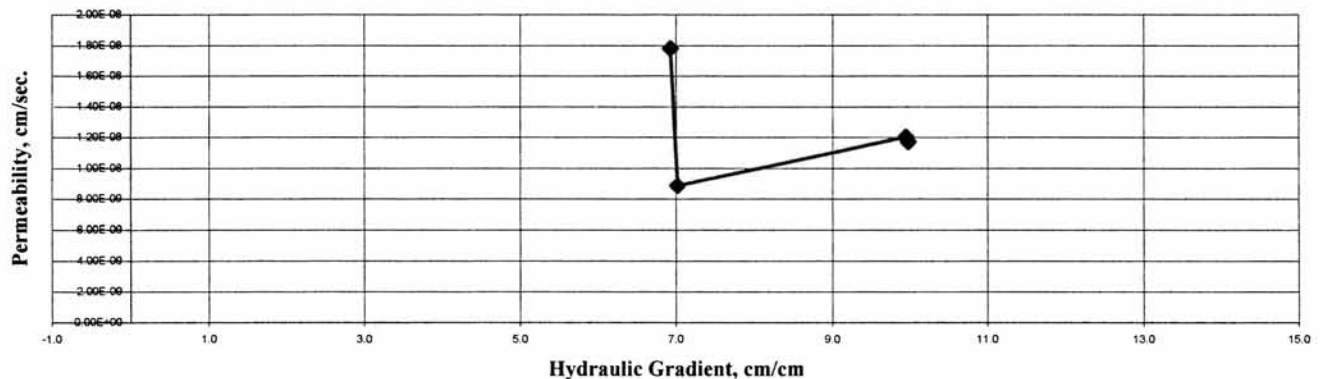
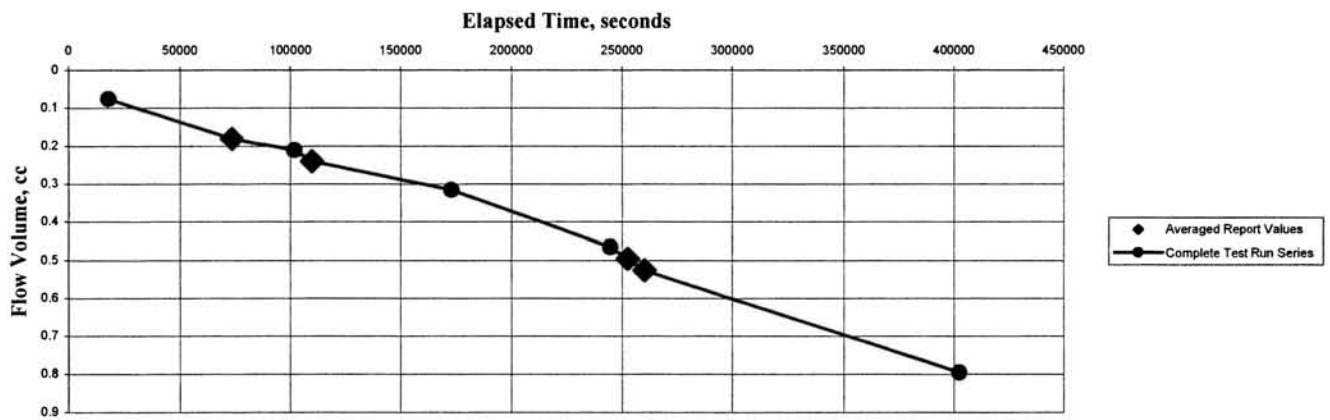
After Test

Specimen Height, cm: 7.04

Specimen Diameter, cm: 6.20

Dry Unit Weight, pcf: 94.3

Moisture Content, % 33.8



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

July 16, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-14

Sample Depth, ft.: 45-46.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 17.2 psi

TEST RESULTS

Permeability, cm/sec.: $3.69\text{E-}07$

Average Hydraulic Gradient: 2.2

Effective Cell Pressure, psi: 17.2

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.86

Specimen Diameter, cm: 6.10

Dry Unit Weight, pcf: 84.3

Moisture Content, % 30.7

Specific Gravity, Assumed

Percent Saturation:

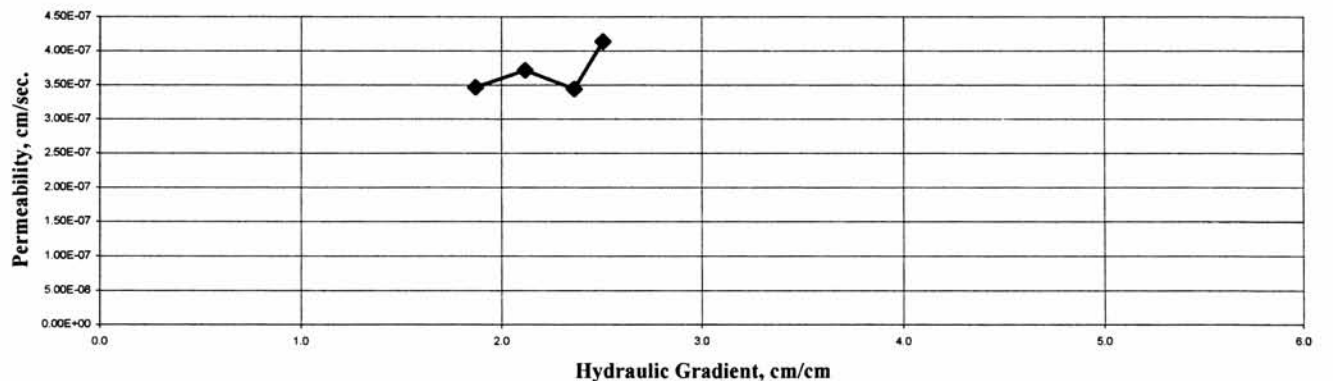
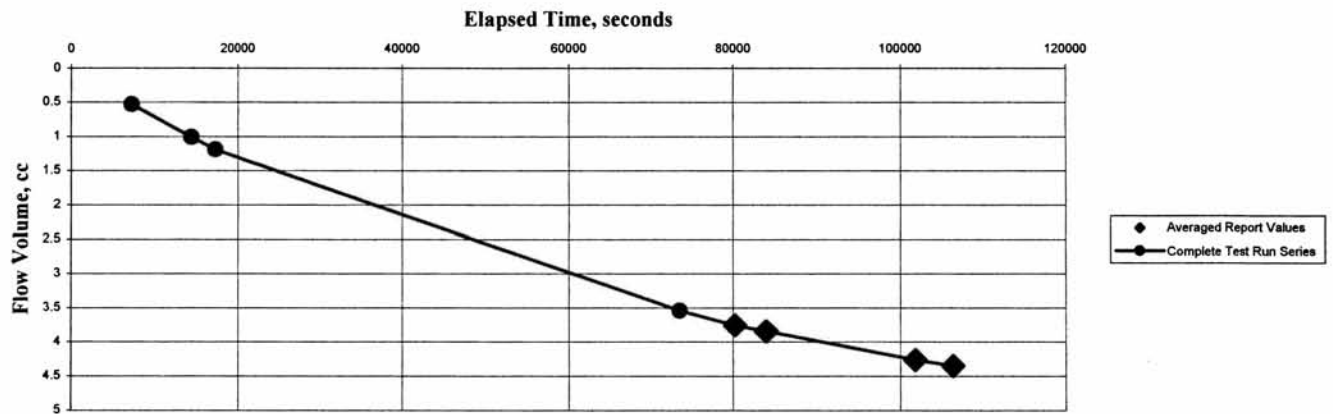
After Test

Specimen Height, cm: 6.99

Specimen Diameter, cm: 6.10

Dry Unit Weight, pcf: 82.8

Moisture Content, % 32.4



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

July 16, 2007

BRC Aquifer Testing



5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-14

Sample Depth, ft.: 65-66.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks: Confining Stress = 24.8 psi

TEST RESULTS

Permeability, cm/sec.: 1.23E-08

Average Hydraulic Gradient: 6.8

Effective Cell Pressure, psi: 24.8

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.65

Specimen Diameter, cm: 6.12

Dry Unit Weight, pcf: 83.7

Moisture Content, % 40.7

Specific Gravity, Assumed

Percent Saturation:

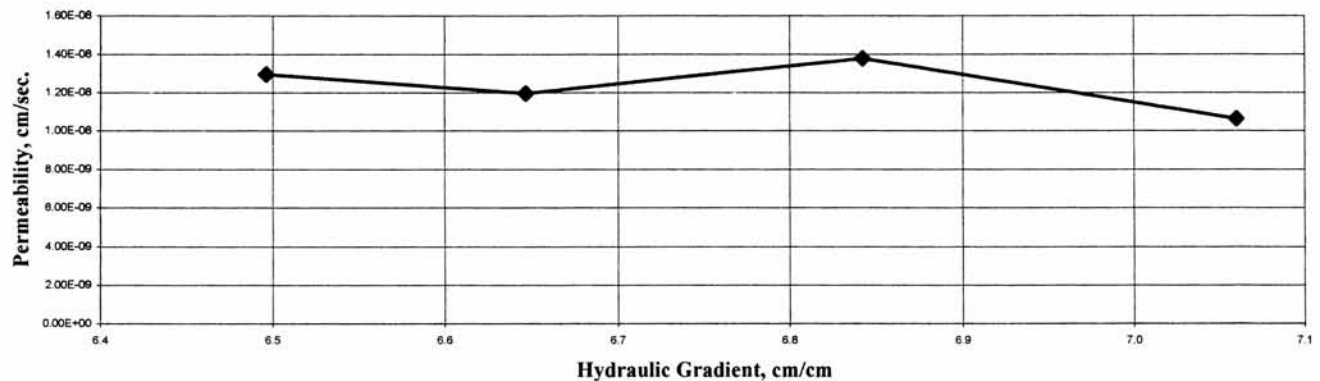
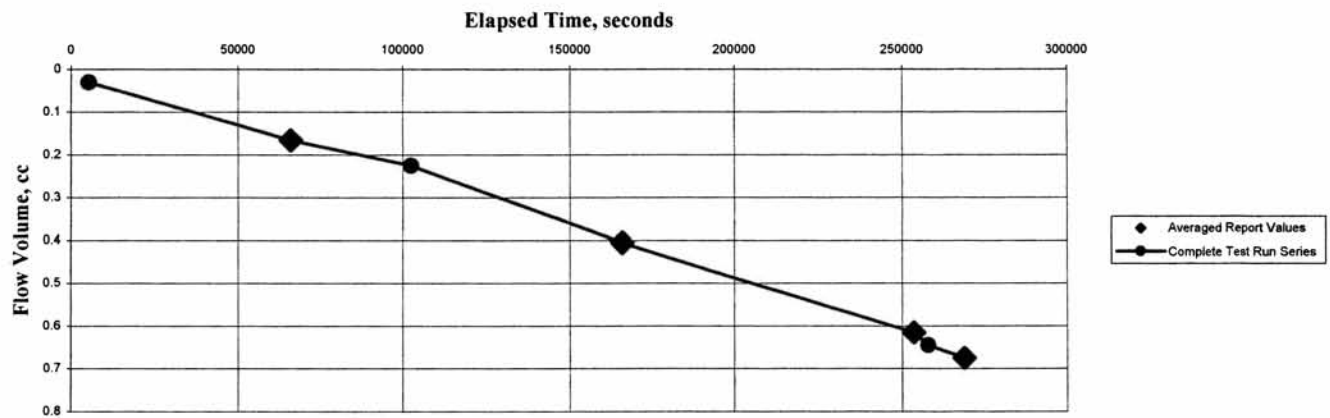
After Test

Specimen Height, cm: 6.65

Specimen Diameter, cm: 6.12

Dry Unit Weight, pcf: 83.0

Moisture Content, % 42.1



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

July 16, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507



August 24, 2007

Kleinfelder, Inc.
Attn: Jessi Henderson
6380 Polaris Ave.
Las Vegas NV 89118

STL Project No: **07-220**
Subject: **BRC Aquifer**
Project No: **83173.4**
Invoice No: **4735**

LABORATORY TEST RESULTS

Dear Mr. Henderson:

As requested, Sierra Testing Laboratories, Inc. performed laboratory testing on **fourteen samples** of material from the subject site. The samples were identified as:

- | | |
|--------------------------------|----------------------|
| 1. DBMW-16, 7/20/07, 110-111.5 | 8. DBMW-5, 35-36.5 |
| 2. DBMW-16, 7/18/07, 70-71.5 | 9. DBMW-18, 55-56.5 |
| 3. DBMW-17, 7/18/07, 75-76.5 | 10. DBMW-18, 65-66.5 |
| 4. DBMW-16, 7/20/0, 100-101.5 | 11. DBMW-19, 20-21.5 |
| 5. DBMW-15, 7/16/07, 45-46.5 | 12. DBMW-19, 40-41.5 |
| 6. DBMW-15, 7/16/07, 65-66.5 | 13. DBMW-4, 15-16.5 |
| 7. DBMW-5, 20-21.5 | 14. DBMW-4, 40-41.5 |

Our laboratory received the samples on **August 6, 2007 and August 13, 2007**. The test performed on the submitted samples was as follows:

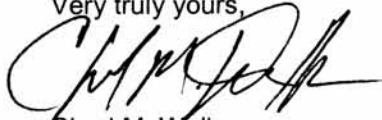
1) Flexible Wall Permeability (ASTM D5084)

The results of the above referenced testing are presented on the attached figure(s).

We appreciate the opportunity to be of service to you on this project and look forward to providing additional service, as needed, in the future.

Should you have any questions or require additional information, please contact our office at your convenience.

Very truly yours,



Chad M. Walker
Project Manager

Enclosures
sm

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-19

Sample Depth, ft.: 40-41.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks:

TEST RESULTS

Permeability, cm/sec.: 9.61E-06

Average Hydraulic Gradient: 9.4

Effective Cell Pressure, psi: 10

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.10

Specimen Diameter, cm: 6.15

Dry Unit Weight, pcf: 82.2

Moisture Content, % 37.4

Specific Gravity, Assumed

Percent Saturation:

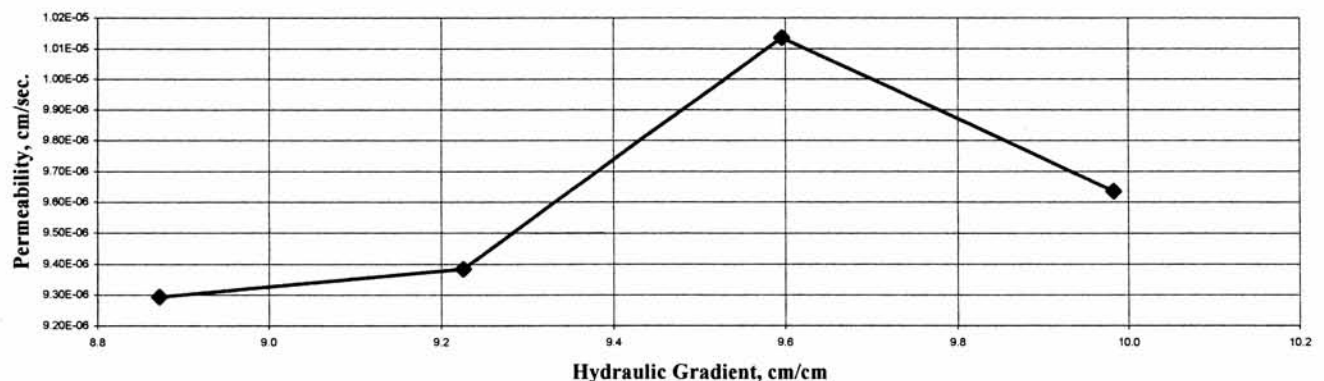
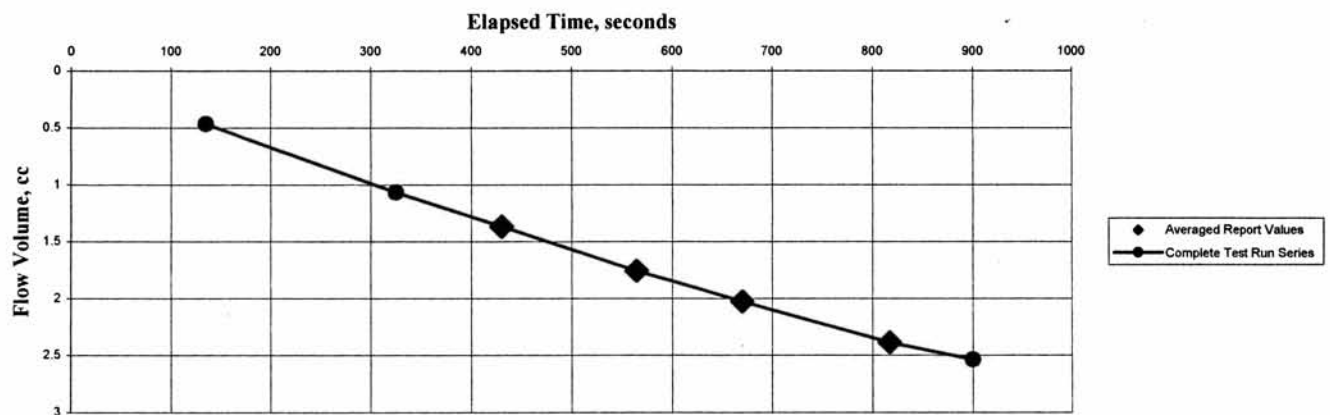
After Test

Specimen Height, cm: 5.94

Specimen Diameter, cm: 6.15

Dry Unit Weight, pcf: 85.8

Moisture Content, % 34.6



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

August 13, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-18

Sample Depth, ft.: 55-56.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks:

TEST RESULTS

Permeability, cm/sec.: 2.75E-06

Average Hydraulic Gradient: 7.9

Effective Cell Pressure, psi: 10

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.35

Specimen Diameter, cm: 6.27

Dry Unit Weight, pcf: 51.4

Moisture Content, % 75.5

Specific Gravity, Assumed

Percent Saturation:

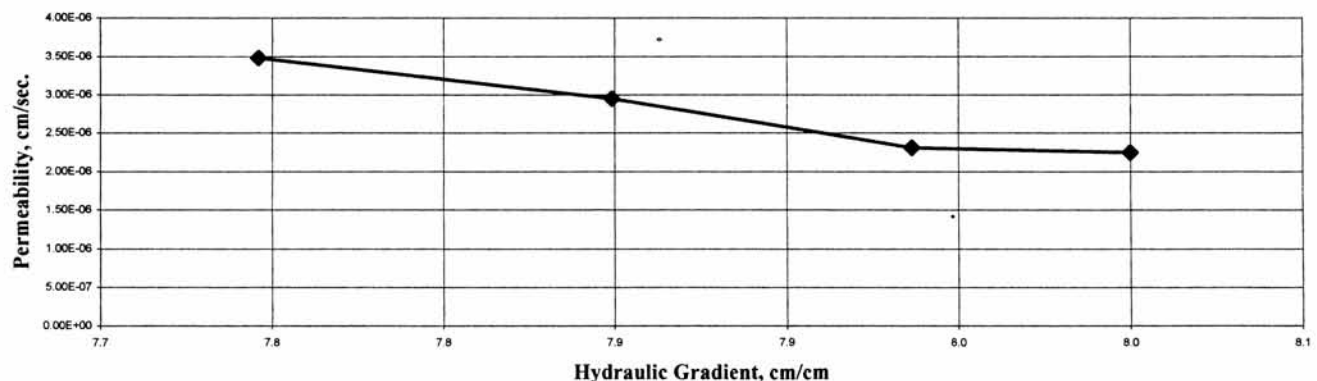
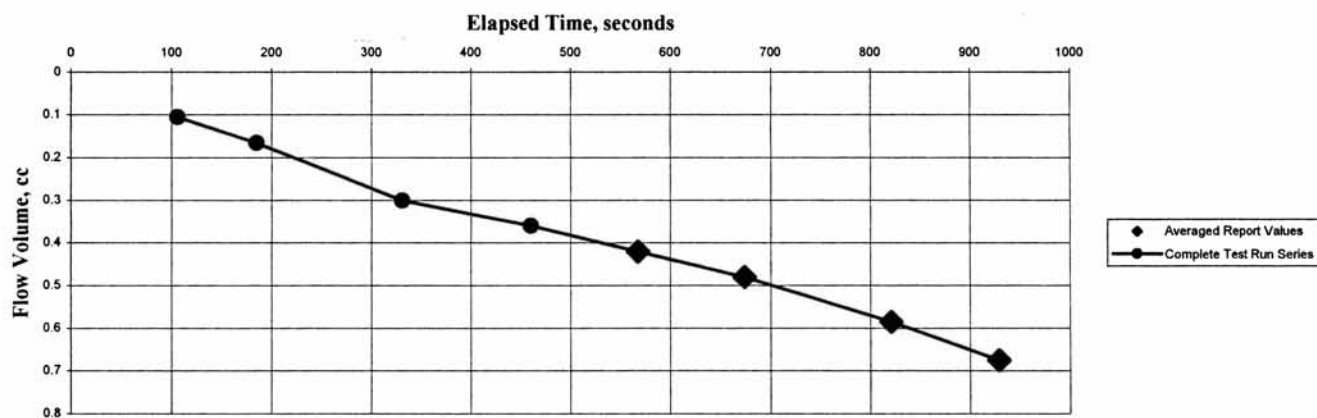
After Test

Specimen Height, cm: 6.30

Specimen Diameter, cm: 6.27

Dry Unit Weight, pcf: 53.1

Moisture Content, % 79.1



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

August 13, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-18

Sample Depth, ft.: 65-66.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks:

TEST RESULTS

Permeability, cm/sec.: 2.33E-05

Average Hydraulic Gradient: 4.3

Effective Cell Pressure, psi: 10

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.27

Specimen Diameter, cm: 6.17

Dry Unit Weight, pcf: 64.4

Moisture Content, % 45.9

Specific Gravity, Assumed

Percent Saturation:

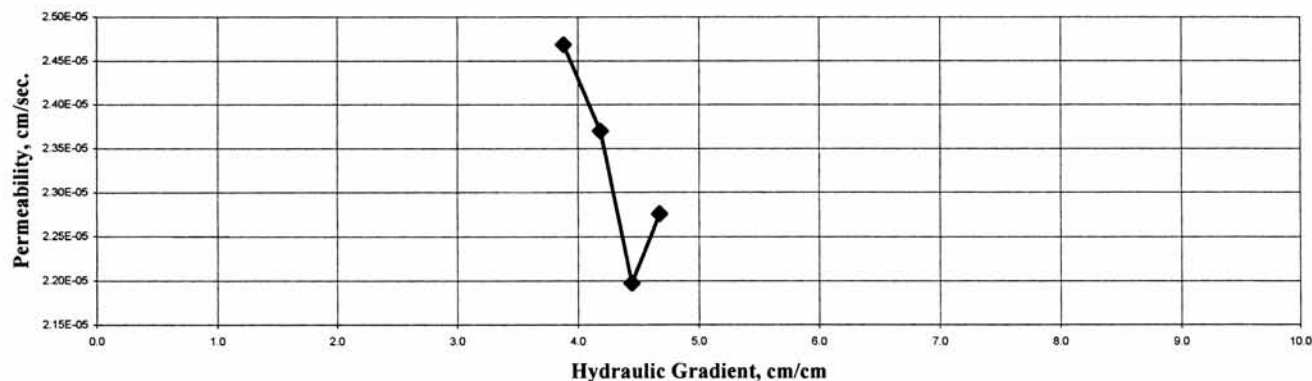
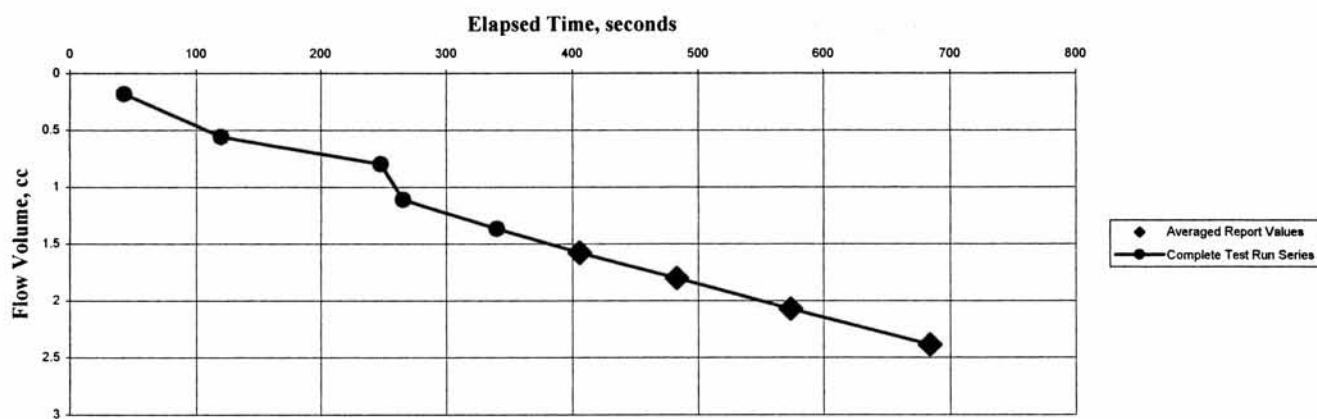
After Test

Specimen Height, cm: 6.35

Specimen Diameter, cm: 6.17

Dry Unit Weight, pcf: 65.2

Moisture Content, % 47.6



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

August 13, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-19

Sample Depth, ft.: 20-21.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks:

TEST RESULTS

Permeability, cm/sec.: 1.43E-04

Average Hydraulic Gradient: 10.4

Effective Cell Pressure, psi: 10

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 4.93

Specimen Diameter, cm: 5.00

Dry Unit Weight, pcf: 109.1

Moisture Content, % 14.3

Specific Gravity, Assumed

Percent Saturation:

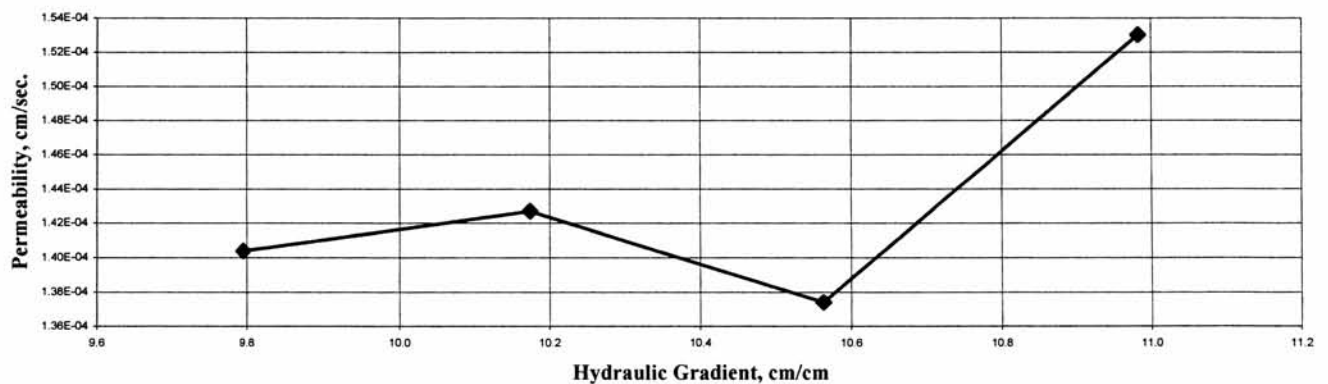
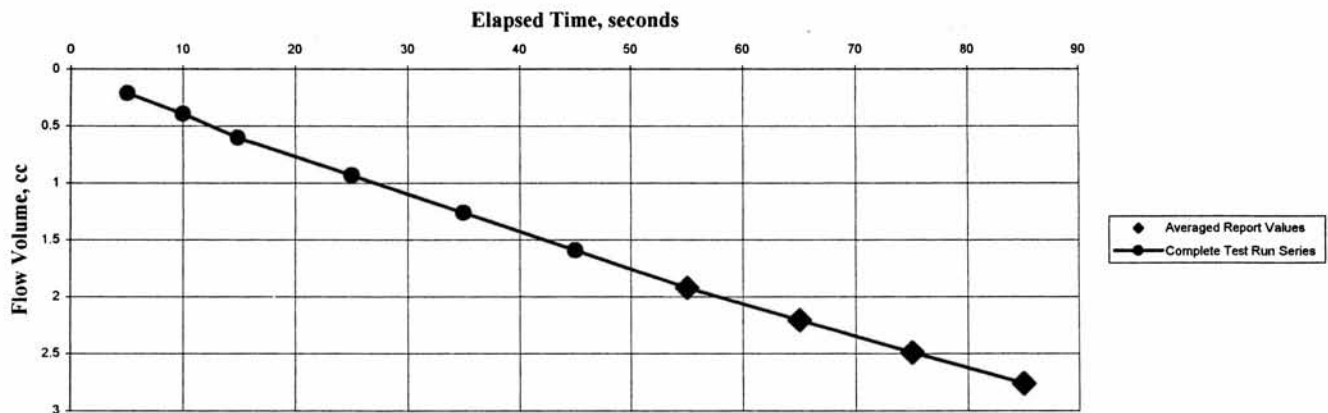
After Test

Specimen Height, cm: 4.88

Specimen Diameter, cm: 5.00

Dry Unit Weight, pcf: 110.3

Moisture Content, % 14.7



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

August 13, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-5

Sample Depth, ft.: 35-36.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks:

TEST RESULTS

Permeability, cm/sec.: $2.34\text{E-}07$

Average Hydraulic Gradient: 4.6

Effective Cell Pressure, psi: 10

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.27

Specimen Diameter, cm: 6.20

Dry Unit Weight, pcf: 90.5

Moisture Content, % 25.6

Specific Gravity, Assumed

Percent Saturation:

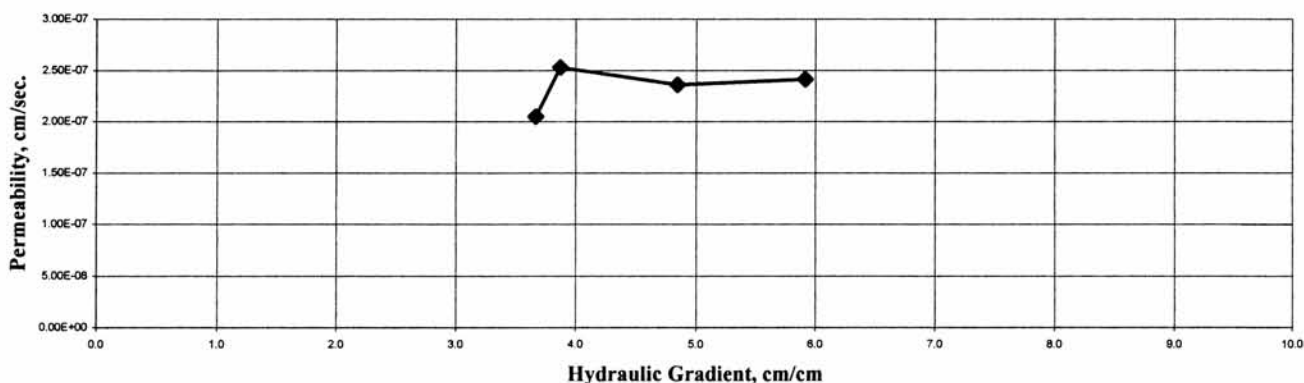
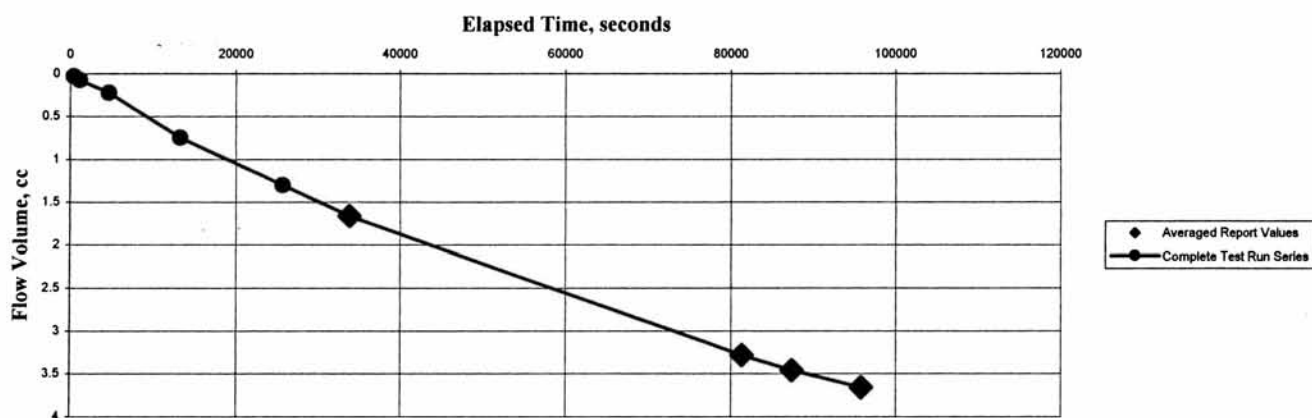
After Test

Specimen Height, cm: 6.17

Specimen Diameter, cm: 6.20

Dry Unit Weight, pcf: 94.3

Moisture Content, % 26.9



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

August 13, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-4

Sample Depth, ft.: 40-41.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks:

TEST RESULTS

Permeability, cm/sec.: 4.22E-04

Average Hydraulic Gradient: 4.6

Effective Cell Pressure, psi: 10

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.10

Specimen Diameter, cm: 6.10

Dry Unit Weight, pcf: 104.0

Moisture Content, % 20.6

Specific Gravity, Assumed

Percent Saturation:

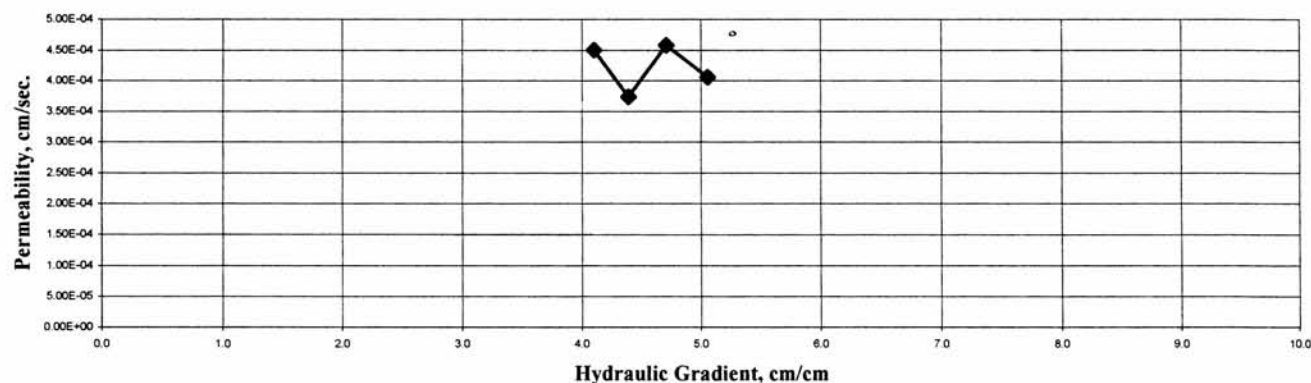
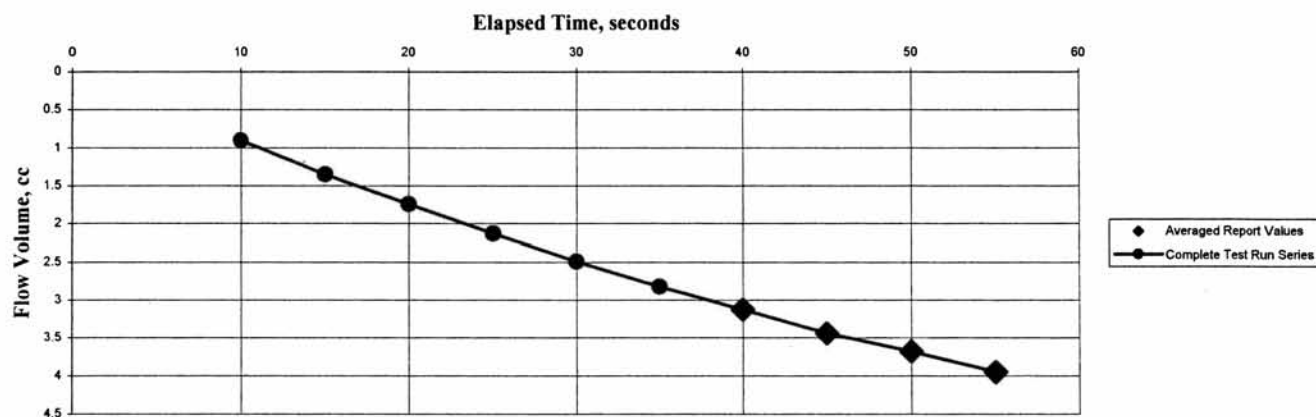
After Test

Specimen Height, cm: 5.87

Specimen Diameter, cm: 6.10

Dry Unit Weight, pcf: 109.9

Moisture Content, % 21.4



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

August 13, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-4

Sample Depth, ft.: 15-16.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks:

TEST RESULTS

Permeability, cm/sec.: $1.55E-05$

Average Hydraulic Gradient: 5.3

Effective Cell Pressure, psi: 10

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 5.59

Specimen Diameter, cm: 6.12

Dry Unit Weight, pcf: 116.8

Moisture Content, % 17.3

Specific Gravity, Assumed

Percent Saturation:

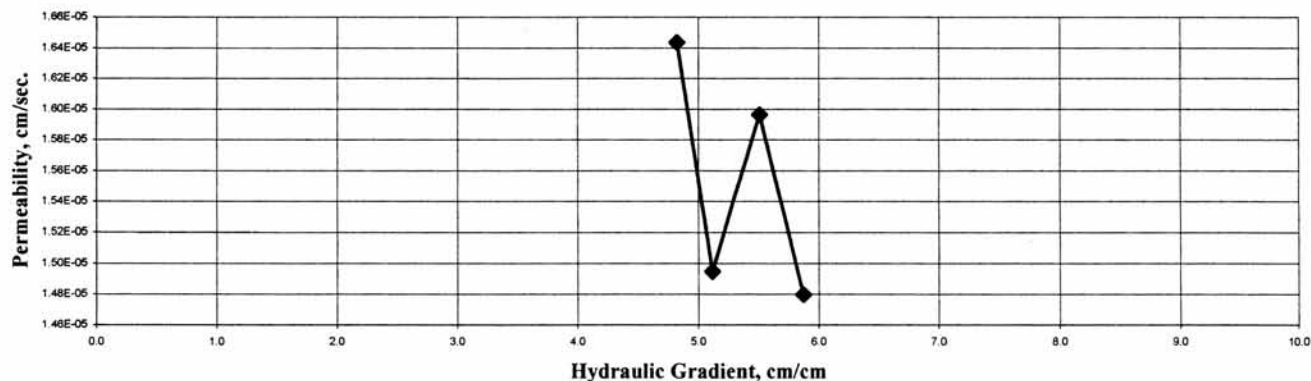
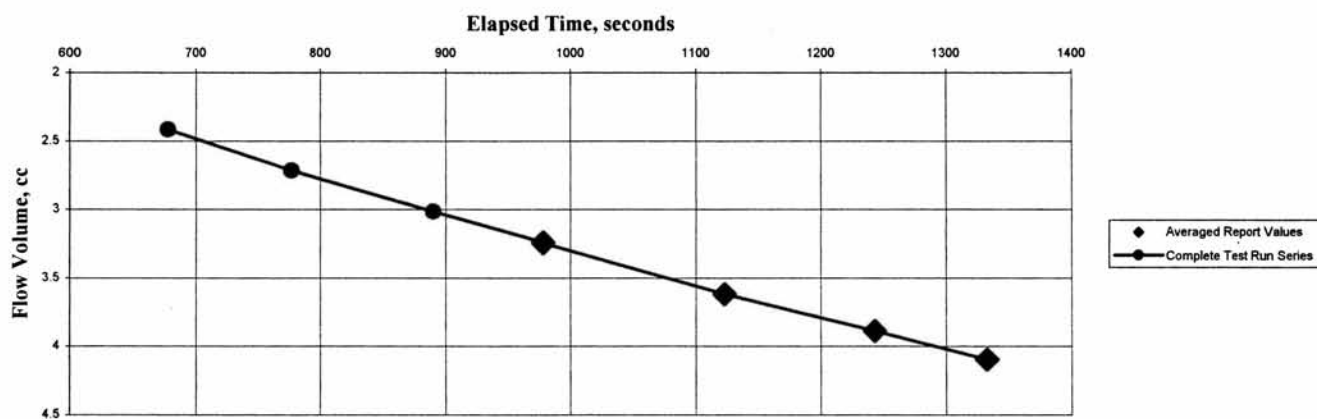
After Test

Specimen Height, cm: 5.49

Specimen Diameter, cm: 6.12

Dry Unit Weight, pcf: 128.4

Moisture Content, % 14.9



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

August 13, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-5

Sample Depth, ft.: 20-21.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks:

TEST RESULTS

Permeability, cm/sec.: 1.73E-05

Average Hydraulic Gradient: 3.7

Effective Cell Pressure, psi: 10

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.40

Specimen Diameter, cm: 6.20

Dry Unit Weight, pcf: 62.5

Moisture Content, % 59.4

Specific Gravity, Assumed

Percent Saturation:

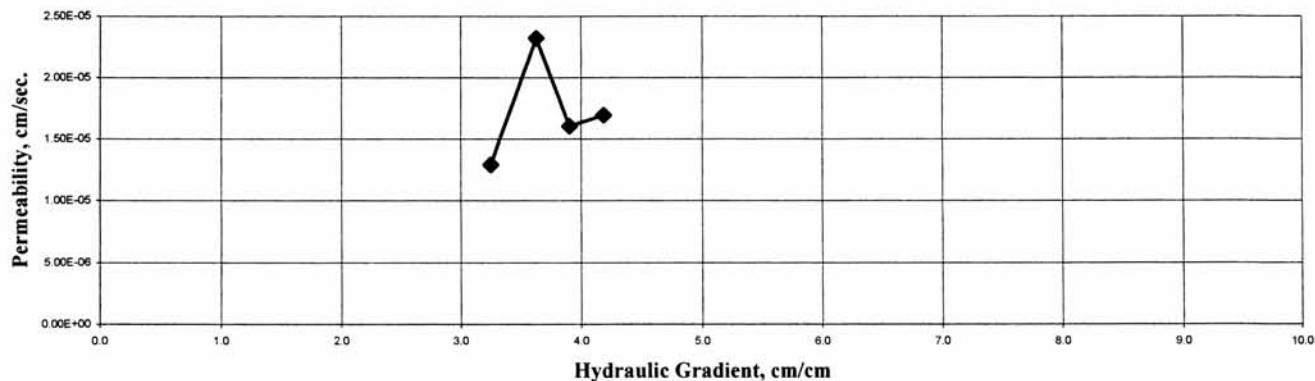
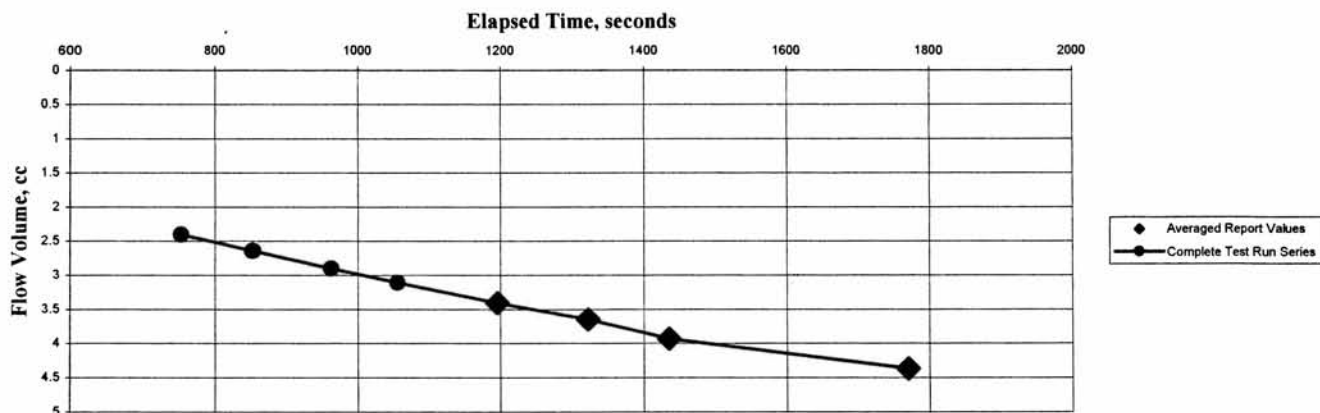
After Test

Specimen Height, cm: 6.35

Specimen Diameter, cm: 6.20

Dry Unit Weight, pcf: 66.8

Moisture Content, % 60.4



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

August 13, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-17

Sample Depth, ft.: 75-76.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks:

TEST RESULTS

Permeability, cm/sec.: 5.84E-06

Average Hydraulic Gradient: 3.2

Effective Cell Pressure, psi: 10

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 7.24

Specimen Diameter, cm: 6.10

Dry Unit Weight, pcf: 79.5

Moisture Content, % 41.8

Specific Gravity, Assumed

Percent Saturation:

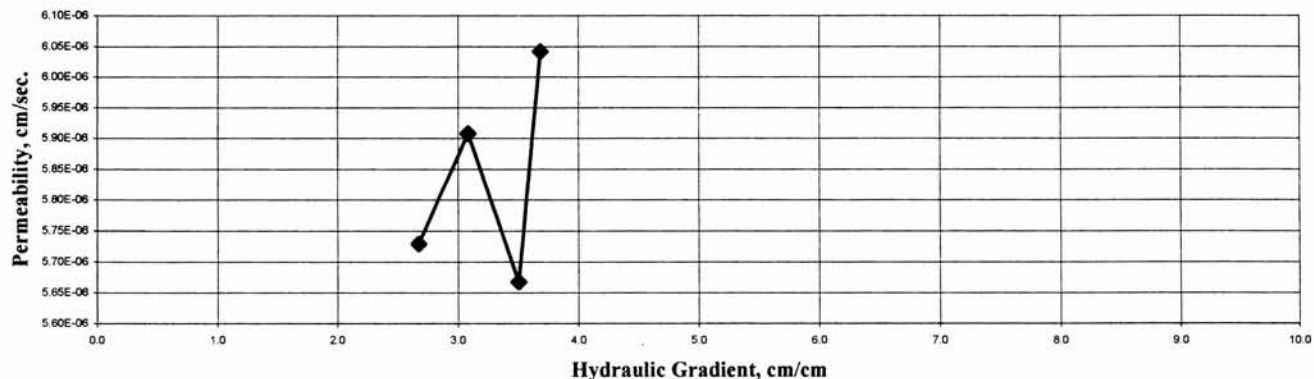
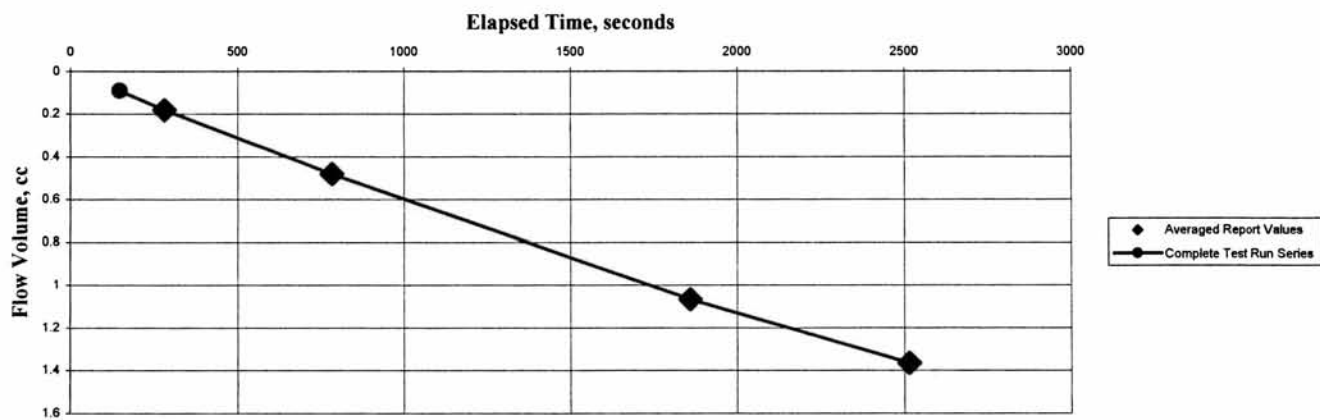
After Test

Specimen Height, cm: 7.11

Specimen Diameter, cm: 6.10

Dry Unit Weight, pcf: 80.3

Moisture Content, % 43.5



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

August 7, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-17

Sample Depth, ft.: 70-71.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks:

TEST RESULTS

Permeability, cm/sec.: 1.01E-03

Average Hydraulic Gradient: 2.1

Effective Cell Pressure, psi: 10

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 9.14

Specimen Diameter, cm: 6.17

Dry Unit Weight, pcf: 112.9

Moisture Content, % 14.2

Specific Gravity, Assumed

Percent Saturation:

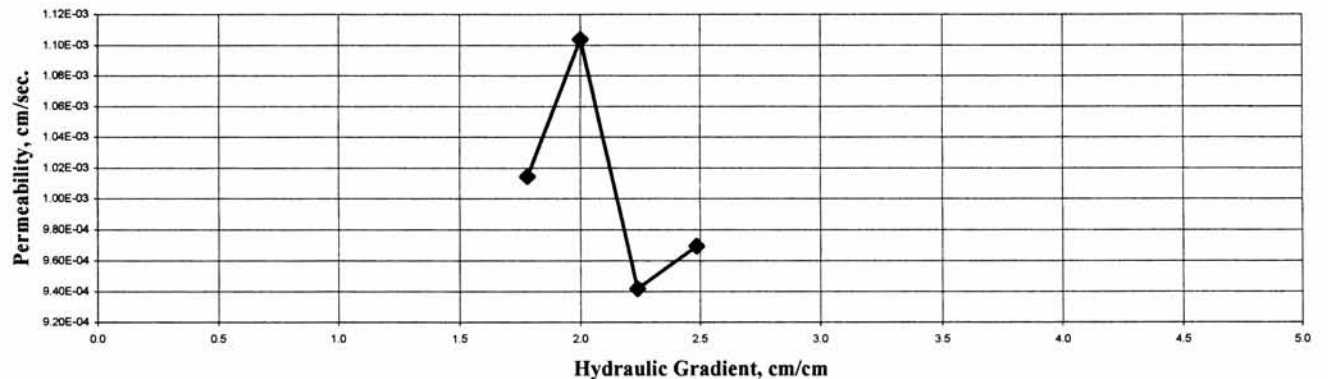
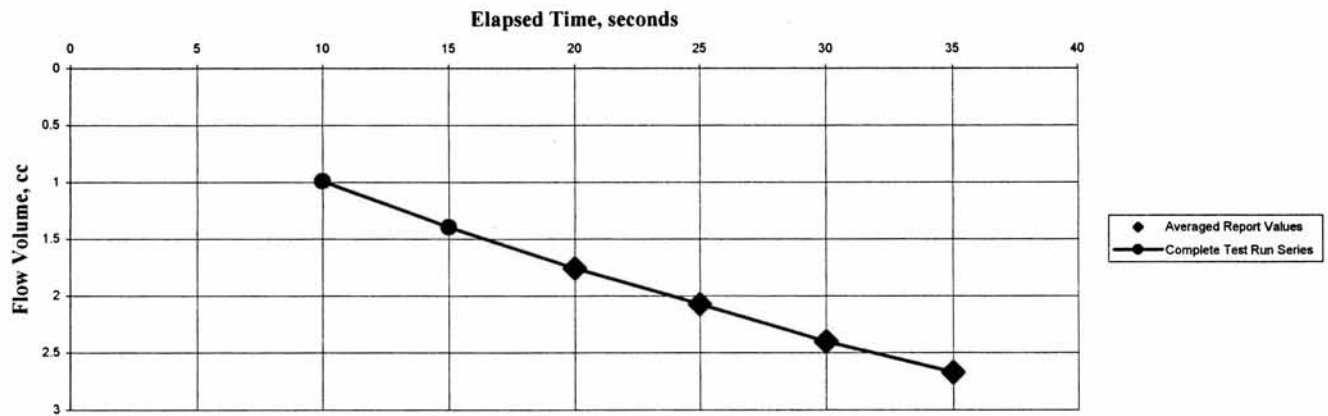
After Test

Specimen Height, cm: 9.09

Specimen Diameter, cm: 6.17

Dry Unit Weight, pcf: 114.5

Moisture Content, % 16.0



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

August 7, 2007

BRC Aquifer Testing


SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-16

Sample Depth, ft.: 110-111.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks:

TEST RESULTS

Permeability, cm/sec.: 4.76E-06

Average Hydraulic Gradient: 3.6

Effective Cell Pressure, psi: 10

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.65

Specimen Diameter, cm: 6.22

Dry Unit Weight, pcf: 64.5

Moisture Content, % 55.5

Specific Gravity, Assumed

Percent Saturation:

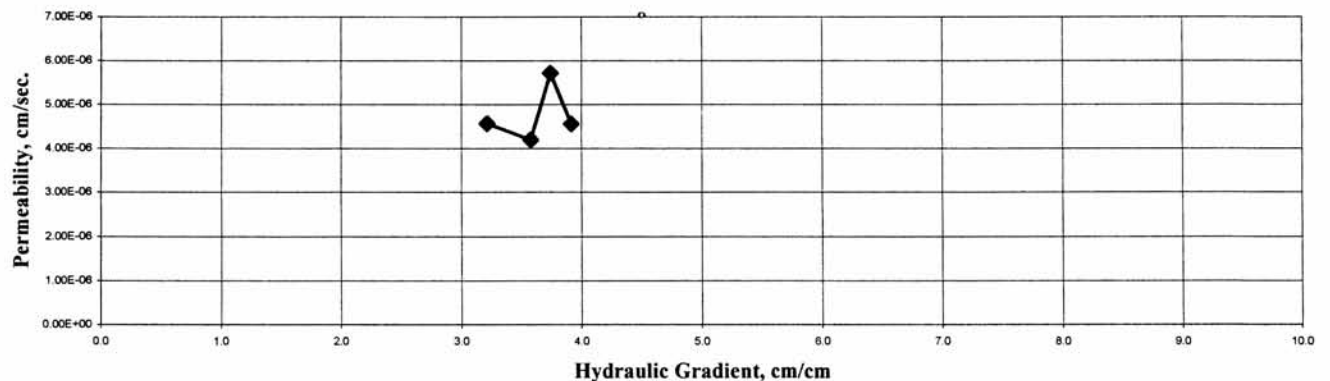
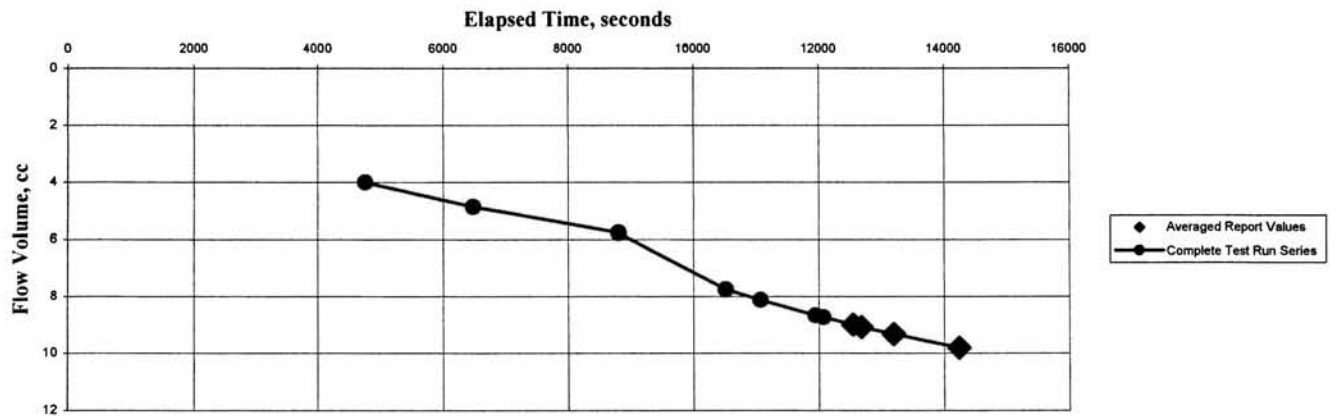
After Test

Specimen Height, cm: 6.65

Specimen Diameter, cm: 6.22

Dry Unit Weight, pcf: 66.7

Moisture Content, % 56.7



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

August 7, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-16

Sample Depth, ft.: 100-101.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks:

TEST RESULTS

Permeability, cm/sec.: 1.65E-05

Average Hydraulic Gradient: 8.1

Effective Cell Pressure, psi: 10

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.22

Specimen Diameter, cm: 6.10

Dry Unit Weight, pcf: 76.0

Moisture Content, % 45.7

Specific Gravity, Assumed

Percent Saturation:

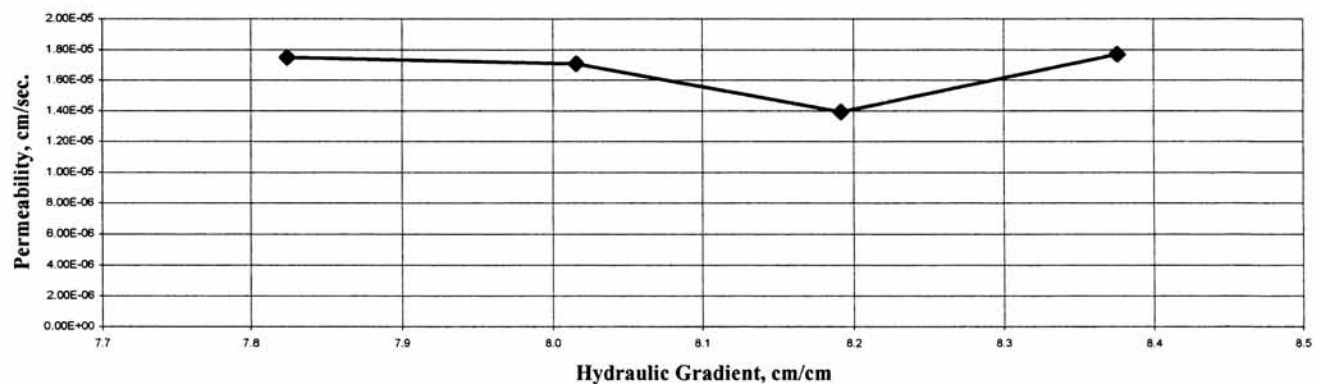
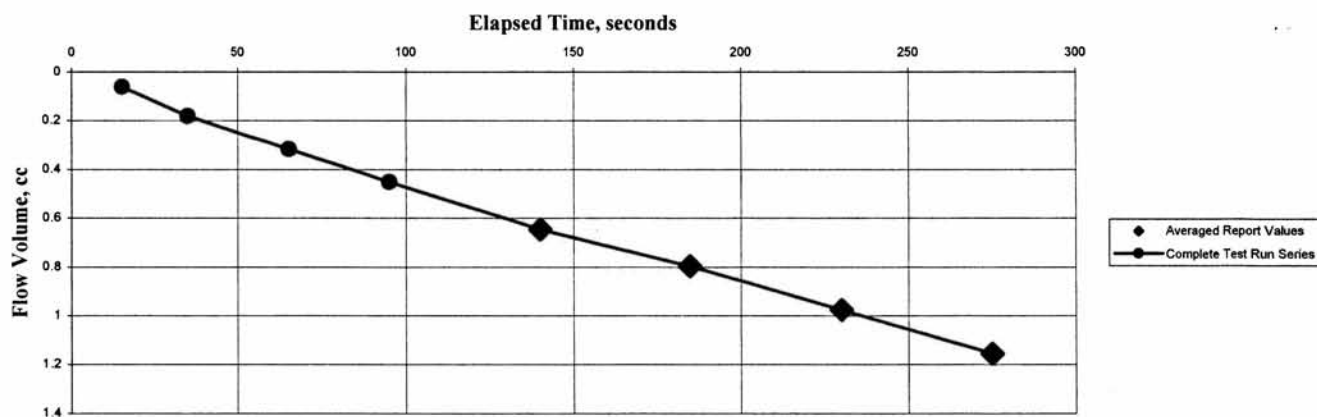
After Test

Specimen Height, cm: 6.25

Specimen Diameter, cm: 6.10

Dry Unit Weight, pcf: 75.7

Moisture Content, % 46.3



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

August 7, 2007

BRC Aquifer Testing


SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-15

Sample Depth, ft.: 45-46.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks:

TEST RESULTS

Permeability, cm/sec.: 4.38E-04

Average Hydraulic Gradient: 4.5

Effective Cell Pressure, psi: 10

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.55

Specimen Diameter, cm: 6.17

Dry Unit Weight, pcf: 109.4

Moisture Content, % 8.9

Specific Gravity, Assumed

Percent Saturation:

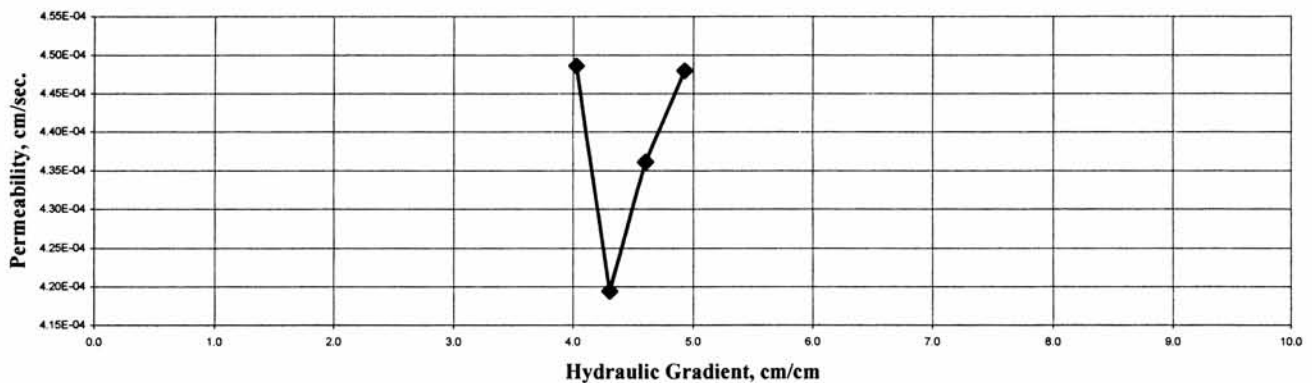
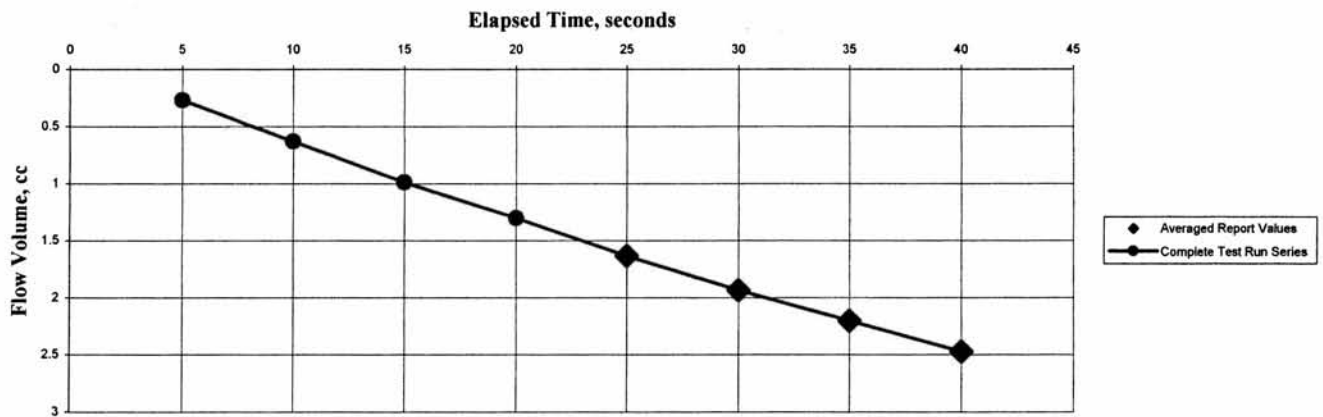
After Test

Specimen Height, cm: 6.43

Specimen Diameter, cm: 6.17

Dry Unit Weight, pcf: 112.5

Moisture Content, % 16.2



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

August 7, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-15

Sample Depth, ft.: 65-66.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks:

TEST RESULTS

Permeability, cm/sec.: $1.47\text{E-}04$

Average Hydraulic Gradient: 4.0

Effective Cell Pressure, psi: 10

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 7.62

Specimen Diameter, cm: 6.22

Dry Unit Weight, pcf: 68.0

Moisture Content, % 50.0

Specific Gravity, Assumed

Percent Saturation:

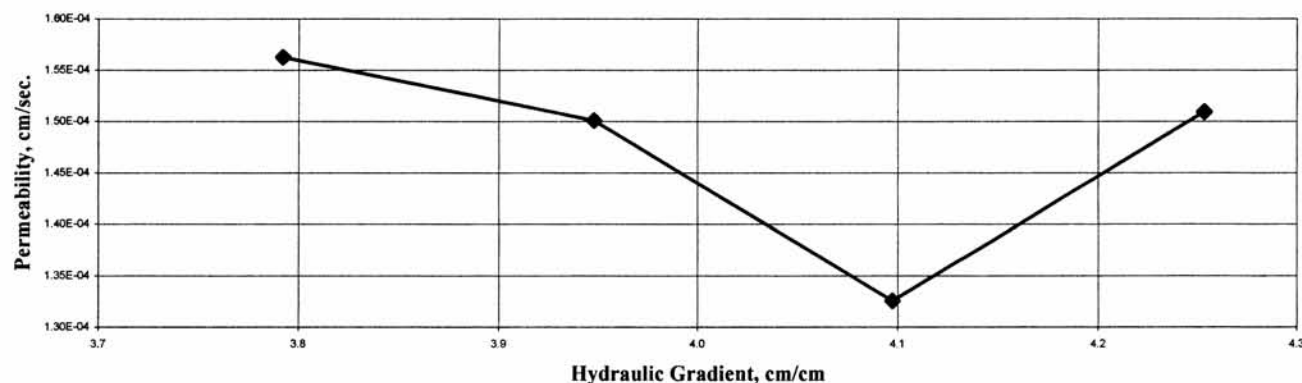
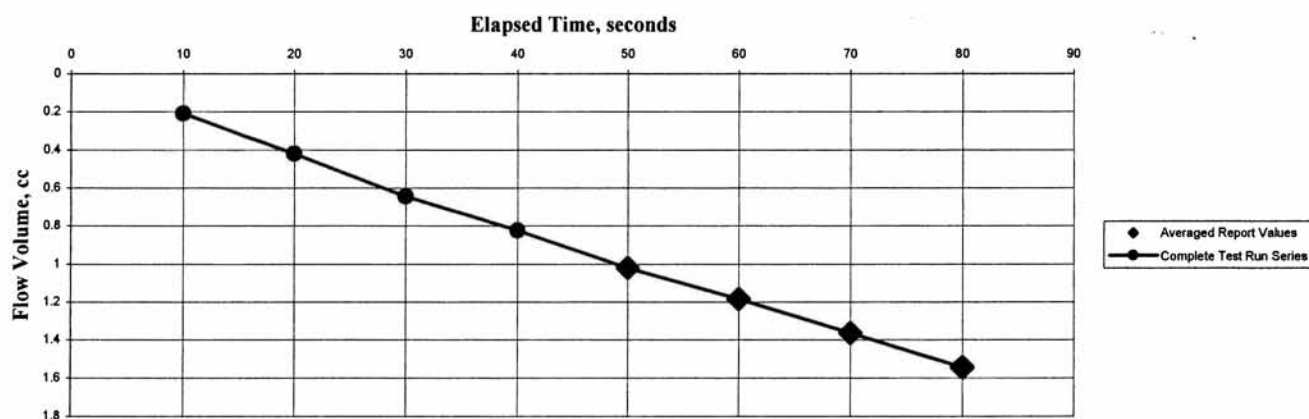
After Test

Specimen Height, cm: 7.70

Specimen Diameter, cm: 6.22

Dry Unit Weight, pcf: 68.4

Moisture Content, % 53.1



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

August 7, 2007

BRC Aquifer Testing


SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: AA-23R, 8/14/07

Sample Depth, ft.: 25-26.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks:

TEST RESULTS

Permeability, cm/sec.: $3.45\text{E-}06$

Average Hydraulic Gradient: 2.0

Effective Cell Pressure, psi: 10

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.35

Specimen Diameter, cm: 6.10

Dry Unit Weight, pcf: 120.7

Moisture Content, % 15.2

Specific Gravity, Assumed

Percent Saturation:

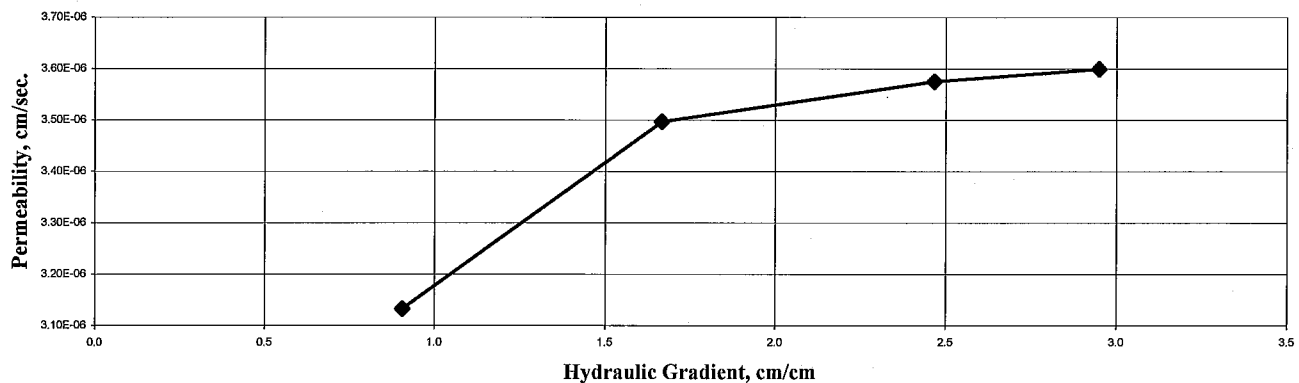
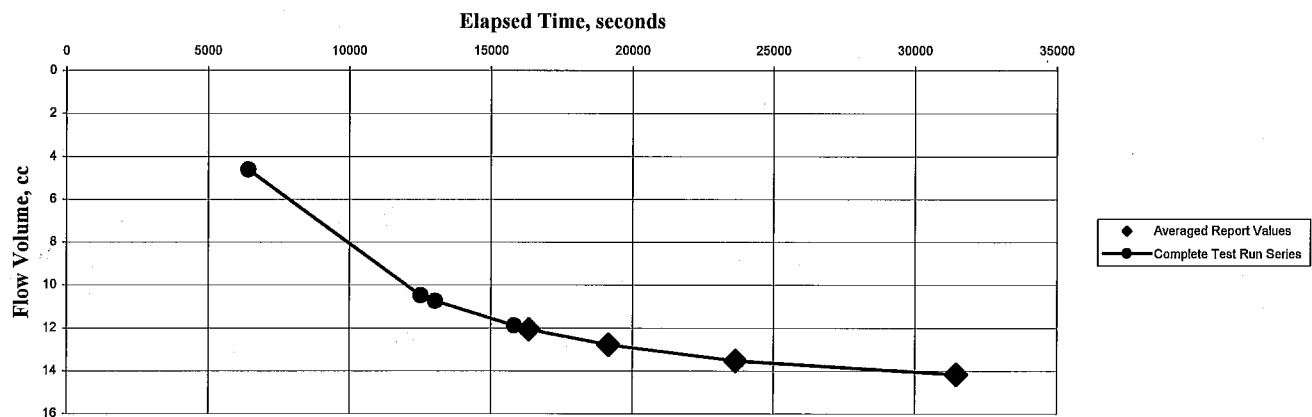
After Test

Specimen Height, cm: 6.12

Specimen Diameter, cm: 6.10

Dry Unit Weight, pcf: 129.5

Moisture Content, % 12.2



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

August 23, 2007

BRC Aquifer Testing



5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-20, 8/15/07

Sample Depth, ft.: 30-31.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks:

TEST RESULTS

Permeability, cm/sec.: $1.60\text{E-}05$

Average Hydraulic Gradient: 7.1

Effective Cell Pressure, psi: 10

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.10

Specimen Diameter, cm: 6.05

Dry Unit Weight, pcf: 100.0

Moisture Content, % 16.4

Specific Gravity, Assumed

Percent Saturation:

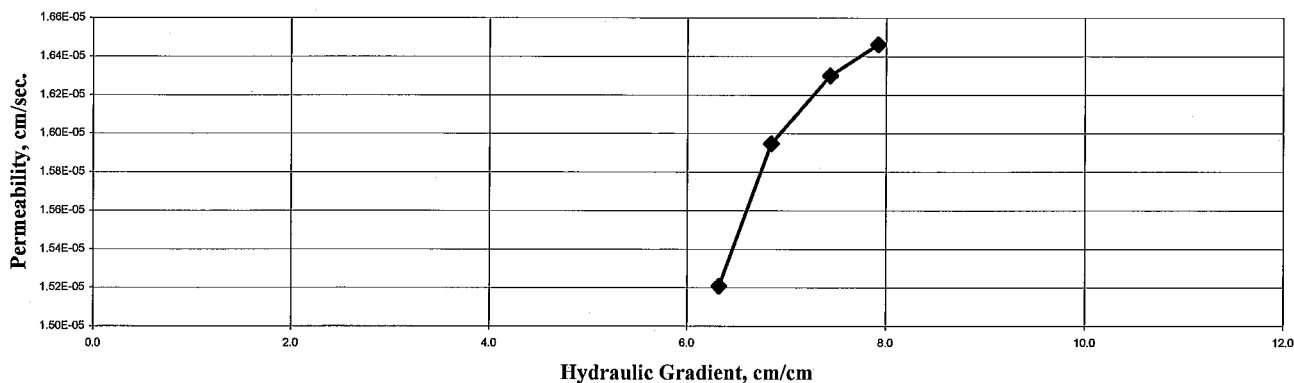
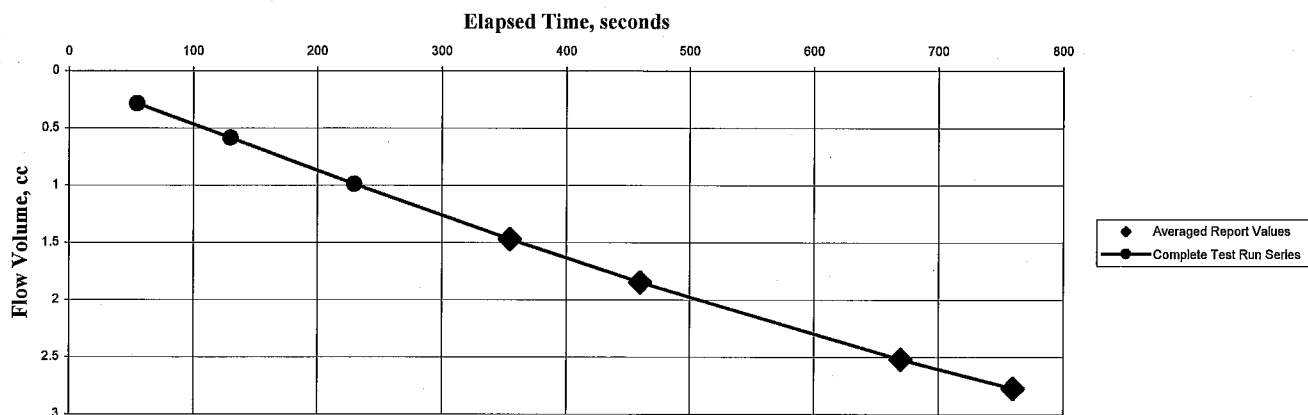
After Test

Specimen Height, cm: 5.92

Specimen Diameter, cm: 6.05

Dry Unit Weight, pcf: 103.0

Moisture Content, % 22.7



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

August 28, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-20, 8/15/07

Sample Depth, ft.: 70-71.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks:

TEST RESULTS

Permeability, cm/sec.: $1.59\text{E-}04$

Average Hydraulic Gradient: 6.5

Effective Cell Pressure, psi: 10

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 7.37

Specimen Diameter, cm: 5.97

Dry Unit Weight, pcf: 107.2

Moisture Content, % 24.2

Specific Gravity, Assumed

Percent Saturation:

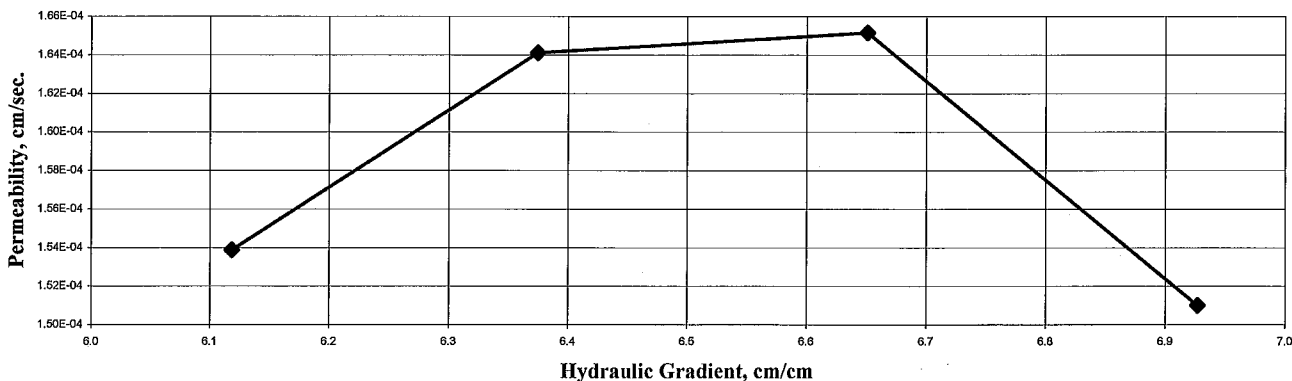
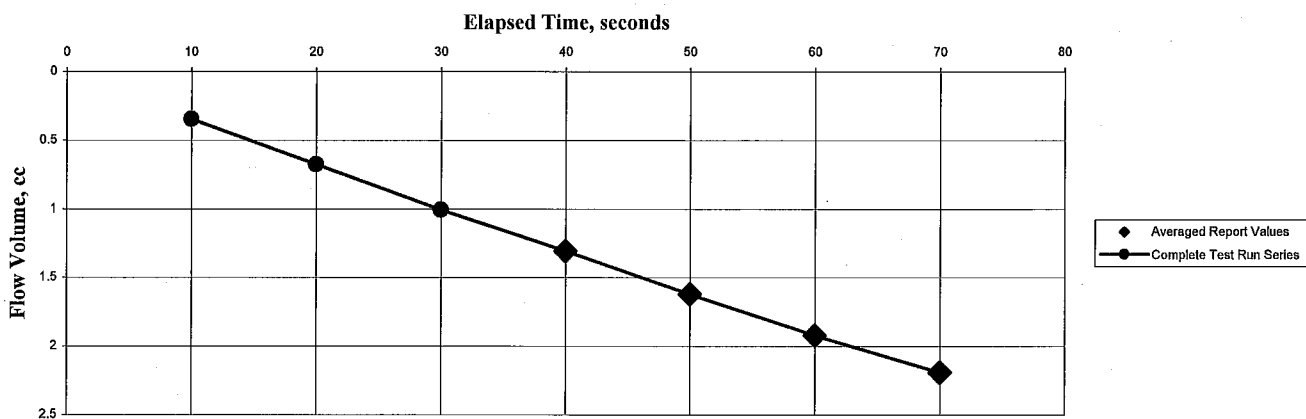
After Test

Specimen Height, cm: 7.42

Specimen Diameter, cm: 5.97

Dry Unit Weight, pcf: 106.5

Moisture Content, % 23.2



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

August 28, 2007

BRC Aquifer Testing


SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-22, 8/13/07

Sample Depth, ft.: 40-41.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks:

TEST RESULTS

Permeability, cm/sec.: 1.64E-06

Average Hydraulic Gradient: 3.8

Effective Cell Pressure, psi: 10

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 6.93

Specimen Diameter, cm: 6.10

Dry Unit Weight, pcf: 67.4

Moisture Content, % 59.2

Specific Gravity, Assumed

Percent Saturation:

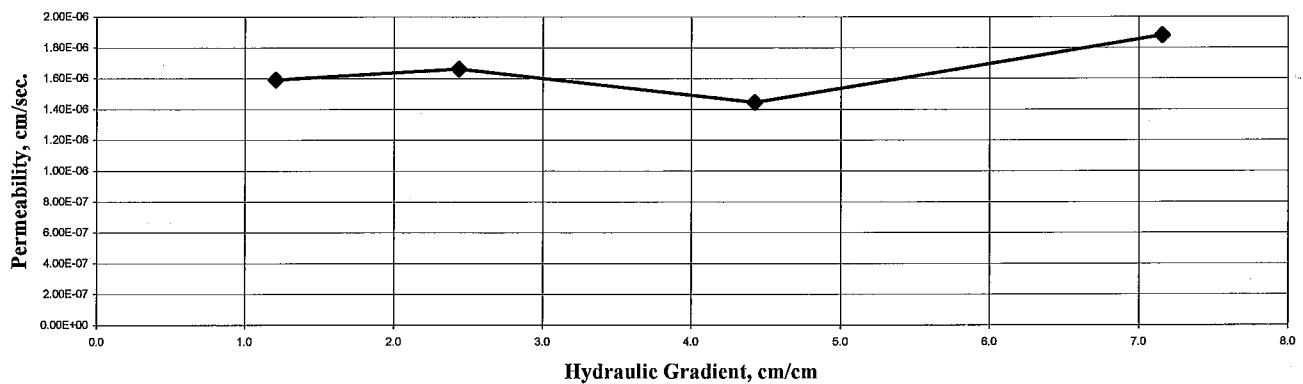
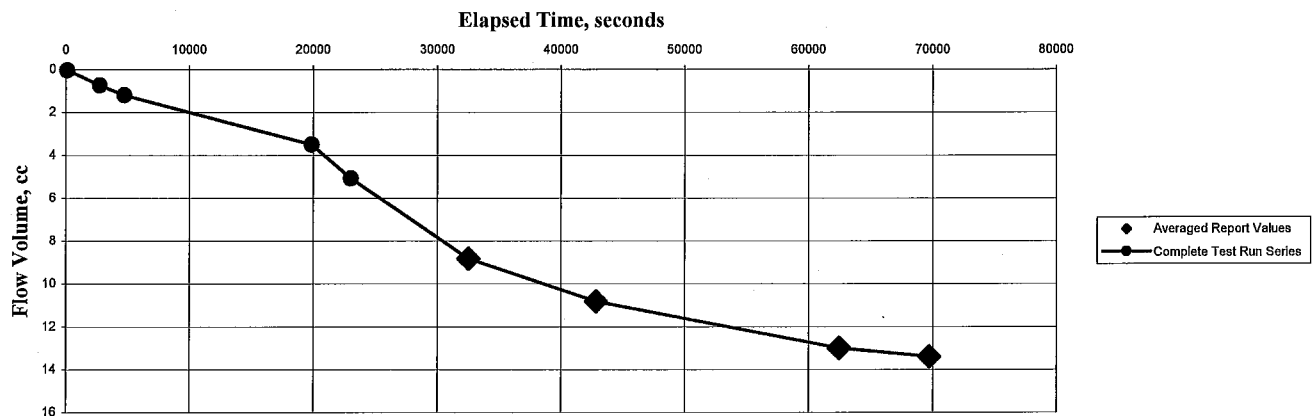
After Test

Specimen Height, cm: 6.99

Specimen Diameter, cm: 6.10

Dry Unit Weight, pcf: 66.9

Moisture Content, % 55.7



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

August 23, 2007

BRC Aquifer Testing


SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: DBMW-22, 8/13/07

Sample Depth, ft.: 50-56.5

Visual Description: N/A

Sample Type: Sample Liner

Remarks:

TEST RESULTS

Permeability, cm/sec.: 1.21E-06

Average Hydraulic Gradient: 6.3

Effective Cell Pressure, psi: 10

TEST SAMPLE DATA

Before Test

Specimen Height, cm: 7.32

Specimen Diameter, cm: 6.05

Dry Unit Weight, pcf: 58.5

Moisture Content, % 61.7

Specific Gravity, Assumed

Percent Saturation:

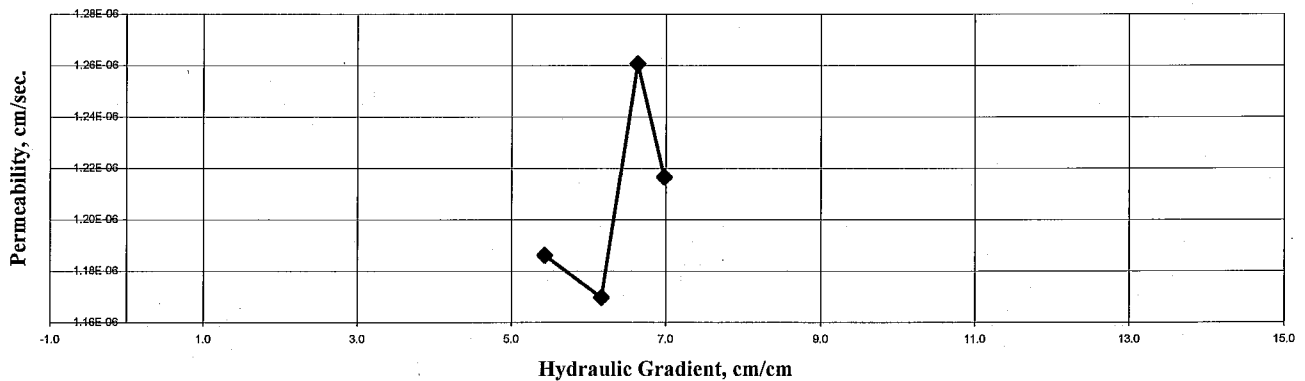
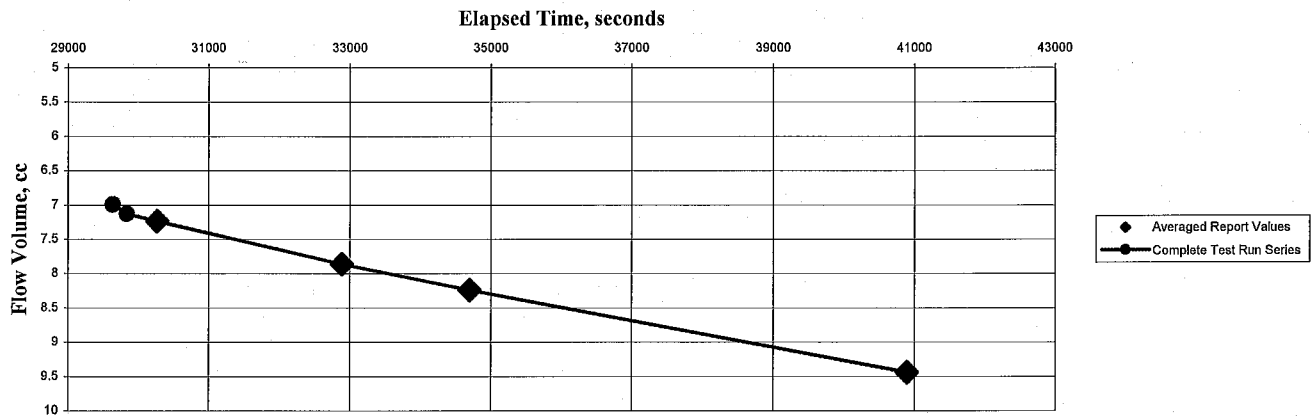
After Test

Specimen Height, cm: 7.14

Specimen Diameter, cm: 6.05

Dry Unit Weight, pcf: 60.4

Moisture Content, % 55.3



Test Method: ASTM D5084 Method C

PROJECT NUMBER: 07-220

August 23, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507