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IMPLEMENTATION OF THE REVISED AQUIFER TESTING WORK PLAN BMI COMMON AREA EASTSIDE HENDERSON, NEVADA

Project No. 83173.10

September 25, 2007
Revised: November 16, 2007

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A Report Prepared for:

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

Implementation of Revised Aquifer-Testing Work Plan BMI Common Area Eastside Henderson, Nevada

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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

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1 INTRODUCTION

Kleinfelder was retained to implement the scope of work described in the "Revised Aquifer Testing Work Plan, BMI Common Area Eastside," dated January 9, 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 slug and pump testing techniques 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.

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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 two 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 "anastimosing 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 Upper Muddy Creek Formation is primarily silts and clay but occasionally includes discontinuous sandy lenses. The sand lenses can be several feet thick but are discontinuous and difficult to correlate between borings. The fine-grained lacustrine facies of the Upper Muddy Creek Formation are dominated by silts and clays, but also include discontinuous sand layers and lenses. (Kleinfelder, 2005).

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

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Creek Formation. Groundwater is also found occurring as confined aquifers in several of the sand units of the Muddy Creek Formation.

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3 FIELD ACTIVITIES

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

- Determine suitability of existing cores for laboratory physical testing
- Determine short-term water level fluctuations
- Obtain new core samples for laboratory testing
- Install and develop monitoring wells to be used for aquifer pumping tests
- Measure depths to water in the new and pre-existing monitoring wells
- Perform slug-testing
- Perform step-drawdown testing
- Perform constant-rate pumping tests

3.1. DETERMINE SUITABILITY OF EXISTING CORES FOR LABORATORY USE

BRC had an archive of soil cores for the area of interest stored at a facility operated by GES of Henderson, Nevada. Kleinfelder inspected the stored cores to assess their suitability for laboratory hydraulic conductivity testing. Kleinfelder found the cores to be desiccated and unsuitable for use in hydraulic conductivity testing. It was decided to obtain the samples for laboratory use from cores drilled for the new monitoring wells.

3.2. ASSESS SHORT-TERM WATER LEVEL FLUCTUATIONS

To evaluate short-term fluctuations that could affect the interpretation of water level data obtained during the aquifer testing, short-term changes in water levels were monitored in wells MCF-06A, MCF-06B, MCF-06C. Data loggers were installed and programmed to collect measurements at 15-minute intervals. The data loggers recorded water level changes in the three wells from June 7 to July 9, 2007. Plots showing the water level changes for these three monitoring wells are presented in Plates 2 and 3.

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The groundwater levels in monitoring well MCF-06A, which is screened in the Muddy Creek Formation from 1177 to 1197 feet, increased approximately three feet over the 34-day period the data loggers were recording. Groundwater levels in monitoring well MCF-06B, which is screened from 1531 to 1551 feet in the alluvial aquifer, generally decreased over the same time period. Daily variations in the groundwater levels in monitoring well MCF-06B suggest the aquifer is being influenced by barometric pressure and may indicate the aquifer is either semi-confined or confined.

Groundwater levels in monitoring well MCF-06C, which is screened from 1554 to 1574 in the alluvial aquifer, increased approximately 1.28 feet over the recording time period. Because the water levels in this well did not appear to fluctuate in response to daily barometric pressure changes, Kleinfelder assumes the aquifer is unconfined.

Water levels were recorded in monitoring wells at the AA-09, AA-20 and AA-08 sites either before or after the aquifer test. Measurements in monitoring wells at AA-09 show water levels generally rising before the aquifer test on June 22, 2007. Water levels remained relatively constant after the aquifer test.

Water levels in monitoring wells at the AA-20 site increased approximately one foot during the 40 days before the aquifer test.

Water levels in the shallower monitoring wells at the AA-08 site steadily decreased before the aquifer test and rose notably after the aquifer test. The rise in groundwater level after the aquifer test period increased water levels to above the initial water levels at the beginning of the pump test.

3.3. SOIL BORINGS AND MONITORING WELL INSTALLATION

Soil boring and monitoring well logs are in Appendix A.

Kleinfelder's subcontractor, Boart-Longyear of Mesa, Arizona, drilled 10 soil borings and completed 6 as wells under the oversight of our geologist. The 10 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

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vibrated and slowly rotated to obtain either 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. Pilot borings for the wells were reamed using an air-rotary casing hammer drilling rig.

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.

One of the wells was completed as a four-inch extraction well near wells AA-08. The new well served as a pumping well, while the existing wells served as observation wells. The extraction well was screened across the entire Qal saturated thickness, which was found to extend to 60 feet at AA-08. The remaining five wells, constructed with 2-inch casings, were intended to serve as observation wells for the pumping tests

Soil cuttings generated from the drilling operation were contained in 55-gallon drums and were left nearby to be transported from the site at a later date.

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), two-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:

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Table 1 - Soil Boring and New Monitoring Well Construction Details

Soil Borings & New Wells	Date Completed	Depth bgs (ft)	Casing Stick-up ags (ft)	Screen Interval (ft)	Casing Diameter (in)	Slot Size (in)
AA-06	6/3/2007	65				
AA-08-OWA	6/4/2007	60	3.1	10 to 60	2	0.020
AA-08-OWB	6/5/2007	50	3.1	10 to 50	2	0.020
AA-08-EW	6/5/2007	60	3.1	10 to 60	4	0.020
AA-09-OW	6/1/2007	70	3.0	30 to 70	2	0.020
AA-20-OW	6/2/2007	55	3.1	15 to 55	2	0.020
B-1	5/31/2007	100				
B-2	5/31/2007	100				
B-3	5/29/2007	80				
B-4	6/1/2007	90				

Bgs	Below ground surface
Ags	Above ground surface
Ft	Feet
In	Inches
NA	Not available

No new wells were installed near monitoring well AA-26 as outlined in the work plan due to land access issues. These wells and the associated aquifer test will be completed at a later date when an access agreement is obtained.

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

3.4. 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

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when the purged water was relatively clear, and the monitored parameters were relatively stabile.

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

3.5. 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 and Pre-existing Monitoring Wells

Well	Date Measured	Top of Casing Elevation (ft)	Depth to Water (ft)	Static Water Level Elevation (ft)
MCF-06C (AA-06C)	6/2/2007	1633.12	51.60	1581.52
MCF-06B	6/5/2007	1633.18	54.39	1578.79
MCF-06A	6/5/2007	1588.80	43.66	1545.14
AA-08-OWA	6/4/2007	1581.03	14.6	1566.4
AA-08-OWB	6/5/2007	1580.97	15.2	1565.8
AA-08-EW	6/5/2007	1581.86	15.7	1566.2
AA-09-OW	6/27/2007	1695.95	36.3	1659.6
MCF-09C	6/5/2007	1696.23	36.36	1659.87
MCF-09B	6/5/2007	1685.77	36.10	1649.67
MCF-09A	6/5/2007	1695.87	38.31	1657.56
AA-20-OW	7/10/2007	1629.07	27.1	1602.0
AA-20	6/5/2007	1628.49	27.27	1601.22

3.6. LABORATORY TESTING

Because it was determined that the archived soil cores were not usable for the laboratory determination of hydraulic parameters, new samples needed to be collected. Kleinfelder oversaw drilling of 10 soil borings at three locations within the east side of the upper ponds. The borings were continuously core sampled at depths below the water table, within the alluvium and upper portion of the TCMf. Kleinfelder lithologically

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logged the three-inch diameter cores and selected samples for physical testing. Monitoring wells were installed in five of the soil borings.

The depths for the monitoring wells and borings are listed in Table 1. The 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.

Data posted from the results of the testing listed in Tables 10 to 15 will be used to provide soil property information to develop the conceptual model and computerized groundwater model outlined in the Groundwater Modeling Work Plan development by Daniel B. Stephens and Associates, Inc in January 2007.

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4 AQUIFER TESTING

4.1. SLUG TESTING

Kleinfelder performed aquifer slug tests on eight wells, MCF-03B, MCF-06C, MCF-16C, AA-13, AA-22, AA-07, AA-09, and AA-20. Five of these slug tests were performed per the DSBS&A standard operating procedure (SOP) as outlined in Appendix C of the work plan. The remaining three were tested with a single slug test due to the long time period for water level recovery.

A 10-foot slug was created by filling a two-inch diameter PVC pipe with sand and sealing both ends. A five-foot-long, two-inch diameter slug was constructed for wells with smaller saturated aquifer thicknesses. Field staff repeated each slug test at least twice with a third test performed if the results from the first two were not similar. Monitoring wells MCF-06C, MCF-16C, and MCF-03B were slug tested once due to slow recovery of water levels in the wells.

The changes in water levels in the wells were recorded using a 30 psi In-Situ Troll 700 data logger. The data loggers were set to record detailed early time information. The Bouwer-Rice solution in Aquifer Test Pro was used to calculate the hydraulic conductivities listed in Table 3. The initial filter pack response and the secondary response were identified in the analysis. Only the secondary response was used to determine the hydraulic conductivities. The plots the recovery responses and monitoring well logs for the slug test data are located in Appendix C.

Table 3 - Hydraulic Conductivities Based upon Slug Testing Results

Well Number	Slug Length (feet)	Initial Water Level Displacement (feet)	Hydraulic Conductivity (feet/day)
AA-20 Slug In-1	5	0.747	29.0
AA-20 Slug Out-1		1.765	32.5
AA-20 Slug In-2	5		Bad Data
AA-20 Slug Out 2		1.154	44.0

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Table 3 - Hydraulic Conductivities Based upon Slug Testing Results (Continued)

Well Number	Slug Length (feet)	Initial Water Level Displacement (feet)	Hydraulic Conductivity (feet/day)
MCF-16C Slug In	5	0.741	0.24
MCF-03B Slug In	10	2.947	0.18
AA-13 Slug In-1	10	1.551	12.2
AA-13 Slug Out-1		2.418	14.2
AA-13-Slug In-2	10	1.981	11.2
AA-13 Slug Out-2		2.107	12.5
AA-07 Slug In-1	10	2.436	8.0
AA-07 Slug Out-1		1.965	6.5
AA-07 Slug In-2	10	1.685	5.0
AA-07 Slug Out-2		1.990	8.0
AA-22 Slug In-1	10	1.003	0.6
AA-22 Slug Out-1		2.261	0.3
AA-22 Slug In-2	10	1.174	0.5
AA-22 Slug Out-2		2.284	0.6
AA-09 Slug In-1	10	0.876	Abnormal Oscillatory Response – Unusable Data
AA-09 Slug Out-1		1.789	67.3
AA-09 Slug In-2	10		Abnormal Oscillatory Response – Unusable Data
AA-09 Slug Out-2		1.909	58.4
AA-09 Slug In-3	10		Abnormal Oscillatory Response – Unusable Data
AA-09 Slug Out-3		1.736	62.0
MCF-06C Slug In	5	5.8	1.5

The groundwater responses in all of the tests were similar for both the slug-in and the slug-out tests. Each successive test in a monitoring well remained relatively constant without showing an increase in hydraulic conductivity. The slugs in all of the tests came out of the well clean without any silts or clays. The clean slugs and the consistency of the tests results suggest the wells are well developed. Minor differences in the responses are noted when plotting the recovery curves for the tests where small oscillatory responses in a few of the slug in tests occurred in a few of the tests. The oscillatory responses occurred in the initial phase of the tests associated with the well

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filter pack. The generally low hydraulic conductivities found in most of the wells may have helped to keep the range of the values consistent.

The slug tests at AA-20 included two slug-in and two slug-out tests. The second slug-in test produced bad data, likely caused by the slug disturbing the data logger cable during insertion. The screened interval in AA-20 is logged as silty sand with gravels. The range of hydraulic conductivities from 29 to 44 feet per day falls within the expected values for a silty sand or fine sand.

A single slug-in test was performed at MCF-16C. The change in water level from the slug-in test took 225 minutes to fully recover. The saturated section within the screened interval is logged as sandy silt. The tested hydraulic conductivity of 0.24 feet per day matches the values commonly found in sandy silts. Lithologies logged in the upper section of the screen include poorly graded gravel and poorly graded sands. The low value of the tested hydraulic conductivity suggests the coarser sediments were not saturated and did not affect the groundwater response.

A single slug in test was performed at MCF-03B. The change in water level from the slug-in test took 182 minutes to fully recover. The screened lithologies for this monitoring well include sandy silt and silt with clay. The hydraulic conductivity of 0.18 feet per day in this test is reflective more by the sandy silt lithology and less of the silty clay which would likely cause a lower value.

The hydraulic conductivities tested in AA-13 ranged from 12.2 to 14.2 feet per day. The lithologies within the screened section of AA-13 include poorly graded sand, poorly graded gravel with silt, poorly graded gravel, and very fine silt. The hydraulic conductivities tested in this well are more commonly associated with fine sands.

The screened lithologies in monitoring well AA-07 are logged as silts interbeds of silty sand with gravel and gravelly silty sand. The silty sand layers occur in thin layers throughout the screened interval. The gravelly silty sand occurs at the base of the screen. The tested hydraulic conductivities ranging from five to eight feet per day in AA-07 are common to silty sands and not the silts.

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The lithologies in the screened section of monitoring well AA-22 is predominately poorly graded sand in the upper half and in poorly graded gravel with sand in the lower half. The hydraulic conductivities tested in AA-22 range from 0.3 to 0.6 feet per day. These hydraulic conductivities are commonly found in silty sands to fine sands suggesting the poorly graded sands in this well likely have a significant finer grained sand component.

Monitoring well AA-09 was tested with three slug-in and slug-out tests. The slug-in tests produced an abnormal oscillatory response that could not be analyzed with a known solution. The slug-out tests resulted in normal curves without oscillation, with a range of hydraulic conductivities from 58.4 to 67.3 ft/day. These hydraulic conductivity values are commonly associated with silty sand that is found within the screened section of this well.

4.2. PUMPING TESTS

According to Kleinfelder's authorized work scope (April 6, 2007), aquifer pump testing was to be performed in six wells: existing wells, AA-07, AA-09, AA-20, MCF-06C; and new wells AA-08 and AA-026. Kleinfelder cancelled the MCF-06C and AA-07 testing, because the slug testing results indicated that we could expect low hydraulic conductivities of less than 10 feet per day. The pump testing at AA-26 was cancelled because we were unable to obtain authorization to access the well site.

Groundwater extracted from the wells during the pump tests was contained at the site in frac tanks provided by Rain for Rent of Las Vegas, Nevada. The contained water was either transferred by water truck or piped to an existing pond on the project site designated by the client. The volume of groundwater transferred to the pond was recorded and reported to State of Nevada officials.

The hydraulic conductivity and storage coefficients for the data from the pump tests were analyzed using Theis equation derived routines in Aquifer Test Pro, Version 4.0 from Waterloo Hydrogeologic. The modeled curves for the data assume the following conditions:

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The aquifer is unconfined.

- The aquifer is isotropic.
- The aquifer is infinite
- Discharge is constant during the constant rate tests.
- Discharge is constant during the tests
- The well screens penetrating the entire saturated zone.

The water table in an unconfined aquifer is equal to the elevation of the head, therefore, transmissivity is no longer constant, and it will decrease with increasing drawdown. This means that there is not only horizontal flow to the well, but there is also a vertical component, which will increase the closer you get to the well. Since transmissivity in unconfined aquifers is not constant, there is no closed solution for this aquifer type. The Theis equation can be corrected in these situations by using the Jacob (1944) correction to compensate for changes in transmissivity.

The Agarwal (1980) method was used to analyze the recovery period data from the pump tests. The Agarwal method assumes there is a two-dimensional radial convergent flow field, in an infinite confined aquifer, with a fully penetrating well, with or without skin effect, and no well-bore storage.

Plots of the modeled data and well logs from each of the aquifer tests are in Appendix D.

4.2.1. Pumping Test at AA-09

On June 26, 2007, Kleinfelder conducted a step-drawdown test at monitoring well site AA-09C. The test was conducted using a Grundfos pump capable of variable pumping rates up to 40 gallons per minute (gpm). Monitoring well MCF-06C (AA-09C) was used as the extraction well for the test. Monitoring wells MCF-09A, MCF-09B and AA-09OW were used as observation wells. In-situ Troll 700 data loggers were set in the pumping

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well and the observation wells before beginning the test. The initial depth to water at the start of the tests for AA-09OW was 36.3 feet from top of casing (toc) in the well.

The initial pumping rate for the step test was set at five gpm and pumped for 90 minutes with resulting drawdown of 0.97 feet. The pumping rate was increased to 15 gpm, which caused drawdown to the bottom of the well at the level of the pump. The pumping rate was reset at 5 gpm and the water levels rapidly returned to a drawdown level of 0.91 feet. The five-gpm rate was increased after 109 minutes to seven gpm, causing an increase in drawdown to 2.1 feet. The seven-gpm rate was maintained until the end of the test at 186 minutes, when drawdown had reached the level of the pump at the bottom of the well.

On the basis of the step-drawdown testing results, Kleinfelder selected a pumping rate of 5.7 gpm for the constant rate test.

On June 27, 2007, Kleinfelder began a constant-rate pumping test of AA-09C. The pumping rate was set at 5.7 gpm and maintained for 13 hours. Drawdown was monitored in wells AA-09OW, AA-09a, MCF-09B, and MCF-09C and recorded. Drawdown from pumping occurred in AA-09 and AA-09OW, while no drawdown was observed in MCF-09A or MCF-09B. The pumping rate of 5.7 gpm created an approximate drawdown of 4.2 feet in the extraction well over the duration of the test. Drawdown began to increase at 12.7 hours into the test, suggesting a boundary condition had been encountered. The test was terminated at 13 hours and groundwater levels were allowed to recover.

Table 4 shows the pumping rate, test duration and resulting drawdown for the constant rate drawdown test for AA-09C.

Table 4 - AA-09 Drawdown, Pumping Rate, Test Duration, and Recovery Time

Well Number	Date	Initial Water Level (amsl)	Drawdown Feet	Pumping Rate	Test Duration (minutes)	Recovery Time (minutes)
AA-09	6/27/2007	1657.63	5.14	5.7	780	547
AA-09OW	6/27/2007	1658.74	0.49	-	-	-
MCF-09A	6/27/2007	1659.6	0	-	-	-
MCF-09B	6/27/2007	1659.67	0	-	-	-

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Analysis of pre-test and post-test water level measurements indicated a change of less than 0.1 foot/day at the monitoring well site. No correction was applied to the test data. The results from the step test, constant rate, and the recovery tests are listed in Table 5.

Table 5 Aquifer Pumping Test Results for Well AA-09

Test	Well Name	Hydraulic Conductivity (ft/day)	Storage Coefficient	Radial Distance to Pumping Well
Step Test	AA-09C	11.1	na	
Constant Rate	AA-09C	9.6	na	
	AA-09OW	15.4	0.0572	29.29
Recovery	AA-09C	9.6	na	
	AA-09OW	14.4	0.0191	29.29
Mean		12.0	0.0665	
Geometric Mean		11.8		
Percent difference		2.0		

The lithologies logged in monitoring well AA-09C are poorly graded sand, poorly graded sandy gravel, and very sandy silt. The hydraulic conductivities tested at the AA-09 site are common to silty sands to fine sands. Storativity values from monitoring well AA-09OW were 0.0572 and 0.0665. These storativity values are within the range associated with unconfined conditions.

4.2.2. Pumping Test at AA-20

On July 10, 2007, Kleinfelder conducted a step-drawdown test of well AA-20C using a three-inch Grundfos pump capable of variable pumping rates up to 30 gpm. The initial pumping rate was set at three gpm and pumped for 90 minutes with a resulting drawdown of 0.80 feet. The pumping rate was increased to five gpm, which resulted in increasing drawdown for the next 90 minutes. On the basis of the step-drawdown testing results, a pumping rate of four gpm was selected for the constant rate pump test.

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On July 11, 2007, Kleinfelder began a constant-rate pumping test of AA-20C. The pumping rate was set at four gpm and maintained for a period of 6.5 hours. A drawdown of approximately 2.4 feet was observed in the extraction well AA-20C. Drawdown began to increase at 3.7 hours into the test, suggesting a boundary condition that provided a source of water had been encountered. The test was terminated at 8.2 hours and allowed to recover.

The initial depth to water at the start of the tests for AA-20OW was 27.1 feet from toc in the well.

Table 6 shows the details for drawdown, pumping rate, and test duration for AA-20.

Table 6 - AA-20 Drawdown, Pumping Rate, Test Duration, and Recovery Time

Well Number	Date	Initial Water Level (amsl)	Drawdown Feet	Pumping Rate	Test Duration (minutes)	Recovery Time
AA-20	7/11/2007	1601.73	2.52	4.0	492	416
AA-20OW	7/11/2007	1601.72	0.21	-	-	-

Analysis of pre-test and post-test water level measurements in AA-20 indicated a 0.19 foot/day rise in water levels at the monitoring well site. A 0.19 foot/day correction was applied to the test data. Results for the step test, pump test and recovery test are listed in Table 7.

Table 7 - Aquifer Pump Testing Results for Well AA-20

Test	Well Name	Hydraulic Conductivity (ft/day)	Storage Coefficient	Radial Distance to Pumping Well
Step Test	AA-20	33.6	na	
Constant Rate	AA-20	22.7	na	
	AA-20OW	69.0	0.0379	14.08
Recovery	AA-20	29.7	na	
	AA-20OW	52.1	0.0450	14.08
Mean		41.4	0.0415	
Geometric Mean		38.2		
Percent difference		7.6		

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The hydraulic conductivities at monitoring well AA-20 ranged from 22.7 to 69.0 feet per day. The lithologies in the screened section of monitoring well AA-20 are predominately silty sands with gravel. The range of hydraulic conductivities tested at this site are commonly found in fine to medium sands. The storativities of 0.0379 and 0.0450 are within the range of values associated with unconfined aquifers.

4.2.3. Pumping Test at AA-08

On July 18, 2007, Kleinfelder conducted a step-drawdown test of well AA-08 using a three-inch Grundfos pump capable of variable pumping rates up to 42 gpm. The initial pumping rate was set at 15 gpm and pumped for 90 minutes with a resulting drawdown of 0.25 feet. The pumping rate was increased to 20 gpm, which caused a drawdown increase to 0.41 feet. The pumping rate was increased to 30 gpm, which resulted in a drawdown increase to 0.61 feet. The pumping rate could not be increased above 30 gpm with the installed pump due to the increased back-pressure caused by the pipeline to the water tanks. On the basis of the step-drawdown testing results, a pumping rate of 30 gpm was selected for the constant-rate test.

The constant-rate pumping test was begun in the evening of July 18, 2007 using well AA-08EW as the extraction well. The pumping rate was set at 29 gpm and maintained for 24 hours. Drawdown during pumping was noted and monitored in wells AA-08EW, AA-08OWA, and AA-08OWB. At 24 hours, the pump motor failed, at which time the recovery rates for the wells were recorded. The pumping rate of 29 gpm created an approximate drawdown of 0.33 feet over the duration of the test in AA-08EW. Drawdown in the monitored wells began to decrease (i.e., water levels began to increase) during the test suggesting a boundary condition had been encountered. The potential exists that water from the ponds at the wastewater treatment plant to the south of the tested wells may have caused the boundary condition and contributed to the increase in groundwater levels. The initial groundwater level in AA-08EW was measured at 15.66 feet toc at the start of the tests. Table 8 shows the details for the constant rate drawdown test for AA-08EW.

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Table 8 - AA-08 Drawdown, Pumping Rate, Test Duration, and Recovery Time

Well Number	Date	Initial Water Level (amsl)	Drawdown Feet	Pumping Rate	Test Duration (minutes)	Recovery Time
AA-08EW	7/18/2007	1565.34	0.328	29.0	1440	390
AA-08OWA	7/18/2007	1565.76	0.018		-	-
AA-08OWB	7/18/2007	1566.32	0.070			

Analysis of pre-test and post-test water level measurements indicated a change of less than 0.1 foot/day at monitoring well site AA-08. No correction was applied to the test data. However, an abnormal curve in the drawdown plots for the constant rate pumping test suggests a possible rise in groundwater levels during the test. Results for the step test, pump test and recovery test are listed in Table 9.

Table 9 - Aquifer Pumping Test Results for Well AA-08

Test	Well Name	Hydraulic Conductivity (ft/day)	Storage Coefficient	Radial Distance to Pumping Well
Step Test	AA-08 EW	192.0	na	
Constant Rate	AA-08EW	654.0	na	
	AA-08OWA	564.0	0.0920	29.35
	AA-08OWB	846.0	0.0292	63.66
Recovery	AA-08OEW	417.0	na	
	AA-08OWA	446.0	0.148	29.35
	AA-08OWB	451.0	0.0409	63.66
Mean		510.0	0.0775	
Geometric Mean		469.5		
Percent difference		7.9		

The lithologies logged in monitoring wells at AA-08 are listed as silty sands with gravel, silty gravel with sand, well graded sands, and well graded gravels. The hydraulic conductivity results from pumping test in these wells range from 192 to 846 feet per day. These hydraulic conductivities are consistent with values commonly associated with

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sandy gravels and gravels. The storativity values ranged from 0.148 to 0.0292 indicating unconfined conditions.

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5 FINDINGS

Hydraulic conductivities derived from slug testing ranges from 0.18 to 67.3 feet per day.

Hydraulic conductivities from aquifer testing produced values from 9.6 to 846.0 feet per day.

During the pumping tests at AA-09 and AA-20, the extraction rates of 5.7 and 4.0 gpm, respectively, were lower than anticipated. The shallower monitoring wells at both of the sites had sufficient drawdown to allow for analysis of the data.

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6 REFERENCES

Agarwal, R.G., 1980. A new method to account for producing time effects when drawdown type curves are used to analyze pressure buildup and other test data. Proceedings of the 55th Annual Fall Technical Conference and Exhibition of the Society of Petroleum Engineers. Paper SPE 9289.

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

Jacob, C. E., 1944, Notes on determining permeability by pumping tests under water-table conditions: U.S. Geological Survey, mimeographed report, referenced in Walton, 1970.

Kleinfelder, 2005. Hydrogeologic Investigation – 2005, Phase V Drilling, American Pacific Corporation, Henderson, Nevada. July 27

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,

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TABLES

Table 10 HYDRAULIC CONDUCTIVITY
Project Name: BMI Aquifer Test
Henderson, Nevada
Project Number: 83173

Sample Identification	Sample Depth (ft)	ASTM Test Method	Sample Type	Confining Stress, psi	Permeability, cm/sec	Average Hydraulic Gradient	Effective Cell Pressure, psi	Specimen Height, cm (Before/After Test)	Specimen Diameter, cm (Before/After Test)	Dry Unit Weight, pcf (Before/After Test)	Moisture Content, % (Before/After Test)
AA-20-OW	30-31.5	D5856	Sample Linear	11.5	1.35E-07	6.1	11.5	5.08/5.08	4.85/4.85	79.6/77.2	39.6/40.8
AA-20-OW	50-51.5	D5856	Sample Linear	19.0	6.38E-08	9.9	19.0	5.08/5.05	4.85/4.85	93.7/95.1	28.0/28.3
AA-06	55-56.5	D5856	Sample Linear	21.0	1.64E-07	8.0	21.0	5.97/5.97	5.08/5.08	81.9/83.5	40.9/36.2
AA-06	60-61.5	D5856	Sample Linear	23.0	1.64E-08	8.7	23.0	5.08/5.05	4.85/4.85	90.0/90.5	29.9/28.2
AA-09-OW	55-56.5	D5856	Sample Linear	21.0	2.80E-08	9.3	21.0	5.08/5.08	4.85/4.85	84.1/84.1	35.1/36.5
AA-09-OW	70-71.5	D5856	Sample Linear	27.0	3.96E-07	5.7	27.0	5.08/5.08	4.85/4.85	63.2/62.6	59.3/60.1
AA-08-OWB	35-36.5	D5856	Sample Linear	13.4	1.02E-03	10.7	13.4	5.08/5.08	4.85/4.85	119.1/119.1	9.7/14.9
AA-08-OW	15-16.5	D5856	Sample Linear	6.0	2.41E-03	2.2	6.0	5.08/5.08	4.85/4.85	114.3/114.3	14.5/14.7
AA-08-OW	40-41.5	D5856	Sample Linear	15.0	1.33E-03	4.3	15.0	5.08/5.08	4.85/4.85	116.1/116.1	15.5/16.5
B-1	65-66.5	D5856	Sample Linear		1.74E-03	3.9	25.0	5.08/5.08	4.88/4.88	110.0/112.3	15.8/16.7
B-1	95-96.5	D5856	Sample Linear	36.0	1.04E-07	10.7	36.0	5.08/5.08	4.85/4.85	64.4/65.1	59.0/58.9
B-2	60-61.5	D5856	Sample Linear	22.9	4.40E-08	14.2	22.9	5.08/4.57	4.85/4.85	93.3/108.1	29.5/20.2
B-2	90-91.5	D5856	Sample Linear	34.4	1.58E-07	9.9	34.4	5.08/5.08	4.85/4.85	80.2/81.0	40.3/42.5
B-3	55-56.5	D5856	Sample Linear		1.75E-04	10.4	21.0	5.08/5.08	4.85/4.85	112.7/113.9	17.0/18.5
B-3	75-75.6	D5856	Sample Linear	29.0	2.72E-08	9.1	29.0	5.08/5.08	4.85/4.85	81.9/81.9	38.3/38.8
B-4	35-36.5	D5856	Sample Linear		6.64E-04	8.1	13.4	5.08/5.08	4.85/4.85	103.2/104.3	25.7/23.2
B-4	80-81.5	D5856	Sample Linear	30.5	1.15E-07	8.3	30.5	5.08/5.03	4.85/4.85	82.9/80.4	34.8/34.5

Table 11 MOISTURE CONTENT OF SOIL
Project Name: BMI Aquifer Test
Henderson, Nevada
Project Number: 83173

Sample Number	Location	Sample Depth (ft)	ASTM Test Method	Tare Weight of Pan (grams)	Wet Weight of Sample & Tare (grams)	Dry Weight of Sample & Tare (grams)	Weight of Moisture (grams)	Dry Weight of Sample (grams)	Percent Moisture
29393	B-1	60	D-2216	433.1	3708.8	3102.8	606.0	2669.7	22.7
29393	B-1	93 - 93.5	D-2216	536.3	1361.0	1068.0	293.0	531.7	55.1
29396	B-2	60	D-2216	538.7	1082.1	948.5	133.6	409.8	32.6
29396	B-2	94.5 - 95	D-2216	608.2	1280.3	1092.2	188.1	484.0	38.9
29392	B-3	59.5 - 60	D-2216	522.7	1012.7	837.7	175.0	315.0	55.6
29392	B-3	72.5	D-2216	231.2	625.8	515.3	110.5	284.1	38.9
29395	B-4	37.5	D-2216	239.0	475.2	409.7	65.5	170.7	38.4
29402	B-4	46 - 47	D-2216	439.0	2360.5	2072.3	288.2	1633.3	17.6
29402	B-4	76 - 77	D-2216	33.8	163.4	132.5	30.9	98.8	31.2
29402	AA-09-OW	57.5 - 58	D-2216	392.9	886.7	665.4	221.2	272.6	81.2
29402	AA-09-OW	66 - 67	D-2216	438.4	1208.9	904.7	304.2	466.3	65.2
29403	AA-20-OW	34 - 35	D-2216	203.3	469.5	403.2	66.3	199.9	33.1
29403	AA-20-OW	45 - 46	D-2216	179.3	680.0	562.7	117.3	383.4	30.6
29401	AA-06	51 - 52.5	D-2216	575.8	920.6	843.8	76.8	268.0	28.7
29401	AA-06	61.5 - 62	D-2216	198.4	294.0	268.2	25.8	69.8	36.9
29404	AA-08-OWA	13 - 15	D-2216	530.6	1784.5	1616.3	168.2	1085.7	15.5
29404	AA-08-OWA	35 - 37	D-2216	369.4	1500.6	1371.7	128.9	1002.3	12.9

Table 11 MOISTURE CONTENT OF SOIL
Project Name: BMI Aquifer Test
Henderson, Nevada
Project Number: 83173

Sample Number	Location	Sample Depth (ft)	ASTM Test Method	Tare Weight of Pan (grams)	Wet Weight of Sample & Tare (grams)	Dry Weight of Sample & Tare (grams)	Weight of Moisture (grams)	Dry Weight of Sample (grams)	Percent Moisture
29413	AA-08-OWB	30 - 32.5	D-2216	387.0	2495.4	2304.6	190.8	1917.6	9.9

Table 12 TOTAL ORGANIC CARBON
Henderson, Nevada
Project Name: BMI Aquifer Test
Project Number: 83173

Sample Number	Location	Sample Type	ASTM Test Method	Depth (ft)	Organic Carbon
29393	B-1	Soil	2974	60-62.5	2.10%
29393	B-1	Soil	2974	93-93.5	3.00%
29396	B-2	Soil	2974	60	2.30%
29396	B-2	Soil	2974	94.5-95.0	2.00%
29392	B-3	Soil	2974	59.5-60.0	6.30%
29392	B-3	Soil	2974	72.5	2.60%
29395	B-4	Soil	2974	37.5	3.30%
29402	B-4	Soil	2974	46-47	1.50%
29402	B-4	Soil	2974	76-77	6.80%
29402	AA-09-OW	Soil	2974	57.5-58.0	4.10%
29402	AA-09-OW	Soil	2974	66-67	4.20%
29403	AA-20-OW	Soil	2974	34-35	1.60%
29403	AA-20-OW	Soil	2974	45-46	4.50%
29401	AA-06	Soil	2974	51-52.5	4.00%
29401	AA-06	Soil	2974	61.5-62.0	3.70%
29404	AA-08-OWA	Soil	2974	13-15	0.70%
29404	AA-08-OWA	Soil	2974	35-37	0.70%
29413	AA-08-OWB	Soil	2974	30-32.5	1.40%

Table 13 PARTICLE-SIZE ANALYSIS of SOILS
Project Name: BMI Aquifer Test
Henderson, Nevada
Project Number: 83173

Sample Identification	ASTM Test Method	USCS	Specific Gravity	Gravel, %	Sand, %	Silt, %	Clay, %
Boring B-2 @ 60'; S-29396 @ 60.0-65.0'	D422-02	ML	2.68	0	8	60	32
Boring B-2 @ 60-62.5'; S-29393 @ 60.0-65.0'	D422-02	SM	2.72	34	37	27	2
Boring B-2 @ 93-93.5'; S-29393 @ 90.0-95.0'	D422-02	ML	2.70	0	5	65	30
Boring B-2 @ 94.5-95'; S-29396 @ 90.0-95.0'	D422-02	ML	2.52	0	1	67	32
Boring B-3 @ 59.5-60'; S-29392 @ 55.0-60.0'	D422-02	ML	2.64	0	33	57	10
Boring B-3 @ 72.5'; S-29392 @ 70.0-75.0'	D422-02	ML	2.84	0	15	55	30
Boring B-4 @ 37.5'; S-29395 @ 35.0-40.0'	D422-02	ML	2.68	2	20	59	19
Boring B-4 @ 46-47'; S-29402 @ 45.0-47.5'	D422-02	SM	2.71	21	50	28	1
Boring B-4 @ 76-77'; S-29402 @ 75.0-80.0'	D422-02	ML	2.67	29	15	50	6
Boring AA-09-OW @ 57.5-58'; S-29402 @ 55.0-60.0'	D422-02	ML	2.67	1	17	56	26
Boring AA-09-OW @ 66-67'; S-29402 @ 65.0-.70.0'	D422-02	ML	2.60	2	24	62	12
Boring AA-09-OW @ 66-67'; S-29413 @ 30.0-35.0'	D422-02	GM	2.73	46	22	30	2
Boring AA-20-OW @ 34-35'; S-29403 @ 30.0-35.0'	D422-02	ML	2.59	0	16	64	20
Boring AA-20-OW @ 45-46'; S-29403 @ 45.0-50.0'	D422-02	ML	2.70	0	12	75	13
Boring AA-06 @ 51-52.5'; S-29401 @ 50.0-55.0'	D422-02	ML	2.85	14	18	51	17
Boring AA-06 @ 61-62.5'; S-29401 @ 60.0-65.0'	D422-02	ML	2.85	0	3	71	26
Boring AA-08-OWA @ 13-15'; S-29404 @ 10.0-15.0'	D422-02	SM	2.73	21	50	28	1
Boring AA-08-OWA @ 35-37'; S-29404 @ 35.0-40.0'	D422-02	SM	2.73	16	54	25	5

Table 14 SPECIFIC GRAVITY OF COARSE AND FINE AGGREGATE
Project Name: BMI Aquifer Test
Henderson, Nevada
Project Number: 83173

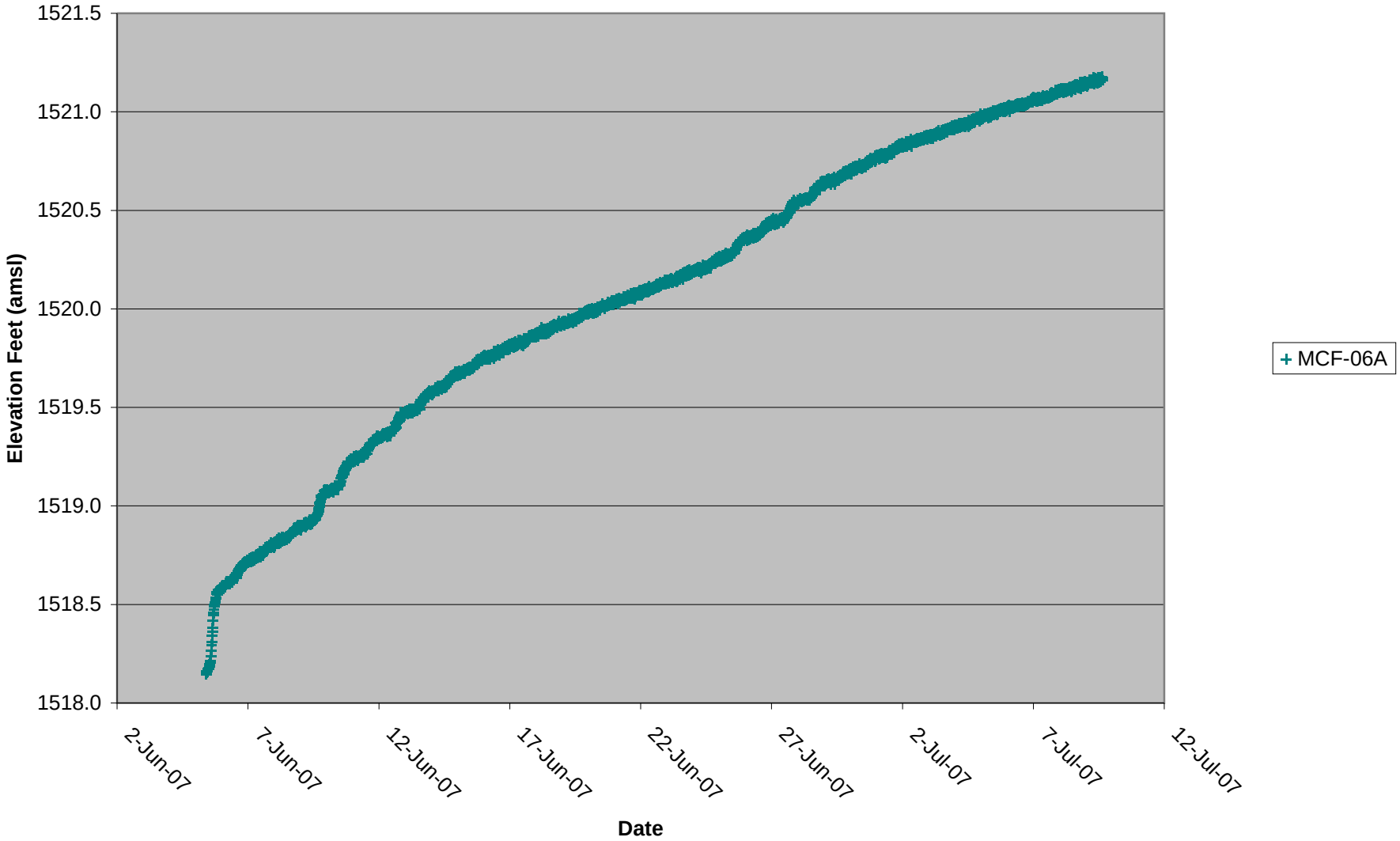
Sample Number	Location	Sample Depth (ft)	ASTM Test Method	Dry Weight of Sample	SSD Weight of Sample	Weight SSD Under Water	Bulk Specific Gravity	Bulk SSD	Apparent Specific Gravity	Absorption
29393	B-1	60 - 62.5	127 & 128	5199.9	5366.5	3202.8	2.403	2.48	2.604	3.2
29402	B-4	45 - 46	127 & 128	1979.4	2046.8	1229.8	2.423	2.505	2.641	3.4
29404	AA-08-OWA	13 - 15	127 & 128	2132.5	2225	1327	2.375	2.478	2.647	4.3
29404	AA-08-OWA	35 - 37	127 & 128	1185.7	1231.1	737.3	2.401	2.493	2.644	3.8
29413	AA-08-OWB	30 - 32.5	127 & 128	6413.6	6636.3	3989.3	2.423	2.507	2.646	3.5

Table 15 SPECIFIC GRAVITY OF SOIL
Project Name: BMI Aquifer Test
Henderson, Nevada
Project Number: 83173

Sample Number	Location	Sample Depth (ft)	ASTM Test Method	Water Density at Ta	Water Density at Tb	K Factor at Tb	Ma at Tb	Specific Gravity at Tb	Specific Gravity at 20 C
29393	B-1	60 - 62.5	D-854	0.99761	0.9981	0.9999	221.9237309	2.724703737	2.724431267
29393	B-1	93 - 93.5	D-854	0.99761	0.99808	0.99987	221.124154	2.701271186	2.700920021
29396	B-2	60	D-854	0.99761	0.99806	0.99985	221.4440865	2.657492355	2.657093731
29396	B-2	94.5 - 95	D-854	0.99764	0.99799	0.99979	224.5844925	2.517523364	2.516994685
29392	B-3	59.5 - 60	D-854	0.99812	998.31	0.9999	497444.2109	2.637698413	2.637434643
29392	B-3	72.5	D-854	0.99761	0.99797	0.99977	221.8590676	2.842801556	2.842147712
29393	B-4	37.5	D-854	0.99764	0.99806	0.99985	224.6093952	2.680569185	2.6801671
29402	B-4	45 - 46	D-854	0.99761	0.99799	0.99979	221.4092286	2.71252015	2.711950521
29402	B-4	76 - 77	D-854	0.99812	0.9981	0.9999	220.9300308	2.673448627	2.673181282
29402	AA-09-OW	57.5 - 58	D-854	0.99764	0.99797	0.99977	224.5645248	2.589772096	2.589176448
29402	AA-09-OW	66 - 67	D-854	0.99761	0.99795	0.99974	221.8491194	2.603917301	2.603240283
29403	AA-20-OW	34 - 35	D-854	0.99812	0.99831	1.0001	224.4947264	2.591293047	2.591552177
29403	AA-20-OW	45 - 46	D-854	0.99761	0.99799	0.99979	221.4092286	2.703640501	2.703072736
29401	AA-06	51 - 52.5	D-854	0.99761	0.99806	0.99985	221.4440865	2.837549185	2.837123553
29401	AA-06	61.5 - 62	D-854	0.99814	0.99804	0.99983	221.630259	2.721083939	2.720621355
29404	AA-08-OWA	13 - 15	D-854	0.99814	0.99831	1.0001	221.7645682	2.725062172	2.725334678
29404	AA-08-OWA	34 - 37	D-854	0.99806	0.99831	1.0001	224.53462	2.726701571	2.726974241
29413	AA-08-OWB	30 - 32.5	D-854	0.99812	0.99833	1.00012	221.0446766	2.72754329	2.727870595

FIGURES

Groundwater Elevation Changes June to July, 2007 in MCF-06A



Drawn By: G. Wittman	**Groundwater Changes in Monitoring Well MCF-06A June, 2007.**	KLEINFELDER	Figure
Revised By:			
Checked By: G. Carter	**Implementation of the Revised Aquifer Testing Work Plan BMI Common Area Eastside Henderson, Nevada**	2315 S. Cobalt Point Way Meridian, Idaho 89642 (208) 893-9700 Www.kleinfelder.com	1
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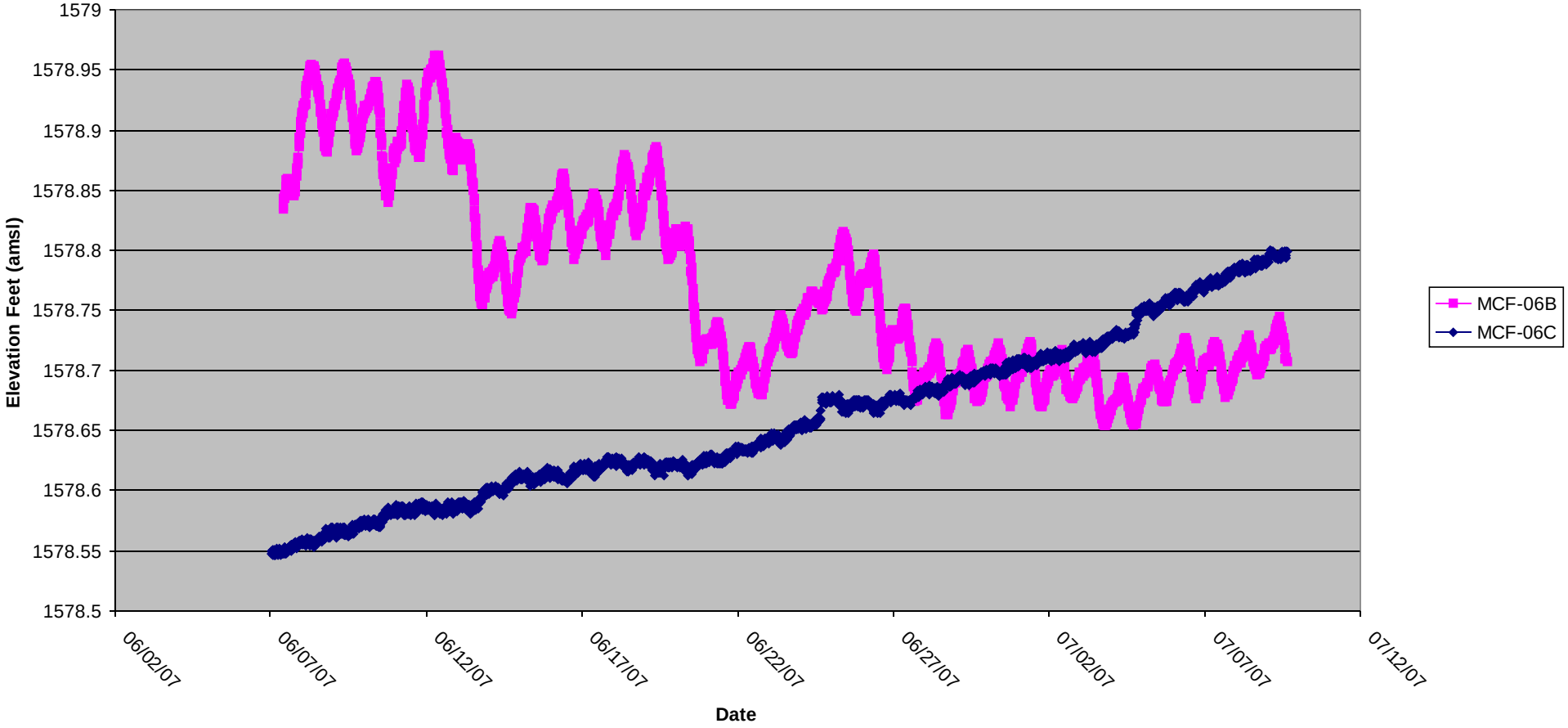
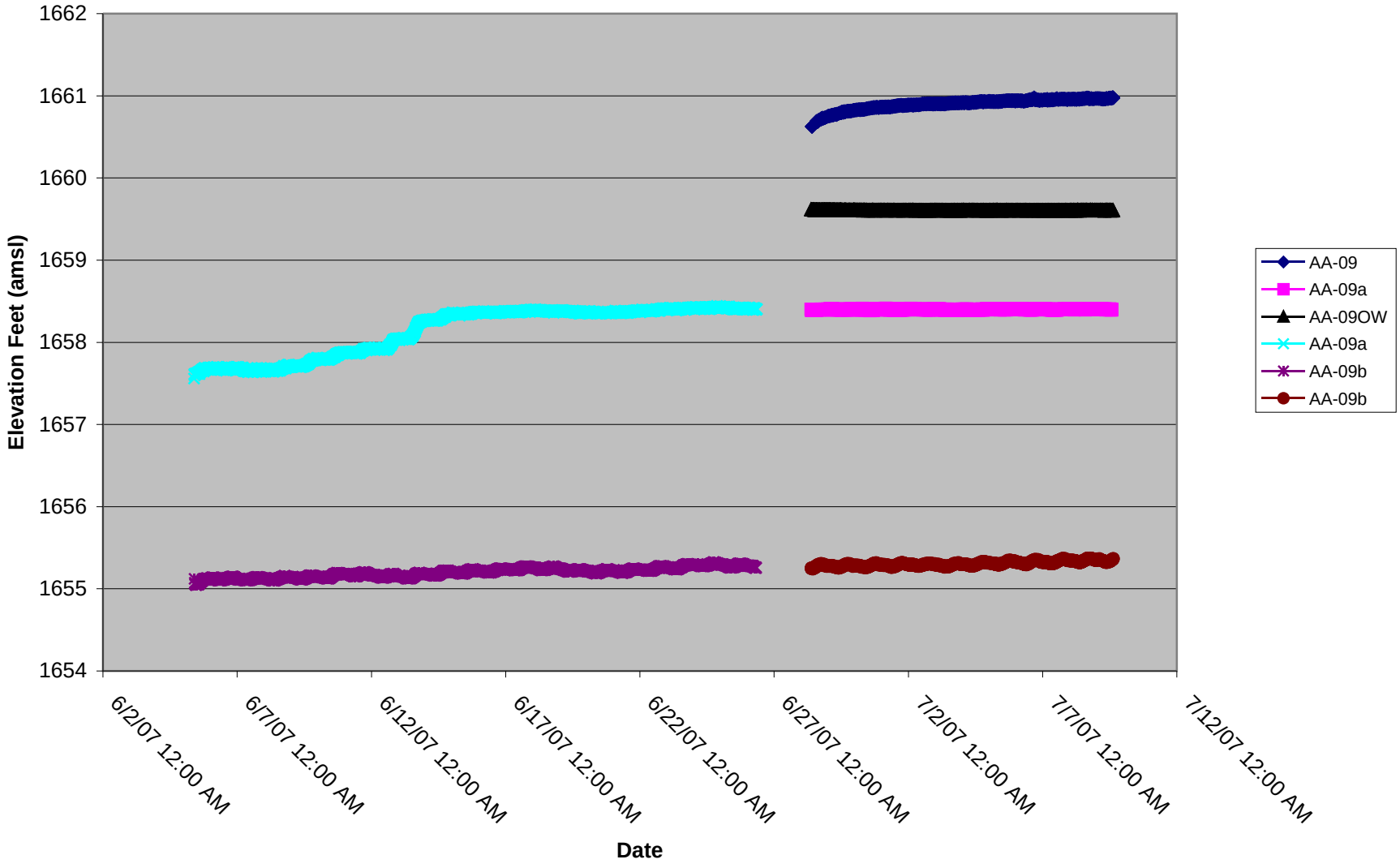
	Project No: 83173 File Name:		

Groundwater Level Changes in MCF-06B and MCF-06C July, 2007



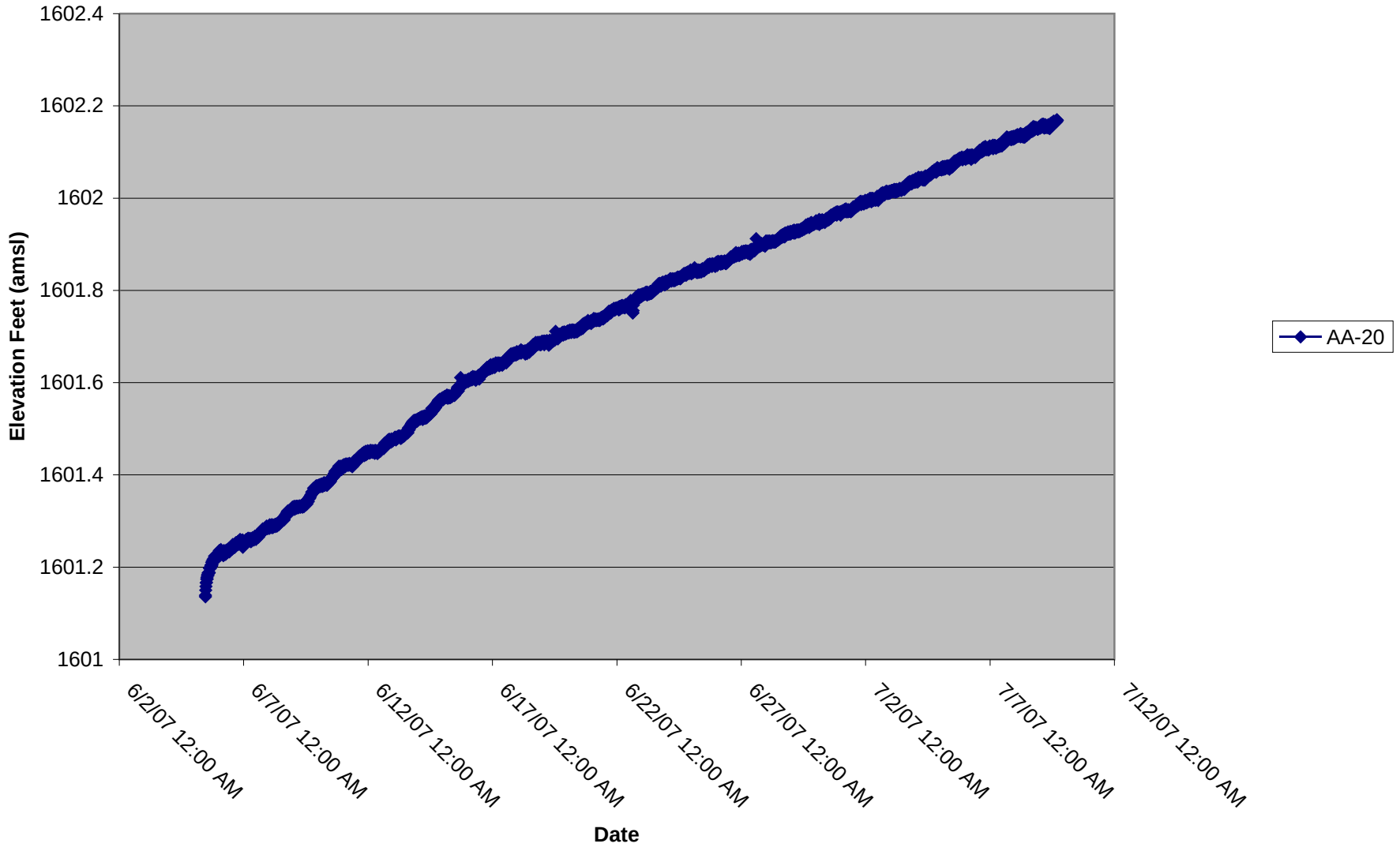
Drawn By: G. Wittman	**Groundwater Changes in Monitoring Wells MCF-06B and MCF-06C June, 2007.**	KLEINFELDER	Figure
Revised By:			
Checked By: G. Carter	**Implementation of the Revised Aquifer Testing Work Plan BMI Common Area Eastside Henderson, Nevada**	2315 S. Cobalt Point Way Meridian, Idaho 89642 (208) 893-9700 Www.kleinfelder.com	**2**
Date: 9/15/07 Approved By: _____	Project No: 83173 File Name:		

Groundwater Levels at Monitoring Wells Site AA-09



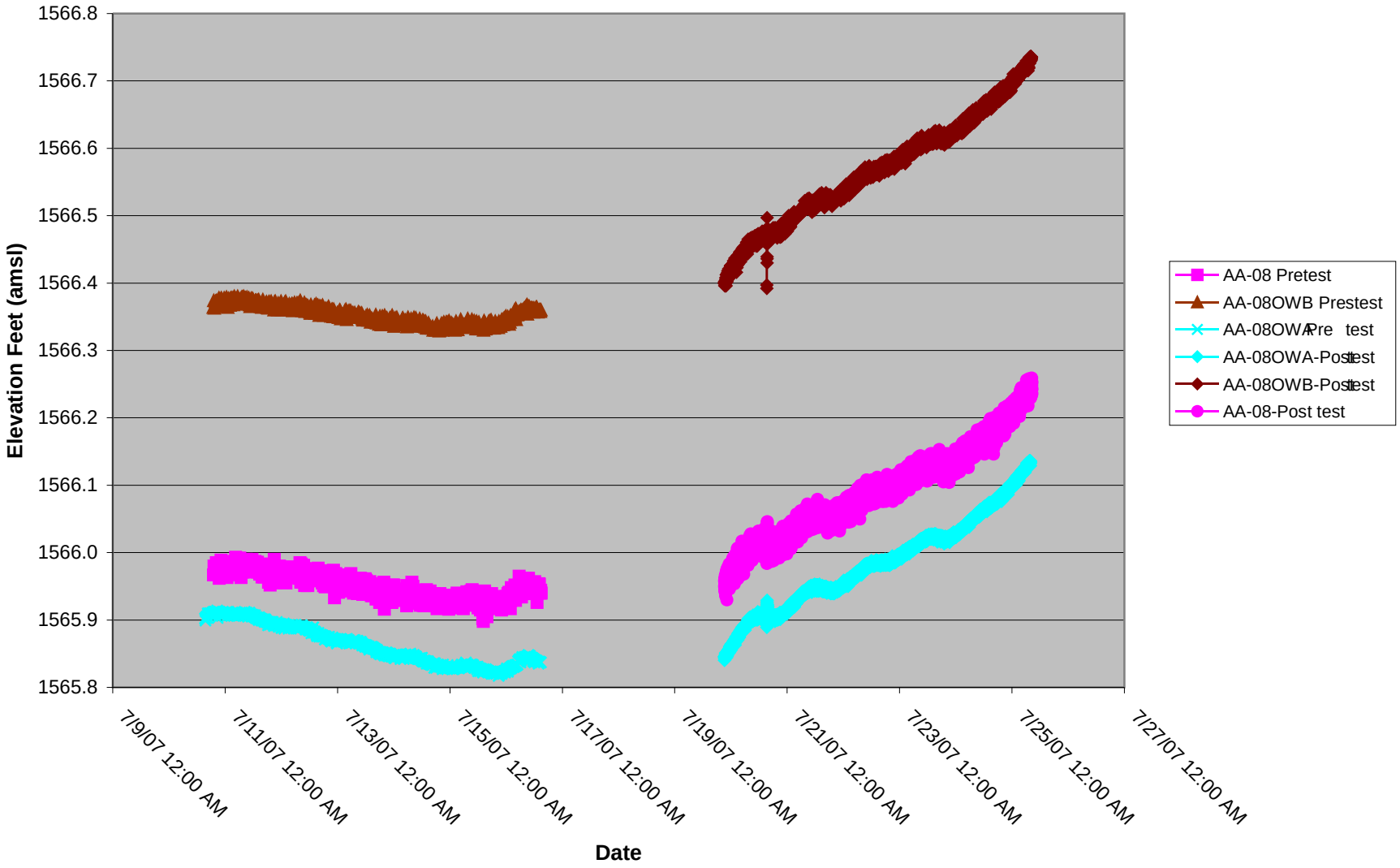
Drawn By: G. Wittman	**Groundwater Changes in Monitoring Wells at the AA-09 Site June, 2007.**	KLEINFELDER	Figure
Revised By:			
Checked By: G. Carter	**Implementation of the Revised Aquifer Testing Work Plan BMI Common Area Eastside Henderson, Nevada**	2315 S. Cobalt Point Way Meridian, Idaho 89642 (208) 893-9700 Www.kleinfelder.com	
Date:9/15/07 Approved By:			3
	Project No: 83173 File Name:		

Groundwater Levels at Monitoring Well AA-20



Drawn By: G. Wittman	**Groundwater Changes in Monitoring Well Site AA-20 June, 2007.**	KLEINFELDER	Figure
Revised By:			
Checked By: G. Carter	**Implementation of the Revised Aquifer Testing Work Plan BMI Common Area Eastside Henderson, Nevada**	2315 S. Cobalt Point Way Meridian, Idaho 89642 (208) 893-9700 Www.kleinfelder.com	**4**
Date: 9/15/07 Approved By: _____	Project No: 83173 File Name:		

Water Level Changes at Monitoring Well site AA-08, July 2007



Drawn By:	**Groundwater Changes in Monitoring Wells Site at AA-08 June, 2007.**	KLEINFELDER 2315 S. Cobalt Point Way Meridian, Idaho 89642 (208) 893-9700 Www.kleinfelder.com
Revised By:		
Checked By: G. Carter	**Implementation of the Revised Aquifer Testing Work Plan BMI Common Area Eastside Henderson, Nevada**	
Date: / Approved By: _____	Project No: 83173 / File Name:	

Figure **5**

PLATES

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LOCATIONS OF INSTALLED TEST WELLS

BRC AQUIFER TESTING
HENDERSON, NEVADA

PLATE: 1

Drawn by: K. Hagan	Date: 09/24/07		
Reviewed by: G. Wittman	Revision Date: 11/16/07	Project No.: 83173.10	File Name: D:\GIS\Projects\83173-BRC_AquiferTest\BRC_Plate1.mxd

Aerial Imagery Source: Clark County Assessor's Office "OpenWeb Info Mapper" Spring 2007

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APPENDIX A

BORING LOGS

KLEINFELDER
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DRILLING LOG
Well No. AA-08-EW

Project Name:	BRC Aquifer Testing	***Start Date:***	6/5/07	***Logged By:***	Davis
Site Location:	Henderson, NV	***End Date:***	6/5/07	***Checked By:***	G. Carter
Project No:	83173	***Total Hole Depth (ft):***	60	***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):***	10-60		
Sampling Method:	Continuous Core	***Ground Surface Elev.:***	1578.39 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): Light Brown					Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 3.1' Stick-up
							Bentonite chip seal
10		WELL GRADED SAND (SW/SM): Brown With Gravel					4" Diameter Schedule 40 PVC Casing, 0.020" Slot Well Screen
		WELL GRADED SAND (SW/SC): With Clay and gravel					
20							#10/20 Colorado Silica Sand
		WELL GRADED GRAVEL (GW/GC): With sand and clay, cobbles					
30		WELL GRADED SAND WITH GRAVEL AND CLAY (SC): Medium to coarse sand, medium to coarse grained gravel					

Note: Screened interval crosses QaL/Muddy Creek Formation Contact

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DRILLING LOG
Well No. AA-08-EW

Project Name:	BRC Aquifer Testing	***Start Date:***	6/5/07	***Logged By:***	Davis
Site Location:	Henderson, NV	***End Date:***	6/5/07	***Checked By:***	G. Carter
Project No:	83173	***Total Hole Depth (ft):***	60	***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):***	10-60		
Sampling Method:	Continuous Core	***Ground Surface Elev.:***	1578.39 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
40		GRAVELY/CLAYEY SAND (SC): Brown					Note: Screened interval crosses QaL/Muddy Creek Formation Contact #10/20 Colorado Silica Sand 4" Diameter, 0.020" Slot
		CLAYEY GRAVEL (GC): Cemented with sand					
50		MUDDY CREEK FORMATION (TMC): Grayish Brown/Brown, Clayey sand with gravel					
60							Stop sampling at 60 feet bgs.

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DRILLING LOG
Well No. AA-08-OWA

Project Name:	BRC Aquifer Testing	***Start Date:***	6/4/07	***Logged By:***	Davis
Site Location:	Henderson, NV	***End Date:***	6/4/07	***Checked By:***	G. Carter
Project No:	83173	***Total Hole Depth (ft):***	60	***Permit No.:***	
Client:	BRC	***Hole Diameter (in):***	8		
Drilling Company:	Boart Longyear	***Well Diameter (in):***	2		
Drill Rig Type:	B.L. - GP24-300RS	***Water Level (Initial, Ft):***	11		
Drilling Method:	Roto-Sonic	***Screen Length (ft):***	10-60		
Sampling Method:	Continuous Core	***Ground Surface Elev.:***	1577.90 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): Light Brown, With gravel					Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 3.1' Stick-up Bentonite chip seal
10		WELL GRADED SAND (SM): With Silt and gravel, Medium to coarse grained sand	A-08-OWA, 15-16				2" Diameter Schedule 40 PVC Casing, 0.020" Slot Well Screen #10/20 Colorado Silica Sand
20		SANDY CLAY (CL): Brown, with lenses of Sand					
30		WELL GRADED SAND WITH SILT (SW/SM): Dark Brown, Fine to coarse grained sand					

Note: Screened interval crosses QaL/Muddy Creek Formation Contact

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DRILLING LOG
Well No. AA-08-OWA

Project Name:	BRC Aquifer Testing	***Start Date:***	6/4/07	***Logged By:***	Davis
Site Location:	Henderson, NV	***End Date:***	6/4/07	***Checked By:***	G. Carter
Project No:	83173	***Total Hole Depth (ft):***	60	***Permit No.:***	
Client:	BRC	***Hole Diameter (in):***	8		
Drilling Company:	Boart Longyear	***Well Diameter (in):***	2		
Drill Rig Type:	B.L. - GP24-300RS	***Water Level (Initial, Ft):***	11		
Drilling Method:	Roto-Sonic	***Screen Length (ft):***	10-60		
Sampling Method:	Continuous Core	***Ground Surface Elev.:***	1577.90 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
		SANDY CLAY (CL): Dark Brown					Note: Screened interval crosses QaL/Muddy Creek Formation Contact
40		POORLY GRADED SAND (SP): Brown, with gravel	\-08-OWA, 40-41				
		WELL GRADED GRAVEL (GW): With sand					
		MUDDY CREEK FORMATION (TMC): Grayish Brown, Clayey Sand					#10/20 Colorado Silica Sand 2" Diameter, 0.020" Slot
50		Reddish Brown Sandy Clay, weakly cemented					
60							Stop sampling at 60 feet bgs.

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DRILLING LOG
Well No. AA-08-OWB

Project Name:	BRC Aquifer Test	*Start Date:*	6/5/07	*Logged By:*	Davis
Site Location:	Henderson, NV	*End Date:*	6/5/07	*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):*	2		
Drill Rig Type:	B.L. - GP24-300RS	*Water Level (Initial, Ft):*	10.5		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	10-50		
Sampling Method:	Continuous Core	*Ground Surface Elev.:*	1577.38 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): Brown, With gravel					Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 3.1' Stick-up Bentonite chip seal
10		WELL GRADED SAND (SM): With Gravel and Clay					2" Diameter Schedule 40 PVC Casing, 0.020" Slot Well Screen
20		GRAVEL WITH SAND AND CLAY (GW): Weakly to Moderately cememted					#10/20 Colorado Silica Sand
30		GRAVELLY SAND WITH CLAY (SW/SC): Brown	-08-OWB, 35-36				

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DRILLING LOG
Well No. AA-08-OWB

Project Name:	BRC Aquifer Test	*Start Date:*	6/5/07	*Logged By:*	Davis
Site Location:	Henderson, NV	*End Date:*	6/5/07	*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):*	2		
Drill Rig Type:	B.L. - GP24-300RS	*Water Level (Initial, Ft):*	10.5		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	10-50		
Sampling Method:	Continuous Core	*Ground Surface Elev.:*	1577.38 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
40		GRAVEL (GW): Cemented (Refusal)					#10/20 Colorado Silica Sand 2" Diameter, 0.020" Slot
50							Stop sampling at 50 feet bgs.

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DRILLING LOG
Well No. AA-09-OW

Project Name:	BRC Aquifer Test	***Start Date:***	6/1/07	***Logged By:***	Davis
Site Location:	Henderson, NV	***End Date:***	6/1/07	***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):***	2		
Drill Rig Type:	B.L. - GP24-300RS	***Water Level (Initial, Ft):***	32		
Drilling Method:	Roto-Sonic	***Screen Length (ft):***	30-70		
Sampling Method:	Continuous Core	***Ground Surface Elev.:***	1692.90 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): [FILL]					Note: Screened interval crosses QaL/Muddy Creek Formation Contact
		SILTY SAND (SM): Reddish Brown Silty Sand with Gravel, Corase Sands					
		SILTY GRAVEL (GM): Reddish Brown Silty Gravel with Sand					
10		SILTY SAND (SM): Reddish Brown, Silty Sand with Gravel and Coarse Sand					Bentonite chip seal
		SILTY GRAVEL (GM): Reddish Brown, Silty Gravel with Sand					
20		SILTY SAND (SM): Reddish Brown, Silty Sand with Gravel					
		SILTY GRAVEL (GM): Reddish Brown Silty Gravel with Sand					
		SILTY SAND (SM): Reddish Brown, Silty Sand with Gravel					2" diameter Schedule 40 PVC casing
30		CLAYEY SAND (SC): Reddish Brown, Clayey Sand/Silty Sand with Gravel					
		SILTY SAND (SM): Reddish Brown, Silty Coarse Sand with Gravel					

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DRILLING LOG
Well No. AA-09-OW

Project Name:	BRC Aquifer Test	***Start Date:***	6/1/07	***Logged By:***	Davis
Site Location:	Henderson, NV	***End Date:***	6/1/07	***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):***	2		
Drill Rig Type:	B.L. - GP24-300RS	***Water Level (Initial, Ft):***	32		
Drilling Method:	Roto-Sonic	***Screen Length (ft):***	30-70		
Sampling Method:	Continuous Core	***Ground Surface Elev.:***	1692.90 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
40		SANDY CLAY (CL): Reddish Brown-Brown, Sandy Clay, Fine Sand					#10/20 Colorado Silica Sand
50		CLAY (CL): Light Greyish Brown Clay with Sand, Trace Gravel					2" diameter, 0.020" slot, Schedule 40 PVC screen
60		SANDSTONE (SS): Muddy Creek Formation (TMC), Light Brown-Brown, Silty/Clayey Sandstone					#10/20 Colorado Silica Sand
70							

Note: Screened interval crosses QaL/Muddy Creek Formation Contact

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DRILLING LOG
Well No. AA-20-OW

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):*	55	*Permit No.:*	
Client:	BRC	*Hole Diameter (in):*	8		
Drilling Company:	Boart Longyear	*Well Diameter (in):*	2		
Drill Rig Type:	Boart Longyear	*Water Level (Initial, Ft):*	24		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	15-55		
Sampling Method:	Continuous Core	*Ground Surface Elev.:*	1625.69 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 Silty Gravel with Sand					
		SILTY SAND (SM): Reddish Brown Silty Sand with Gravel, Medium to Coarse Sand Fine to Medium Grained Gravels					Bentonite chip seal
10		SILTY GRAVEL (GM): Reddish brown Silty Gravel with Sand					
		SILTY SAND (SM): Reddish brown Silty Sand with Gravel, Fine to Medium Grained sand, Fine to Medium grained Gravels					2" diameter Schedule 40 PVC casing, 0.020" slot well screen
20		SILTY GRAVEL (GM): Reddish Brown Silty Gravel with Sand, Coarse Gravel					
		SILTY SAND (SM): Reddish Brown Silty Sand with Gravel					
		CLAY (CL): Yellowish Green Gypsyferous Clay					
30		CLAYEY SILT (ML): Redish Brown-Brown Clayey Sand/Silt	A-20-OW-30-31.				#10/20 Colorado Silica Sand

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DRILLING LOG
Well No. AA-20-OW

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):*	55	*Permit No.:*	
Client:	BRC	*Hole Diameter (in):*	8		
Drilling Company:	Boart Longyear	*Well Diameter (in):*	2		
Drill Rig Type:	Boart Longyear	*Water Level (Initial, Ft):*	24		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	15-55		
Sampling Method:	Continuous Core	*Ground Surface Elev.:*	1625.69 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
40		SILT (ML): Brown/Reshish Brown, Thin Interbeds/Lenses of Sandy Clay					
50		SANDSTONE (SS): Muddy Creek Formation (TMC), Reddish Brown Silty Sandstone	A-20-OW-50-51.				

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DRILLING LOG
Well No. B-1

Project Name:	BRC Aquifer test	*Start Date:*	5/30/07	*Logged By:*	Davis
Site Location:	Henderson, NV	*End Date:*	5/31/07	*Checked By:*	G. Carter
Project No:	83173	*Total Hole Depth (ft):*	100	*Permit No.:*	
Client:	BRC	*Hole Diameter (in):*	8		
Drilling Company:	Boart Longyear	*Well Diameter (in):*	NA		
Drill Rig Type:	B.L. - GP24-300RS	*Water Level (Initial, Ft):*	52.5		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	NA		
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
0		FILL: Reddish Brown Sand and Gravel					
		SILTY SAND (SM): Reddish Brown Silty Sand with Gravel (Subangular/Subrounded)					
10		SILTY GRAVEL (GM): Reddish Brown Silty Gravel with Sand					
		SILTY SAND (SM): Reddish Brown Silty Sands with Gravels					
		SILTY GRAVEL (GM): Reddish Brown Silty Gravel with Sand					
20		SILTY SAND (SM): Reddish Brown Silty Sand with Gravel					
		SILTY GRAVEL (GM): Silty Gravel with Sand					
		SILTY SAND (SM): Reddish Brown Silty Sand with Gravel					
		SILTY GRAVEL (GM): Silty Gravel with Sand					
		SILTY SAND (SM): Reddish Brown Silty Sand with Gravel					
30		SILTY GRAVEL (GM): Reddish Brown Silty Gravel with Sand					

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DRILLING LOG
Well No. B-1

Project Name:	BRC Aquifer test	*Start Date:*	5/30/07	*Logged By:*	Davis
Site Location:	Henderson, NV	*End Date:*	5/31/07	*Checked By:*	G. Carter
Project No:	83173	*Total Hole Depth (ft):*	100	*Permit No.:*	
Client:	BRC	*Hole Diameter (in):*	8		
Drilling Company:	Boart Longyear	*Well Diameter (in):*	NA		
Drill Rig Type:	B.L. - GP24-300RS	*Water Level (Initial, Ft):*	52.5		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	NA		
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
40		SILTY SAND (SM): Reddish Brown Silty Sand with Gravel, Sub-angular/Sub-rounded Gravel (15-30%)					
		SILTY GRAVEL (GM): Reddish Brown Silty Gravel with Sand					
		SILTY SAND (SM): Silty Sand with Gravel					
		SILTY GRAVEL (GM): Silty Gravel with Sand					
50		SILTY SAND (SM): Silty Sand with Gravel, Coarse Sand					
		SILTY CLAY (CL): Light Greyish Green Silty Clay					
		SILTY CLAY (CL): Brown Silty Clay					
60		SILTY SAND (SM): Reddish Brown Silty Sand with Gravel					
		SANDY SILT (ML): Light Greyish Green Sandy Silty, Trace Clay					
		SILTY SAND (SM): Reddish Brown Silty Sand with Gravel, Coarse Sand	B-1-65-66.5				
70							

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DRILLING LOG
Well No. B-1

Project Name:	BRC Aquifer test	*Start Date:*	5/30/07	*Logged By:*	Davis
Site Location:	Henderson, NV	*End Date:*	5/31/07	*Checked By:*	G. Carter
Project No:	83173	*Total Hole Depth (ft):*	100	*Permit No.:*	
Client:	BRC	*Hole Diameter (in):*	8		
Drilling Company:	Boart Longyear	*Well Diameter (in):*	NA		
Drill Rig Type:	B.L. - GP24-300RS	*Water Level (Initial, Ft):*	52.5		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	NA		
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
80		SANDY SILT (ML): Light Greyish Green Sandy Silt, Trace Clay, Trace Gravel					
90		SILTY SANDSTONE (SS): Muddy Creek Formation (TMC), Reddish Brown	B-1-95-96.5				
100							

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DRILLING LOG
Well No. B-2

Project Name:	BRC Aquifer test	*Start Date:*	5/30/07	*Logged By:*	Davis/Hall
Site Location:	Henderson, NV	*End Date:*	5/31/07	*Checked By:*	G. Carter
Project No:	83173	*Total Hole Depth (ft):*	100	*Permit No.:*	
Client:	BRC	*Hole Diameter (in):*	8		
Drilling Company:	Boart Longyear	*Well Diameter (in):*	NA		
Drill Rig Type:	B.L. - GP24-300RS	*Water Level (Initial, Ft):*	52.5		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	NA		
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
0		FILL: Reddish Brown Silty Sand and Gravel					
10		SILTY SAND (SM): Reddish Brown Silty Sand with Gravel					
		SILTY GRAVEL (GM): Reddish Brown Silty Gravel with Sand					
		SILTY SAND (SM): Reddish Brown Silty Sands with Gravels					
		SILTY GRAVEL (GM): Reddish Brown Silty Gravel with Sand					
20							
30		SILTY SAND (SM): Reddish Brown Silty Sand with Gravel					

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DRILLING LOG
Well No. B-2

Project Name:	BRC Aquifer test	*Start Date:*	5/30/07	*Logged By:*	Davis/Hall
Site Location:	Henderson, NV	*End Date:*	5/31/07	*Checked By:*	G. Carter
Project No:	83173	*Total Hole Depth (ft):*	100	*Permit No.:*	
Client:	BRC	*Hole Diameter (in):*	8		
Drilling Company:	Boart Longyear	*Well Diameter (in):*	NA		
Drill Rig Type:	B.L. - GP24-300RS	*Water Level (Initial, Ft):*	52.5		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	NA		
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
40		SILTY SAND (SM): Brown to Reddish Brown Silty Sand/Clayey Sand					
50		CLAYEY SAND (SC): Brown to Reddish Brown, Gypsiferous, Disseminated and Thin <1" Beds/Veinlets of Gypsum (3-12%)					
60		SANDY CLAY (CL): Yellowish Green Sandy Clay, Fine Grained Sand/Silt	B-2-60-61.5				
70		CLAYEY SAND (SC): Reddish Brown Clayey Sand/Silty Sand (3-8%), Disseminated and Veinlet Gypsum					

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Las Vegas, Nevada 89118
(702) 736-2936 Fax (702) 361-9094

DRILLING LOG
Well No. B-2

Project Name:	BRC Aquifer test	*Start Date:*	5/30/07	*Logged By:*	Davis/Hall
Site Location:	Henderson, NV	*End Date:*	5/31/07	*Checked By:*	G. Carter
Project No:	83173	*Total Hole Depth (ft):*	100	*Permit No.:*	
Client:	BRC	*Hole Diameter (in):*	8		
Drilling Company:	Boart Longyear	*Well Diameter (in):*	NA		
Drill Rig Type:	B.L. - GP24-300RS	*Water Level (Initial, Ft):*	52.5		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	NA		
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
80		CLAYEY SANDSTONE (SS): Muddy Creek Formation (TMC), Reddish Brown/Brown	B-2-90-91.5				
90							
100							

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DRILLING LOG
Well No. B-3

Project Name:	BRC Aquifer test	*Start Date:*	5/29/07	*Logged By:*	Davis
Site Location:	Henderson, NV	*End Date:*	5/29/07	*Checked By:*	G. Carter
Project No:	83173	*Total Hole Depth (ft):*	80	*Permit No.:*	
Client:	BRC	*Hole Diameter (in):*	8		
Drilling Company:	Boart Longyear	*Well Diameter (in):*	NA		
Drill Rig Type:	B.L. - GP24-300RS	*Water Level (Initial, Ft):*	UNK		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	NA		
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
0							
10							
20		SILTY SAND (SM): Reddish Brown, with Gravel					
30							

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DRILLING LOG
Well No. B-3

Project Name:	BRC Aquifer test	*Start Date:*	5/29/07	*Logged By:*	Davis
Site Location:	Henderson, NV	*End Date:*	5/29/07	*Checked By:*	G. Carter
Project No:	83173	*Total Hole Depth (ft):*	80	*Permit No.:*	
Client:	BRC	*Hole Diameter (in):*	8		
Drilling Company:	Boart Longyear	*Well Diameter (in):*	NA		
Drill Rig Type:	B.L. - GP24-300RS	*Water Level (Initial, Ft):*	UNK		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	NA		
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
40		SILTY CLAY (CL): Light Greyish Green with Abundant Gypsum (25%)					
50		CLAYEY SAND (SC): Reddish Brown to Greyish Green, Very Moist	B-3-55-56.5				
60							
70		SANDSTONE (SS): Muddy Creek Formation (TMC), Reddish Brown	B-3-70-71.5				

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DRILLING LOG
Well No. B-3

Project Name:	BRC Aquifer test	*Start Date:*	5/29/07	*Logged By:*	Davis
Site Location:	Henderson, NV	*End Date:*	5/29/07	*Checked By:*	G. Carter
Project No:	83173	*Total Hole Depth (ft):*	80	*Permit No.:*	
Client:	BRC	*Hole Diameter (in):*	8		
Drilling Company:	Boart Longyear	*Well Diameter (in):*	NA		
Drill Rig Type:	B.L. - GP24-300RS	*Water Level (Initial, Ft):*	UNK		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	NA		
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
80							

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DRILLING LOG
Well No. B-4

Project Name:	BRC Aquifer test	*Start Date:*	5/31/07	*Logged By:*	Davis
Site Location:	Henderson, NV	*End Date:*	6/1/07	*Checked By:*	G. Carter
Project No:	83173	*Total Hole Depth (ft):*	90	*Permit No.:*	
Client:	BRC	*Hole Diameter (in):*	8		
Drilling Company:	Boart Longyear	*Well Diameter (in):*	NA		
Drill Rig Type:	B.L. GP24-300RS	*Water Level (Initial, Ft):*	UNK		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	NA		
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
0		SILTY SAND (SM): Reddish Brown, with Gravel					
		SILTY GRAVEL (GM): with sand					
		SILTY SAND (SM): Reddish Brown with gravel					
10		CLAYEY SAND (SC): Reddish Brown, Trace Gravel					
		SILTY SAND (SM): Reddish Brown with Gravel					
		CLAYEY SAND (SC): Reddish Brown, Trace Gravel					
20		SILTY SAND (SM): Reddish Brown, With gravel					
		CLAYEY SAND (SC): Reddish Brown, Trace gravel					
		SILTY SAND (SM): Reddish Brown, with gravel					
30		CLAYEY SAND (SC): Reddish Brown					
			B-4-35-36.5				

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DRILLING LOG
Well No. B-4

Project Name:	BRC Aquifer test	*Start Date:*	5/31/07	*Logged By:*	Davis
Site Location:	Henderson, NV	*End Date:*	6/1/07	*Checked By:*	G. Carter
Project No:	83173	*Total Hole Depth (ft):*	90	*Permit No.:*	
Client:	BRC	*Hole Diameter (in):*	8		
Drilling Company:	Boart Longyear	*Well Diameter (in):*	NA		
Drill Rig Type:	B.L. GP24-300RS	*Water Level (Initial, Ft):*	UNK		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	NA		
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
40		CLAYEY SAND/CLAYEY SAND (SC/CL): Yellowish Green					
		SILTY SAND (SM): Reddish Brown, with gravel					
50							
60		SANDY CLAY (CL): Yellowish Green, Trace Gypsum					
70							

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DRILLING LOG
Well No. B-4

Project Name:	BRC Aquifer test	*Start Date:*	5/31/07	*Logged By:*	Davis
Site Location:	Henderson, NV	*End Date:*	6/1/07	*Checked By:*	G. Carter
Project No:	83173	*Total Hole Depth (ft):*	90	*Permit No.:*	
Client:	BRC	*Hole Diameter (in):*	8		
Drilling Company:	Boart Longyear	*Well Diameter (in):*	NA		
Drill Rig Type:	B.L. GP24-300RS	*Water Level (Initial, Ft):*	UNK		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	NA		
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
80		SILTY/CLAYAY SANDSTONE (SS): Muddy Creek Formation (TMC), Reddish Brown, Gypsiferous, Contact with overlying clays (15-25% Gypsum)	B4-80-81.5				
90							

PROJECT: BRC Aquifer Test

Log of Boring No. AA-06

BORING LOCATION:	GROUND SURFACE ELEVATION AND DATUM:
DRILLING CONTRACTOR:	DATE STARTED: 6/03/07 / DATE FINISHED: 6/03/07
DRILLING METHOD: Sonic	TOTAL DEPTH (ft.): 65 / SCREEN INTERVAL (ft.):
DRILLING EQUIPMENT:	DEPTH TO WATER: / FIRST: / COMPL.: NA / CASING:
SAMPLING METHOD: Continuous Core	LOGGED BY: Davis
HAMMER WEIGHT: / DROP:	RESPONSIBLE PROFESSIONAL: / REG. NO. XXXX

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM Reading	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
					Surface Elevation: 8.51' MSL (NGVD29)	
0–2					SILTY GRAVEL (GM): Reddish Brown, with sand	
2–4					SILTY SAND (SM): Reddish Brown, with Gravel	
4–12					GRAVEL (GW): Well Graded, with Sand and Silt	
12–18					SILTY SAND (SM): Reddish Brown, with Gravel	
18–23					WELL GRADED GRAVEL (GW-GM): Reddish Brown, with Silt and Sand	
23–26					SILTY SAND (SM): With Gravel	
26–28					WELL GRADED GRAVEL (GW-GM): Reddish Brown, with Silt and Sand	
28–36					SILTY SAND (SM): Reddish Brown, with Gravel	

PROJECT: BRC Aquifer Test

Log of Boring No. AA-06

BORING LOCATION:	GROUND SURFACE ELEVATION AND DATUM:
DRILLING CONTRACTOR:	DATE STARTED: 6/03/07 / DATE FINISHED: 6/03/07
DRILLING METHOD: Sonic	TOTAL DEPTH (ft.): 65 / SCREEN INTERVAL (ft.):
DRILLING EQUIPMENT:	DEPTH TO WATER: FIRST: / COMPL.: NA / CASING:
SAMPLING METHOD: Continuous Core	LOGGED BY: Davis
HAMMER WEIGHT: / DROP:	RESPONSIBLE PROFESSIONAL: / REG. NO.: XXXX

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM Reading	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
					Surface Elevation: 8.51' MSL (NGVD29)	
37–40					WELL GRADED GRAVEL (GW-GM): Interbedded with Silt and Sand. And Silty Sand with Gravel	
41–46					SILTY SAND (SM): Reddish Brown, with Gravel	
47–65	AA-06-50-51.5 AA-06-60-61.5				CLAYEY SANDSTONE (SS): Muddy Creek Formation (TMC), Reddish Brown/Brown. Gypsiferous Clayey Sandstone at 56 feet.	

APPENDIX B

SOIL SAMPLE PHYSICAL TESTING REPORTS

Project Name: BRC Aquifer Testing | **Client:** BRC | **By:** Doug Davis

Project Number: 83173 Task: 4 | **Date:** 5/30/07 | **Date Due:**

Boring Number	B-1	B-1	B-1	B-1
Depth	95-96.5	90-95	65-66.5	60-65
Water Content (ASTM 2216)		X		X
Dry Bulk Density (ASTM D2937)		X		X Moist/DENS.
Total Porosity (ASTM D2435)		X		X CONSOL
Flexible Wall (ASTM D5084) *OUTSIDE SERVICE*	X		X	
Rigid Wall (ASTM D2434) *OUTSIDE SERVICE*	X		X	
Specific Gravity (ASTM D854)		X		X
Specific Gravity (ASTM C127)		X		X
Hydrometer (ASTM D422)		X		X
Sieve Anysis (ASTM D422)		X		X
Total Organic Carbon *OUTSIDE SERVICE (ATLAS)*		X		X 60°C DRY -10 TO ATLAS
Remarks	Shipped 5/31	Sampled from 83-93.5	Shipped 5/31	Clear

29393

LABORATORY WORK ORDER

KLEINFELDER

Project No: 83173 Phase: 4

Project Name: BRC Aquifer Test

Client Name: BRC

Client Ref./P.O.#:

Special Instructions:

Sample Number: 29393

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

Date Sampled: 5/30/07

Date Received:

Date Needed:

Billed Date Completed: 6/18/07

Complete Verified By: 6/20/07

ASPHALT TESTING

Usage	Qty.	99#	Status
C123 Lt Wt Pieces/Agg		990715	
C127 Absorption/Gravity	3	~~990306~~ 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	

MISC. OTHER

Usage	Qty.	99#	Status
Chloride Analysis		996020	
Corrosivity Analysis		991508	
Corrosivity, Resistivity, Sodium Sulfate, Solubility, pH		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	✓
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	1	990316	✓
Plasticity Index		990310	
Resistivity Analysis		992318	
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	

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

FOR ACCOUNTING USE ONLY

Entered By: Date Entered:

Source:

Supplier:

Sample Location: B-1 - 65-66.5

Type of Material: Silt

Sampled by: Doug Davis

Project Manager: G. Wiltman / G. Carter

Kleinfelder West, Inc.
BMI/BRC Project
Project Number: 83173
Project Task: 4

Date: 5-30-07 **Date Sampled:** 5-30-07
Time: 1141 **Date Received:** _____ **Received By:** _____

Boring: B-1
Sample Depth: 60-65

Property Analysis	**Sample Number**	**Sample Type**		**Date Completed**
Initial volumetric and gravimetric water conte ASTM D2216/ D4643/D2974	✓			
Dry bulk density ASTM D2937	✓			
Calculated total porosity ASTM D2435	✓			
Saturated Hydraulic Conductivity				
Flexible Wall ASTM D5084				
Rigid Wall ASTM D2434				
Specific Gravity (Particle Density)			**Date Shipped**	
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			**Date Shipped**	
Analysis performed by Hall laboratory in Albuquerque, NM	✓			

Walkley Black

Sierra Testing Laboratories, Inc.
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762
(916) 939-3507

Hall Environmental Analysis Laboratory (HEAL)
4901 Hawkins St NE # A
Albuquerque, NM 87109
505) 345-3975

Kleinfelder West, Inc.
BMI/BRC Project
Project Number: 83173
Project Task: 4

Date: 5-30-07 **Date Sampled:** 5-30-07
Time: 1111 **Date Received:** _____ **Received By:** _____

Boring: B-1
Sample Depth: 65-66.5

Property Analysis	**Sample Number**	**Sample Type**		**Date Completed**
Initial volumetric and gravimetric water conte ASTM D2216/ D4643/D2974				
Dry bulk density ASTM D2937				
Calculated total porosity ASTM D2435				
Saturated Hydraulic Conductivity				
Flexible Wall ASTM D5084	✓			
Rigid Wall ASTM D2434	✓			
Specific Gravity (Particle Density)			**Date Shipped**	
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			**Date Shipped**	
Analysis performed by Hall laboratory in Albuquerque, NM				

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Kleinfelder West, Inc.
BMI/BRC Project
Project Number: 83173
Project Task: 4

Date: 5-30-07 **Date Sampled:** 5-30-07
Time: 1111 **Date Received:** _____ **Received By:** _____

Boring: B-1
Sample Depth: 90-95

Property Analysis	Sample Number	Sample Type		Date Completed
Initial volumetric and gravimetric water conte ASTM D2216/ D4643/D2974	✓			
Dry bulk density ASTM D2937	✓			
Calculated total porosity ASTM D2435	✓			
Saturated Hydraulic Conductivity				
Flexible Wall ASTM D5084				
Rigid Wall ASTM D2434				
Specific Gravity (Particle Density)			Date Shipped	
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			Date Shipped	
Analysis performed by Hall laboratory in Albuquerque, NM	✓			

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Kleinfelder West, Inc.
BMI/BRC Project
Project Number: 83173
Project Task: 4

Date: 5-30-07 **Date Sampled:** 5-30-07
Time: 11 11 **Date Received:** _____ **Received By:** _____

Boring: B-1
Sample Depth: 95-96.5

Property Analysis	**Sample Number**	**Sample Type**		**Date Completed**
Initial volumetric and gravimetric water conte ASTM D2216/ D4643/D2974				
Dry bulk density ASTM D2937				
Calculated total porosity ASTM D2435				
Saturated Hydraulic Conductivity				
Flexible Wall ASTM D5084	✓			
Rigid Wall ASTM D2434	✓		R	
Specific Gravity (Particle Density)			Date Shipped	
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			Date Shipped	
Analysis performed by Hall laboratory in Albuquerque, NM				

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4901 Hawkins St NE # A
Albuquerque, NM 87109
505) 345-3975

Atlas Consultants, Inc.

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

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TESTING MATERIALS

LABORATORY NO:	14462(a)	**DATE:**	June 13, 2007
SAMPLE:	Soil	**P.O.:**	
MARKED:	83173	**LAB ID:**	29393
SUBMITTED BY:	Kleinfelder, Inc.		
ANALYZED BY:	Kurt D. Ergun		

REPORT OF DETERMINATION
ASTM 2974

SAMPLE NO.	LOCATION	DEPTH (feet)	ORGANIC CARBON
29393	B-1	60-62.5	2.10%

Robert L. Sommers

LABORATORY MANAGER

PROJECT NAME:	BRC AQUIFER TESTING
PROJECT NUMBER:	83173
LAB NUMBER:	29393
BORING:	B-1
DEPTH:	60 - 62.5'
DATE:	06/04/07
TECHNICIAN:	JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	1	2	
Mass of Pycometer,Mf =>	221.68		A
Mass of Pycometer & Water,Ma =>	719.09		B
Temperature of Water when			
Ma above was Taken, Ta =>	22.7		C
Mass of Speciman & Pycnometer =>	280.73		D
Mass of Pycnometer, Mf =>	220.95	0	E
Mass of Oven-Dry Specimen, Mo =>	59.78		F
Mass of Pycnometer, Soil & Water, Mb =>	756.93		G
Temperature of Water when			
Mb Above was Taken, Tb =>	20.5		H

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	0.99761	
Water Density at Tb	0.9981	
K Factor at Tb	0.9999	
Ma at Tb	221.9237309	0
Sp Gr at Tb	2.724703737	#DIV/0!
Sp Gr at 20 C	2.724431267	#DIV/0!
SPECIFIC GRAVITY AT 20 C	2.724431267	

SPECIFIC GRAVITY OF COARSE AND FINE AGGREGATE ASTM 127 & 128

Job # => 83173
Project => #N/A
Client => #N/A
Phase => #N/A
Sample Location => B-1 @ 60 - 62.5'

Lab Number => 29393
Date Sampled =>
Date Received =>
Sampled By =>
Tested By => JLW
Reviewed By =>

COARSE AGGREGATE

Dry Wt. of Sample A=>	5199.9		
SSD Wt. of Sample B=>	5366.5		
Wt. SSD Under Water C=>	3202.8		Averages
Bulk Sp Gr. A/(B-C) =>	2.403		2.403
Bulk SSD B/(B-C) =>	2.480		2.480
Apparent Sp Gr A/(A-C) =>	2.604		2.604
Absorption ((B-A)/A)*100 =>	3.2		3.2

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

Job # =>	83173	Lab Number =>	29393
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	NR
Sample Location =>	B-1 @ 60'	Tested By =>	JLW
		Reviewed By =>	JH

Pan Label =>	DUDE	
Tare Weight of Pan =>	433.1	A
Wet Wt. of Sample & Tare =>	3708.8	B
Dry Wt. of Sample & Tare =>	3102.8	C
Weight of Moisture (B-C) =>	606.0	D
Dry Wt. of Sample (C-A) =>	2669.7	E
Percent Moisture (D/E)*100 =>	22.7	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

PARTICLE-SIZE ANALYSIS of SOILS

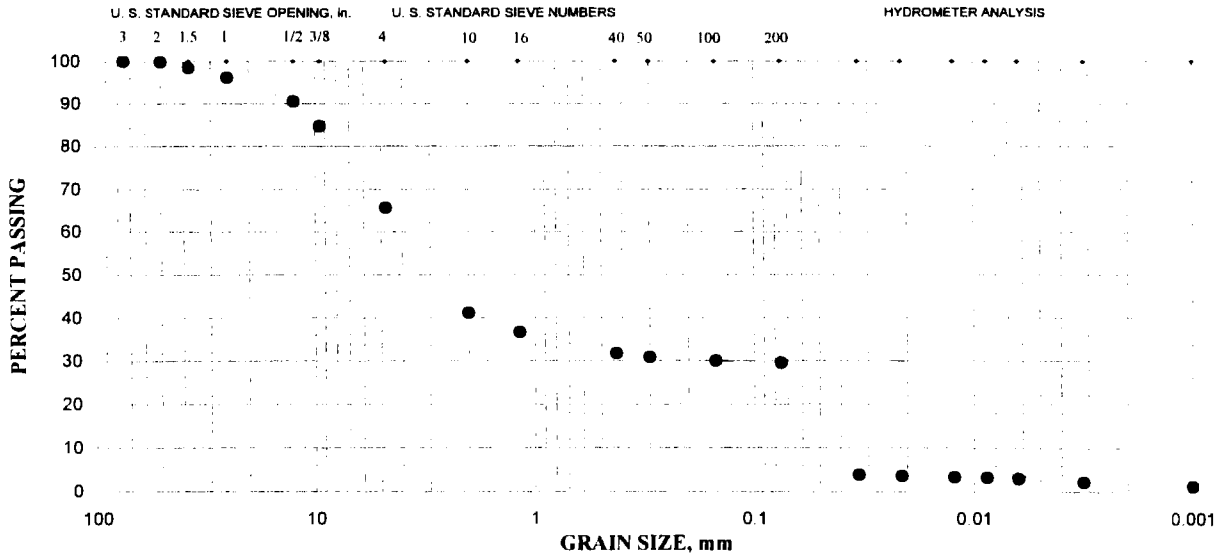
ASTM D 422-02

Boring #B- 2 @ 60-62.5'; S-29393 @ 60.0 - 65.0' June 7, 2007

Silty Sand with Gravel (SM) Specific Gravity = 2.72

LL = ; PL = ; PI = Gravel = 34%; Sand = 37%; Silt = 27%; 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)	4	96
1/2" (12.5-mm)	10	90
3/8" (9.5-mm)	15	85
#4 (4.75-mm)	34	66
#10 (2.00-mm)	59	41
#16 (1.18-mm)	63	37
#40 (425-µm)	68	32
#50 (300-µm)	69	31
#100 (150-µm)	70	30
#200 (75-µm)	71	29
Hydrometer Analysis		
33-µm		4
21-µm		4
12-µm		3
9-µm		3
6-µm		3
3.2-µm		2
Colloids (<1-µm)		1



Atlas Consultants, Inc.

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(702) 383-1199 • Fax (702) 383-4983

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LABORATORY NO: 14451(b) **DATE:** June 6, 2007

SAMPLE: Soil **P.O.:**

MARKED: 83173 **LAB ID:** 29393

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974

SAMPLE NO.	LOCATION	DEPTH (feet)	ORGANIC CARBON
29393	B-1	93-93.5	3.00%

Robert L. Summers

LABORATORY MANAGER

PARTICLE-SIZE ANALYSIS of SOILS

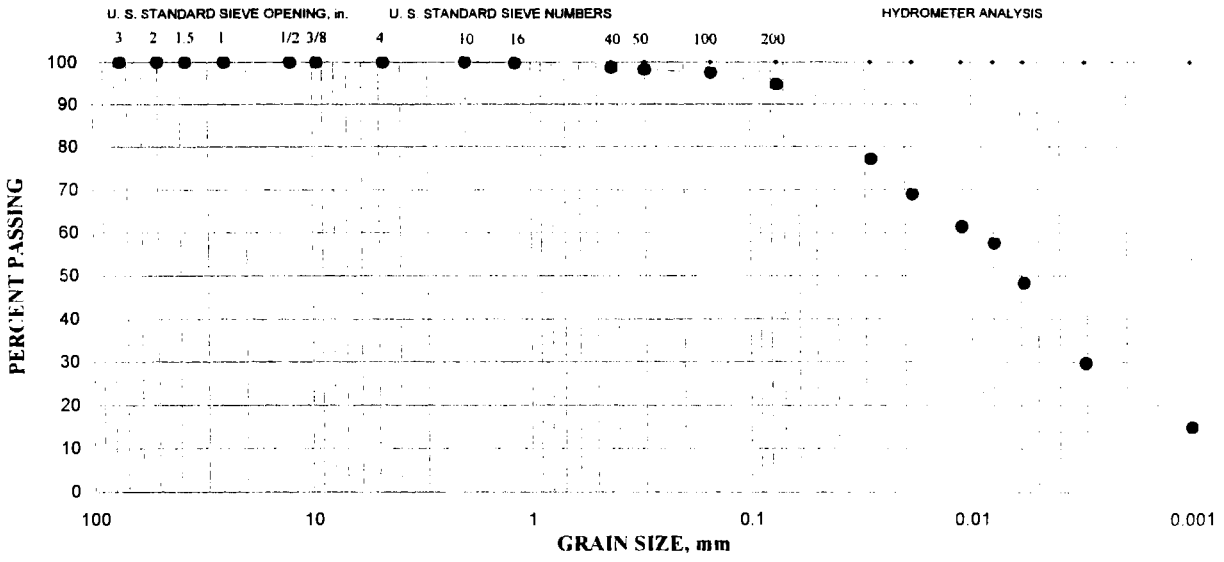
ASTM D 422-02

Boring #B- 2 @ 93-93.5'; S-29393 @ 90.0 - 95.0' June 7, 2007

Silt (ML) Specific Gravity = 2.70

LL = ; PL = ; PI = Gravel = 0%; Sand = 5%; Silt = 65%; 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-µm)	1	99
#50 (300-µm)	2	98
#100 (150-µm)	2	98
#200 (75-µm)	5	95
Hydrometer Analysis		
28-µm		77
18-µm		69
11-µm		61
8-µm		58
6-µm		48
3.1-µm		30
Colloids (<1-µm)		15



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

Job # =>	83173	Lab Number =>	29393
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	NR
Sample Location =>	B-1 @ 93 - 93.5'	Tested By =>	JLW
		Reviewed By =>	JH

Pan Label =>	DORK	
Tare Weight of Pan =>	536.3	A
Wet Wt. of Sample & Tare =>	1361	B
Dry Wt. of Sample & Tare =>	1068	C
Weight of Moisture (B-C) =>	293.0	D
Dry Wt. of Sample (C-A) =>	531.7	E
Percent Moisture (D/E)*100 =>	55.1	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	05/31/07	
Project Number	83173	Phase No.	4	Tested By	JLW	Checked By	JH
Lab Number	29393						
Boring Number	B-1						
Sample Depth	93-93.5'						
Height (inches)	6.5						
Diameter (inches)	5.10						
Volume	0.0770						
Wt. of Sample At Field Moisture	3403.70						
Wet Density (pcf)	97.5						
Dry Density (pcf)	62.8						
Container No.							
Wt. of Wet Sample Plus Tare	1361.00						
Wt. of Dry Sample Plus Tare	1068.00						
Tare (g)	536.30						
Dry Wt. Of Sample (g)	531.70						
Moisture Content, %	55.1%						

moist-dens form

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

Project Name: BRC AQUIFER TESTING

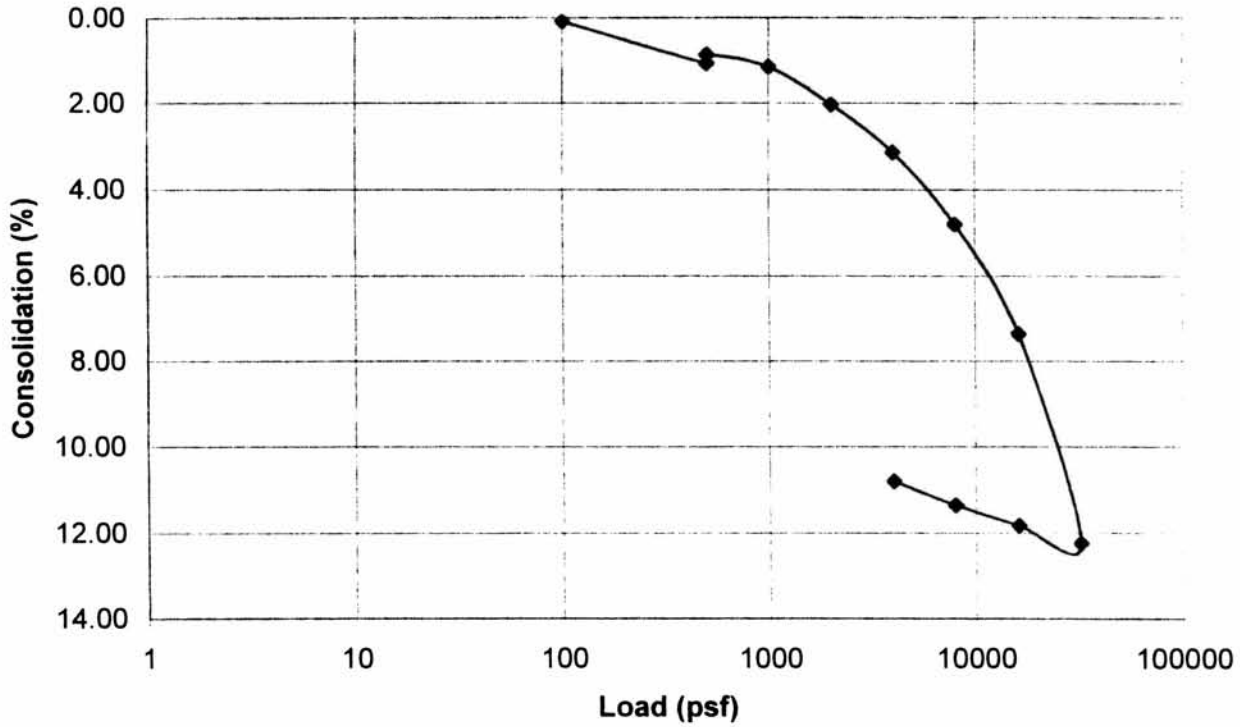
Project No.: 83173-4

Report Date: 06/14/07

Sample No.: 29393 Tech.: jlw
Sample Depth (ft.): B-1 @ 93 - 93.5'
Material Description:

Load (psf)	Consolidation (%)
100	0.09
500	1.07
500	0.86
1000	1.15
2000	2.03
4000	3.13
8000	4.80
16000	7.36
32000	12.23
16000	11.82
8000	11.35
4000	10.79

B-1 @ 93 - 93.5'



PROJECT NAME:	BRC AQUIFER TESTING
PROJECT NUMBER:	83173
LAB NUMBER:	29393
BORING:	B-1
DEPTH:	93 - 93.5'
DATE:	06/04/07
TECHNICIAN:	JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	1	2	
Mass of Pycometer,Mf =>	220.89		A
Mass of Pycometer & Water,Ma =>	719.09		B
Temperature of Water when			
Ma above was Taken, Ta =>	22.7		C
Mass of Speciman & Pycnometer =>	271.89		D
Mass of Pycnometer, Mf =>	220.89	0	E
Mass of Oven-Dry Specimen, Mo =>	51		F
Mass of Pycnometer, Soil & Water, Mb =>	751.21		G
Temperature of Water when			
Mb Above was Taken, Tb =>	20.6		H

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	0.99761	
Water Density at Tb	0.99808	
K Factor at Tb	0.99987	
Ma at Tb	221.124154	0
Sp Gr at Tb	2.701271186	#DIV/0!
Sp Gr at 20 C	2.700920021	#DIV/0!
SPECIFIC GRAVITY AT 20 C	2.700920021	

Project Name: BRC Aquifer Testing | Client: BRC | By: Doug Davis

Project Number: 83173 Task: 4 | Date: 5-31-07 | Date Due:

Boring Number	Depth	Remarks
B-2	90-95	
B-2	90-91.5	Shipped 6/1
B-2	60-61.5	Shipped 6/1
B-2	60-68	
Water Content (ASTM 2216)		
Dry Bulk Density (ASTM D2937)		
Total Porosity (ASTM D2435)		
Flexible Wall (ASTM D5084) *OUTSIDE SERVICE*		
Rigid Wall (ASTM D2434) *OUTSIDE SERVICE*		
Specific Gravity (ASTM D854)		
Specific Gravity (ASTM C127)		
Hydrometer (ASTM D422)		
Sieve Anysis (ASTM D422)		
Total Organic Carbon *OUTSIDE SERVICE (ATLAS)*		

LABORATORY NUMBER: 29396

LABORATORY WORK ORDER

KLEINFELDER

Project No: 83173 Phase: 4

Project Name: BRC Aggr Testing

Client Name: BRC

Client Ref./P.O.#:

Special Instructions:

Sample Number: 29396

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

Date Sampled: 5-31-07

Date Received: 5-31-07

Billed
~~Date Needed:~~ 6/18/07

Date Completed: 6/20/07

Verified By:

ASPHALT TESTING

Usage	Qty.	99#	Status
C123 Lt Wt Pieces/Agg		990715	
C127 Absorption/Gravity	2	~~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	

MISC. OTHER

Usage	Qty.	99#	Status
Chloride Analysis		996020	
Corrosivity Analysis		991508	
Corrosivity, Resistivity, Sodium Sulfate, Solubility, pH		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	✓
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	1	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	

☐ CCSD ☐ LIWD ☐ NDOT

☐ UBC ☐ AASHTO

☐ CCPW ☐ ASTM ☐ Other

FOR ACCOUNTING USE ONLY

Entered By: Date Entered:

Source: B-2 60-95'

Supplier: BRC B-2 AAAAAA

Sample Location: Soil

Type of Material: Doug Davis

Sampled by: Greg Clarke

Project Manager:

DISTRIBUTION WHITE - YELLOW - Sample PINK - Project Manager GOLD - Sample Log Book

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 1, 2007
File:
Copies: 3

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 flexible wall (ASTM D2435) and rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-4: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
B-4@35-36.5	05/31/07	29395	06/1/07
B-2@60-61.5	05/31/07	29396	06/1/07
B-2@90-91.5	05/31/07	29396	06/1/07

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

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Kleinfelder West, Inc.
BMI/BRC Project
Project Number: 83173
Project Task: 4

Date: 5-31-07 **Date Sampled:** 5-31-07
Time: 1645 **Date Received:** _____ **Received By:** _____

Boring: B-2
Sample Depth: 90-95

Property Analysis	**Sample Number**	**Sample Type**		**Date Completed**
Initial volumetric and gravimetric water conte ASTM D2216/ D4643/D2974	✓			
Dry bulk density ASTM D2937	✓			
Calculated total porosity ASTM D2435	✓			
Saturated Hydraulic Conductivity				
Flexible Wall ASTM D5084				
Rigid Wall ASTM D2434				
Specific Gravity (Particle Density)			**Date Shipped**	
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	✓		**Date Shipped**	
Analysis performed by Hall laboratory in Albuquerque, NM				

Sierra Testing Laboratories, Inc.
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762
(916) 939-3507

Hall Environmental Analysis Laboratory (HEAL)
4901 Hawkins St NE # A
Albuquerque, NM 87109
505) 345-3975

Wakley Black

ATCAS

Kleinfelder West, Inc.
BM/BRC Project
Project Number: 83173
Project Task: 4

Date: 5-31-07 **Date Sampled:** _____
Time: 1145 **Date Received:** _____ **Received By:** _____

Boring: B-2
Sample Depth: 90-91.5

Property Analysis	Sample Number	Sample Type		Date Completed
Initial volumetric and gravimetric water conte ASTM D2216/ D4843/D2974				
Dry bulk density ASTM D2937				
Calculated total porosity ASTM D2435				
Saturated Hydraulic Conductivity				
Flexible Wall ASTM D5084	X	SOIL		
Rigid Wall ASTM D2434	X	SOIL		
Specific Gravity (Particle Density)			Date Shipped	
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			Date Shipped	
Analysis performed by Hall laboratory in Albuquerque, NM				
Walkley Black				

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El Dorado, CA 95762
(916) 939-3507

Hall Environmental Analysis Laboratory (HEAL)
4901 Hawkins St NE # A
Albuquerque, NM 87109
505) 345-3975

AFCA5

Kleinfelder West, Inc.
BMI/BRC Project
Project Number: 83173
Project Task: 4

Date: 5-31-07 Date Sampled: 5-31-07
Time: 1028 Date Received: _____ Received By: _____

Boring: B-2
Sample Depth: 60-61.5

Property Analysis	**Sample Number**	**Sample Type**		**Date Completed**
Initial volumetric and gravimetric water conte ASTM D2216/ D4643/D2974				
Dry bulk density ASTM D2937				
Calculated total porosity ASTM D2435				
Saturated Hydraulic Conductivity				
Flexible Wall ASTM D5084	L	SU-1		
Rigid Wall ASTM D2434	✓	SU-1		
Specific Gravity (Particle Density)			Date Shipped	
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			Date Shipped	
Analysis performed by Hall laboratory in Albuquerque, NM				

Walkley Black

Sierra Testing Laboratories, Inc.
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762
(916) 939-3507

Hall Environmental Analysis Laboratory (HEAL)
4901 Hawkins St NE # A
Albuquerque, NM 87109
505) 345-3975

Kleinfelder West, Inc.
BMI/BRC Project
Project Number: 83173
Project Task: 4

Date: 5-31-07 Date Sampled: 5-31-07
Time: 10:40 Date Received: _____ Received By: _____

Boring: B-2
Sample Depth: 60-65

Property Analysis	Sample Number	Sample Type		Date Completed
Initial volumetric and gravimetric water conte ASTM D2216/ D4643/D2974	✓	SOIL		
Dry bulk density ASTM D2937	✓	↓		
Calculated total porosity ASTM D2435	✓			
Saturated Hydraulic Conductivity				
Flexible Wall ASTM D5084				
Rigid Wall ASTM D2434				
Specific Gravity (Particle Density)			Date Shipped	
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	✓		Date Shipped	
Analysis performed by Hall laboratory in Albuquerque, NM				
Walkley Black				

Sierra Testing Laboratories, Inc.
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762
(916) 939-3507

Hall Environmental Analysis Laboratory (HEAL)
4901 Hawkins St NE # A
Albuquerque, NM 87109
505) 345-3975

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LABORATORY NO: 14462(e) **DATE:** June 11, 2007

SAMPLE: Soil **P.O.:**

MARKED: 83173 **LAB ID:** 29396

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION
ASTM 2974

SAMPLE NO.	LOCATION	DEPTH (feet)	ORGANIC CARBON
29396	B-2	60.0	2.30%
29396	B-2	94.5-95.0	2.00%

Robert L. Summers
LABORATORY MANAGER

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #B- 2 @ 60'; S-29396 @ 60.0 - 65.0'

June 7, 2007

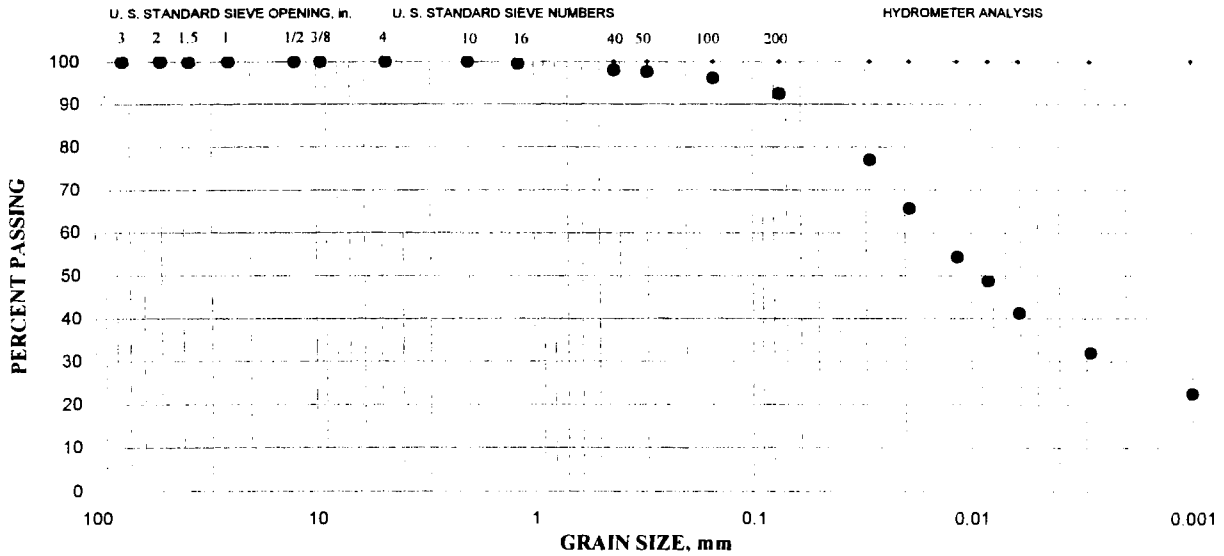
Silt (ML)

Specific Gravity = 2.68

LL = ; PL = ; PI =

Gravel = 0%; Sand = 8%; Silt = 60%; Clay = 32%

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)	4	96
#200 (75-µm)	8	92
Hydrometer Analysis		
29-µm		77
19-µm		66
12-µm		54
8-µm		49
6-µm		41
2.9-µm		32
Colloids (<1-µm)		23



PROJECT NAME:	BRC Aquifer Testing
PROJECT NUMBER:	83173
LAB NUMBER:	29396
BORING:	B - 2
DEPTH:	60'
DATE:	06/05/07
TECHNICIAN:	JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Z
Mass of Pycometer,Mf =>	221.22
Mass of Pycometer & Water,Ma =>	719.19
Temperature of Water when	
Ma above was Taken, Ta =>	22.7
Mass of Speciman & Pycnometer =>	281.80
Mass of Pycnometer, Mf =>	220.97
Mass of Oven-Dry Specimen, Mo =>	60.83
Mass of Pycnometer, Soil & Water, Mb =>	757.13
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	0.99761
Water Density at Tb	0.99806
K Factor at Tb	0.99985
Ma at Tb	221.4440865
Sp Gr at Tb	2.657492355
Sp Gr at 20 C	2.657093731
SPECIFIC GRAVITY AT 20 C	2.657093731

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

Job # =>	83173	Lab Number =>	29396
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	NR
Sample Location =>	B - 2 @ 60'	Tested By =>	JLW
		Reviewed By =>	JH

Pan Label =>	CDF	
Tare Weight of Pan =>	538.7	A
Wet Wt. of Sample & Tare =>	1082.1	B
Dry Wt. of Sample & Tare =>	948.5	C
Weight of Moisture (B-C) =>	133.6	D
Dry Wt. of Sample (C-A) =>	409.8	E
Percent Moisture (D/E)*100 =>	32.6	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

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

Job # =>	83173	Lab Number =>	29396
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	NR
Sample Location =>	B - 2 @ 94.5 - 95'	Tested By =>	JLW
		Reviewed By =>	JH

Pan Label =>	CTR 1	
Tare Weight of Pan =>	608.2	A
Wet Wt. of Sample & Tare =>	1280.3	B
Dry Wt. of Sample & Tare =>	1092.2	C
Weight of Moisture (B-C) =>	188.1	D
Dry Wt. of Sample (C-A) =>	484	E
Percent Moisture (D/E)*100 =>	38.9	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

Moisture Density

Project Name	BRC AQUIFER TESTING				Date	06/04/07	
Project Number	83173	Phase No.		Tested By	JLW	Checked By	JH
Lab Number	29396						
Boring Number	B-2						
Sample Depth	94.5-95						
Height (inches)	2.5						
Diameter (inches)	5.05						
Volume	0.0290						
Wt. of Sample At Field Moisture	1389.30						
Wet Density (pcf)	105.6						
Dry Density (pcf)	76.1						
Container No.							
Wt. of Wet Sample Plus Tare	1280.30						
Wt. of Dry Sample Plus Tare	1092.20						
Tare (g)	608.20						
Dry Wt. Of Sample (g)	484.00						
Moisture Content, %	38.9%						

moist-dens form

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

Project Name: BRC AQUIFER TESTING

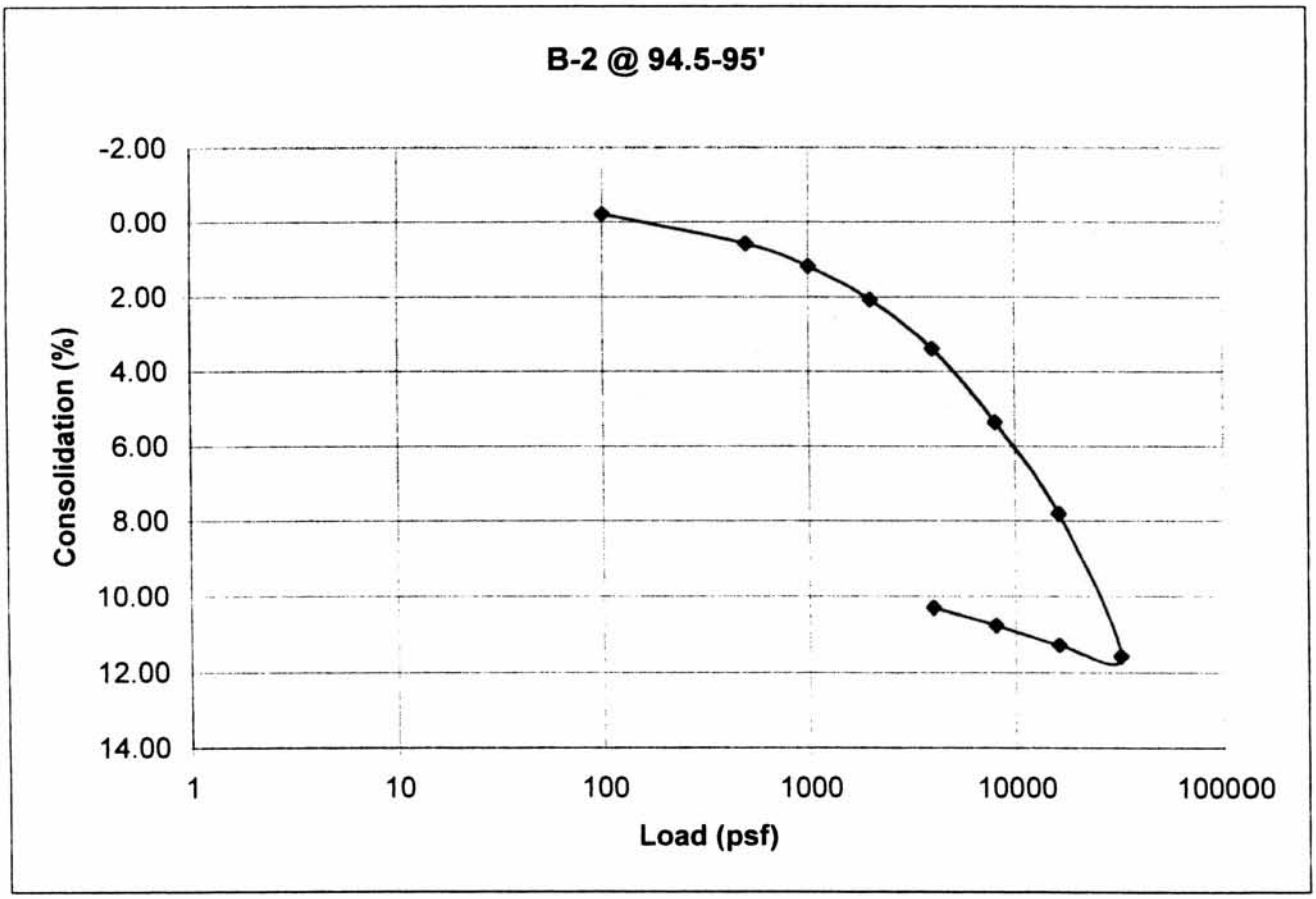
Project No.: 83173-4

Report Date: 06/11/07

Sample No.: 29396
Sample Depth (ft.): B-2 @ 94.5 - 95'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	-0.22
500	0.58
1000	1.19
2000	2.07
4000	3.38
8000	5.35
16000	7.81
32000	11.56
16000	11.27
8000	10.75
4000	10.30



PROJECT NAME:	BRC Aquifer Testing
PROJECT NUMBER:	83173
LAB NUMBER:	29396
BORING:	B - 2
DEPTH:	94.5 - 95'
DATE:	06/05/07
TECHNICIAN:	JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Y
Mass of Pycometer,Mf =>	224.41
Mass of Pycometer & Water,Ma =>	722.96
Temperature of Water when	
Ma above was Taken, Ta =>	22.6
Mass of Speciman & Pycnometer =>	267.50
Mass of Pycnometer, Mf =>	224.40
Mass of Oven-Dry Specimen, Mo =>	43.10
Mass of Pycnometer, Soil & Water, Mb =>	748.94
Temperature of Water when	
Mb Above was Taken, Tb =>	21.0

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	0.99764
Water Density at Tb	0.99799
K Factor at Tb	0.99979
Ma at Tb	224.5844925
Sp Gr at Tb	2.517523364
Sp Gr at 20 C	2.516994685
SPECIFIC GRAVITY AT 20 C	2.516994685

PARTICLE-SIZE ANALYSIS of SOILS

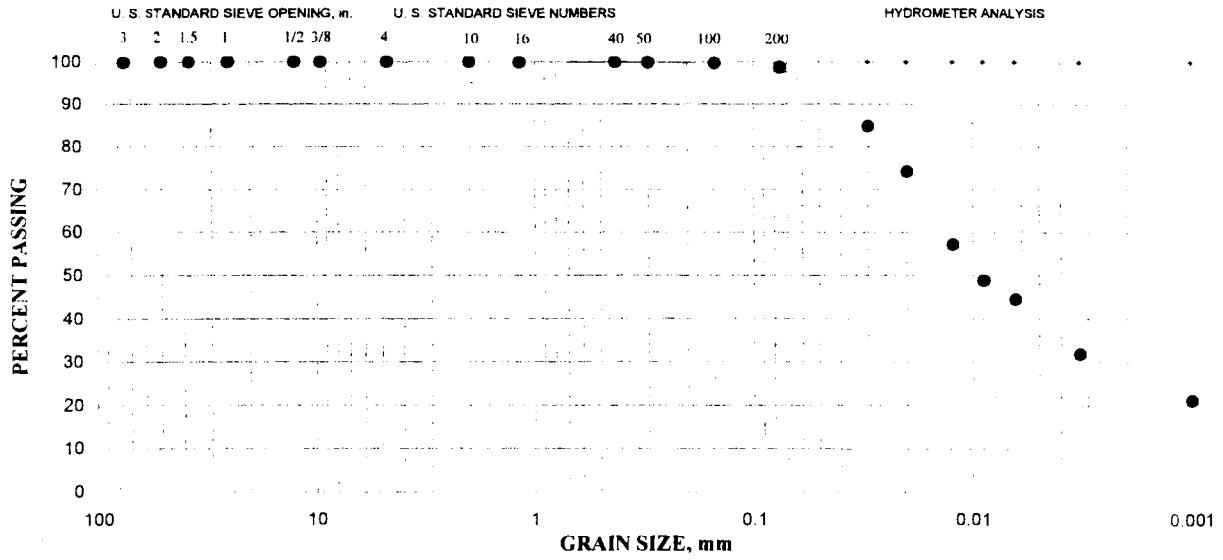
ASTM D 422-02

Boring #B- 2 @ 94.5-95'; S-29396 @ 90.0 - 95.0' June 7, 2007

Silt (ML) Specific Gravity = 2.52

LL = ; PL = ; PI = Gravel = 0%; Sand = 1%; Silt = 67%; Clay = 32%

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		
30-µm		85
20-µm		74
12-µm		57
9-µm		49
6-µm		45
3.3-µm		32
Colloids (<1-µm)		21



Project Name: BRC Aquifer Testing | **Client:** BRC | **By:** Doug Davis

Project Number: 83173 Task: 4 | **Date:** 5/29/07 | **Date Due:**

Boring Number	Depth	Remarks
Water Content (ASTM 2216)		
Dry Bulk Density (ASTM D2937)		
Total Porosity (ASTM D2435)		
Flexible Wall (ASTM D5084) *OUTSIDE SERVICE*		
Rigid Wall (ASTM D2434) *OUTSIDE SERVICE*		
Specific Gravity (ASTM D854)		
Specific Gravity (ASTM C127)		
Hydrometer (ASTM D422)		
Sieve Anysis (ASTM D422)		
Total Organic Carbon *OUTSIDE SERVICE (ATLAS)*		
B-3	7.5-15	-12.5'
B-3	55-60	59.5-60'
B-3	55-59.5	Shipped 5/31
B-3	7.5-15	Shipped 5/31

LAB# 29392

LABORATORY WORK ORDER

KLEINFELDER

Project No: 83173 Phase: 4

Project Name: BRC Aquifer Testing

Client Name: BRC

Client Ref./P.O.#:

Special Instructions:

Sample Number: 29392

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

Date Sampled: 5/29/07
Date Received: 5/29/07
Date Needed:
Billed:
Date Completed: 6/18/07
complete
Verified By: 6/20/07

ASPHALT TESTING

Usage	Qty.	99#	Status
C123 Lt Wt Pieces/Agg		990715	
C127 Absorption/Gravity	2	~~990707~~ 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	

MISC. OTHER

Usage	Qty.	99#	Status	
Chloride Analysis		996020		
Corrosivity Analysis		991508		
Corrosivity, Resistivity, Sodium Sulfate, Solubility, pH*		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		

☐ CCPW ☒ ASTM ☐ Other

☐ CCSD ☐ UBC ☐ LLWD ☐ AASHTO ☐ NDOT

FOR ACCOUNTING USE ONLY
Entered By: Date Entered:

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		

Source: 1
Supplier:
Sample Location: B-3, 35 - 40' 75'
Type of Material: Soil
Sampled by: Doug Davis
Project Manager: Gwen Tmonu/G. Carter

Kleinfelder West, Inc.
BMI/BRC Project
Project Number: 83173
Project Task: 4

Date: 5/29/07 Date Sampled: 5/29/07
Time: 1630 Date Received: 5/29/07 Received By: _____

Boring: B3

Sample Depth: 70-75

Property Analysis	Sample Number	Sample Type	Date Shipped	Date Completed
Initial volumetric and gravimetric water conte ASTM D2216/ D4643/D2974	B3			
Dry bulk density ASTM D2937	B3			
Calculated total porosity ASTM D2435	B3			
Saturated Hydraulic Conductivity				
Flexible Wall ASTM D5084				
Rigid Wall ASTM D2434				
Specific Gravity (Particle Density)				
Fine (< 4.75 mm diameter material) ASTM D854	B3			
Coarse (> 4.75 mm diameter material) ASTM C127	B3			
Particle size analysis (Wet				
Standard Sieves with Wash ASTM D422	B3			
Hydrometer (applicable when >5% fines) ASTM D422	B3			
Total or Fractional Organic Carbon	B3			

Analysis performed by Hall laboratory in
Albuquerque, NM
Walkley Black

Sierra Testing Laboratories, Inc.
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762
(916) 939-3507

Hall Environmental Analysis Laboratory (HEAL)
4901 Hawkins St NE # A
Albuquerque, NM 87109
505) 345-3975

Kleinfelder West, Inc.
BMI/BRC Project
Project Number: 83173
Project Task: 4

Date: 5/29/07 Date Sampled: 5/29/07
Time: 1630 Date Received: 5/29/07 Received By:

Boring: B3
Sample Depth: 75-75.6

Property Analysis	Sample Number	Sample Type	Date Completed
Initial volumetric and gravimetric water conte ASTM D2216/ D4643/D2974			
Dry bulk density ASTM D2937			
Calculated total porosity ASTM D2435			
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			

Date Shipped

Sierra Testing Laboratories, Inc.
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762
(916) 939-3507

Total or Fractional Organic Carbon
Analysis performed by Hall laboratory in
Albuquerque, NM
Walkley Black

Date Shipped

Hall Environmental Analysis Laboratory (HEAL)
4901 Hawkins St NE # A
Albuquerque, NM 87109
505) 345-3975

100-200 g
#10
oven dry

Kleinfelder West, Inc.
BMI/BRC Project
Project Number: 83173
Project Task: 4

Date: 5/29/07 Date Sampled: 5/29/07
Time: 1630 Date Received: 5/29/07 Received By:

Boring: B3
Sample Depth: 55 - 56.5

Property Analysis	**Sample Number**	**Sample Type**	**Date Completed**
Initial volumetric and gravimetric water conte ASTM D2216/ D4643/D2974			
Dry bulk density ASTM D2937			
Calculated total porosity ASTM D2435			
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			

Date Shipped

Sierra Testing Laboratories, Inc.
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762
(916) 939-3507

Total or Fractional Organic Carbon
Analysis performed by Hall laboratory in
Albuquerque, NM
Walkley Black

Date Shipped

Hall Environmental Analysis Laboratory (HEAL)
4901 Hawkins St NE # A
Albuquerque, NM 87109
505) 345-3975

Kleinfelder West, Inc.
BMI/BRC Project
Project Number: 83173
Project Task: 4

Date: 5/29/07 **Date Sampled:** 5/29/07
Time: 1630 **Date Received:** 5/29/07 **Received By:**

Boring: B-3
Sample Depth: 55 to 60

Property Analysis	Sample Number	Sample Type		Date Completed
Initial volumetric and gravimetric water conte ASTM D2216/ D4643/D2974	B3			
Dry bulk density ASTM D2937	B3			
Calculated total porosity ASTM D2435	B3			
Saturated Hydraulic Conductivity				
Flexible Wall ASTM D5084				
Rigid Wall ASTM D2434				
Specific Gravity (Particle Density)				
Fine (< 4 75 mm diameter material) ASTM D854	B3			
Coarse (> 4.75 mm diameter material) ASTM C127	B3			
Particle size analysis (Wet				
Standard Sieves with Wash ASTM D422	B3			
Hydrometer (applicable when >5% fines) ASTM D422	B3			
Total or Fractional Organic Carbon	B3			
Analysis performed by Hall laboratory in Albuquerque. NM				
Walkley Black				

Date Shipped

Sierra Testing Laboratories, Inc.
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762
(916) 939-3507

Date Shipped

Hall Environmental Analysis Laboratory (HEAL)
4901 Hawkins St NE # A
Albuquerque, NM 87109
505) 345-3975

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: May 31, 2007
File:
Copies: 3

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 flexible wall (ASTM D2435) and rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-4: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
B-3@75-75.6	05/29/07	29392	05/31/07
B-3@55-56.5	05/29/07	29392	05/31/07
B-1@65-66.5	05/30/07	29393	05/31/07
B-1@95-96.5	05/30/07	29393	05/31/07

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

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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: 14462(f) **DATE:** June 13, 2007

SAMPLE: Soil **P.O.:**

MARKED: 83173 **LAB ID:** 29392

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974

SAMPLE NO.	LOCATION	DEPTH (feet)	ORGANIC CARBON
29392	B-3	59.5-60.0	6.30%
29392	B-3	72.5	2.60%

Robert L. Summers

LABORATORY MANAGER

PARTICLE-SIZE ANALYSIS of SOILS

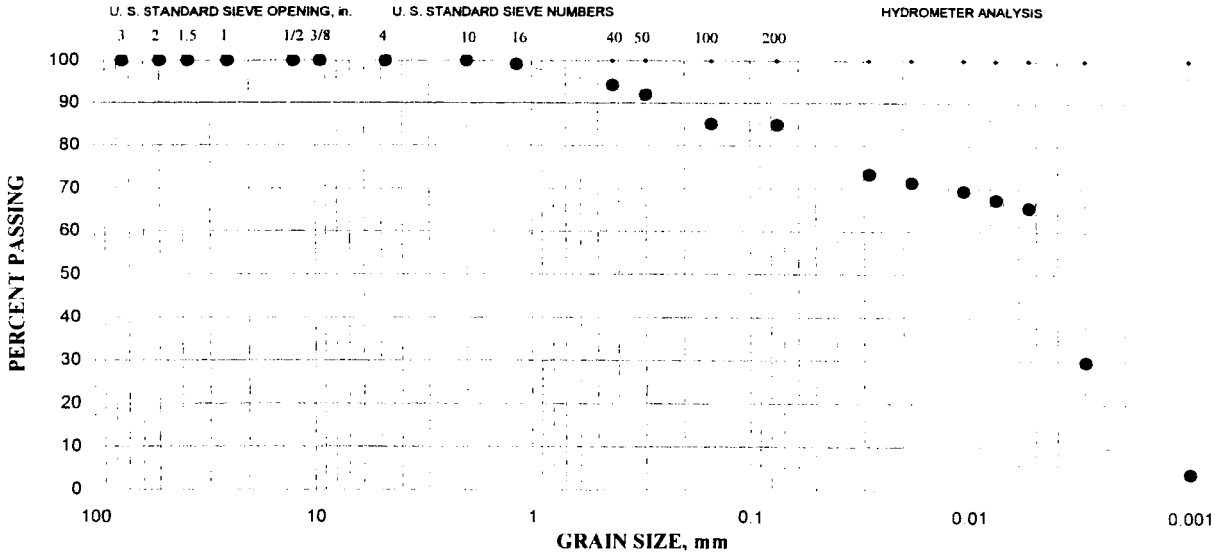
ASTM D 422-02

Boring #B-3 @ 72.5'; S-29392 @ 70.0 - 75.0' June 14, 2007

Silt with Sand (ML) Specific Gravity = 2.84

LL = ; PL = ; PI = Gravel = 0%; Sand = 15%; Silt = 55%; 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)	1	99
#40 (425-µm)	6	94
#50 (300-µm)	8	92
#100 (150-µm)	15	85
#200 (75-µm)	15	85
Hydrometer Analysis		
28-µm		73
18-µm		71
11-µm		69
8-µm		67
5-µm		65
3.0-µm		30
Colloids (<1-µm)		4



PROJECT NAME:	BRC Aquifer Testing
PROJECT NUMBER:	83173
LAB NUMBER:	29392
BORING:	B-3
W	72.5'
DATE:	06/08/07
TECHNICIAN:	JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	1
Mass of Pycometer,Mf =>	221.68
Mass of Pycometer & Water,Ma =>	719.09
Temperature of Water when	
Ma above was Taken, Ta =>	22.7
Mass of Speciman & Pycnometer =>	257.44
Mass of Pycnometer, Mf =>	220.91
Mass of Oven-Dry Specimen, Mo =>	36.53
Mass of Pycnometer, Soil & Water, Mb =>	742.77
Temperature of Water when	
Mb Above was Taken, Tb =>	21.1

Water Density at Ta	0.99761
Water Density at Tb	0.99797
K Factor at Tb	0.99977
Ma at Tb	221.8590676
Sp Gr at Tb	2.842801556
Sp Gr at 20 C	2.842147712
SPECIFIC GRAVITY AT 20 C	2.842147712

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

Project Name: BRC AQUIFER TESTING

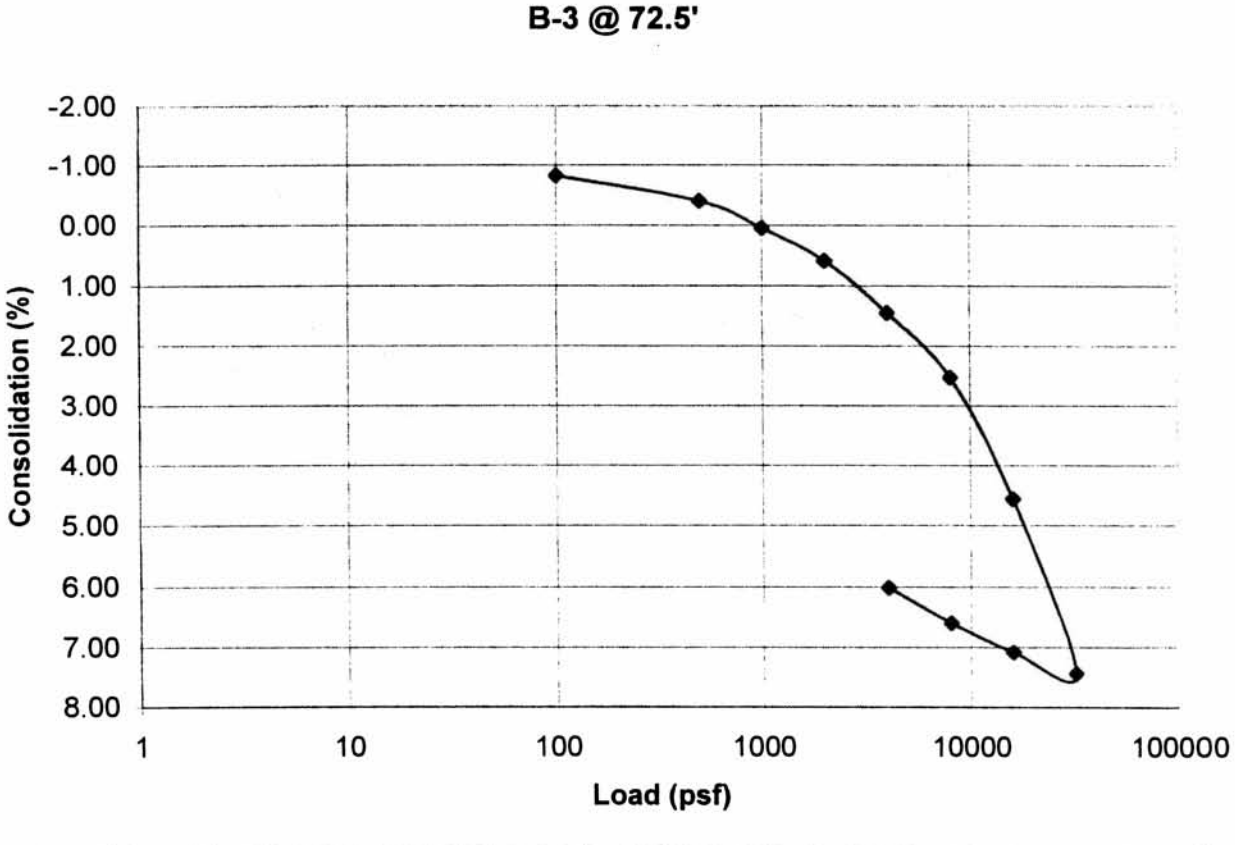
Project No.: 83173-4

Report Date: 06/14/07

Sample No.: 29392
Sample Depth (ft.): B-3 @ 72.5'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	-0.83
500	-0.40
1000	0.04
2000	0.58
4000	1.45
8000	2.52
16000	4.55
32000	7.44
16000	7.08
8000	6.59
4000	6.01



Moisture Density

Project Name	BRC AQUIFER TESTING				Date	06/04/07	
Project Number	83173	Phase No.	4	Tested By	JLW	Checked By	JH
Lab Number	29392						
Boring Number	B-3						
Sample Depth	72.5						
Height (inches)	1.85						
Diameter (inches)	5.15						
Volume	0.0223						
Wt. of Sample At Field Moisture	1063.99						
Wet Density (pcf)	105.2						
Dry Density (pcf)	75.7						
Container No.							
Wt. of Wet Sample Plus Tare	625.80						
Wt. of Dry Sample Plus Tare	515.30						
Tare (g)	231.20						
Dry Wt. Of Sample (g)	284.10						
Moisture Content, %	38.9%						

moist-dens form

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

Job # =>	83173	Lab Number =>	29392
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	NR
Sample Location =>	B-3 @ 72.5'	Tested By =>	JLW
		Reviewed By =>	JH

Pan Label =>	JW	
Tare Weight of Pan =>	231.2	A
Wet Wt. of Sample & Tare =>	625.8	B
Dry Wt. of Sample & Tare =>	515.3	C
Weight of Moisture (B-C) =>	110.5	D
Dry Wt. of Sample (C-A) =>	284.1	E
Percent Moisture (D/E)*100 =>	38.9	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

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #B-3 @ 59.5-60'; S-29392 @ 55.0 - 60.0'

June 14, 2007

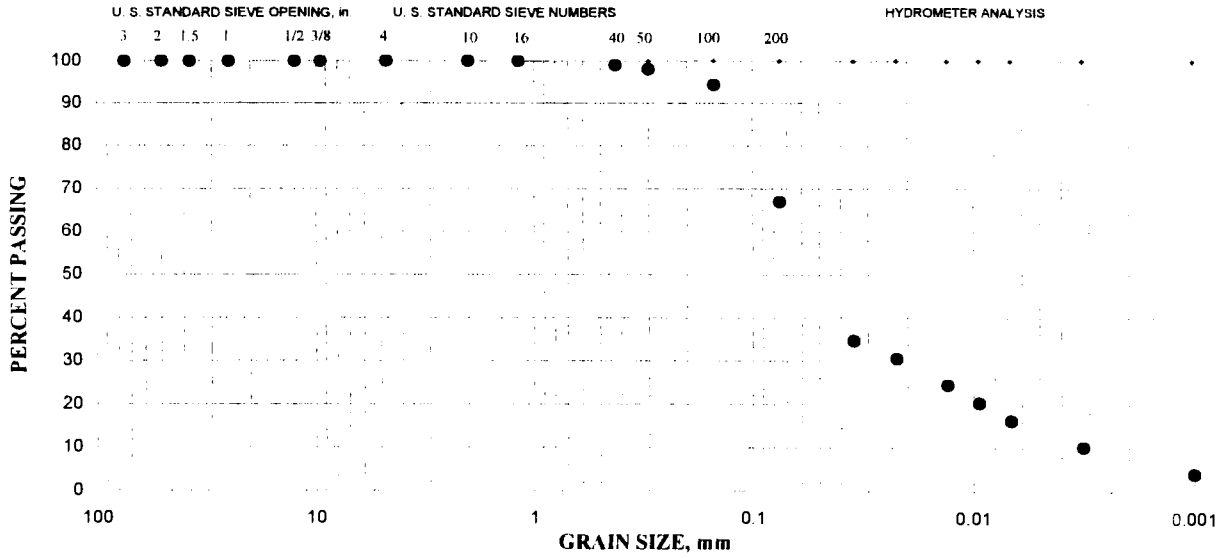
Sandy Silt (ML)

Specific Gravity = 2.64

LL = ; PL = ; PI =

Gravel = 0%; Sand = 33%; Silt = 57%; 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-µm)	1	99
#50 (300-µm)	2	98
#100 (150-µm)	6	94
#200 (75-µm)	33	67
Hydrometer Analysis		
35-µm		35
22-µm		31
13-µm		24
9-µm		20
7-µm		16
3.2-µm		10
Colloids (<1-µm)		4



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

Job # =>	83173	Lab Number =>	29392
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	NR
Sample Location =>	B-3 @ 59.5 - 60'	Tested By =>	JLW
		Reviewed By =>	JH

Pan Label =>	SMALL	
Tare Weight of Pan =>	522.7	A
Wet Wt. of Sample & Tare =>	1012.7	B
Dry Wt. of Sample & Tare =>	837.7	C
Weight of Moisture (B-C) =>	175.0	D
Dry Wt. of Sample (C-A) =>	315	E
Percent Moisture (D/E)*100 =>	55.6	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

Moisture Density

Project Name	BRC AQUIFER TESTING				Date	06/04/07	
Project Number	83173	Phase No.	4	Tested By	JLW	Checked By	JH
Lab Number	29392						
Boring Number	B-3						
Sample Depth	59.5 - 60'						
Height (inches)	3.01						
Diameter (inches)	5.05						
Volume	0.0348						
Wt. of Sample At Field Moisture	1724.30						
Wet Density (pcf)	109.2						
Dry Density (pcf)	70.2						
Container No.							
Wt. of Wet Sample Plus Tare	1012.70						
Wt. of Dry Sample Plus Tare	837.70						
Tare (g)	522.70						
Dry Wt. Of Sample (g)	315.00						
Moisture Content, %	55.6%						

moist-dens form

Particle-Size Analysis of Soil (ASTM D 422)

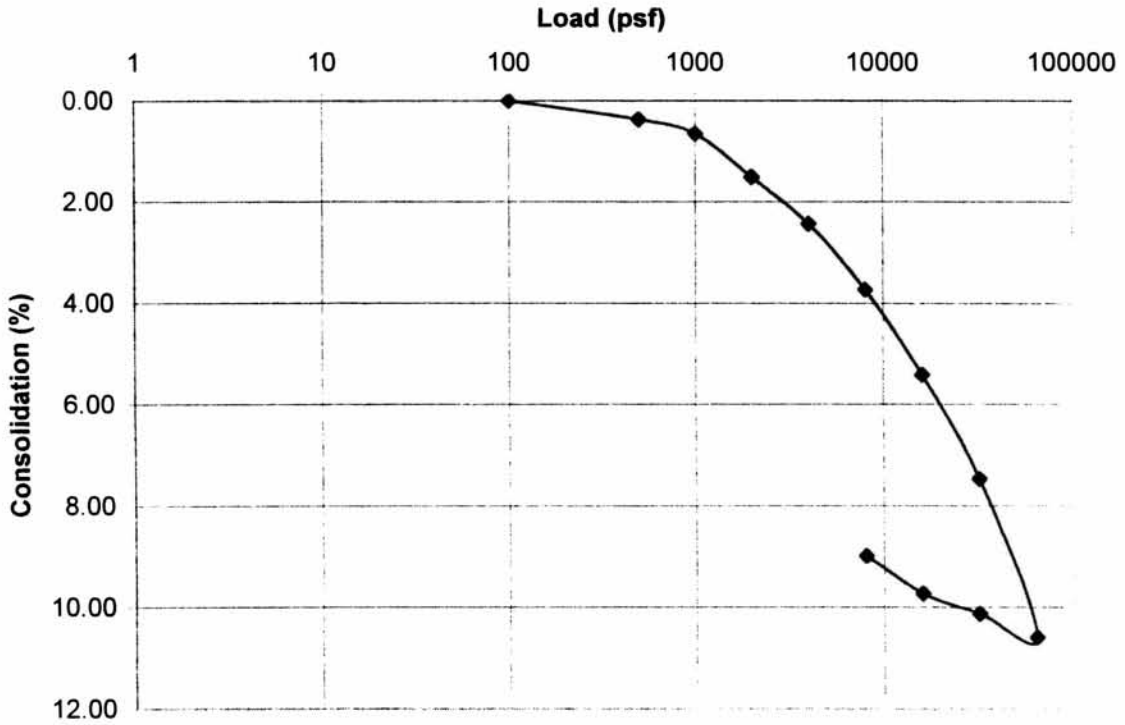
Project Name: BRC AQUIFER TESTING
Project No.: 83173-4
Report Date: 06/14/07

Sample No.: 29392
Sample Depth (ft.): B-3 59.5' - 60'
Material Description:

Tech.: jlw

Load (psf)	Consolidation (%)
100	0.00
500	0.37
1000	0.65
2000	1.51
4000	2.43
8000	3.73
16000	5.40
32000	7.46
64000	10.59
32000	10.13
16000	9.73
8000	8.99

B-3 @ 59.5 - 60'



PROJECT 83173-4
LAB 29392
B-3
59.5' to 60' ASTM D-854

Pycnometer Label	1
Mass of Pycometer,Mf =>	224.4
Mass of Pycometer & Water,Ma =>	722.96
Temperature of Water when	
Ma above was Taken, Ta =>	20.5
Mass of Speciman & Pycnometer =>	291.22
Mass of Pycnometer, Mf =>	224.4
Mass of Oven-Dry Specimen, Mo =>	66.47
of Pycnometer, Soil & Water, Mb =>	764.23
Temperature of Water when	20.5
Mb Above was Taken, Tb =>	

Prodedure

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

Water Density at Ta	0.99812
Water Density at Tb	998.31
K Factor at Tb	0.9999
Ma at Tb	497444.2109
Sp Gr at Tb	2.637698413
Sp Gr at 20 C	2.637434643
SPECIFIC GRAVITY AT 20 C	2.637434643

Project Name: BRC Aquifer Testing | Client: BRC | By: Doug Davis

Project Number: 83173 Task: 4 | Date: 5-31-07 | Date Due:

B-4	Boring Number
35-36.5	Depth
	Water Content (ASTM 2216)
	Dry Bulk Density (ASTM D2937)
	Total Porosity (ASTM D2435)
X	Flexible Wall (ASTM D5084) *OUTSIDE SERVICE*
X	Rigid Wall (ASTM D2434) *OUTSIDE SERVICE*
	Specific Gravity (ASTM ~~D698~~ 854)
	Specific Gravity (ASTM C127)
	Hydrometer (ASTM D422)
	Sieve Anysis (ASTM D422)
	Total Organic Carbon *OUTSIDE SERVICE (ATLAS)*
Shipped 6/1	Remarks

LABORATORY NUMBER: 29395

LABORATORY WORK ORDER

KLEINFELDER

Project No: 83173 Phase: 4

Project Name: BRC Aquifer Testing

Client Name: BRC

Client Ref /P.O #:

Special Instructions:

Sample Number: 29395

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

Date Sampled: 5/31/07

Date Received: 5/31/07

Date Needed:

~~Date Completed~~ Billed: 6/18/07

Verified By:

ASPHALT TESTING

Usage	Qty.	99#	Status
C123 Lt Wt Pieces/Agg		990715	
C127 Absorption/Gravity	1	~~990702~~ 990307	
CAL 205 Crushed Part		990712	
CAL 227 Cleanness TSI		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*		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	1	990305	
Moisture Determination Only	1	990317	
Moisture Determination/Unit Weight	1	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	1	990301	
Sulfate Sound (5) Sieve SZ C88		990708	
Swell Test FHA Specification (60 psi)		990312	
Unconfined Comp/Inc Moist D2166		990601	

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

FOR ACCOUNTING USE ONLY

Entered By: Date Entered:

Source: N/A

Supplier: N/A

Sample Location: B-4 35-40'

Type of Material: Gravel

Sampled by: D. Davis

Project Manager: C. Carlton / Chris W.

Kleinfelder West, Inc.
BMI/BRC Project
Project Number: 83173
Project Task: 4

Date: 5-31-07 **Date Sampled:** 5-31-07
Time: 1900 **Date Received:** _____ **Received By:** _____

Boring: B-4
Sample Depth: 35-40

Property Analysis	**Sample Number**	**Sample Type**		**Date Completed**
Initial volumetric and gravimetric water conte ASTM D2216/ D4643/D2974	✓			
Dry bulk density ASTM D2937	✓			
Calculated total porosity ASTM D2435	✓			
Saturated Hydraulic Conductivity				
Flexible Wall ASTM D5084				
Rigid Wall ASTM D2434				
Specific Gravity (Particle Density)			**Date Shipped**	
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			**Date Shipped**	
Analysis performed by Hall laboratory in Albuquerque, NM	✓			

Waikley Black

Sierra Testing Laboratories, Inc.
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762
(916) 939-3507

Hall Environmental Analysis Laboratory (HEAL)
4901 Hawkins St NE # A
Albuquerque, NM 87109
505) 345-3975

ATCAS

Kleinfelder West, Inc.
BMI/BRC Project
Project Number: 83173
Project Task: 4

Date: 5-31-07 **Date Sampled:** 5-31-07
Time: 1607 **Date Received:** _____ **Received By:** _____

Boring: B-4
Sample Depth: 35-36.5

Property Analysis	**Sample Number**	**Sample Type**		**Date Completed**
Initial volumetric and gravimetric water conte ASTM D2216/ D4643/D2974				
Dry bulk density ASTM D2937				
Calculated total porosity ASTM D2435				
Saturated Hydraulic Conductivity				
Flexible Wall ASTM D5084		SU1		
Rigid Wall ASTM D2434		SU1		
Specific Gravity (Particle Density)			Date Shipped	
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			Date Shipped	
Analysis performed by Hall laboratory in Albuquerque, NM				
Walkley Black				

Sierra Testing Laboratories, Inc.
5040 Robert J. Mathews Suite 1
El Dorado, CA 95762
(916) 939-3507

Hall Environmental Analysis Laboratory (HEAL)
4901 Hawkins St NE # A
Albuquerque, NM 87109
505) 345-3975

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 1, 2007
File:
Copies: 3

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 flexible wall (ASTM D2435) and rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-4: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
B-4@35-36.5	05/31/07	29395	06/1/07
B-2@60-61.5	05/31/07	29396	06/1/07
B-2@90-91.5	05/31/07	29396	06/1/07

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

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PARTICLE-SIZE ANALYSIS of SOILS

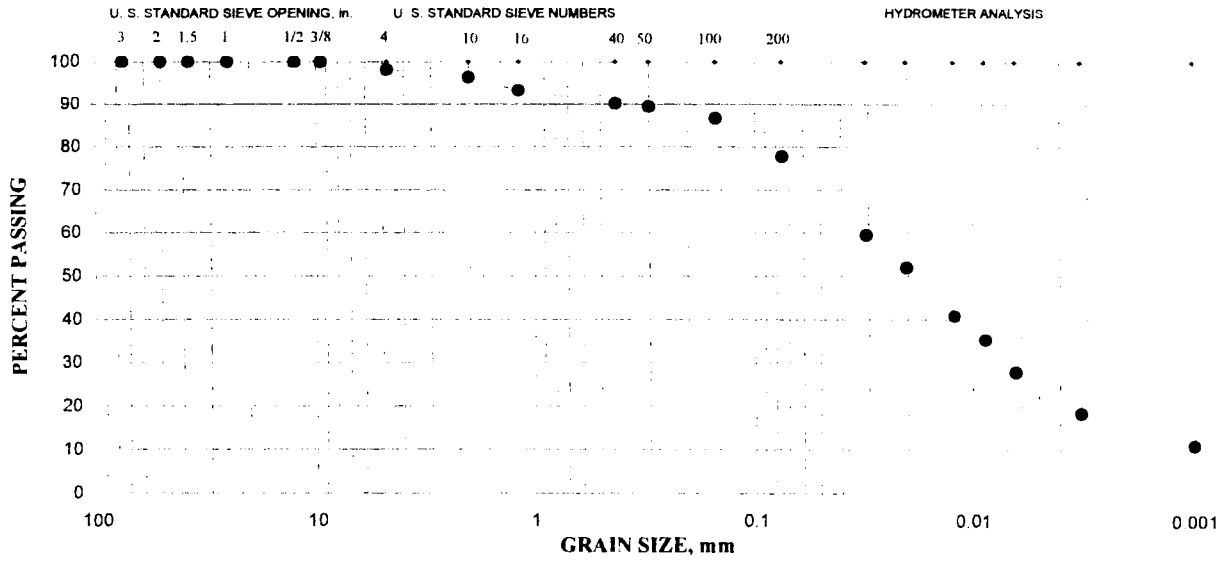
ASTM D 422-02

Boring #B- 4 @ 37.5'; S-29395 @ 35.0 - 40.0' June 7, 2007

Silt with Sand (ML) Specific Gravity = 2.68

LL = ; PL = ; PI = Gravel = 2%; Sand = 20%; Silt = 59%; 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)	2	98
#10 (2.00-mm)	4	96
#16 (1.18-mm)	7	93
#40 (425-µm)	10	90
#50 (300-µm)	11	89
#100 (150-µm)	13	87
#200 (75-µm)	22	78
Hydrometer Analysis		
31-µm		59
20-µm		52
12-µm		41
9-µm		35
6-µm		28
3.2-µm		19
Colloids (<1-µm)		11



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: 14462(b) **DATE:** June 12, 2007

SAMPLE: Soil **P.O.:**

MARKED: 83173 **LAB ID:** 29395

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974

SAMPLE NO.	LOCATION	DEPTH (feet)	ORGANIC CARBON
29395	B-4	37.5	3.30%

Robert L. Summers

LABORATORY MANAGER

Moisture Density

Project Name	BRC AQUIFER TESTING			Date	06/08/07	
Project Number	83173	Phase No.	Tested By	JLW	Checked By	JH
Lab Number	29395					
Boring Number	B-4					
Sample Depth	37.5					
Height (inches)	4.39					
Diameter (inches)	5.17					
Volume	0.0533					
Wt. of Sample At Field Moisture	2597.66					
Wet Density (pcf)	107.4					
Dry Density (pcf)	77.7					
Container No.						
Wt. of Wet Sample Plus Tare	475.15					
Wt. of Dry Sample Plus Tare	409.70					
Tare (g)	239.00					
Dry Wt. Of Sample (g)	170.70					
Moisture Content, %	38.3%					

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

Job # =>	83173	Lab Number =>	29395
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	NR
Sample Location =>	B-4 @ 37.5'	Tested By =>	JLW
		Reviewed By =>	JH

Pan Label =>	OZZY	
Tare Weight of Pan =>	239	A
Wet Wt. of Sample & Tare =>	475.2	B
Dry Wt. of Sample & Tare =>	409.7	C
Weight of Moisture (B-C) =>	65.5	D
Dry Wt. of Sample (C-A) =>	170.7	E
Percent Moisture (D/E)*100 =>	38.4	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
LAB NUMBER:	29393
BORING:	B-4
DEPTH:	37.5'
DATE:	06/11/07
TECHNICIAN:	JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	1	2	
Mass of Pycometer,Mf =>	224.4		A
Mass of Pycometer & Water,Ma =>	722.96		B
Temperature of Water when			
Ma above was Taken, Ta =>	22.6		C
Mass of Speciman & Pycnometer =>	279.24		D
Mass of Pycnometer, Mf =>	224.61	0	E
Mass of Oven-Dry Specimen, Mo =>	54.63		F
Mass of Pycnometer, Soil & Water, Mb =>	757.21		G
Temperature of Water when			
Mb Above was Taken, Tb =>	20.7		H

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	0.99764	
Water Density at Tb	0.99806	
K Factor at Tb	0.99985	
Ma at Tb	224.6093952	0
Sp Gr at Tb	2.680569185	#DIV/0!
Sp Gr at 20 C	2.6801671	#DIV/0!
SPECIFIC GRAVITY AT 20 C	2.6801671	

Project Name: BRC Aquifer Testing | Client: BRC | By: Doug Davis

Project Number: 83173 Task: 4 | Date: 6-1-07 | Date Due:

Boring Number	B-4	B-4	B-4	AP-09-04	AP-09-04	AP-09-04
Depth	45-48.5	75-80	80-81.5	55-60	55-56.5	65-70
Water Content (ASTM 2216)	X	X		X		X
Dry Bulk Density (ASTM D2937)	X	X		X		X
Total Porosity (ASTM D2435)	X	X		X		X
Flexible Wall (ASTM D5084) *OUTSIDE SERVICE*			X		X	
Rigid Wall (ASTM D2434) *OUTSIDE SERVICE*			X		X	
Specific Gravity (ASTM D854)	X	X		X		X
Specific Gravity (ASTM C127)	X			X		X
Hydrometer (ASTM D422)	X	X		X		X
Sieve Anysis (ASTM D422)	X	X		X		X
Total Organic Carbon *OUTSIDE SERVICE (ATLAS)*	X	X		X		X
Remarks			Shipped 6/4		Shipped 6/4	Billed on accident was BRC2 Shipped 6/4

LABORATORY NUMBER: 29402

LABORATORY WORK ORDER

KLEINFELDER

Project No: 83173 Phase: 4

Project Name: BRC AQUIFER Testing

Client Name: BRC

Client Ref./P.O.#:

Special Instructions:

Sample Number: 29402

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

Date Sampled: 6/1/07
Date Received: 6/1/07
Date Needed: ASAP
Billed
~~Date Completed~~: 6/18/07
Verified By:

ASPHALT TESTING

Usage	Qty.	99#	Status
C123 Lt Wt Pieces/Agg		~~990715~~	
C127 Absorption/Gravity		72 ~~990716~~ (HC307)	
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*		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	✓
Correct Oversize Material in Sample CAL301		990203	
Direct Shear 1 Point		990608	
Direct Shear 3 Point		990609	
Harvard Miniature		992191	
Hydrometer Only	4	990305	✓
Moisture Determination Only	3	990317	✓
Moisture Determination/Unit Weight	3	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	4	990301	✓
Sulfate Sound (5) Sieve SZ C88		990708	
Swell Test FHA Specification (60 psi)		990312	
Unconfined Comp/Inc Moist D2166		990601	

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

FOR ACCOUNTING USE ONLY
Entered By: Date Entered:

Source:
Supplier:
Sample Location: B-4 / AA-09-CW
Type of Material: ENVIRO.
Sampled by: DOUG DAVIS
Project Manager: G. CARTER / EMILIA

DISTRIBUTION: WHITE - Lab Manager/Accounting YELLOW - Sample PINK - Project Manager GOLD - Sample Log Book

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 4, 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 flexible wall (ASTM D5084) and rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-4: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
AA-20-OW@30-31.5'	06/02/07	29403	06/4/07
AA-20-OW@50-51.5'	06/02/07	29403	06/4/07
AA-06@55-56.5'	06/03/07	29401	06/4/07
AA-06@60-61.5'	06/03/07	29401	06/4/07
B-4@80-81.5'	06/01/07	29402	06/4/07
AA-09-OW@55-56.5'	06/01/07	29402	06/4/07
AA-09-OW@70-71.5'	06/01/07	29402	06/4/07

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

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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 4, 2007
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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 flexible wall (ASTM D5084) and rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-4: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
AA-20-OW@30-31.5'	06/02/07	29403	06/4/07
AA-20-OW@50-51.5'	06/02/07	29403	06/4/07
AA-06@55-56.5'	06/03/07	29401	06/4/07
AA-06@60-61.5'	06/03/07	29401	06/4/07
B-4@80-81.5'	06/01/07	29402	06/4/07
AA-09-OW@55-56.5'	06/01/07	29402	06/4/07
AA-09-OW@70-71.5'	06/01/07	29402	06/4/07

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

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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: 14462(g) **DATE:** June 15, 2007

SAMPLE: Soil **P.O.:**

MARKED: 83173 **LAB ID:** 29402

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974

SAMPLE NO.	LOCATION	DEPTH (feet)	ORGANIC CARBON
29402	B-4	76-77	6.80%
29402	AA-09-OW	57.5-58.0	4.10%
29402	AA-09-OW	66-67	4.20%

Robert L. Summers

LABORATORY MANAGER

PARTICLE-SIZE ANALYSIS of SOILS

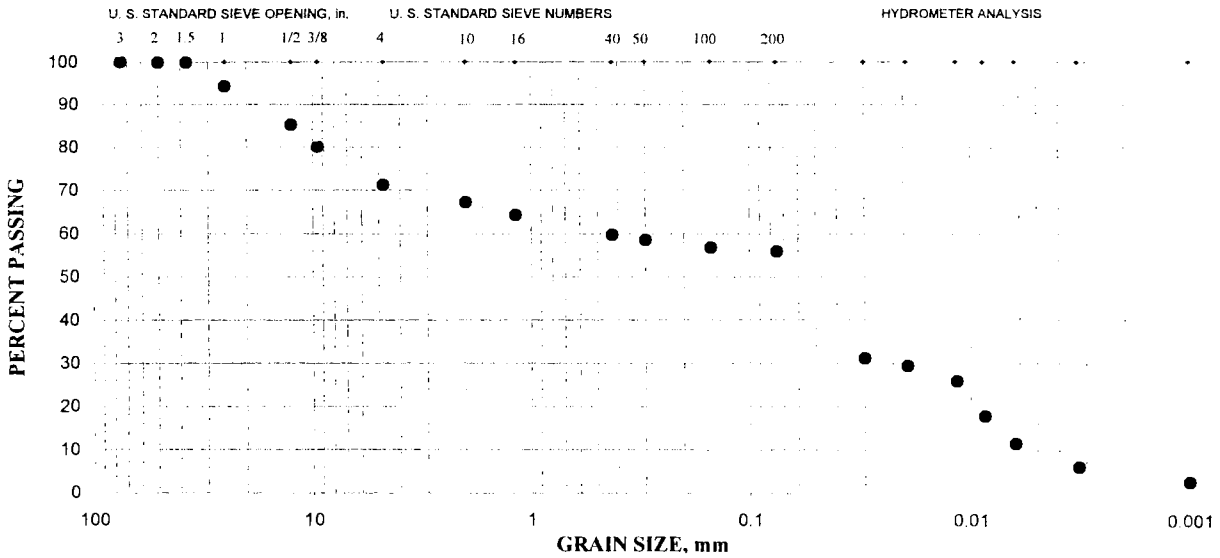
ASTM D 422-02

Boring #B-4@76-77'; S-29402 @ 75.0 - 80.0' June 7, 2007

Silt with Gravel (ML) Specific Gravity = 2.67

LL = ; PL = ; PI = Gravel = 29%; Sand = 15%; Silt = 50%; 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)	6	94
1/2" (12.5-mm)	15	85
3/8" (9.5-mm)	20	80
#4 (4.75-mm)	29	71
#10 (2.00-mm)	33	67
#16 (1.18-mm)	36	64
#40 (425-µm)	40	60
#50 (300-µm)	41	59
#100 (150-µm)	43	57
#200 (75-µm)	44	56
Hydrometer Analysis		
30-µm		31
19-µm		29
12-µm		26
9-µm		18
6-µm		12
3.3-µm		6
Colloids (<1-µm)		3



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

Project Name: BRC AQUIFER TESTING

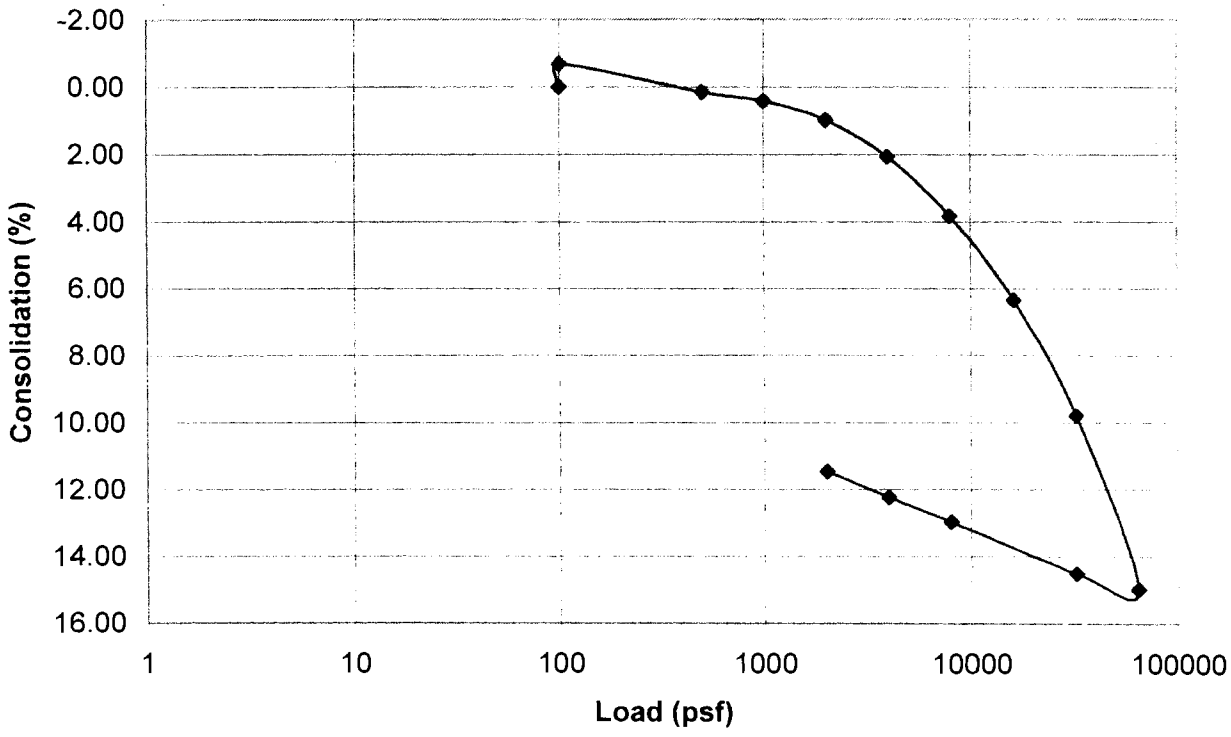
Project No.: 83173-4

Report Date:

Sample No.: Tech.: jlw
Sample Depth (ft.): B-4 @ 76 - 77'
Material Description:

Load (psf)	Consolidation (%)
100	0.00
100	-0.68
500	0.15
1000	0.41
2000	0.98
4000	2.07
8000	3.82
16000	6.35
32000	9.78
64000	14.98
32000	14.50
8000	12.97
4000	12.23
2000	11.46

B-4 @ 76 - 77'



PROJECT NAME:	BRC Aquifer Testing
PROJECT NUMBER:	83173
LAB NUMBER:	29402
BORING:	B-4
DEPTH:	76 - 77'
DATE:	06/14/07
TECHNICIAN:	JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	1
Mass of Pycometer,Mf =>	220.94
Mass of Pycometer & Water,Ma =>	719.4
Temperature of Water when	
Ma above was Taken, Ta =>	20.4
Mass of Speciman & Pycnometer =>	273.66
Mass of Pycnometer, Mf =>	220.94
Mass of Oven-Dry Specimen, Mo =>	52.56
Mass of Pycnometer, Soil & Water, Mb =>	752.3
Temperature of Water when	
Mb Above was Taken, Tb =>	20.5

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	0.9981
K Factor at Tb	0.9999
Ma at Tb	220.9300308
Sp Gr at Tb	2.673448627
Sp Gr at 20 C	2.673181282
SPECIFIC GRAVITY AT 20 C	2.673181282

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

Job # =>	83173	Lab Number =>	29402
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	NR
Sample Location =>	B-4 @ 76 - 77'	Tested By =>	JLW
		Reviewed By =>	JH

Pan Label =>	ZI	
Tare Weight of Pan =>	33.76	A
Wet Wt. of Sample & Tare =>	163.36	B
Dry Wt. of Sample & Tare =>	132.51	C
Weight of Moisture (B-C) =>	30.9	D
Dry Wt. of Sample (C-A) =>	98.75	E
Percent Moisture (D/E)*100 =>	31.2	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

Moisture Density

Project Name	BRC AQUIFER TESTING				Date	06/07/07	
Project Number	83173	Phase No.		Tested By	JLW	Checked By	JH
Lab Number	29402						
Boring Number	B-4						
Sample Depth	76-77						
Height (inches)	1						
Diameter (inches)	2.41						
Volume	0.8282						
Wt. of Sample At Field Moisture	129.70						
Wet Density (pcf)	107.4						
Dry Density (pcf)	81.8						
Container No.							
Wt. of Wet Sample Plus Tare	163.40						
Wt. of Dry Sample Plus Tare	132.50						
Tare (g)	33.76						
Dry Wt. Of Sample (g)	98.74						
Moisture Content, %	31.3%						

moist-dens form

PARTICLE-SIZE ANALYSIS of SOILS

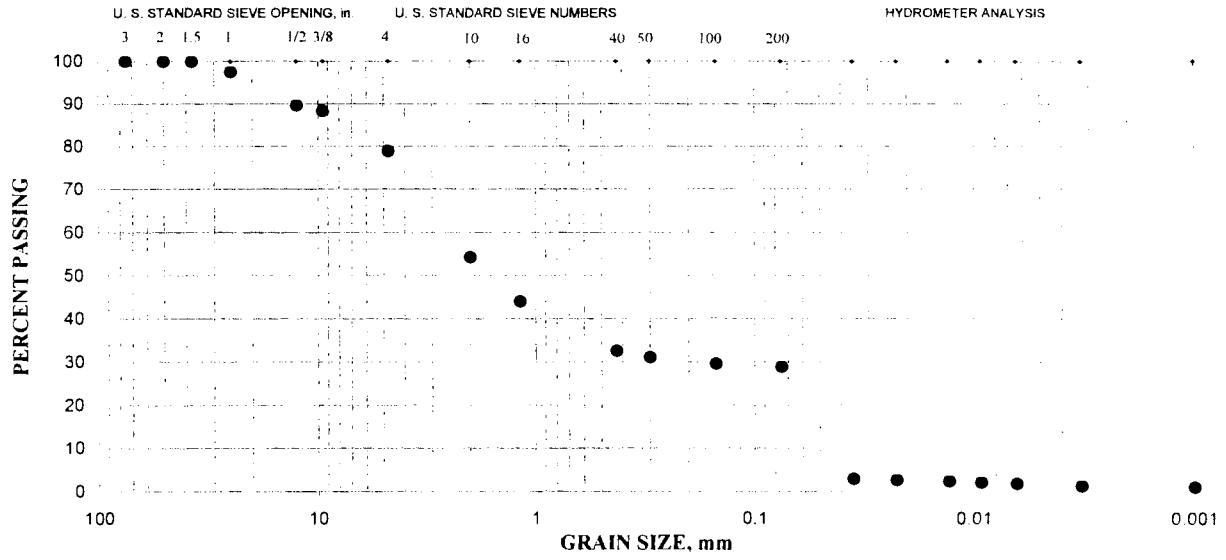
ASTM D 422-02

Boring #B-4@46-47'; S-29402 @ 45.0 - 47.5' June 7, 2007

Silty Sand with Gravel (SM) Specific Gravity = 2.71

LL = ; PL = ; PI = Gravel = 21%; Sand = 50%; 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)	0	100
1" (25.0-mm)	3	97
1/2" (12.5-mm)	10	90
3/8" (9.5-mm)	12	88
#4 (4.75-mm)	21	79
#10 (2.00-mm)	46	54
#16 (1.18-mm)	56	44
#40 (425-µm)	67	33
#50 (300-µm)	69	31
#100 (150-µm)	71	29
#200 (75-µm)	71	29
Hydrometer Analysis		
35-µm		3
22-µm		3
13-µm		2
9-µm		2
6-µm		2
3.3-µm		1
Colloids (<1-µm)		1



SPECIFIC GRAVITY OF COARSE AND FINE AGGREGATE ASTM 127 & 128

Job # =>	83173	Lab Number =>	29402
Project =>	BRC Aquifer Testing	Date Sampled =>	
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	
Sample Location =>	B-4 @ 45 - 46'	Tested By =>	JLW
		Reviewed By =>	

COARSE AGGREGATE

Dry Wt. of Sample A=>	1979.4		
SSD Wt. of Sample B=>	2046.8		
Wt. SSD Under Water C=>	1229.8		Averages
Bulk Sp Gr. A/(B-C) =>	2.423		2.423
Bulk SSD B/(B-C) =>	2.505		2.505
Apparent Sp Gr A/(A-C) =>	2.641		2.641
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
LAB NUMBER:	29402
BORING:	B - 4
DEPTH:	45 - 46'
DATE:	06/13/07
TECHNICIAN:	JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Z
Mass of Pycometer,Mf =>	221.22
Mass of Pycometer & Water,Ma =>	719.19
Temperature of Water when	
Ma above was Taken, Ta =>	22.7
Mass of Speciman & Pycnometer =>	322.08
Mass of Pycnometer, Mf =>	221.12
Mass of Oven-Dry Specimen, Mo =>	100.96
Mass of Pycnometer, Soil & Water, Mb =>	782.93
Temperature of Water when	
Mb Above was Taken, Tb =>	21

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	0.99761
Water Density at Tb	0.99799
K Factor at Tb	0.99979
Ma at Tb	221.4092286
Sp Gr at Tb	2.71252015
Sp Gr at 20 C	2.711950521
SPECIFIC GRAVITY AT 20 C	2.711950521

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

Job # =>	83173	Lab Number =>	29402
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	NR
Sample Location =>	B-4 @ 46 - 47'	Tested By =>	JLW
		Reviewed By =>	JH

Pan Label =>	ROCK	
Tare Weight of Pan =>	439	A
Wet Wt. of Sample & Tare =>	2360.5	B
Dry Wt. of Sample & Tare =>	2072.3	C
Weight of Moisture (B-C) =>	288.2	D
Dry Wt. of Sample (C-A) =>	1633.3	E
Percent Moisture (D/E)*100 =>	17.6	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

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: 14462(d) **DATE:** June 12, 2007

SAMPLE: Soil **P.O.:**

MARKED: 83173 **LAB ID:** 29402

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974

SAMPLE NO.	LOCATION	DEPTH (feet)	ORGANIC CARBON
29402	B-4	46-47	1.50%

Robert L. Summers

LABORATORY MANAGER

PARTICLE-SIZE ANALYSIS of SOILS

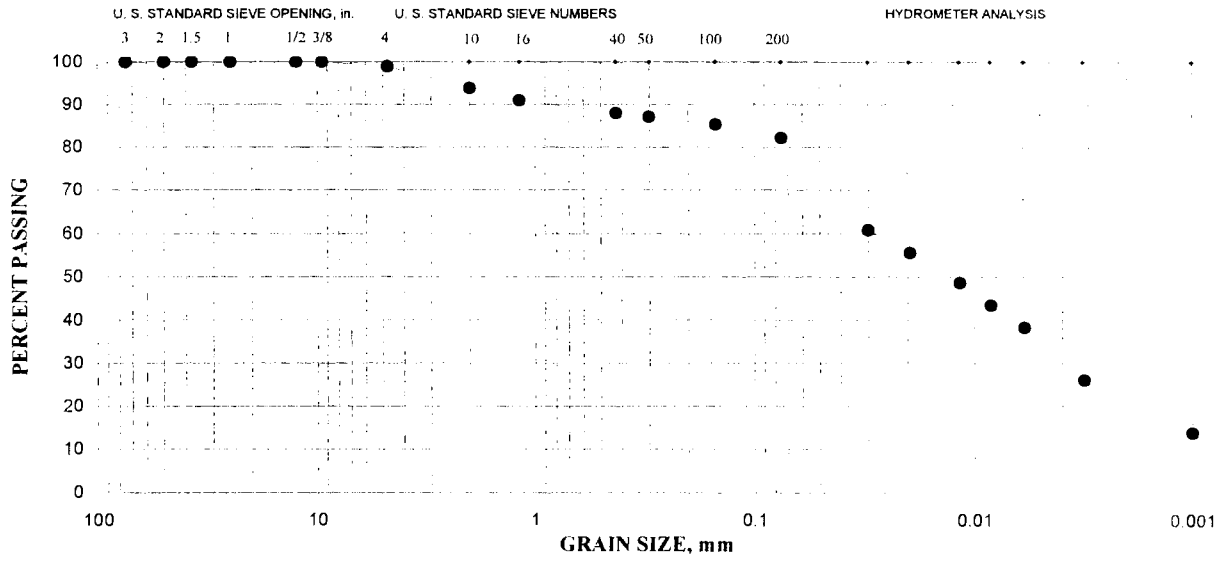
ASTM D 422-02

Boring #AA-09-OW@57.5-58'; S-29402 @ 55.0 - 60.0' June 7, 2007

Silt with Sand (ML) Specific Gravity = 2.67

LL = ; PL = ; PI = Gravel = 1%; Sand = 17%; Silt = 56%; Clay = 26%

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)	9	91
#40 (425-µm)	12	88
#50 (300-µm)	13	87
#100 (150-µm)	15	85
#200 (75-µm)	18	82
Hydrometer Analysis		
30-µm		61
19-µm		56
12-µm		49
8-µm		43
6-µm		38
3.2-µm		26
Colloids (<1-µm)		14



PROJECT NAME:	BRC Aquifer Testing
PROJECT NUMBER:	83173
LAB NUMBER:	29402
BORING:	AA-09-OW
DEPTH:	57.5 - 58
DATE:	06/13/07
TECHNICIAN:	JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Y
Mass of Pycometer,Mf =>	224.4
Mass of Pycometer & Water,Ma =>	722.96
Temperature of Water when	
Ma above was Taken, Ta =>	22.6
Mass of Speciman & Pycnometer =>	271.18
Mass of Pycnometer, Mf =>	224.59
Mass of Oven-Dry Specimen, Mo =>	46.59
Mass of Pycnometer, Soil & Water, Mb =>	751.56
Temperature of Water when	
Mb Above was Taken, Tb =>	21.1

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	0.99764
Water Density at Tb	0.99797
K Factor at Tb	0.99977
Ma at Tb	224.5645248
Sp Gr at Tb	2.589772096
Sp Gr at 20 C	2.589176448
SPECIFIC GRAVITY AT 20 C	2.589176448

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

Job # =>	83173	Lab Number =>	29402
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	NR
Sample Location =>	AA-09-OW @ 57.5 - 58'	Tested By =>	JLW
		Reviewed By =>	JH

Pan Label =>	KL	
Tare Weight of Pan =>	392.85	A
Wet Wt. of Sample & Tare =>	886.65	B
Dry Wt. of Sample & Tare =>	665.44	C
Weight of Moisture (B-C) =>	221.2	D
Dry Wt. of Sample (C-A) =>	272.59	E
Percent Moisture (D/E)*100 =>	81.2	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

PARTICLE-SIZE ANALYSIS of SOILS

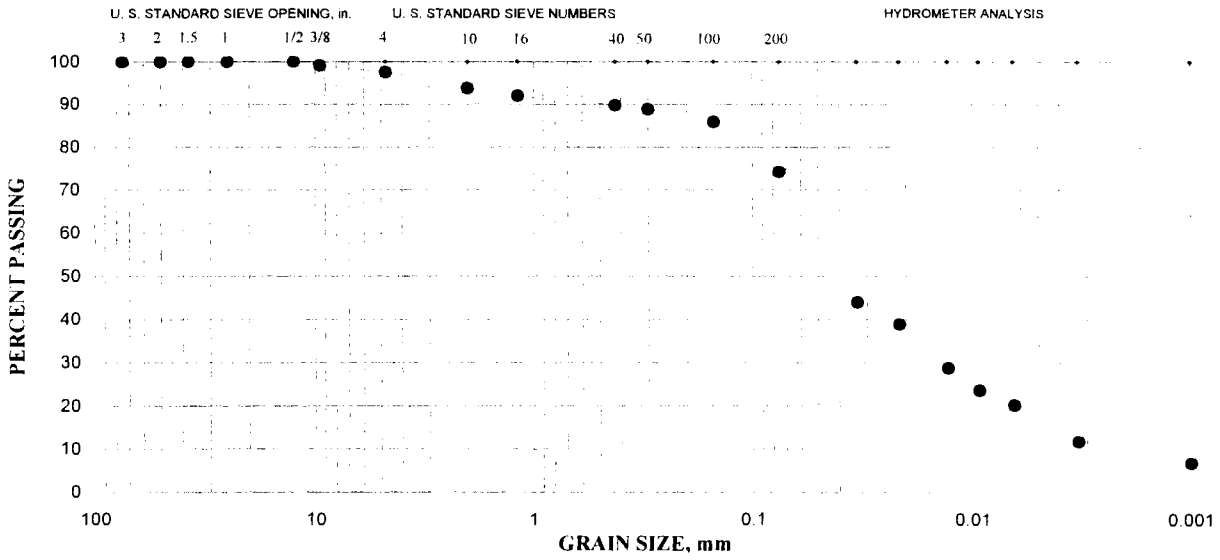
ASTM D 422-02

Boring #AA-09-OW@66-67'; S-29402 @ 65.0 - 70.0' June 7, 2007

Silt with Sand (ML) Specific Gravity = 2.60

LL = ; PL = ; PI = Gravel = 2%; Sand = 24%; Silt = 62%; 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)	1	99
#4 (4.75-mm)	2	98
#10 (2.00-mm)	6	94
#16 (1.18-mm)	8	92
#40 (425-µm)	10	90
#50 (300-µm)	11	89
#100 (150-µm)	14	86
#200 (75-µm)	26	74
Hydrometer Analysis		
33-µm		44
21-µm		39
13-µm		29
9-µm		24
6-µm		20
3.3-µm		12
Colloids (<1-µm)		7



PROJECT NAME:	BRC Aquifer Testing
PROJECT NUMBER:	83173
LAB NUMBER:	29402
BORING:	AA-09-OW
DEPTH:	66 - 67'
DATE:	06/13/07
TECHNICIAN:	JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	X
Mass of Pycometer,Mf =>	221.68
Mass of Pycometer & Water,Ma =>	719.09
Temperature of Water when	
Ma above was Taken, Ta =>	22.7
Mass of Speciman & Pycnometer =>	269.54
Mass of Pycnometer, Mf =>	221.68
Mass of Oven-Dry Specimen, Mo =>	47.86
Mass of Pycnometer, Soil & Water, Mb =>	748.57
Temperature of Water when	
Mb Above was Taken, Tb =>	21.2

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	0.99761
Water Density at Tb	0.99795
K Factor at Tb	0.99974
Ma at Tb	221.8491194
Sp Gr at Tb	2.603917301
Sp Gr at 20 C	2.603240283
SPECIFIC GRAVITY AT 20 C	2.603240283

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

Job # =>	83173	Lab Number =>	29402
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	NR
Sample Location =>	AA-09-OW @ 66 - 67'	Tested By =>	JLW
		Reviewed By =>	JH

Pan Label =>	23	
Tare Weight of Pan =>	438.36	A
Wet Wt. of Sample & Tare =>	1208.88	B
Dry Wt. of Sample & Tare =>	904.68	C
Weight of Moisture (B-C) =>	304.2	D
Dry Wt. of Sample (C-A) =>	466.32	E
Percent Moisture (D/E)*100 =>	65.2	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

Project Name: BRC Aquifer Testing | **Client:** BRC | **By:** Doug Davis

Project Number: 83173 Task: 4 | **Date:** 6/2/07 | **Date Due:**

Boring Number	AA-20-CW	AA-20-CW	AA-20-CW	AA-20-CW
Depth	50-51.5	45-50	30-35	30.31.5
Water Content (ASTM 2216)		X	X	
Dry Bulk Density (ASTM D2937)		X	X	
Total ~~Porosity~~ (ASTM D2435)		X	X	
Flexible Wall (ASTM D5084) *OUTSIDE SERVICE*	X			X
Rigid Wall (ASTM D2434) *OUTSIDE SERVICE*	X			X
Specific Gravity (ASTM ~~D698~~)		X	X	
Specific Gravity (ASTM C127)		X	X	
Hydrometer (ASTM D422)		X	X	
Sieve Anysis (ASTM D422)		X	X	
Total Organic Carbon *OUTSIDE SERVICE (ATLAS)*		X	X	
Remarks	Shipped 6/4		34-35'	Shipped 6/4

LABORATORY NUMBER: 29403

LABORATORY WORK ORDER

KLEINFELDER

Project No: 83173 Phase: 4

Project Name: BRC Aquifer Testing

Client Name: BRC

Client Ref./P.O.#:

Special Instructions:

Sample Number: 29403

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

Date Sampled: 6/26/07

Date Received: 6/12/07

Date Needed: ASAP

~~Date Completed:~~ Billed 6/18/07

~~Verified by:~~ complete 6/21/07

ASPHALT TESTING

Usage	Qty.	99#	Status
C123 Lt Wt Pieces/Agg		990715	
C127 Absorption/Gravity	2	~~990702~~ F10307	
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*		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	

☐ NDOT ☐ LWD ☐ AASHTO ☐ CCSD ☐ UBC ☐ CCPW ☐ ASTM ☐ Other

FOR ACCOUNTING USE ONLY

Entered By: Date Entered:

Source: N/A

Supplier: N/A

Sample Location: AA-20-GW 30-51.5'

Type of Material:

Sampled by: Dennis Davis

Project Manager: G. Oberta / Doug N.

DISTRIBUTION: WHITE - Lab Manager/Accounting YELLOW - Sample PINK - 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 4, 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 flexible wall (ASTM D5084) and rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-4: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
AA-20-OW@30-31.5'	06/02/07	29403	06/4/07
AA-20-OW@50-51.5'	06/02/07	29403	06/4/07
AA-06@55-56.5'	06/03/07	29401	06/4/07
AA-06@60-61.5'	06/03/07	29401	06/4/07
B-4@80-81.5'	06/01/07	29402	06/4/07
AA-09-OW@55-56.5'	06/01/07	29402	06/4/07
AA-09-OW@70-71.5'	06/01/07	29402	06/4/07

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

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PARTICLE-SIZE ANALYSIS of SOILS

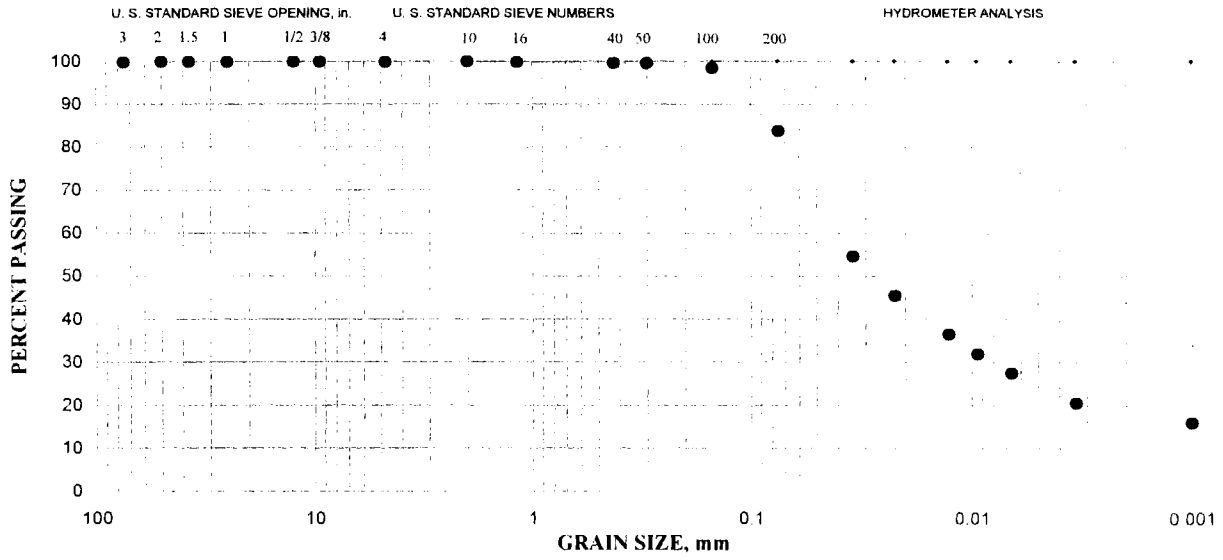
ASTM D 422-02

Boring #AA-20-OW@34-35'; S-29403 @ 30.0 - 35.0' June 7, 2007

Silt with Sand (ML) Specific Gravity = 2.59

LL = ; PL = ; PI = Gravel = 0%; Sand = 16%; Silt = 64%; Clay = 20%

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)	16	84
Hydrometer Analysis		
34-µm		55
22-µm		46
13-µm		36
9-µm		32
7-µm		27
3.4-µm		20
Colloids (<1-µm)		16



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

Project Name: BRC AQUIFER TESTING

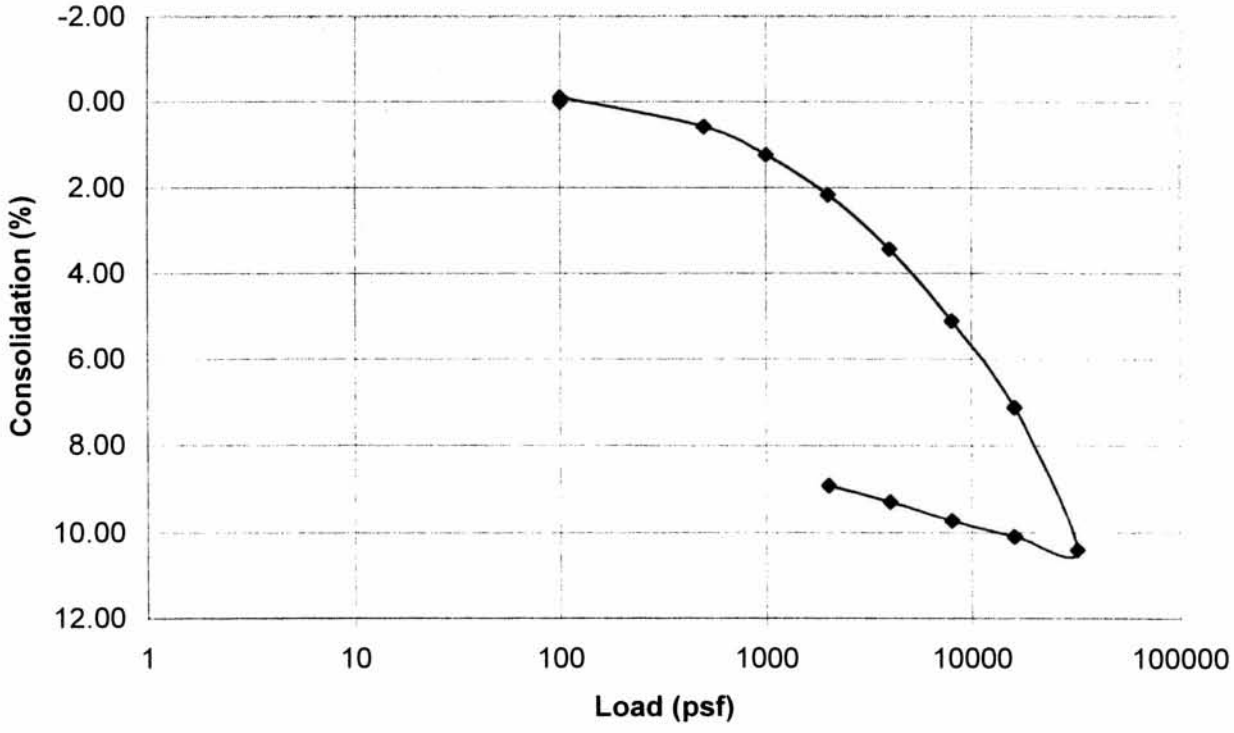
Project No.: 83173-4

Report Date: 06/21/07

Sample No.: 29403 Tech.: jlw
Sample Depth (ft.): AA-20-OW @ 34 - 35'
Material Description:

Load (psf)	Consolidation (%)
100	0.00
100	-0.11
500	0.57
1000	1.23
2000	2.16
4000	3.42
8000	5.11
16000	7.13
32000	10.40
16000	10.09
8000	9.72
4000	9.29
2000	8.91

AA-20-OW @ 34 - 35'



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

Job # =>	83173	Lab Number =>	29403
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	NR
Sample Location =>	AA-20-OW @ 34 - 35'	Tested By =>	JLW
		Reviewed By =>	JH

Pan Label =>	JOE-2	
Tare Weight of Pan =>	203.26	A
Wet Wt. of Sample & Tare =>	469.46	B
Dry Wt. of Sample & Tare =>	403.19	C
Weight of Moisture (B-C) =>	66.3	D
Dry Wt. of Sample (C-A) =>	199.93	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

Moisture Density

Project Name	BRC AQUIFER TESTING				Date	06/13/07	
Project Number	83173	Phase No.		Tested By	JLW	Checked By	JH
Lab Number	29403						
Boring Number	AA-20-OW						
Sample Depth	34-35						
Height (inches)	3.5						
Diameter (inches)	5.26						
Volume	0.0440						
Wt. of Sample At Field Moisture	2073.72						
Wet Density (pcf)	103.9						
Dry Density (pcf)	78.1						
Container No.							
Wt. of Wet Sample Plus Tare	469.40						
Wt. of Dry Sample Plus Tare	403.20						
Tare (g)	203.26						
Dry Wt. Of Sample (g)	199.94						
Moisture Content, %	33.1%						

moist-dens form

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TESTING MATERIALS

LABORATORY NO: 14462(j) **DATE:** June 20, 2007

SAMPLE: Soil **P.O.:**

MARKED: 83173-4 **LAB ID:** 29403

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974

SAMPLE NO.	LOCATION	DEPTH (feet)	ORGANIC CARBON
29403	AA-20-OW	34-35	1.60%

Robert L. Summers

LABORATORY MANAGER

PROJECT NAME:	BRC Aquifer Testing
PROJECT NUMBER:	83173
LAB NUMBER:	29403
BORING:	AA-20-OW
DEPTH:	34 - 35'
DATE:	06/19/07
TECHNICIAN:	JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	Y
Mass of Pycometer,Mf =>	224.4
Mass of Pycometer & Water,Ma =>	722.96
Temperature of Water when	
Ma above was Taken, Ta =>	20.4
Mass of Speciman & Pycnometer =>	264.28
Mass of Pycnometer, Mf =>	224.4
Mass of Oven-Dry Specimen, Mo =>	39.88
Mass of Pycnometer, Soil & Water, Mb =>	747.45
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	224.4947264
Sp Gr at Tb	2.591293047
Sp Gr at 20 C	2.591552177
SPECIFIC GRAVITY AT 20 C	2.591552177

PARTICLE-SIZE ANALYSIS of SOILS

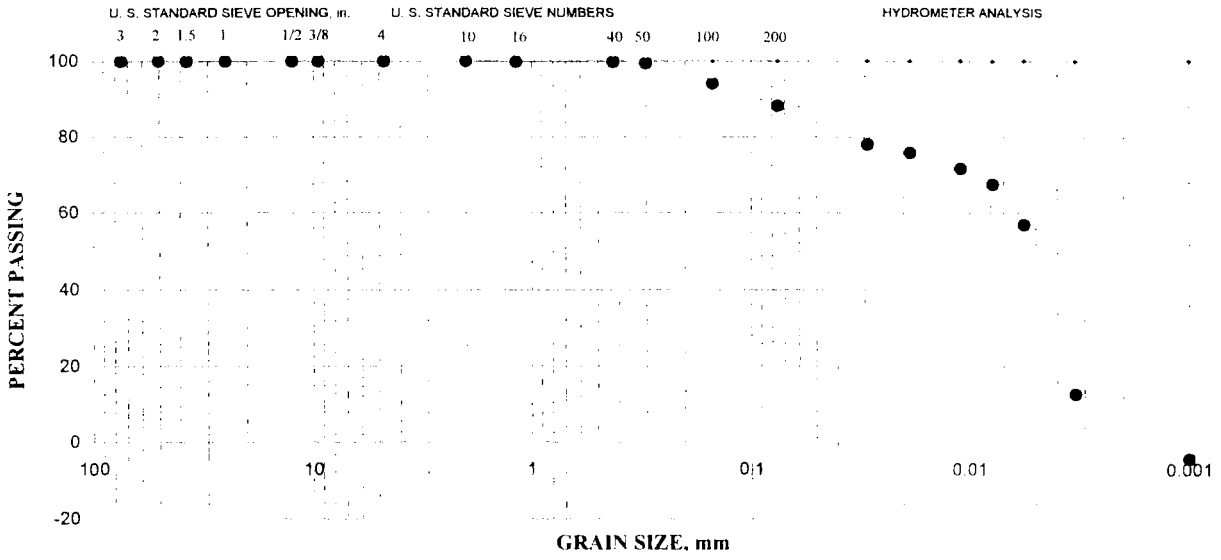
ASTM D 422-02

Boring #AA-20-OW@45-46'; S-29403 @ 45.0 - 50.0' June 7, 2007

Silt (ML) Specific Gravity = 2.70

LL = ; PL = ; PI = Gravel = 0%; Sand = 12%; Silt = 75%; Clay = 13%

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)	6	94
#200 (75-µm)	12	88
Hydrometer Analysis		
29-µm		78
19-µm		76
11-µm		72
8-µm		67
6-µm		57
3.3-µm		13
Colloids (<1-µm)		-4



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

Project Name: BRC AQUIFER TESTING

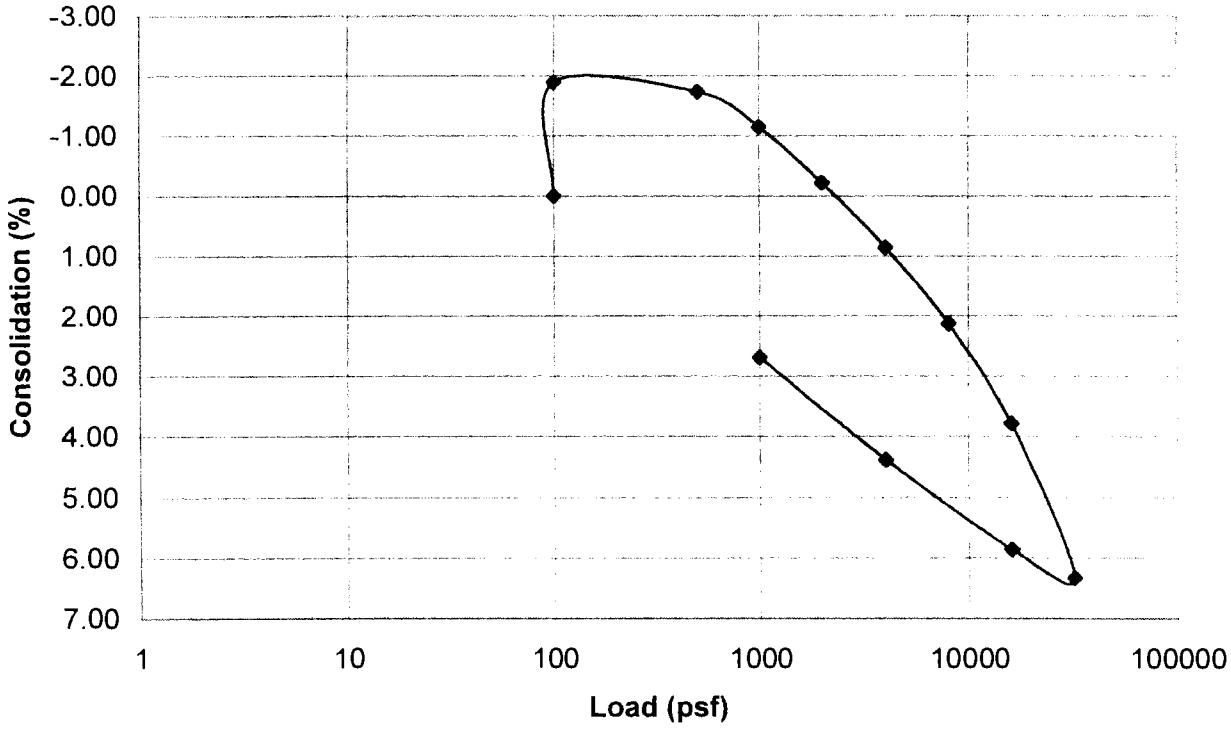
Project No.: 83173-4

Report Date:06/18/07

Sample No.: 29403 Tech.: jlw
Sample Depth (ft.): AA-20-OW @ 45 - 46'
Material Description:

Load (psf)	Consolidation (%)
100	0.00
100	-1.89
500	-1.73
1000	-1.15
2000	-0.22
4000	0.86
8000	2.13
16000	3.79
32000	6.33
16000	5.86
4000	4.38
1000	2.69

AA-20-OW @ 45 - 46'



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LABORATORY NO: 14462(h) **DATE:** June 15, 2007

SAMPLE: Soil **P.O.:**

MARKED: 83173 **LAB ID:** 29403

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974

SAMPLE NO.	LOCATION	DEPTH (feet)	ORGANIC CARBON
29403	AA-20-OW	45-46	4.50%

Robert L. Summers

LABORATORY MANAGER

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

Job # =>	83173	Lab Number =>	29403
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	NR
Sample Location =>	AA-20-OW @ 45 - 46'	Tested By =>	JLW
		Reviewed By =>	JH

Pan Label =>	HB	
Tare Weight of Pan =>	179.26	A
Wet Wt. of Sample & Tare =>	679.97	B
Dry Wt. of Sample & Tare =>	562.68	C
Weight of Moisture (B-C) =>	117.3	D
Dry Wt. of Sample (C-A) =>	383.42	E
Percent Moisture (D/E)*100 =>	30.6	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

Moisture Density

Project Name	BRC AQUIFER TESTING				Date	06/14/07	
Project Number	83173	Phase No.		Tested By	JLW	Checked By	JH
Lab Number	29403						
Boring Number	AA-20-OW						
Sample Depth	45-46'						
Height (inches)	4.9						
Diameter (inches)	5.01						
Volume	0.0559						
Wt. of Sample At Field Moisture	2938.95						
Wet Density (pcf)	115.9						
Dry Density (pcf)	88.7						
Container No.							
Wt. of Wet Sample Plus Tare	680.00						
Wt. of Dry Sample Plus Tare	562.68						
Tare (g)	179.30						
Dry Wt. Of Sample (g)	383.38						
Moisture Content, %	30.6%						

moist-dens form

PROJECT NAME:	BRC Aquifer Testing
PROJECT NUMBER:	83173
LAB NUMBER:	29403
BORING:	AA-20-OW
DEPTH:	45 - 46'
DATE:	06/13/07
TECHNICIAN:	JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	1
Mass of Pycometer,Mf =>	221.22
Mass of Pycometer & Water,Ma =>	719.19
Temperature of Water when	
Ma above was Taken, Ta =>	22.7
Mass of Speciman & Pycnometer =>	268.62
Mass of Pycnometer, Mf =>	221.09
Mass of Oven-Dry Specimen, Mo =>	47.53
Mass of Pycnometer, Soil & Water, Mb =>	749.14
Temperature of Water when	
Mb Above was Taken, Tb =>	21.0

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	0.99761
Water Density at Tb	0.99799
K Factor at Tb	0.99979
Ma at Tb	221.4092286
Sp Gr at Tb	2.703640501
Sp Gr at 20 C	2.703072736
SPECIFIC GRAVITY AT 20 C	2.703072736

Project Name: BRC Aquifer Testing | Client: BRC | By: Doug Davis

Project Number: 83173 Task: 4 | Date: 6/3/07 | Date Due:

Boring Number	AA-06	AA-06	AA-06	
Depth	50-55	55-56.5	60-61.5	
Water Content (ASTM 2216)	X	X	X	
Dry Bulk Density (ASTM D2937)	X	X	X	
Total Porosity (ASTM D2435)	X	X	X	
Flexible Wall (ASTM D5084) *OUTSIDE SERVICE*		X	X	
Rigid Wall (ASTM D2434) *OUTSIDE SERVICE*		X	X	
Specific Gravity (ASTM ~~D698~~ D854)	X			
Specific Gravity (ASTM C127)	X			
Hydrometer (ASTM D422)	X			
Sieve Anysis (ASTM D422)	X			
Total Organic Carbon *OUTSIDE SERVICE (ATLAS)*	X			
	X			
Remarks		Shipped 6/4	Shipped 6/4	

Billed: 6/18/07
Complete: 6/20/07

LABORATORY NUMBER: 29401

LABORATORY WORK ORDER

KLEINFELDER

Project No: 83173 Phase: 4

Project Name: BRC Aquifer Testing

Client Name: BRC

Client Ref./P.O.#:

Special Instructions:

Sample Number: 29401

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

Date Sampled: 6/3/07
Date Received: 6/3/07
Date Needed: ASAP
Billed
~~Date Completed~~: 6/18/07
Verified By:

ASPHALT TESTING

Usage	Qty.	99#	Status
C123 Lt Wt Pieces/Agg		990715	
C127 Absorption/Gravity	3	~~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	

MISC. OTHER

Usage	Qty.	99#	Status
Chloride Analysis		996020	
Corrosivity Analysis		991508	
Corrosivity, Resistivity, Sodium Sulfate, Solubility, pH*		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	✓
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	1	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	

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

FOR ACCOUNTING USE ONLY
Entered By: Date Entered:

Source: N/A
Supplier: N/A
Sample Location: AA-06 @ 50-65'
Type of Material: CLAYEY
Sampled by: DOANS
Project Manager: E. CHRISTENSEN

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 4, 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 flexible wall (ASTM D5084) and rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-4: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
AA-20-OW@30-31.5'	06/02/07	29403	06/4/07
AA-20-OW@50-51.5'	06/02/07	29403	06/4/07
AA-06@55-56.5'	06/03/07	29401	06/4/07
AA-06@60-61.5'	06/03/07	29401	06/4/07
B-4@80-81.5'	06/01/07	29402	06/4/07
AA-09-OW@55-56.5'	06/01/07	29402	06/4/07
AA-09-OW@70-71.5'	06/01/07	29402	06/4/07

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

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BRC Aquifer Testing
AA-06@51-52.5'

83173-4

PARTICLE-SIZE ANALYSIS of SOILS

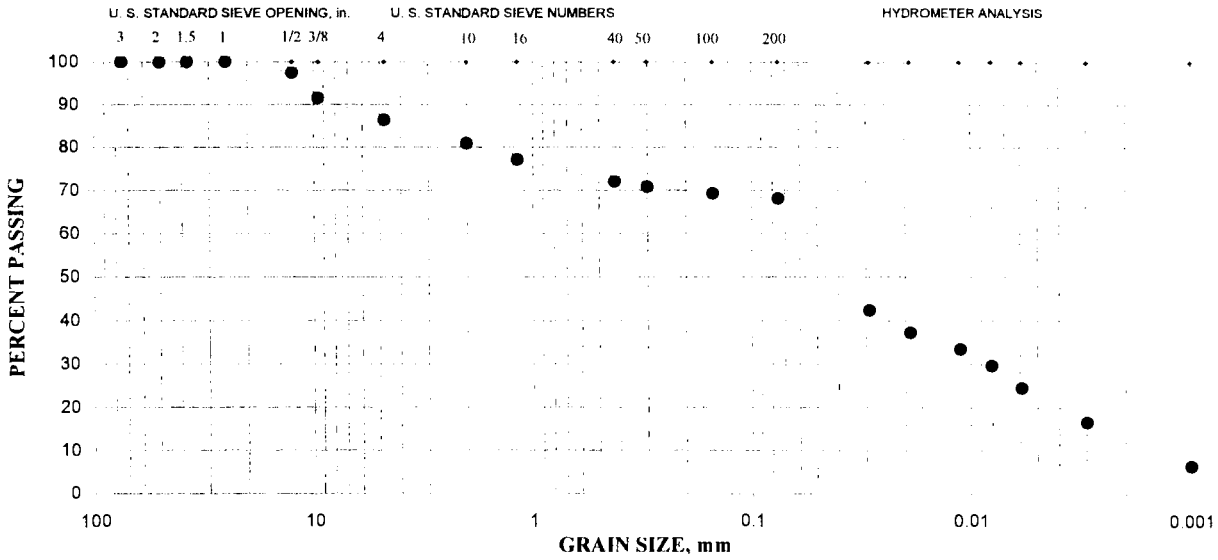
ASTM D 422-02

Boring #AA-06@51-52.5'; S-29401 @ 50.0 - 55.0'
June 11, 2007

Silt with Sand (ML)
Specific Gravity = 2.85

LL = ; PL = ; PI =
Gravel = 14%; Sand = 18%; Silt = 51%; Clay = 17%

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)	3	97
3/8" (9.5-mm)	8	92
#4 (4.75-mm)	14	86
#10 (2.00-mm)	19	81
#16 (1.18-mm)	23	77
#40 (425-µm)	28	72
#50 (300-µm)	29	71
#100 (150-µm)	31	69
#200 (75-µm)	32	68
Hydrometer Analysis		
29-µm		42
19-µm		37
11-µm		33
8-µm		30
6-µm		24
3.0-µm		17
Colloids (<1-µm)		6



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(702) 383-1199 • Fax (702) 383-4983

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TESTING MATERIALS

LABORATORY NO: 14462(c) **DATE:** June 13, 2007

SAMPLE: Soil **P.O.:**

MARKED: 83173 **LAB ID:** 29401

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974

SAMPLE NO.	LOCATION	DEPTH (feet)	ORGANIC CARBON
29401	AA-06	51-52.5	4.00%

Robert L. Summers

LABORATORY MANAGER

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

Job # =>	83173	Lab Number =>	29401
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	NR
Sample Location =>	AA - 06 @ 51 - 52.5'	Tested By =>	JLW
		Reviewed By =>	JH

Pan Label =>	EL	
Tare Weight of Pan =>	575.8	A
Wet Wt. of Sample & Tare =>	920.6	B
Dry Wt. of Sample & Tare =>	843.8	C
Weight of Moisture (B-C) =>	76.8	D
Dry Wt. of Sample (C-A) =>	268	E
Percent Moisture (D/E)*100 =>	28.7	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
LAB NUMBER:	29401
BORING:	AA-06
DEPTH:	51 - 52.5'
DATE:	06/13/07
TECHNICIAN:	JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	1
Mass of Pycometer,Mf =>	221.22
Mass of Pycometer & Water,Ma =>	719.19
Temperature of Water when	
Ma above was Taken, Ta =>	22.7
Mass of Speciman & Pycnometer =>	271.65
Mass of Pycnometer, Mf =>	221.17
Mass of Oven-Dry Specimen, Mo =>	50.48
Mass of Pycnometer, Soil & Water, Mb =>	751.88
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	0.99761
Water Density at Tb	0.99806
K Factor at Tb	0.99985
Ma at Tb	221.4440865
Sp Gr at Tb	2.837549185
Sp Gr at 20 C	2.837123553
SPECIFIC GRAVITY AT 20 C	2.837123553

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LABORATORY NO: 14462(i) **DATE:** June 20, 2007

SAMPLE: Soil **P.O.:**

MARKED: 83173 **LAB ID:** 29401

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974

SAMPLE NO.	LOCATION	DEPTH (feet)	ORGANIC CARBON
29401	AA-06	61.5-62.0	3.70%

Robert L. Summers

LABORATORY MANAGER

PARTICLE-SIZE ANALYSIS of SOILS

ASTM D 422-02

Boring #AA-06@61-62.5'; S-29401 @ 60.0 - 65.0'

June 14, 2007

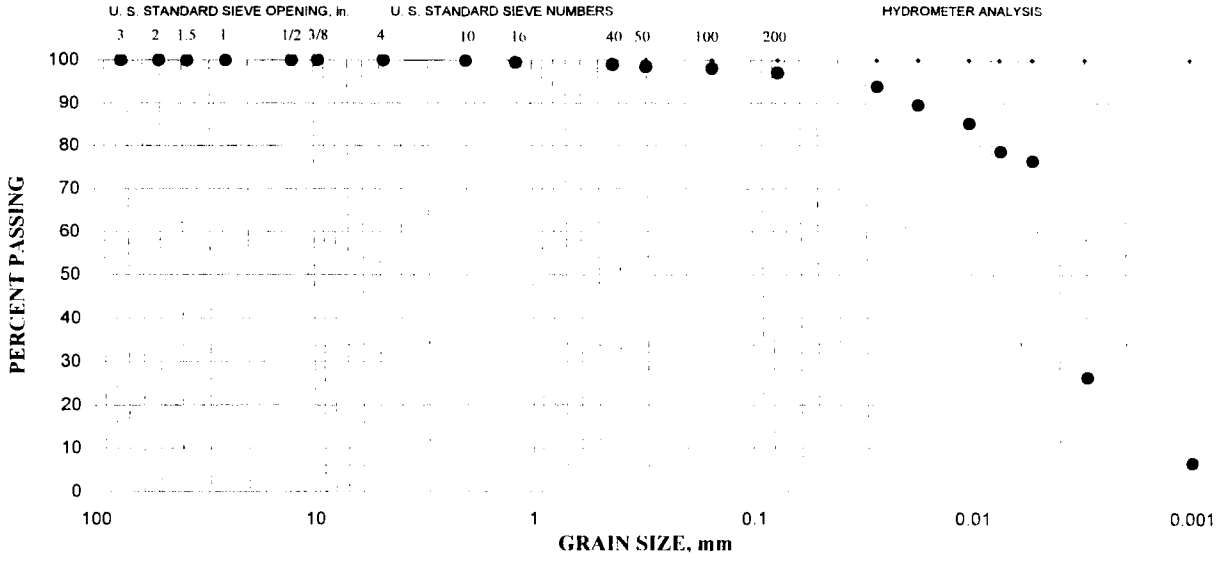
Silt (ML)

Specific Gravity = 2.85

LL = ; PL = ; PI =

Gravel = 0%; Sand = 3%; Silt = 71%; Clay = 26%

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)	1	99
#50 (300-µm)	2	98
#100 (150-µm)	2	98
#200 (75-µm)	3	97
Hydrometer Analysis		
26-µm		94
17-µm		89
10-µm		85
7-µm		79
5-µm		76
3.0-µm		26
Colloids (<1-µm)		7



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

Project Name: BRC AQUIFER TESTING

Project No.: 83173-4

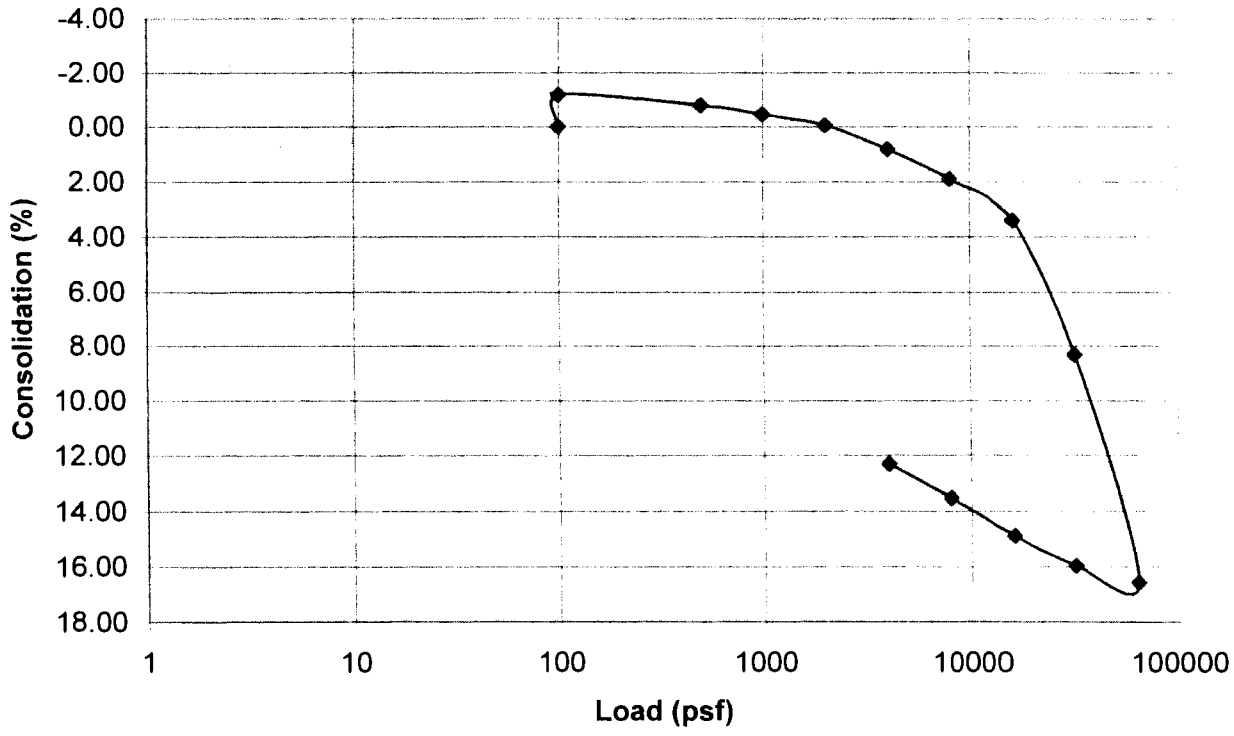
Report Date:06/19/07

Sample No.: 29401
Sample Depth (ft.): 61.5 - 62'
Material Description: White Fat Clay

Tech.: jlw

Load (psf)	Consolidation (%)
100	0.00
100	-1.19
500	-0.81
1000	-0.47
2000	-0.06
4000	0.82
8000	1.88
16000	3.41
32000	8.31
64000	16.58
32000	15.96
16000	14.88
8000	13.53
4000	12.32

AA-06 @ 61.5 - 62'



PROJECT NAME:	BRC Aquifer Testing
PROJECT NUMBER:	83173
LAB NUMBER:	29401
BORING:	AA - 06
DEPTH:	61.5 - 62'
DATE:	06/14/07
TECHNICIAN:	JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	1
Mass of Pycometer,Mf =>	221.68
Mass of Pycometer & Water,Ma =>	719.09
Temperature of Water when	
Ma above was Taken, Ta =>	22.7
Mass of Speciman & Pycnometer =>	262.24
Mass of Pycnometer, Mf =>	221.07
Mass of Oven-Dry Specimen, Mo =>	41.17
Mass of Pycnometer, Soil & Water, Mb =>	745.13
Temperature of Water when	
Mb Above was Taken, Tb =>	20.8

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	0.99814
Water Density at Tb	0.99804
K Factor at Tb	0.99983
Ma at Tb	221.630259
Sp Gr at Tb	2.721083939
Sp Gr at 20 C	2.720621355
SPECIFIC GRAVITY AT 20 C	2.720621355

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

Job # =>	83173	Lab Number =>	29401
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	NR
Sample Location =>	AA-06 @ 61.5 - 62'	Tested By =>	JLW
		Reviewed By =>	JH

Pan Label =>	911		539K
Tare Weight of Pan =>	198.4	A	32.6
Wet Wt. of Sample & Tare =>	294	B	110.29
Dry Wt. of Sample & Tare =>	268.2	C	95.36
Weight of Moisture (B-C) =>	25.8	D	14.9
Dry Wt. of Sample (C-A) =>	69.8	E	62.76
Percent Moisture (D/E)*100 =>	37.0	F	23.8

TOTAL MOISTURE CONTENT = 60.8%

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	06/07/07	
Project Number	83173	Phase No.	Tested By	JLW	Checked By	JH
Lab Number	29401					
Boring Number	AA-06					
Sample Depth	61.5-62					
Height (inches)	3.79					
Diameter (inches)	5.09					
Volume	0.0446					
Wt. of Sample At Field Moisture	2153.40					
Wet Density (pcf)	106.4					
Dry Density (pcf)	77.7					
Container No.						
Wt. of Wet Sample Plus Tare	294.00					
Wt. of Dry Sample Plus Tare	268.21					
Tare (g)	198.40					
Dry Wt. Of Sample (g)	69.81					
Moisture Content, %	36.9%					

moist-dens form

Project Name: BRC Aquifer Testing | **Client:** BRC | **By:** Doug Davis

Project Number: 83173 Task: 4 | **Date:** 6-4-07 | **Date Due:**

Boring Number	Depth	Water Content (ASTM 2216)	Dry Bulk Density (ASTM D2937)	Total Porosity (ASTM D2435)	Flexible Wall (ASTM D5084) *OUTSIDE SERVICE*	Rigid Wall (ASTM D2434) *OUTSIDE SERVICE*	Specific Gravity (ASTM ~~D698~~ D854)	Specific Gravity (ASTM C127)	Hydrometer (ASTM D422)	Sieve Anysis (ASTM D422)	Total Organic Carbon *OUTSIDE SERVICE (ATLAS)*	Remarks
AA-08-Dup	40-41.5				X	X						Shipped 6/5
AA-08-Dup	35-40	X	X	X			X	X	X	X	X	Shipped 6/5
AA-08-Dup	10-15	X	X	X			X	X	X	X	X	13-15'
AA-08-Dup	15-16.5				X	X						

LABORATORY NUMBER: 29404

LABORATORY WORK ORDER

KLEINFELDER

Project No: 83173 Phase: 4

Project Name: BRC AQUIFER TESTING

Client Name: BRC

Client Ref./P.O.#:

Special Instructions:

Sample Number: 29404

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

Date Sampled: 6/4/07
Date Received: 6/4/07
Date Needed: ASAP
Date Completed: 6/25/07
Verified By: DA

ASPHALT TESTING

Usage	Qty.	99#	Status
C123 Lt Wt Pieces/Agg		990715	
C127 Absorption/Gravity	4	~~990708~~ 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	

MISC. OTHER

Usage	Qty.	99#	Status
~~Chloride Analysis~~ ORGANIC CARBONS	2	~~990000~~ ATTN:	
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	2	990305	X
Moisture Determination Only	2	990317	X
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	2	990301	X
Sulfate Sound (5) Sieve SZ C88		990708	
Swell Test FHA Specification (60 psi)		990312	
Unconfined Comp/Inc Moist D2166		990601	

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

FOR ACCOUNTING USE ONLY
Entered By: Date Entered:

Source: N/A
Supplier: N/A
Sample Location: BA-08-DW4 @ 0-40.5'
Type of Material: ENVIRO
Sampled by: D. DAVIS
Project Manager: G. Coates / BILL WHITMAN

DISTRIBUTION: WHITE - Lab Manager/Accounting YELLOW - Sample PINK - Project Manager

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(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 5, 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 flexible wall (ASTM D5084) and rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-4: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
AA-08-OW@15-16.5'	06/04/07	29404	06/5/07
AA-08-OW@40-41.5'	06/04/07	29404	06/5/07

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

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PARTICLE-SIZE ANALYSIS of SOILS

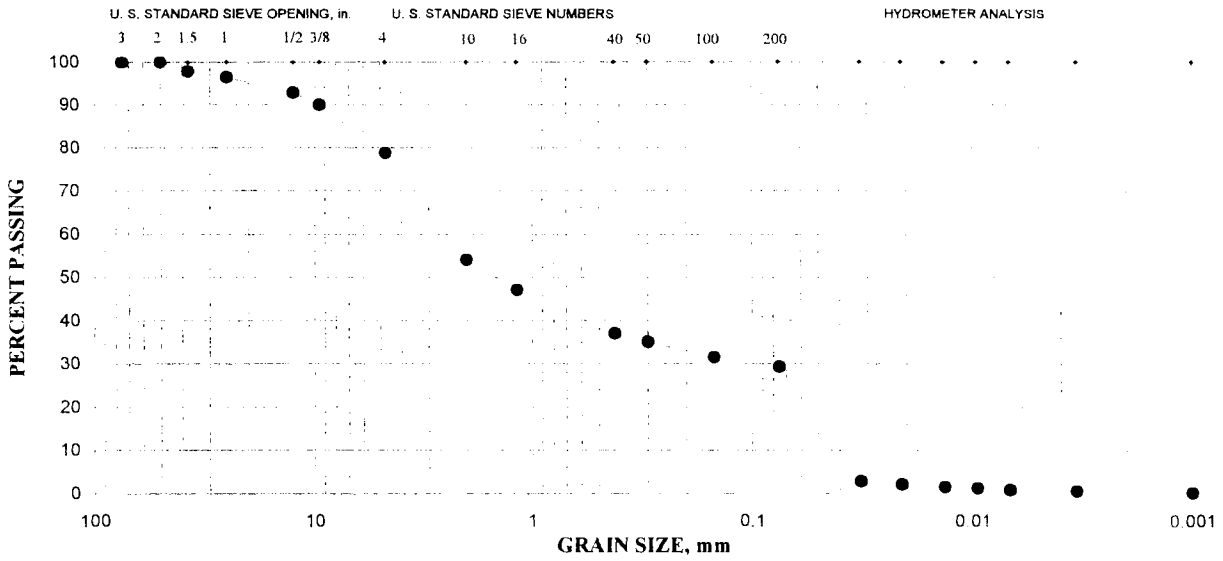
ASTM D 422-02

Boring #AA-08-OWA@13-15'; S-29404 @ 10.0 - 15.0' June 7, 2007

Silty Sand with Gravel (SM) Specific Gravity = 2.73

LL = ; PL = ; PI = Gravel = 21%; Sand = 50%; 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)	2	98
1" (25.0-mm)	4	96
1/2" (12.5-mm)	7	93
3/8" (9.5-mm)	10	90
#4 (4.75-mm)	21	79
#10 (2.00-mm)	46	54
#16 (1.18-mm)	53	47
#40 (425-µm)	63	37
#50 (300-µm)	65	35
#100 (150-µm)	69	31
#200 (75-µm)	71	29
Hydrometer Analysis		
32-µm		3
21-µm		2
13-µm		2
10-µm		1
7-µm		1
3.4-µm		1
Colloids (<1-µm)		0



PARTICLE-SIZE ANALYSIS of SOILS

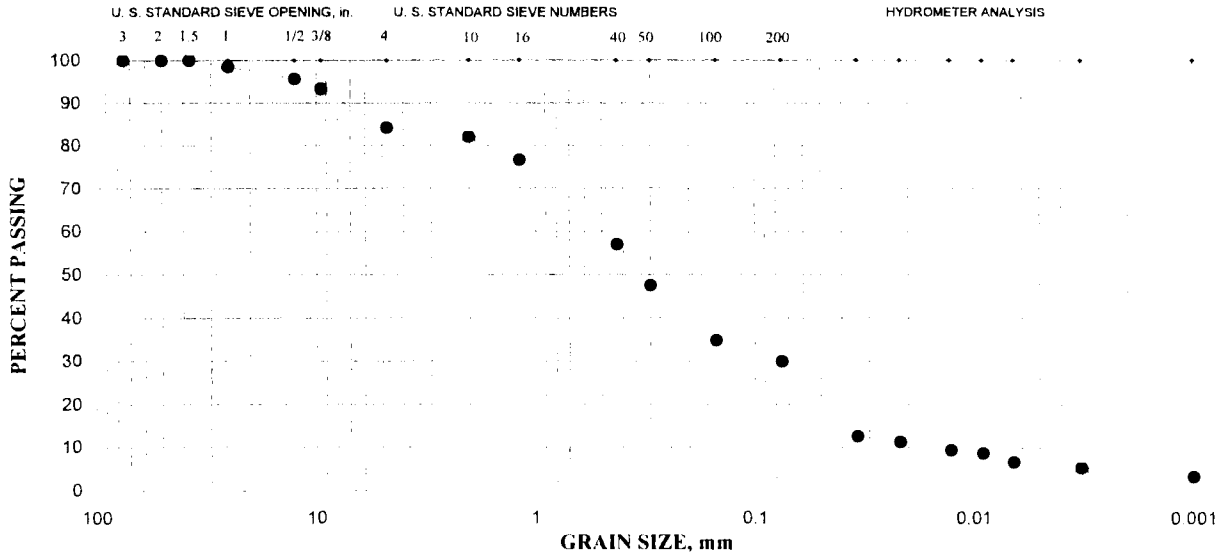
ASTM D 422-02

Boring #AA-08-OWA@35-37'; S-29404 @ 35.0 - 40.0' June 7, 2007

Silty Sand with Gravel (SM) Specific Gravity = 2.73

LL = ; PL = ; PI = Gravel = 16%; Sand = 54%; Silt = 25%; 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)	2	98
1/2" (12.5-mm)	4	96
3/8" (9.5-mm)	7	93
#4 (4.75-mm)	16	84
#10 (2.00-mm)	18	82
#16 (1.18-mm)	23	77
#40 (425-µm)	43	57
#50 (300-µm)	53	47
#100 (150-µm)	65	35
#200 (75-µm)	70	30
Hydrometer Analysis		
34-µm		13
22-µm		11
13-µm		9
9-µm		9
7-µm		7
3.2-µm		5
Colloids (<1-µm)		3



SPECIFIC GRAVITY OF COARSE AND FINE AGGREGATE ASTM 127 & 128

Job # =>	83173	Lab Number =>	29404
Project =>	BRC Aquifer Testing	Date Sampled =>	
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	
Sample Location =>	AA-08-OWA @ 35 - 37'	Tested By =>	JLW
		Reviewed By =>	

COARSE AGGREGATE

Dry Wt. of Sample A=>	1185.7		
SSD Wt. of Sample B=>	1231.1		
Wt. SSD Under Water C=>	737.3		Averages
Bulk Sp Gr. A/(B-C) =>	2.401		2.401
Bulk SSD B/(B-C) =>	2.493		2.493
Apparent Sp Gr A/(A-C) =>	2.644		2.644
Absorption ((B-A)/A)*100 =>	3.8		3.8

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		

SPECIFIC GRAVITY OF COARSE AND FINE AGGREGATE ASTM 127 & 128

Job # =>	83173	Lab Number =>	29404
Project =>	BRC Aquifer Testing	Date Sampled =>	
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	
Sample Location =>	AA-08-OWA @ 13 - 15'	Tested By =>	JLW
		Reviewed By =>	

COARSE AGGREGATE

Dry Wt. of Sample A=>	2132.5		
SSD Wt. of Sample B=>	2225		
Wt. SSD Under Water C=>	1327		Averages
Bulk Sp Gr. A/(B-C) =>	2.375		2.375
Bulk SSD B/(B-C) =>	2.478		2.478
Apparent Sp Gr A/(A-C) =>	2.647		2.647
Absorption ((B-A)/A)*100 =>	4.3		4.3

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		

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TESTING MATERIALS

LABORATORY NO: 14462(k) **DATE:** June 20, 2007

SAMPLE: Soil **P.O.:**

MARKED: 83173-4 **LAB ID:** 29404

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974

SAMPLE NO.	LOCATION	DEPTH (feet)	ORGANIC CARBON
29404	AA-08-OWA	13-15	0.70%
29404	AA-08-OWA	35-37	0.70%

Robert L. Sommers

LABORATORY MANAGER

PROJECT NAME:	BRC Aquifer Testing
PROJECT NUMBER:	83173
LAB NUMBER:	29404
BORING:	AA-08-OWA
DEPTH:	35 - 37'
DATE:	06/15/07
TECHNICIAN:	JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	1
Mass of Pycometer,Mf =>	224.41
Mass of Pycometer & Water,Ma =>	722.89
Temperature of Water when	
Ma above was Taken, Ta =>	20.7
Mass of Speciman & Pycnometer =>	328.57
Mass of Pycnometer, Mf =>	224.41
Mass of Oven-Dry Specimen, Mo =>	104.16
Mass of Pycnometer, Soil & Water, Mb =>	788.85
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	0.99806
Water Density at Tb	0.99831
K Factor at Tb	1.0001
Ma at Tb	224.53462
Sp Gr at Tb	2.726701571
Sp Gr at 20 C	2.726974241
SPECIFIC GRAVITY AT 20 C	2.726974241

PROJECT NAME:	BRC Aquifer Testing
PROJECT NUMBER:	83173
LAB NUMBER:	29404
BORING:	AA-08-OWA
DEPTH:	13 - 15'
DATE:	06/15/07
TECHNICIAN:	JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	1
Mass of Pycometer,Mf =>	221.68
Mass of Pycometer & Water,Ma =>	719.14
Temperature of Water when	
Ma above was Taken, Ta =>	20.3
Mass of Speciman & Pycnometer =>	319.53
Mass of Pycnometer, Mf =>	220.91
Mass of Oven-Dry Specimen, Mo =>	98.62
Mass of Pycnometer, Soil & Water, Mb =>	781.57
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	2.725062172
Sp Gr at 20 C	2.725334678
SPECIFIC GRAVITY AT 20 C	2.725334678

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

Job # =>	83173	Lab Number =>	29404
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	NR
Sample Location =>	AA-08-OWA @ 35 - 37'	Tested By =>	JLW
		Reviewed By =>	JH

Pan Label =>		
Tare Weight of Pan =>	369.4	A
Wet Wt. of Sample & Tare =>	1500.6	B
Dry Wt. of Sample & Tare =>	1371.74	C
Weight of Moisture (B-C) =>	128.9	D
Dry Wt. of Sample (C-A) =>	1002.34	E
Percent Moisture (D/E)*100 =>	12.9	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

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

Job # =>	83173	Lab Number =>	29404
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	NR
Sample Location =>	AA-08-OWA @ 13 - 15'	Tested By =>	JLW
		Reviewed By =>	JH

Pan Label =>	SMALL	
Tare Weight of Pan =>	530.6	A
Wet Wt. of Sample & Tare =>	1784.5	B
Dry Wt. of Sample & Tare =>	1616.31	C
Weight of Moisture (B-C) =>	168.2	D
Dry Wt. of Sample (C-A) =>	1085.71	E
Percent Moisture (D/E)*100 =>	15.5	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 | Client: BRC | By: Doug Davis

Project Number: 83173 Task: 4 | Date: 6-5-07 | Date Due:

Boring Number	Depth	Water Content (ASTM 2216)	Dry Bulk Density (ASTM D2937)	Total Porosity (ASTM D2435)	Flexible Wall (ASTM D5084) *OUTSIDE SERVICE*	Rigid Wall (ASTM D2434) *OUTSIDE SERVICE*	Specific Gravity (ASTM ~~D698~~ D854)	Specific Gravity (ASTM C127)	Hydrometer (ASTM D422)	Sieve Anysis (ASTM D422)	Total Organic Carbon *OUTSIDE SERVICE (ATLAS)*
AA-CB-0015	35-35.5				1	1					
AA-08-0013	30-35	X	X	X			X	X	X	X	X

Remarks: (30-35') Shipped 6/7/07

LABORATORY NUMBER: 2943

LABORATORY WORK ORDER

KLEINFELDER

Project No: 83173 Phase: 4

Project Name: BRC Aquifer Test

Client Name: BRC

Client Ref./P.O.#:

Special Instructions:

Sample Number:
~~AA-03~~ 30-35'
35-36.5
2943

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

Date Sampled: 6-5-07
Date Received: 6-5-07
Date Needed: ASAP
Date Completed: 6/25/07
Verified By:

ASPHALT TESTING

Usage	Qty.	99#	Status	
C123 Lt Wt Pieces/Agg		990715		
C127 Absorption/Gravity	2	~~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		

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	1	990305	X	
Moisture Determination Only	1	990317	X	
Moisture Determination/Unit Weight	3	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	1	990301	X	
Sulfate Sound (5) Sieve SZ C88		990708		
Swell Test FHA Specification (60 psi)		990312		
Unconfined Comp/Inc Moist D2166		990601		

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

FOR ACCOUNTING USE ONLY
Entered By: Date Entered:

Source: N/A
Supplier: N/A
Sample Location: BH-05-Dw8
Type of Material: Sand
Sampled by: Craig Davis
Project Manager: G. Whitman/G Cathey

DISTRIBUTION: WHITE - Lab Manager/Accounting YELLOW - Sample PINK - 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 7, 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 flexible wall (ASTM D5084) and rigid wall (ASTM D2434) on all of the following samples. For invoicing purposes please reference 83173-4: BRC Aquifer Testing.

Sample Location	Sample Date	Laboratory Number	Shipped Date
AA-08-OWB@35-36.5'	06/05/07	29413	06/7/07

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

696002
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PARTICLE-SIZE ANALYSIS of SOILS

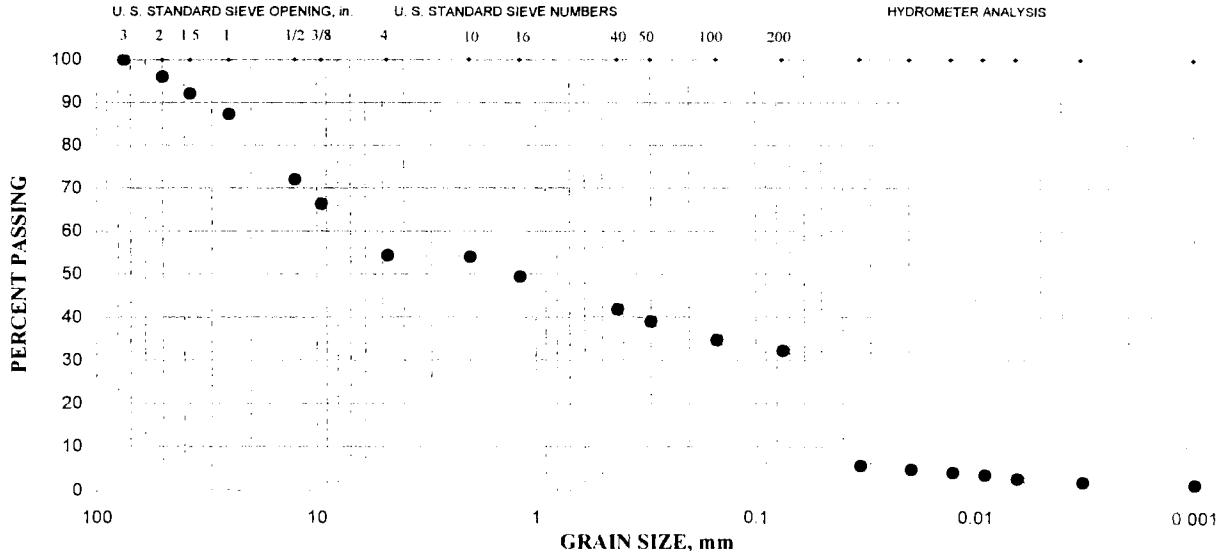
ASTM D 422-02

Boring #AA-09-OW@66-67'; S-29413 @ 30.0 - 35.0' June 7, 2007

Silty Gravel with Sand (GM) Specific Gravity = 2.73

LL = ; PL = ; PI = Gravel = 46%; Sand = 22%; Silt = 30%; Clay = 2%

Sieve size	% Retained	% Passing
3" (75.0-mm)	0	100
2" (50.0-mm)	4	96
1-1/2" (37.5-mm)	8	92
1" (25.0-mm)	13	87
1/2" (12.5-mm)	28	72
3/8" (9.5-mm)	34	66
#4 (4.75-mm)	46	54
#10 (2.00-mm)	46	54
#16 (1.18-mm)	51	49
#40 (425-µm)	58	42
#50 (300-µm)	61	39
#100 (150-µm)	65	35
#200 (75-µm)	68	32
Hydrometer Analysis		
33-µm		6
20-µm		5
13-µm		4
9-µm		4
6-µm		3
3.2-µm		2
Colloids (<1-µm)		1



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

Job # =>	83173	Lab Number =>	29413
Project =>	BRC AQUIFER TESTING	Date Sampled =>	NR
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	NR
Sample Location =>	AA-08-OWB @ 30-32.5	Tested By =>	JLW
		Reviewed By =>	JH

Pan Label =>	DUDE	
Tare Weight of Pan =>	387	A
Wet Wt. of Sample & Tare =>	2495.4	B
Dry Wt. of Sample & Tare =>	2304.64	C
Weight of Moisture (B-C) =>	190.8	D
Dry Wt. of Sample (C-A) =>	1917.64	E
Percent Moisture (D/E)*100 =>	9.9	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
LAB NUMBER:	29413
BORING:	AA-08-OWB
DEPTH:	30 - 32.5'
DATE:	06/15/07
TECHNICIAN:	JLW

ASTM D-854

SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER

Pycnometer Label	1
Mass of Pycometer,Mf =>	220.94
Mass of Pycometer & Water,Ma =>	719.4
Temperature of Water when	
Ma above was Taken, Ta =>	20.4
Mass of Speciman & Pycnometer =>	321.75
Mass of Pycnometer, Mf =>	220.94
Mass of Oven-Dry Specimen, Mo =>	100.81
Mass of Pycnometer, Soil & Water, Mb =>	783.25
Temperature of Water when	
Mb Above was Taken, Tb =>	19.4

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	0.99833
K Factor at Tb	1.00012
Ma at Tb	221.0446766
Sp Gr at Tb	2.72754329
Sp Gr at 20 C	2.727870595
SPECIFIC GRAVITY AT 20 C	2.727870595

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: 14462(l) **DATE:** June 20, 2007

SAMPLE: Soil **P.O.:**

MARKED: 83173-4 **LAB ID:** 29413

SUBMITTED BY: Kleinfelder, Inc.

ANALYZED BY: Kurt D. Ergun

REPORT OF DETERMINATION

ASTM 2974

SAMPLE NO.	LOCATION	DEPTH (feet)	ORGANIC CARBON
29413	AA-08-OWB	30-32.5	1.40%

Robert L. Summers
LABORATORY MANAGER

SPECIFIC GRAVITY OF COARSE AND FINE AGGREGATE ASTM 127 & 128

Job # =>	83173	Lab Number =>	29413
Project =>	BRC Aquifer Testing	Date Sampled =>	
Client =>	BRC	Date Received =>	
Phase =>	4	Sampled By =>	
Sample Location =>	AA-08-OWB @ 30 - 32.5'	Tested By =>	JLW
		Reviewed By =>	

COARSE AGGREGATE

Dry Wt. of Sample A=>	6413.6		
SSD Wt. of Sample B=>	6636.3		
Wt. SSD Under Water C=>	3989.3		Averages
Bulk Sp Gr. A/(B-C) =>	2.423		2.423
Bulk SSD B/(B-C) =>	2.507		2.507
Apparent Sp Gr A/(A-C) =>	2.646		2.646
Absorption ((B-A)/A)*100 =>	3.5		3.5

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		

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

June 18, 2007

Kleinfelder, Inc.
Attn: Jessi Henderson
4875 Longley Ln Ste 100
Reno NV 89502-5953

STL Project No: **07-220**
Subject: **BRC Aquifer**
Project No: **83173.4**
Invoice No: **4535**

LABORATORY TEST RESULTS

Dear Mr. Henderson:

As requested, Sierra Testing Laboratories, Inc. performed laboratory testing on **four samples** of material from the subject site. The samples were identified as:

1. **B-4, 35-36.5**
2. **B-2, 60-61.5**
3. **B-2, 90-91.5**

Our laboratory received the samples on **June 5, 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
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HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: B-2
Visual Description: N/A
Remarks: Confining Stress = 22.9 psi

Sample Depth, ft.: 60-61.5
Sample Type: Sample Liner

TEST RESULTS

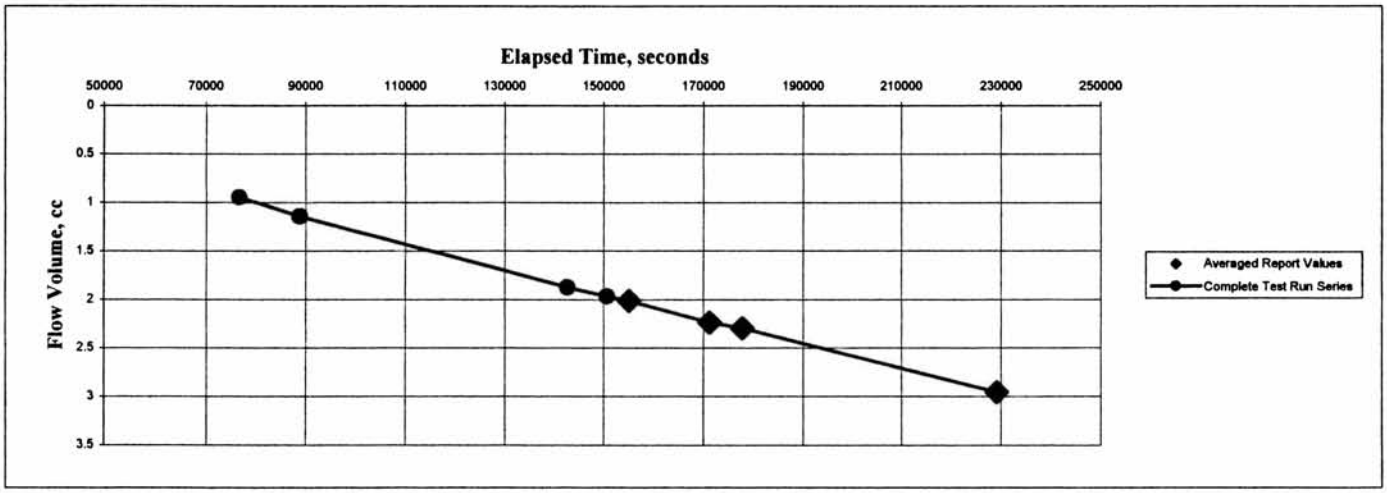
Permeability, cm/sec.: 4.40E-08

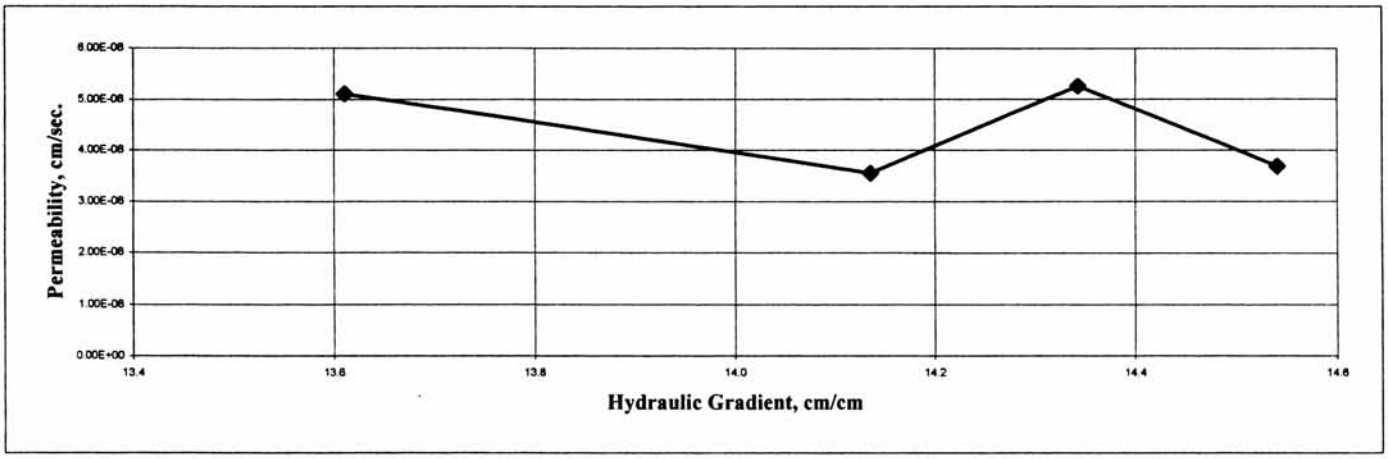
Average Hydraulic Gradient: 14.2

Effective Cell Pressure, psi: 22.9

TEST SAMPLE DATA

Before Test		After Test	
Specimen Height, cm:	5.08	Specimen Height, cm:	4.57
Specimen Diameter, cm:	4.85	Specimen Diameter, cm:	4.85
Dry Unit Weight, pcf:	93.3	Dry Unit Weight, pcf:	108.1
Moisture Content, %	29.5	Moisture Content, %	20.2
Specific Gravity, Assumed			
Percent Saturation:			





Test Method: ASTM D5856

PROJECT NUMBER:	07-220	June 5, 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: B-2
Visual Description: N/A
Remarks: Confining Stress = 34.4 psi

Sample Depth, ft.: 90-91.5
Sample Type: Sample Liner

TEST RESULTS

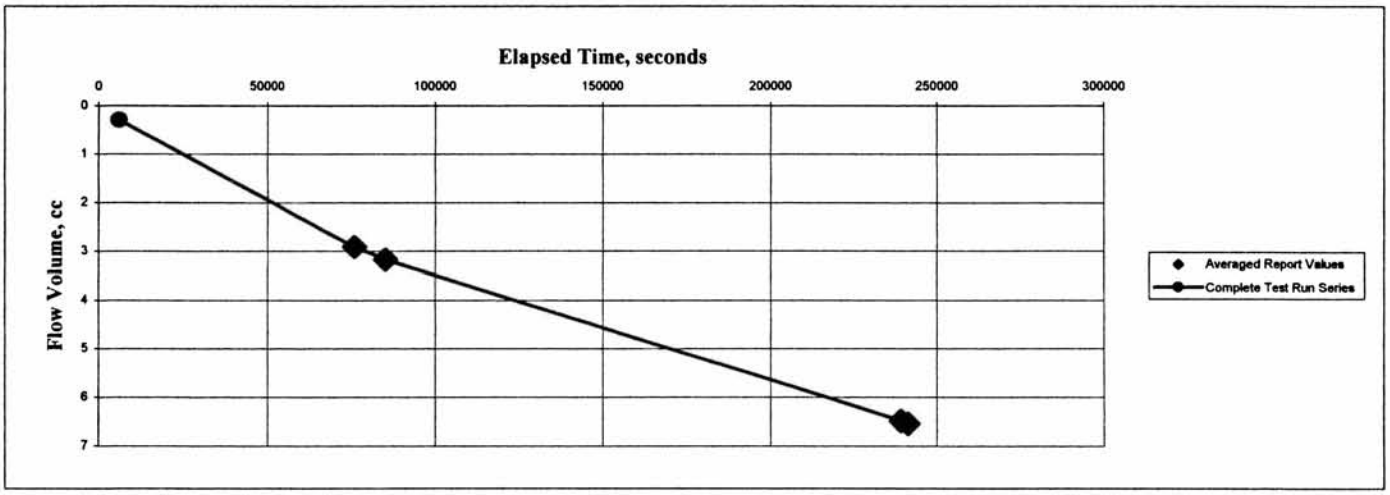
Permeability, cm/sec.: 1.58E-07

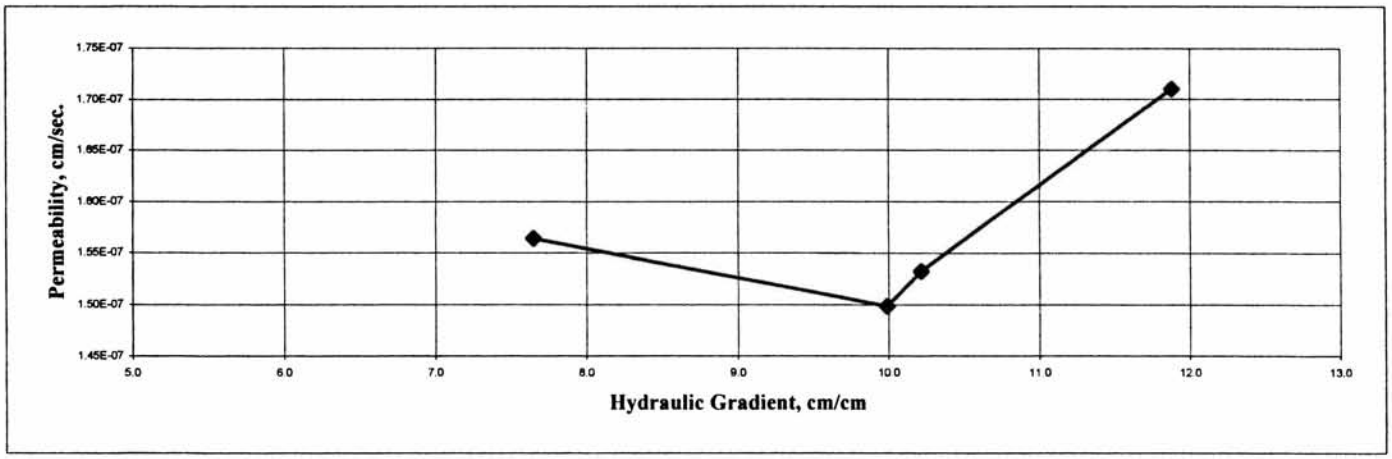
Average Hydraulic Gradient: 9.9

Effective Cell Pressure, psi: 34.4

TEST SAMPLE DATA

Before Test		After Test	
Specimen Height, cm:	5.08	Specimen Height, cm:	5.08
Specimen Diameter, cm:	4.85	Specimen Diameter, cm:	4.85
Dry Unit Weight, pcf:	80.2	Dry Unit Weight, pcf:	81.0
Moisture Content, %	40.3	Moisture Content, %	42.5
Specific Gravity, Assumed			
Percent Saturation:			





Test Method: ASTM D5856

PROJECT NUMBER:	07-220	June 5, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

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Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: B-4
Visual Description: N/A
Remarks:

Sample Depth, ft.: 35-36.5
Sample Type: Sample Liner

TEST RESULTS

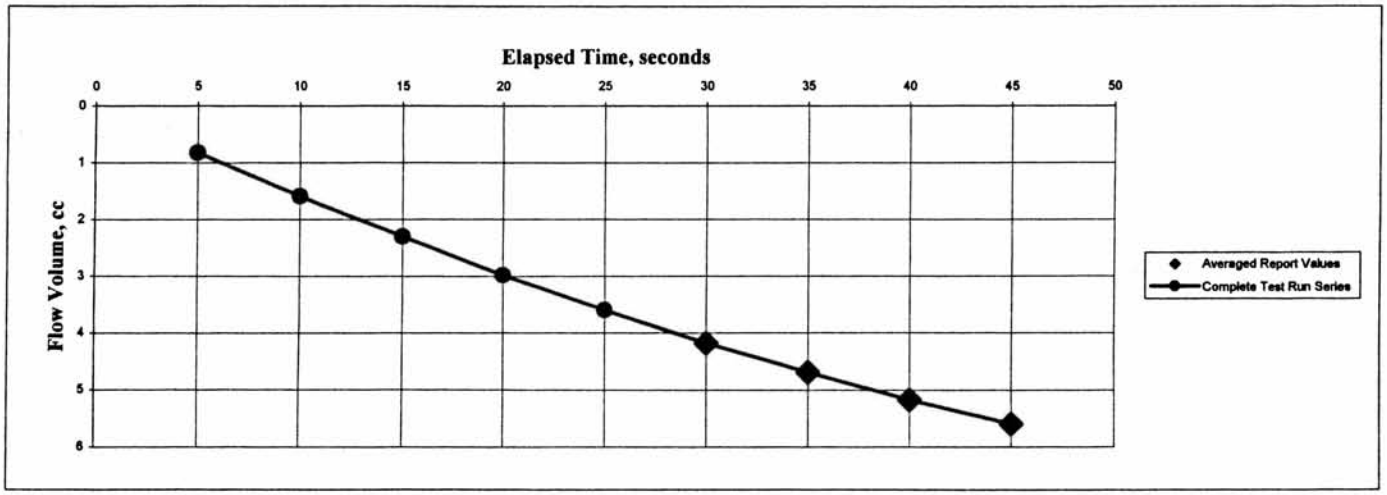
Permeability, cm/sec.: 6.64E-04

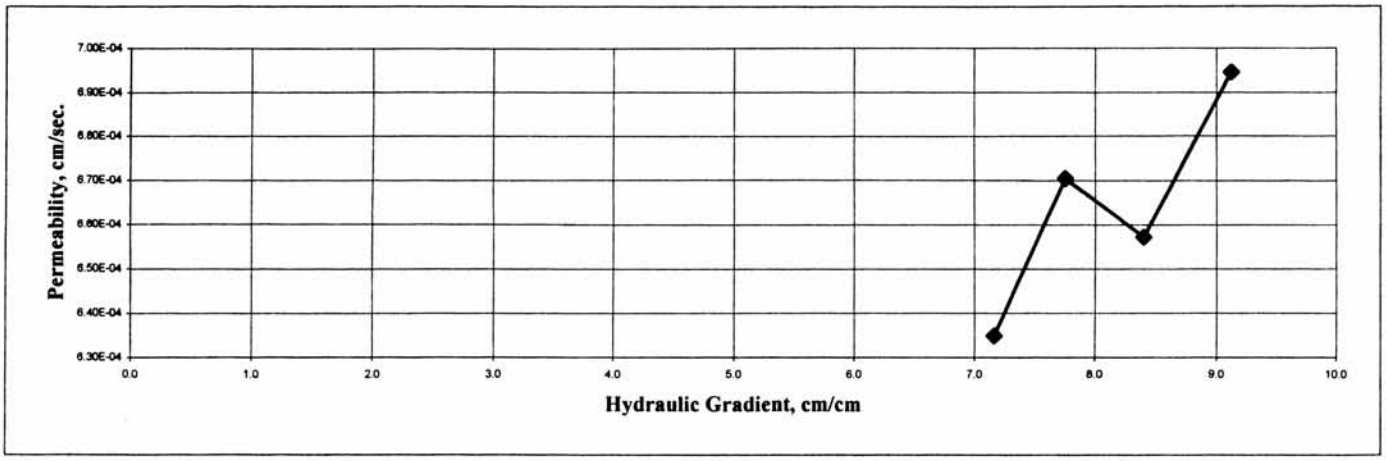
Average Hydraulic Gradient: 8.1

Effective Cell Pressure, psi: 13.4

TEST SAMPLE DATA

Before Test		After Test	
Specimen Height, cm:	5.08	Specimen Height, cm:	5.08
Specimen Diameter, cm:	4.85	Specimen Diameter, cm:	4.85
Dry Unit Weight, pcf:	103.2	Dry Unit Weight, pcf:	104.3
Moisture Content, %	25.7	Moisture Content, %	23.2
Specific Gravity, Assumed			
Percent Saturation:			





Test Method: ASTM D5856

PROJECT NUMBER:	07-220	June 5, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

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Phone: (916) 939-3460 FAX: (916) 939-3507

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

Invoice

COPY

Invoice Date	Invoice #:
6/18/2007	4533

Bill To:

Kleinfelder, Inc.
4875 Longley Lane, Suite 100
Reno, NV 89502-5953
Attn: Accounts Payable

Customer Job:

BRC Aquifer Testing

STL Job #:	Customer Job#:
07-220	83173.4

Samples Tested	Test Method	Description	Qty	Rate	Amount
B-3, 75-75.6	ASTM D5084 -3"	Flexible Wall Permeability 1.4"-3.0" sample diameter		210.00	210.00
B-3, 55-56.5	ASTM D5084 -3"	Flexible Wall Permeability 1.4"-3.0" sample diameter		210.00	210.00
B-1, 65-66.5	ASTM D5084 -3"	Flexible Wall Permeability 1.4"-3.0" sample diameter		210.00	210.00
B-1, 95-96.5	ASTM D5084 -3"	Flexible Wall Permeability 1.4"-3.0" sample diameter		210.00	210.00
		Total			**$840.00**

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.

5040 Robert J. Mathews, Suite 1, El Dorado Hills, CA 95762 (916) 939-3460 Fax (916) 939-3507
www.sierratestinglaboratories.com

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

June 18, 2007

Kleinfelder, Inc.
Attn: Jessi Henderson
4875 Longley Ln Ste 100
Reno NV 89502-5953

STL Project No: **07-220**
Subject: **BRC Aquifer**
Project No: **83173.4**
Invoice No: **4533**

LABORATORY TEST RESULTS

Dear Mr. Henderson:

As requested, Sierra Testing Laboratories, Inc. performed laboratory testing on **four samples** of material from the subject site. The samples were identified as:

1. **B-3, 75-75.6**
2. **B-3, 55-56.5**
3. **B-1, 65-66.5**
4. **B-1, 95-96.5**

Our laboratory received the samples on **June 4, 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: B-1
Visual Description: N/A
Remarks:

Sample Depth, ft.: 65-66.5
Sample Type: Sample Liner

TEST RESULTS

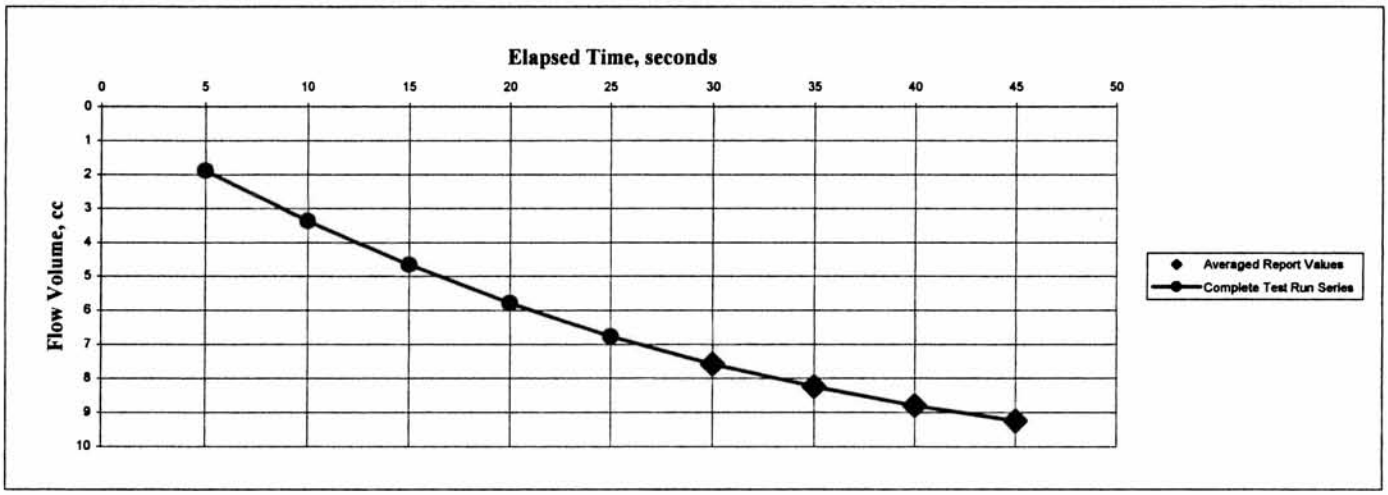
Permeability, cm/sec.: 1.74E-03

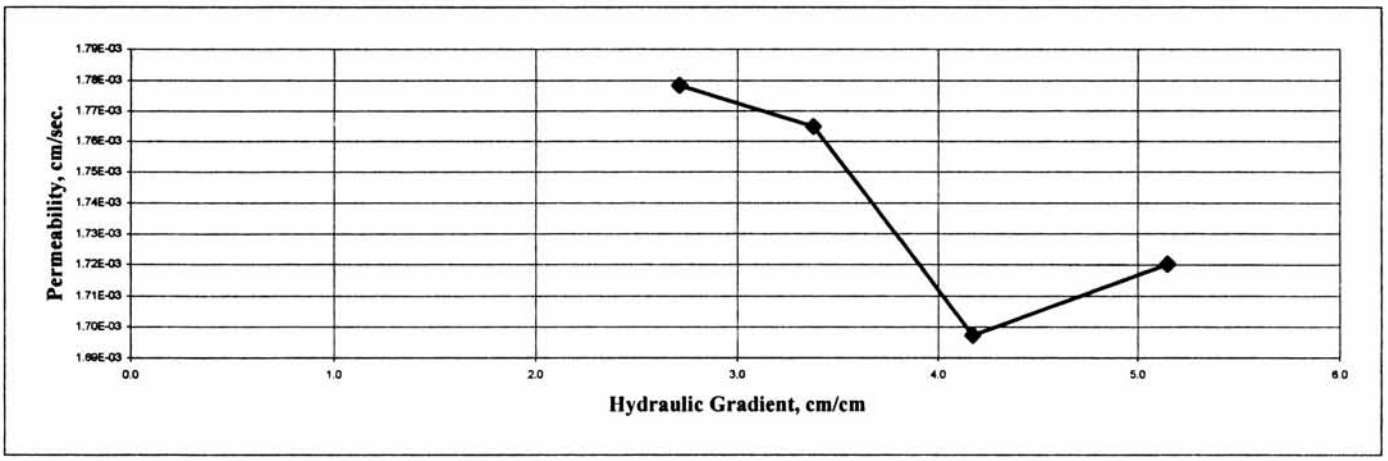
Average Hydraulic Gradient: 3.9

Effective Cell Pressure, psi: 25

TEST SAMPLE DATA

Before Test		After Test	
Specimen Height, cm:	5.08	Specimen Height, cm:	5.08
Specimen Diameter, cm:	4.88	Specimen Diameter, cm:	4.88
Dry Unit Weight, pcf:	110.0	Dry Unit Weight, pcf:	112.3
Moisture Content, %	15.8	Moisture Content, %	16.7
Specific Gravity, Assumed			
Percent Saturation:			





Test Method: ASTM D5856

PROJECT NUMBER:	07-220	June 4, 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: B-1
Visual Description: N/A
Remarks:

Sample Depth, ft.: 65-66.5
Sample Type: Sample Liner

TEST RESULTS

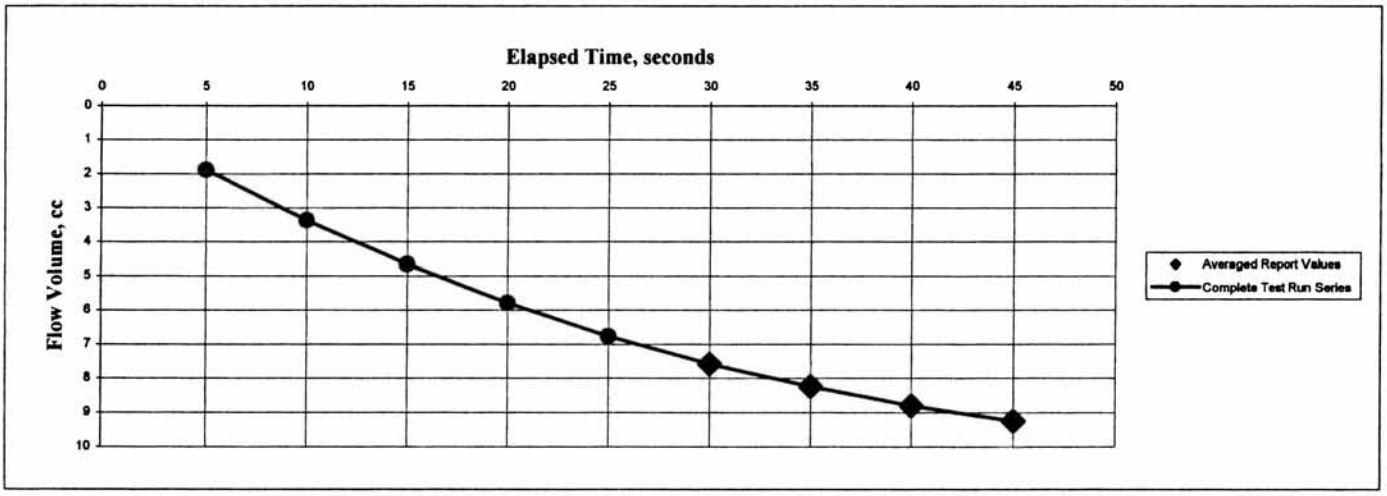
Permeability, cm/sec.: 1.74E-03

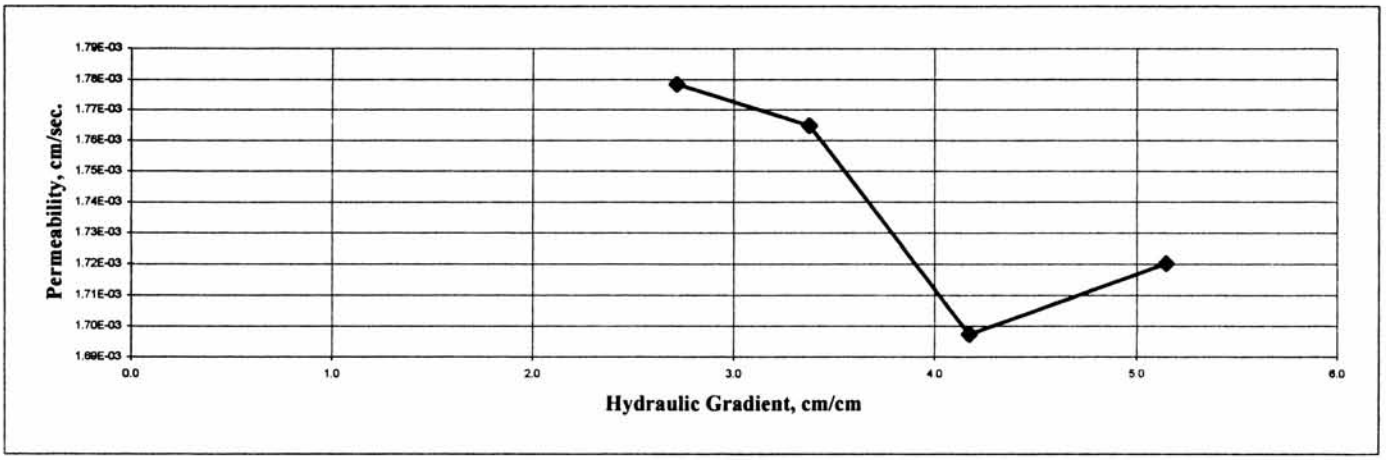
Average Hydraulic Gradient: 3.9

Effective Cell Pressure, psi: 25

TEST SAMPLE DATA

Before Test		After Test	
Specimen Height, cm:	5.08	Specimen Height, cm:	5.08
Specimen Diameter, cm:	4.88	Specimen Diameter, cm:	4.88
Dry Unit Weight, pcf:	110.0	Dry Unit Weight, pcf:	112.3
Moisture Content, %	15.8	Moisture Content, %	16.7
Specific Gravity, Assumed			
Percent Saturation:			





Test Method: ASTM D5856

PROJECT NUMBER:	07-220	June 4, 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: B-1
Visual Description: N/A
Remarks: Confining Stress = 36 psi

Sample Depth, ft.: 95-96.5
Sample Type: Sample Liner

TEST RESULTS

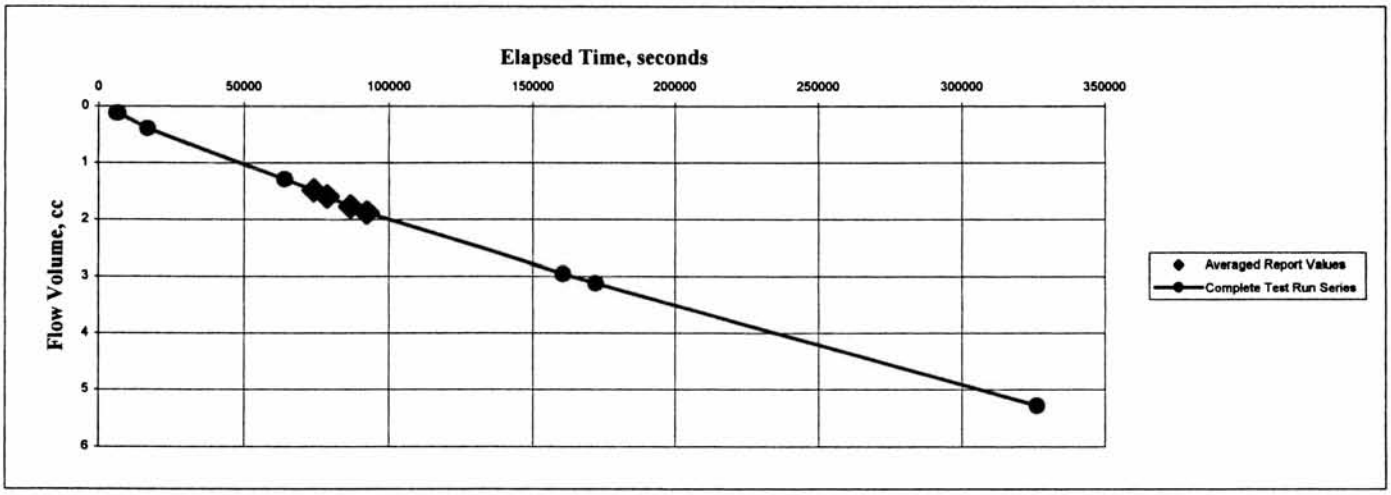
Permeability, cm/sec.: 1.04E-07

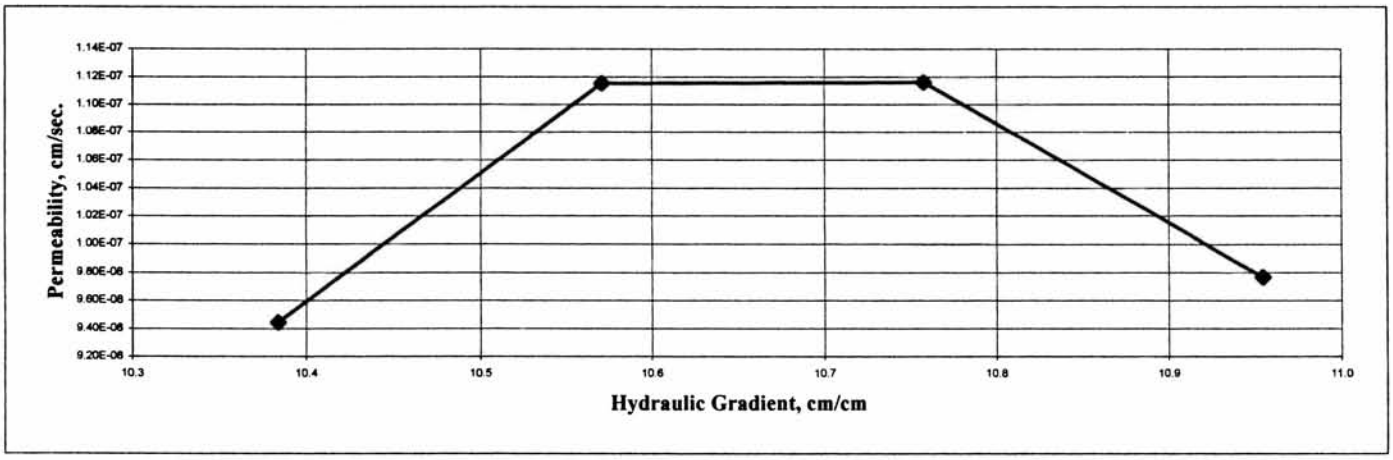
Average Hydraulic Gradient: 10.7

Effective Cell Pressure, psi: 36

TEST SAMPLE DATA

Before Test		After Test	
Specimen Height, cm:	5.08	Specimen Height, cm:	5.08
Specimen Diameter, cm:	4.85	Specimen Diameter, cm:	4.85
Dry Unit Weight, pcf:	64.4	Dry Unit Weight, pcf:	65.1
Moisture Content, %	59.0	Moisture Content, %	58.9
Specific Gravity, Assumed			
Percent Saturation:			





Test Method: ASTM D5856

PROJECT NUMBER:	07-220	June 4, 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: B-3
Visual Description: N/A
Remarks:

Sample Depth, ft.: 55-56.5
Sample Type: Sample Liner

TEST RESULTS

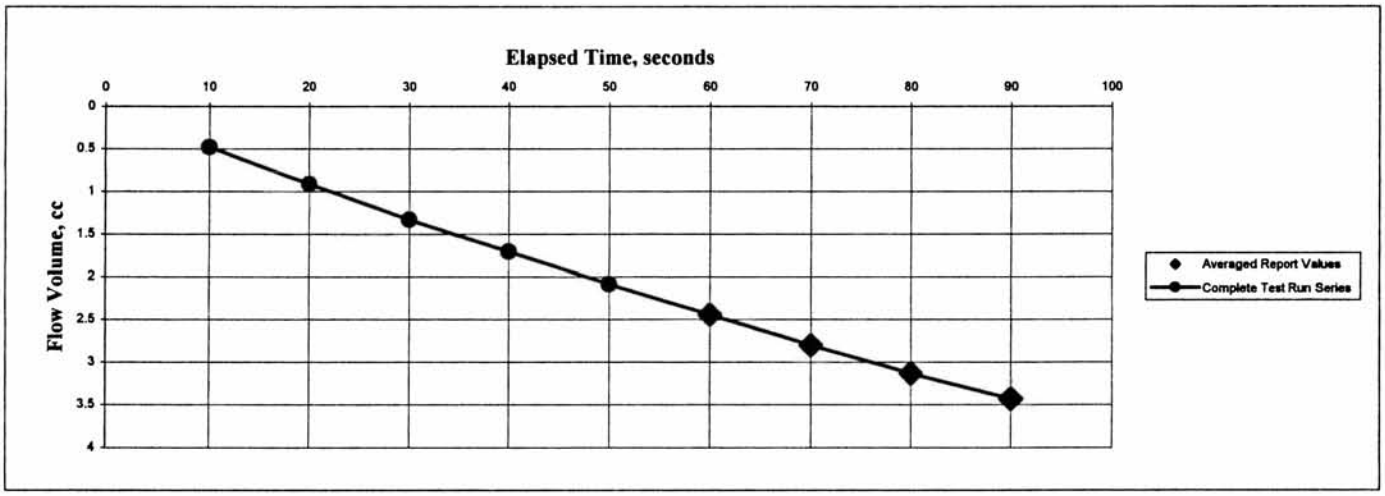
Permeability, cm/sec.: 1.75E-04

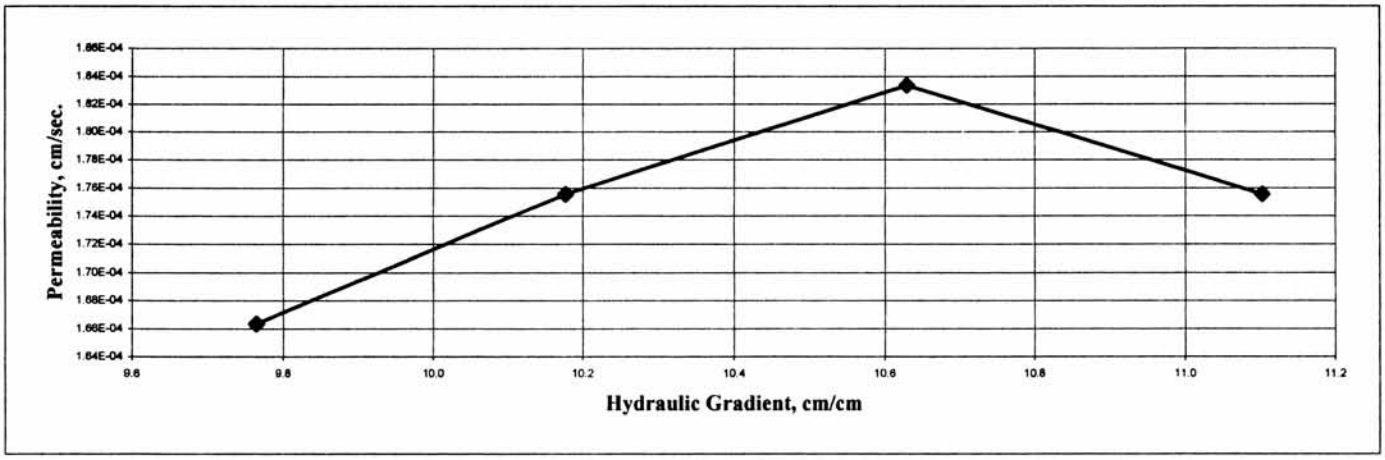
Average Hydraulic Gradient: 10.4

Effective Cell Pressure, psi: 21

TEST SAMPLE DATA

Before Test		After Test	
Specimen Height, cm:	5.08	Specimen Height, cm:	5.08
Specimen Diameter, cm:	4.85	Specimen Diameter, cm:	4.85
Dry Unit Weight, pcf:	112.7	Dry Unit Weight, pcf:	113.9
Moisture Content, %	17.0	Moisture Content, %	18.5
Specific Gravity, Assumed			
Percent Saturation:			





Test Method: ASTM D5856

PROJECT NUMBER:	07-220	June 4, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

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Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: B-3
Visual Description: N/A
Remarks: Confining Stress = 29 psi

Sample Depth, ft.: 75-75.6
Sample Type: Sample Liner

TEST RESULTS

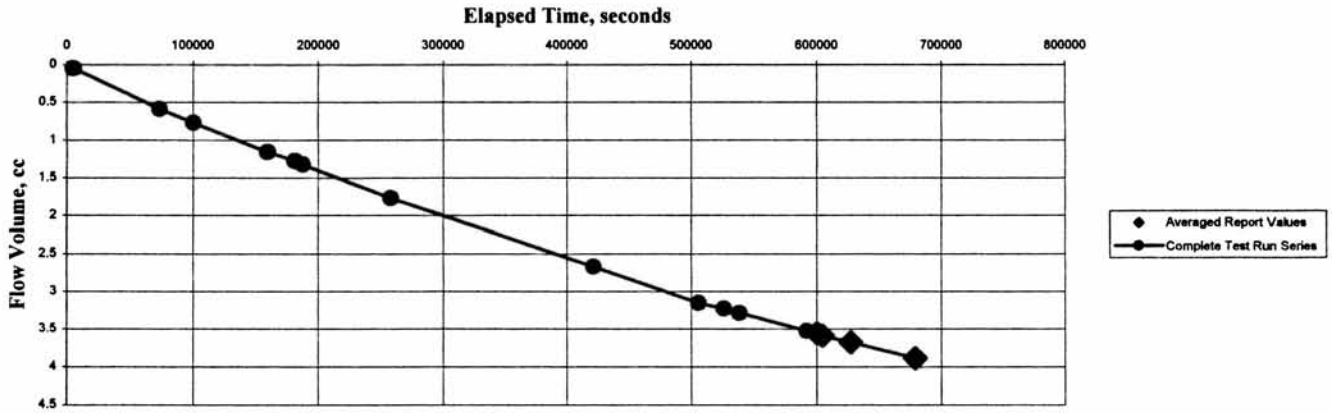
Permeability, cm/sec.: 2.72E-08

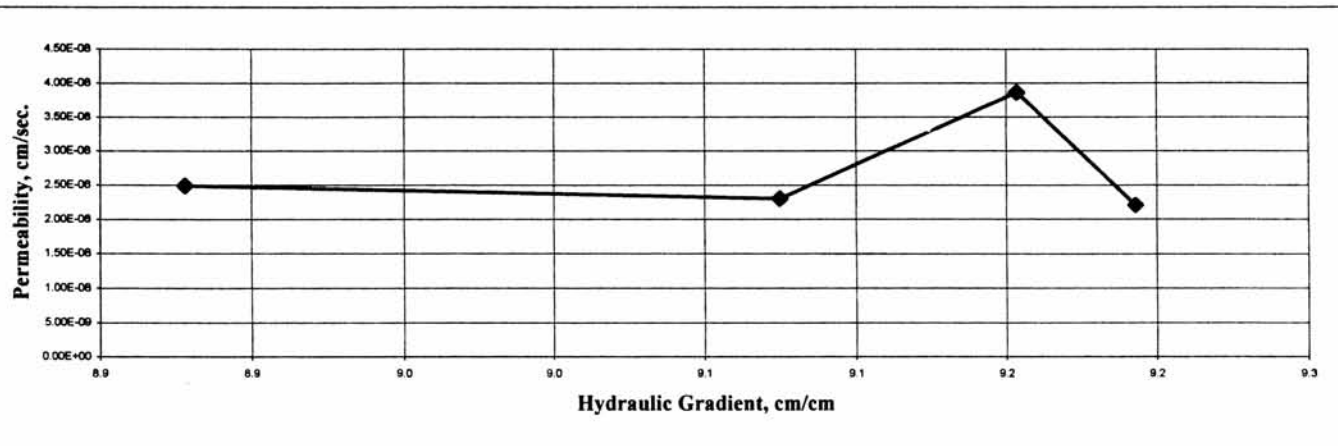
Average Hydraulic Gradient: 9.1

Effective Cell Pressure, psi: 29

TEST SAMPLE DATA

Before Test		After Test	
Specimen Height, cm:	5.08	Specimen Height, cm:	5.08
Specimen Diameter, cm:	4.85	Specimen Diameter, cm:	4.85
Dry Unit Weight, pcf:	81.9	Dry Unit Weight, pcf:	81.9
Moisture Content, %	38.3	Moisture Content, %	38.8
Specific Gravity, Assumed			
Percent Saturation:			





Test Method: ASTM D5856

PROJECT NUMBER:	07-220	June 4, 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

June 25, 2007

Kleinfelder, Inc.
Attn: G. Whittman
4875 Longley Ln Ste 100
Reno NV 89502-5953

STL Project No: **07-220**
Subject: **BRC Aquifer**
Project No: **83173.4**
Invoice No: **4546**

LABORATORY TEST RESULTS

Dear Mr. Whittman:

As requested, Sierra Testing Laboratories, Inc. performed laboratory testing on **seven samples** of material from the subject site. The samples were identified as:

1. **AA-20-OW, 6/2/07, 30-31.5**
2. **AA-20-OW, 6/2/07, 50-51.5**
3. **AA-06, 6/3/07, 55-56.5**
4. **AA-06, 6/3/07, 60-61.5**
5. **B-4, 6/1/07, 80-81.5**
6. **AA-09-OW, 6/1/07, 55-56.5**
7. **AA-09-OW, 6/1/07, 70-71.5**

Our laboratory received the samples on **June 7, 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: AA-20-OW
Visual Description: N/A
Remarks: Confining Stress = 11.5 psi

Sample Depth, ft.: 30-31.5
Sample Type: Sample Liner

TEST RESULTS

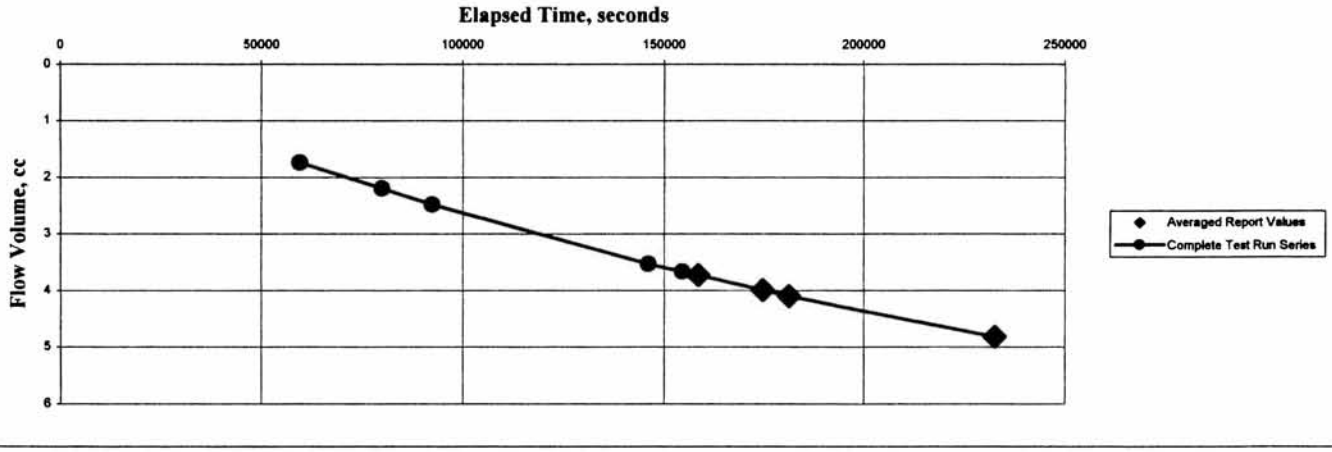
Permeability, cm/sec.: 1.35E-07

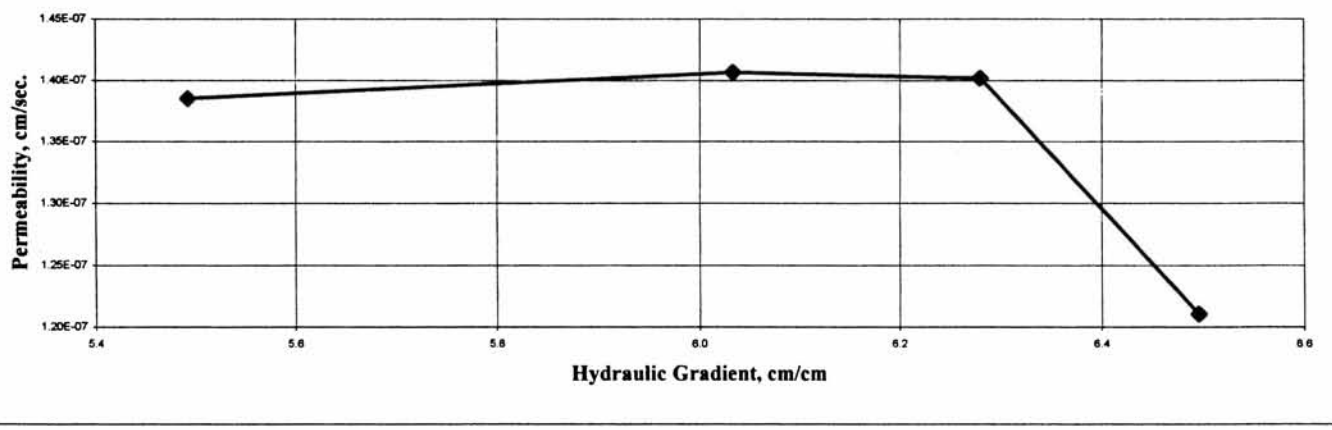
Average Hydraulic Gradient: 6.1

Effective Cell Pressure, psi: 11.5

TEST SAMPLE DATA

Before Test		After Test	
Specimen Height, cm:	5.08	Specimen Height, cm:	5.08
Specimen Diameter, cm:	4.85	Specimen Diameter, cm:	4.85
Dry Unit Weight, pcf:	79.6	Dry Unit Weight, pcf:	77.2
Moisture Content, %	39.6	Moisture Content, %	40.8
Specific Gravity, Assumed			
Percent Saturation:			





Test Method: ASTM D5856

PROJECT NUMBER:	07-220	June 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-20-OW
Sample Depth, ft.: 50-51.5
Visual Description: N/A
Sample Type: Sample Liner
Remarks: Confining Stress = 19.0 psi

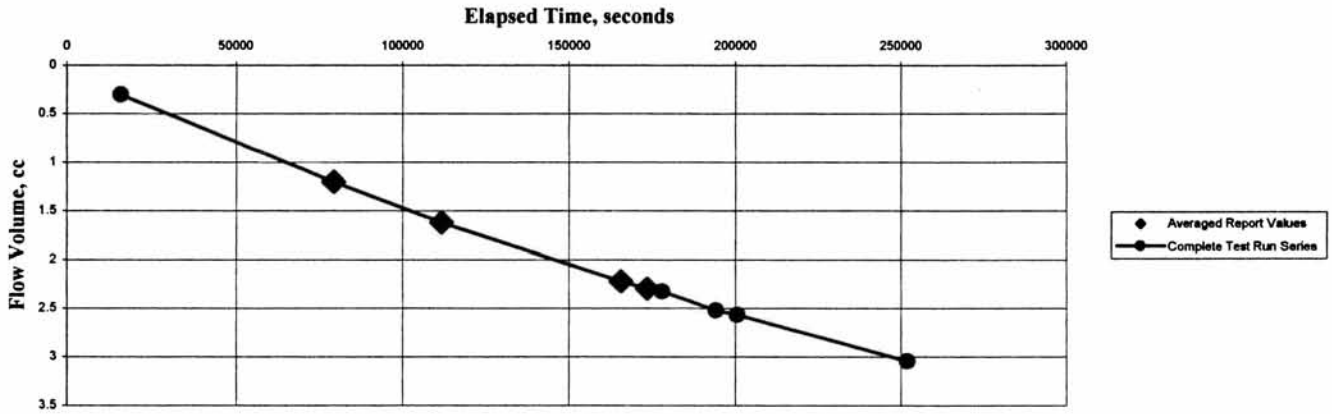
TEST RESULTS

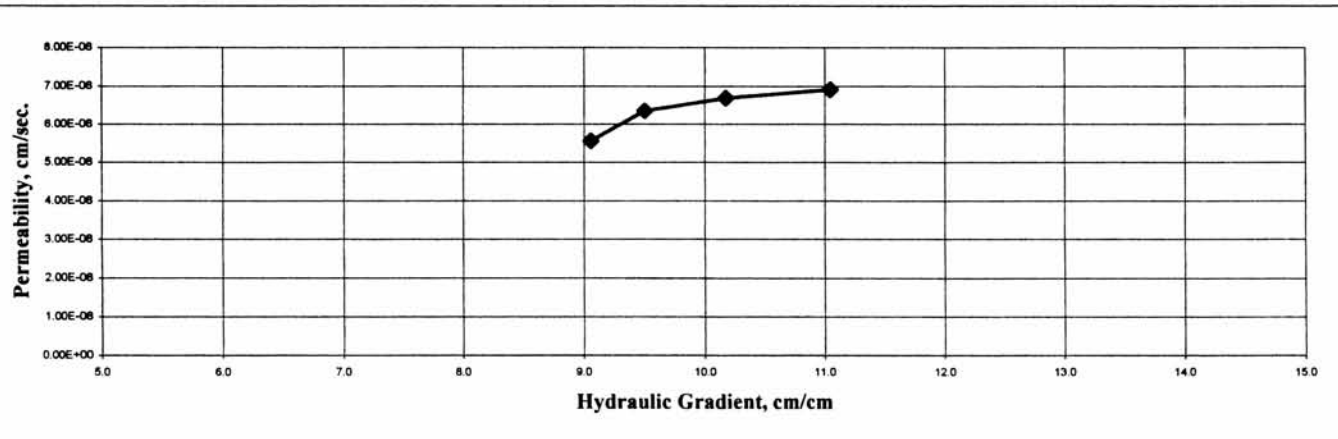
Permeability, cm/sec.: 6.38E-08
Average Hydraulic Gradient: 9.9

Effective Cell Pressure, psi: 19

TEST SAMPLE DATA

Before Test		After Test	
Specimen Height, cm:	5.08	Specimen Height, cm:	5.05
Specimen Diameter, cm:	4.85	Specimen Diameter, cm:	4.85
Dry Unit Weight, pcf:	93.7	Dry Unit Weight, pcf:	95.1
Moisture Content, %	28.0	Moisture Content, %	28.3
Specific Gravity, Assumed			
Percent Saturation:			





Test Method: ASTM D5856

PROJECT NUMBER:	07-220	June 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-06
Visual Description: N/A
Remarks: Confining Stress = 21.0 psi

Sample Depth, ft.: 55-56.5
Sample Type: Sample Liner

TEST RESULTS

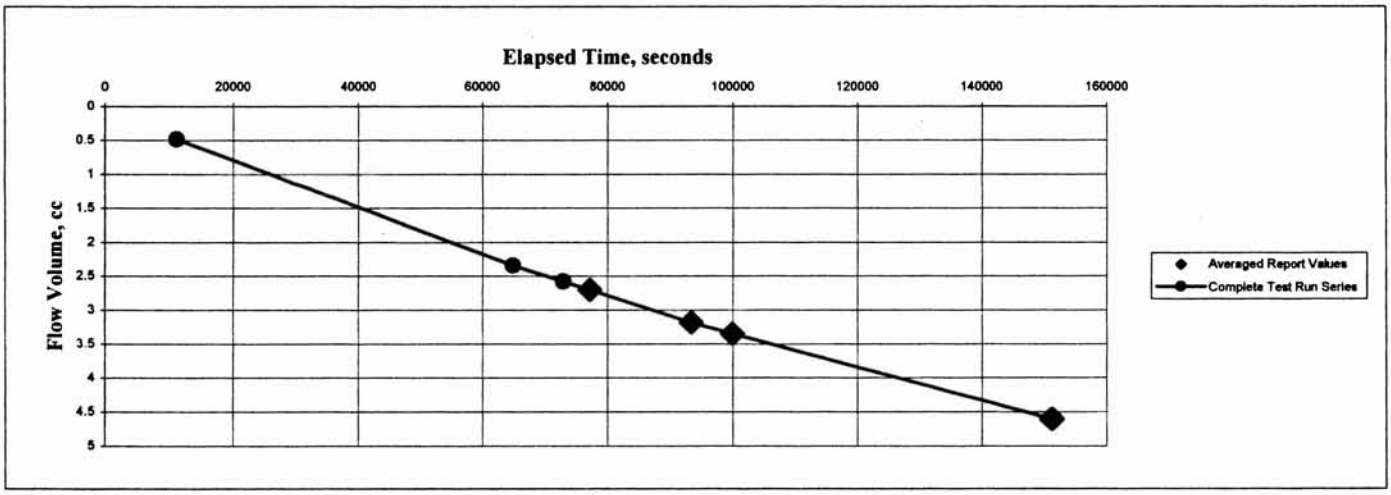
Permeability, cm/sec.: 1.64E-07

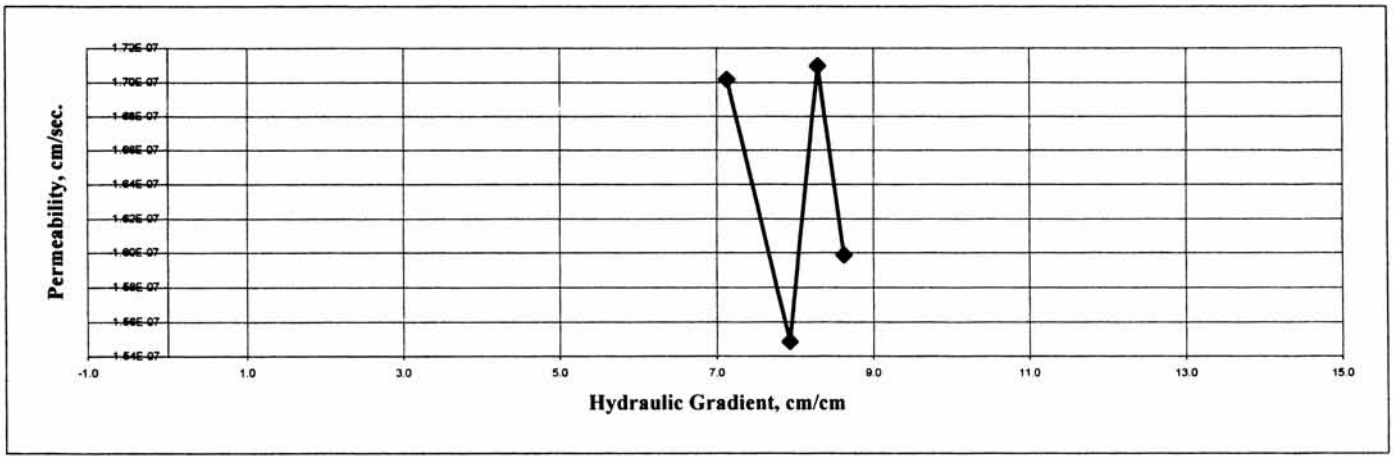
Average Hydraulic Gradient: 8.0

Effective Cell Pressure, psi: 21

TEST SAMPLE DATA

Before Test		After Test	
Specimen Height, cm:	5.97	Specimen Height, cm:	5.97
Specimen Diameter, cm:	5.08	Specimen Diameter, cm:	5.08
Dry Unit Weight, pcf:	81.9	Dry Unit Weight, pcf:	83.5
Moisture Content, %	40.9	Moisture Content, %	36.2
Specific Gravity, Assumed			
Percent Saturation:			





Test Method: ASTM D5856

PROJECT NUMBER:	07-220	June 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-06
Sample Depth, ft.: 60-61.5
Visual Description: N/A
Sample Type: Sample Liner
Remarks: Confining Stress = 23.0 psi

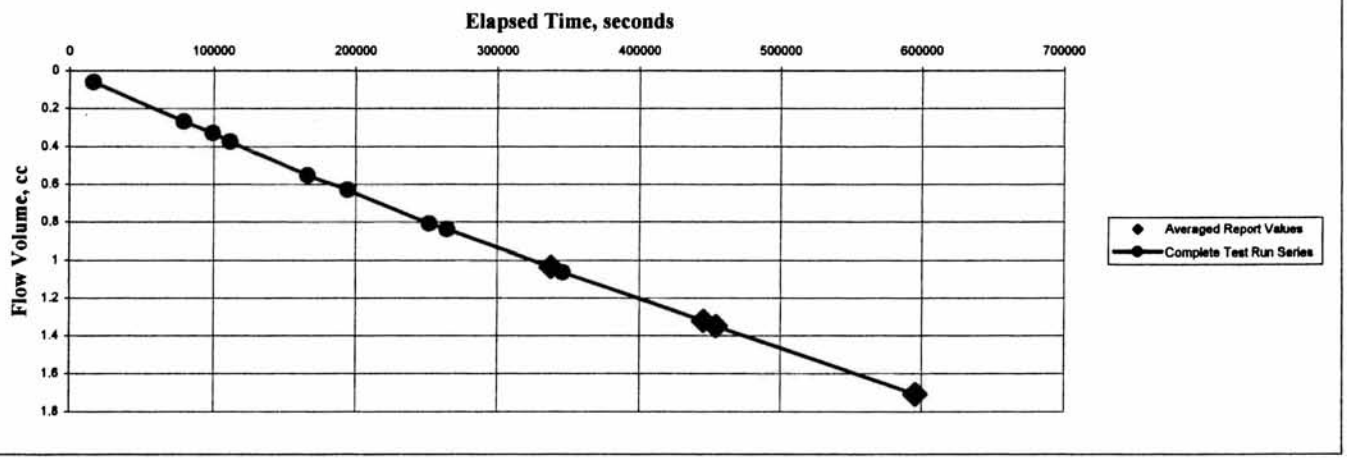
TEST RESULTS

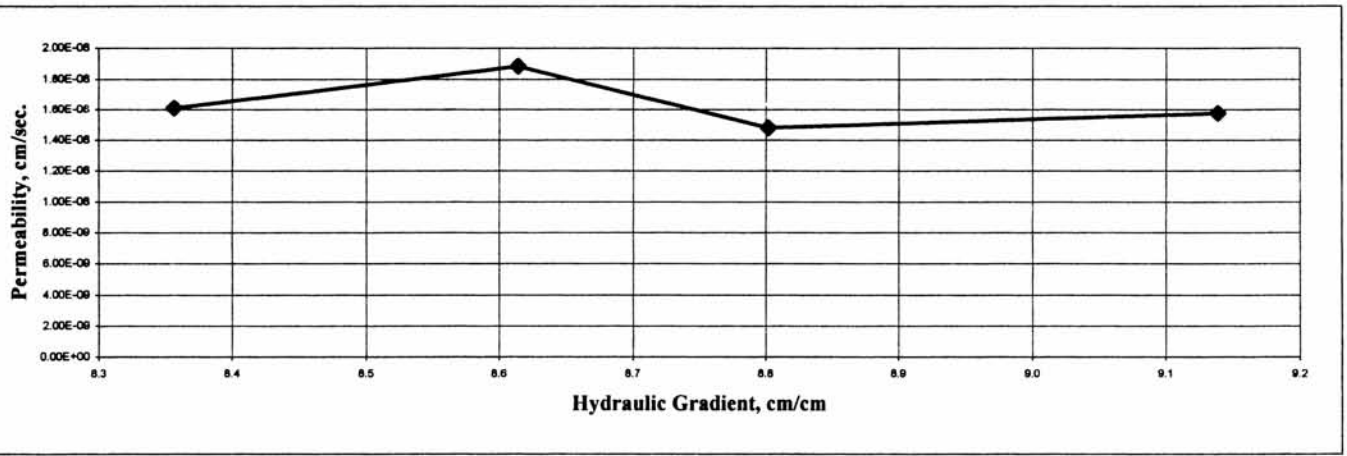
Permeability, cm/sec.: 1.64E-08
Average Hydraulic Gradient: 8.7

Effective Cell Pressure, psi: 23

TEST SAMPLE DATA

Before Test		After Test	
Specimen Height, cm:	5.08	Specimen Height, cm:	5.05
Specimen Diameter, cm:	4.85	Specimen Diameter, cm:	4.85
Dry Unit Weight, pcf:	90.0	Dry Unit Weight, pcf:	90.5
Moisture Content, %	29.9	Moisture Content, %	28.2
Specific Gravity, Assumed			
Percent Saturation:			





Test Method: ASTM D5856

PROJECT NUMBER:	07-220	June 7, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

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Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: B-4
Visual Description: N/A
Remarks: Confining Stress = 30.5 psi

Sample Depth, ft.: 80-81.5
Sample Type: Sample Liner

TEST RESULTS

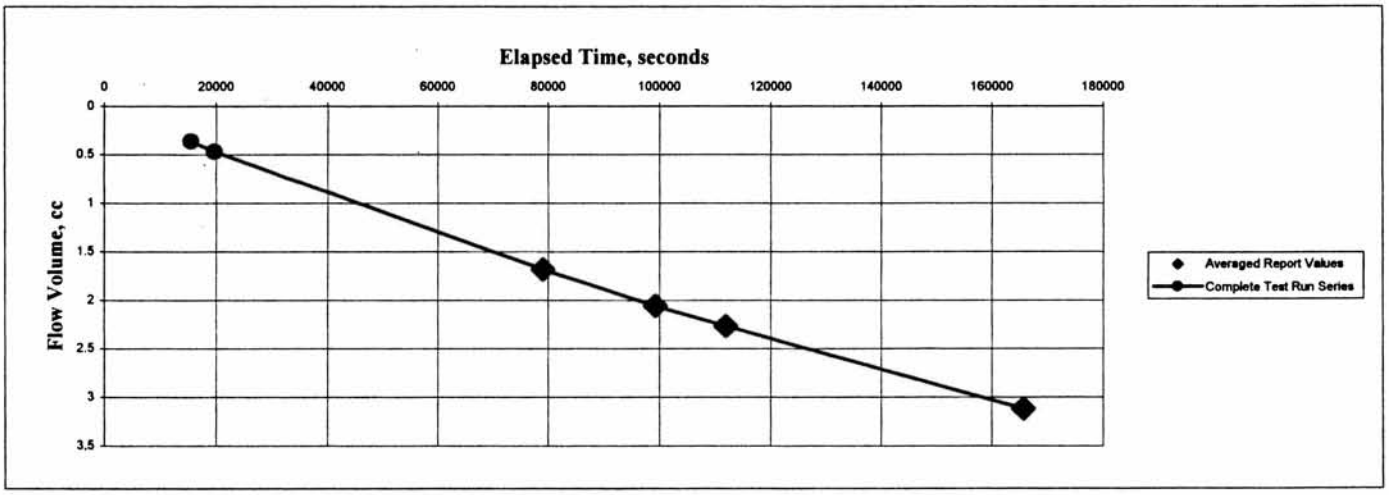
Permeability, cm/sec.: 1.15E-07

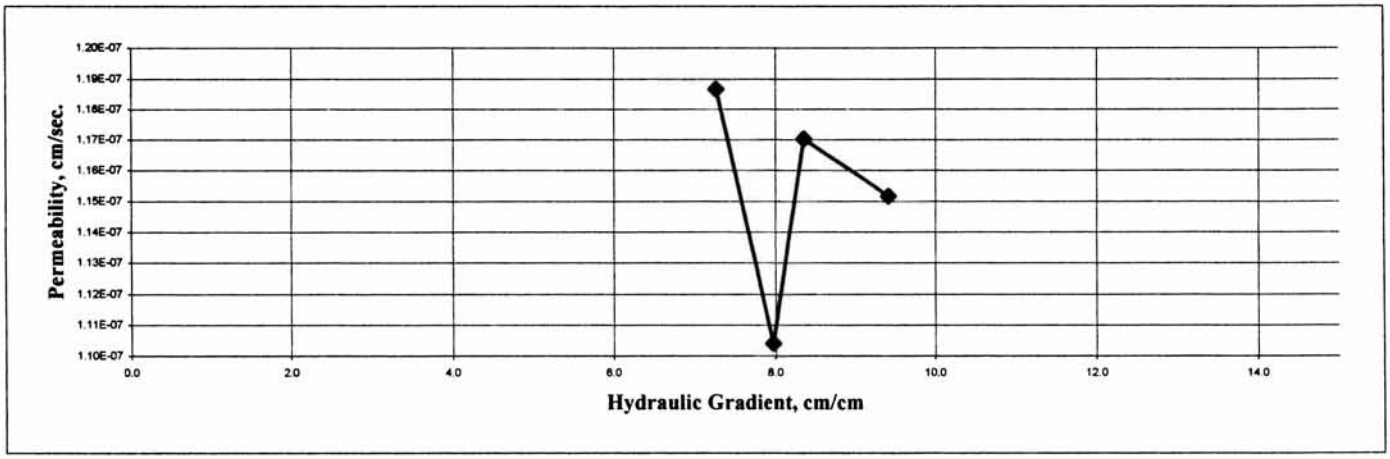
Average Hydraulic Gradient: 8.3

Effective Cell Pressure, psi: 30.5

TEST SAMPLE DATA

Before Test		After Test	
Specimen Height, cm:	5.08	Specimen Height, cm:	5.03
Specimen Diameter, cm:	4.85	Specimen Diameter, cm:	4.85
Dry Unit Weight, pcf:	82.9	Dry Unit Weight, pcf:	80.4
Moisture Content, %	34.8	Moisture Content, %	34.5
Specific Gravity, Assumed			
Percent Saturation:			





Test Method: ASTM D5856

PROJECT NUMBER:	07-220	June 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-09-OW
Sample Depth, ft.: 55-56.5
Visual Description: N/A
Sample Type: Sample Liner
Remarks: Confining Stress = 21.0 psi

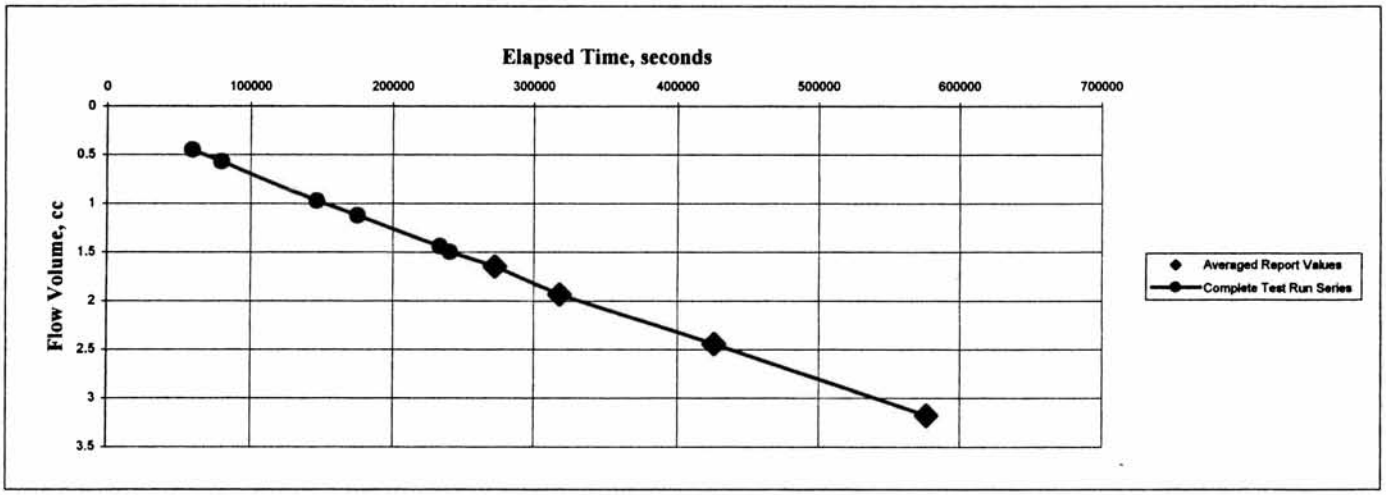
TEST RESULTS

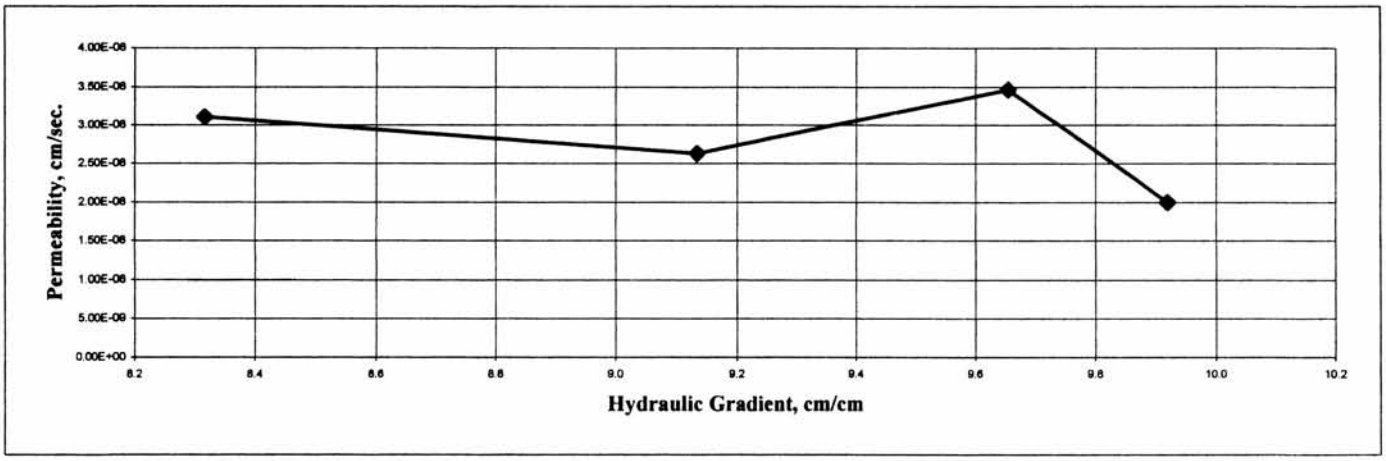
Permeability, cm/sec.: 2.80E-08
Average Hydraulic Gradient: 9.3

Effective Cell Pressure, psi: 21

TEST SAMPLE DATA

Before Test		After Test	
Specimen Height, cm:	5.08	Specimen Height, cm:	5.08
Specimen Diameter, cm:	4.85	Specimen Diameter, cm:	4.85
Dry Unit Weight, pcf:	84.1	Dry Unit Weight, pcf:	84.1
Moisture Content, %	35.1	Moisture Content, %	36.5
Specific Gravity, Assumed			
Percent Saturation:			





Test Method: ASTM D5856

PROJECT NUMBER:	07-220	June 7, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

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Phone: (916) 939-3460 FAX: (916) 939-3507

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: AA-09-OW
Sample Depth, ft.: 70-71.5
Visual Description: N/A
Sample Type: Sample Liner
Remarks: Confining Stress = 27 psi

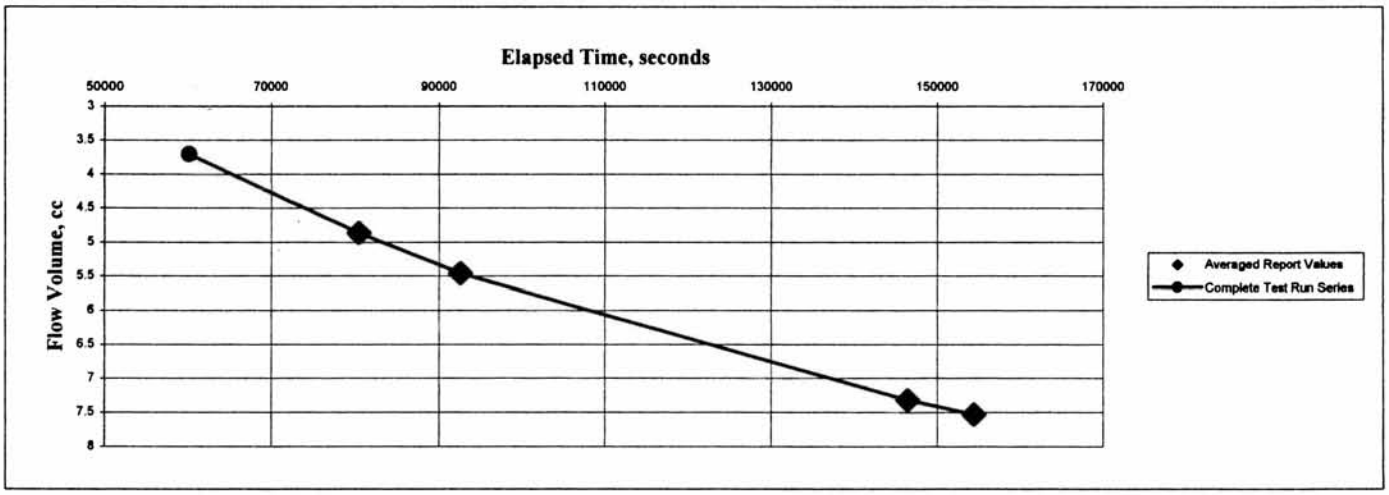
TEST RESULTS

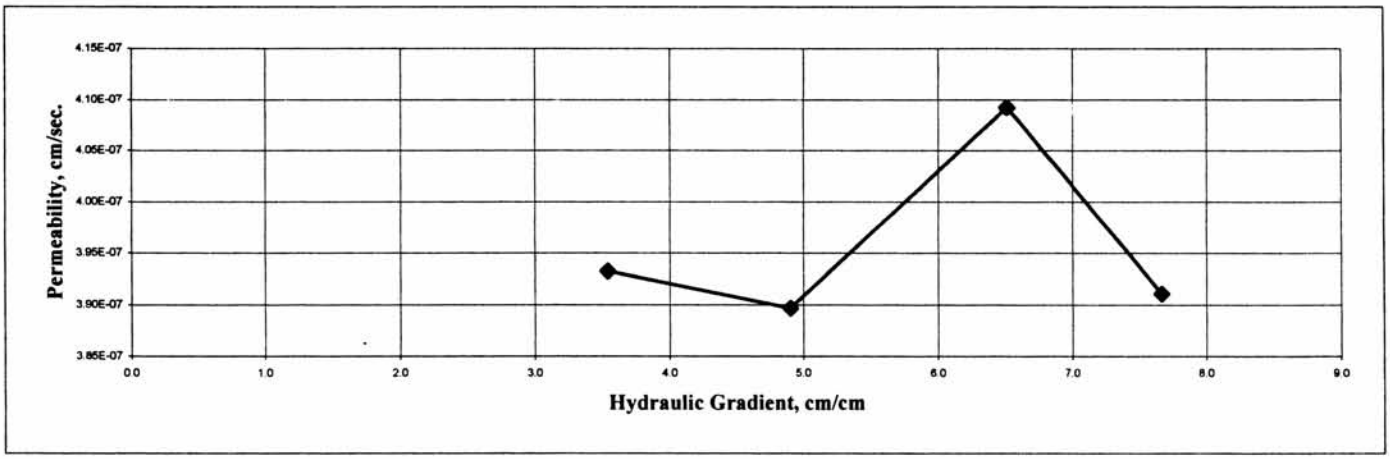
Permeability, cm/sec.: 3.96E-07
Average Hydraulic Gradient: 5.7

Effective Cell Pressure, psi: 27

TEST SAMPLE DATA

Before Test		After Test	
Specimen Height, cm:	5.08	Specimen Height, cm:	5.08
Specimen Diameter, cm:	4.85	Specimen Diameter, cm:	4.85
Dry Unit Weight, pcf:	63.2	Dry Unit Weight, pcf:	62.6
Moisture Content, %	59.3	Moisture Content, %	60.1
Specific Gravity, Assumed			
Percent Saturation:			





Test Method: ASTM D5856

PROJECT NUMBER:	07-220	June 7, 2007

BRC Aquifer Testing

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

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Phone: (916) 939-3460 FAX: (916) 939-3507

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

June 20, 2007

Kleinfelder, Inc.
Attn: Jessi Henderson
4875 Longley Ln Ste 100
Reno NV 89502-5953

STL Project No: **07-220**
Subject: **BRC Aquifer**
Project No: **83173.4**
Invoice No: **4541**

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:

AA-08-OWB, 6/5/07

Our laboratory received the samples on **June 11, 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

5040 Robert J. Mathews, Suite 1, El Dorado Hills, CA 95762 (916) 939-3460 Fax (916) 939-3507
www.sierratestinglaboratories.com

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: AA-08-OWB
Sample Depth, ft.: 35-36.5
Visual Description: N/A
Sample Type: Sample Liner
Remarks: Confining Stress = 13.4 psi

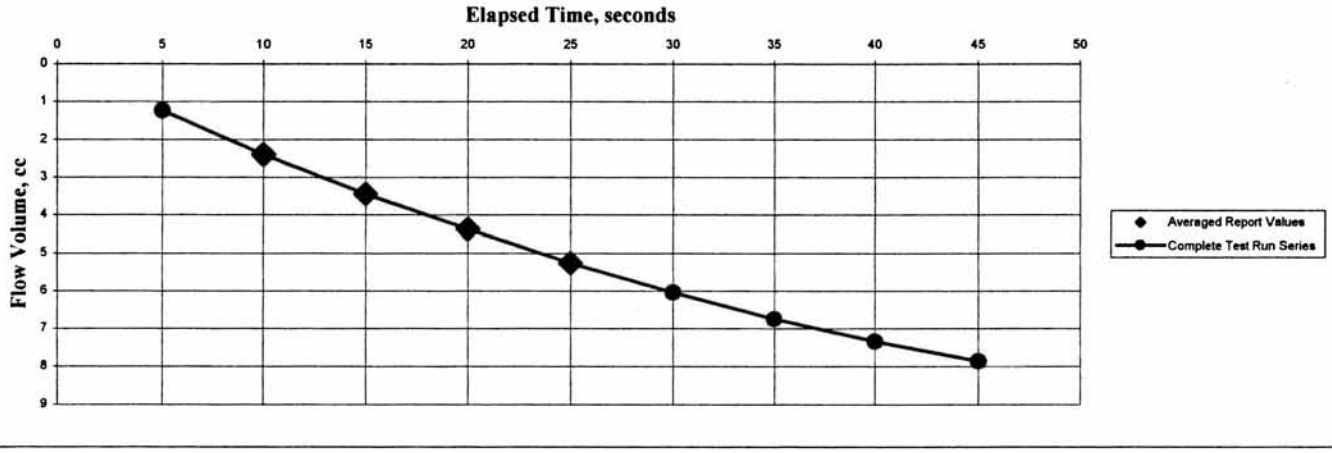
TEST RESULTS

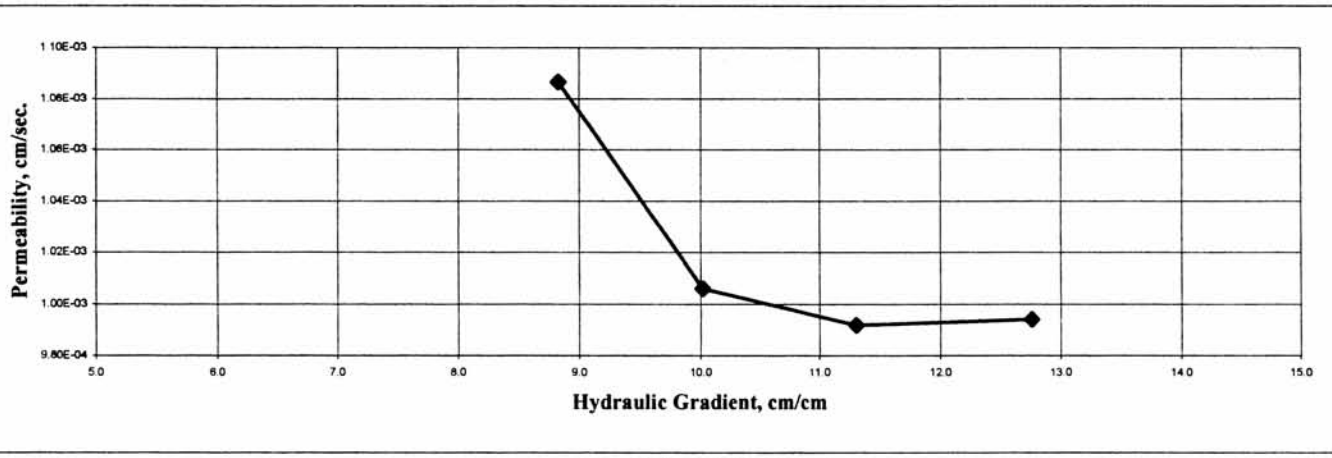
Permeability, cm/sec.: 1.02E-03
Average Hydraulic Gradient: 10.7

Effective Cell Pressure, psi: 13.4

TEST SAMPLE DATA

Before Test		After Test	
Specimen Height, cm:	5.08	Specimen Height, cm:	5.08
Specimen Diameter, cm:	4.85	Specimen Diameter, cm:	4.85
Dry Unit Weight, pcf:	119.1	Dry Unit Weight, pcf:	119.1
Moisture Content, %	9.7	Moisture Content, %	14.9
Specific Gravity, Assumed			
Percent Saturation:			





Test Method: ASTM D5856

PROJECT NUMBER:	07-220	June 11, 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

June 18, 2007

Kleinfelder, Inc.
Attn: Jessi Henderson
4875 Longley Ln Ste 100
Reno NV 89502-5953

STL Project No: **07-220**
Subject: **BRC Aquifer**
Project No: **83173.4**
Invoice No: **4536**

LABORATORY TEST RESULTS

Dear Mr. Henderson:

As requested, Sierra Testing Laboratories, Inc. performed laboratory testing on **two samples** of material from the subject site. The samples were identified as:

1. **AA-08-OW, 6/4/07: 15-16.5**
2. **AA-08-OW, 6/4/07: 40-41.5**

Our laboratory received the samples on **June 7, 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: AA-08-OW
Sample Depth, ft.: 15-16.5
Visual Description: N/A
Sample Type: Sample Liner
Remarks: Confining Stress = 6.0 psi

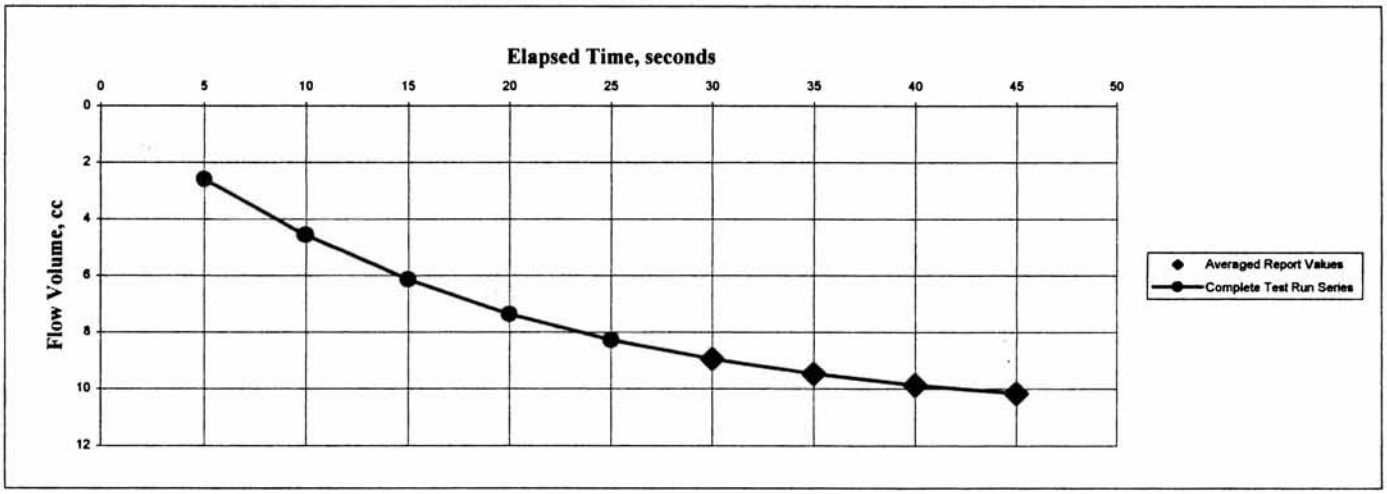
TEST RESULTS

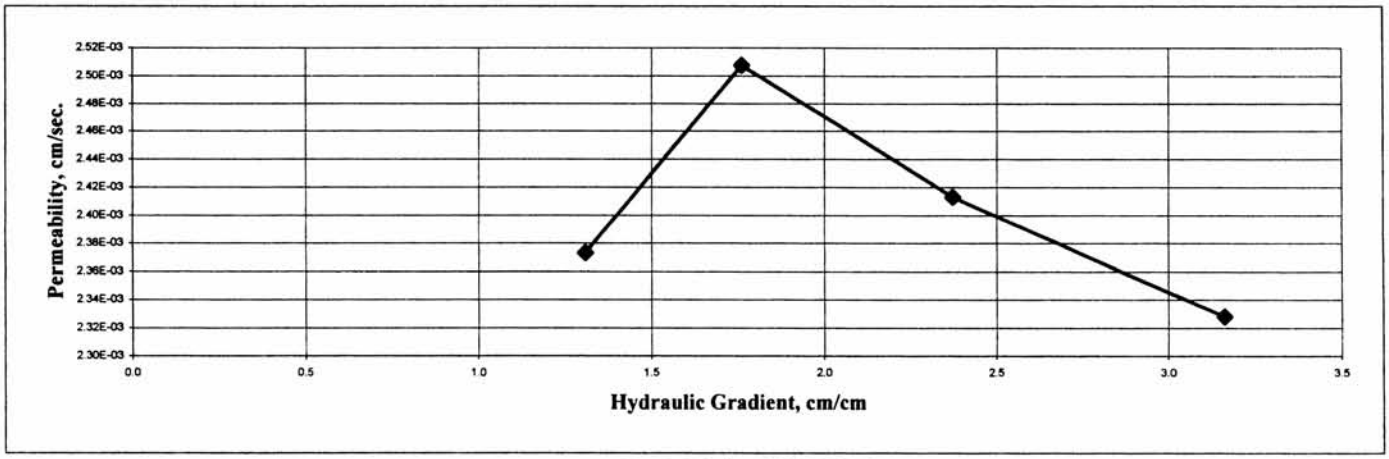
Permeability, cm/sec.: 2.41E-03
Average Hydraulic Gradient: 2.2

Effective Cell Pressure, psi: 6

TEST SAMPLE DATA

Before Test		After Test	
Specimen Height, cm:	5.08	Specimen Height, cm:	5.08
Specimen Diameter, cm:	4.85	Specimen Diameter, cm:	4.85
Dry Unit Weight, pcf:	114.3	Dry Unit Weight, pcf:	114.3
Moisture Content, %	14.5	Moisture Content, %	14.7
Specific Gravity, Assumed			
Percent Saturation:			





Test Method: ASTM D5856

PROJECT NUMBER:	07-220	June 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-08-OW
Sample Depth, ft.: 40-41.5
Visual Description: N/A
Sample Type: Sample Liner
Remarks: Confining Stress = 15.0 psi

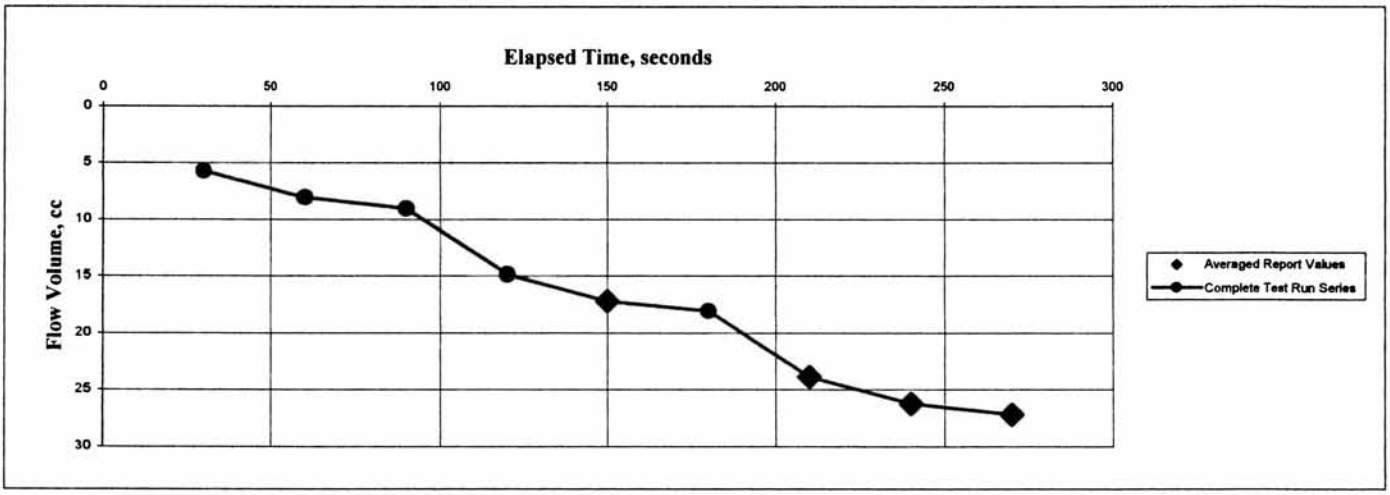
TEST RESULTS

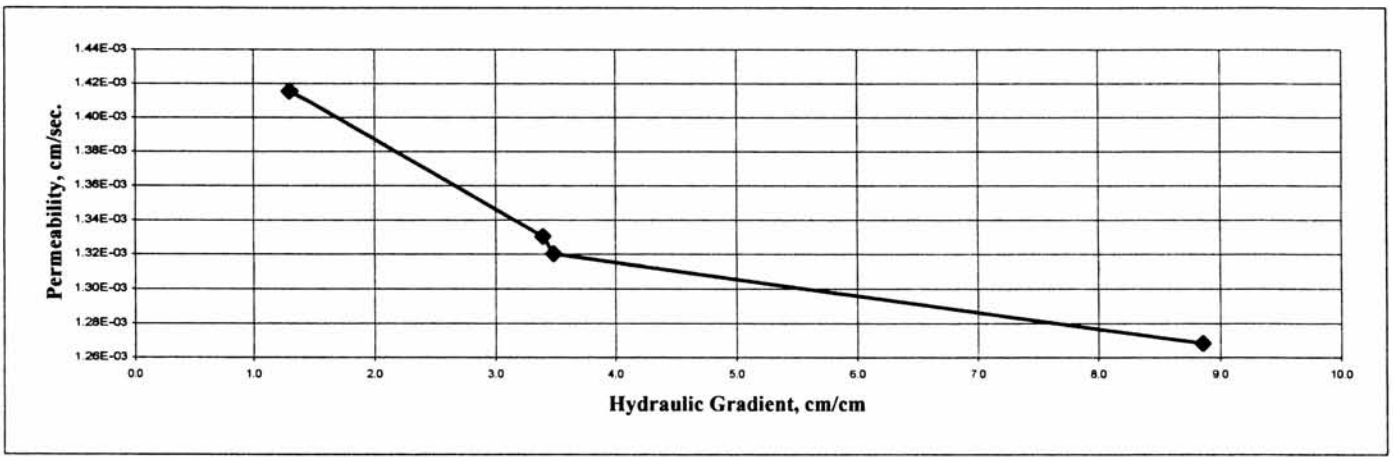
Permeability, cm/sec.: 1.33E-03
Average Hydraulic Gradient: 4.3

Effective Cell Pressure, psi: 15

TEST SAMPLE DATA

Before Test		After Test	
Specimen Height, cm:	5.08	Specimen Height, cm:	5.08
Specimen Diameter, cm:	4.85	Specimen Diameter, cm:	4.85
Dry Unit Weight, pcf:	116.1	Dry Unit Weight, pcf:	116.1
Moisture Content, %	15.5	Moisture Content, %	16.5
Specific Gravity, Assumed			
Percent Saturation:			





Test Method: ASTM D5856

PROJECT NUMBER:	07-220	June 7, 2007	BRC Aquifer Testing

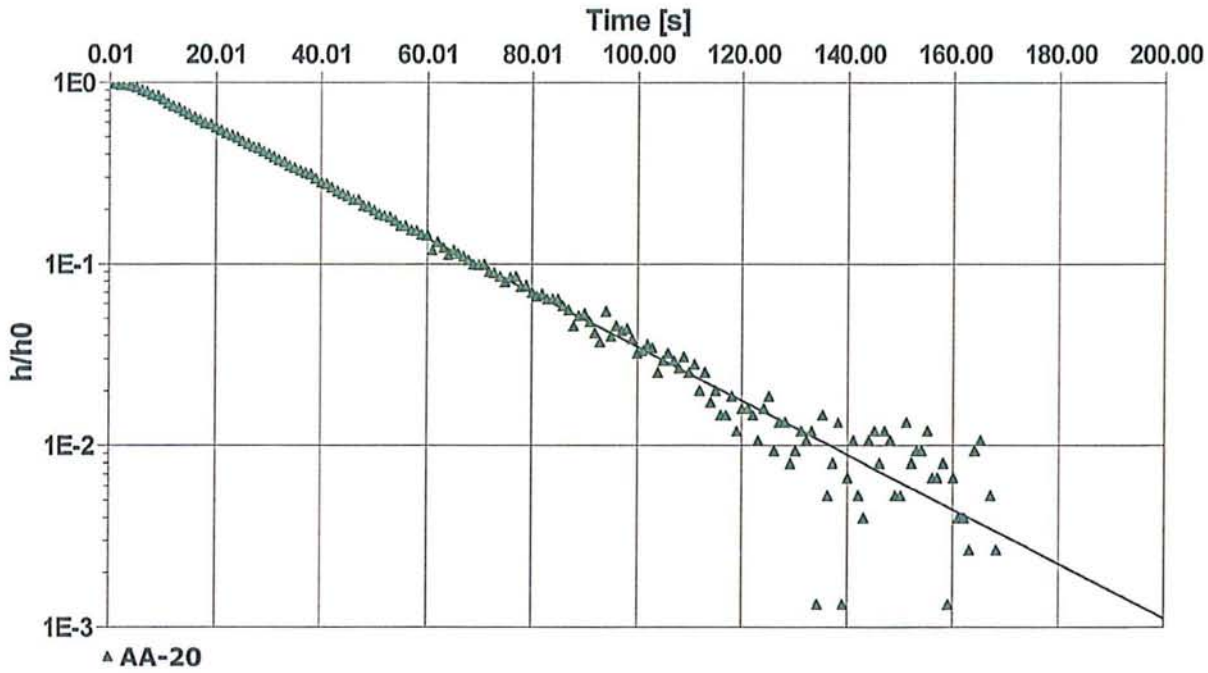
SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES
5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

APPENDIX C

SLUG TEST DATA PLOTS AND PERTINENT PRE-EXISTING BORING LOGS

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Slug Test Analysis Report
	Project: BMI Aquifer Test
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Slug Test: AA-20 Slug In-1	Test Well: AA-20
Test conducted by: G.P. Wittman		Test date: 8/24/2007
Analysis performed by: G.P. Wittman	AA-20 Slug In-1	Date: 8/24/2007
Aquifer Thickness: 13.50 ft		

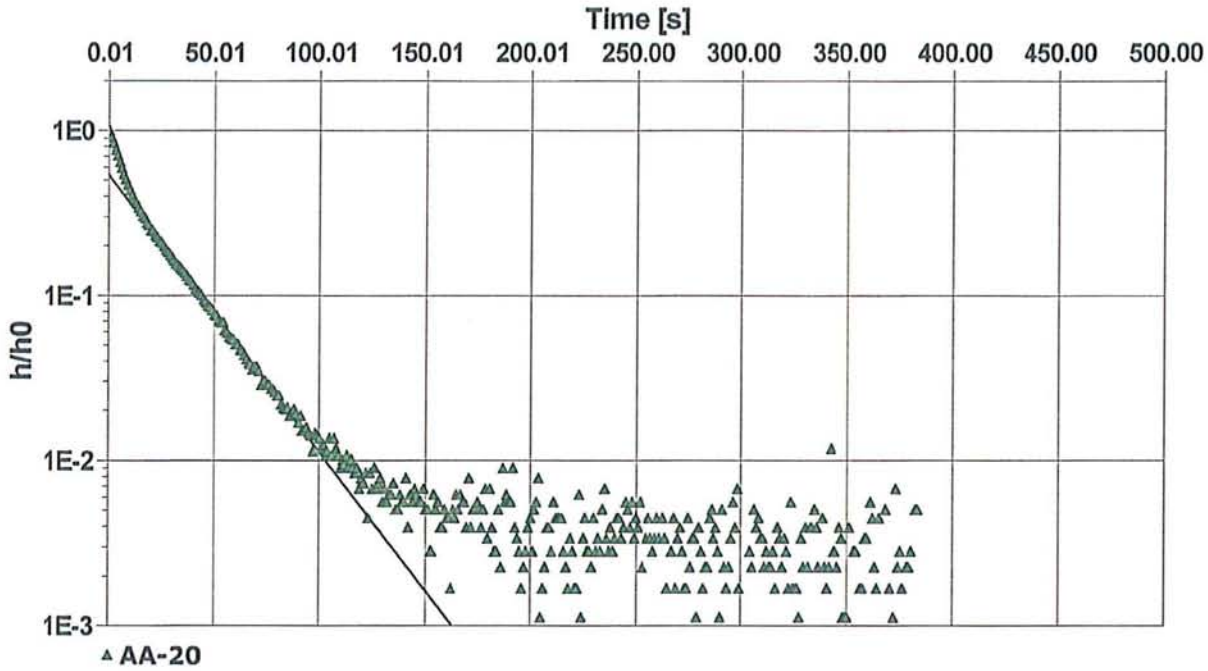


Calculation after Bouwer && Rice

Observation well	K [ft/d]	
AA-20	2.90×10^{1}	

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Slug Test Analysis Report
	Project: BMI Aquifer Test
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Slug Test: AA-20 Slug Out-1	Test Well: AA-20
Test conducted by: G.P. Wittman		Test date: 8/24/2007
Analysis performed by: G.P. Wittman	AA-20 Slug Out-1	Date: 8/24/2007
Aquifer Thickness: 13.50 ft		

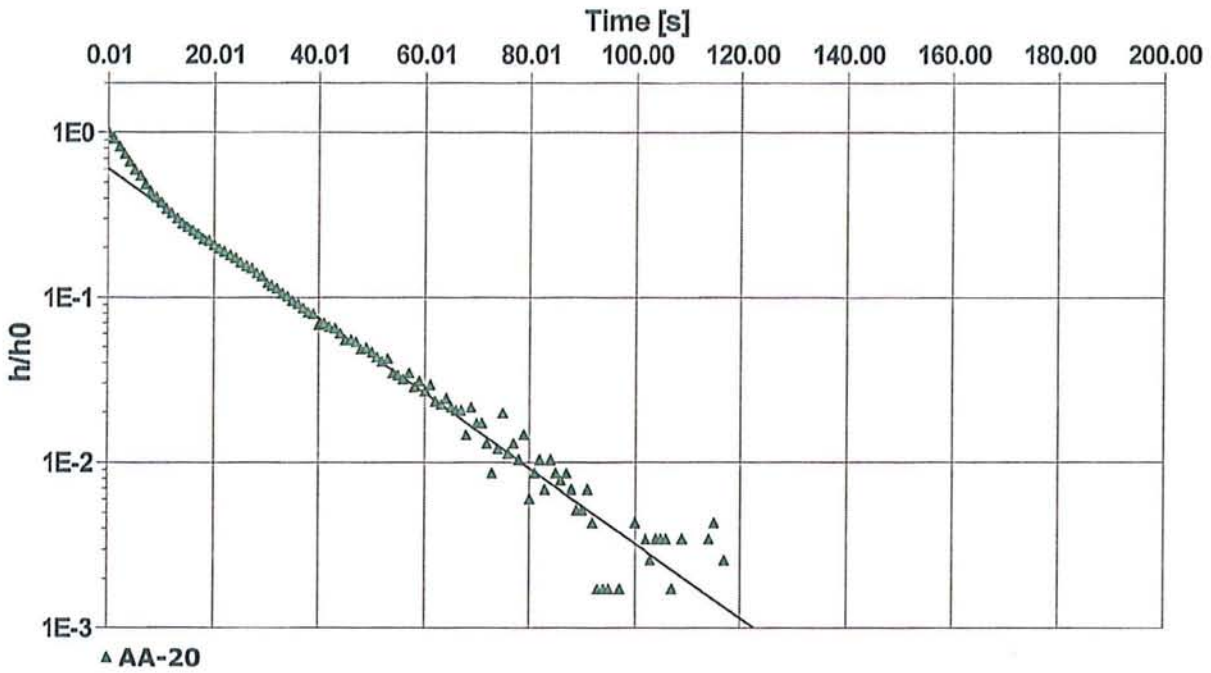


Calculation after Bouwer && Rice

Observation well	K [ft/d]	
AA-20	3.25×10^{1}	

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Slug Test Analysis Report
	Project: BMI Aquifer Test
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Slug Test: AA=20 Slug Out-2	Test Well: AA-20
Test conducted by: G.P. Wittman		Test date: 8/24/2007
Analysis performed by: G.P. Wittman	AA-20 Slug Out-2	Date: 8/24/2007
Aquifer Thickness: 13.50 ft		



Calculation after Bouwer && Rice

Observation well	K [ft/d]	
AA-20	4.40×10^{1}	

Log of Boring No. BRC-SB-20-A

BMI Site - Hydrogeologic Characterization

Henderson, Nevada

Basic Remediation COMPANY

Drilling Method: Rotary Sonic
Drilling Equipment: Rotary Sonic
Drilling Contractor: Prosonic Corporation
Driller: Don Youngblood

Borehole Total Depth: 78.5 ft bgs
Borehole Diameter: 8.5 in
Boring Location: Location 20 (Well ID: AA-20)
Depth to Water (ft. bgs): 16.5 ft bgs ⊻

Sample Type: Split-Spoon (2"ID)
Sample Interval Varies

Logged By: Adam Norris
Date Started: 7/10/04
Date Completed: 7/11/04

Monitoring Well Construction

Type of Surface Seal:	Bentonite-Grout	**Screen Slot Size:**	0.010 in
Blank Casing Type/Size:	4" Sch 80 PVC	**Top of Screen (ft. bgs):**	-10 ft bgs
Screen Type/Size:	4" Sch 80 PVC	**Bottom of Screen (ft. bgs):**	-30 ft bgs
Transition Sand Type:	N/A	**Type of Sand Pack:**	#2 x 12

Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
0	Grab		1.5/1.5		0		SM: Silty sand with gravel, pale brown (10YR 6/3), dry, subangular to subrounded sand, nonplastic silt, subangular to subrounded fine to coarse volancic gravel (up to 3" long). Approximately 20% gravel, 10% coarse sand, 15% medium sand, 35% fine sand, 20% silt and no clay.	Locking monument well box with concrete apron and ballards
					0			
					0			Cement Bentonite Grout
					0		Collected sample BRC-SB-20-A-0	
					0		Silty sand with gravel, yellowish brown (10YR 5/4), dry, subangular to subrounded sand, nonplastic silt, subangular to subrounded fine to coarse volanic gravel (up to 3" long). Approximately 25% gravel, 10% coarse sand, 10% medium sand, 35% fine sand, 20% silt and no clay.	
					0			Bentonite seal
					0			
	Grab		1.5/1.5		0		Collected sample BRC-SB-20-A-7	4" Blank PVC Riser Pipe
					0			
					0		Silty sand with gravel, brown (7.5YR 5/4), dry to moist, subangular to subrounded sand, nonplastic silt, subangular to subrounded fine to coarse volanic gravel (up to 3" long), trace local cementation. Approximately 25% gravel, 10% coarse sand, 10% medium sand, 350% fine sand, 20% silt and no clay.	
-10								#10 x 20 Sand Pack
					0			
					0		Silty sand with gravel, brown (7.5YR 5/4), moist, subangular to subrounded sand, nonplastic silt, subangular to subrounded fine to coarse volanic gravel (up to 2" long), trace local weak to moderate cementation. Approximately 25% gravel, 10% coarse sand, 10% medium sand, 35% fine sand, 20% silt and no clay.	
					0			
					0		Silty sand with gravel, brown (7.5YR 5/3), moist, subangular to subrounded sand, nonplastic to very low plasticity silt, subangular to subrounded fine to coarse volanic gravel (up to 2" long), trace local weak cementation. Approximately 20% gravel, 10% coarse sand, 15% medium sand, 35% fine sand, 20% silt and no clay	
					0			
					0		Becomes wet @ approximately 16.5' bgs.	
	Grab		0.5/1.5		0		Collected sample BRC-SB-20-A-17.5	4" 0.010 Slot PVC screen
					0		Silty sand with gravel, brown (7.5YR 5/4), wet, subangular to subrounded sand, nonplastic silt, subangular to subrounded fine to coarse volanic gravel (up to 2" long). Approximately 20% gravel, 10% coarse sand, 20% medium sand, 30% fine sand, 20% silt and no clay	
-20								
					0		Traces local volanic cobbles (up to 5" long).	
					0			
					0		Silty sand with gravel, brown (7.5YR 4/3), subangular to subrounded sand, nonplastic silt, subangular to subrounded fine to coarse volanic gravel (up to 3" long), trace local volcanic cobbles (up to 4" long). Approximately 20% gravel, 10% coarse sand, 20% medium sand, 30% fine sand, 20% silt and no clay	
					0			
					0			

BMI Site - Hydrogeologic Characterization

Basic Remediation COMPANY

Henderson, Nevada

Log of Boring No. BRC-SB-20-A

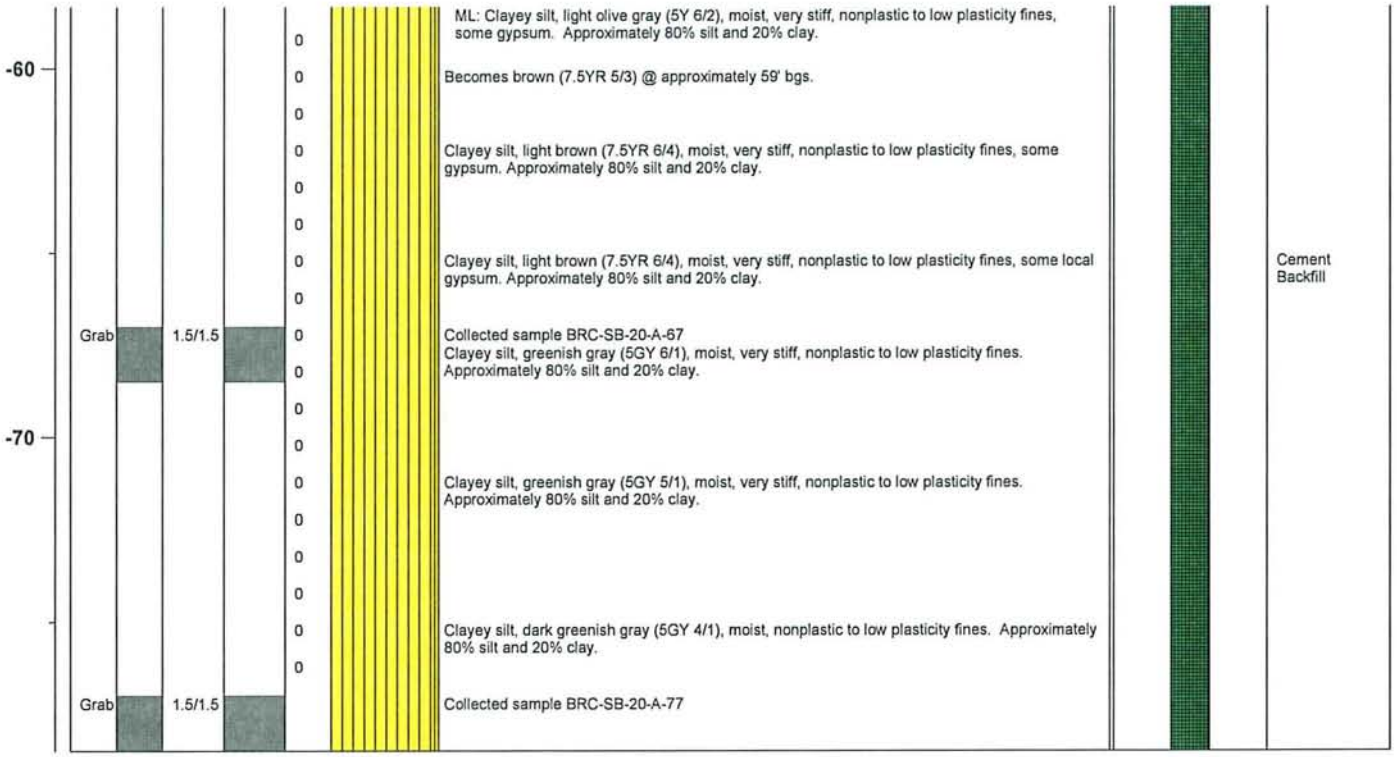
Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
					0		Silty sand with gravel, brown (7.5YR 4/3), wet, subangular to subrounded sand, nonplastic silt, subangular to subrounded fine to coarse volanic gravel (up to 2" long). Approximately 20% gravel, 10% coarse sand, 25% medium sand, 25% fine sand, 20% silt and no clay	#10 x 20 Sand Pack
					0		ML: Sandy silt, pale brown (10YR 6/3), moist to wet, nonplastic to low plasticity fines, subangular to subrounded sand. Approximately 30% fine sand, 70% silt and trace % clay	
-30					0		Silt with clay and sand, brown (7.5YR 5/3), moist, very stiff, nonplastic to low plasticity fines, subangular to subrounded sand. Approximately 10% fine sand, 80% silt and 10% clay..	Threaded PVC Well Base Cap
					0		Clayey silt, brown (7.5YR 5/4), moist, hard, nonplastic to low plasticity fines. Approximately 80silt and 20% clay.	
					0		Sandy silt, light yellowish brown (10YR 6/4), moist, nonplastic silt, subangular to subrounded sand. Approximately 40% fine sand, 60% silt and no clay..	
	Grab		0.5/0.5		0		Collected sample BRC-SB-20-A-36.5	
					0		Sandy silt with clay, light yellowish brown (10YR 6/4), wet, nonplastic to low plasticity fines, subangular to subrounded sand. Approximately 35% fine sand, 55% silt and 10% clay..	
-40					0		Clayey silt, light brown (7.5YR 6/4), moist, very stiff, nonplastic to low plasticity fines. Approximately 85% silt and 15% clay.	
					0		Clayey silt, light brown (7.5YR 6/4), moist, very stiff, nonplastic to low plasticity fines. Approximately 5% fine sand, 85% silt and 15% clay.	
					0		Clayey silt, light brown (7.5YR 6/4), moist, very stiff, nonplastic to low plasticity fines. Approximately 5% fine sand, 85% silt and 15% clay.	Cement Backfill
	Grab		1.5/1.5		0		Collected sample BRC-SB-20-A-47	
					0		Silt with sand, brown (7.5YR 5/3), moist, very stiff, nonplastic to low plasticiy fines, subangular to subrounded sand, Approximately 10% fine sand, 80% silt and 10% clay.	
-50					0		Collected sample BRC-SB-20-A-56.5	
					0		SM: Silty sand, yellowish brown (10YR 5/4), wet, subangular to subrounded sand, nonplastic silt. Approximately trace % medium sand, 65% fine sand, 35% silt and no clay.	
					0		ML: Clayey sandy silt, yellowish brown (10YR 5/4), wet, nonplastic to low plasticity fines, locally subangular to subrounded sand, Approximately 30 % fine sand, 55% silt and 15% clay.	
					0		SM: Silty sand, yellowish brown (10YR 5/6), wet, nonplastic to low plasticity fines, subangular to subrounded sand, nonplastic silt. Approximately 10% fine sand, 80% silt and 10% clay.	
					0		ML: Silt with clay, yellowish brown (10YR 5/4), moist, nonplastic to low plasticity fines, subangular to subrounded sand. Approximately 10% fine sand, 80% silt and 10% clay.	
	Grab		0.5/0.5		0		SM: Silty sand, brown (7.5YR 5/4), wet, subangular to subrounded sand, nonplastic silt. Approximately 65% fine sand, 35% silt and no clay.	

BMI Site - Hydrogeologic Characterization

Basic Remediation COMPANY

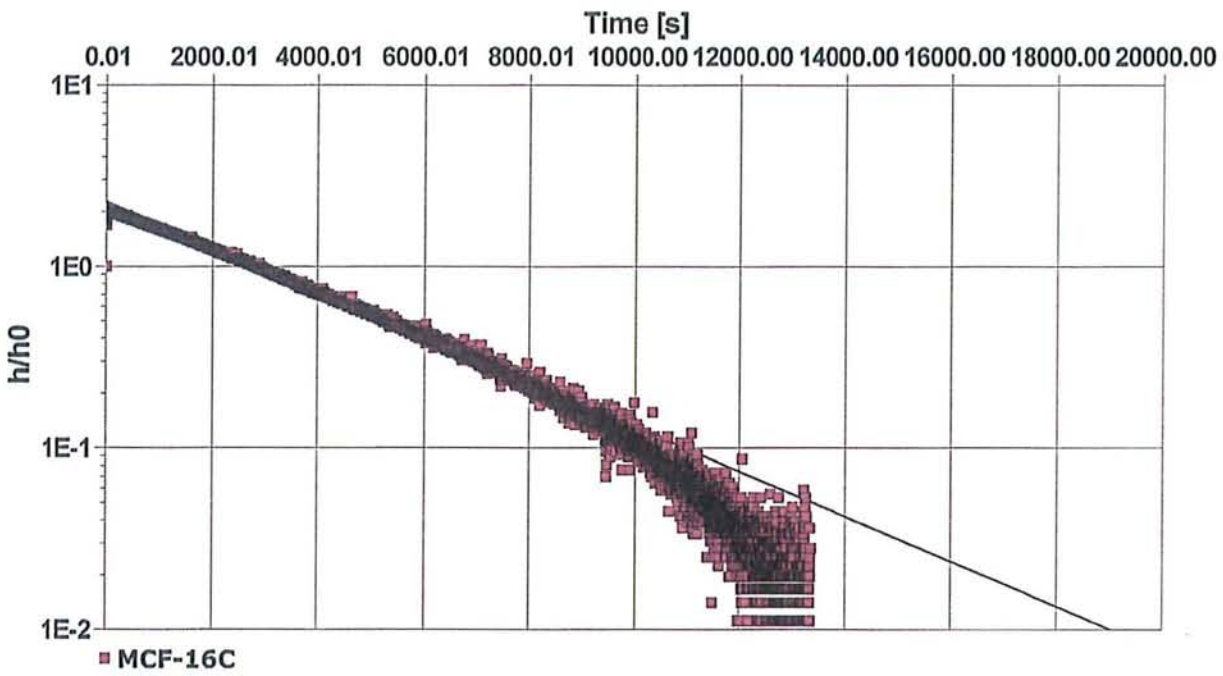
Henderson, Nevada

Log of Boring No. BRC-SB-20-A



Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Slug Test Analysis Report
	Project: BMI Aquifer Test
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Slug Test: Slug Test 40	Test Well: MCF-16C
Test conducted by:		Test date: 8/23/2007
Analysis performed by: g.p. wITTMAN	MCF-16C Slug In-1	Date: 8/23/2007
Aquifer Thickness: 10.00 ft		



Calculation after Bouwer && Rice

Observation well	K [ft/d]	
MCF-16C	2.40×10^{-1}	

Log of Boring No. BRC-SB-16-C

BMI Site - Hydrogeologic Characterization

Henderson, Nevada

Basic Remediation COMPANY

Drilling Method: Sonic
Drilling Equipment: Rotary Sonic
Drilling Contractor: Prosonic
Driller: ProSonic

Borehole Total Depth: 77 ft bgs
Borehole Diameter: 8.5 in
Boring Location: Location 16 (Well ID: MCF-16C)
Depth to Water (ft. bgs): NA ⊻

Sample Type: N/A
Sample Interval Cont.

Logged By: Jennifer Wiley
Date Started: 06/04/04
Date Completed: 06/05/04

Monitoring Well Construction

Type of Surface Seal:	Bentonite-Grout	**Screen Slot Size:**	0.010 in
Blank Casing Type/Size:	4" Sch 80 PVC	**Top of Screen (ft. bgs):**	53 ft bgs
Screen Type/Size:	4" Sch 80 PVC	**Bottom of Screen (ft. bgs):**	73 ft bgs
Transition Sand Type:	N/A	**Type of Sand Pack:**	2 x 12

Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
0							For lithologic interpretation, see boring log BRC-SB-16-A	Locking monument well box with concrete apron and ballards; Cement Bentonite Grout; 4" Blank PVC Riser Pipe
-10								
-20								

Basic Remediation COMPANY

Log of Boring No. BRC-SB-16-C

Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
-30							For lithologic interpretation, see boring log BRC-SB-16-A	Cement Bentonite Grout; 4" Blank PVC Riser Pipe
-40								Bentonite seal
-50								#10 x 20 Sand Pack; 4" 0.010 Slot PVC screen

BMI Site - Hydrogeologic Characterization

Henderson, Nevada

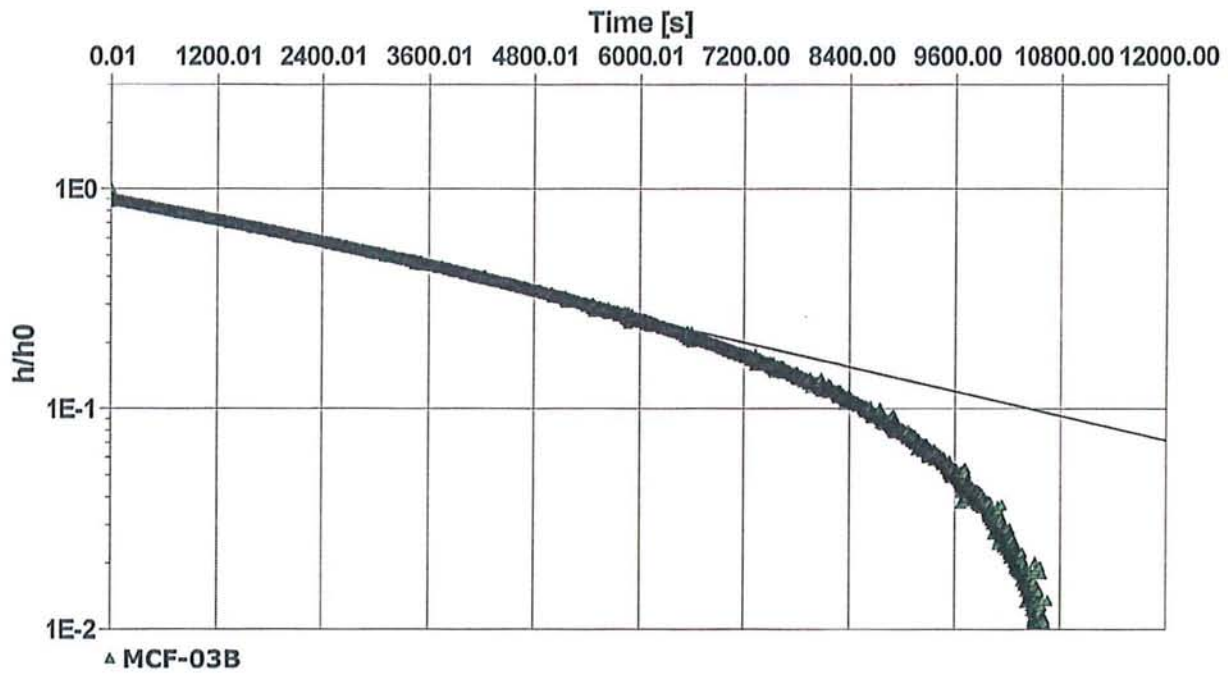
Basic Remediation COMPANY

Log of Boring No. BRC-SB-16-C

Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
-60							For lithologic interpretation, see boring log BRC-SB-16-A	#10 x 20 Sand Pack
-70								Threaded PVC Well Base Cap Cement Backfill

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Slug Test Analysis Report
	Project: BMI Aquifer Test
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Slug Test: MCF-03B Slug In	Test Well: MCF-03B
Test conducted by:		Test date: 8/23/2007
Analysis performed by: G.P. Wittman	MCF-03B Slug In	Date: 8/23/2007
Aquifer Thickness: 10.00 ft		



Calculation after Bouwer && Rice

Observation well	K [ft/d]	
MCF-03B	1.80×10^{-1}	

Log of Boring No. BRC-SB-03-B

BMI Site - Hydrogeologic Characterization

Henderson, Nevada

Basic Remediation COMPANY

Drilling Method: Rotary Sonic
Drilling Equipment: Rotary Sonic
Drilling Contractor: Prosonic Corporation
Driller: Gerald Sealey

Borehole Total Depth: 150 ft bgs
Borehole Diameter: 9.5 in /8.5 in
Boring Location: Location 3 (Well ID: MCF-03B)
Depth to Water (ft. bgs): 56 ft bgs ▽

Sample Type: Cont. Core/S.S.
Sample Interval Various

Logged By: Tony Mikacich
Date Started: 6/5/04
Date Completed: 6/5/04

Monitoring Well Construction

Type of Surface Seal:	Bentonite-Cement	**Screen Slot Size:**	0.010" slot
Blank Casing Type/Size:	4" Sch 80 PVC	**Top of Screen (ft. bgs):**	57 ft bgs
Screen Type/Size:	4" Sch 80 PVC	**Bottom of Screen (ft. bgs):**	77 ft bgs
Transition Sand Type:	NA	**Type of Sand Pack:**	# 2/12 Sand

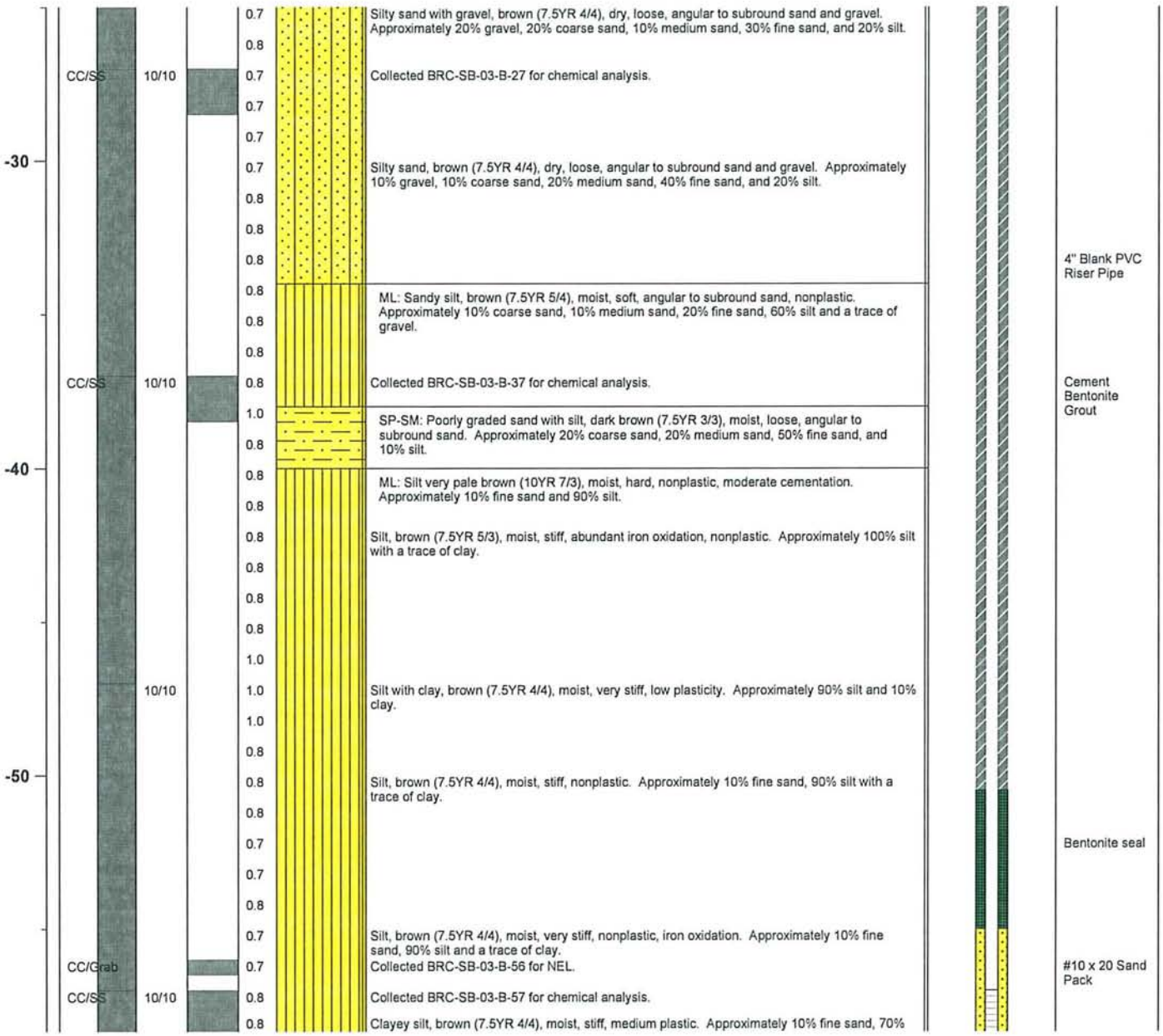
Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
0	CC/SS		7/7		0.7		SM: Silty sand, brown (7.5YR 4/4), moist, loose, angular to subround volcanic sand and fine gravel. Approximately 10% gravel, 10% coarse sand, 20% medium sand, 40% fine sand and 20% silt.	Locking monument well box with concrete apron and ballards
					0.7		Collected BRC-SB-03-B-0 for chemical analysis.	
					0.7			
					0.8			
					0.7			
					0.7		Silty sand with gravel, brown (7.5YR 4/4), dry, loose, angular to subround volcanic sand and fine to coarse gravel. Approximately 30% gravel, 10% coarse sand, 10% medium sand, 30% fine sand, and 20% silt.	Cement Bentonite Grout
					0.7			
	CC/SS		10/10		0.7		Collected BRC-SB-03-B-7 for chemical analysis.	
					0.8			
					0.7			
-10					0.8		Silty sand with gravel, brown (7.5YR 4/4), dry, loose, angular to subround volcanic sand and fine to coarse gravel. Approximately 30% gravel, 10% coarse sand, 10% medium sand, 30% fine sand, and 20% silt.	4" Blank PVC Riser Pipe
					0.7			
					0.7			
					0.7			
					0.8		Silty sand with gravel, brown (7.5YR 4/4), dry, loose, angular to subround volcanic sand and fine to coarse gravel. Approximately 30% gravel, 20% coarse sand, 10% medium sand, 20% fine sand, and 20% silt.	
					0.8			
	CC/SS		10/10		0.8		Collected BRC-SB-03-B-17 for chemical analysis.	
					0.7			
					0.7			
-20					0.7		Silty sand with gravel, brown (7.5YR 4/4), dry, loose, angular to subround sand and gravel. Approximately 30% gravel, 20% coarse sand, 10% medium sand, 20% fine sand, and 20% silt.	
					0.8			
					0.7			
					0.7			
					0.7			

BMI Site - Hydrogeologic Characterization

Basic Remediation COMPANY

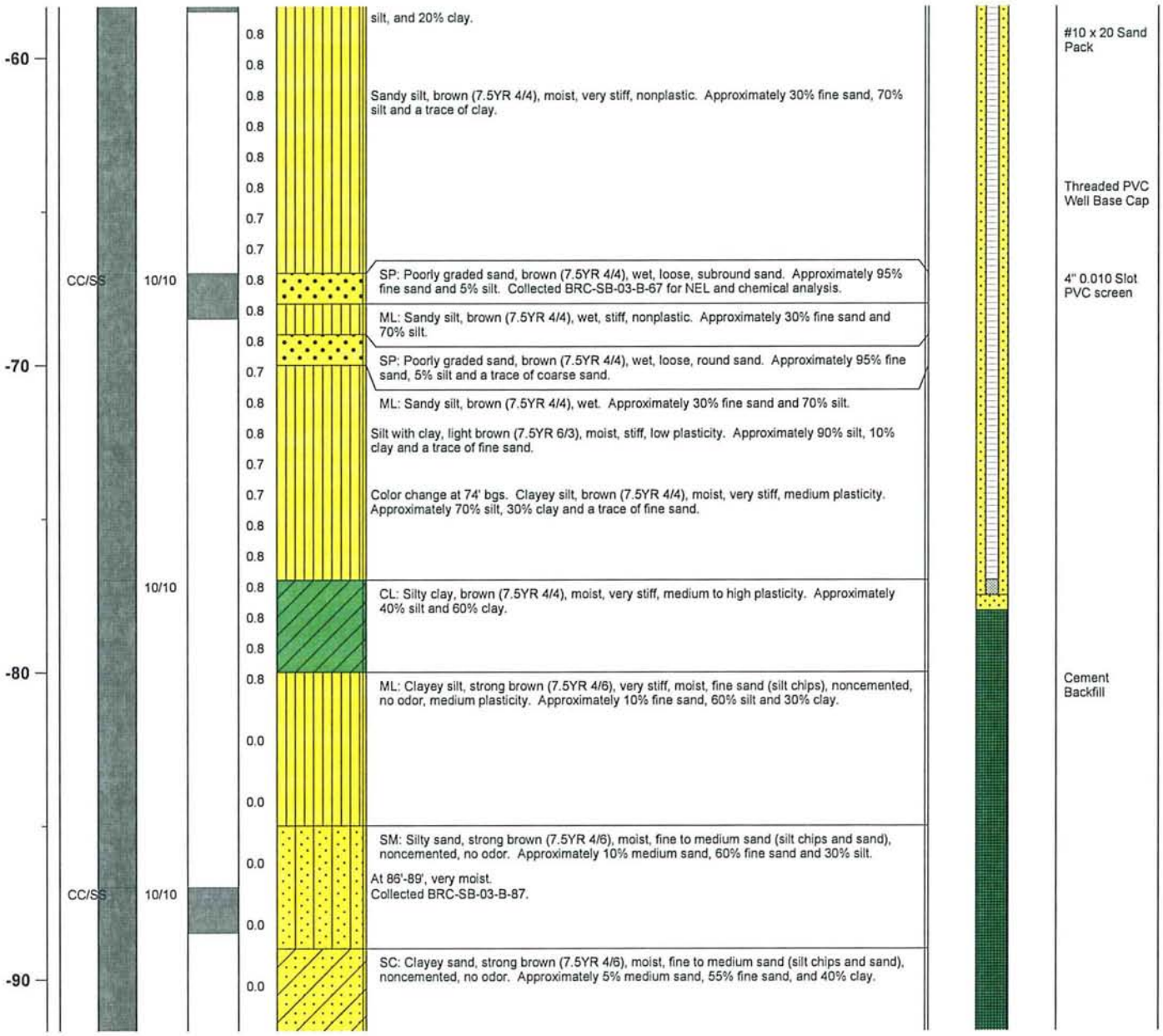
Henderson, Nevada

Log of Boring No. BRC-SB-03-B



Basic Remediation COMPANY

Log of Boring No. BRC-SB-03-B



BMI Site - Hydrogeologic Characterization

Basic Remediation COMPANY

Henderson, Nevada

Log of Boring No. BRC-SB-03-B

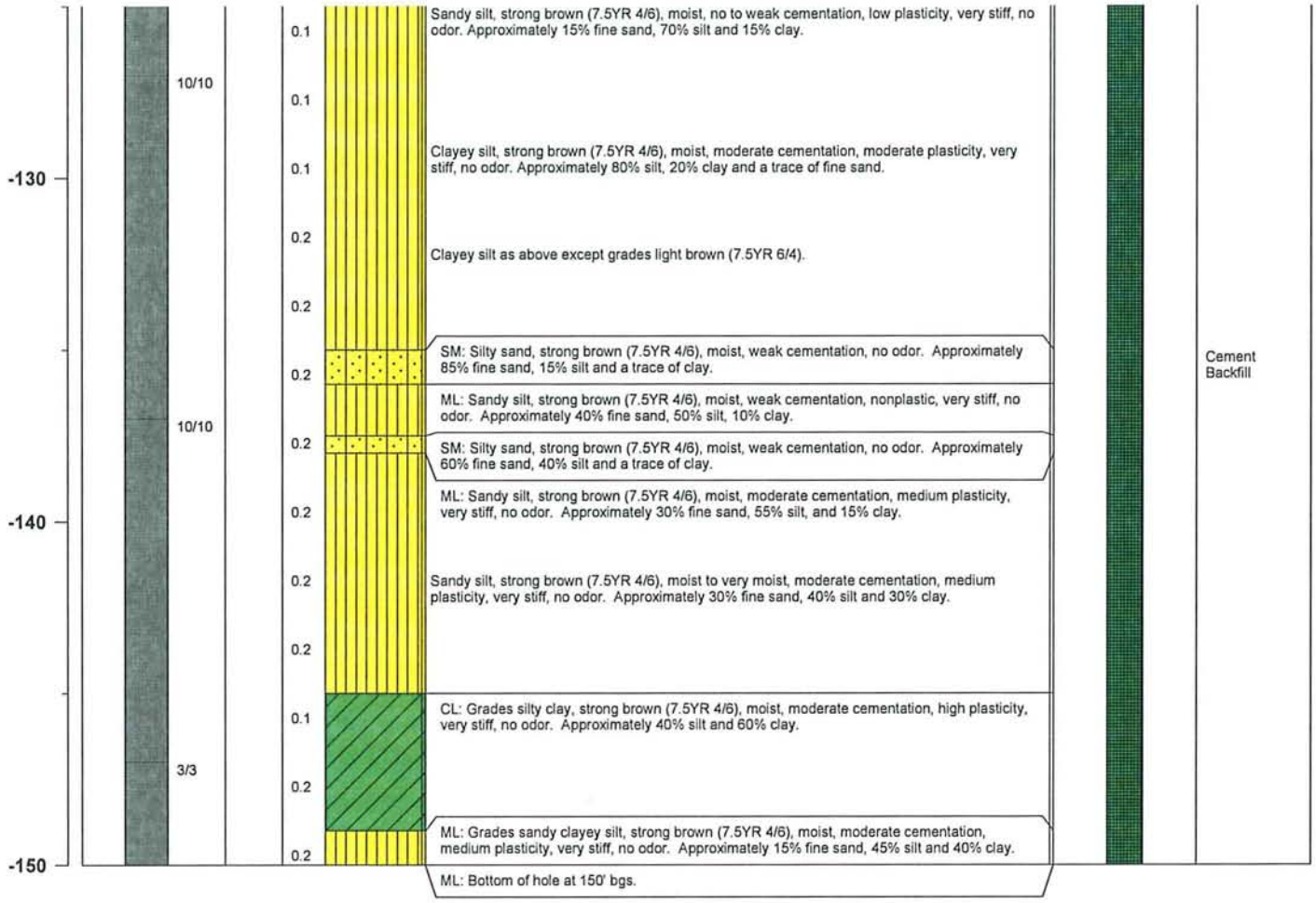
Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
					0.0		Clayey sand, strong brown (7.5YR 4/6), very moist, fine to medium sand (silt chips and sand), noncemented, no odor, with silt. Approximately 10% medium sand, 60% fine sand, 10% silt and 20% clay.	
					0.0			
					0.0		SM: Silty sand, strong brown (7.5 YR 4/6), very moist, fine to medium sand (silt chips and sand), noncemented, no odor with clay. Approximately 10% medium sand, 60% fine sand, 20% silt and 10% clay.	Cement Backfill
			10/10		0.0			
					0.0		Same as above, trace clay. Approximately 10% medium sand, 70% fine sand, 20% silt and a trace of clay.	
-100							-JLW stop logging-	
					0.3		Log continued by DUB 6/6/04, silty sand, strong brown (7.5YR 4/6), very moist, no cementation, no odor. Approximately 85% fine sand, 15% silt and a trace of clay.	
					0.2		ML: Sandy silt, strong brown (7.5YR 4/6), very moist, no to weak cementation, low plasticity, very stiff, no odor. Approximately 10% medium sand, 20% fine sand, 55% silt, and 15% clay.	
					0.1			
			10/10		0.1			
					0.1		SM: Silty sand, strong brown (7.5YR 4/6), very moist, no cementation, no odor. Approximately 20% medium sand, 40% fine sand, 40% silt and a trace of clay.	
-110					0.1		ML: Sandy silt, strong brown (7.5YR 4/6), very moist, weak cementation, medium plasticity, very stiff, no odor. Approximately 10% medium sand, 20% fine sand, 50%silt and 20% clay.	
					0.2		SM: Silty sand, strong brown , very moist, weak cementation, no odor.	
					0.2		ML: Sandy silt, strong brown, (7.5YR 4/6), moist, weak cementation, low plasticity, very stiff, no odor. Approximately 20% fine sand, 60% silt and 20% clay.	
					0.2			
					0.2		Sandy silt, strong brown (7.5YR 4/6), moist, no to weak cementation, nonplastic, no odor, very stiff. Approximately 15% fine sand, 85% silt and a trace of clay.	
			10/10		0.2			
					0.2		Sandy silt, strong brown (7.5YR 4/6), moist, no to weak cementation, very stiff, low plasticity, no odor. Approximately 20% fine sand, 65% silt and 15% clay.	
-120					0.2			
					0.2			
					0.1			

BMI Site - Hydrogeologic Characterization

Basic Remediation COMPANY

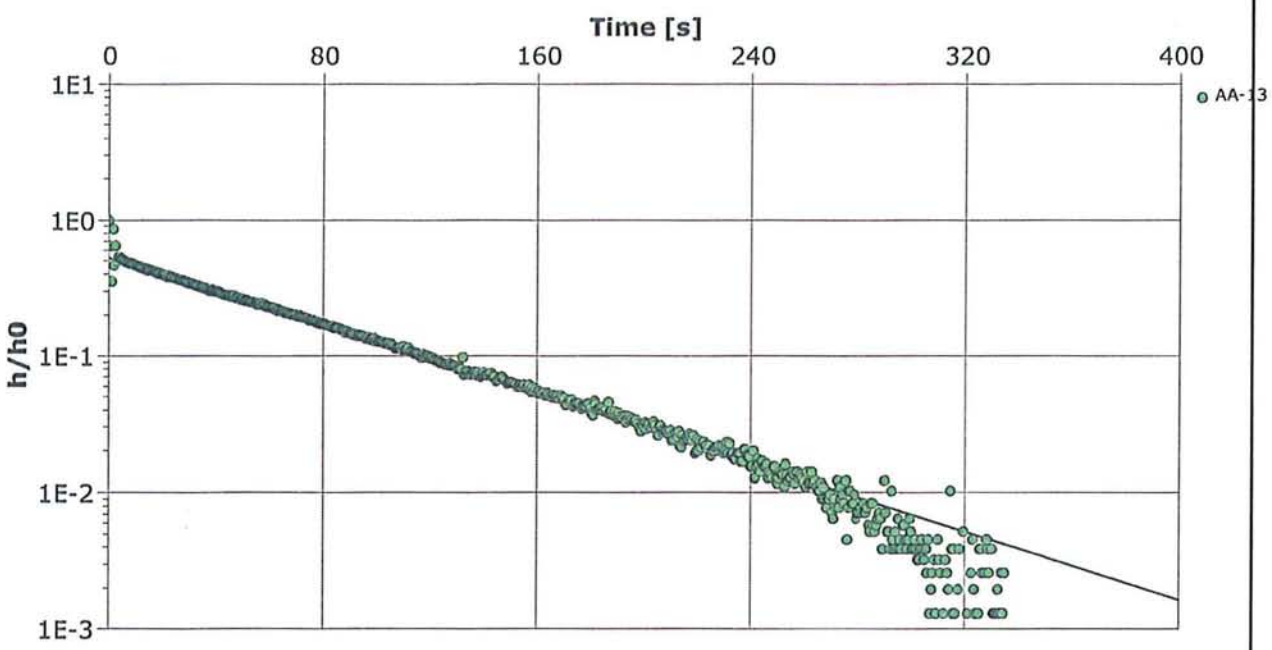
Henderson, Nevada

Log of Boring No. BRC-SB-03-B



Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Slug Test Analysis Report
	Project: BMI Aquifer Test
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Slug Test:	Test Well: AA-13
Test conducted by:		Test date: 8/23/2007
Analysis performed by: G.P. Wittman	AA-13 Slug In-1	Date: 8/23/2007
Aquifer Thickness: 5.00 ft		

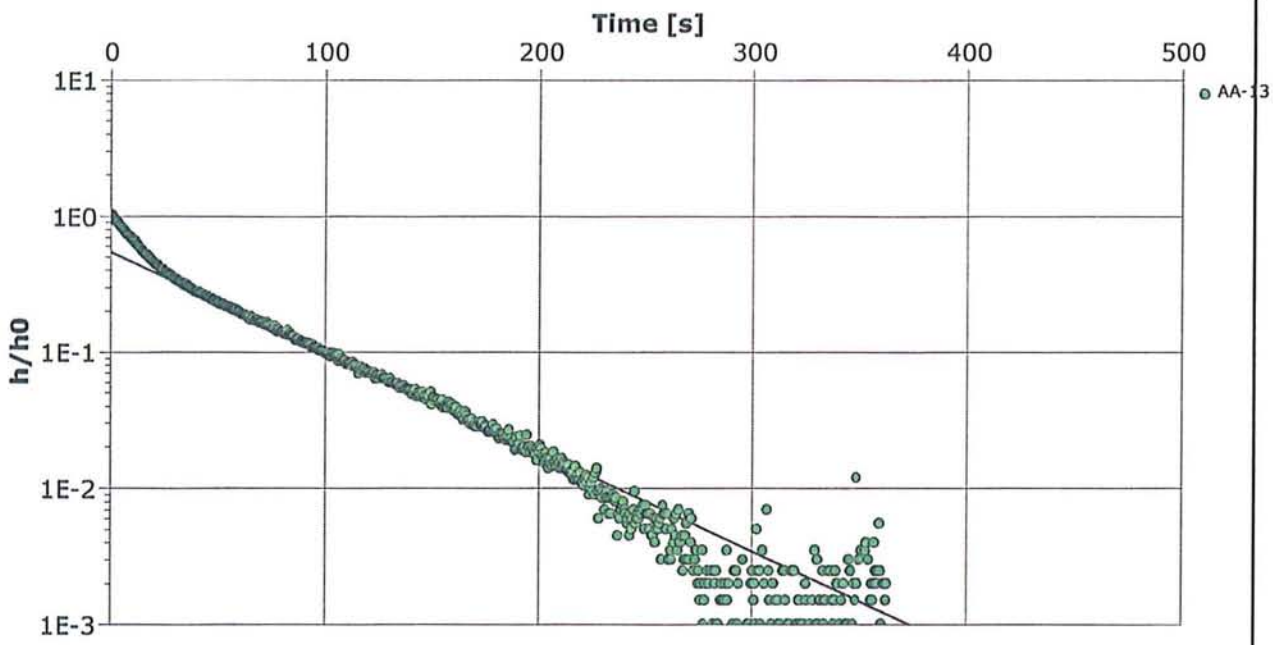


Calculation after Bouwer && Rice

Observation well	K [ft/d]	
AA-13	1.22×10^{1}	

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Slug Test Analysis Report
	Project: BMI Aquifer Test
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Slug Test: AA-13 Slug Out-1	Test Well: AA-13
Test conducted by: L.Fleischhauer		Test date: 8/23/2007
Analysis performed by: G.P. Wittman	AA-13 Slug Out-1	Date: 8/23/2007
Aquifer Thickness: 5.00 ft		

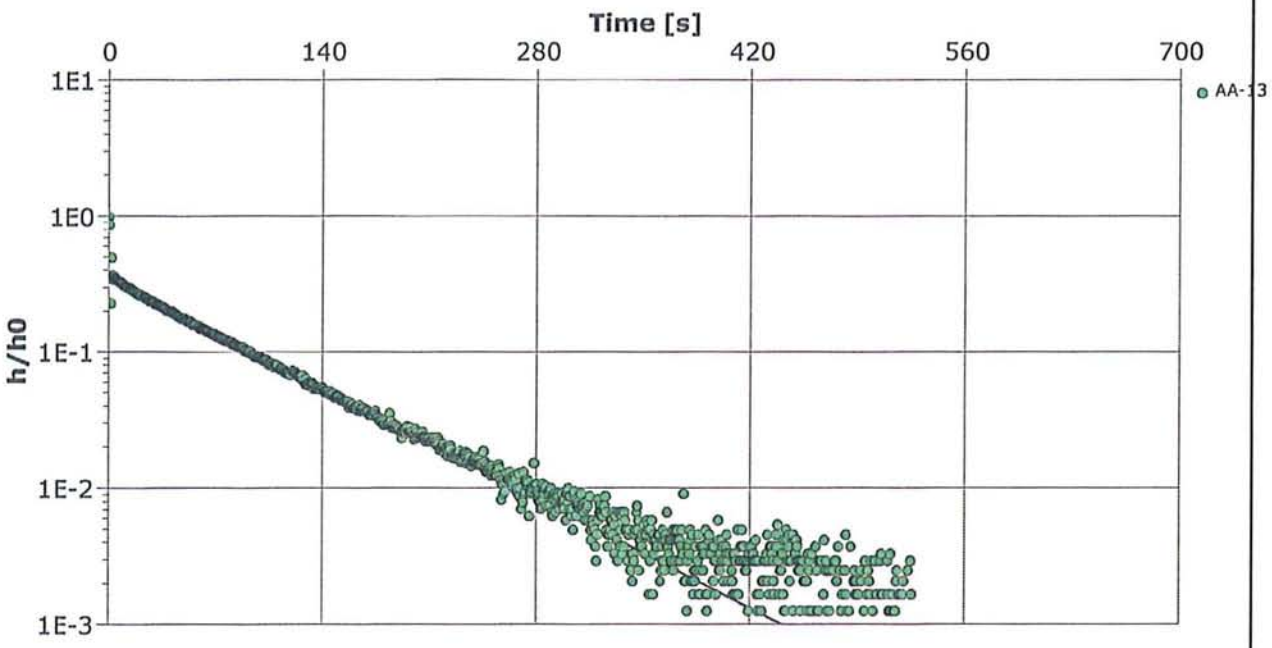


Calculation after Bouwer && Rice

Observation well	K [ft/d]	
AA-13	1.42×10^{1}	

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Slug Test Analysis Report
	Project: BMI Aquifer Test
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Slug Test: AA-13 Slug In-2	Test Well: AA-13
Test conducted by: G.P. Wittman		Test date: 8/23/2007
Analysis performed by: G.P. Wittman	AA-13 Slug In-2	Date: 8/23/2007
Aquifer Thickness: 5.00 ft		

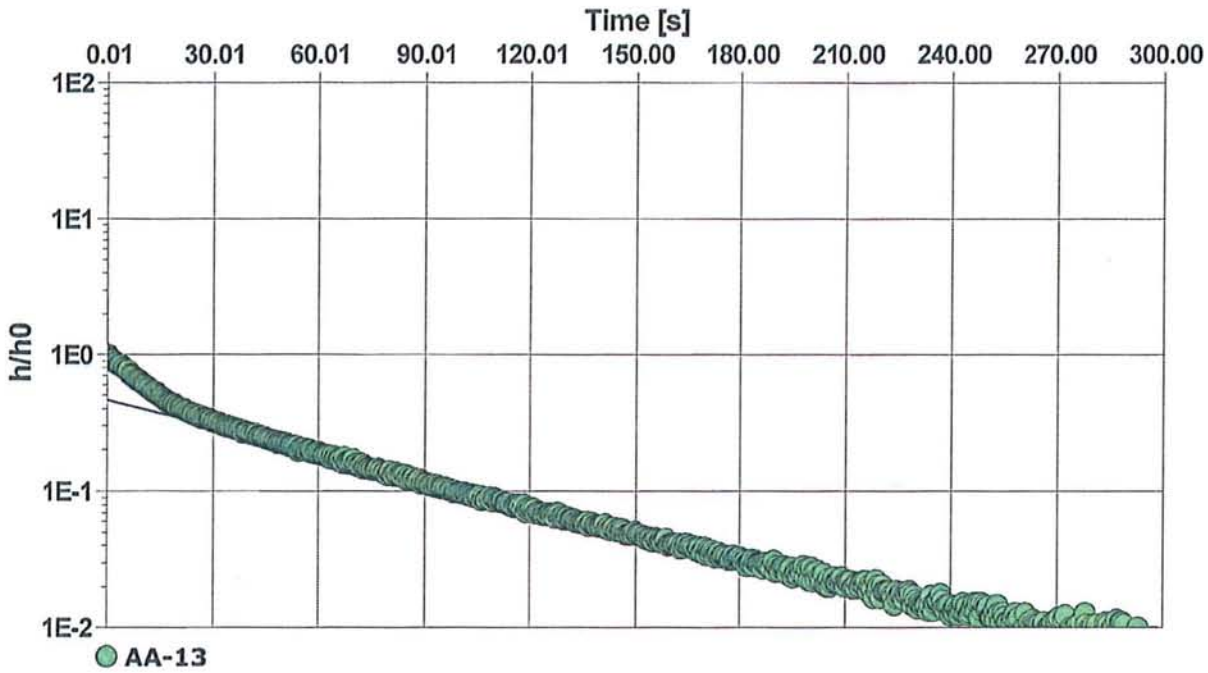


Calculation after Bouwer && Rice

Observation well	K [ft/d]	
AA-13	1.12×10^{1}	

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Slug Test Analysis Report
	Project: BMI Aquifer Test
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Slug Test: Slug Test 39	Test Well: AA-13
Test conducted by:		Test date: 8/23/2007
Analysis performed by: G.P. Wittman	Aa-13 Slug -2	Date: 8/23/2007
Aquifer Thickness: 5.00 ft		



Calculation after Bouwer && Rice

Observation well	K [ft/d]	
AA-13	1.25×10^{1}	

Log of Boring No. BRC-SB-13-A

BMI Site - Hydrogeologic Characterization

Henderson, Nevada

Basic Remediation COMPANY

Drilling Method: Rotary Sonic
Drilling Equipment: Rotary Sonic
Drilling Contractor: Prosonic Corporation
Driller: Gerardo Chavez

Borehole Total Depth: 98.5 ft bgs
Borehole Diameter: 8.5 in
Boring Location: Location 13 (Well ID: AA-13)
Depth to Water (ft. bgs): NA ▽

Sample Type: Continuous Core
Sample Interval Continuous

Logged By: Jennifer Wiley
Date Started: 6/10/04
Date Completed: 6/10/04

Monitoring Well Construction

Type of Surface Seal:	Bentonite Grout	**Screen Slot Size:**	0.010 in
Blank Casing Type/Size:	4" Sch 80 PVC	**Top of Screen (ft. bgs):**	38 ftbgs
Screen Type/Size:	4" Sch 80 PVC	**Bottom of Screen (ft. bgs):**	58 ft bgs
Transition Sand Type:	N/A	**Type of Sand Pack:**	#2 x 12

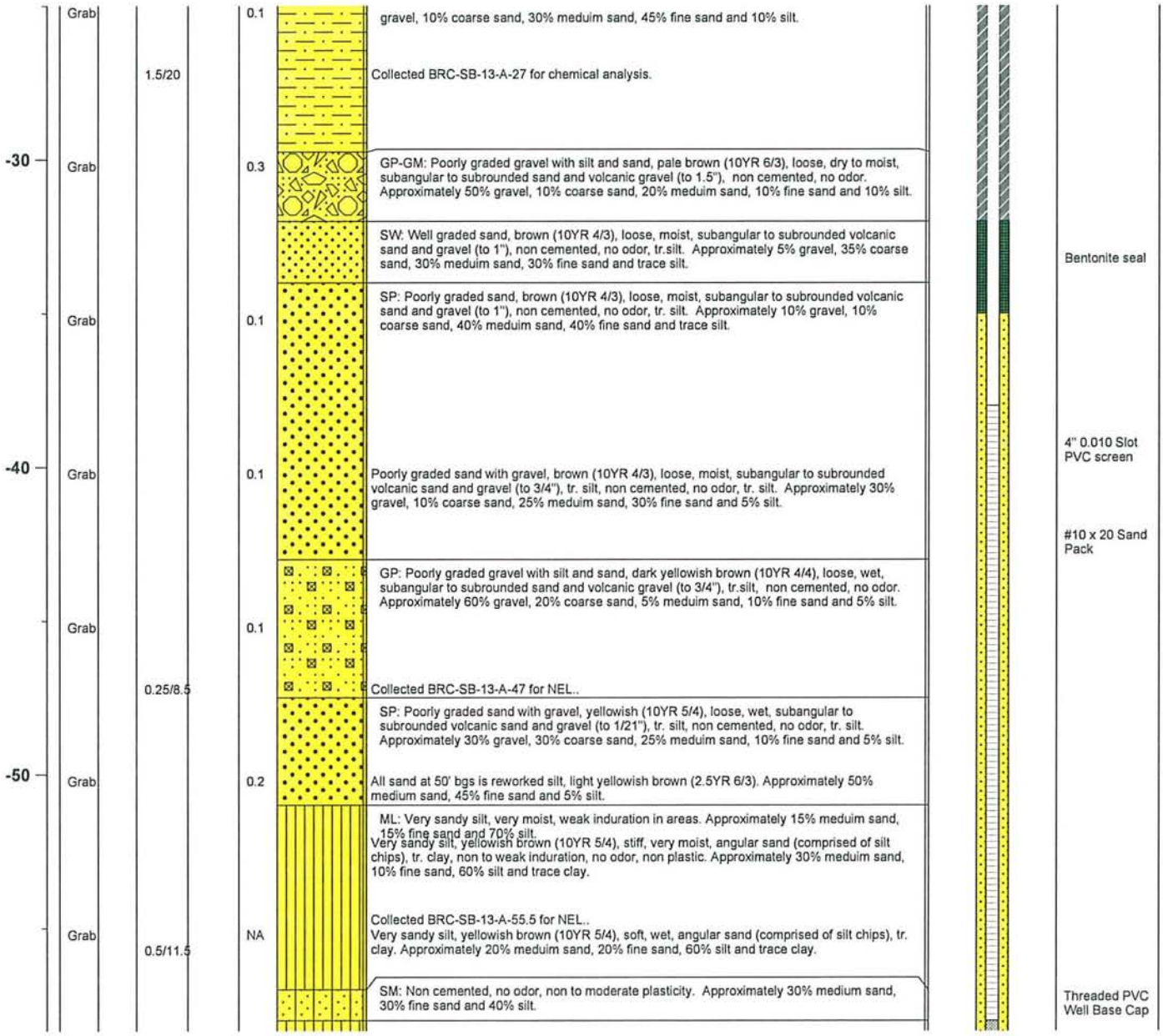
Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
0			1.5/7		0.1		SP: Poorly graded sand, yellowish brown (10YR5/4), loose, dry to moist, subangular to subrounded volcanic sand and gravel (to 1/2"), tr. silt, noncemented, no odor. Approximately trace gravel, 5 % coarse sand, 50% medium sand, 45% fine sand and trace silt. Collected BRC-SB-13-A-0 for chemical analysis.	Locking monument well box with concrete apron and ballards
	Grab				0.1		Poorly graded sand, yellowish brown (10YR 5/4), loose, dry to moist, subangular to subrounded sand and gravel (to 1"), tr. silt, non cemented, no odor. Approximately 5% gravel, 5 % coarse sand, 40% medium sand, 50% fine sand and trace silt.	Cement Bentonite Grout
			1.5/10				Collected BRC-SB-13-A-7 for chemical analysis. Poorly graded sand, brown (10YR 4/3), loose, moist (may be due to added water from drilling), subangular to subrounded sand and gravel (to 15"), non cemented, no odor. Approximately 10% gravel, 50 % coarse sand, 30% medium sand, 10% fine sand and trace silt.	
-10	Grab				0.2		Poorly graded sand, dark yellowish brown (10YR 4/4), loose, dry to moist, subangular to subrounded sand and gravel (to 3/4"), non cemented, no odor. Approximately trace gravel, 5 % coarse sand, 50% medium sand, 45% fine sand and trace silt.	4" Blank PVC Riser Pipe
							SW: Well graded sand with gravel, pale brown (10YR 6/3), loose, dry, subangular to subrounded volcanic sand and gravel (to 2"), tr.silt, non cemented, no odor. Approximately 30% gravel, 20% coarse sand, 20% medium sand, 25% fine sand, and trace silt.	
	Grab				NA		Well graded sand with gravel, pale brown (10YR 6/3), loose, dry, subangular to subrounded volcanic sand and gravel (to 2"), tr.silt, non cemented, no odor. Approximately 15% gravel, 25% coarse sand, 30% medium sand, 30% fine sand, and trace silt.	
			1.5/10				Collected BRC-SB-13-A-17 for chemical analysis.	
-20	Grab				0.2		GP-GM: Poorly graded gravel with silt and sand, pale brown (10YR 6/3), loose, dry to moist, subangular to subrounded sand and volcanic gravel (to 1"), non cemented, no odor. Approximately 55% gravel, 15% coarse sand, 10% meduim sand, 10% fine sand and 10% silt.	
							SP-SM: Poorly graded sand with silt, pale brown (10YR 6/3), loose, dry to moist, subangular to subrounded sand and volcanic gravel (to 1/4"), non cemented, no odor. Approximately 5%	

BMI Site - Hydrogeologic Characterization

Basic Remediation COMPANY

Henderson, Nevada

Log of Boring No. BRC-SB-13-A



Basic Remediation COMPANY

Log of Boring No. BRC-SB-13-A

Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
-60	Grab				0.1		ML: Silty sand, light gray (5Y 7/2), moist to very moist, angular sand (comprised of silt chips), weak induration, no odor. Approximately 15% meduim sand, 15% fine sand, 70% silt and trace clay.	
							Sandy silt, light gray (5Y 7/2), angular sand (comprised of silt chips), weak induration, no odor, low plasticity, tr.clay, moist to very moist. Approximately 55% meduim sand, 15% fine sand, 60% silt and trace clay. At 60' bgs color change to pale olive (5Y 6/2), moist to very moist.	
	Grab				0.1		Silt, light gray (5Y 7/2), moist to very moist, friable, weakly indurated, silt easily crumbles into smaller silt chips, non plastic. Approximately 100% silt.	
			1.5/10				Collected BRC-SB-13-A-67 for chemical analysis. Silt, pale brown (10YR 6/3), moist to very moist, very stiff, angular sand (comprised of silt chips), non cemented, no odor, low plasticity. Approximately 10% meduim sand, 10% fine sand and 80% silt.	
-70	Grab				0.1		Sandy silt, yellowish brown (10YR 5/4), moist, very stiff, angular sand (comprised of silt chips), tr. clay, non cemented, no odor and low plasticity. Approximately 15% meduim sand, 15% fine sand and 70% silt.	Cement Backfill
	Grab				0.1		Very sandy silt, yellowish brown (10YR 5/4), moist to very moist, stiff, angular sand (comprised of silt chips), tr. clay, non cemented, no odor and non plastic. Approximately 30% meduim sand, 15% fine sand and 55% silt and trace clay.	
			1.5/12				Collected BRC-SB-13-A-77 for chemical analysis. Color change to light gray (5Y 7/2), soft, moist to very moist in spots, non cemented, no odor, low plasticity ant tr. clay. Approximately 20% meduim sand, 15% fine sand and 65% silt and trace clay.	
-80	Grab				0.1		Color change to yellowish brown (10YR 5/4), moist. Approximately 10% meduim sand, 10% fine sand and 80% silt and trace clay.	
	Grab				0.1		Silt with sand, yelloiwsh brown (10YR 5/4), very stiff, moist, angular sand (silt chips), non cemented to weak induration in areas, no odor, non to weak plasticity, tr. clay. Approximately 10% meduim sand, 10% fine sand and 80% silt and trace clay.	
			0.5/8				SM: Silty sand, yellowish brown (10YR 5/4), wet, non cemented, no odor. Approximately 70% fine sand and 30% silt.	
-90	Grab				0.1		Collected BRC-SB-13-A-89 for NEL.. Color change to light gray (5Y 7/2), increased silt, wet. Approximately 65% fine sand and 45% silt.	

BMI Site - Hydrogeologic Characterization

Henderson, Nevada

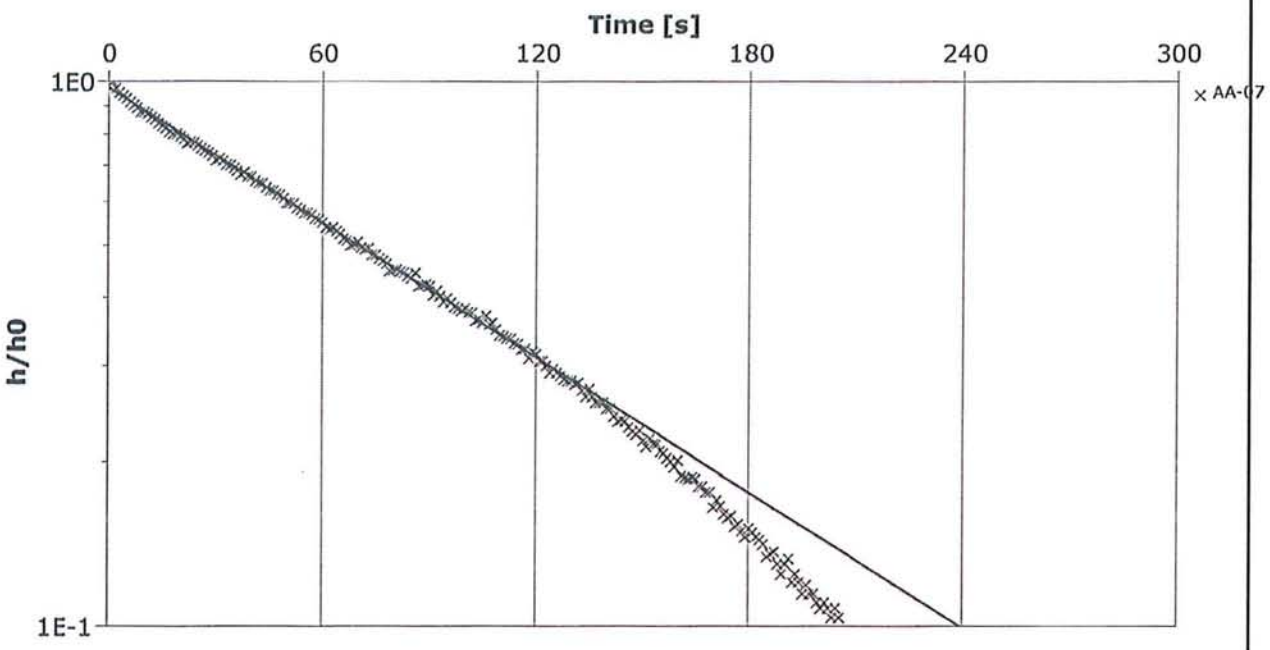
Basic Remediation COMPANY

Log of Boring No. BRC-SB-13-A

Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
							ML: Sandy silt, yellowish brown (10YR 5/4), stiff, moist to very moist, angular sand (silt chips), non cemented, no odor, non plastic. Approximately 20% meduim sand, 20% fine sand and 60%.	
	Grab		1.5/1.5		0.1		Sandy silt, yellowish brown (10YR 5/4), stiff, moist to very moist, angular sand (silt chips), non cemented, no odor, non plastic. Approximately 20% meduim sand, 20% fine sand and 60%. Collected BRC-SB-13-A-97 for chemical analysis.	Cement Backfill

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Slug Test Analysis Report
	Project: BMI Aquifer Test
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Slug Test: AA-07-IN-1	Test Well: AA-07
Test conducted by:		Test date: 6/21/2007
Analysis performed by: G.P. Wittman	AA-07 Slug In-1	Date: 8/23/2007
Aquifer Thickness: 9.00 ft		

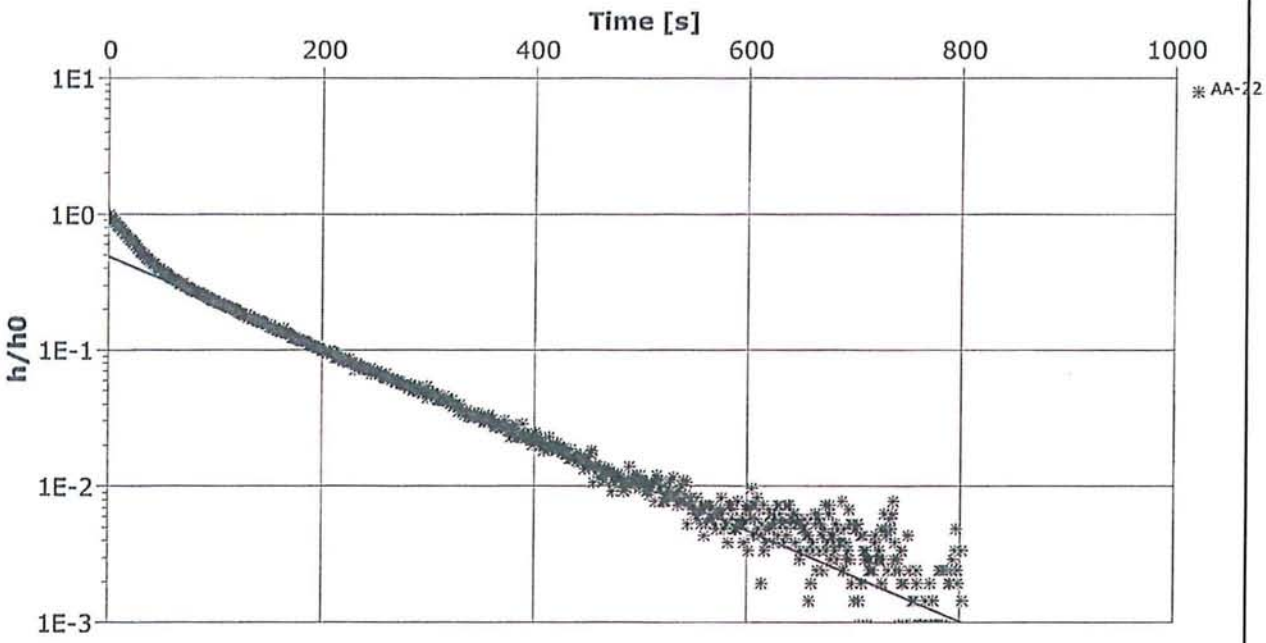


Calculation after Bouwer && Rice

Observation well	K [ft/d]	
AA-07	8.00×10^{0}	

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Slug Test Analysis Report
	Project: BMI Aquifer Test
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Slug Test: AA-07-out-1	Test Well: AA-22
Test conducted by:		Test date: 6/22/2007
Analysis performed by: G.P. Wittman	AA-07-Slug Out-1	Date: 7/2/2007
Aquifer Thickness: 9.50 ft		

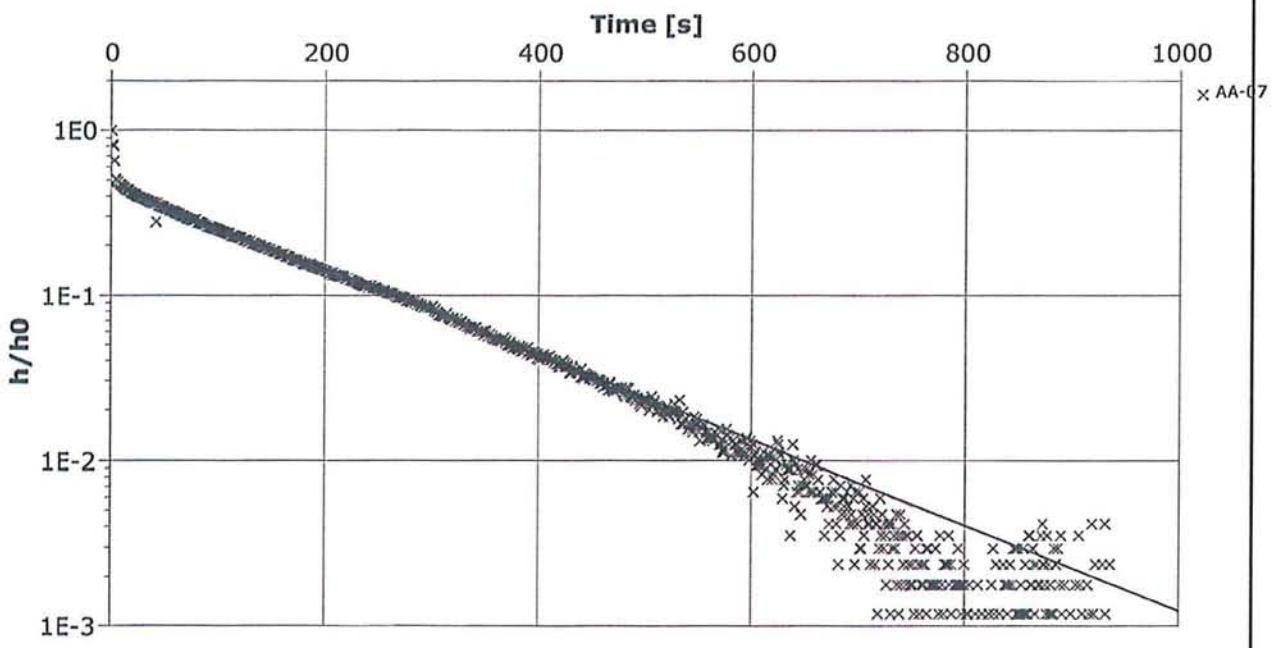


Calculation after Bouwer && Rice

Observation well	K [ft/d]	
AA-22	6.50×10^{0}	

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Slug Test Analysis Report
	Project: BMI Aquifer Test
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Slug Test: AA-07-In-2	Test Well: AA-07
Test conducted by:		Test date: 6/22/2007
Analysis performed by: G.P. Wittman	AA-07 Slug In-2	Date: 7/2/2007
Aquifer Thickness: 9.50 ft		

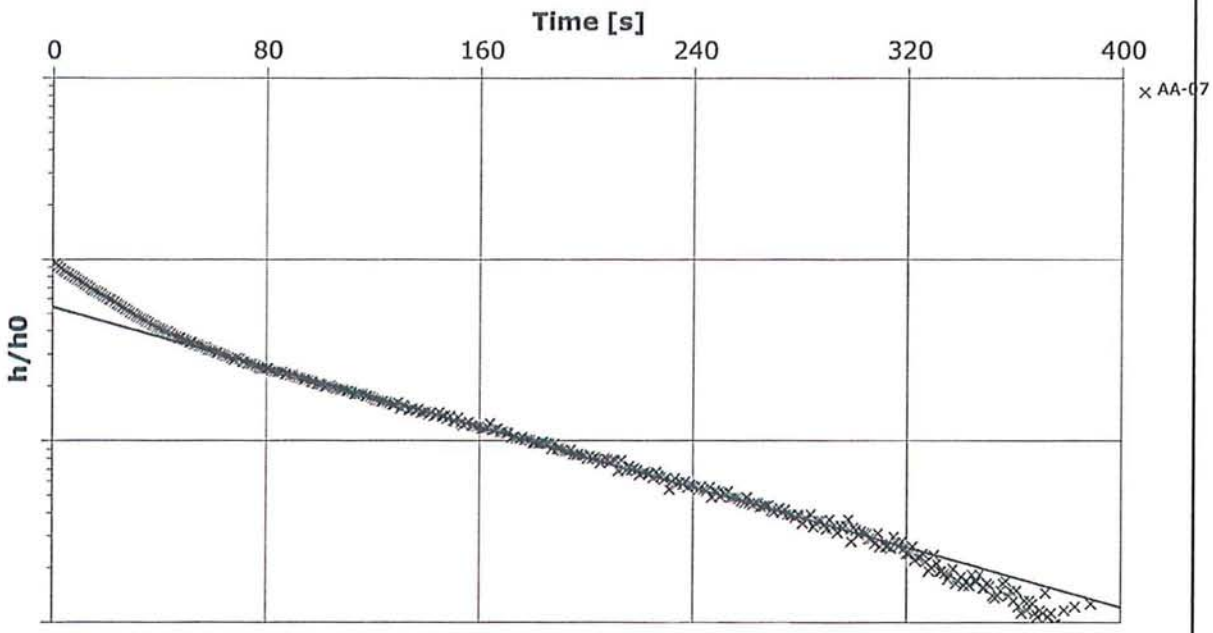


Calculation after Bouwer && Rice

Observation well	K [ft/d]	
AA-07	5.00×10^{0}	

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Slug Test Analysis Report
	Project: BMI Aquifer Test
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Slug Test: AA-07-out-2	Test Well: AA-07
Test conducted by:		Test date: 6/22/2007
Analysis performed by: G.P. Wittman	AA-07 Slug Out 2	Date: 7/2/2007
Aquifer Thickness: 9.60 ft		



Calculation after Bouwer && Rice

Observation well	K [ft/d]	
AA-07	8.00×10^{0}	

Log of Boring No. BRC-SB-07-B

BMI Site - Hydrogeologic Characterization

Henderson, Nevada

Basic Remediation COMPANY

Drilling Method: Rotary Sonic
Drilling Equipment: Roto Sonic
Drilling Contractor: Prosonic Corporation
Driller: Gerald Sealey

Borehole Total Depth: 255 ft bgs
Borehole Diameter: 4.5 in to 0-65 ft bgs, 8.5 in to 65-255 ft bgs
Boring Location: Location 7 (Well ID: MCF-07)
Depth to Water (ft. bgs): 45 ft bgs ▽

Sample Type: Grab
Sample Interval Various

Logged By: Adam Norris
Date Started: 4/21/04
Date Completed: 4/23/04

Monitoring Well Construction

Type of Surface Seal:	Bentonite-Cement	**Screen Slot Size:**	0.010 in
Blank Casing Type/Size:	4" Sch 80 PVC	**Top of Screen (ft. bgs):**	30 ft bgs
Screen Type/Size:	4" Sch 80 PVC	**Bottom of Screen (ft. bgs):**	50 ft bgs
Transition Sand Type:	NA	**Type of Sand Pack:**	#2 x 12

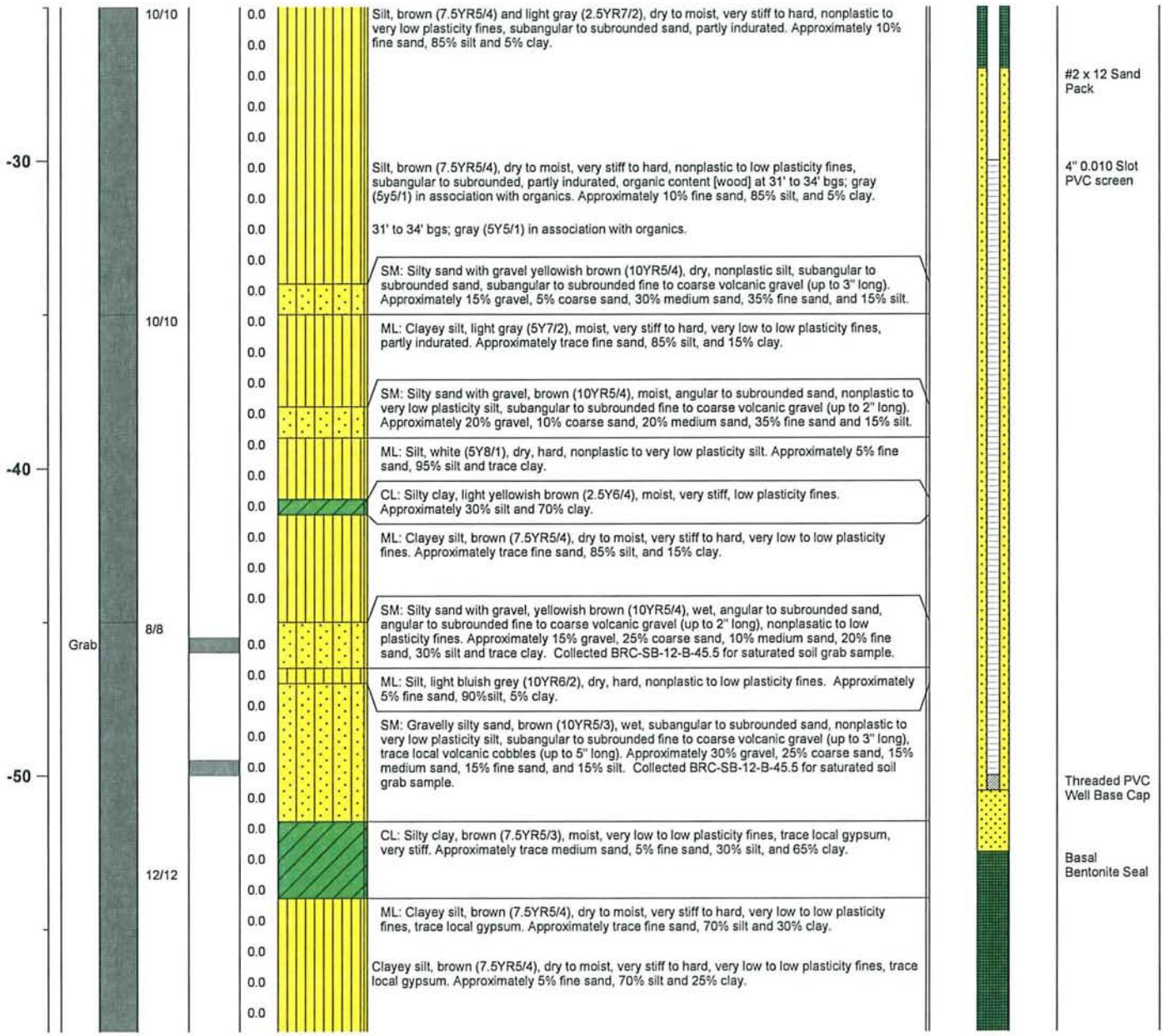
Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
0					0.0		ML: Silt, white (2.5YR8/1) and brown (7.5YR5/4), dry, hard, nonplastic to very low plasticity silt, subangular to subrounded sand, some local gypsum, partly indurated. Approximately 10% fine sand, 90% silt.	Locking monument well box with concrete apron and ballards
			10/10		0.0		Silt with sand, brown (7.5YR5/4), moist, very stiff to hard, nonplastic to very low plasticity fines, angular to subrounded sand, partly indurated, some local gypsum. Approximately 5% medium sand, 10% fine sand, 80% silt and 5% clay.	
-10					0.0		Clayey silt, brown (7.5YR5/4), moist, very stiff to hard, nonplastic to very low plasticity fines, angular to subrounded sand, partly indurated, some local gypsum. Approximately trace medium sand, 10% fine sand, 75% silt, and 15% clay.	4" Blank PVC Riser Pipe
					0.0		Silt, brown (7.5YR5/4) and white (2.5YR8/1), dry to moist, very stiff to hard, nonplastic to very low plasticity fines, angular to subrounded sand, partly indurated to weakly cemented; weakly cemented lenses are white, some local gypsum. Approximately trace medium sand, 10% fine sand, 85% silt, and 5% clay.	
			10/10		0.0		Clayey silt, brown (7.5YR5/4), moist, very stiff to hard, nonplastic to low plasticity fines, partly indurated, some local gypsum. Approximately trace medium sand, 10% fine sand, 75% silt, and 15% clay.	
-20					0.0		SM: Silty sand pale brown (10YR6/3), moist, angular to subrounded sand, nonplastic silt, trace local gypsum. Approximately 35% medium sand, 50% fine sand, 15% silt.	
					0.0		ML: Clayey silt, brown (7.5YR5/4), dry to moist, very stiff to hard, nonplastic to low plasticity fines, subangular to subrounded sand, some local gypsum, partly indurated, locally pale yellow (2.5YR7/3) in association with gypsum content. Approximately 10% fine sand, 75% silt and 15% clay.	Bentonite seal

BMI Site - Hydrogeologic Characterization

Basic Remediation COMPANY

Henderson, Nevada

Log of Boring No. BRC-SB-07-B

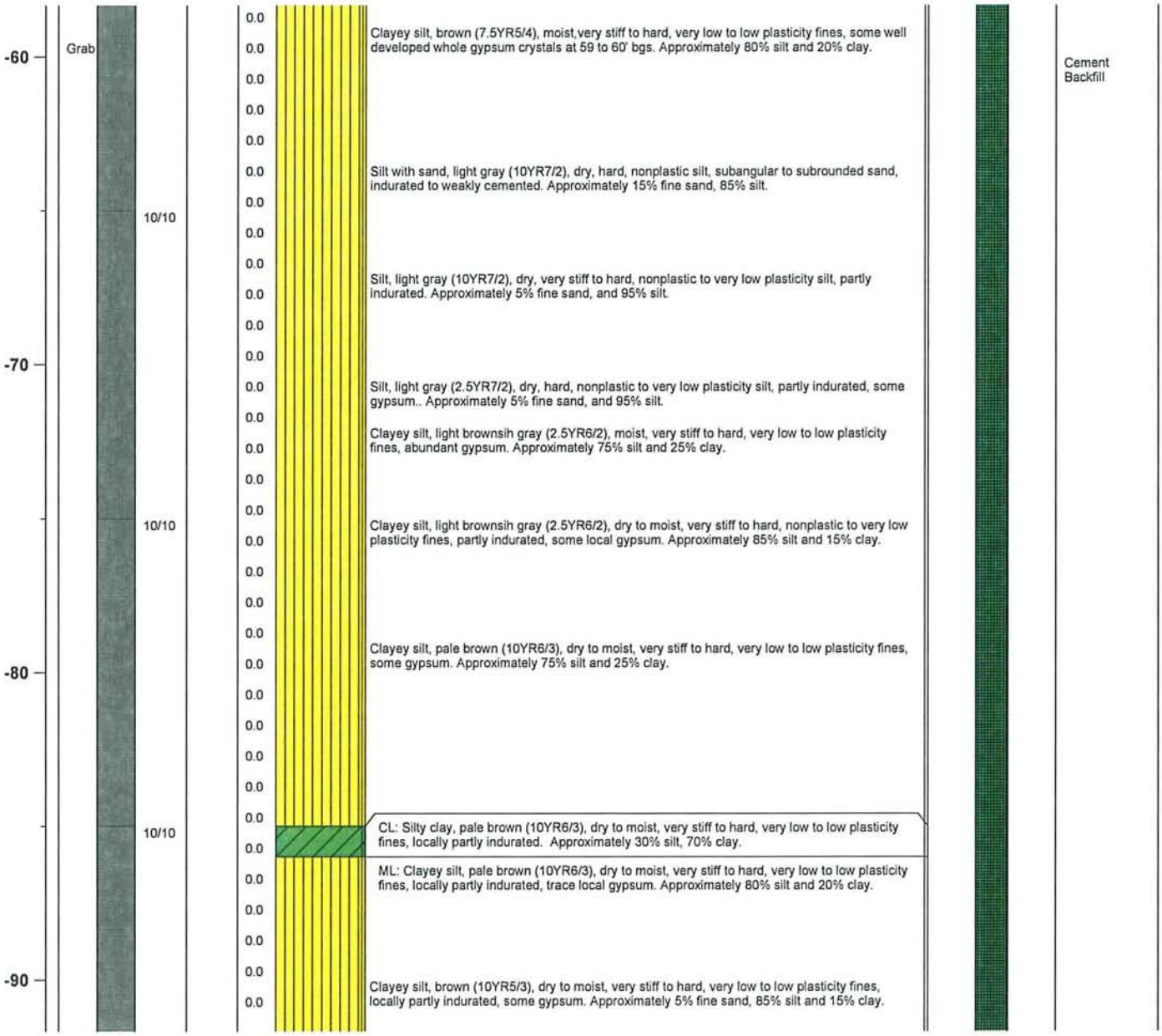


BMI Site - Hydrogeologic Characterization

Basic Remediation Company

Henderson, Nevada

Log of Boring No. BRC-SB-07-B



Basic Remediation COMPANY

Log of Boring No. BRC-SB-07-B

Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
-100			10/10		0.0		Silt, light brownish gray (2.5Y6/2), dry to moist, very stiff to hard, nonplastic to low plasticity fines, partly indurated. Approximately 5% fine sand, 90% silt and 5% clay.	Cement Backfill
					0.0		Clayey silt. Approximately 70% silt and 30% clay.	
					0.0		Clayey silt, brown (10YR5/3), moist, very stiff to hard, very low to low plasticity fines, some gypsum. Approximately 70% silt and 30% clay.	
					0.0		Clayey silt, brown (10YR5/3), dry to moist, very stiff to hard, very low to low plasticity fines, some local gypsum. Approximately 70% silt and 30% clay.	
					0.0		Clayey silt, brown (10YR5/3), moist, very stiff to hard, very low to low plasticity fines, some local gypsum. Approximately 70% silt and 30% clay.	
					0.0		CL: Silty clay, brown (10YR5/3), moist, very stiff, very low to low plasticity fines, some local gypsum. Approximately 30% silt and 70% clay.	
			10/10		0.0		ML: Silt, light gray (10YR7/1), moist, very stiff, nonplastic to very low plasticity silt. Approximately 5% fine sand, and 95% silt.	
					0.0		Clayey silt, light greenish gray (10Y7/1), moist, very stiff to hard, nonplastic to low plasticity fines, some gypsum. Approximately 85% silt and 15% clay.	
-110					0.0		Clayey silt, light greenish gray (10Y7/1), moist, very stiff to hard, nonplastic to low plasticity fines, some gypsum. Approximately 5% fine sand, 80% silt and 15% clay.	
					0.0		Clayey silt, light greenish gray (10Y7/1), moist, very stiff to hard, nonplastic to low plasticity fines. Approximately trace fine sand, 85% silt and 15% clay.	
					0.0		Silt with sand, gray (5Y6/1), moist, very stiff to hard, nonplastic to very low plasticity fines, subangular to subrounded sand, partly indurated to weakly cemented. Approximately 15% fine sand 85% silt and 15% clay.	
			10/10		0.0		Clayey silt, brown (10YR5/3), moist, very stiff to hard, very low to low plasticity fines, some local gypsum. Approximately 5% fine sand, 80% silt, and 15% clay.	
-120					0.0		Silt with sand, light gray (5Y7/1), moist to dry, very stiff to hard, subangular to subrounded sand, partly indurated to weakly cemented, some gypsum. Approximately 15% fine sand and 85% silt.	
					0.0		Clayey silt, greenish gray (10Y6/1), moist, very stiff to hard, very low to low plasticity fines, some gypsum. Approximately 85% silt and 15% clay.	
					0.0		CL: Clay, dark yellowish brown (10YR4/4), moist, hard, very low to low plasticity fines, some gypsum. Approximately 5% silt and 95% clay.	

Basic Remediation COMPANY

Log of Boring No. BRC-SB-07-B

Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
-130			10/10		0.0		ML: Silt, light gray (5Y7/1), dry to moist, hard, nonplastic to very low plasticity fines, subangular to subrounded sand. Approximately 10% silt and 90% clay.	Cement Backfill
					0.0		Silt, light greenish gray (10Y8/1), dry to moist, hard, nonplastic to very low plasticity fines, partly indurated to weakly cemented. Approximately 5% fine sand, 90% silt, and 5% clay.	
					0.0		Silt, light greenish gray (5GY7/1), dry to moist, hard, subangular to subrounded sand, partly indurated to weakly cemented. Approximately 10% fine sand, 90% silt and trace clay.	
					0.0		Clayey silt, brown (10YR4/3), moist, hard, very low to low plasticity fines, partly indurated, some local gypsum. Approximately 5% fine sand, 65% silt, and 30% clay.	
			10/10		0.0		Clayey silt, brown (10YR4/3), moist, hard, very low to low plasticity fines, some local gypsum. Approximately trace fine sand, 70% silt, and 30% clay.	
-140					0.0		Clayey silt, brown (10YR5/3), dry to moist, hard, very low to low plasticity fines, some local gypsum. Approximately 5% fine sand, 70% silt and 25% clay.	
					0.0		Clayey silt, brown (10YR5/3), dry to moist, hard, very low to low plasticity fines, abundant gypsum cotent. Approximately 70% silt and 30% clay.	
			10/10		0.0		Clayey silt, brown (10YR5/3), dry to moist, hard, very low to low plasticity fines, partly indurated, some local gypsum. Approximately 75% silt and 25% clay.	
					0.0		Silt, white (N8) to greenish gray (5GY6/1), dry, nonplastic to very low plasticity fines, weakly to strongly cemented, hard. Approximately 95% silt and 5% clay.	
-150					0.0		Silt, white (N8) to brown (10YR5/3), dry to moist, hard, partly indurated to strongly cemented, nonplastic to very low plasticity fines. Approximately 95% silt and 5% clay.	
					0.0		Clayey silt, brown (10YR5/3), dry to moist, very low to low plasticity fines, partly indurated, some gypsum. Approximately 70% silt and 30% clay.	
					0.0		Clayey silt, brown (10YR4/3), dry to moist, hard, very low to low plasticity fines, some local gypsum, locally partly indurated. Approximately 65% silt and 35% clay.	
			10/10		0.0		Clayey silt, dark grayish brown (10YR4/2), moist, hard, very low to low plasticity fines, locally partly indurated, trace local gypsum. Approximately 5% fine sand, 80% silt and 15% clay.	

Basic Remediation Company

Log of Boring No. BRC-SB-07-B

Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
-160					0.0		Clayey silt, brown (10YR4/3), dry to moist, hard, very low to low plasticity fines, trace local gypsum. Approximately 5% fine sand, 75% silt and 20% clay.	Cement Backfill
					0.0		Silt with sand, greenish gray (5GY6/1), dry to moist, hard, nonplastic to very low plasticity fines, partly indurated to weakly cemented. Approximately 15% fine sand, 80% silt and 5% clay.	
			10/10		0.0		Clayey silt, greenish gray (10Y6/1), moist, hard, very low plasticity fines, partly indurated, some gypsum. Approximately 85% silt and 15% clay.	
					0.0		Clayey silt, brown (10YR4/3), hard, dry to moist, very low to low plasticity fines, some gypsum, locally partly indurated. Approximately 70% silt and 30% clay.	
					0.0		Clayey silt, brown (7.5YR4/2), dry to moist, hard, very low to low plasticity fines, partly indurated, some gypsum. Approximately 70% silt and 30% clay.	
-170					0.0			
					0.0		Clayey silt, brown (7.5YR4/2), dry to moist, hard, very low to low plasticity fines, partly indurated, some gypsum. Approximately 85% silt and 15% clay.	
			10/10		0.0		Clayey silt, brown (10YR4/3), moist, hard, very low to low plasticity fines, trace local gypsum. Approximately trace fine sand, 65% silt and 35% clay.	
					0.0		Clayey silt, brown (7.5YR4/2), moist, very stiff to har, very lo to low plasticity fines, some gypsum. Approximately 70% silt and 30% clay.	
-180					0.0			
					0.0		Clayey silt, brown (7.5YR4/2), moist, hard, very low to low plasticity fines, partly indurated, some gypsum. Approximately 70% silt and 30% clay.	
			10/10		0.0		Clayey silt, brown (7.5YR4/3), moist, hard, very low to low plasticity fines, locally partly indurated some local gypsum. Approximately 70% silt and 30% clay.	
					0.0		Clayey siilt, brown (7.5YR4/2), dry to moist, hard, very low to low plasticity fines, partly indurated, some local gypsum. Approximately trace fine sand, 70% silt and 30% clay.	
-190					0.0			

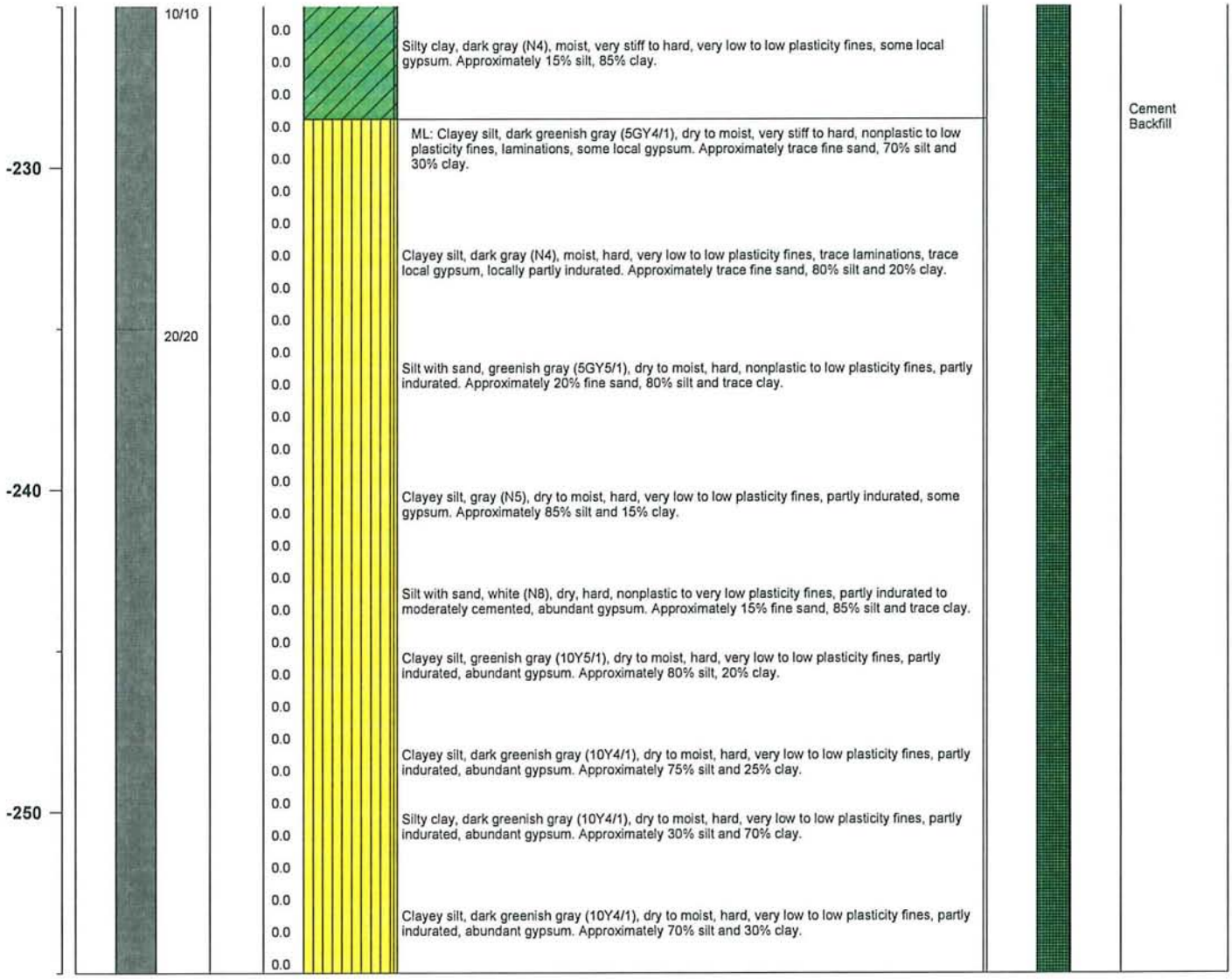
Basic Remediation COMPANY

Log of Boring No. BRC-SB-07-B

Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
					0.0		Clayey silt, brown (10YR5/3), dry to moist, hard, very low to low plasticity fines, some gypsum. Approximately 70% silt and 30% clay.	
			10/10		0.0		Clayey silt, dark greenish gray (10Y4/1), dry to moist, hard, very low to low plasticity fines, some gypsum. Approximately 65% silt and 35% clay.	Cement Backfill
					0.0		Clayey silt, dark greenish gray (10Y3/1), hard, dry to moist, very low to low plasticity fines, abundant gypsum. Approximately 75% silt and 25% clay.	
-200					0.0		Silt with sand, dark greenish gray (5GY4/1), dry to moist, hard, very low to low plasticity fines, subangular to subrounded sand, partly indurated, som gypsum. Approximately trace medium sand, 15% fine sand, 80% silt and 5% clay.	
			10/10		0.0		Clayey silt, greenish gray (10GY5/1), moist, hard, low to very low plasticity fines, trace gypsum. Approximately 5% fine sand, 80% silt and 15% clay.	
					0.0		Clayey silt, greenish gray (5GY6/1), dry to moist, hard, very low to low plasticity fines, partly indurated, abundant gypsum. Approximately 70% silt and 30% clay.	
-210					0.0		Clayey silt, light greenish gray (5GY7/1), dry to moist, hard, nonplastic to low plasticity fines, locally partly indurated, some local gypsum. Approximately 85% silt and 15% clay.	
			10/10		0.0		Clayey silt, greenish gray (5GY6/1), moist, hard, very low to low plasticity fines, locally partly indurated, trace local gypsum. Approximately 70% silt and 30% clay.	
					0.0		Clayey silt, dark greenish gray (10Y3/1), dry to moist, hard, very low to low plasticity fines, trace local gypsum. Approximately 70% silt and 30% clay.	
-220					0.0		Clayey silt, dark greenish gray (10Y3/1), moist, very stiff to hard, nonplastic to low plasticity fines, trace local gypsum. Approximately trace fine sand, 65% silt and 35% clay.	
					0.0		Clayey silt, dark greenish gray (10Y3/1), moist, very stiff to hard, very low to low plasticity fines, trace local gypsum. Approximately 70% silt and 30% clay.	
					0.0		CL: Silty clay, greenish black (10Y2.5/1), moist, very stiff, very low to low plasticity fines, some local gypsum. Approximately 20% silt and 80% clay.	

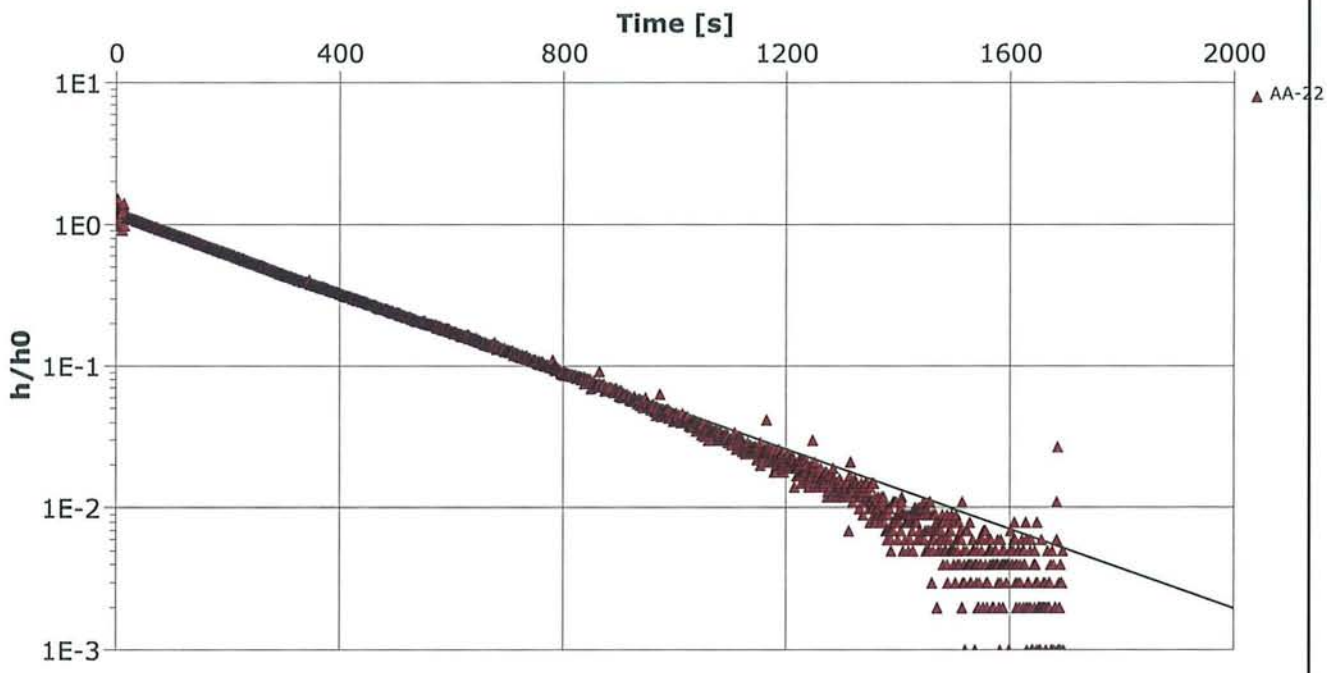
Basic Remediation COMPANY

Log of Boring No. BRC-SB-07-B



Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Slug Test Analysis Report
	Project: AA-22
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Slug Test: AA-22-in-1	Test Well: AA-22
Test conducted by:		Test date: 7/2/2007
Analysis performed by: G. P. Wittman	AA-22 Slug In 1	Date: 7/2/2007
Aquifer Thickness: 18.00 ft		

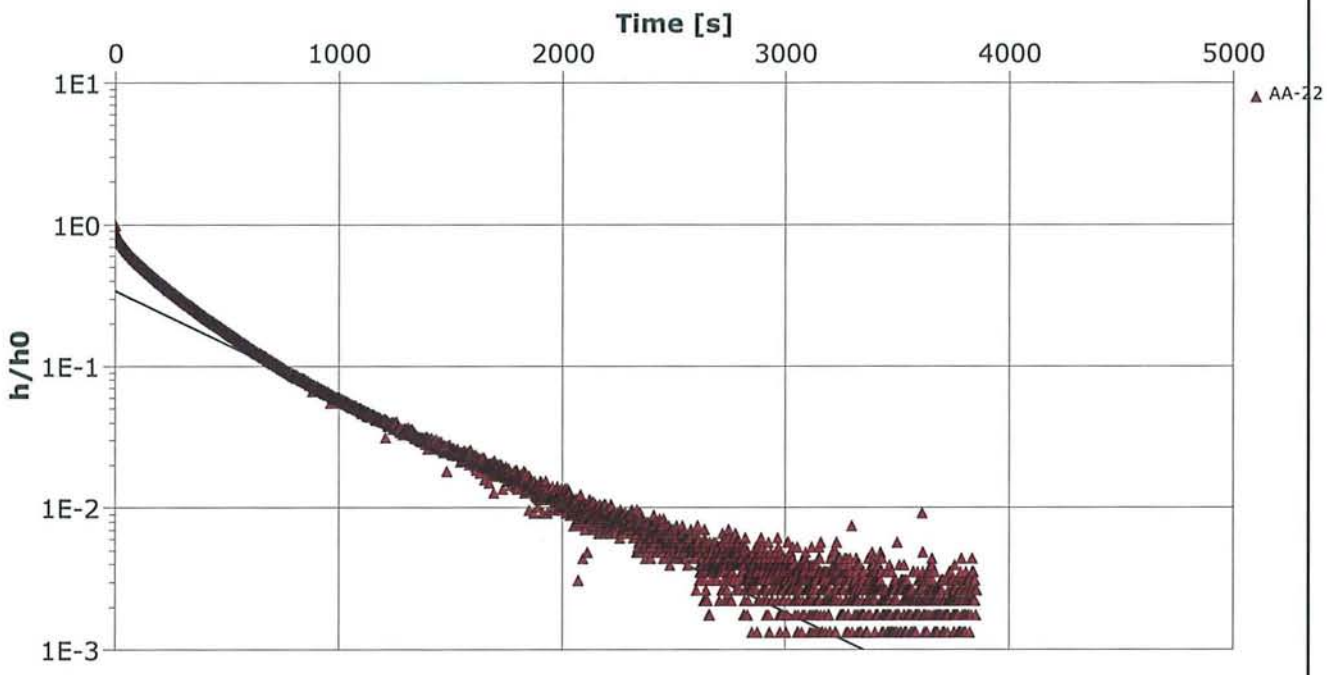


Calculation after Bouwer && Rice

Observation well	K [ft/d]	
AA-22	6.00×10^{-1}	

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Slug Test Analysis Report
	Project: AA-22
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Slug Test: AA-22-out-1	Test Well: AA-22
Test conducted by:		Test date: 7/2/2007
Analysis performed by: G.P. Wittman	AA-22 Slug Out 1	Date: 7/2/2007
Aquifer Thickness: 18.00 ft		

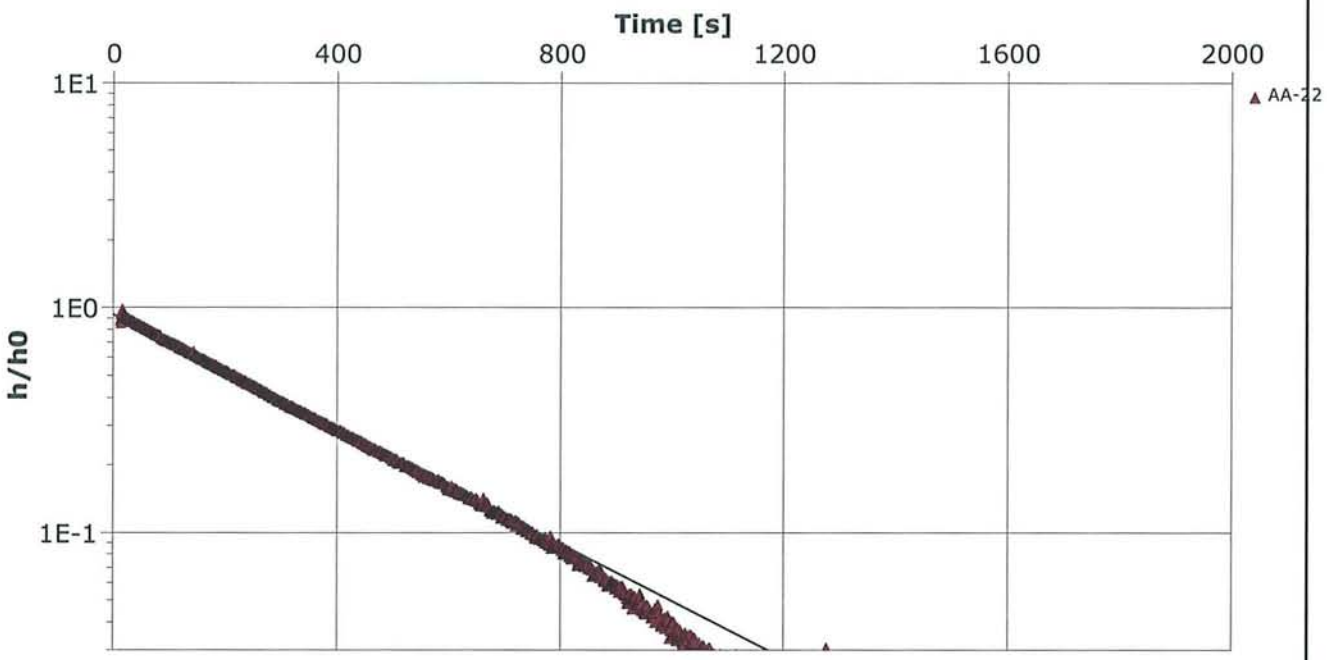


Calculation after Bouwer && Rice

Observation well	K [ft/d]	
AA-22	3.25×10^{-1}	

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Slug Test Analysis Report
	Project: AA-22
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Slug Test: Slug Test AA-22	Test Well: AA-22
Test conducted by:		Test date: 7/2/2007
Analysis performed by: G.P. Wittman	AA-22 Slug In 2	Date: 7/2/2007
Aquifer Thickness: 18.00 ft		

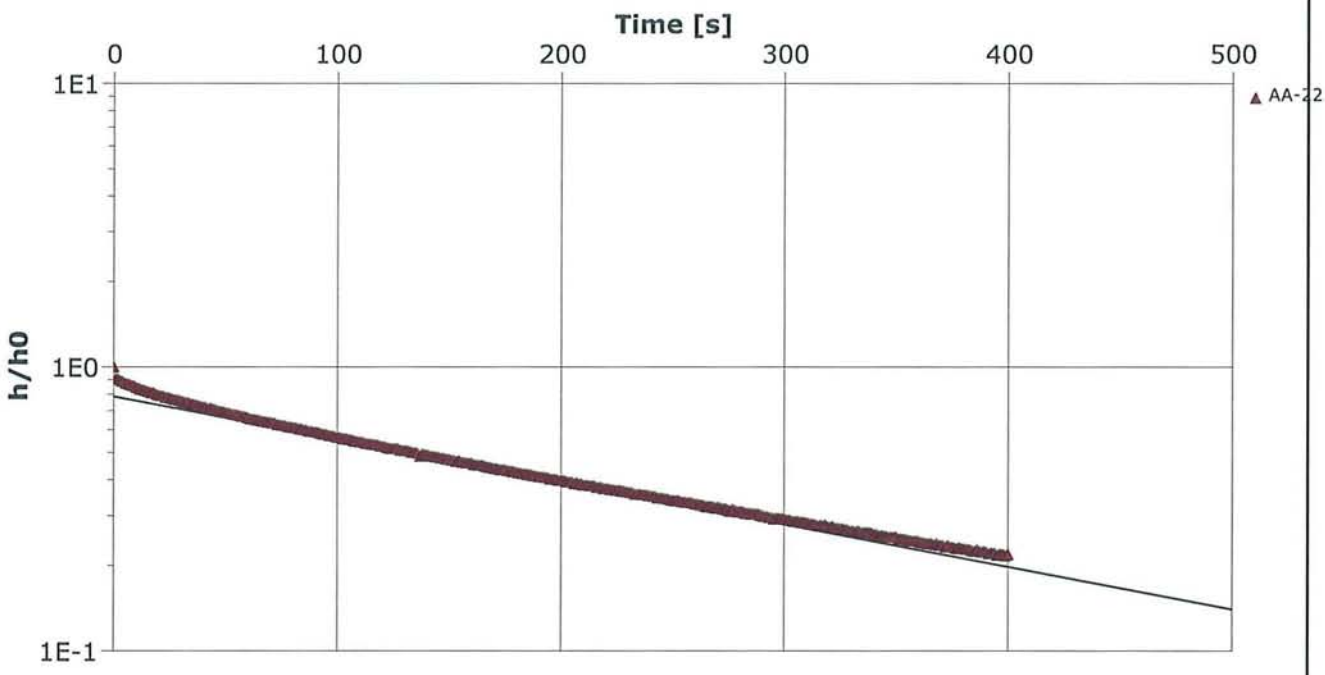


Calculation after Bouwer && Rice

Observation well	K [ft/d]	
AA-22	5.48×10^{-1}	

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Slug Test Analysis Report
	Project: AA-22
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Slug Test: AA-22-out-2	Test Well: AA-22
Test conducted by:		Test date: 7/2/2007
Analysis performed by: G.P. Wittman	AA-22 Slug Out 2	Date: 7/2/2007
Aquifer Thickness: 18.00 ft		



Calculation after Bouwer && Rice

Observation well	K [ft/d]	
AA-22	6.44×10^{-1}	

Log of Boring No. BRC-SB-22-A

BMI Site - Hydrogeologic Characterization

Henderson, Nevada

Basic Remediation COMPANY

Drilling Method: Hollow Stem Auger
Drilling Equipment: CME-95/Hollow Stem Auger
Drilling Contractor: Water Development Corporation
Driller: George Guzman

Borehole Total Depth: 40 ft bgs
Borehole Diameter: 11 in
Boring Location: Location 22 (Well ID: AA-22)
Depth to Water (ft. bgs): 12 ft bgs ⧖

Sample Type: Grab/Split spoon
Sample Interval Varied

Logged By: Jennifer Wiley
Date Started: 4/1/04
Date Completed: 4/1/04

Monitoring Well Construction

Type of Surface Seal:	Cement-Grout	**Screen Slot Size:**	0.020 in
Blank Casing Type/Size:	4" Sch 80 PVC	**Top of Screen (ft. bgs):**	9 ft bgs
Screen Type/Size:	4" Sch 80 PVC	**Bottom of Screen (ft. bgs):**	31 ft bgs
Transition Sand Type:	#1C	**Type of Sand Pack:**	#3

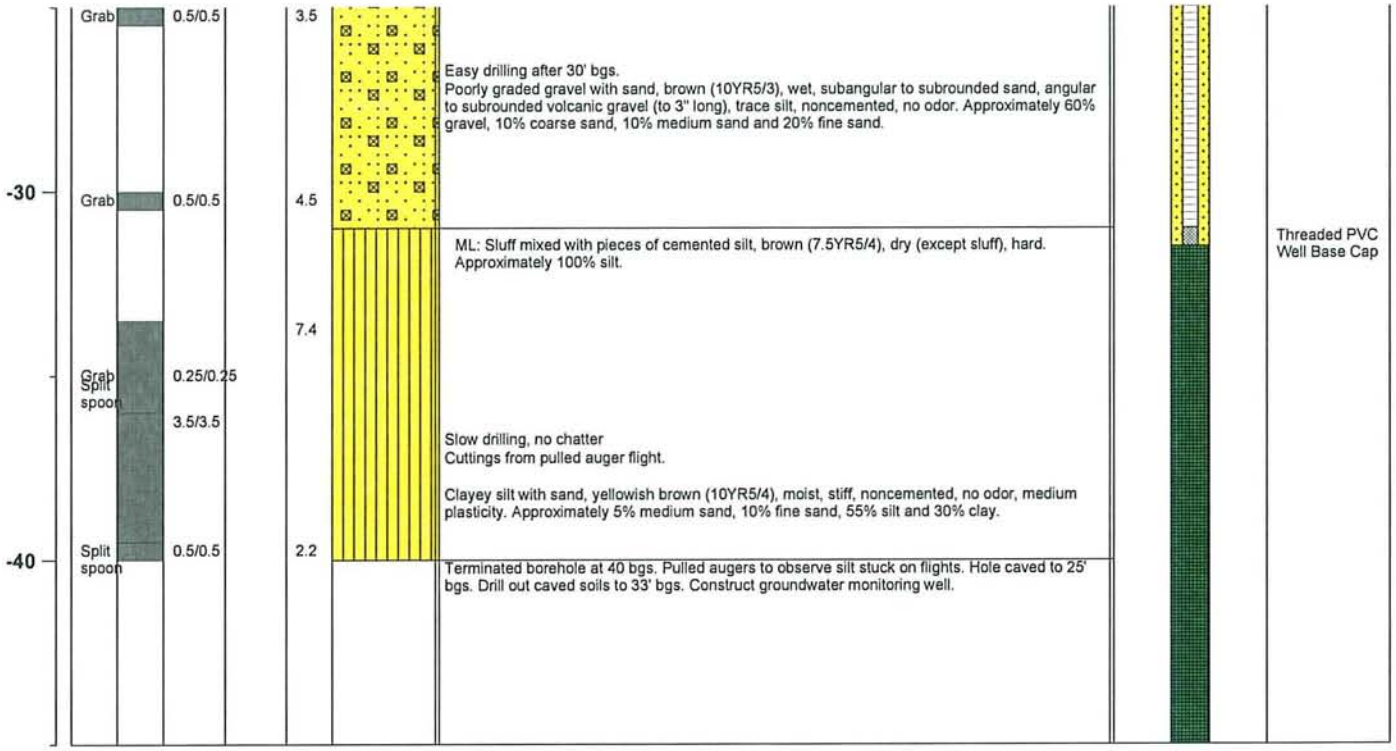
Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
0								Locking monument well box with concrete apron and ballards
							Hand auger borehole to 2.5' bgs - refusal. Ream to 11" OD with posthole digger.	Cement grout
								4" Blank PVC Riser Pipe
	Grab		0.5/0.5		3.2			Bentonite seal
								#1C Transition Sand
								#3 Sand Pack
-10	Grab		0.5/0.5		5.2		Poorly graded sand with gravel, brown (7.5YR4/4), moist, subangular to subrounded sand, angular to subrounded volcanic gravel (up to 2" long), noncemented, no odor. Approximately 15% gravel, 10% coarse sand, 15% medium sand and 60% fine sand.	4" 0.020 Slot PVC screen
	Grab		0.5/0.5		5.8		Poorly graded sand, brown (10YR4/3), moist, subangular to subrounded sand, subangular to subrounded volcanic gravel, noncemented, no odor. Approximately 10% gravel, 15% coarse sand, 50% medium sand and 25% fine sand	
-20	Grab		0.5/0.5		1.6		Poorly graded sand, brown (10YR4/3), moist, subangular to subrounded sand, subangular to subrounded volcanic gravel, noncemented, no odor. Approximately 10% gravel, 10% coarse sand, 30% medium sand and 50% fine sand.	
							GP: Poorly graded gravel with sand, dark yellowish brown (10YR4/4), moist, subangular to subrounded sand, angular to subrounded volcanic gravel (to 3" long), noncemented, no odor. Approximately 60% gravel, 5% coarse sand, 15% medium sand and 20% fine sand.	

BMI Site - Hydrogeologic Characterization

Basic Remediation COMPANY

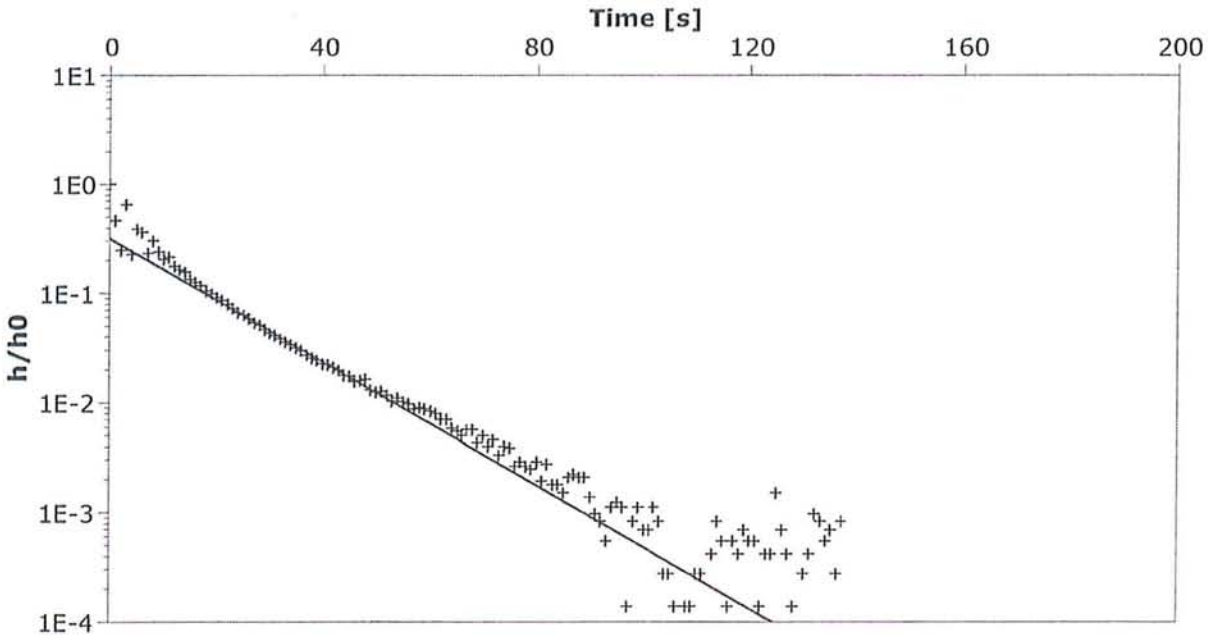
Henderson, Nevada

Log of Boring No. BRC-SB-22-A



Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Slug Test Analysis Report
	Project:
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Slug Test: AA-09 Slug Out-1	Test Well: AA-09
Test conducted by: G.P. Wittman		Test date: 8/24/2007
Analysis performed by: G.P. Wittman	AA-09 Slug Out-1	Date: 8/24/2007
Aquifer Thickness: 20.00 ft		

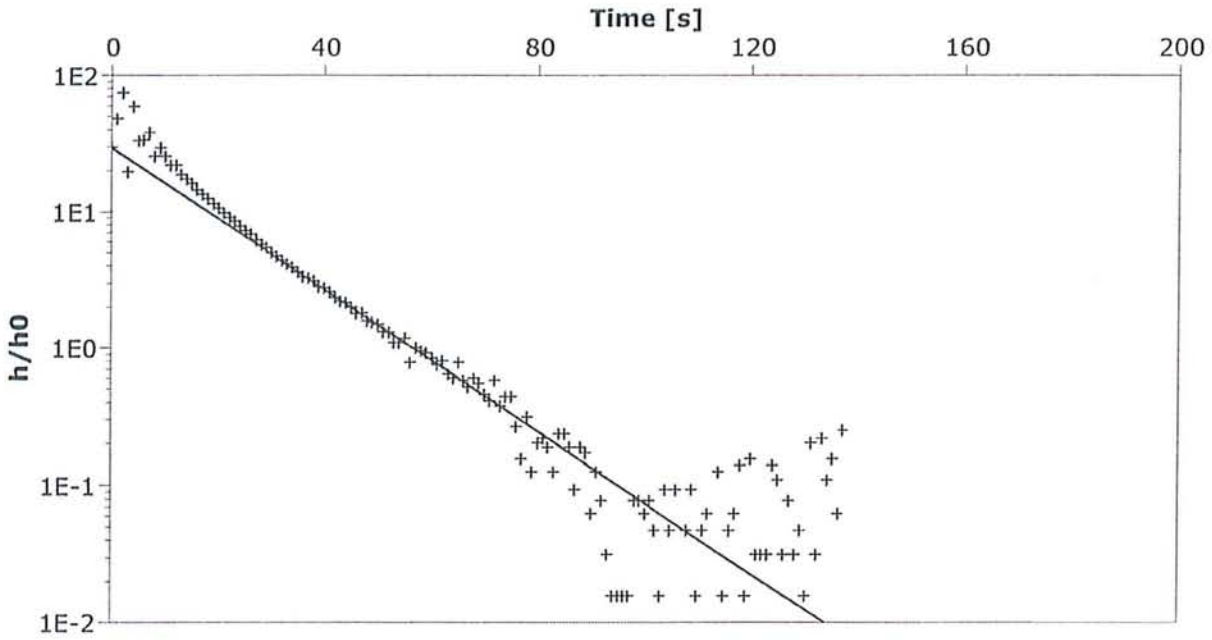


Calculation after Bouwer && Rice

Observation well	K [ft/d]	
AA-09	6.73×10^{1}	

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Slug Test Analysis Report
	Project:
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Slug Test: Slug Test 34	Test Well: AA-09
Test conducted by:		Test date: 8/24/2007
Analysis performed by: G.P Witlman	AA-09 Slug Out-2	Date: 8/24/2007
Aquifer Thickness: 20.00 ft		

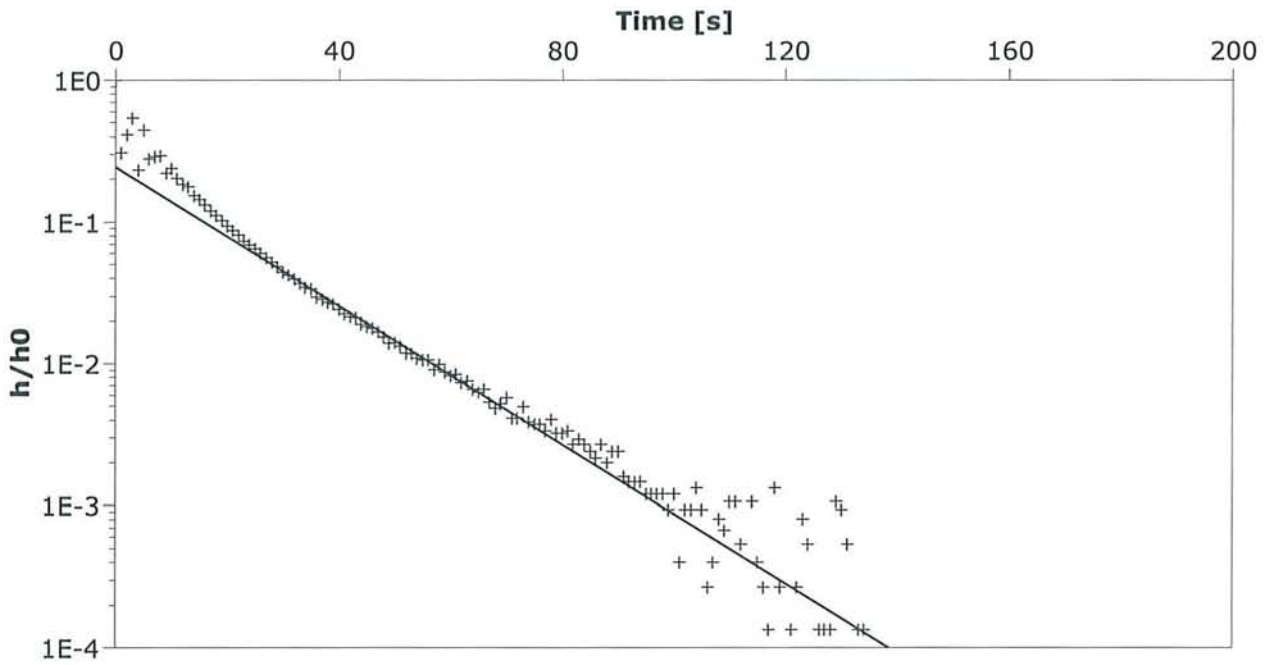


Calculation after Bouwer && Rice

Observation well	K [ft/d]	
AA-09	6.20×10^{1}	

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Slug Test Analysis Report
	Project: AA-22
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Slug Test: AA-09_3	Test Well: AA-09
Test conducted by:		Test date: 5/31/2007
Analysis performed by: G.P. Wittman	AA-09 Slug Out-3	Date: 7/2/2007
Aquifer Thickness: 20.00 ft		

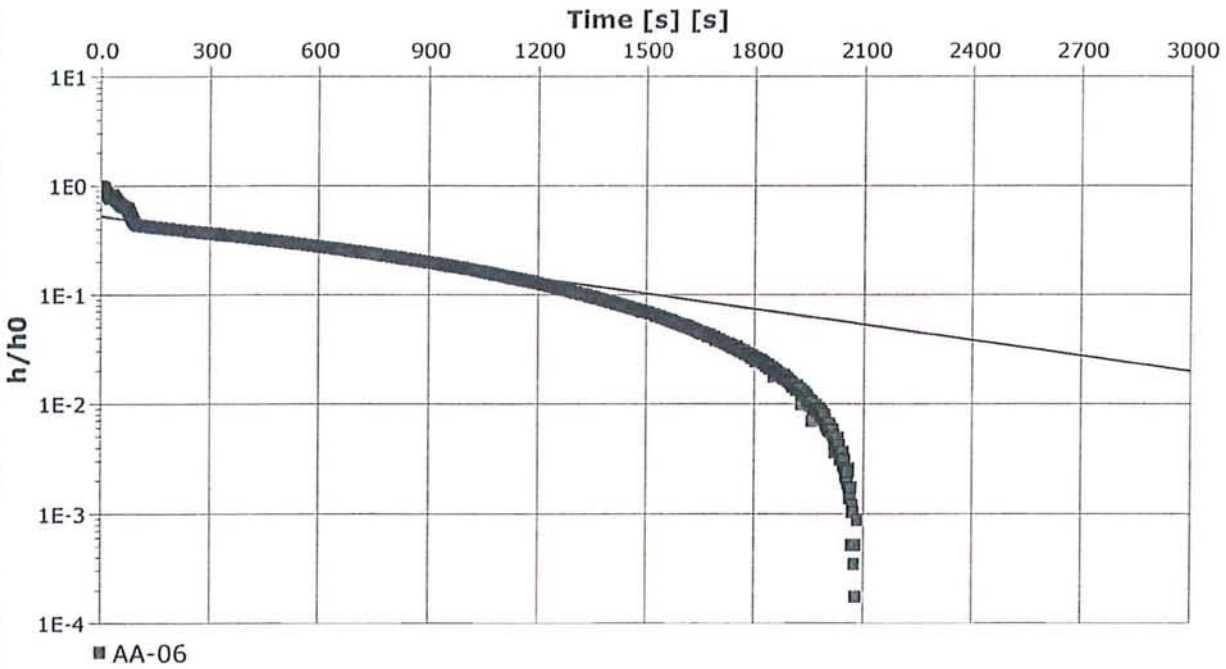


Calculation after Bouwer && Rice

Observation well	K [ft/d]	
AA-09	5.84×10^{1}	

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Slug Test Analysis Report
	Project:
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Slug Test: Slug Test 36	Test Well: AA-06
Test conducted by:		Test date: 8/24/2007
Analysis performed by: G.P. Wittman	AA-06 Slug In	Date: 8/24/2007
Aquifer Thickness: 10.00 ft		



Calculation after Bouwer && Rice

Observation well	K [ft/d]	
AA-06	1.50×10^{0}	

Log of Boring No. BRC-SB-09-C

BMI Site - Hydrogeologic Characterization

Henderson, Nevada

Basic Remediation COMPANY

Drilling Method: Sonic
Drilling Equipment: Rotary Sonic
Drilling Contractor: ProSonic
Driller: ProSonic

Borehole Total Depth: 67 ft bgs
Borehole Diameter: 8.5 in
Boring Location: Location 9 (Well ID: MCF-09B)
Depth to Water (ft. bgs): NA ⧖

Sample Type: N/A
Sample Interval Cont.

Logged By: Jennifer Wiley
Date Started: 06/09/04
Date Completed: 06/09/04

Monitoring Well Construction

Type of Surface Seal:	Bentonite-Grout	**Screen Slot Size:**	0.010 in
Blank Casing Type/Size:	4" Sch 80 PVC	**Top of Screen (ft. bgs):**	105 ft bgs
Screen Type/Size:	4" Sch 80 PVC	**Bottom of Screen (ft. bgs):**	125 ft bgs
Transition Sand Type:	N/A	**Type of Sand Pack:**	#2 x 12

Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
0							For lithologic interpretation, see boring log BRC-SB-09-A	Locking monument well box with concrete apron and ballards Cement Bentonite Grout 4" Blank PVC Riser Pipe Bentonite seal
-10								
-20								

Basic Remediation COMPANY

Log of Boring No. BRC-SB-09-C

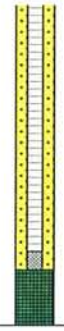
Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
-30							For lithologic interpretation, see boring log BRC-SB-09-A	Bentonite seal
-40								#10 x 20 Sand Pack
-50								4" 0.010 Slot PVC screen

BMI Site - Hydrogeologic Characterization

Basic Remediation COMPANY

Henderson, Nevada

Log of Boring No. BRC-SB-09-C

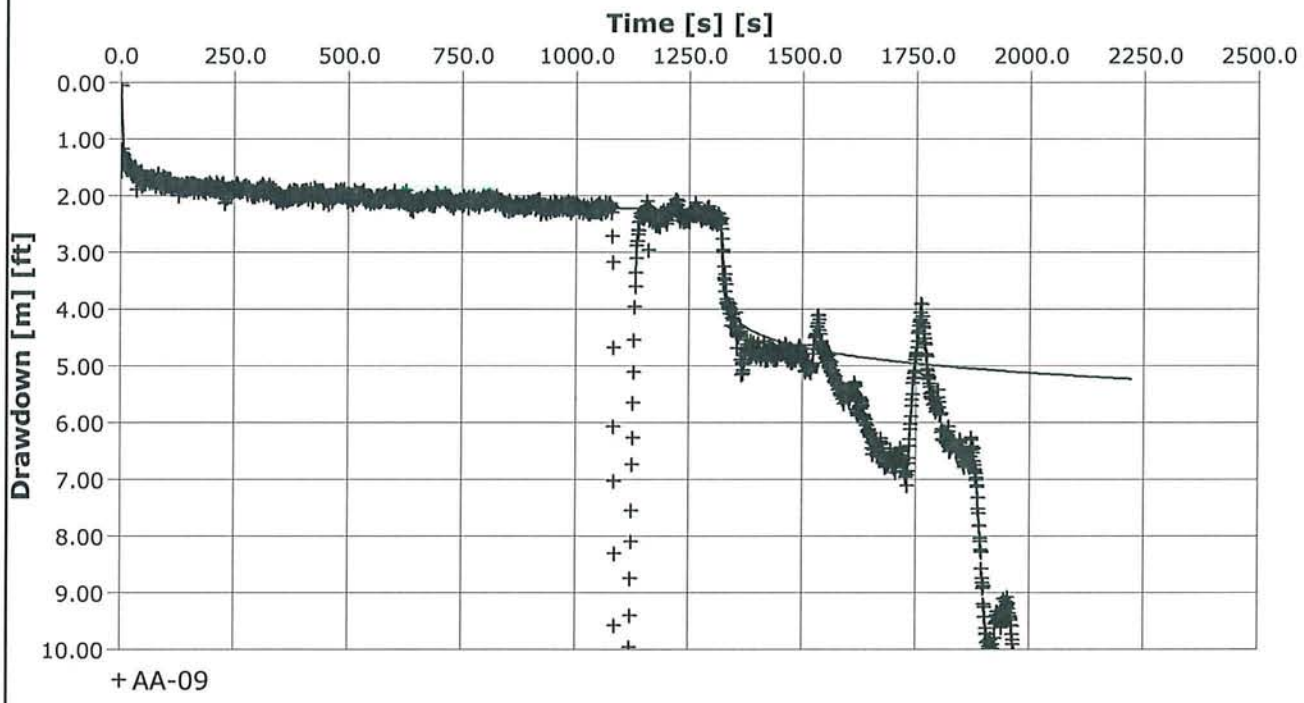
Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
-60							For lithologic interpretation, see boring log BRC-SB-09-A	 #10 x 20 Sand Pack Threaded PVC Well Base Cap Cement Backfill

APPENDIX D

AQUIFER PUMPING TEST DATA

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Pumping Test Analysis Report
	Project: BRC Aquifer Test
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Pumping Test: Step AA-09	Pumping well: AA-09
Test conducted by: B. Peck		Test date: 6/26/2007
Analysis performed by:	Step Test AA-09C	Date: 8/29/2007
Aquifer Thickness: 33.70 ft	Discharge: variable, average rate 7.4532 [U.S. gal/min]	

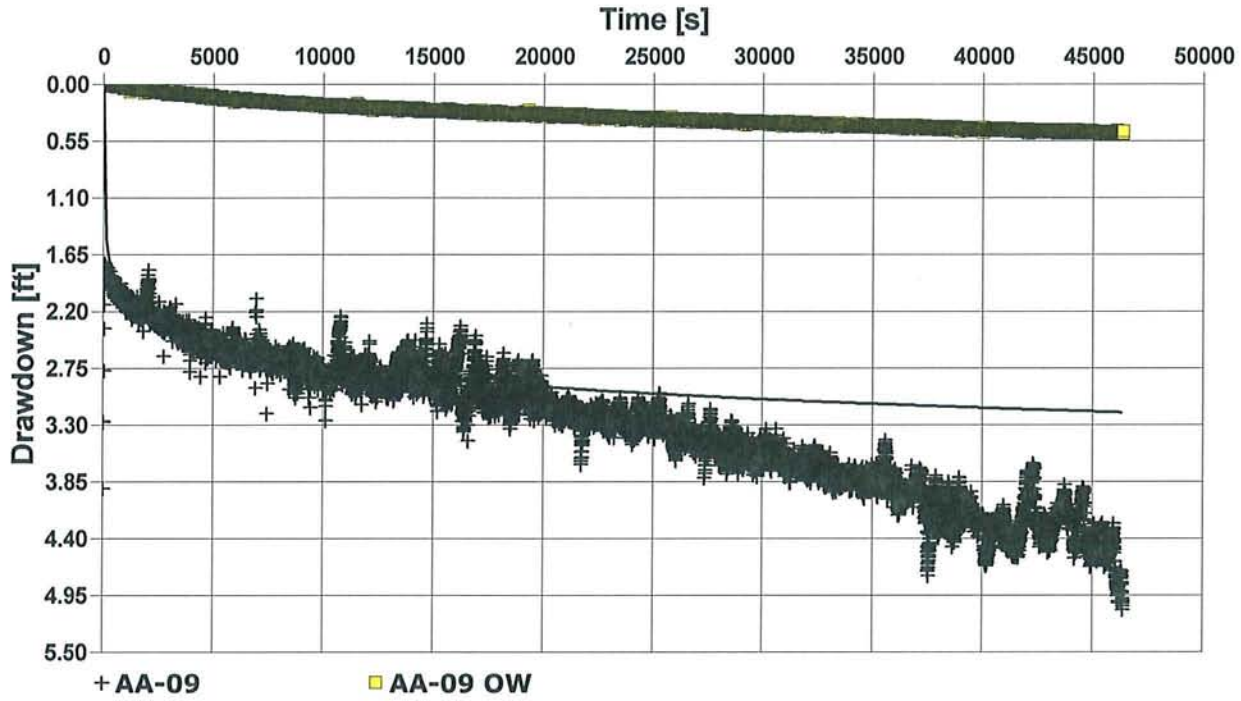


Calculation after Theis with Jacob Correction

Observation well	Transmissivity [ft²/d]	K [ft/d]	Storage coefficient	Radial distance to PW [ft]	
AA-09	3.75×10^{2}	1.11×10^{1}	2.27×10^{-3}	0.35	

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Pumping Test Analysis Report
	Project: BRC Aquifer Test
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Pumping Test: Constant Rate AA-09	Pumping well: AA-09
Test conducted by: B. Peck		Test date: 6/27/2007
Analysis performed by: G. P. Wittman	Constant Rate Pump Test AA-09	Date: 9/10/2007
Aquifer Thickness: 33.70 ft	Discharge rate: 5.7 [U.S. gal/min]	

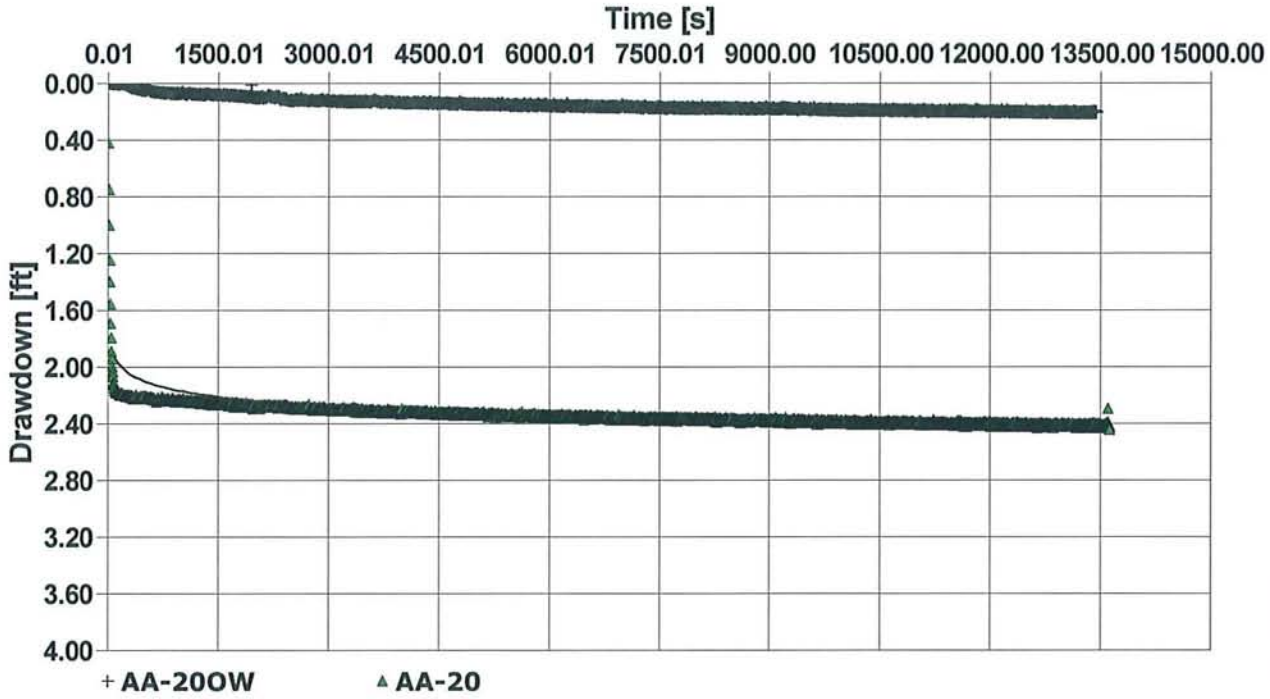


Calculation after Theis with Jacob Correction

Observation well	Transmissivity [ft²/d]	K [ft/d]	Storage coefficient	Radial distance to PW [ft]	
AA-09	3.25×10^{2}	9.64×10^{0}	3.95×10^{-2}	0.35	
AA-09 OW	5.20×10^{2}	1.54×10^{1}	5.72×10^{-2}	29.29	
Average	4.23×10^{2}	1.25×10^{1}	4.84×10^{-2}		

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Pumping Test Analysis Report
	Project: BMI Aquifer Test
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Pumping Test: Pumping Test AA-09 Recovery	Pumping well: AA-20
Test conducted by:		Test date: 9/10/2007
Analysis performed by: G.P. Wittman	AA-20 Recovery	Date: 9/10/2007
Aquifer Thickness: 22.90 ft	Discharge: variable, average rate 2.1869 [U.S. gal/min]	

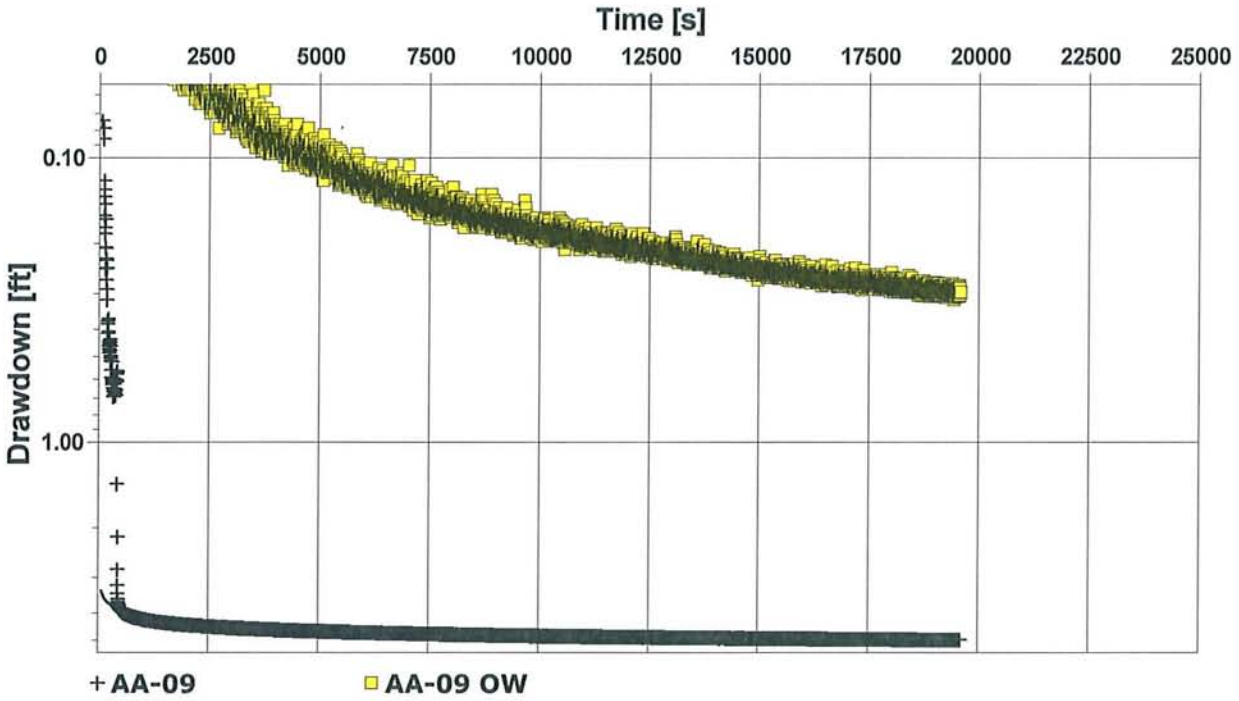


Calculation after AGARWAL + Theis with Jacob Correction

Observation well	Transmissivity [ft²/d]	K [ft/d]	Storage coefficient	Radial distance to PW [ft]	
AA-20OW	1.19×10^{3}	5.21×10^{1}	4.50×10^{-2}	14.08	
AA-20	6.80×10^{2}	2.97×10^{1}	1.53×10^{-8}	0.35	
Average	9.37×10^{2}	4.09×10^{1}	2.25×10^{-2}		

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Pumping Test Analysis Report
	Project: BRC Aquifer Test
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Pumping Test: Constant Rate Recovery AA-09	Pumping well: AA-09
Test conducted by: B. Peck		Test date: 6/28/2007
Analysis performed by: G. P. Wittman	Constant Rate Pump Test AA-09 Recovery	Date: 9/10/2007
Aquifer Thickness: 33.70 ft	Discharge rate: 5.7 [U.S. gal/min]	

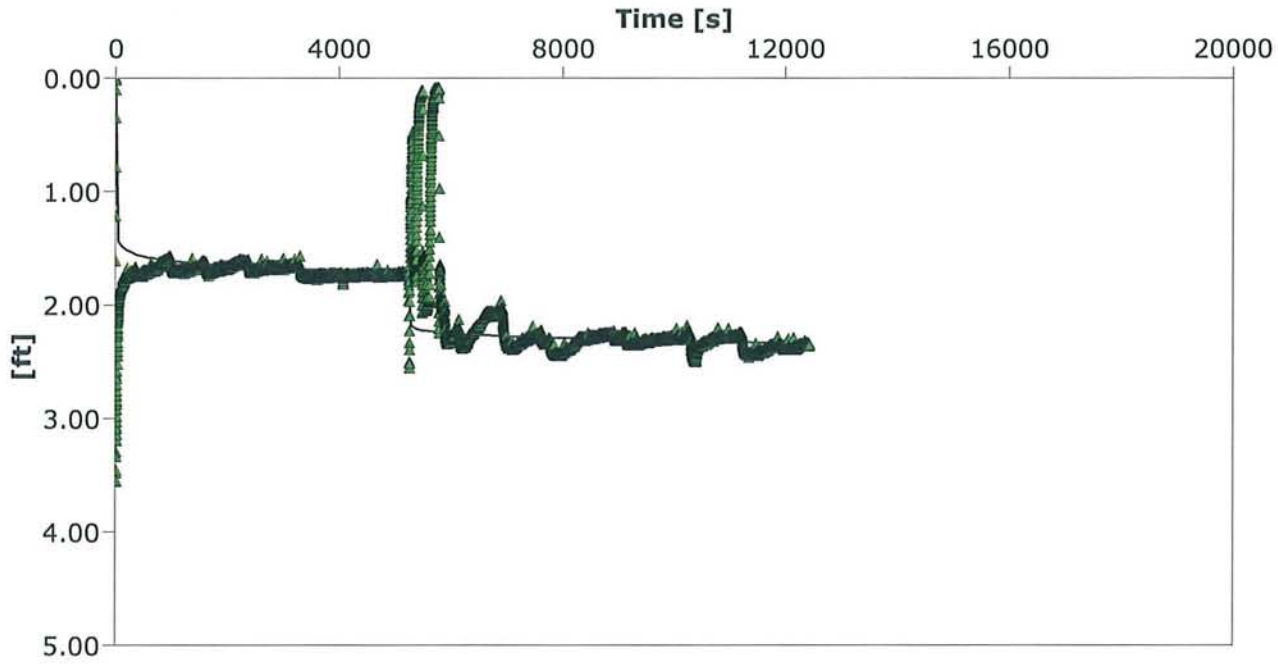


Calculation after AGARWAL + Theis with Jacob Correction

Observation well	Transmissivity [ft²/d]	K [ft/d]	Storage coefficient	Radial distance to PW [ft]	
AA-09	3.25×10^{2}	9.64×10^{0}	3.83×10^{-5}	0.35	
AA-09 OW	4.84×10^{2}	1.44×10^{1}	6.65×10^{-2}	29.29	
Average	4.05×10^{2}	1.20×10^{1}	3.33×10^{-2}		

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Pumping Test Analysis Report
	Project: BMI Aquifer Test
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Pumping Test: AA-20 Step Test	Pumping well: AA-20
Test conducted by: B. Peck, G. Wittman		Test date: 9/17/2007
Analysis performed by: G. Wittman	Step Test AA-20	Date: 9/17/2007
Aquifer Thickness: 22.90 ft	Discharge: variable, average rate 3.5764 [U.S. gal/min]	

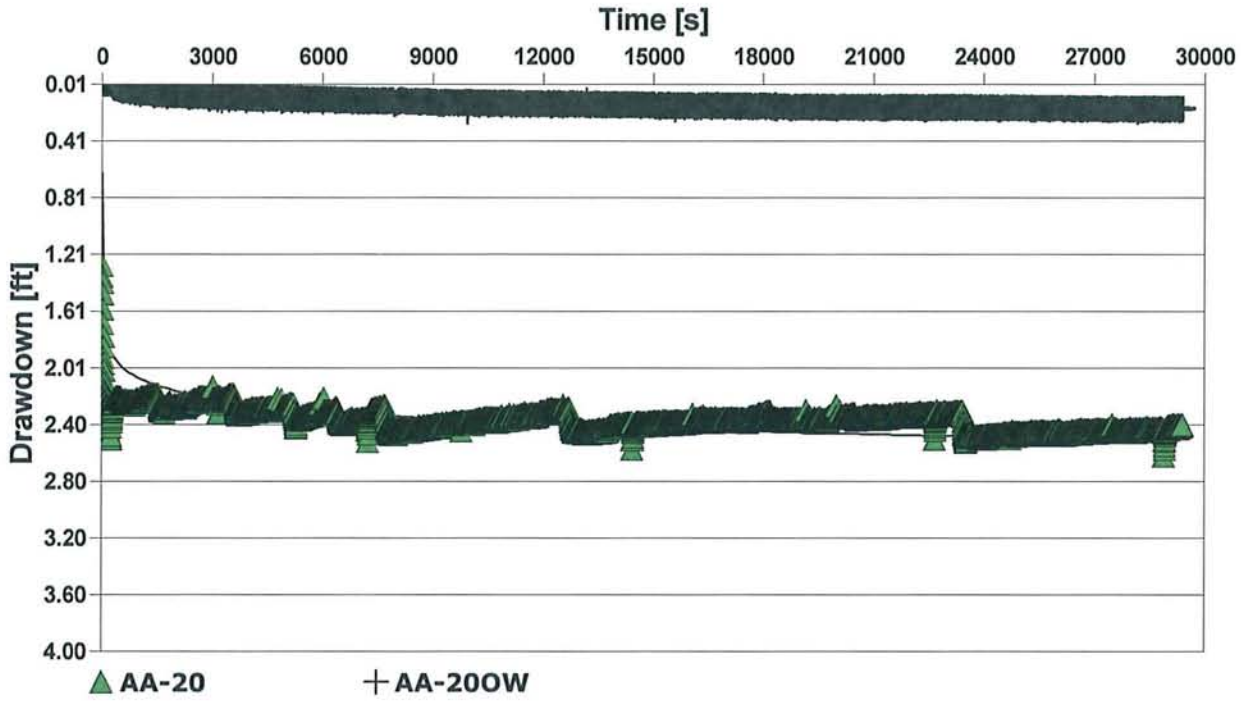


Calculation after Theis

Observation well	Transmissivity [ft²/d]	K [ft/d]	Storage coefficient	Radial distance to PW [ft]	
AA-20	7.70×10^{2}	3.36×10^{1}	2.99×10^{-10}	0.35	

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Pumping Test Analysis Report
	Project: BMI Aquifer Test
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Pumping Test: Constant Rate Pump Test AA-20	Pumping well: AA-20
Test conducted by: G. Wittman, B. Peck		Test date: 7/10/2007
Analysis performed by: G. Wittman	Constant Rate Pumping Test AA-20	Date: 9/10/2007
Aquifer Thickness: 22.90 ft	Discharge rate: 4 [U.S. gal/min]	

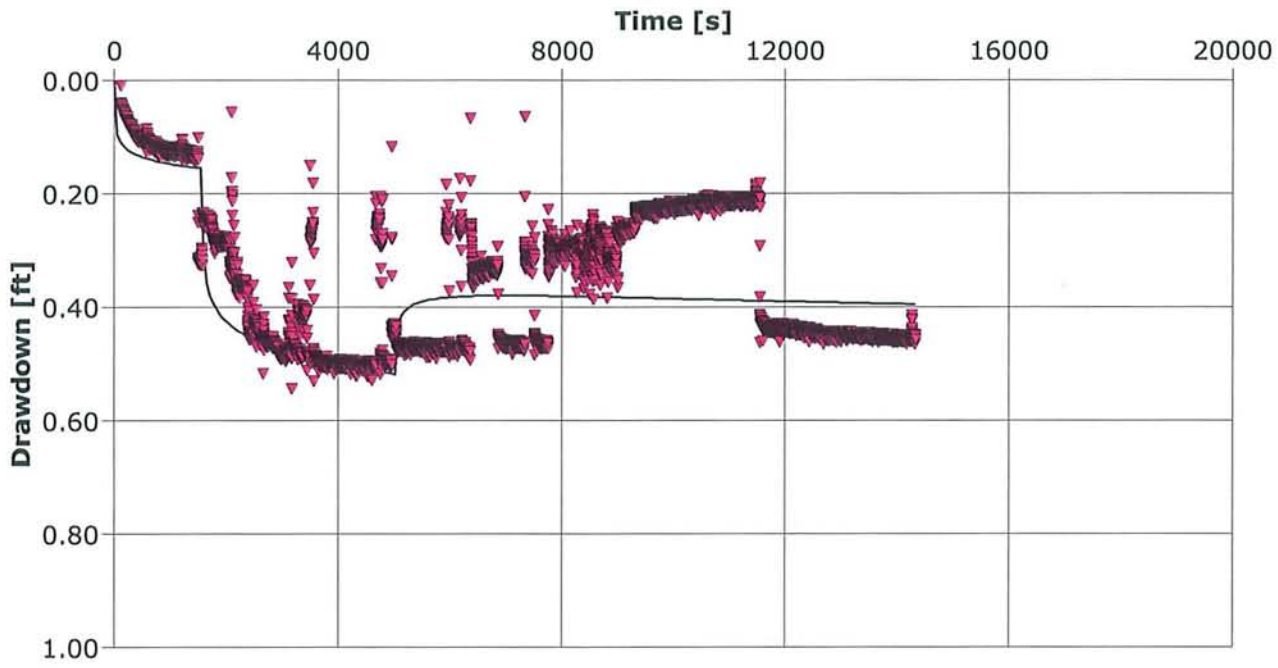


Calculation after Theis with Jacob Correction

Observation well	Transmissivity [ft²/d]	K [ft/d]	Storage coefficient	Radial distance to PW [ft]	
AA-20	5.20×10^{2}	2.27×10^{1}	5.41×10^{-6}	0.35	
AA-20OW	1.58×10^{3}	6.90×10^{1}	3.79×10^{-2}	14.08	
Average	1.05×10^{3}	4.59×10^{1}	1.90×10^{-2}		

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Pumping Test Analysis Report
	Project: BMI Aquifer Test
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Pumping Test: Step- AA-08	Pumping well: AA-08
Test conducted by: G. Wittman		Test date: 9/17/2007
Analysis performed by: G. Wittman	Step Test AA-08	Date: 9/17/2007
Aquifer Thickness: 44.34 ft	Discharge: variable, average rate 22.4 [U.S. gal/min]	

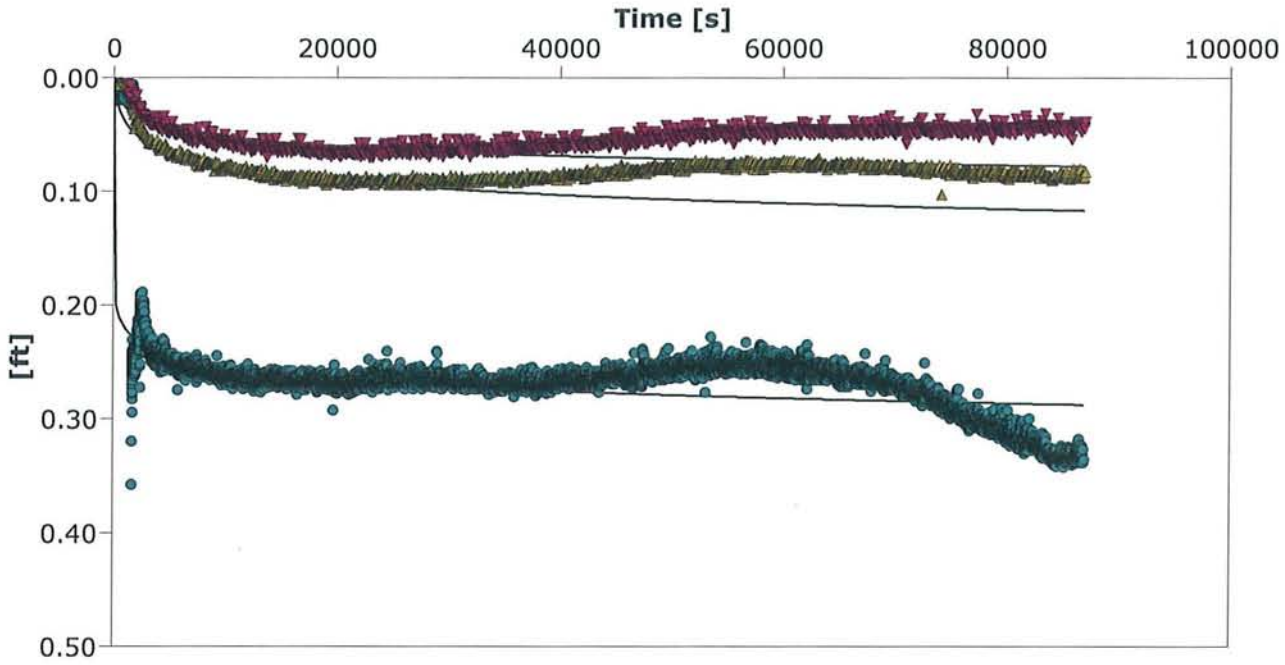


Calculation after Theis with Jacob Correction

Observation well	Transmissivity [ft²/d]	K [ft/d]	Storage coefficient	Radial distance to PW [ft]	
AA-08	8.50×10^{3}	1.92×10^{2}	5.00×10^{-1}	0.35	

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Pumping Test Analysis Report
	Project: BMI Aquifer Test
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Pumping Test: AA-08	Pumping well: AA-08EW
Test conducted by:		Test date: 6/1/2007
Analysis performed by: G. P. Wittman	Constant Rate Pump Test AA-08EW	Date: 6/1/2007
Aquifer Thickness: 44.34 ft	Discharge rate: 29 [U.S. gal/min]	

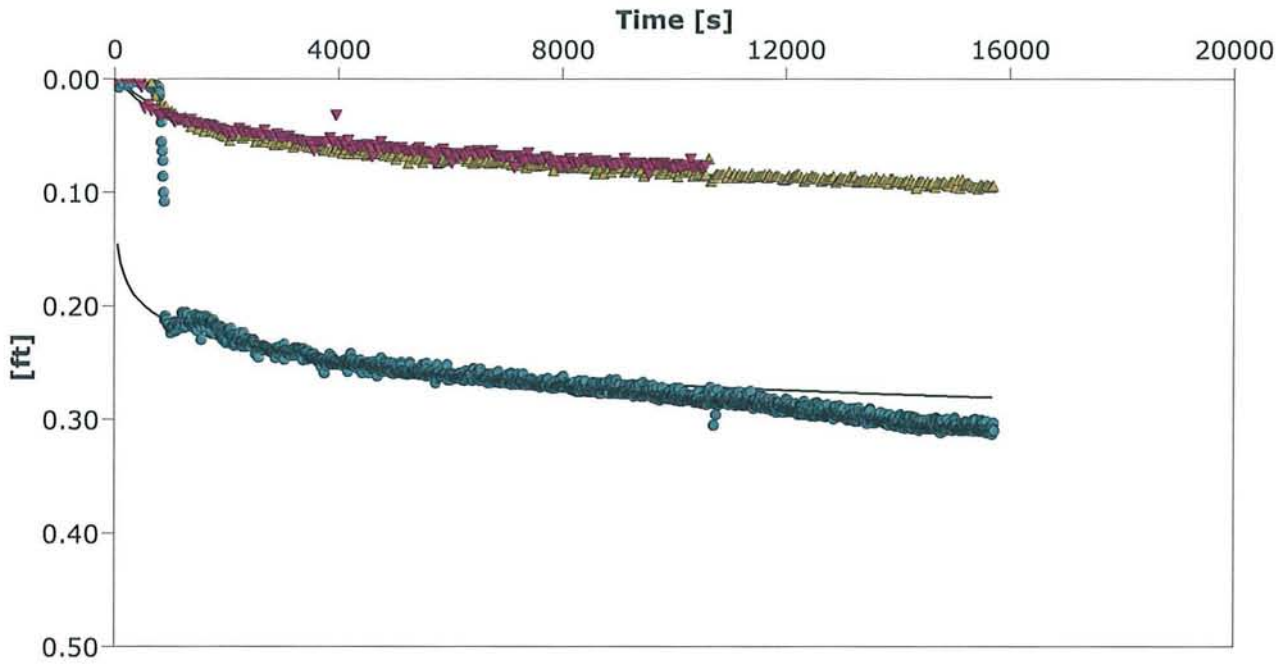


Calculation after Theis with Jacob Correction

Observation well	Transmissivity [ft²/d]	K [ft/d]	Storage coefficient	Radial distance to PW [ft]	
AA-08EW	2.90×10^{4}	6.54×10^{2}	3.85×10^{-3}	0.35	
AA-08A	2.50×10^{4}	5.64×10^{2}	9.20×10^{-2}	29.35	
AA-08B	3.75×10^{4}	8.46×10^{2}	2.92×10^{-2}	63.66	
Average	3.05×10^{4}	6.88×10^{2}	4.17×10^{-2}		

Kleinfelder West, Inc 2315 S. Cobalt Point Way Meridian, Idaho 83642 (208) 893-9700	Pumping Test Analysis Report
	Project: BMI Aquifer Test
	Number: 83173
	Client: BRC

Location: Henderson, Nevada	Pumping Test: Constant Rate Pump Test AA-08	Pumping well: AA-08EW
Test conducted by: G. Wittman		Test date: 6/1/2007
Analysis performed by: G. Wittman	Constant Rate Pump Test AA-08 Recovery	Date: 9/17/2007
Aquifer Thickness: 44.35 ft	Discharge: variable, average rate 23.181 [U.S. gal/min]	



Calculation after AGARWAL + Theis

Observation well	Transmissivity [ft²/d]	K [ft/d]	Storage coefficient	Radial distance to PW [ft]	
AA-08EW	1.85×10^{4}	4.17×10^{2}	5.00×10^{-1}	0.35	
AA-08A	1.98×10^{4}	4.46×10^{2}	1.48×10^{-1}	29.35	
AA-08B	2.00×10^{4}	4.51×10^{2}	4.09×10^{-2}	63.66	
Average	1.94×10^{4}	4.38×10^{2}	2.30×10^{-1}		

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DRILLING LOG
Well No. AA-09-OW

Project Name:	BRC Aquifer Test	*Start Date:*	6/1/07	*Logged By:*	Davis
Site Location:	Henderson, NV	*End Date:*	6/1/07	*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):*	2		
Drill Rig Type:	B.L. - GP24-300RS	*Water Level (Initial, Ft):*	32		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	30-70		
Sampling Method:	Continuous Core	*Ground Surface Elev.:*	1692.90 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): [FILL]					
		SILTY SAND (SM): Reddish Brown Silty Sand with Gravel, Corase Sands					
		SILTY GRAVEL (GM): Reddish Brown Silty Gravel with Sand					
10		SILTY SAND (SM): Reddish Brown, Silty Sand with Gravel and Coarse Sand					Bentonite chip seal
		SILTY GRAVEL (GM): Reddish Brown, Silty Gravel with Sand					
20		SILTY SAND (SM): Reddish Brown, Silty Sand with Gravel					
		SILTY GRAVEL (GM): Reddish Brown Silty Gravel with Sand					
		SILTY SAND (SM): Reddish Brown, Silty Sand with Gravel					2" diameter Schedule 40 PVC casing
30		CLAYEY SAND (SC): Reddish Brown, Clayey Sand/Silty Sand with Gravel					
		SILTY SAND (SM): Reddish Brown, Silty Coarse Sand with Gravel					

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DRILLING LOG
Well No. AA-09-OW

Project Name:	BRC Aquifer Test	*Start Date:*	6/1/07	*Logged By:*	Davis
Site Location:	Henderson, NV	*End Date:*	6/1/07	*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):*	2		
Drill Rig Type:	B.L. - GP24-300RS	*Water Level (Initial, Ft):*	32		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	30-70		
Sampling Method:	Continuous Core	*Ground Surface Elev.:*	1692.90 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
40		SANDY CLAY (CL): Reddish Brown-Brown, Sandy Clay, Fine Sand					#10/20 Colorado Silica Sand
50		CLAY (CL): Light Greyish Brown Clay with Sand, Trace Gravel					2" diameter, 0.020" slot, Schedule 40 PVC screen
60		SANDSTONE (SS): Muddy Creek Formation (TMC), Light Brown-Brown, Silty/Clayey Sandstone					#10/20 Colorado Silica Sand
70							

Log of Boring No. BRC-SB-09-C

BMI Site - Hydrogeologic Characterization

Henderson, Nevada

Basic Remediation Company

Drilling Method: Sonic
Drilling Equipment: Rotary Sonic
Drilling Contractor: ProSonic
Driller: ProSonic

Borehole Total Depth: 67 ft bgs
Borehole Diameter: 8.5 in
Boring Location: Location 9 (Well ID: MCF-09B)
Depth to Water (ft. bgs): NA ⊻

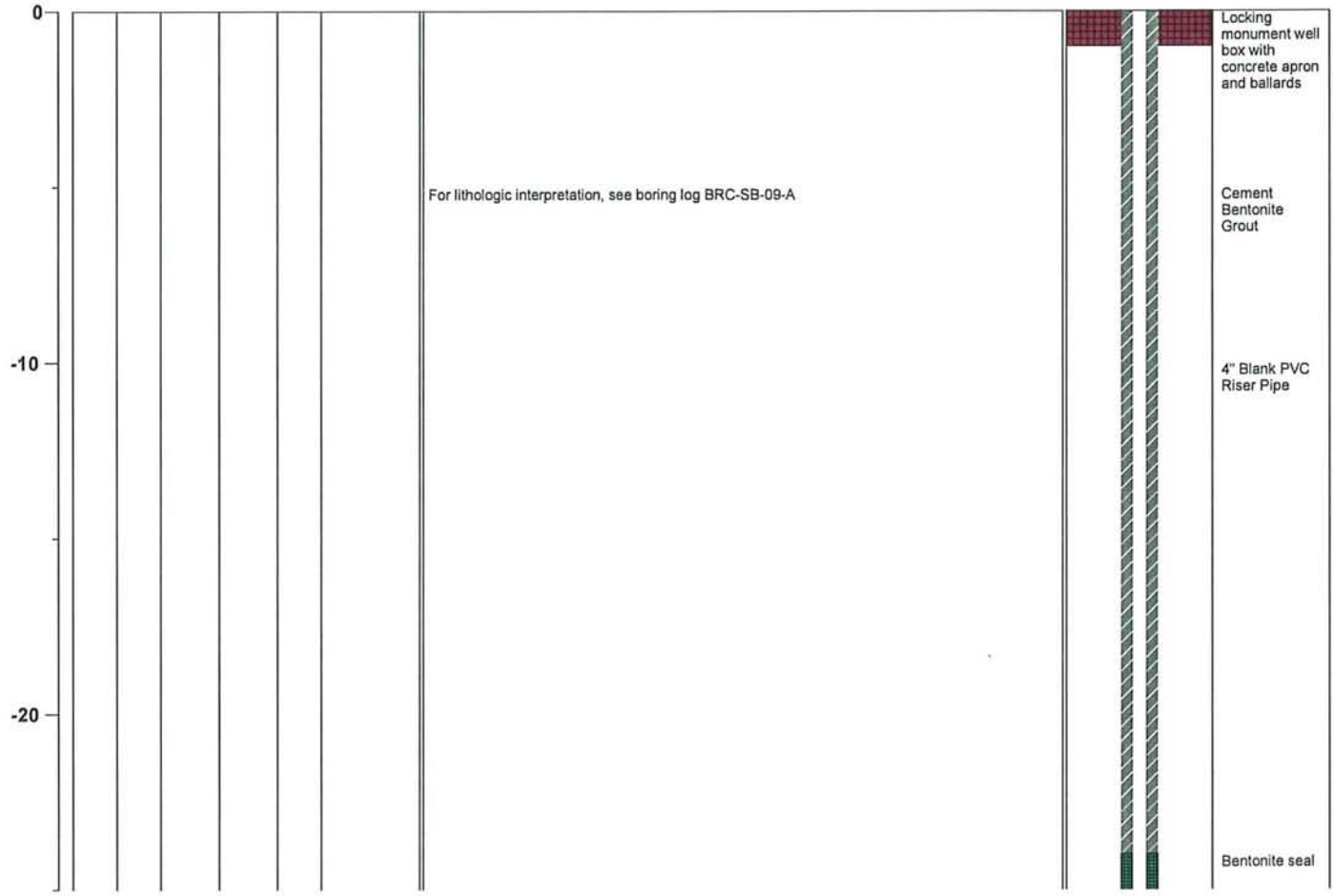
Sample Type: N/A
Sample Interval Cont.

Logged By: Jennifer Wiley
Date Started: 06/09/04
Date Completed: 06/09/04

Monitoring Well Construction

Type of Surface Seal:	Bentonite-Grout	**Screen Slot Size:**	0.010 in
Blank Casing Type/Size:	4" Sch 80 PVC	**Top of Screen (ft. bgs):**	105 ft bgs
Screen Type/Size:	4" Sch 80 PVC	**Bottom of Screen (ft. bgs):**	125 ft bgs
Transition Sand Type:	N/A	**Type of Sand Pack:**	#2 x 12

Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction



Basic Remediation COMPANY

Log of Boring No. BRC-SB-09-C

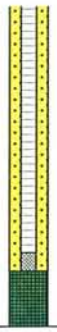
Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
-30							For lithologic interpretation, see boring log BRC-SB-09-A	Bentonite seal
-40								#10 x 20 Sand Pack
-50								4" 0.010 Slot PVC screen

BMI Site - Hydrogeologic Characterization

Basic Remediation COMPANY

Henderson, Nevada

Log of Boring No. BRC-SB-09-C

Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
-60							For lithologic interpretation, see boring log BRC-SB-09-A	 #10 x 20 Sand Pack Threaded PVC Well Base Cap Cement Backfill

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DRILLING LOG
Well No. AA-20-OW

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):*	55	*Permit No.:*	
Client:	BRC	*Hole Diameter (in):*	8		
Drilling Company:	Boart Longyear	*Well Diameter (in):*	2		
Drill Rig Type:	Boart Longyear	*Water Level (Initial, Ft):*	24		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	15-55		
Sampling Method:	Continuous Core	*Ground Surface Elev.:*	1625.69 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 Silty Gravel with Sand					
		SILTY SAND (SM): Reddish Brown Silty Sand with Gravel, Medium to Coarse Sand Fine to Medium Grained Gravels					Bentonite chip seal
10		SILTY GRAVEL (GM): Reddish brown Silty Gravel with Sand					
		SILTY SAND (SM): Reddish brown Silty Sand with Gravel, Fine to Medium Grained sand, Fine to Medium grained Gravels					2" diameter Schedule 40 PVC casing, 0.020" slot well screen
20		SILTY GRAVEL (GM): Reddish Brown Silty Gravel with Sand, Coarse Gravel					
		SILTY SAND (SM): Reddish Brown Silty Sand with Gravel					
		CLAY (CL): Yellowish Green Gypsyferous Clay					
30		CLAYEY SILT (ML): Redish Brown-Brown Clayey Sand/Silt	A-20-OW-30-31.				#10/20 Colorado Silica Sand

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DRILLING LOG
Well No. AA-20-OW

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):*	55	*Permit No.:*	
Client:	BRC	*Hole Diameter (in):*	8		
Drilling Company:	Boart Longyear	*Well Diameter (in):*	2		
Drill Rig Type:	Boart Longyear	*Water Level (Initial, Ft):*	24		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	15-55		
Sampling Method:	Continuous Core	*Ground Surface Elev.:*	1625.69 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
40		SILT (ML): Brown/Reshish Brown, Thin Interbeds/Lenses of Sandy Clay					
50		SANDSTONE (SS): Muddy Creek Formation (TMC), Reddish Brown Silty Sandstone	A-20-OW-50-51.				

Log of Boring No. BRC-SB-20-A

BMI Site - Hydrogeologic Characterization

Henderson, Nevada

Basic Remediation COMPANY

Drilling Method: Rotary Sonic
Drilling Equipment: Rotary Sonic
Drilling Contractor: Prosonic Corporation
Driller: Don Youngblood

Borehole Total Depth: 78.5 ft bgs
Borehole Diameter: 8.5 in
Boring Location: Location 20 (Well ID: AA-20)
Depth to Water (ft. bgs): 16.5 ft bgs ▽

Sample Type: Split-Spoon (2"ID)
Sample Interval Varies

Logged By: Adam Norris
Date Started: 7/10/04
Date Completed: 7/11/04

Monitoring Well Construction

Type of Surface Seal:	Bentonite-Grout	**Screen Slot Size:**	0.010 in
Blank Casing Type/Size:	4" Sch 80 PVC	**Top of Screen (ft. bgs):**	-10 ft bgs
Screen Type/Size:	4" Sch 80 PVC	**Bottom of Screen (ft. bgs):**	-30 ft bgs
Transition Sand Type:	N/A	**Type of Sand Pack:**	#2 x 12

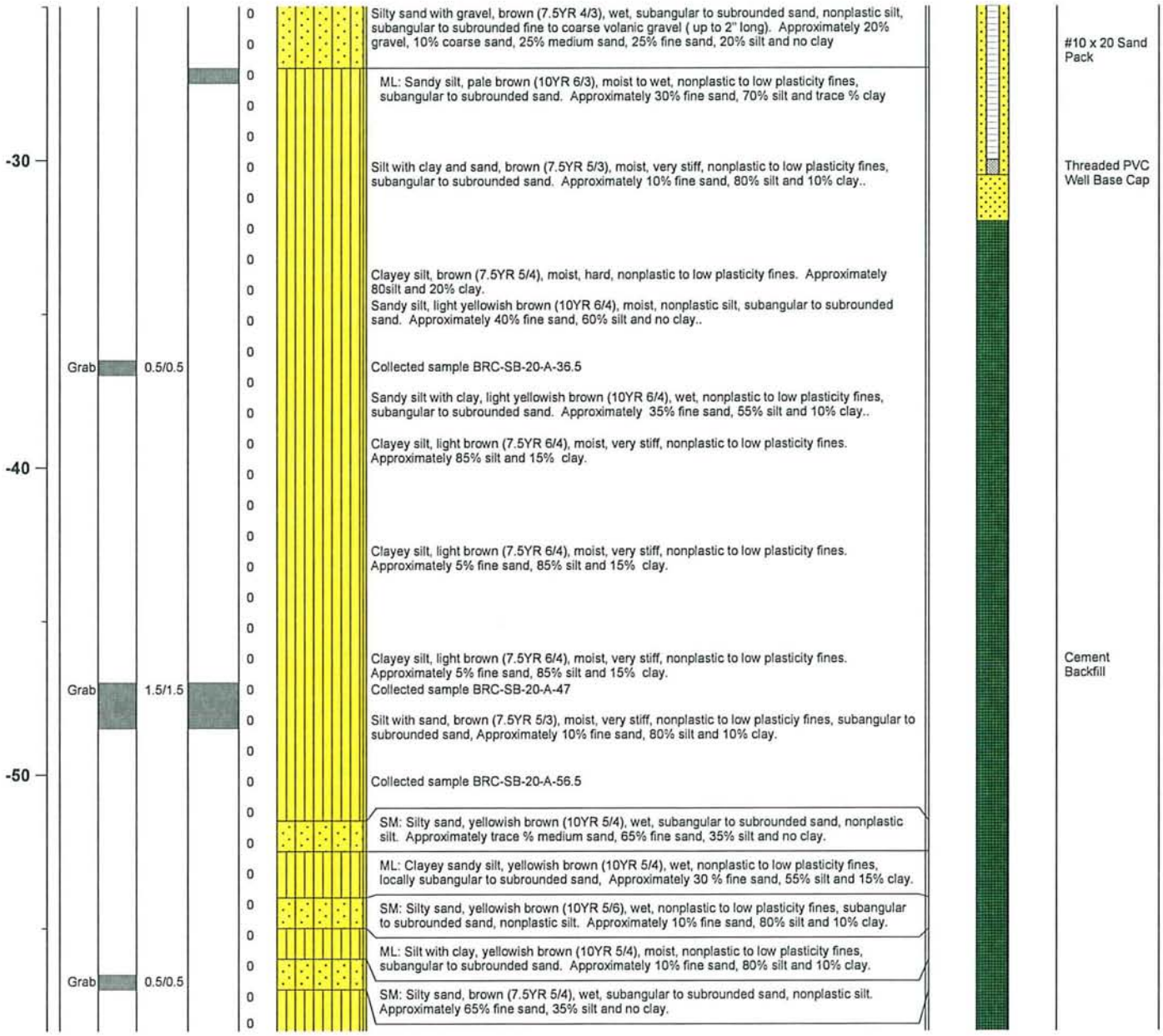
Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
0	Grab		1.5/1.5		0		SM: Silty sand with gravel, pale brown (10YR 6/3), dry, subangular to subrounded sand, nonplastic silt, subangular to subrounded fine to coarse volancic gravel (up to 3" long). Approximately 20% gravel, 10% coarse sand, 15% medium sand, 35% fine sand, 20% silt and no clay.	Locking monument well box with concrete apron and ballards
					0			
					0			
					0		Collected sample BRC-SB-20-A-0	Cement Bentonite Grout
					0		Silty sand with gravel, yellowish brown (10YR 5/4), dry, subangular to subrounded sand, nonplastic silt, subangular to subrounded fine to coarse volanic gravel (up to 3" long). Approximately 25% gravel, 10% coarse sand, 10% medium sand, 35% fine sand, 20% silt and no clay.	
					0			Bentonite seal
					0			
	Grab		1.5/1.5		0		Collected sample BRC-SB-20-A-7	4" Blank PVC Riser Pipe
					0			
					0		Silty sand with gravel, brown (7.5YR 5/4), dry to moist, subangular to subrounded sand, nonplastic silt, subangular to subrounded fine to coarse volanic gravel (up to 3" long), trace local cementation. Approximately 25% gravel, 10% coarse sand, 10% medium sand, 350% fine sand, 20% silt and no clay.	
-10								#10 x 20 Sand Pack
					0			
					0		Silty sand with gravel, brown (7.5YR 5/4), moist, subangular to subrounded sand, nonplastic silt, subangular to subrounded fine to coarse volanic gravel (up to 2" long), trace local weak to moderate cementation. Approximately 25% gravel, 10% coarse sand, 10% medium sand, 35% fine sand, 20% silt and no clay.	
					0			
					0		Silty sand with gravel, brown (7.5YR 5/3), moist, subangular to subrounded sand, nonplastic to very low plasticity silt, subangular to subrounded fine to coarse volanic gravel (up to 2" long), trace local weak cementation. Approximately 20% gravel, 10% coarse sand, 15% medium sand, 35% fine sand, 20% silt and no clay	
					0			
					0		Becomes wet @ approximately 16.5' bgs.	
	Grab		0.5/1.5		0		Collected sample BRC-SB-20-A-17.5	4" 0.010 Slot PVC screen
					0		Silty sand with gravel, brown (7.5YR 5/4), wet, subangular to subrounded sand, nonplastic silt, subangular to subrounded fine to coarse volanic gravel (up to 2" long). Approximately 20% gravel, 10% coarse sand, 20% medium sand, 30% fine sand, 20% silt and no clay	
-20								
					0		Traces local volanic cobbles (up to 5" long).	
					0			
					0		Silty sand with gravel, brown (7.5YR 4/3), subangular to subrounded sand, nonplastic silt, subangular to subrounded fine to coarse volanic gravel (up to 3" long), trace local volcanic cobbles (up to 4" long). Approximately 20% gravel, 10% coarse sand, 20% medium sand, 30% fine sand, 20% silt and no clay	
					0			
					0			

BMI Site - Hydrogeologic Characterization

Basic Remediation COMPANY

Henderson, Nevada

Log of Boring No. BRC-SB-20-A

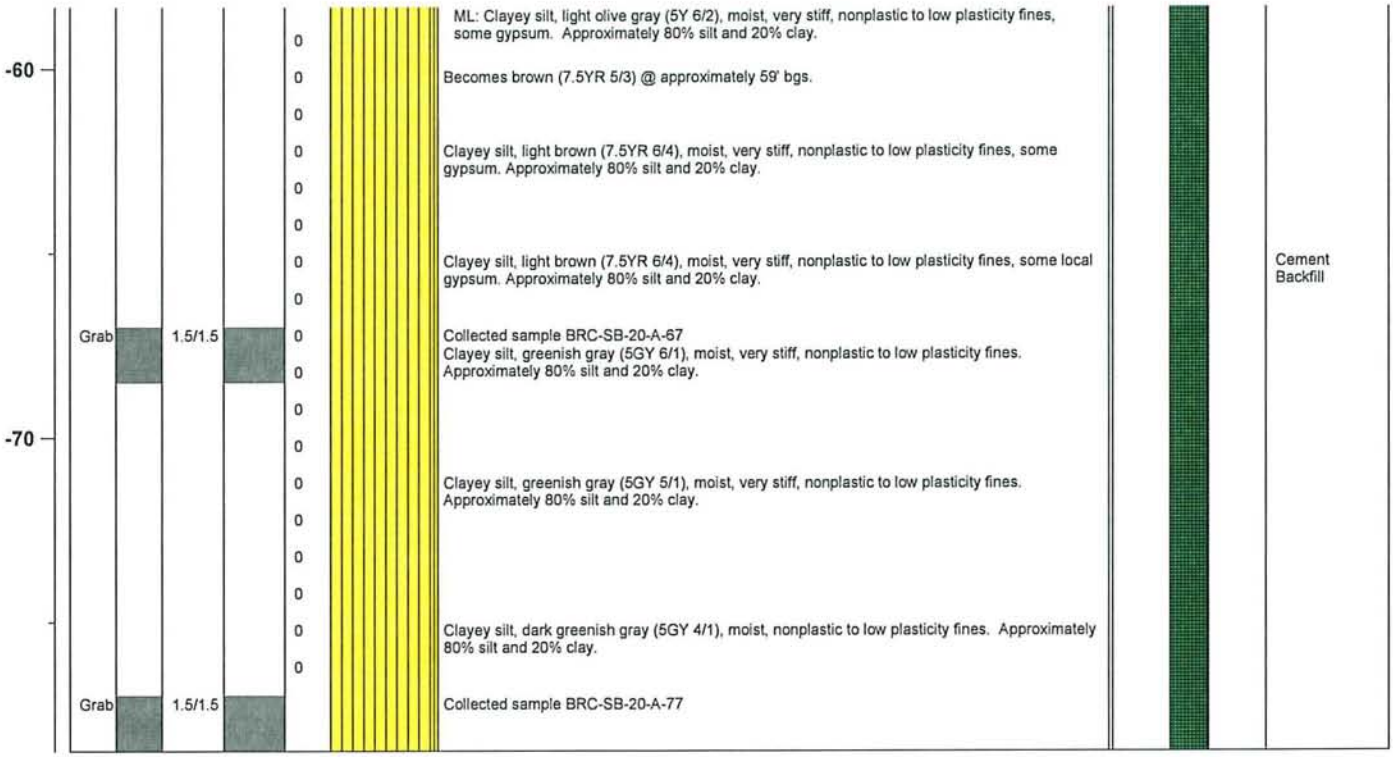


BMI Site - Hydrogeologic Characterization

Basic Remediation COMPANY

Henderson, Nevada

Log of Boring No. BRC-SB-20-A



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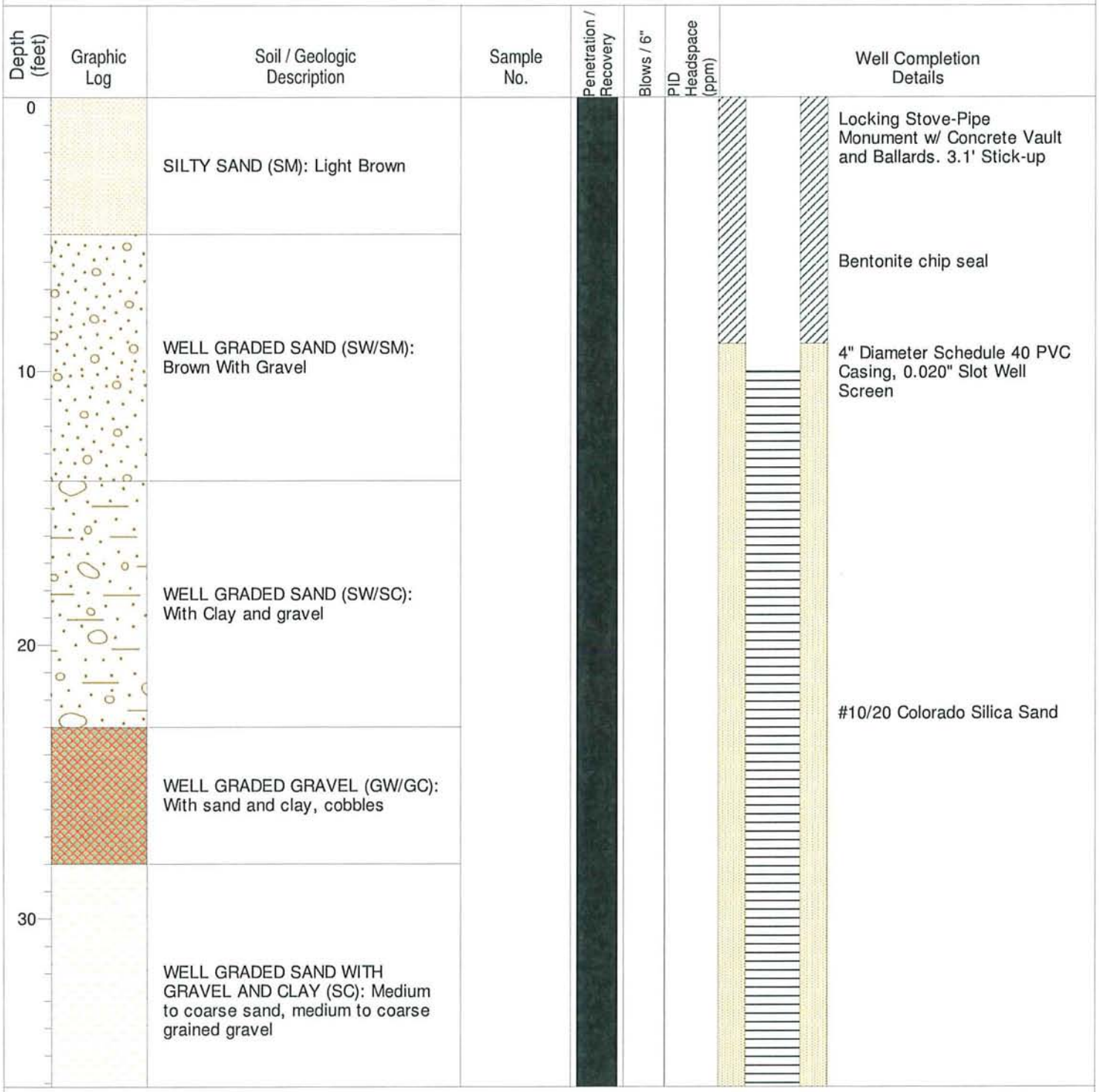
(702) 736-2936 Fax (702) 361-9094

DRILLING LOG
Well No. AA-08-EW

Project Name:	BRC Aquifer Testing	*Start Date:*	6/5/07	*Logged By:*	Davis
Site Location:	Henderson, NV	*End Date:*	6/5/07	*Checked By:*	G. Carter
Project No:	83173	*Total Hole Depth (ft):*	60	*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):*	10-60		
Sampling Method:	Continuous Core	*Ground Surface Elev.:*	1578.39 feet NAVD88		



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DRILLING LOG
Well No. AA-08-EW

Project Name:	BRC Aquifer Testing	*Start Date:*	6/5/07	*Logged By:*	Davis
Site Location:	Henderson, NV	*End Date:*	6/5/07	*Checked By:*	G. Carter
Project No:	83173	*Total Hole Depth (ft):*	60	*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):*	10-60		
Sampling Method:	Continuous Core	*Ground Surface Elev.:*	1578.39 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
40		GRAVELY/CLAYEY SAND (SC): Brown					#10/20 Colorado Silica Sand 4" Diameter, 0.020" Slot
		CLAYEY GRAVEL (GC): Cemented with sand					
50		MUDDY CREEK FORMATION (TMC): Grayish Brown/Brown, Clayey sand with gravel					
60							Stop sampling at 60 feet bgs.

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DRILLING LOG
Well No. AA-08-OWA

Project Name:	BRC Aquifer Testing	*Start Date:*	6/4/07	*Logged By:*	Davis
Site Location:	Henderson, NV	*End Date:*	6/4/07	*Checked By:*	G. Carter
Project No:	83173	*Total Hole Depth (ft):*	60	*Permit No.:*	
Client:	BRC	*Hole Diameter (in):*	8		
Drilling Company:	Boart Longyear	*Well Diameter (in):*	2		
Drill Rig Type:	B.L. - GP24-300RS	*Water Level (Initial, Ft):*	11		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	10-60		
Sampling Method:	Continuous Core	*Ground Surface Elev.:*	1577.90 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): Light Brown, With gravel					Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 3.1' Stick-up Bentonite chip seal
10		WELL GRADED SAND (SM): With Silt and gravel, Medium to coarse grained sand	-08-OWA, 15-16				2" Diameter Schedule 40 PVC Casing, 0.020" Slot Well Screen #10/20 Colorado Silica Sand
20							
30		SANDY CLAY (CL): Brown, with lenses of Sand WELL GRADED SAND WITH SILT (SW/SM): Dark Brown, Fine to coarse grained sand					

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Las Vegas, Nevada 89118
(702) 736-2936 Fax (702) 361-9094

DRILLING LOG
Well No. AA-08-OWA

Project Name:	BRC Aquifer Testing	*Start Date:*	6/4/07	*Logged By:*	Davis
Site Location:	Henderson, NV	*End Date:*	6/4/07	*Checked By:*	G. Carter
Project No:	83173	*Total Hole Depth (ft):*	60	*Permit No.:*	
Client:	BRC	*Hole Diameter (in):*	8		
Drilling Company:	Boart Longyear	*Well Diameter (in):*	2		
Drill Rig Type:	B.L. - GP24-300RS	*Water Level (Initial, Ft):*	11		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	10-60		
Sampling Method:	Continuous Core	*Ground Surface Elev.:*	1577.90 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
		SANDY CLAY (CL): Dark Brown					
40		POORLY GRADED SAND (SP): Brown, with gravel	-08-OWA, 40-41				
		WELL GRADED GRAVEL (GW): With sand					#10/20 Colorado Silica Sand 2" Diameter, 0.020" Slot
		MUDDY CREEK FORMATION (TMC): Grayish Brown, Clayey Sand					
50							
		Reddish Brown Sandy Clay, weakly cemented					
60							Stop sampling at 60 feet bgs.

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DRILLING LOG
Well No. AA-08-OWB

Project Name:	BRC Aquifer Test	*Start Date:*	6/5/07	*Logged By:*	Davis
Site Location:	Henderson, NV	*End Date:*	6/5/07	*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):*	2		
Drill Rig Type:	B.L. - GP24-300RS	*Water Level (Initial, Ft):*	10.5		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	10-50		
Sampling Method:	Continuous Core	*Ground Surface Elev.:*	1577.38 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): Brown, With gravel					Locking Stove-Pipe Monument w/ Concrete Vault and Ballards. 3.1' Stick-up Bentonite chip seal
10		WELL GRADED SAND (SM): With Gravel and Clay					2" Diameter Schedule 40 PVC Casing, 0.020" Slot Well Screen
20		GRAVEL WITH SAND AND CLAY (GW): Weakly to Moderately cememted					#10/20 Colorado Silica Sand
30		GRAVELLY SAND WITH CLAY (SW/SC): Brown	-08-OWB, 35-36				

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DRILLING LOG
Well No. AA-08-OWB

Project Name:	BRC Aquifer Test	*Start Date:*	6/5/07	*Logged By:*	Davis
Site Location:	Henderson, NV	*End Date:*	6/5/07	*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):*	2		
Drill Rig Type:	B.L. - GP24-300RS	*Water Level (Initial, Ft):*	10.5		
Drilling Method:	Roto-Sonic	*Screen Length (ft):*	10-50		
Sampling Method:	Continuous Core	*Ground Surface Elev.:*	1577.38 feet NAVD88		

Depth (feet)	Graphic Log	Soil / Geologic Description	Sample No.	Penetration / Recovery	Blows / 6"	PID Headspace (ppm)	Well Completion Details
40		GRAVEL (GW): Cemented (Refusal)					#10/20 Colorado Silica Sand 2" Diameter, 0.020" Slot
50							Stop sampling at 50 feet bgs.

APPENDIX E

NDEP COMMENTS ON SEPTEMBER 25, 2007 VERSION AND CORRESPONDING RESPONSES

November 1, 2007

Mr. Mark Paris
Basic Remediation Company (BRC)
875 West Warm Springs
Henderson, NV 89011

Re.: Nevada Division of Environmental Protection Response to:
Implementation of the Revised Aquifer Testing Work Plan
dated September 25, 2007
NDEP Facility ID# H-000688

Dear Mr. Paris:

The NDEP has received and reviewed BRC's document identified above and provides comments below and in Attachment A:

Please provide a revised report, including a fully annotated, response to comments letter **by December 15, 2007**. There are substantial compounded errors in this report, however the actual data from the investigation appears to be usable, pending additional quality assurance and potential re-analysis of raw data.

Should you have any questions or concerns, please do not hesitate to contact me at (702) 486-2850x247 or brakvica@ndep.nv.gov.

Sincerely,

Brian A. Rakvica, P.E.
Supervisor, Special Projects Branch
Bureau of Corrective Actions

BAR:s

cc: Jim Najima, NDEP, BCA, Carson City
Barry Conaty, Akin, Gump, Strauss, Hauer & Feld, L.L.P., 1333 New Hampshire Avenue, N.W., Washington, D.C. 20036
Brenda Pohlmann, City of Henderson, PO Box 95050, Henderson, NV 89009
Mitch Kaplan, U.S. Environmental Protection Agency, Region 9, mail code: WST-5, 75 Hawthorne Street, San Francisco, CA 94105-3901
Rob Mrowka, Clark County Comprehensive Planning, PO Box 551741, Las Vegas, NV, 89155-1741
Girard Page, Clark County Fire Department, 575 East Flamingo Road, Las Vegas, Nevada 89119
Ranajit Sahu, BRC, 311 North Story Place, Alhambra, CA 91801
Rick Kellogg, BRC, 875 West Warm Springs, Henderson, NV 89011
Sherry Bursey, Davis, Graham & Stubbs, LLP, 1550 17th Street, Suite 500, Denver, CO 80202
Tara Bahn, U.S. Department of Justice, PO Box 23896, Washington, DC 20026-3986
Craig Wilkinson, TIMET, PO Box 2128, Henderson, Nevada, 89009-7003
Kirk Stowers, Broadbent & Associates, 8 West Pacific Avenue, Henderson, Nevada 89015
George Crouse, Syngenta Crop Protection, Inc., 410 Swing Road, Greensboro, NC 27409
Nicholas Pogoncheff, PES Environmental, Inc., 1682 Novato Blvd., Suite 100, Novato, CA 94947-7021
Susan Crowley, Tronox, PO Box 55, Henderson, Nevada 89009
Keith Bailey, Environmental Answers, 3229 Persimmon Creek Dr, Edmond, Oklahoma 73013
Sally Bilodeau, ENSR, 1220 Avenida Acaso, Camarillo, CA 93012-8727
Lee Erickson, Stauffer Management Company, P.O. Box 18890, Golden, Co 80402
Stan Smith, Olin Chlor Alkali, PO Box 86, Henderson, Nevada 89009
Michael Bellotti, Olin Corporation, PO Box 248, 1186 Lower River Road, Charleston, TN 37310-0248
Curt Richards, Olin Corporation, PO Box 248, 1186 Lower River Road, Charleston, TN 37310-0248
Paul Sundberg, Montrose Chemical Corporation, 3846 Estate Drive, Stockton, California 95209
Joe Kelly, Montrose Chemical Corporation of CA, 600 Ericksen Avenue NE, Suite 380, Bainbridge Island, WA 98110
Jon Erskine, Northgate Environmental Management, Inc., 300 Frank H. Ogawa Plaza, Suite 510, Oakland, CA 94612
Deni Chambers, Northgate Environmental Management, Inc., 300 Frank H. Ogawa Plaza, Suite 510, Oakland, CA 94612
Robert Infelise, Cox Castle Nicholson, 555 California Street, 10th Floor, San Francisco, CA 94104-1513
Michael Ford, Bryan Cave, One Renaissance Square, Two North Central Avenue, Suite 2200, Phoenix, AZ 85004
Brian Giroux, McGinley and Associates, 425 Maestro Drive, Suite 202, Reno, NV 89511
Paul Hackenberry, Hackenberry Associates, LLC, 550 W. Plumb Lane B425, Reno, Nevada 89509

Attachment A

Section 3.2 Assess Short Term Water Level Fluctuations

This brief section appears to indicate that adequate water level data were obtained for pre-test trend observation. There is no mention of aquifer testing data correction using these data throughout the remainder of the report. This issue requires further discussion in the revised report.

Response: Comments noted and corrections to the aquifer test data for AA-20 have been made. An adjustment to water level changes over time was made (see Section 4.2.2).

Section 3.3 Soil Borings and Monitoring Well Installation and Appendix A (boring logs)

This brief section describes the drilling of ten soil borings and completing six as monitoring wells. Specific comments on boring/construction logs follow below. Noted deviations from work plan appear to be insignificant (i.e., Rotosonic drilling was used where hollow stem auger was proposed, AQTESOLV software was specified for use where Aquifer Test Pro was used, Agarwal method for recovery solution was not proposed in work plan). Other deviations (e.g., elimination of two aquifer tests based on slug testing results) are accounted for as results of professional judgment.

It is noted that location AA-06 is screened across the Quaternary Alluvium (Qal)/ Muddy Creek formation (MCf) contact, however, the water bearing zone is currently only in the MCf. Future monitoring results should be evaluated for this fact if the water level rises substantively.

Locations AA-08EW, AA-08OWA, AA-08OWB, AA-09OW are also screened across the Qal/MCf contact and the water bearing zone extends to the top of screen. Hence in this case both formations are being evaluated; monitoring results should be "flagged" for this fact.

Location AA-20OW, it appears that the MCf includes silty sandstone (SS), logged at 48 - 55 feet. The MCf is also noted as SS in other borings at depth. Please explain.

Response: AA-06 is a boring and not a new monitoring well. The log shown in Appendix A and Table 1 of the report incorrectly lists AA-06 as a new monitoring well. This is corrected in the revised report in the AA-06 boring log (Appendix A), Table 1, and Plate 1.

New monitoring wells AA-08EW and AA-08OWA both have screens that cross the Qal/MCf contact. The screen in monitoring well AA-08OWB is entirely within the Qal. The two wells screened across the Qal/MCf are noted and are “flagged” as an alert on their respective logs (see Appendix A) for future monitoring purposes.

Monitoring well AA-09OW is screened across the Qal/MCf contact and was also “flagged” as an alert on its logs(see Appendix A) for future monitoring purposes.

The Upper Muddy Creek Formation is primarily silts and clay but occasionally includes discontinuous sandy lenses. The sand lenses can be several feet thick but are discontinuous and difficult to correlate between borings.

Upper Muddy Creek Formation: The fine-grained lacustrine facies of the Upper Muddy Creek Formation are dominated by silts and clays, but also include discontinuous sand layers and lenses. (Kleinfelder, 2005).

Reference: Kleinfelder, 2005. Hydrogeologic Investigation – 2005, Phase V Drilling, American Pacific Corporation, Henderson, Nevada. July 27.

Section 3.6 Laboratory Testing

This section inadequately describes the laboratory testing of soil properties: only a brief listing of the sum of performed analyses is given, and there is no mention of these activities or reported results throughout the remainder of the report. The NDEP is left to parse through the voluminous Appendix B laboratory results, and to assemble these results into a spatial relationship. Further development of these data is requested (i.e., cross sections, maps, correlations with bore logs, etc.).

Incorporation of this data to the CSM should be either presented, or the report should refer to the document or process where incorporation will be made, or this report should be an Attachment to the document which does incorporate results into CSM. Since the CSM will likely be generated after the groundwater model it is suggested that these items be submitted with the revised report.

Response: The soil property results will be used to develop the conceptual site model in a separate document. The soil properties will also be used to assign values to the computerized groundwater model based on the conceptual site model. This is noted in the revised report text in Section 3.6.

Section 4.1 Slug Testing and Appendix C

The description of activities and results is brief. All basic descriptions are provided, however details are lacking within this section. Field logs and raw data should be provided. The results and the interpretation of analysis also lack detail. Additional detail should be provided in the revised report.

Response: Comment noted and more detail is included in the revised report in Section 4.1. The CD copy of the report also contains the raw slug test data in spreadsheet format.

Two slug-in tests and two slug-out tests are generally performed at each location. Slug out tests usually result in calculation of higher K - this is not the case with many of the test pairs, which may indicate that slug-out tests generally produced good data. This is probably due to relatively low formation K, and the high contrast between formation and gravel pack. This matter should be discussed in the revised report.

Response: Comment noted and more detail is included in the revised report in Section 4.1.

Slug-in and slug-out K's, for both initial and secondary tests, appear to group well - K's vary by less than a factor of 2. Given that K generally varies by orders of magnitude in nature, the tight grouping of K's for each location appears good. This matter should be discussed in the revised report.

Response: Comment noted and more detail is included in the revised report in Section 4.1.

Total initial displacement is not reported for these tests, the NDEP finds that information helpful for quality assurance. Slug tests should generally displace 10 to 50 cm (Kruseman and de Ritter, 1970) in typical monitoring wells, in order to affect formation water levels substantively. Please provide this information and discuss this matter in the revised submittal.

Response: Comment noted and the displacement by the slug has been added to Table 3. The initial displacement of groundwater in the wells fell within the 10 to 50 cm range in all cases using either the 10-foot or the 5-foot slug.

Initial and secondary responses, and ending data noise, are evident in most test responses. The tests all correctly focus on the secondary response, versus the primary gravel pack response. This matter should be discussed in the revised report.

Response: Comment noted and discussion of the selected response are included in the revised report in Section 4.1.

Section 4.2 Pumping Tests and Appendix D

Again, description of activities and results is brief. Field logs and raw data are not presented and should be in the revised report. Based on the volume of error and questionability described below, NDEP highly recommends that raw data be included in electronic copy. Also necessary for future user re-analysis will be well logs for previously existing wells that were used for these tests.
Specific comments for tests are provided below. In general the tests appear to have been performed using good SOP. The major points of good testing appear to have been covered: pre-test water level data were collected, constant pumping rates were determined using step testing, constant pumping rates were generally employed successfully, pumped water was containerized, sufficient water level data density appears to have been achieved, recovery testing was conducted at each location, monitoring wells were generally close enough for response measurement.

Response: Comment noted and all monitoring well logs used in the tests have been included in the revised report Appendix D. The data loggers were set with either a one second interval or a one minute interval depending on the proximity to the pumping well. The timing of the water level records produced rather large electronic data files. The raw data is included along with the electronic version of the report on a CD since the data collected from any single well would be several hundred pages of data.

One of the six planned tests (AA-26) was not conducted due to lack of site access agreement. This location lies at the furthest north-east portion of the site, near the Las Vegas Wash. Two other tests were not performed; however, the rationale (low expected K from results of slug testing) is acceptable.
Tests were not run for long enough period to calculated specific yield. This parameter may be important for future modeling, and will have to be assumed within reasonable ranges, and may need to be used as a sensitivity parameter.

Response: Comment noted. The comment "Tests were not run for long enough period to calculated specific yield." not understood unless this comment refers to no storativity values available with slug testing.

K was calculated for each location using data from multiple tests (including step, constant rate, and recovery tests). The values are all tabulated for each location (good) and the average is also calculated. A better group statistic is the geometric mean (versus arithmetic mean), since K varies over orders of magnitude in nature. NDEP's calculations (below) show that the geometric mean of the K values differ from the simple mean by as much as 20%. This is more appropriate for the end-user, and is less important for this document. Hence, a report of any data statistic may be beyond the scope of this document.

Response: Comment noted and geometric mean values have been listed in the Tables 5, 7, and 9.

Tabulated Ks	AA-09	AA-20	AA-08
K (ft/d)	18.8	78.1	256
	35	26	1000
	61.9	79	1020
	21.5	85.2	900
	34	14	566
			571
mean	34.24	56.46	718.8333
Geometric mean	31.24	45.33	668.01
Percent difference	8.7%	19.7%	7.1%

Pre-test data appear to indicate generally less than 0.1 foot/day changes. No correction to test data appears to be necessary (and none reported either).

Response: Comment noted.

Section 4.2.1 Pumping Test at AA-09

Table 5 reports K=34 ft/d for AA-09OW recovery test, however Appendix D reports 46.5. Please clarify which is the correct value. Using Appendix D value instead of tabulated value, final geometric mean K equals 33.3 ft/d, which is very close to tabulated value. However, the corrected figures should be consistently reported (this sort of error is repeated for AA-20 test group detailed below).

Appendix Ks	AA-09	AA-20	AA-08
K (ft/d)	18.8	78.1	256
	35	26	1400
	61.9	79	1430

	21.5	85.2	1260
	46.5	140	566
			571
Geometric mean	33.26	71.84	817.67
from Tablulated Ks above	31.24	45.33	668.01
Percent difference	6.1%	36.9%	18.3%

Response: Comment noted and the value for AA-09 was checked in the revised report and the numbers reported are consistent between the text and Appendix D.

These calculated K values are consistent with common charted values (Freeze and Cherry '79) for silty sand to middle clean sand. The AA-09OW lithologic log compares with that classification for only the upper 4 feet of aquifer, and is relatively inconsistent for the lower 35 feet (clay, sandy clay and sandstone). The log for well AA-09 was not provided, however, based on the AA-09OW log, 34 ft/d is very fast for a clay. Please explain if the AA-09 log differs greatly from AA-09OW. If not please justify this inconsistency.

Response: An expanded discussion about the K values in the AA-09 Pump test was included in the revised report in Section 4.2.1.

Tests for AA-09: aquifer thickness parameter is listed as 20 feet for the step test and recovery solutions, but is listed as 10 feet for the constant rate test (Appendix D). Please clarify which is correct. This sort of error is repeated for AA-20 test group detailed below.

Response: Comment noted and corrections have been made in the revised report in Appendix D and reflected in Table 5 showing the correct thickness of the aquifer (33.7 feet) .

Log AA-09-OW shows 38 feet of saturated thickness. If AA-09 has similar screen and lithology, then the 10 or 20 foot aquifer thickness parameter (which ever is the correct value, see above) for this test analysis should be reviewed. Since the Theis Equation solves for transmissivity (T=KD), an incorrect K by factors of 2 or more can be calculated easily using the wrong aquifer thickness D.

Response: Comment noted. The saturated thickness values have been checked on all of the aquifer tests and corrected in Appendix D and reflected appropriately in Table 5 (33.7 feet).

Section 4.2.2 Pumping Test at AA-20

All of the errors described above are observed here for this group of tables, logs and test solutions. NDEP requests that BRC re-address all aquifer testing (and slug testing) materials for correctness and consistency.

Response: Comment noted and corrections have been made in the revised report text and tables in Section 4.2.2.

Table 7 reports K=14 ft/d for AA-20OW recovery test, however Appendix D reports 140. This translates to a 37% difference between tabulated versus appendix group geometric mean.
Tests for AA-20: Aquifer thickness parameter is listed as 10 feet for the step test and recovery solutions, but is listed as 20 feet for the constant rate test (Appendix D). Only one value should be correct, please clarify.

Response: Comment noted and corrections have been made in the revised report in Appendix D and reflected in Table 7 showing the correct thickness of the aquifer (22.9 feet).

Log AA-20-OW shows 31 feet of saturated thickness, in clays and silts. The log for well AA-20 was not provided; however, if AA-20 has similar screen and lithology, then the 10 foot or 20 foot aquifer thickness parameter for these test analyses should be reviewed. The Theis Equation comment provided above applies here as well.

Response: Comment noted. The saturated thickness values have been checked on all of the aquifer tests and corrected in Appendix D and reflected appropriately in Table 7 (22.9 feet).

Section 4.2.3 Pumping Test at AA-08

Table 9 lists three K values (for constant rate test) that do not match Appendix D values (see Table above). This translates to an 18% difference between tabulated versus appendix group geometric mean.

Response: Comment noted and corrections have been made in the revised report in Appendix D and reflected in Table 9 showing the correct thickness of the aquifer (44.34 feet).

Tests for AA-08: Aquifer thickness parameter is listed as 35 feet for the step test and constant rate solutions, but is listed as 25 feet for the recovery test (Appendix D). Only one value should be correct, please clarify.

Response: Comment noted. The saturated thickness values have been checked on all of the aquifer tests and corrected in Appendix D and reflected appropriately in Table 9 (44.34 feet).

APPENDIX F

FIELD LOGS FOR AQUIFER TESTS

KLEINFELDER

Environmental Field Daily Report

Project Name : BRC Aquifer Test	Date : 6/26/07	Report # : 1
Project / Task # : 83173	Site Location : AA-09 Step Test	

Field notes continued :

1350 10
22.04' depth Start @ 1349, ½ sec intervals, 5gpm
22.20

20.83	20.36	20.15 @ 1412	13.04
20.81	20.40	20.15 @ 1413	14.22
20.59	20.30	20.06 @ 1414	15.65
20.67	20.22	20.11 @ 1415	16.72
20.65	20.27	20.09 @ 1420	17.74
20.58	20.20	20.12 @ 1425	18.60
20.58	20.28	20.12 @ 1430	19.01
20.61	20.19	20.03 @ 1435	19.25
20.47	20.21	20.01 @ 1440	19.50
20.59	20.26	19.95 @ 1445	19.55
20.47	20.36	19.94 @ 1450	19.66
20.48	20.30	19.89 @ 1455	19.70
20.47	20.17	19.99 @ 1500	19.81
20.33	20.36	19.83 @ 1506	19.69
20.20	20.28	19.92 @ 1510	19.68 @ 1526
20.36	20.18	19.72 @ 1515	19.85
20.36	20.16	19.82 @ 1516	19.80
20.41	20.16	19.86 @ 15.17	19.72
20.35	20.27	19.80 @ 1518	19.52
20.38	20.17	19.88 @ 1519	19.71
20.33	20.31 @ 1400	19.89 @ 1520	19.76 @ 1527
20.34	20.21	8.21 @ 1521	19.66
20.33	20.18	5.68 15gpm	19.78
20.32	20.13	3.25 10 ½ sec	19.65
20.30	20.19	0.52	19.63
20.29	—	-0.02	19.60
20.35	20.27 @ 1402	-0.04	19.54 @ 1528
20.32	20.15 @ 1403	-0.03	19.54
20.45	20.17 @ 1404	1.49 5gpm	19.63
20.45	20.23 @ 1405	3.16 10 ½ sec	19.57
20.47	20.23 @ 1406	4.96	19.51
20.33	20.17 @ 1407	6.26	19.57
20.37	20.24 @ 1408	7.57	19.68 @ 1529
20.34	20.13 @ 1409	9.08	19.67
20.28	20.09 @ 1410	10.49	19.72
20.30	20.10 @ 1411	11.75	19.66

EDFR Submitted to : _____

Reviewed by : _____ Signature : _____

KLEINFELDER

Environmental Field Daily Report

Project Name : BRC Aquifer Test | Date : 6/20/07 | Report # : 1

Project / Task # : 83173 | Site Location : MW-09 Step Test

Field notes continued :

19.59	17.89	17.24	1.62 @ 1654
19.65	17.90	17.35	0.99 @ 1654.5
19.60 @ 1530	17.73	17.45 @ 1549	0.38 @ 1655
19.72	18.01	17.27	-0.03 @ 1656.5
19.76	17.87	17.24	
19.80	17.45 @ 1543	17.36	6.04 @ 1656.5
19.78	17.58	17.14	21.11 @ 1700
19.84	17.61	17.22	21.33 @ 1706
19.88 @ 1531	17.70	↓ 17.35 @ 1550	21.49 @ 1717
19.81	17.21	1 min 17.16 @ 1551	
19.80	16.81	17.38 @ 1552	
19.91	17.30 @ 1544	17.24 @ 1553	
20.00	...	17.26 @ 1554	
19.98	17.42	17.11 @ 1555	
19.93 @ 1532	17.37	17.07 @ 1556	
19.67 @ 1533	17.32	17.29 @ 1557	
19.57 @ 1534	17.36 @ 1545	17.19 @ 1558	
19.79 @ 1535	17.18	17.30 @ 1559	
19.78 @ 1536	17.42	↓ 17.07 @ 1600	
19.63 @ 1537	...	5 min 16.09 @ 1605	
19.74 @ 1538	17.32	15.37 @ 1610	
19.65 @ 1539	17.31	16.51 @ 1615	
19.72 @ 1539.5 -----	17.32 @ 1546	16.12 @ 1620	
19.59 10 sec	17.24	15.49 @ 1625	
19.63	17.27	11.93 @ 1630	
19.58	17.14	10.97 @ 1635	
19.33 87 1/2 gpm @ 1540	17.41	10.32 @ 1640	
18.93 10 sec	17.47	8.98 @ 1645	
18.77	17.34 @ 1547	↓ 7.51 @ 1646	
18.60	17.29	1 min 6.47 @ 1647	
18.29	17.26	6.16 @ 1648	
18.08 @ 1541	17.11	5.57 @ 1649	
18.08	17.27	5.23 @ 1650	
17.95	17.22	4.44 @ 1651	
17.95	17.16 @ 1548	3.55 @ 1652	
18.00	17.24	3.04 @ 1652.5	
17.81	17.30	2.75 @ 1653	
17.83 @ 1542	17.16	2.18 @ 1653.5	

EDFR Submitted to : _____

Reviewed by : _____ Signature : _____

KLEINFELDER

Environmental
Field Daily Report

Project Name: 83173 BRC Aquifer Test	Date: 6/27/07	Report #: 1
Project / Task #: 83173	Site Location: AA-09 Constant Rate	

Field notes continued :

Well	Depth	Time		
AA-09-OW	36.33'	0927	} by sounder	- Depth to water
MCF-09B	36.1'	0931		
MCF-09A	38.27	0935		
AA-09	22.07	0937	- by datalogger	- Depth of transducer

STATIC 22.07

Submerg. Time	dH ↓	ΔH	Δt	ΔH/Δt
Start constant rate test, 1000 Sgpm, started at 10:00 AM @ 5.0 GPM				
20.13 @ 1005	1.94	1.94	5min	0.388 ft/min (Rotameter)
20.03 @ 1030	2.04	0.1	25	0.004
19.76 @ 1104	2.31	0.27	34	0.008
19.36 @ 1146	2.71	0.4	42	0.009
19.44 @ 1230	2.63	-0.08	44	-0.002
19.23 @ 1306	2.84	0.21	36	0.006
19.10 @ 1340	2.97	0.13	34	0.004
19.63 @ 1430	2.44	-0.53	50	-0.011
19.06 - 1448	3.01	0.57	18	0.03
18.94 - 1500	3.13	0.12	12	0.01

Reading AA-09-OW by sounder
36.63' @ 1525 = 0.60' over 5:25 hrs =

18.744 @ 1530	3.326	0.196	30	0.0065
18.90 @ 1650	3.17	-0.156	80	-0.00195
18.64 @ 1717	3.43	0.26	27	0.0096
18.38 @ 1865		0.26		

EDFR Submitted to : _____

Reviewed by : _____ Signature : _____

BRC: AA09 STEP TEST 6/26/07 Page 1 of

Totalizer 46529156 (small, #1)

Sensus

DATE	TIME	Reading	Δ	ET	Flow Rate
6.26.07	—	3347.4	—	—	—
	13:50	3351.8			
	13:51	3358.0			
	13:52	3363.0			
	13:53	3368.8			
	13:54	3374.4			
	13:55	3380.2			
	13:56	3385.7			
	13:57	3391.4			
	13:58	3397.1			
	13:59	3404.1			
	~~14:00~~ 13:60	3408.3			
	14:01	3413.9			
	14:02	3419.6			
	14:03	3425.3			
	14:04	3430.8			
	14:05	3436.5			
	14:06	3442.0			
	14:07	3447.6			
	14:08	3453.1			
	14:09	3458.9			
	14:10	3464.6			
	14:11	3470.1 ~~+6~~			
	14:12	3475.6			
	14:13	3481.1			
	14:14	3486.7			
	14:15	3492.2			
	14:16	3497.6			
	14:17	3503.0			
	14:18	3508.5			
	14:19	3514.3			
	14:20	3520.2			
	14:22	3531.4			
	14:24	3542.3			
	14:26	3553.2	4.8 gpm		
	14:28	3564.3	5.0		

STEP TEST

Page 2 of

AA0.9

small (#1)

Date	Time	Reading	Δ	ET	Flow Rate	Rotameter Q
6/26/07	14:30	3575.4				
	14:34	3597.1				
	~~14:40~~					
	14:41	3635.7				
	14:43	3646.7				
	14:45	3658.0				
	14:50	3685.2				4.8
	14:55	3712.7				5.0
	15:00	3740.2				
	15:06	3767.7				
	15:10	3795.3				
	15:15	3822.9				
	15:19	3845.3				
	15:20	3850.9				

→ STEP 2 @ 15:20 @ 15 GPM

15:21 — briefly at 15 GPM but rapid DD to 6 gpm.

15:21(:30) Back to 5 GPM

	15:25	3892.6				
	15:30	3920.3				
	15:36	3952.6				
	15:39	9.14				
→	15:40	STEP to 7.5 GPM				
	15:40:(30)	3979.0				
	15:41:00	3982.8				
	15:43	3998.8				
	15:46	4023.1				
	15:49	4046.8				
	15:50	4054.6				
	15:53	4078.2				
	15:55	4093.7				
	15:58	4116.6				
	16:00	4132.2				
	16:02	4148.1				
	16:05	4171.5				
	16:11	4219.7				
	16:15	4249.1				
	16:27	4340.3				

AA09 Constant RATE TEST

AMCO 17298000 (2ND INLINE = Downstream)

Initial Reading : ~~20~~ 21.2

DATE	TIME	RDG	Δ	ET	Q	Initial Rdg.
6.27.07	~~10:00~~	21.2	—	—	—	
	10:01	27.1	5.9	1		
	10:02	32.8	5.7	1		
	10:03	38.6	5.8	1		
	10:04	44.2	5.6	1		
	10:05	50.0	5.8	1		
	10:06	55.8	5.8	1		
	10:07	61.4	5.6	1		
	10:08	67.1	5.7	1		
	10:09	72.7	5.6	1		
	10:10	78.6	5.9	1		
	10:11	84.2	5.6	1		
	10:12	90.0	5.8	1		
	10:13	95.7	5.7	1		
	10:14	101.4	5.7	1		
	10:16	112.7	11.3	2	5.65	
	10:17	118.6	5.9	1		
	10:18	124.3	5.7	1		
	10:19	130.0	5.7	1		
	10:20	135.8	5.8	1		
	10:21	141.4	5.6	1		
	10:22	147.3	5.9	1		
	10:23	153.1	5.8	1		
	10:24	158.8	5.7	1		
	10:25	164.5	5.7	1		
	10:26	170.2	5.7	1		
	10:29	176.0	5.8	1		
	10:28	181.7	5.7	1		
	10:29	187.6	5.9	1		
	10:30	193.2	5.6	1		
	10:31	198.8	5.6			
	10:32	204.2	5.4			
	10:33	209.4	5.2			
	10:34	214.3	4.9			
	10:35	219.7	5.4			
	10:36	225.5	5.8			

AA09 Constant Rate Test

AMCO 17298000 (2ND INLINE, DOWNSTREAM)

DATE	TIME	RDG	Δ	ET	Q
6.27.07	10:39	242.5	17	3	5.67
	10:41	254.0	11.5	2	5.75
	10:43	265.3	11.3	2	5.65
	10:46	282.4	17.1	3	5.7
	10:48	293.9	11.5	2	5.75
	10:50	305.3	11.4	2	5.70
	10:52	316.7	11.4	2	5.70
	10.54	328.2	11.5	2	5.75
	10:56	339.6	11.4	2	5.70
	10:58	351.2	11.6	2	5.80
	~~10:59~~ 11:01	368.5	17.3	3	5.77
	11:03	379.9	11.4	2	5.7
	11:05	391.4	11.5	2	5.75
	11:07	403.2	11.8	2	5.9
	11:09	414.7	11.5	2	5.75
	11:12	432.1	17.4	3	5.8
	11:14	443.7	11.6	2	5.8
	11:17	461.1	17.4	3	5.8
	11:20	478.4	17.3	3	5.77
	11:22	489.8	11.4	2	5.7
	11:24	501.4	11.6	2	5.8
	11:26	512.9	11.5	2	5.75
	11:29	53.02	17.3	2	8.65
	11:31	54.16	11.4	2	5.70
	11:33	55:34	11.8	2	5.90
	11:35	56.51	8.1	2	4.05
	11:37	576.9	11.8	2	5.90
	11:39	587.8	10.9	2	5.45
	11:41	599.1	11.3	2	5.65
	11:44	616.4	17.3	3	5.76
	11:46	628.0	11.6	2	5.8
	11:48	639.4	11.4	2	5.7
	11:52	~~656.5~~ 658.9	23.1	4	5.78
	11:57	691.1	28.6	5	5.72
	12:02	719.5	28.4	5	5.68
	12:07	748.2	28.7	5	5.74
	12:12	777.1	28.9	5	5.78

AA 09 Constant Rate Test

AMCO 17298000 (2ND MAIN LINE - downstream)

DATE	TIME	RDG	Δ	ET	Q
6-27-07	12:17	805.7	28.6	5	5.72
	12:22	834.3	28.6	5	5.72
	12:27	863.5	29.2	5	5.84
	12:32	891.5	28.0	5	5.60
	12:37	920.4	28.9	5	5.78
	12:42	949.0	28.6	5	5.72
	12:47	978.0	29.0	5	5.80
	12:52	1007.1	29.1	5	5.82
	12:57	1035.8	28.7	5	5.74
	13:02	1062.0	26.2	5	5.24
	13:07	1090.3	28.3	5	5.66
	13:12	1118.7	28.4	5	5.68
	13:17	1147.2	28.5	5	5.70
	13:22	1174.8	27.6	5	5.52
	13:28	1209.4	34.6	6	5.77
	13:34	1243.4	34.5	6	5.75
	13:39	1272.1	29.1	5	5.82
	13:44	1299.6	27.5	5	5.5
	13:52	1343.0	43.4	8	5.43
	13:57	1371.0	28.0	5	5.60
	14:02	1398.5	27.5	5	5.50
	14:12	1454.5	56	10	5.60
	14:21	1504.3	49.8	9	5.53
	14:35	1581.5	77.1	14	5.51
	14:42	1625.5	44.0	7	6.29
	14:57	1704.5	79.0	15	5.27
	15:13	1794.7	90.2	15	6.01
	15:28	1877.2	82.5	15	5.5
	15:42	1956.4	79.2	14	5.66
	15:43	1962.1	5.7	1	5.7
	15:58	2047.8	85.7	15	5.71
	16:12	2133.9	86.1	15	6.74
	16:28	2219.4	85.5	15	5.7
	16:43	2305.1	85.7	15	5.71
	16:58	2389.9	84.8	15	5.65
	17:13	2474.8	84.9	15	5.66
	17:30	2572.7	97.9	17	5.76

Constant Rate Test

Amco 17298000 (2nd in-line, downstream)

DATE	TIME	RDG	Δ	ET	Q
6.27.07	17:45	2659.0	86.3	15	5.75
	18:01	2751.0	92	16	5.75
	18:16	2838.3	87.3	15	5.82
	18:31	2923.8	85.5	15	5.70
	18:46	3010.7	86.9	15	5.79
	19:01	3097.2	86.5	15	5.77
	19:16	3184.6	87.4	15	5.83
	19:32	3276.5			
	19:40	3323.7			
	19:50	3387.0			
20:15	~~20:17~~	3525.6			
	2028	3601.6			
	2040	3671.5			
	2102	3799.5			
	2118	3893.4			
2141	~~2139~~	4026.8			
	2207	4175.3			
	22:27:30	4292.3			
23:00	~~444~~	44813			
		FINAL			

CONSTANT RATE TEST

SENSUS 46529156 (Int in line, upstream ~~out upstream~~)

DATE	TIME	RDG	Δ	ET	Q
6/27/07	19:33	7824.0			
"	19:52	7933.2			
	20:16	8071.8			
	20:27	8136.5			
	20 39	8206.4			
	21 01	8334.0			
	21 17	8427.9			
	21 38	8550.4			
	2206	8709.7			
	22:29	8841.3			
	23:00	9021.4			
		FINAL			

Constant Rate Test AA-09 p. 1

SENSUS 465 29156 (1st inline = upstream)
INITIAL : 4566.7

DATE	TIME	RDG	Δ	ET	Q	
6·27·07	10:00	4566.7				INITIAL
	10:14:30	4649.9	85.2	14:30	5.74	
	10:29:30	4735.8	85.9	15	5.7	
	10:44:00	4816.5	86.7	14:30	5.57	
	10:59	4902.3	85.8	15	5.72	
	11:15	4994.7	92.4	16	5.78	
	11:25	5052.2	57.5	10	5.75	
	11:42	5149.8	97.6	17	5.74	
	12:00	5252.7	102.9	18	5.72	
	12:20	5377.4	124.7	20	6.23	
	12:40	5481.8	104.4	20	5.22	
	13:00	5595.0	113.2	20	5.66	
	13:20	5708.0	113.0	20	5.65	
	13:40:30	5824.5	116.5	20:30	5.68	
	14:00	5931.2	106.7	19:30	5.47	
	14:203	6058.7	127.5	23	5.54	
~~14:43~~		~~5.5~~		~~20~~		
	14:45	6179.4	120.7	22	5.49	
	15:00	6264.8	85.4	15	~~5.65~~ 5.69	
	15:15	6348.3	83.5	15	5.57	
	15:30	6431.0	82.7	15	~~5.~~ 5.51	
	1545	6515.8	84.8	15	5.65	
	1600	6600.0	85.2	15	5.68	
	1615	6686.9	85.9	15	5.73	
	1630	6772.3	85.4	15	5.69	
	1645	6867.8	95.5	15	6.37 ?	
	1700	6942.3	74.5	15	4.97 ?	~~Totalizer failure~~ ?
	1715	7037.8	95.5	15	6.37 ?	
	1732	7125.3 ~~8.5~~	87.5	~~16~~ 17	5.15	
	1746	7205.9	80.6	14	5.76	
	18:02	7297.8	91.9	16	5.74	
	18:16	7384.8	87	14	6.21 ?	
	18:33	7476.0	91.2	17	5.36	
	18:48	7563.0	87	15	5.80	
	19:02	7643.7	80.7	14	5.76	
	19:16	7731.1	87.4	14	6.24	
	19:32	7824.0				

AA-20 Constant Rate Test

KLEINFELDER AQUIFER TEST DATA

Project Name: BRC Number: 83 Location: Pabco Rd. nr. COH WRF

Pumped Well: AA20 Observation Wells: AA20 OW Sheet 1 of 3

Source of Data: _____ Distance from Pumped Well (ft): _____ Measuring Point Height above Ground: _____

Test Started: Date: 7/10/07 Time: 10:33 Pre-test Static Water Level (ft): _____

Test Ended: Date: _____ Time: _____ Final Water Level (ft): _____

Initial Totalizer Reading (gal): 4482.5 Pump Capacity (type/hp): 0.75 HP

Final Totalizer Reading (gal): _____ Range of Pumping Rates (gpm): _____

Average Pumping Rate (gpm): _____

Test Conducted by ~~Subsurface~~

Time (Hr:min:sec)	Elapsed Time (minutes)	~~Depth to~~ Water (feet)	~~Drawdown,~~ Recovery (ft)	17298000 Totalizer #1 (gallons)	Pumping Rate (gpm)	Notes Totalizer #2 46529156
10:28:		3.52		4482.5	(Rotameter)	Pretest 9022.0
10:33:	0					start @ 1053
10:35:	2			4490.3	3.0	
10:38:	5	1.80		4498.5	3.0	
10:39:	6	1.85			3.0	
10:41:	8			4514.2		
10:43:00	10			4522.0		9062.3
10:49:00	16			4544.9	3.0	
10:53:	20			4560.6	3.0	(10:54 = 9104.9)
11:04:	31			4603.1	3.0	
11:05:	32	1.87				(11:05 = 9196.2)
11:09:		1.92				
11:12:	39	1.92		4633.4	3.0	small vlv. adj.
11:20:	47	1.87		4663.9	3.0	
11:26:	53			4686.8	3.0	small valve adj @ 1128
11:31:	58	1.78		4706.1	3.0	
11:36:	683	1.78		4725.6	3.0	
11:44:	761	1.81		4756.8	3.0	(11:45 = 9309.7)
11:50:	827	1.80		4780.1	3.0	
11:55:	882	1.81		4799.4	3.0	
12:00:	937	1.80		4818.7	3.0	
: :	Stopped up to Shut down to fix		4gpm - blew PVC piping			
: :						
12:10:10	947	1.52			4.0	
12:11:	958	1.46				
12:12:	969	1.20		48509	4.0	
12:15:	992	1.26		4865.5		Small valve adj
12:20:	1027	1.29		4889.7	4.0	
12:30:	102	1:24		4930.5	4.0	small valve adj
12:50:	122	1:13		5032.8	4.0	
13:10:	142	1.21		5128.0	4.0	

(Rev. 1-17-05; B.PECK; KA, RENO, NV)

KLEINFELDER AQUIFER TEST DATA

Project Name: BRC Number: 83173 Location: Meco Rd

Pumped Well: AA 20 Observation Wells: Sheet 2 of 3

Source of Data: Distance from Pumped Well (ft): Measuring Point Height above Ground:

Test Started: Date: 7/10/07 Time: 10:33 Pre-test Static Water Level (ft):

Test Ended: Date: Time: Final Water Level (ft):

Initial Totalizer Reading (gal): Pump Capacity (type/hp):

Final Totalizer Reading (gal): Range of Pumping Rates (gpm):

Average Pumping Rate (gpm):

Test Conducted by Subsurface

Time (Hr:min:sec)	Elapsed Time (minutes)	Depth to Water (feet)	Drawdown, Recovery (ft)	Totalizer (gallons)	Pumping Rate (gpm)	Notes
13:20:	157	1.26		5175.7	4.0	
13:30:	167			5223.7	4.0	
13:41:	178	1.11		5275.6	4.0	
13:51:	188			5324.9	4.0	(1352 - 98776)
: :	Stop @	1400				
: :						
14:01:30		3.32 →				
14:02:		3.34 →				
15:40:		3.50 →				
: :						
16:09:		3.50				
16:10:	0					Start Constant Rate
16:10:30		1.80			4.0	
16:11:	1	1.52			4.0	
16:11:30		1.31			4.0	
16:12:	2	1.21		5378.5	4.0	
16:13:	3	1.09			4.0	small valve adj
16:16:	6	1.27			4.0	
16:20:	10	1.27		5418.0	4.0	
16:27:	17	1.27		5451.9	4.0	
16:36:	26	1.23		5494.5	4.0	sm valve adj.
16:45:	35	1.22		5538.1	4.0	
16:51:	41	1.26		5566.8	4.0	
17:00:	50	1.28		5609.3	4.0	(1701 - 10151.8)
17:11:	66	1.20		5660.8	4.0	sm valve adj
17:30:	80	1.21		5752.0	4.0	
18:10:	120	1.16		5949.8	4.0	
18:50:	160	1.09		6091.5	4.0	
19:10:	180	1.13		6237.0	4.0	
19:45:	215	1.07		6403.2	4.0	
20:00:	220	1.10		6525.2	4.0	

KLEINFELDER AQUIFER TEST DATA

Project Name: BRC Number: 83173 Location:

Pumped Well: AA20 Observation Wells: Sheet 3 of 3

Source of Data: Distance from Pumped Well (ft): Measuring Point Height above Ground:

Test Started: Date: 7/10/07 Time: Pre-test Static Water Level (ft):

Test Ended: Date: Time: Final Water Level (ft):

Initial Totalizer Reading (gal): Pump Capacity (type/hp):

Final Totalizer Reading (gal): Range of Pumping Rates (gpm):

Average Pumping Rate (gpm):

Test Conducted by

Time (Hr:min:sec)	Elapsed Time (minutes)	Depth to Water (feet)	Drawdown, Recovery (ft)	Totalizer (gallons)	Pumping Rate (gpm)	Notes
20:30:	250	1.12		6623.0	4.0	
21:10:	290	1.16		6812.0	4.0	
21:40:	320	1.16		6953.8	4.0	
22:10:	350	1.16		7095.0	4.0	
22:40:	420	1.02		7238.0	4.0	
23:10:	450	1.03		7382.0	4.0	
23:42:	532	1.08		7537.0	4.0	
24:10:	540	1.06		7670.0	4.0	
24:20:		1.10		7721.1	4.0	Pump off
24:21:			3.26			
24:22:			3.27			
24:29:			3.31			
7:14:			3.			
: :						
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(Rev. 1-17-05; B.PECK; KA, RENO, NV)

KLEINFELDER AQUIFER TEST DATA

Project Name: BRC Aquifer Test Number: 83713 Location: BMI NE

Pumped Well: AA-08-EW Observation Wells: Sheet 1 of 2

Source of Data: Transducer Distance from Pumped Well (ft): Measuring Point Height above Ground:

Test Started: Date: 7/18/07 Time: 17:20 Pre-test Static Water Level (ft):

Test Ended: Date: 7/19/07 Time: Final Water Level (ft):

Initial Totalizer Reading (gal): Pump Capacity (type/hp): 42 gpm, 5HP

Final Totalizer Reading (gal): Range of Pumping Rates (gpm):

Average Pumping Rate (gpm): 29

Test Conducted by Transducer ~~Depter~~

Time (Hr:min:sec)	Elapsed Time (minutes)	~~Depth to~~ Water (feet)	~~Drawdown;~~ Recovery (ft)	Totalizer (gallons)	Pumping Rate (gpm)	(Rotometer) Notes
12:58		32.11				
13:10	0			8288.6		<12820.5>
13:12	2	32.24			20.0	
13:13	3	32.23				
13:14	4	32.23				
13:15	5	32.27				
						STOP
		32.42				Static
17:20	0					Constant Rate Test - START
17:23	3	32.20			29	
17:52		32.21			28	
18:30		32.19			28	
18:56		32.19			29	
19:30		32.19			29	
20:00		32.19			29	
20:30		32.19			29	
21:00		32.18			29	
21:30		32.18			29	
22:00		32.19			29	
22:30		32.18			29	
23:00		32.19			29	
23:30		32.18			29	
7/19 00:00		32.19			29	
00:30		32.20			29	
01:00		32.18			29	
01:30		32.18			29	
02:00		32.19			29	
02:30		32.19			29	
03:00		32.19			29	
03:30		32.18			29	
04:00		32.19			29	

KLEINFELDER

SHEET 2 OF 2

PROJECT BRC PROJECT NO. 83173

SUBJECT AA08 Constant Test BY DATE 7/19/07

REVIEWED BY DATE 7/20/07

	Time	Transducer Reading to water	Pump rate
7/19	0430	32.19	29
	0500	32.19	29
	0530	32.20	29
	0600	32.19	29
	0630	32.20	29
	0700	32.20	28
	0730	32.20	28
	0800	32.21	28
	0830	32.20	28
	0900	32.20	28
	0930	32.20	28
	1000	32.20	28
	1030	32.20	28
	1100	32.19	28
	1130	32.19	28
	1200	32.19	28
	1230	32.18	28
	1300	32.17	28
	13:05:40	Fuel truck entity across discharge hose (1st set of tires)	
	13:09	While generator full of fuel	
	13:11:00	Fuel truck exit across discharge hose (1st set of tires)	
	1330	32.17	28
	1400	32.16	28
	1430	32.16	28
	1500	32.15	28
	1530	32.15	28
	1600	32.13	28
	1630	32.12	28
	1700	32.12	27
	1720 - pump stopped.		
	1732	32.34	
	1750	32.36	
	1806	32.34	
7/20	0710	32.51	0
	0800	Downloaded all transducers.	

KLEINFELDER

SHEET ____ OF ____

PROJECT BRC Remediation PROJECT NO. 83173

PROJECT ____ REVIEWED BY ____ DATE 7/18/07 +

SUBJECT AA08 CRT Test BY Karin Hagan DATE 7/19/07

Start of Test

Time 13:02 AA-08 EW 32.11' DL AA-08 OW(A) DRW 7.5' AA08W(B) DRW 37.77' AA08 19.59'

13:07 15.66 15:05 15.19 TOC 13:03 14.61 TOC 15.25' 13:03

CONSTANT RATE TEST

Time	Head AA08OWA
17:25	15.23'
18:30	15.28
19:30	15.28
20:30	15.30
21:30	15.31
22:30	15.31
7/18 23:30	15.31
7/19 00:30	15.30
01:30	15.30
02:30	15.30
03:30	15.30
04:30	15.30
05:30	15.30
06:30	15.29
07:30	15.28
0830	15.28
0930	15.28
1033	15.28
1135	15.28
1232	15.29
1331	15.29
1431	15.29
1533	15.29
1634	15.30
1801	15.23

Time	Head AA-08-OWB
17:26	14.65'
18:31	14.7'
19:31	14.7'
20:31	14.71
21:31	14.71
22:31	14.72
23:31	14.72
00:31	14.70
01:31	14.70
02:31	14.71
03:31	14.71
04:31	14.71
05:31	14.71
06:31	14.70
07:31	14.69
0831	14.69
0931	14.69
1031	14.69
1134	14.68
1234	14.69
1332	14.69
1432	14.70
1535	14.70
1635	14.69
1803	14.64

Time	Head AA-08
17:27	15.30
18:32	15.35
19:32	15.35
20:32	15.36
21:32	15.36
22:32	15.37
23:32	15.37
00:32	15.37
01:32	15.37
02:32	15.37
03:32	15.37
04:32	15.37
05:32	15.36
06:32	15.36
07:32	15.35
0832	15.35
0932	15.35
1032	15.35
1133	15.34
1235	15.35
1334	15.36
1433	15.34
1536	15.35
1637	15.36
1804	15.29

KLEINFELDER AQUIFER TEST DATA

Project Name: B2C Number: Location:

Pumped Well: AA-08-EW Observation Wells: AA-08-OWA, OWB, AA-08 Sheet ____ of ____

Source of Data: Distance from Pumped Well (ft): Measuring Point Height above Ground:

Test Started: Date: 7/10/07 Time: Pre-test Static Water Level (ft): 15.71", 40.38 (DMM CHECK)

Test Ended: Date: Time: Final Water Level (ft):

Initial Totalizer Reading (gal): 77211, 12265 (SWMU) Pump Capacity (type/hp):

Final Totalizer Reading (gal): Range of Pumping Rates (gpm):

Average Pumping Rate (gpm):

Test Conducted by

Time (Hr:min:sec)	Elapsed Time (minutes)	Depth to Water (feet)	Drawdown, Recovery (ft)	Totalizer (gallons)	Pumping Rate (gpm)	Notes
17 : 15 : 00		40.38		77211	5gpl	
17 : 19 : 30		40.45				
17 : 24 : 30		40.41		77431		
17 : 30 : 00		40.41		77771, 12318		
17 : 40 : 30	25.30	40.39		78021, 12397	7	Bypass is up to 7942 @ 7gpl/4hr
18 : 00 : 00		40.41		80198	8	
18 : 20 : 00		40.38		81711	8	
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