REPORT

NEAR WEST TSF GEOTECHNICAL FIELD INVESTIGATION SUMMARY REPORT

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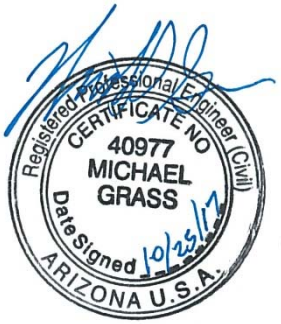

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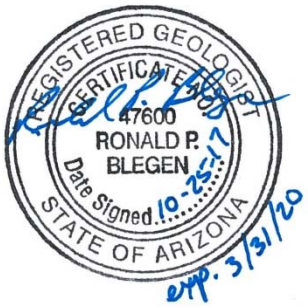

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EXECUTIVE SUMMARY

Golder Associates Inc. (Golder) has prepared this Field Summary Report for Resolution Copper Mining LLC (RCML) to describe the investigation tasks and activities associated with the Near West Tailings Storage Facility (TSF) geotechnical investigation. The objectives of the investigation were to obtain data necessary to support the pre-feasibility design of the proposed Near West TSF, to obtain additional information to support hydrogeological characterization of the site, and to characterize potential borrow materials located near the TSF footprint.

The investigations at the proposed Near West TSF facility were described in the "*Work Plan for Subsurface Investigation*" prepared by RCML design contractor Klohn Crippen Berger (KCB). The work plan presented the initial field work scope for the geotechnical site investigation and the roles for each team member. All work completed during the field program was completed in general accordance with the work plan, with minor modifications to adjust to site conditions encountered in the field.

This report summarizes the following elements of the geotechnical investigation at the Near West TSF site:

- Thirty-eight cored drillholes, with field core logging, sample preparation, and installation of standpipe piezometers.
- Hydrogeological testing performed during the drilling program. This included a total of 161 individual packer tests or falling head tests conducted as each drillhole was advanced. Test data were analyzed to provide an estimate of formation hydraulic conductivity values within each testing zone.
- Excavation of 30 test pits, with logging, sample collection, and a total of 36 infiltration tests conducted at select pits.

The geotechnical field investigation began on September 20, 2016, and was completed on February 17, 2017.

Section 1.0 of the report provides a brief introduction to the general scope of work and Golder's role in the project. Section 2.0 presents the major elements of the geotechnical investigation, including the geotechnical core drilling and testing program (Section 2.1), summaries of subsurface conditions at each drilling location (Section 2.2), and the test pit investigation and infiltration testing program (Section 2.3). Data collected during the investigation is summarized in Tables 1 through 7. Documentation of field operations and data analyses, including logs, photographs, and results of test data analyses, are presented in Appendices A through D.

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1.0 INTRODUCTION

Golder Associates Inc. (Golder) has prepared this Field Summary Report for Resolution Copper Mining LLC (RCML) to describe the investigation tasks and activities associated with the Near West Tailings Storage Facility (TSF) geotechnical investigation. The objectives of the investigation were to obtain data necessary to support the pre-feasibility design of the proposed Near West TSF, obtain additional information to support hydrogeological characterization of the site, and to characterize potential borrow materials located near the TSF footprint.

The scope of the subsurface investigations at the proposed Near West TSF facility was defined in the subsurface investigation work plan ("Work Plan") prepared by Klohn Crippen Berger (KCB) in 2016 (KCB 2016) and modified in 2017 (KCB 2017). All work completed during the field program was in general accordance with the Work Plan, with minor modifications to adapt to site conditions encountered in the field.

Golder staff provided oversight, documentation, or support for the following elements of the subsurface investigation:

- Core drilling and logging
- Open-drillhole hydrogeological (packer) testing in open drillholes and subsequent analyses
- Standpipe piezometer installation
- Test pit excavation, infiltration testing and data analysis

This report presents a description of investigation tasks and procedures and observations in the following report sections. Data collected and analysis results are summarized in Tables 1 through 7. Documentation collected during the field investigation, including logs, data analysis, and site photographs, are presented in Appendices A through D.

Near West TSF geotechnical field investigation activities began on September 20, 2016, and were completed on February 17, 2017.

2.0 GEOTECHNICAL FIELD INVESTIGATION

2.1 Geotechnical Core Drilling

A total of 38 geotechnical drillholes were drilled in the Near West TSF area between September 20, 2016, and February 17, 2017. The locations of these drillholes (designated by “DH” in the location number) are shown on Figure 1. Many of these locations shared a drilling site with boreholes drilled as part of a separate hydrogeological investigation of the TSF site (designated with “DS” in the location number on Figure 1 and in the site descriptions in Section 2.2). All drillholes were advanced using track-mounted diamond core drill rigs provided by Boart Longyear of Glendale, Arizona. The drilling program began with a BK30 model Boart Longyear rig. In November 2016, a second drill rig was added, a BK60 model Boart Longyear rig. The drillers used HQ3 wireline core drilling methods.

Drilling was advanced using core drilling methods from the ground surface. Surface casing was used to maintain stability in the surficial alluvium and highly weathered rock near surface. After advancement into more competent rock (typically at depths of approximately 5 to 60 feet below ground surface [ft-bgs]), the drill crew stopped coring and conducted a falling head test to assess permeability in near-surface materials (see Section 2.1.3 for a description of test methodology). Upon completion of the falling head test, the hole was backfilled with bentonite chips to improve hole stability in the unconsolidated material, and then reamed with a tricone bit to a diameter of approximately 5 inches to accommodate placement of surface casing. HW casing with a cutting shoe was inserted after reaming, and coring activities resumed. Further hydrogeological testing was conducted during advancement of the drillhole to total depth (see Section 2.1.3).

Unless otherwise noted in the drillhole summaries (Section 2.2), water was used as the drilling fluid with no outside additives. However, Golder observed that total containment methods were in place during the investigation with drilling fluids contained within, and recirculated through, 500-gallon plastic water reservoirs. Rock materials with a high clay content, including the Gila Conglomerate, Pinal Schist, fault zones, and basalts, often introduced clayey materials into the recirculated drilling fluids, causing a buildup of drill cuttings and clay-rich material in the reservoirs. If the build-up became excessive, the reservoirs were emptied using a vacuum truck supplied by Jonovich Inc., or transported off site in buckets by Boart Longyear personnel.

As each drillhole was advanced, the crew was asked to conduct or assist with Standard Penetration Test (SPT) sampling, downhole packer testing, downhole geophysics, and standpipe piezometer installation. These tasks are described below.

A summary of the drillhole information is provided in Table 1. Drillhole logs (Record of Drillhole) are presented in Appendix A-1. The logs present pertinent information on each drilling location, including the

drillhole identifier, drilling dates, and detailed descriptions of the earthen materials encountered. The drillholes were originally identified for the permitting process using a temporary identifier then were assigned final identifiers based on the order of drilling. After logging the core, photographs of each filled core box were collected. Core box photos taken during field activities are presented in Appendix A-2.

2.1.1 Geotechnical Core Logging and Sampling

Golder geotechnical personnel were present throughout the field investigation to observe the drilling and related activities. As each drillhole was advanced, Golder personnel recorded geologic and geotechnical data including core recovery, rock quality designation (RQD), rock strength, weathering, and discontinuity information. Data collection was performed in general accordance with International Society of Rock Mechanics (ISRM) standards (1981) and the requirements of the Work Plan. Field logging of geologic and geotechnical data was conducted using weather- and heat-resistant electronic tablets. Data downloaded from the tablets was imported into the project database at the end of each daily shift, and draft field logs were generated for inclusion in the daily field report.

Golder personnel boxed the core in boxes provided by Boart Longyear, and RCML Drilling Services personnel transported the filled core boxes to the RCML core storage facility. Golder personnel also wrapped or bagged core samples at 5 to 10-foot intervals for the preservation of moisture content for geotechnical laboratory testing. These sample depths are noted in the drillhole logs (Appendix A-1). KCB personnel were responsible for sample selection and transportation of samples for laboratory testing.

2.1.2 Standard Penetration Tests

When overlying soil materials were encountered during drilling, Golder personnel also observed and recorded SPTs and visually classified the soil samples in accordance with the Unified Soil Classification System (USCS). SPT samples were collected for field classification using a SPT split-spoon sampler at regular intervals of 5 feet until rocky materials were encountered. This sampler consists of a 2-inch outside diameter, 1.4-inch inside diameter split barrel shaft that is driven 18 inches, or until refusal, into the soil at the bottom of the drillhole. SPTs were conducted in general accordance with the American Society for Testing and Materials (ASTM) Method D1586. The split-spoon sampler was driven 18 inches into the soil with a 140-pound hammer freely falling from a height of 30 inches. The SPTs were conducted using an automatic hammer. The number of blows required for each 3 inches of penetration was recorded. The number of blows required to advance the sampler the last 12 inches is the penetration resistance (the N-value, or blow count), and provides a qualitative measure of the relative density of cohesionless soils or the consistency of cohesive soils. The N-value recorded in the field for each SPT is shown on the drillhole logs included in Appendix A-1. The ASTM visual classification procedure (ASTM Method D2488) was used for the field descriptions of the soil encountered in the SPT samples. Samples collected from the SPT split-spoon samplers were placed and sealed in plastic bags for later archiving.

The tricone and coring drilling methods used to advance the drillhole between SPT samples introduce fluids to the formation and may significantly disturb the material below the bit, particularly when advancing through granular materials, such as alluvium and weathered bedrock surfaces. Therefore the SPT samples and blow counts obtained in this drilling program may not necessarily be representative of in situ conditions. In addition, soil deposits containing gravels, cobbles, or boulders typically result in penetration refusal, as defined in ASTM Method D1586 (ASTM 2011). Any SPT samples which were performed in gravelly and cobbly soils, highly weathered Gila Conglomerate, intermediate geomaterials, or other weathered rock material also may not necessarily provide data representative of the in situ conditions.

2.1.3 Hydrogeological Testing Program

The following sections provide information on the individual activities carried out as part of the hydrogeological testing program. Table 2 summarizes the hydrogeological testing zones, types of test, and qualitative descriptions of hydraulic permeability recorded by field personnel at the time of testing.

2.1.3.1 Testing Approach

Single-well pressure response tests were carried out in the drillholes both to obtain continuous hydraulic conductivity profiles and to characterize the geologic materials encountered on site. Testing was conducted with a pneumatic packer tool in a wireline packer configuration provided by Boart Longyear. Both single- and straddle-packer configurations were used in this testing program.

The single-packer tool consists of two packers connected by a seating cone that keeps one packer inside the core barrel with the second packer extending into the open hole below the core bit. A schematic diagram of the tool assembly is shown on Figure 2. To perform a test, the drill string was pulled up to expose a section of the drillhole selected for testing, and the tool was lowered on a wireline through the drill string into the drillhole. When the packers were seated, they were inflated with nitrogen gas, isolating the section of the drillhole between the lower packer and the bottom of the drillhole at the time of the test. After the test was completed, the packers were deflated and removed from the drillhole.

The straddle-packer tool consists of three packers; the upper two packers are connected by a seating cone that keeps one packer inside the core barrel with the second packer extending into the open hole below the core bit. A third packer is connected below the upper packers by a perforated pipe, isolating the testing zone at the top and the bottom with packers. Testing procedures remained the same as for the single packer configuration.

Monitoring of the pressure response during the tests was performed in real time. Two pressure transducers (In Situ LevelTROLLs) were lowered into the drillhole: one with a direct read cable, sitting above the packer assembly and another “blind” transducer placed a cage set below the lower packer at a set distance from the bottom of the lower packer to collect head data directly from the testing interval. Pressure readings in

the upper transducer were monitored by field staff to assess the progress of the test and determine if additional tests were required. Both pressure transducers were programmed to collect data at one second intervals and data from the lower pressure transducer was used to calculate estimated hydraulic conductivity values (as described below).

Prior to testing, the core recovered from the drillholes was reviewed to identify testing intervals, based on depth, lithologic transitions, and drillhole conditions. High fracture density, poor rock quality, or unstable drillhole wall materials may prevent the packers from achieving a competent seal against the drillhole wall. In these cases, the targeted zone of interest is not fully isolated by the packer (referred to as bypass) and remains connected to the remainder of the drillhole. When bypass occurred during testing, the packers were deflated, moved, and re-inflated to attempt achieving a seal. In the cases where a bypass could not be resolved, the testing interval was adjusted or the packer test was substituted with an open-hole falling head test.

Open-hole falling head tests were performed to obtain estimated hydraulic conductivity values for drillhole zones which could not be effectively tested with a packer system. These zones often included the near-surface, weathered zone encountered in the drillholes, or zones of very poor rock quality. As with the packer tests, the progress of each test was monitored in real time using a LevelTROLL pressure transducer connected to the surface by a direct read cable. This transducer was programmed to collect data at one second intervals. A second transducer was not required for the open-hole falling head tests.

2.1.3.2 Testing Methodology for Packer Testing

The following testing sequences describe the methodology used to perform a single-well pressure response test carried out with the pneumatic packer testing system:

- Pressure Static Recovery Sequence (PSR)
- Slug Injection Sequence (SI)
- Constant Rate Injection (CRI) Sequence
- Constant Rate Injection Recovery Sequence (CRIR)

The exact procedure followed for each hydrogeologic test was adjusted based on the conditions encountered and the results of previous individual test sequences. The following subsections provide detailed descriptions of the individual testing sequences, and decisions made regarding proceeding to each subsequent test sequence.

2.1.3.2.1 Pressure Static Recovery Sequence

Following packer inflation, a pressure static recovery (PSR) sequence was performed to allow the aquifer within the testing interval to reach a static condition after packer inflation. This sequence lasted from

approximately 5 minutes to no longer than 30 minutes. After this time, the slug injection test was performed even if full hydrostatic conditions were not reached.

2.1.3.2.2 Slug Injection Sequence

At the completion of the PSR sequence, the slug injection (SI) sequence was performed. The SI sequence was performed by injecting a near-instantaneous slug of water into the drill rods, and then monitoring the water level until it recovered to pre-SI conditions. The results of the SI sequence were used to determine the remainder of the testing procedure.

If the water level recovered (reaching 75 percent recovery to pre-SI levels) within 30 minutes, the SI was followed by a constant rate injection sequence. If the water level did not sufficiently recover within 30 minutes, the SI was continued for another 30 minutes. After one hour, the test procedure was terminated and the packers were deflated and removed.

2.1.3.2.3 Constant Rate Injection Sequence

If water level recovery was reached in the SI sequence, the test procedure continued with the CRI sequence. The CRI sequence consists of injecting water into the test interval at a constant rate for a minimum of 30 minutes. A water injection assembly (pump, flow control panel, flow meter, pressure gauge, and header) was connected to the intake on the stuffing box on top of the drill rods. Water was injected until all air had been eliminated from the drill rods, at which point the stuffing box was closed to the atmosphere, allowing for additional pressure head in the testing zone during the CRI sequence. Flow rate and water injection pressure were recorded from the water injection assembly for the duration of the sequence. Test initiation was considered the time at which the stuffing box was closed. The LevelTROLL pressure transducer mounted within the packer assembly also recorded the pressure within the testing interval.

If the flow rate provided by the bean pump on the drill rig was insufficient to bring the water level to the surface (as in highly transmissive zones), then a variation of the CRI was performed. This variation, the gravity feed injection (GFI) sequence, was performed in the same manner as the CRI, but because the water level never reached the top of the drill rods, the stuffing box and drilling rods remained open to the atmosphere. Flow rate was recorded from the water injection assembly. However, because the drill rods remained open to atmospheric pressure, the pressure at surface was not recorded, and the test was monitored solely by the LevelTROLL pressure transducer mounted in the packer assembly.

The CRI (and GFI) sequence is not to be confused with a Lugeon injection test, which uses constant pressure steps with variable flow rates to determine hydraulic conductivity values for tight geologic materials based on the steady state Thiem equation. The CRI differs in that it is used for highly conductive materials, and it is analogous to a reverse single-well pump test following the Theis transient solution.

2.1.3.2.4 Constant Rate Injection Recovery

After completion of the CRI (or GFI) sequence, the pump was turned off, and the constant rate injection recovery (CRIR) was monitored. The time allowed for recovery of the water level was roughly equivalent to the amount of time required for water level recovery during the SI sequence in that test.

2.1.3.3 Hydrogeological Testing Data Analysis

2.1.3.4 Software and Data Reduction

All test analyses were performed using the commercially available analytical software AQTESOLV Pro (Version 4.50) (HydroSOLVE, Inc. 2007). Slug injection tests and open-hole falling head tests were analyzed using the Slug Test Wizard available in the program. Test data were only modified to include seconds from the initiation of the test (e.g. starting at zero). The AQTESOLV software utilizes difference in head from time step to time step, rather than absolute head at any given time step. Therefore, offsets for transducer depth were not necessary to calculate hydraulic conductivity.

CRI tests were analyzed using the Pump Test Wizard in AQTESOLV Pro. Data manipulation prior to importing included:

- Head data were adjusted using pre-test head values so that test data were presented as a changes in hydraulic head.
- Identification of the time pumping started and estimation of flow rates from the time of pump initiation to test initiation. A geometric mean flow rate was calculated after the first 10 minutes of the test to estimate this flow rate.
- Flow rate data were matched to recorded hydraulic head data based on field notes.
- Hydraulic head data were reduced to one minute intervals in order to match flow rate measurements.
- Recovery data were included in the analysis at 1 minute intervals.

The data were then imported into AQTESOLV Pro and analyzed using the Theis solution for the majority of tests. Transmissivity was converted to hydraulic conductivity by dividing the transmissivity by the thickness of the test interval. As noted in Table 3, four CRI test data sets required a different analytical solution (e.g. Gringarten fractured flow) based on the fracture density and orientation. These tests were verified using field notes, core photos, and discussions with field personnel.

For falling head tests, the thickness of the test interval was assumed to be the length of the drillhole exposed to water infiltration from the slug injection. For the purposes of selecting the AQTESOLV input parameters, the aquifer (or saturated) thickness was assumed to be the length of pulled rods from the bottom on the drillhole to the bit. If standing water was present in the drillhole above the level of the bit prior to the falling head test, this value was input as the “depth of top of well screen” below the “static water level or aquifer top” in the AQTESOLV slug test wizard. If the drillhole was dry or the measured water level was below the

level of the bit, then per AQTESOLV data input requirements, the “depth of top of well screen” was set to zero, thereby indicating that test interval was across the water table.

It should be noted that there are limitations to using a saturated hydraulic conductivity model to estimate formation hydraulic conductivity within the unsaturated portions of a drillhole. These include, but are not limited to, the following:

- Falling head tests or slug tests, conducted under unsaturated conditions are subject to capillarity, which can result in an overestimation of saturated hydraulic conductivity due to the wetting front being drawn into the formation more rapidly than under saturated conditions.
- Hydraulic testing in the unsaturated zone on the whole is further complicated by the texture of the unsaturated materials (e.g. particle size distribution), degree of incipient saturation or water content, and fracture geometry, density, and connectedness within each tested zone.
- In most cases, the depth to groundwater, degree of formation saturation, and possible presence of perched groundwater conditions was not known at the time drilling started at each location.
- The incipient water content of the intercepted formation material was disturbed by the injection of water during drilling. As a result, all hydraulic tests were conducted under the assumption that any portion of the column may be saturated.

As a precautionary step, only late-time data were used to calculate hydraulic conductivity values from falling head and slug test data as it was assumed that late time data would represent near-saturated conditions within the area of influence of the test, even within the unsaturated zone. However, as a result of these limitations, the resulting estimates of formation hydraulic conductivity should be considered an “order of magnitude” estimate for planning purposes.

2.1.3.5 Data Analysis Results

Calculated hydraulic conductivity values for each test are presented in Table 3. The table presents the drillhole identification, testing interval, calculated formation hydraulic conductivity values (in units of centimeters per second [cm/sec]), the analysis solution method, and notes or observations on each test. Test sequences were followed as described above. However, if the SI sequence results were considered to be outside the reasonable analytical range (i.e. greater than 1×10^{-4} cm/sec), the result was not included in the table and the CRI sequence was assumed to represent the hydraulic conductivity within that testing interval. For SI sequences that were coupled with CRI sequences, and were within a reasonable analytical range (i.e. less than 1×10^{-4} cm/sec), both results were included as a check on the precision of the analytical methodologies. AQTESOLV software printouts for each analysis are presented in Appendix B.

Analytical test results were independently reviewed by Golder staff not otherwise involved with the project who have relevant experience and substantial knowledge of the AQTESOLV software. The input parameters were verified by these steps:

- Review and confirm input parameters
- Review and confirm units and unit conversions
- Review and confirm data series input

The data results were also confirmed by independently analyzing the data sets using similar hydrologic solution methods as a test to check the sensitivity of the analytical results. All analytical results were within an order of magnitude of the original calculated hydraulic conductivity values.

2.1.4 Downhole Geophysical Surveys

After drilling had been completed at each location, a suite of downhole geophysical surveys was conducted by Southwest Exploration Services of Chandler, Arizona. A summary of the survey suite used in each drillhole is summarized in Table 4. The geophysical logs and log interpretations were not part of Golder's investigation scope of work and are not included in this report.

2.1.5 Standpipe Piezometer Construction

After completion of drilling activities and hydrogeological testing, the drillholes were completed either by backfilling or with installation of a standpipe piezometer. Drillhole DH17-29 (GT-14-2) was backfilled with cement bentonite grout and DH17-34 (GT-27) was backfilled with hydrated bentonite pellets. The remainder of the drillholes were completed with standpipe piezometers.

The manner of completion for each drillhole was selected in conference between representatives of KCB, Duke Hydrochem, Wickham GeoGroup, Golder, and RCML. Decisions regarding piezometer design were based on:

- Lithology encountered
- Reported drilling water levels as each hole was advanced
- Qualitative estimates of formation transmissivity (based on field observations of water level declines and responses during hydrogeologic testing)
- Proximity to other drillholes and monitoring wells.
- The location of the drillhole relative to the proposed facility footprint

All standpipe piezometers were installed in the HQ diameter (96 millimeter) drillhole. The piezometers were constructed with flush-threaded, 2-inch nominal diameter, Schedule 40 polyvinyl chloride (PVC) pipe blanks and 0.010-inch slotted PVC screen. Blank and screen sections were delivered to the site in 10-foot long sections, assembled at the surface and inserted into the drillhole. A filter pack consisting of 10/20 silica sand was placed in the annular space around the screened interval. Typically, the sand was added to a level at least 2 to 3 feet above the top of the screened interval, although some variations on this basic design were incorporated into the individual piezometer designs. Bentonite pellets or chips were placed above the filter pack material to act as a seal and to prevent grout from infiltrating into the monitored zone. The remainder of the annular space was filled with cement-bentonite grout or bentonite. After construction,

the piezometer was completed with a steel monument. Piezometer construction details are presented in Table 5, and as-built diagrams for each piezometer are presented in Appendix C.

At several locations the piezometers were constructed with screened intervals well above the bottom of the cored drillhole. In these instances, the bottom of the drillhole was backfilled with timed-release bentonite pellets placed in the lower portion of the drillhole up to the desired monitoring zone. In drillholes DH17-31 and DH17-33, portions of the bottom of the drillhole were partially filled with material that naturally sloughed from the sides of the drillhole wall. This sloughed material was subsequently buried under bentonite pellets added to seal off the lower portion of the drillhole.

2.2 Drillhole Summaries

This section provides brief narrative summaries of the lithology and drilling conditions encountered within each geotechnical investigation drillhole. Each drillhole summary presented in the following subsections presents generalized descriptions of the lithologies encountered and logged. Notable lithologic or structural features observed within a geologic formation, or those that are characteristic of a specific depth interval are also discussed. Notable field observations of drilling conditions are also included. This section presents a brief overview of the lithology and conditions encountered at each drillhole location and are presented as a quick reference. Detailed and complete geologic information and field observations for each drillhole can be found in the individual Record of Drillhole logs presented in Appendix A-1. A complete rock core photographic log is presented in Appendix A-2.

Table 1 presents information on each drillhole location, drilling dates, completion type, and whether downhole geophysical surveys were conducted. Table 2 presents a summary of the hydrogeological testing program, including the intervals selected for packer testing, the types of testing performed and qualitative observations of test conditions. Table 3 presents the analytical results of those tests, including the estimated hydraulic conductivity value for each test interval. .

All of the proposed drillholes were started with a proposed maximum depth of 250 ft-bgs. The actual drilled depth was adjusted as needed based on lithology and hydrogeological conditions encountered, drilling conditions, and the availability of other data. All drillholes were completed with standpipe piezometers unless otherwise noted. Piezometer construction details are presented in Table 5 and piezometer diagrams are presented in Appendix C.

2.2.1 DH16-01 (GT-14)

Drillhole DH16-01 is co-located with borehole DS16-01. RCML requested that DH16-01 be extended past the planned total depth of 250 ft-bgs to 451 ft-bgs to confirm the depth of the Gila Conglomerate formation at that location, and to perform packer testing in a transmissive zone observed in borehole DS16-01 at approximately 450 ft-bgs. This transmissive zone was also observed in drillhole DH16-01. Drillholes

DH17-29 (Section 2.8.29) and DH17-36 (Section 2.8.36) were later drilled at this same location for further investigation of shallow groundwater conditions. The lithology intercepted by the drillhole is summarized below:

- 0-353 ft-bgs: Gila Sandstone. Predominantly fine to coarse sand in texture, with zones of gravel and cobbles throughout.
- 353-358 ft-bgs: Volcaniclastic sandstone (lithic tuff).
- 358-427 ft-bgs: Tertiary basalt flow. Generally vesicular with zones of flow breccia and discontinuous voids.
- 427-436 ft-bgs: Volcaniclastic sandstone and conglomerate.
- 436-451 ft-bgs: Mescal Limestone. Zones of alteration including silicification. Weakly calcareous with highly transmissive fracture zones.

2.2.2 DH16-02 (GT-08)

Drillhole DH16-02 was advanced to a total depth of 260 ft-bgs. The final depth of the hole was extended past the planned depth of 250 ft-bgs in order to confirm the contact with Apache Leap Tuff. Surface drilling fluid circulation in the hole was lost while drilling through a transmissive zone of the Gila Conglomerate at a depth of approximately 56 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-4.5 ft-bgs: Surface residual soil.
- 4.5-10.5 ft-bgs: Gila Sandstone. Weak, light brown, fine to coarse sandstone.
- 4.5-248 ft-bgs: Gila Conglomerate. Predominantly gravelly with cobbles, matrix- to clast-dominated, and intermittent zones of fine to coarse Gila Sandstone. A vertical fault zone was observed from 79-81.2 ft-bgs.
- 248-260 ft-bgs: Apache Leap tuff. Aphanitic, weak, competent rock with jointing.

2.2.3 DH16-03 (GT-07)

Drillhole DH16-03 is co-located with borehole DS16-02. DH16-03 was advanced to a total depth of 164 ft-bgs. The drillhole was terminated after confirming the total depth of the Gila Conglomerate overlying the Apache Leap Tuff. Surface circulation in the hole was lost within the Gila Conglomerate at a depth of 54 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-3.5 ft-bgs: Surface residual soil and sediment.
- 161 ft-bgs: Gila Conglomerate. Predominantly gravelly with cobbles, matrix- to clast-dominated.
- 161-164 ft-bgs: Apache Leap tuff. Aphanitic and competent.

2.2.4 DH16-04 (GT-41)

Drillhole DH16-04 was advanced to a total depth of 220 ft-bgs. Zones of partial drilling fluid circulation returns were noted from 87 ft-bgs to 108 ft-bgs and 177.5 ft-bgs to 181 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-103.5 ft-bgs: Pinal Schist. Metasiltstones and metasandstones, phyllitic to schistose, with angled bedding. Foliated along bedding with fault zones throughout.
- 103.5-142 ft-bgs: A mafic, aphanitic, intrusive igneous rock (Diabase). Competent with faulted zones and oxidation on discontinuities.
- 142-220 ft-bgs: Pinal Schist. Similar to upper section above.

2.2.5 DH16-05 (GT-39)

Drillhole DH16-05 was advanced to a total depth of 250 ft-bgs. Access to the DH16-05 site was through a wash on unimproved surfaces, and was only accessible by the tracked drill rig and all-terrain vehicles, increasing time required for mobilization and demobilization. Poor rock conditions and drillhole caving made the use of a drilling fluid additive (EZmud® polymer) necessary after the surface casing was set. The drillers were able to drill with water only below 90 ft-bgs. A zone of partial circulation return was encountered at the contact with the mafic intrusive at 80.5 ft-bgs to 82 ft-bgs and at 86 ft-bgs. Zones of lost circulation were also observed within fractured schist at depths of 153.5 ft-bgs to 156.5 ft-bgs and within a fractured metasandstone from 168 ft-bgs to 172 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-6 ft-bgs: Surface alluvium. Washed gravels.
- 6-21 ft-bgs: Weathered bedrock, including both Pinal Schist and mafic intrusive.
- 21-30 ft-bgs: Mafic intrusive breccia. Highly- to moderately- weathered.
- 30-80 ft-bgs: Pinal Schist. Psammitic facies. Jointed and competent.
- 80-125 ft-bgs: Mafic intrusive. The upper portion of the zone is highly fractured. Very competent from 90-125 ft-bgs.
- 125-250 ft-bgs: Pinal Schist. Schistose, sheared and faulted throughout.

2.2.6 DH16-06 (GT-21)

Drillhole DH16-06 was advanced to a total depth of 249 ft-bgs. A zone of partial lost fluid circulation in a fault zone was observed at a depth of 125 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-4 ft-bgs: Surficial soils.
- 4-25 ft-bgs: Gila Conglomerate. Completely weathered to highly weathered.
- 25-249 ft-bgs: Gila Conglomerate. Slightly weathered to fresh. Matrix-dominated, competent rock.

2.2.7 DH16-07 (GT-20)

Drillhole DH16-07 is co-located with borehole DS16-03. DH16-07 was advanced to a total depth of 249 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-3.5 ft-bgs: Surficial soils.
- 3.5-17 ft-bgs: Gila Conglomerate. Completely weathered to highly-weathered.
- 17-123 ft-bgs: Gila Conglomerate. Slightly weathered to fresh. Predominantly gravelly with cobbles.

- 123-198 ft-bgs: Perlitic rhyolite. Vitreous, with zones of autobreccia and argillization.
- 198-249 ft-bgs: Rhyolite with white, argillic matrix, very weak.

2.2.8 DH16-08 (GT-15) A & B

Drillhole DH16-08 is co-located with borehole DS16-04. Drillhole DH16-08 was advanced to a total depth of 249 ft-bgs. The initial hole (designated “A”) encountered drilling difficulties in the highly weathered near-surface material. After advancing the drillhole to a depth of 34 ft-bgs the bit became stuck and repeated efforts to free them failed. Drillhole “A” was abandoned, with rods and the bit left in the hole, by backfilling with cement-bentonite grout. The second drillhole (designated “B”) was offset 5 feet from Drillhole A, and advanced Drillhole B with the tricone bit to 30 ft-bgs. Coring resumed at 30 ft-bgs with no further drilling difficulties. DH16-08 was completed at a depth of 249 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-6 ft-bgs: Colluvium. Well-graded sand.
- 6-24 ft-bgs: Gila Conglomerate. Completely weathered to highly weathered.
- 24-249 ft-bgs: Gila Conglomerate. Slightly weathered to fresh. Gravelly. Matrix-dominated.

2.2.9 DH16-09 (GT-32)

Drillhole DH16-09 was advanced to a total depth of 250 ft-bgs. Zones of reduced circulation of drilling fluids were encountered at depths of 60 ft-bgs, 95 to 99 ft-bgs, and from 161 to 163 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-54 ft-bgs: Rhyolite. Perlitic and glassy. Laminated, foliated and crenulated. Jointed and slightly fractured.
- 54-250 ft-bgs: Rhyolite. Laminated, foliated, and crenulated. Highly fractured in zones. Faulted at 95 ft-bgs.

2.2.10 DH16-10 (GT-31)

Drillhole DH16-10 was advanced to a total depth of 254 ft-bgs. Reduced circulation of drilling fluids was observed at a depth of 244 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-99 ft-bgs: Rhyolite. Perlitic and aphyric. Laminated, foliated and crenulated. Highly vitreous. Jointed and slightly fractured.
- 99-211 ft-bgs: Rhyolite. Laminated, foliated, and crenulated, with zones of silicification, vesicles, and flow breccia texture.
- 211-254 ft-bgs: Perlitic rhyolite. Breccia-like texture. Highly vitreous.

2.2.11 DH16-11 (GT-18)

Drillhole DH16-11 is co-located with borehole DS16-08. The drillhole was advanced to a total of 254 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-7.5 ft-bgs: Surficial soils, sand with little silt.

- 7.5-29 ft-bgs: Diabase. Completely weathered to moderately weathered, with rubbly zones, iron staining and calcite veining.
- 29-54 ft-bgs: Diabase. Slightly weathered. Jointed, with iron staining and calcite veining.
- 54-254 ft-bgs: Diabase. Fresh. Jointed to massive. Some calcite veining.

2.2.12 DH16-12 (GT-19)

Drillhole DH16-12 is co-located with borehole DS16-10. The drillhole was advanced to a total depth of 293 ft-bgs to confirm the depth of the contact between the Gila Conglomerate and Apache Leap Tuff. A zone of partial lost fluid circulation was noted at 124 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-31 ft-bgs: Surficial soils grading to completely weathered Gila Conglomerate at approximately 4 ft-bgs.
- 31-59 ft-bgs: Gila Conglomerate. Slightly weathered. Gravelly. Matrix-dominated.
- 59-284 ft-bgs: Gila Conglomerate. Fresh with intermittent weathered zones. Gravelly. Matrix-dominated.
- 284-293 ft-bgs: Gradational contact between Gila Conglomerate and Apache Leap Tuff.

2.2.13 DH16-13 (GT-17)

Drillhole DH16-13 is co-located with borehole DS16-11. The drillhole was advanced to a total depth of 249 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-18 ft-bgs: Completely weathered Gila Conglomerate.
- 23-44 ft-bgs: Gila Conglomerate. Slightly weathered. Gravelly. Matrix-dominated.
- 44-144 ft-bgs: Gila Conglomerate. Fresh. Gravelly. Matrix-dominated.
- 144-150.2 ft-bgs: Gradational contact with Apache Leap Tuff.
- 150.2-249 ft-bgs: Apache Leap Tuff. Fresh with few sub-horizontal joints.

2.2.14 DH16-14 (GT-01)

Drillhole DH16-14 was advanced to a total depth of 238.5 ft-bgs. The drillhole was terminated prior to reaching the proposed maximum depth of 250 ft-bgs as RCML determined the Pinal Schist lithology had been sufficiently confirmed. The lithology intercepted by the drillhole is summarized below:

- 0-4.5 ft-bgs: Poorly-graded, fine-to-coarse gravel surface deposit.
- 4.5-91.5 ft-bgs: Pinal Schist. Completely weathered to highly weathered. Encountered zones of very poor recovery, including fault gouge, and rubble. Foliated and fractured with zones of heavy oxidation.
- 91.5-238.5 ft-bgs: Pinal Schist. Slightly weathered to highly weathered. Foliated and fractured with some oxidation.

2.2.15 DH16-15 (GT-16)

Drillhole DH16-15 was advanced to a total depth of 290 ft-bgs. The drillhole was advanced past the proposed maximum depth of 250 ft-bgs to assure interception with the water table. The lithology intercepted by the drillhole is summarized below:

- 0-6 ft-bgs: Surficial soils.
- 6-24 ft-bgs: Gila Conglomerate. Completely weathered to moderately weathered. Gravelly and matrix-dominated.
- 24-59 ft-bgs: Gila Conglomerate. Slightly weathered, gravelly, and matrix-dominated.
- 59-109 ft-bgs: Gila Conglomerate. Fresh, gravelly, and matrix-dominated.
- 109-164 ft-bgs: Gila Conglomerate. Slightly weathered to moderately weathered, gravelly, and matrix-dominated.
- 164-290 ft-bgs: Gila Conglomerate. Fresh, gravelly, and matrix-dominated.

2.2.16 DH16-16 (GT-02)

Drillhole DH16-16 is co-located with borehole DS16-06. The drillhole was advanced to a total depth of 250 ft-bgs. Partial lost fluid circulation was noted throughout the Pinal Schist zone to a depth of 185 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-7 ft-bgs: Surficial soils and alluvium.
- 7-60 ft-bgs: Pinal Schist. Completely weathered to moderately weathered, with rubble and fault zones.
- 60-185 ft-bgs: Pinal Schist. Slightly weathered to moderately weathered. Foliated and fractured with rubble and fault zones. Transitional contact with underlying diabase from 181 to 185 ft-bgs.
- 185-250 ft-bgs: Diabase. Slightly weathered, competent and jointed.

2.2.17 DH16-17 (GT-36)

Drillhole DH16-17 is co-located with borehole DS16-09. The drillhole was advanced to a total depth of 199 ft-bgs. The drillhole was terminated prior to reaching the proposed maximum depth 250 ft-bgs as RCML and KCB determined the Pinal Schist lithology had been sufficiently confirmed. The lithology intercepted by the drillhole is summarized below:

- 0-30 ft-bgs: Pinal Schist. Completely weathered to highly weathered with zones of poor to very poor recovery. Highly foliated and fractured with some iron staining and clay-rich gouge.
- 30-90 ft-bgs: Pinal Schist. Moderately-weathered. Highly foliated, fractured and rubbly, with moderate to heavy iron staining.
- 84-199 ft-bgs: Pinal Schist. Slightly weathered to moderately weathered. Foliated and fractured with zones of crushed and brecciated rock. Light iron staining.

2.2.18 DH16-18 (GT-35)

Drillhole DH16-18 is co-located with borehole DS16-05. The drillhole was advanced to a total depth of 249.5 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-13.5 ft-bgs: Surface alluvium, sand and gravel.
- 13.5-57 ft-bgs: Pinal Schist. Completely weathered to highly weathered. Highly foliated, with zones of faulting, extremely weak rock, and some oxidation.
- 57-175 ft-bgs: Pinal Schist. Highly weathered to moderately weathered. Foliated and jointed with few fault zones. Some indicators of oxidation observed.
- 175-197 ft-bgs: Pinal Schist. Fresh to slightly weathered, foliated, with little oxidation evident.
- 197-249.5 ft-bgs: Pinal Schist. Completely weathered to moderately weathered. Highly foliated with zones of faulting, extremely weak rock, and evidence of oxidation.

2.2.19 DH16-19 (GT-04)

Drillhole DH16-19 was advanced to a total depth of 249 ft-bgs. A zone of partial fluid circulation loss was noted at the limestone/diabase contact at 49 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-42.3 ft-bgs: Basalt. Completely weathered to moderately weathered, jointed-to-rubbly. Vesicles to a depth of 9 ft-bgs.
- 42.3-49.7 ft-bgs: Mescal Limestone. Slightly weathered with healed fractures and light iron staining.
- 49.7-111 ft-bgs: Diabase. Highly weathered to moderately weathered. Medium-to-coarsely crystalline. Thin brecciated zones, with calcite veining, and some oxidation.
- 111-249 ft-bgs: Diabase. Fresh to slightly-weathered. Medium-to-coarsely crystalline. Jointed, with few calcite veins, and few zones of oxidation.

2.2.20 DH16-20 (GT-03)

Drillhole DH16-20 is co-located with borehole DS16-07. The drillhole was advanced to a total depth of 250 ft-bgs. Field personnel noted that the drillhole was located along the surface expression of a fault or contact between outcrops of limestone and diabase. Surface fluid circulation was lost at 237 ft-bgs near an interval of faulting spanning 233 ft-bgs to 237.9 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-8 ft-bgs: Surface alluvium. Sandy gravelly clay and sand.
- 8-47 ft-bgs: Diabase. Completely weathered to moderately weathered. Highly fractured, jointed and oxidized.
- 47-133 ft-bgs: Mescal Limestone and Limestone Breccia. Highly to moderately weathered. Rock is alternately well-healed, strong rock to extremely weak, clayey gouge with highly fractured zones.
- 133-233 ft-bgs: Dripping Springs Quartzite. Moderately weathered. Bedded and abundant iron staining, with large zones of completely weathered to highly weathered, rubbly rock, clayey gouge and quartzite breccia.

- 233-250 ft-bgs: Dripping Springs Quartzite. Slightly weathered to completely weathered. Highly fractured with partial healing. Rubbly and brecciated with large voids.

2.2.21 DH16-21 (GT-05)

Drillhole DH16-21 was advanced to a total depth of 249 ft-bgs. The upper part of the drillhole (to 60 ft-bgs) was in unstable, highly weathered rock, which required the advancement of surface casing to 55 ft-bgs and coating the drillhole walls with bentonite to a depth of 69 ft-bgs. Continued circulation of drilling fluid returns from the in situ, clayey material, as well as the added bentonite, created highly viscous, clayey fluids. These drilling fluids were replaced with clean water after the drillhole was advanced to 109 ft-bgs and the remainder of the drillhole was completed with no further drilling issues. The lithology intercepted by the drillhole is summarized below:

- 0-6 ft-bgs: Silty clay colluvium.
- 6-18.5 ft-bgs: Very dense, poorly-graded medium sand composed of residual weathered diabase. SPT data were collected and samples collected within this zone, but core recovery was extremely poor.
- 18.5-81 ft-bgs: Diabase and mafic intrusive. Completely weathered to moderately weathered. Very fine to coarsely-crystalline. Primarily undifferentiated rubble. Extremely poor drilling recovery.
- 81-84 ft-bgs: Well-cemented breccia, limestone and diabase clasts, massive and strong.
- 84-95 ft-bgs: Mescal Limestone. Slightly weathered to moderately weathered. Jointed with small gougey faults and healed breccia texture.
- 95 – 212 ft-bgs: Diabase. Completely weathered to moderately weathered. Coarsely-crystalline trending to finely-crystalline. Zones of weakly indurated diabase breccia with a friable matrix. Moderate to strong oxidation and argillic alteration.
- 212-249 ft-bgs: Diabase. Slightly weathered to moderately weathered. Jointed. Some argillic alteration and oxidation.

2.2.22 DH16-22 (GT-40)

Drillhole DH16-22 was advanced to a total depth of 250 ft-bgs. Drillhole DH17-24 (GT-40-2) was later co-located at this drilling site (see Section 2.8.24). The lithology intercepted by the drillhole is summarized below:

- 0-3 ft-bgs: Surface alluvium. Fine to coarse gravel with sand and fines. Transitional contact to the underlying Pinal Schist from 3 to 4 ft-bgs.
- 3-250 ft-bgs: Pinal Schist. Completely weathered to moderately weathered. Alternately highly-foliated, weak rock, with faulted and sheared zones of rubble and clayey gouge. Intermittent iron staining on discontinuities. Poor rock quality throughout.

2.2.23 DH17-23 (GT-06) A & B

Drillhole DH17-23 was advanced to a total depth of 249 ft-bgs. An initial drillhole, designated GT-6-A, was advanced to a depth of 29 ft-bgs before the drill string pulled apart. The drillhole was abandoned by backfilling with bentonite grout, leaving the bit and core barrel in the hole. Drillhole GT-6-B, located at the same drilling pad as GT-6-A, was advanced to a depth of 20 ft-bgs using the tricone rock bit, before

switching back to coring methods for the remainder of the drillhole. Surface drilling fluid circulation was lost between 49 and 52 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-14 ft-bgs: Apache Leap Tuff. Highly weathered. Very weak to weak rubbly material.
- 14-54 ft-bgs: Apache Leap Tuff. Slightly weathered to moderately weathered, highly welded and competent tuff. Sub-horizontally jointed.
- 54-249 ft-bgs: Apache Leap Tuff. Fresh. Highly welded and competent, with little staining. Sub-horizontally jointed.

2.2.24 DH17-24 (GT-40-2)

Drillhole DH17-24 was advanced to a total depth of 75 ft-bgs. The drillhole was co-located with DH16-22 for the installation of a shallow water table piezometer. Drillhole conditions were unstable due to the extremely poor rock quality. Drillhole wall sloughing during standpipe installation resulted in placement of the bottom of the piezometer screen at 68 ft-bgs. Lithology encountered in the hole did not differ materially from DH16-22 and is summarized below:

- 0-4 ft-bgs: Surface alluvium. Gravel with little sand and fines.
- 4-32 ft-bgs: Pinal Schist. Highly to moderately weathered. Highly foliated, fractured, and jointed, with some iron staining on discontinuities.
- 32-75 ft-bgs: Pinal Schist. Slightly weathered to moderately weathered. Foliated, fractured, and jointed, with some iron staining on discontinuities.

2.2.25 DH17-25 (GT-37)

Drillhole DH17-25 was advanced to a total depth of 249 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-45 ft-bgs: Pioneer Shale. Completely weathered. Very fine-grained to fine-grained. Highly fractured and rubbly. Poor drilling recovery.
- 45-249 ft-bgs: Pioneer Shale. Slightly weathered to completely weathered. Variably medium strong, bedded and jointed, to very weak rubble, with poor drilling recovery. Light iron staining. Few calcite veins.

2.2.26 DH17-26 (GT-13)

Drillhole DH17-26 was advanced to a total depth of 250 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-2 ft-bgs: Dark brown, laminated clay with some gravel.
- 2-57 ft-bgs: Gila Sandstone interbedded with matrix-supported Gila Conglomerate. Completely weathered to moderately weathered, thinly bedded with clay lenses, extremely weak to very weak.
- 57-137 ft-bgs: Gila Sandstone interbedded with matrix-supported Gila Conglomerate. Moderately weathered to slightly weathered, thinly bedded, with few hard clay lenses,
- 137-147 ft-bgs: Volcaniclastic sandstone. Massive, medium-strong to very weak rock. Ash-rich and highly oxidized.

- 147-250 ft-bgs: Basalt. Slightly weathered, with calcite-filled amygdules and abundant thick calcite veins. Jointed, with zones of heavy oxidation.

2.2.27 DH17-27 (GT-12)

Drillhole DH17-27 was advanced to a total depth of 250 ft-bgs. Partial fluid loss was observed while drilling through the oxidized basalt between 132 and 192 ft-bgs, but later packer testing did not confirm the presence of a highly conductive zone. The lithology intercepted by the drillhole is summarized below:

- 0-5 ft-bgs: Unconsolidated alluvium. Dark brown gravelly clay.
- 5-6.4 ft-bgs: Fragmented rubble consisting of basalt, welded tuff and other volcanic fragments.
- 6.4-48 ft-bgs: Basalt. Moderately weathered to highly weathered. Highly jointed and fractured, and variably oxidized.
- 48-132 ft-bgs: Basalt. Slightly weathered to fresh. Finely crystalline. Medium-strong to strong. Jointed. Little staining evident on discontinuities.
- 132-192 ft-bgs: Basalt. Slightly weathered to moderately weathered. Strongly oxidized. Strong. Little jointing. Amygdaloidal with calcite infilling. Fracture surfaces were coated with calcite and possibly zeolite.
- 192-232 ft-bgs: Apache Leap Tuff. Slightly weathered. Moderately welded. Competent. Weak.
- 232-246 ft-bgs: Lithic-rich tuff and volcaniclastics. Poorly welded, moderately weathered to highly weathered with clayey texture.
- 246-250 ft-bgs: Pinal Schist. Schistose clasts in a medium- to coarse-grained sandy clay matrix.

2.2.28 DH17-28 (GT-23)

Drillhole DH17-28 was advanced to a total depth of 250 ft-bgs. Some partial fluid circulation loss was noted while drilling from 16 to 39 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-16 ft-bgs: Gila Conglomerate. Highly weathered.
- 16-39 ft-bgs: Gila Conglomerate. Slightly weathered to moderately weathered. Gravelly with cobbles. Clast-dominated, with zones of very poor rock quality and heavy jointing.
- 39-250 ft-bgs: Gila Conglomerate. Fresh. Gravelly with cobbles, Clast-dominated.

2.2.29 DH17-29 (GT-14-2)

Drillhole DH17-29 was advanced to a total depth of 62 ft-bgs. This was the second drillhole at this location and was intended for the installation of a shallow piezometer to complement the piezometer installed in DH16-01 and the monitoring well in DS16-01. The drillhole was terminated and abandoned with cement bentonite grout after drilling and testing to a depth of 62 ft-bgs. Drill fluid circulation was lost at 15.5 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-12 ft-bgs: Gila Conglomerate. Moderately weathered and weakly cemented. Sub-angular to sub-round clasts to 4-inches.
- 12-22 ft-bgs: Gila Sandstone. Moderately weathered to highly weathered, coarse-grained to medium-grained sandstone facies. Moderately cemented.
- 22-62 ft-bgs: Massive Gila Conglomerate with intervals of sandstone. Few discontinuities.

2.2.30 DH17-30 (GT-25)

Drillhole DH17-30 was advanced to a total of 248 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-14 ft-bgs: Surface alluvium, washed gravel with little clayey sand.
- 14-84 ft-bgs: Gila Conglomerate. Slightly weathered to moderately weathered, matrix- to clast-supported, with small quartz-filled vugs. Friable matrix. Few small faults, some jointing.
- 84-219 ft-bgs: Gila Conglomerate. Fresh and massive, with few discontinuities.
- 219-229 ft-bgs: Gila Sandstone. Fresh and massive, weak fine to coarse-grained clayey sand with some gravel. Gradational contact with Gila Conglomerate above and below the sandstone.
- 229-249 ft-bgs: Gila Conglomerate. Fresh, weak, clast-supported gravel with cobbles. Clasts of schist, tuff rhyolite, quartzite, and diabase.

2.2.31 DH17-31 (GT-34)

Drillhole DH17-31 is co-located with borehole DS16-12. The drillhole was advanced to a total of 249 ft-bgs. Partial fluid circulation loss was observed while drilling between depths of 143 ft-bgs to 207 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-15 ft-bgs: Overburden and colluvium consisting of weakly cemented gravel to cobble-size clasts of limestone and volcanics.
- 15-57 ft-bgs: Apache Leap Tuff. Moderately weathered to slightly weathered. Jointed and fractured with zones of clayey gouge.
- 57-128 ft-bgs: Apache Leap Tuff. Slightly weathered to moderately weathered. Generally massive with intervals of highly fractured rock.
- 128-155 ft-bgs: Tuff. Moderately weathered to completely weathered. Highly altered, oxidized groundmass. Very weak rock.
- 155-227.3 ft-bgs: Limestone. Moderately weathered. Strong. Jointed with zones of hydrothermal breccia.
- 227.3-249 ft-bgs: Diabase. Moderately weathered. Medium strong. Fractured and oxidized.

2.2.32 DH17-32 (GT-42)

Drillhole DH17-32 was advanced to a total of 250 ft-bgs. This drillhole was located within a dry alluvial wash, which presented challenging drilling conditions through unconsolidated alluvium, and underlying highly weathered Pinal Schist. Partial fluid circulation loss was noted from the surface to approximately 150 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-34.7 ft-bgs: Alluvium, well-graded gravel with few fines, loose to compact.
- 34.7-52 ft-bgs: Pinal Schist. Moderately weathered to highly weathered. Rubbly. Extremely poor rock quality and poor rock drilling recovery. Variably silicified.
- 52-56.5 ft-bgs: Diabase. Moderately weathered diabase intrusion. Highly oxidized, massive and weak.
- 56.5-209 ft-bgs: Pinal Schist. Completely weathered to moderately weathered. Encountered zones of silicification, variably-cemented schist breccia, clayey fault gouge, and rubble with very poor drilling recovery. Extremely poor rock quality throughout, with iron and manganese oxide staining on discontinuities.

- 209-250 ft-bgs: Pinal Schist. Moderately weathered to slightly weathered. Foliated and fractured. Good drilling recovery.

2.2.33 DH17-33 (GT-29)

Drillhole DH17-33 is co-located with borehole DS16-13. The drillhole was advanced to a total depth of 250 ft-bgs. Surface circulation was lost while drilling from 47 to 52 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-5 ft-bgs: Surface alluvium, predominantly gravel and cobbles.
- 5-82 ft-bgs: Gila Sandstone. Moderately weathered to completely weathered. Monomictic with diabase clasts. Beds coarsen with depth.
- 82-142 ft-bgs: Apache Leap Tuff. Moderately weathered to completely weathered. Fine-grained with few lithics. Strong argillic alteration. Weak to very weak, few joints.
- 142-212 ft-bgs: Tuff. Moderately weathered to highly weathered crystal-rich tuff. Fractured, with some argillic alteration.
- 212-250 ft-bgs: Tuff. Fresh to slightly weathered. Competent and strong.

2.2.34 DH17-34 (GT-27)

Drillhole DH17-34 is co-located with borehole DS16-14. The drillhole was advanced to a total depth of 250 ft-bgs. Surface circulation of drilling fluids was lost while drilling from 37.5 to 40.5 ft-bgs. After consultation with RCML, a piezometer was deemed unnecessary at this location, and the drillhole was backfilled with cement grout. The lithology intercepted by the drillhole is summarized below:

- 0-6 ft-bgs: Overburden and alluvium consisting of loose coarse sand- to cobble-size rounded clasts of schist, quartz, and diabase.
- 6-104 ft-bgs: Gila Conglomerate. Fresh to slightly weathered. Gravelly and cobbly, clast-supported conglomerate. Few joints, with iron and manganese oxide staining on discontinuities.
- 104-250 ft-bgs: Gila Conglomerate. Fresh, gravelly, cobbly, and clast-supported. Few joints and calcite veins.

2.2.35 DH17-35 (GT-30)

Drillhole DH17-35 was drilled to a depth of 250 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-3 ft-bgs: Colluvium consisting of angular diabase gravel and cobbles, and washed out fines.
- 3-132 ft-bgs: Diabase and diabase breccia. Completely weathered to moderately weathered. Jointed with zones of clayey gouge or fault breccia at depths of 42 to 47 ft-bgs and 92 to 115 ft-bgs. Calcite veins and calcite cementation above 92 ft-bgs. Little to heavy oxidation.
- 132-136 ft-bgs: Clayey fault gouge with breccia, contact between diabase and limestone.
- 136-250 ft-bgs: Mescal Limestone. Moderately weathered to slightly weathered. Bedded, with zones of breccia and calcite veining. Competent and jointed throughout.

2.2.36 DH17-36 (GT-14-3)

Drillhole DH17-36 was advanced to a total depth of 100 ft-bgs. Drillhole DH17-36 is co-located with drillholes DH16-01 (see Section 2.8.1) and DH17-29 (see Section 2.8.29), and borehole DS16-01, and was drilled for the purpose of installing a shallow groundwater piezometer complementing the piezometers already installed at this site. The lithology intercepted by the drillhole is summarized below:

- 0-2 ft-bgs: Alluvium consisting predominantly silty sandy gravel.
- 2-69 ft-bgs: Gila Sandstone. Slightly weathered to moderately weathered. Medium strength.
- 69-100 ft-bgs: Gila Sandstone. Fresh to slightly weathered. Massive.

2.2.37 DH17-37 (GT-28)

Drillhole DH17-37 was advanced to a total depth of 250 ft-bgs. Partial loss of fluid circulation was noted at 67 ft-bgs; surface fluid circulation was lost at 82 ft-bgs; and partial loss of fluid circulation was again noted at 105 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-11 ft-bgs: Colluvium, predominantly washed out fines, coarse silty sand with multilithic gravel and cobbles.
- 11-124 ft-bgs: Gila Conglomerate. Slightly weathered to moderately weathered. Gravelly and clast-dominated. Zones of heavy jointing with iron and manganese oxide staining on discontinuities.
- 124-250 ft-bgs: Gila Conglomerate. Fresh to slightly weathered, clast- to matrix-dominated, with few calcite crystals in small voids.

2.2.38 DH17-38 (GT-22)

Drillhole DH17-38 was advanced to a total depth of 250 ft-bgs. The lithology intercepted by the drillhole is summarized below:

- 0-11 ft-bgs: Gila Conglomerate. Completely weathered to highly weathered.
- 11-59 ft-bgs: Gila Conglomerate. Moderately weathered to slightly weathered. Gravelly with cobbles. Clast-supported.
- 59-250 ft-bgs: Gila Conglomerate. Fresh to slightly weathered. Gravelly with cobbles. Clast-supported.

2.3 Geotechnical Test Pit Investigation

2.3.1 Test Pit Excavation and Infiltration Testing

Thirty (30) test pits were excavated for the Near West TSF geotechnical investigation, with 28 test pits excavated between October 24, 2016 and November 15, 2016, and two additional test pits excavated between January 26 and 27, 2017. The test pit locations are presented on Figure 1. Table 6 summarizes the test pit excavation locations, testing performed, and notes on the excavation depths. The test pits were excavated and backfilled by Dalmolin Excavation of Globe, Arizona at the direction of Golder and RCML staff. Test pits TP16-01 through TP16-11 were excavated using a CAT 308 track-mounted excavator

equipped with a 24-inch bucket. Test pits TP16-12 through TP16-30 were excavated using a larger Komatsu 220 track-mounted excavator equipped with a 36-inch bucket to improve equipment reach and excavation depth in hard material. Westland Resources personnel were onsite as wildlife and archaeological monitors.

Each test pit was excavated to bucket refusal, equipment reach refusal, or the proposed maximum depth of 15 ft-bgs. Golder geotechnical personnel performed field duties including soil logging, test pit excavation and backfilling oversight, soil sampling, and infiltration testing. The test pit logs present the pit identification number, excavation data, a description of the encountered earthen materials, photographs of the excavation or spoils pile, and reports on the approximate depth ranges at which soil samples were obtained and infiltration tests performed (Appendix D-1). Photographs of the infiltration tests and setup are presented in Appendix D-2. The transition between different soil types shown on the logs are considered to be approximate. Materials from test pit excavations were visually classified in accordance with the USCS in general accordance with the ASTM visual classification procedure (ASTM D2488). Samples of all soil material types identified in each test pit were collected from the excavation spoils. These samples were placed and sealed in plastic bags or stored as bulk samples in plastic buckets. A list of samples was prepared and submitted to RCML for chain-of-custody purposes. The samples were subsequently transported by RCML personnel to a designated storage facility for processing.

2.3.2 Infiltration Testing

Golder field personnel performed infiltration testing as part of the test pit program at test pit locations TP16-01 through TP16-14, TP16-29, and TP16-30. The data collected were used to calculate estimates of field-saturated hydraulic conductivity of the near-surface geologic materials encountered. Infiltration test methods used included bottomless bucket infiltration tests, constant head tests, and percolation tests.

The bottomless bucket (BB) infiltration test is a variation of the ring-infiltrometer method of infiltration testing. The BB tests conducted for this investigation used the method described by Nimmo, et al (2009) for soil materials, and the adaptation as described by Mirus and Perkins (2012) for rock or hard surfaces. The BB method uses a light-weight plastic bucket, with the bottom removed, sealed to the test surface with common sealants including bentonite and silicone caulking. For the test, water is added to the bucket and infiltration is measured by monitoring water levels within the bucket.

Constant head tests are a variation of the BB infiltration test. In the constant head method, water is also initially added to the bucket. However, as the water level in the bucket drops, additional water is added to maintain the water level. The amount of water and time of addition are recorded and used to calculate the field saturated hydraulic conductivity values. Constant head tests were attempted at test pits TP17-29 and TP17-30. However, the results of these tests were inconclusive due to the presence of stiff, clayey and very low permeability soils.

A percolation test was also performed in TP16-01. This test was performed by adding water to the bottom of the test pit to raise the initial water level in the test pit to approximately 4 feet above the bottom. The increased uncertainty created by the geometry of the test pit resulted in field saturated hydraulic conductivity values that corresponded poorly with the BB infiltration test results, and no further percolation tests were performed.

Appendix D-3 contains the calculations of hydraulic conductivities from BB tests and constant head tests. Table 7 summarizes the infiltration testing and resulting calculated field saturated hydraulic conductivities (K_{fs}).

3.0 USE OF THIS REPORT

This report has been prepared exclusively for the use of Resolution Copper Mining LLC for specific application to the Near West Tailings Storage Facility. No third party engineer or consultant shall be entitled to rely on any of the information, conclusions, or opinions contained in this report, without the prior approval from Resolution Copper Mining LLC and Golder Associates Inc.

The conclusions and recommendations in this report have been prepared in a manner consistent with that level of care and skill ordinarily exercised by engineering professionals currently practicing under similar conditions, and subject to the time limits and financial and physical constraints imposed on, or otherwise applicable to, Golder's analyses. In preparing our conclusions and recommendations, Golder has relied upon information provided by the client and other consultants such as topographic data, laboratory test results, piezometer readings, leaching information, ore properties, operational parameters, etc. Golder is not responsible for errors or omissions in the information provided by the client.

Golder appreciates the opportunity to assist RCML on this important project. If you have any questions or comments concerning this letter report, please feel free to contact Ron Blegen at (480) 966-0153.

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TABLES

TABLE 1: DRILLHOLE SUMMARY

Drillhole ID	Temp ID	Date Started	Date Completed	Northing[1]	Easting[1]	Elevation (ft-amsl)[2]	Depth (ft-bgs)[3]	Downhole Geophysics	Paired Site	Completion	Completion Details
DH16-01	GT-14	9/21/2016	9/27/2016	838455.3	923218.8	2406.7	451	No	DS16-01	Piezometer	Screened in Mescal Limestone
DH16-02	GT-08	9/28/2016	10/2/2016	840617.7	919190.4	2391.1	260	Yes	-	Piezometer	Screened in Gila Conglomerate
DH16-03	GT-07	10/2/2016	10/6/2016	842613.8	918055.2	2487.7	164	No	DS16-02	Piezometer	Two screened intervals in Gila Conglomerate
DH16-04	GT-41	10/6/2016	10/11/2016	840820.5	916971.3	2429.4	220	Yes	-	Piezometer	Screened in Pinal Schist
DH16-05	GT-39	10/13/2016	10/18/2016	838290.6	916377.8	2247	250	Yes	-	Piezometer	Two screened intervals - Pinal schist and Diabase
DH16-06	GT-21	10/21/2016	10/24/2016	841669.4	924865.5	2561.6	249	Yes	-	Piezometer	Screened in Gila Conglomerate
DH16-07	GT-20	10/25/2016	10/28/2016	843639.6	926190.8	2496.6	249	Yes	DS16-03	Piezometer	Screened in Gila Conglomerate
DH16-08	GT-15	10/29/2016	11/2/2016	842210.9	922847.6	2441.6	249	Yes	DS16-04	Piezometer	Screened in Gila Conglomerate
DH16-09	GT-32	11/2/2016	11/7/2016	845384.4	927715.4	2619.7	250	Yes	-	Piezometer	Screened in rhyolite.
DH16-10	GT-31	11/8/2016	11/11/2016	845876.6	929846.5	2699.5	254	Yes	-	Piezometer	Screened in rhyolite breccia
DH16-11	GT-18	11/12/2016	11/16/2016	850298.7	924155.5	2704	254	No	DS16-08	Piezometer	Screened in diabase
DH16-12	GT-19	11/17/2016	11/19/2016	847001.8	923395.5	2669.1	293	No	DS16-10	Piezometer	Screened in Gila Conglomerate
DH16-13	GT-17	11/28/2016	11/30/2016	849356.6	921449.2	2733.8	249	No	DS16-11	Piezometer	Screened in Apache Leap Tuff
DH16-14	GT-01	11/29/2016	12/2/2016	845266.2	910364.5	2316	238.5	Yes	-	Piezometer	Screened in Pinal Schist
DH16-15	GT-16	12/2/2016	12/5/2016	845116.3	920175.6	2667.7	290	Yes	-	Piezometer	Screen in Gila
DH16-16	GT-02	12/4/2016	12/6/2016	845081.2	912658.1	2284.5	250	No	DS16-06	Piezometer	Screened in Pinal Schist
DH16-17	GT-36	12/6/2016	12/10/2016	851183.5	924179.7	2671.9	199	No	DS16-09	Piezometer	Screened in Pinal Schist
DH16-18	GT-35	12/8/2016	12/11/2016	842318.9	909644.3	2222	249.5	No	DS16-05	Piezometer	Screened in Pinal Schist
DH16-19	GT-04	12/11/2016	12/14/2016	846100.6	916858.5	2443.4	249	Yes	-	Piezometer	Screened in Diabase
DH16-20	GT-03	12/12/2016	12/17/2016	844754.3	915215.3	2369.5	250	Yes	DS16 -07	Piezometer	Screened in limestone
DH16-21	GT-05	12/16/2016	1/4/2017	845595.1	917417.3	2406.9	249	Yes	-	Piezometer	Screened across mafic intrusives, limestone, and diabase breccia.
DH16-22	GT-40	12/18/2016	1/6/2017	841494.9	912378.3	2303	250	Yes	-	Piezometer	Screened in Pinal Schist
DH17-23	GT-06	1/5/2017	1/8/2017	843657.7	916937.3	2419.8	250	Yes	-	Piezometer	Screened in Apache Leap Tuff
DH17-24	GT-40-2	1/7/2017	1/8/2017	841494.9	912378.3	2303	75	No	-	Piezometer	Screened in Pinal Schist
DH17-25	GT-37	1/9/2017	1/15/2017	843072.1	914518.6	2350.4	249	Yes	-	Piezometer	Screened in Pioneer Shale
DH17-26	GT-13	1/10/2017	1/13/2017	834202.6	924372.3	2383.8	250	Yes	-	Piezometer	Screened in Gila Conglomerate
DH17-27	GT-12	1/14/2017	1/18/2017	832976.9	923487.7	2333	250	Yes	-	Piezometer	Screened in basalt
DH17-28	GT-23	1/16/2017	1/19/2017	835599.3	929090.3	2516	250	Yes	-	Piezometer	Screened in Gila Conglomerate
DH17-29	GT-14-2	1/23/2017	1/24/2017	838432.8	923219.9	2405	62	No	-	Backfilled	Backfilled with cement grout
DH17-30	GT-25	1/24/2017	1/27/2017	833472.1	931659.3	2472	249	Yes	-	Piezometer	Screened in Gila Conglomerate
DH17-31	GT-34	1/25/2017	1/29/2017	845356	939790	2877	249	No	DS16-12	Piezometer	Screened in Limestone and Apache Tuff
DH17-32	GT-42	1/28/2017	2/1/2017	837520.2	915556.5		250	Yes	-	Piezometer	Screened in Pinal Schist
DH17-33	GT-29	1/30/2017	2/2/2017	842390.7	937370.8	2709	250	No	DS16-13	Piezometer	Screened in Gila Sandstone
DH17-34	GT-27	2/2/2017	2/5/2017	837367.1	937529.8	2648	250	No	DS16-14	Backfilled	Backfilled with bentonite
DH17-35	GT-30	2/3/2017	2/6/2017	842900.4	933749.3	2710	250	Yes	-	Piezometer	Screened in Limestone and Diabase
DH17-36	GT-14-3	2/7/2017	2/8/2017	838432.8	923219.9	2405	100	No	DS16-01	Piezometer	Screened in Gila Conglomerate
DH17-37	GT-28	2/7/2017	2/9/2017	839358.2	936278.2	2664	250	Yes	-	Piezometer	Screened in Gila Conglomerate
DH17-38	GT-22	2/14/2017	2/17/2017	837080	927268.9	2402	250	Yes	-	Piezometer	Screened in Gila Conglomerate

Notes:

1: Coordinates in NAD83 SPC Zone AZ C-0202 (US Survey Feet)

2: ft-amsl = feet above mean sea level

3: ft-bgs = feet below ground surface

TABLE 2: HYDROGEOLOGICAL TESTING SUMMARY

Drillhole ID	Date	Test Number	Testing Zone (ft-bgs)		Packer Setup	Test Type	Unit Tested/Comments	Field Observations / Notes
			From	To				
DH16-01 (GT-14)	9/24/2016	1	44.40	303.00	Single	SI	Slightly weathered Gila conglomerate	Very low take
	9/25/2016	2	354.50	424.00	Single	SI	Basalt and contact with upper Gila unit	Very low take
	9/26/2016	3	434.50	451.00	Single	SI, CRI	Fracture zone in Mescal limestone	High take
DH16-02 (GT-08)	9/29/2016	1	55.00	99.00	Single	SI	Slightly weathered Gila conglomerate	Low Take
	10/1/2016	2	105.05	250.00	Single	SI, CRI	Fresh Gila Conglomerate, contact with Apache Leap Tuff	Moderate Take
	10/1/2016	3	236.45	260.00	Single	SI	Tuff/Gila Contact	Very low take
	10/1/2016	4	196.45	260.00	Single	SI	Lower Gila and Apache Leap Tuff	Very low take
DH16-03 (GT-07)	10/4/2016	1	75.00	164.00	Single	SI, CRI	Lower Gila and contact with Apache Leap Tuff.	Moderate take
	10/5/2016	2	45.50	59.60	Straddle	SI, CRI	Straddle packer over zone of lost circulation.	High take
	10/5/2016	3	115.00	164.00	Single	SI	Fresh Gila and contact with Apache Leap Tuff.	Moderate take
DH16-04 (GT-41)	10/7/2016	1	0.00	35.00	NA	FHT	Slightly weathered Pinal Schist	Low take
	10/7/2016	2	22.85	50.00	Single	SI, CRI	Pinal Schist	Moderate take
	10/8/2016	3	78.95	108.00	Single	SI, CRI	Pinal Schist and contact with mafic intrusive	Moderate take
	10/10/2016	4	189.55	220.00	Single	SI	Pinal Schist	Low take
DH16-05 (GT-39)	10/14/2016	1	28.95	43.00	NA	FHT	Mafic intrusive contact with Pinal Schist	High take
	10/15/2016	2	69.35	99.00	Single	SI, CRI	Competent Pinal Schist / contact with mafic intrusive.	Moderate take
	10/16/2016	3	109.30	189.00	Single	SI, CRI	Mafic intrusive contact with Pinal Schist	Moderate-low take
	10/17/2016	4	184.35	250.00	Single	SI	Faulted/sheared Pinal schist.	Low take
	10/17/2016	5	49.35	62.50	Straddle	SI	Competent Pinal schist.	Low take
DH16-06 (GT-21)	10/21/2016	1	0.00	29.00	NA	FHT	Weathered Gila Conglomerate	Moderate-low take
	10/21/2016	2	34.10	64.00	Single	SI	Slightly weathered Gila conglomerate	Very low take
	10/22/2016	3	64.10	109.00	Single	SI	Fresh Gila conglomerate	Very low take
	10/22/2016	4	114.10	139.00	Single	SI, CRI	Fault zone in fresh Gila conglomerate	High take
	10/23/2016	5	139.10	249.00	Single	SI	Fresh Gila conglomerate	Very low take
DH16-07 (GT-20)	10/25/2016	1	24.10	49.00	Single	SI	Slightly weathered Gila conglomerate	Low Take
	10/26/2016	2	49.10	104.00	Single	SI	Fresh Gila conglomerate	Very low take
	10/26/2016	3	124.10	152.50	Single	SI	Slightly weathered rhyolitic perlite	Moderate-low take
	10/27/2016	4	194.10	249.00	Single	SI, CRI	Moderately to highly weathered rhyolite	High Take
DH16-08 (GT-15)-A	10/29/2016	1	0.00	29.00	NA	FHT	Weathered Gila conglomerate	Low Take
DH16-08 (GT-15)-B	10/30/2016	2	34.60	69.00	Single	SI	Slightly weathered Gila conglomerate	Low take
	10/31/2016	3	74.60	142.00	Single	SI	Fresh Gila conglomerate	Low take
	11/1/2016	4	139.60	249.00	Single	SI	Fresh Gila conglomerate	Low take
DH16-09 (GT-32)	11/3/2016	1	8.95	24.00	NA	FHT	Weathered perlitic rhyolite	Low take
	11/3/2016	2	54.35	97.00	Single	SI, CRI	Fractured rhyolite	Very high take, unsuccessful test
	11/5/2016	3	93.80	109.00	Single	SI, CRI	Fractured rhyolite	High take
	11/6/2016	4	114.30	168.00	Single	SI, CRI	Fractured rhyolite	High take
	11/6/2016	5	183.45	250.00	Single	SI, GFI	Fractured rhyolite	Very high take
DH16-10 (GT-31)	11/8/2016	1	0.00	24.00	NA	FHT	Perlite breccia	Very low take
	11/9/2016	2	43.65	104.00	Single	SI	Foliated rhyolite	Low take
	11/10/2016	3	104.40	208.50	Single	SI	Foliated rhyolite	Low take
	11/10/2016	4	214.40	254.00	Single	SI	Rhyolite with zone of lost circulation	High Take
	11/11/2016	4b	214.40	254.00	Single	CRI	Rhyolite with zone of lost circulation	High Take
DH16-11 (GT-18)	11/13/2016	1	0.00	29.00	NA	FHT	Weathered diabase	Low Take
	11/13/2016	2	24.07	69.00	Single	SI, CRI	Slightly weathered diabase	Moderate-high take
	11/14/2016	3	74.07	133.50	Single	SI	Fresh diabase	Low Take
	11/15/2016	4	154.07	254.00	Single	SI	Fresh diabase	Low Take
DH16-12 (GT-19)	11/17/2016	1	0.00	31.00	NA	FHT	Alluvium and weathered Gila Conglomerate	Very low take
	11/17/2016	2	34.30	69.00	Single	SI	Slightly weathered Gila conglomerate	Very low take
	11/18/2016	3	74.30	119.00	Single	SI	Fresh Gila Conglomerate	Very low take
	11/18/2016	4	109.30	174.00	Single	SI, CRI	Gila conglomerate with fracture	Moderate Take
	11/19/2016	5	194.30	293.00	Single	SI	Gila conglomerate and Apache Leap Tuff	Low take

TABLE 2: HYDROGEOLOGICAL TESTING SUMMARY

Drillhole ID	Date	Test Number	Testing Zone (ft-bgs)		Packer Setup	Test Type	Unit Tested/Comments	Field Observations / Notes
			From	To				
DH16-13 (GT-17)	11/28/2016	1	0.00	28.00	NA	FHT	Alluvium and weathered Gila Conglomerate	Low (no) take
	11/29/2016	2	29.00	59.00	Single	SI	Slightly weathered Gila conglomerate	No take
	11/30/2016	3	64.90	154.00	Single	SI	Slightly weathered Gila conglomerate	Low take
	11/30/2016	4	164.00	249.00	Single	SI, CRI	Apache Leap Tuff	Moderate take
DH16-14 (GT-01)	11/30/2016	1	0.00	38.00	NA	FHT	Pinal Schist	Very low take
	12/1/2016	2	77.30	91.50	Single	SI	Pinal Schist	Low take
	12/2/2016	3	77.30	238.50	Single	SI	Pinal Schist	Low take
DH16-15 (GT-16)	12/2/2016	1	0.00	29.00	N/A	FHT	Alluvium and weathered Gila Conglomerate	Very low to (No take)
	12/3/2016	2	24.85	74.00	Single	SI	Slightly weathered Gila conglomerate	No take
	12/3/2016	3	79.85	124.00	Single	SI	Fresh Gila conglomerate	No take
	12/4/2016	4	134.85	250.00	Single	SI	Fresh Gila conglomerate	Very low take
	12/5/2016	5	249.85	290.00	Single	SI	Fresh Gila conglomerate	Very low take
DH16-16 (GT-02)	12/4/2016	1	0.00	17.00	NA	FHT	Test unsuccessful due to hole cave	NA
	12/5/2016	2	17.30	77.00	Single	SI, CRI	Pinal Schist	High take
	12/5/2015	3	112.85	142.00	Single	SI, CRI	Pinal Schist	High take
	12/6/2016	4	182.90	250.00	Single	SI	Diabase	Very low take
DH16-17 (GT-36)	12/6/2016	1	0.00	38.00	NA	FHT	Test unsuccessful due to hole cave	NA
	12/7/2016	2	39.85	70.00	Single	SI	Pinal Schist	Low take
	12/8/2016	3	69.85	139.50	Single	SI	Pinal Schist	Low take
	12/9/2016	4	139.85	199.00	Single	SI	Pinal Schist	Low take
DH16-18 (GT-35)	12/8/2016	1	0.00	24.00	NA	FHT	Unconsolidated alluvium & Pinal Schist	Low take
	12/9/2016	2	27.20	80.50	Single	SI	Highly weathered Pinal Schist	Low take
	12/10/2016	3	83.20	184.50	Single	SI	Moderately weathered Pinal Schist	Low take
	12/11/2016	4	183.20	249.50	Single	SI	Pinal Schist	Low take
DH16-19 (GT-04)	12/11/2016	1	0.00	39.00	NA	FHT	Weathered basalt	Low take
	12/12/2016	2	39.85	57.50	Single	SI, CRI	Limestone/Diabase contact	Moderate Take
	12/13/2016	3	54.85	139.00	Single	SI	Weathered Diabase	Low take
	12/13/2016	4	134.00	189.00	Single	SI	Fresh Diabase	Low take
	12/14/2016	5	189.85	249.00	Single	SI	Fresh Diabase	Low take
DH16-20 (GT-03)	12/12/2016	1	0.00	25.00	NA	FHT	Brecciated diabase	Low-moderate take
	12/13/2016	2	35.66	57.00	Single	SI	Contact between Diabase and Limestone	Very low take
	12/14/2016	3	52.25	131.00	Single	SI	Limestone	Very low take
	12/15/2016	4	227.35	250.00	Single	SI, CRI	Fractured Quartzite	High take
	12/16/2016	5	131.45	225.00	Single	sdfs	Cemented and fractured Quartzite	Moderate Take
DH16-21 (GT-05)	12/16/2016	1	0.00	31.50	NA	FHT	Weathered diabase	Low take
	12/18/2016	2	45.00	64.00	NA	FHT	Weathered diabase	Low take
	12/21/2016	3	204.79	249.00	Single	SI	Test zone in diabase.	Very low take
	12/21/2016	4	84.79	249.00	-	-	Unable to seat packers. Test unsuccessful	NA
	12/21/2016	5	55.00	249.00	NA	FHT	Moderately weathered diabase	Low Take
DH16-22 (GT-40)	12/19/2016	1	0.00	32.00	NA	FHT	Highly weathered Pinal Schist	Low take
	12/20/2016	2	30.00	90.00	NA	FHT	Highly weathered Pinal Schist	Low take
	12/21/2016	3	92.25	150.00	Single	SI	Moderately to highly weathered Pinal Schist	Very low take
	1/5/2017	4	147.30	250.00	Single	SI	SI test in highly weathered Pinal schist	Low take
DH17-23 (GT-6)-A	N/A							
DH17-23 (GT-6)-B	12/19/2016	1	0.00	32.00	NA	FHT	Highly weathered Pinal Schist	Low take
	12/20/2016	2	30.00	64.00	NA	FHT	Highly weathered Pinal Schist	Mod. take
	12/21/2016	3	49.60	79.00	Single	SI	Moderately to highly weathered Pinal Schist	Low take
	1/5/2017	4	104.60	250.00	Single	SI	Highly weathered Pinal schist	Low take
DH17-24 (GT-40-2)	1/8/2017	1	37.30	75.00	Single	SI	Second borehole at GT-40 site; Pinal schist	Low take
DH17-25 (GT-37)	1/11/2017	1	0.00	37.00	NA	FHT	Alluvium and weathered Pioneer Shale	Low take
	1/13/2017	2	59.00	102.00	Single	SI	Weathered Pioneer shale	Low take
	1/14/2017	3	109.00	249.00	Single	SI	Weathered Pioneer shale	Low take

TABLE 2: HYDROGEOLOGICAL TESTING SUMMARY

Drillhole ID	Date	Test Number	Testing Zone (ft-bgs)		Packer Setup	Test Type	Unit Tested/Comments	Field Observations / Notes
			From	To				
DH17-26 (GT-13)	1/11/2017	1	0.00	12.00	NA	FHT	Highly weathered Gila Conglomerate	Low take
	1/11/2017	2	16.30	67.00	Single	SI	Moderately weathered Gila Conglomerate	Low take
	1/12/2017	3	65.78	162.00	Single	SI	Mod. weathered sandstone beds of Gila	Very low take
	1/13/2017	4	166.45	250.00	Single	SI	Slightly weathered basalt	Mod. take
DH17-27 (GT-12)	1/15/2017	1	33.20	62.00	Single	SI, CRI	Moderately weathered basalt	High take
	1/16/2017	2	63.20	132.00	Single	SI	Basalt	Low take
	1/17/2017	3	133.20	250.00	Single	SI, CRI	Basalt and tuff	Moderate Take
	1/18/2017	4	193.20	250.00	Single	SI	Moderate- to strongly-welded tuff	No take
DH17-28 (GT-23)	1/17/2017	1	0.00	32.00	NA	FHT	Alluvium and weathered Gila Conglomerate	Moderate take
	1/17/2017	2	29.60	104.00	Single	SI, CRI	Gila Conglomerate	Moderate take
	1/18/2017	3	104.60	250.00	Single	SI	Gila Conglomerate	No take
DH17-29 (GT-14-2)	1/23/2017	1	0.00	27.00	NA	FHT	Alluvium and weathered Gila Sandstone	High Take
	1/24/2017	2	23.25	62.00	Single	SI, CRI	Weathered Gila Sandstone	High take
DH17-30 (GT-25)	1/24/2017	1	0.00	32.50	NA	FHT	Gila Conglomerate	Low take
	1/25/2017	2	33.45	94.00	Single	SI	Slightly/moderately weathered Gila Conglomerate	Low take
	1/26/2017	3	94.45	250.00	Single	SI	Fresh Gila Conglomerate	No take
DH17-31 (GT-34)	1/25/2017	1	0.00	30.00	NA	FHT	Colluvium / Weathered Apache Leap Tuff	Low take
	1/25/2017	2	22.85	67.00	Single	SI, CRI	Apache Leap Tuff	High take
	1/26/2017	3	62.75	111.00	Single	SI, GFI	Fractured Apache Leap Tuff	Very high take
	1/27/2017	4	107.45	157.00	Single	SI, GFI	Fractured Apache Leap Tuff	Very high take
	1/28/2017	5	156.45	231.00	Single	SI, CRI	Bedded/fractured limestone	High take
	1/28/2017	6	232.05	249.00	Single	SI	Diabase	Very low take
DH17-32 (GT-42)	1/28/2017	1	0.00	32.50	NA	FHT	Quaternary alluvium	Very high take
	1/29/2017	2	34.75	58.00	NA	FHT	Pinal Schist and diabase intrusion	High take
	1/30/2017	3	53.95	144.00	Single	SI, CRI	Pinal Schist	High take
	1/31/2017	4	225.50	250.00	Single	SI	Pinal Schist	Very low take
DH17-33 (GT-29)	1/30/2017	1	0.00	22.00	NA	FHT	Weathered Gila sandstone	Low take
	1/31/2017	3	17.95	87.00	Single	SI, GFI	Fractured Gila sandstone	High take
	1/31/2017	4a	82.95	152.00	Single	SI	Weathered tuff	High take
	2/1/2017	4b	82.95	152.00	Single	CRI	Weathered tuff	High take
	2/1/2017	5	151.45	250.00	Single	SI	Massive tuff	Low take
DH17-34 (GT-27)	2/3/2017	1	8.95	19.00	NA	FHT	Alluvium and weathered Gila conglomerate	Low take
	2/3/2017	2	24.95	47.00	Single	SI, GFI	Gila conglomerate	Very high take
	2/4/2017	3	44.95	104.00	Single	SI, GFI	Gila conglomerate	Very high take
	2/5/2017	4	79.80	189.00	Single	SI, CRI	Gila conglomerate	Moderate-high take
	2/5/2017	5	184.90	250.00	Single	SI	Gila conglomerate	No take
DH17-35 (GT-30)	2/3/2017	1	0.00	22.00	NA	FHT	Brecciated fractured diabase	Moderate take
	2/3/2017	2	15.00	57.00	NA	FHT	Brecciated diabase	Low take
	2/4/2017	3	51.45	141.00	Single	SI	Brecciated diabase	Low take
	2/6/2017	4	137.95	250.00	Single	SI	Limestone	No take
DH17-36 (GT-14-3)	2/7/2017	1	0.00	10.00	NA	FHT	Gila sandstone	Low take
	2/7/2017	2	14.80	100.00	Single	SI	Gila sandstone	Low take
DH17-37 (GT-28)	2/7/2017	1	0.00	27.00	NA	FHT	Quaternary alluvium and Gila Conglomerate	Moderate take
	2/8/2017	2	32.95	121.00	Single	SI, CRI	Gila Conglomerate with lost circulation zone	High take
	2/9/2017	3	112.95	250.00	Single	SI	Gila Conglomerate	No take
DH17-38 (GT-22)	2/14/2017	1	0.00	16.00	NA	FHT	Weathered Gila Conglomerate	Low take
	2/15/2017	2	24.95	129.00	Single	SI	Slightly weathered Gila Conglomerate	Very low take
	2/16/2017	3	124.95	250.00	Single	SI	Gila Conglomerate	Very low take
	2/16/2017	4	184.85	250.00	Single	SI	Gila Conglomerate	Very low take

Notes:

FHT = Falling Head Test

SI = Slug Injection Test

CRI = Continuous Rate Injection Test

GFI = Gravity Feed Injection Test

TABLE 3: HYDROGEOLOGICAL TESTING RESULTS

Drillhole	Test Number	Test Interval (feet)		Packer Test Sequence Analyzed	Hydraulic Conductivity (cm/sec)	Analytical Solution Reference	General Assumptions/Notes
		Top	Bottom				
DH16-01 (GT-14)	1	44.40	303.00	SI	8.E-07	Bouwer-Rice	Unconfined, uniform flow
	2	354.50	424.00	SI	1.E-06	Bouwer-Rice	Confined, uniform flow
	3	434.50	451.00	CRI	6.E-03	Theis	Confined, uniform flow
DH16-02 (GT-08)	1	55.00	99.00	SI	3.E-06	Bouwer-Rice	Confined, uniform flow
	2	105.05	250.00	CRI	2.E-05	Bouwer-Rice	Confined, uniform flow
	2	105.05	250.00	CRI	NA	NA	Data irreconcilable, analysis not possible
	3	236.45	260.00	SI	2.E-06	Bouwer-Rice	Confined, uniform flow
	4	196.45	260.00	SI	5.E-07	Bouwer-Rice	Confined, uniform flow
DH16-03 (GT-07)	1	64.75	164.00	SI	2.E-05	Bouwer-Rice	Unconfined, uniform flow
	1	75.00	164.00	CRI	2.E-05	Theis	Confined, uniform flow
	2	45.50	59.60	CRI	6.E-03	Theis	Confined, uniform flow
	3	115.00	164.00	SI	3.E-05	Bouwer-Rice	Confined, uniform flow
DH16-04 (GT-41)	1	0.00	35.00	FHT	3.E-06	Bouwer-Rice	Unconfined, uniform flow, falling head, no packer
	2	22.85	50.00	CRI	5.E-04	Theis	Confined, uniform flow
	3 Slug	78.95	108.00	SI	8.E-05	Bouwer-Rice	Confined, uniform flow
	3 CRI	78.95	108.00	CRI	2.E-04	Theis	Confined, uniform flow
	4	189.55	220.00	SI	2.E-05	Bouwer-Rice	Confined, uniform flow
DH16-05 (GT-39)	1	28.95	43.00	FHT	4.E-04	Bouwer-Rice	Unconfined, uniform flow
	2 CRI	69.35	99.00	CRI	8.E-05	Theis	Confined, estimated anisotropy
	3 Slug	109.30	189.00	SI	5.E-05	Bouwer-Rice	Confined, uniform flow
	3 CRI	109.30	189.00	CRI	6.E-05	Gringarten (Horizontal)	Confined, fractured flow, estimated anisotropy
	4	184.35	250.00	SI	1.E-05	Bouwer-Rice	Confined, uniform flow
	5	49.35	62.50	SI	1.E-05	Bouwer-Rice	Confined, uniform flow
DH16-06 (GT-21)	1	0.00	29.00	FHT	6.E-05	Bouwer-Rice	Confined, uniform flow
	2	34.10	64.00	SI	2.E-07	Bouwer-Rice	Confined, uniform flow
	3	64.10	109.00	SI	9.E-07	Bouwer-Rice	Confined, uniform flow
	4	114.10	139.00	CRI	1.E-04	Theis	Confined, estimated anisotropy
	5	139.10	249.00	SI	5.E-08	Bouwer-Rice	Confined, uniform flow
DH16-07 (GT-20)	1	24.10	49.00	SI	1.E-06	Bouwer-Rice	Confined, uniform flow
	2	49.10	104.00	SI	5.E-08	Bouwer-Rice	Confined, uniform flow
	3	124.10	152.50	SI	3.E-06	Bouwer-Rice	Confined, uniform flow
	4	194.10	249.00	CRI	8.E-05	Theis	Confined, estimated anisotropy
DH16-08 (GT-15)-A	1	0.00	29.00	FHT	3.E-06	Bouwer-Rice	Unconfined, uniform flow
DH16-08 (GT-15)-B	2	34.60	69.00	SI	6.E-07	Bouwer-Rice	Confined, uniform flow
	3	74.60	142.00	SI	8.E-07	Bouwer-Rice	Confined, uniform flow
	4	139.60	249.00	SI	2.E-07	Bouwer-Rice	Confined, uniform flow
DH16-09 (GT-32)	1	8.95	24.00	FHT	2.E-05	Bouwer-Rice	Unconfined, uniform flow
	2	54.35	97.00	CRI	NA	NA	Data irreconcilable, analysis not possible
	3	93.80	109.00	SI	4.E-05	Bouwer-Rice	Confined, uniform flow
	3	93.80	109.00	CRI	5.E-04	Theis	Confined, estimated anisotropy
	4	114.30	168.00	CRI	3.E-05	Theis	Confined, estimated anisotropy
	5	183.45	250.00	GFI	2.E-03	Theis	Confined, estimated anisotropy, open SB, not pressurized
DH16-10 (GT-31)	1	0.00	24.00	FHT	4.E-06	Bouwer-Rice	Unconfined, uniform flow
	2	43.65	104.00	SI	4.E-06	Bouwer-Rice	Confined, uniform flow
	3	104.40	208.50	SI	1.E-06	Bouwer-Rice	Confined, uniform flow
	4	214.40	254.00	SI	7.E-05	Bouwer-Rice	Confined, uniform flow
	4b	214.40	254.00	CRI	8.E-05	Theis	Confined, estimated anisotropy
DH16-11 (GT-18)	1	0.00	29.00	FHT	6.E-06	Bouwer-Rice	Unconfined, uniform flow
	2	24.07	69.00	CRI	4.E-06	Theis	Confined, estimated anisotropy
	3	74.07	133.50	SI	2.E-07	Bouwer-Rice	Confined, uniform flow
	4	154.07	254.00	SI	NA	NA	Data not recovered
DH16-12 (GT-19)	1	0.00	31.00	FHT	7.E-06	Bouwer-Rice	Unconfined, uniform flow
	2	34.30	69.00	SI	3.E-07	Bouwer-Rice	Confined, uniform flow
	3	74.30	119.00	SI	8.E-08	Bouwer-Rice	Confined, uniform flow
	4	109.30	174.00	CRI	2.E-05	Theis	Confined, estimated anisotropy
	5	194.30	293.00	SI	2.E-07	Bouwer-Rice	Confined, uniform flow
DH16-13 (GT-17)	1	0.00	28.00	FHT	6.E-07	Bouwer-Rice	Unconfined, uniform flow
	2	29.00	59.00	SI	7.E-07	Bouwer-Rice	Confined, uniform flow
	3	64.90	154.00	SI	5.E-07	Bouwer-Rice	Confined, uniform flow
	4	164.00	249.00	CRI	5.E-06	Gringarten (Vertical)	Confined, estimated anisotropy

TABLE 3: HYDROGEOLOGICAL TESTING RESULTS

Drillhole	Test Number	Test Interval (feet)		Packer Test Sequence Analyzed	Hydraulic Conductivity (cm/sec)	Analytical Solution Reference	General Assumptions/Notes
		Top	Bottom				
DH16-14 (GT-01)	1	0.00	38.00	FHT	3.E-06	Bouwer-Rice	Unconfined, uniform flow
	2	77.30	91.50	SI	2.E-06	Bouwer-Rice	Confined, uniform flow
	3	77.30	238.50	SI	5.E-06	Bouwer-Rice	Confined, uniform flow
DH16-15 (GT-16)	1	0.00	29.00	FHT	2.E-06	Bouwer-Rice	Unconfined, uniform flow
	2	24.85	74.00	SI	2.E-07	Bouwer-Rice	Confined, uniform flow
	3	79.85	124.00	SI	3.E-07	Bouwer-Rice	Confined, uniform flow
	4	134.85	250.00	SI	4.E-07	Bouwer-Rice	Confined, uniform flow
	5	249.85	290.00	SI	4.E-07	Bouwer-Rice	Confined, uniform flow
DH16-16 (GT-02)	1	0.00	17.00	FHT	NA	NA	Unsuccessful test due to hole cave.
	2	17.30	77.00	CRI	5.E-05	Theis	Confined, estimated anisotropy
	3	112.85	142.00	CRI	4.E-04	Theis	Confined, estimated anisotropy
	4	182.90	250.00	SI	3.E-07	Bouwer-Rice	Confined, uniform flow
DH16-17 (GT-36)	1	0.00	38.00	FHT	NA	NA	Unsuccessful test due to hole cave.
	2	39.85	70.00	SI	8.E-07	Bouwer-Rice	Unconfined, uniform flow
	3	69.85	139.50	SI	1.E-07	Bouwer-Rice	Confined, uniform flow
	4	139.85	199.00	SI	6.E-08	Bouwer-Rice	Confined, uniform flow
DH16-18 (GT-35)	1	0.00	24.00	FHT	1.E-05	Bouwer-Rice	Unconfined, uniform flow
	2	27.20	80.50	SI	3.E-07	Bouwer-Rice	Confined, uniform flow
	3	83.20	184.50	SI	4.E-07	Bouwer-Rice	Confined, uniform flow
	4	183.20	249.50	SI	4.E-07	Bouwer-Rice	Confined, uniform flow
DH-16-19 (GT-04)	1	0.00	39.00	FHT	1.E-05	Bouwer-Rice	Confined, uniform flow
	2	39.85	57.50	SI	1.E-05	Bouwer-Rice	Confined, uniform flow
	2	39.85	57.50	CRI	2.E-04	Theis	Confined, estimated anisotropy
	3	54.85	139.00	SI	8.E-07	Bouwer-Rice	Confined, uniform flow
	4	134.00	189.00	SI	7.E-07	Bouwer-Rice	Confined, uniform flow
	5	189.85	249.00	SI	2.E-06	Bouwer-Rice	Confined, uniform flow
DH16-20 (GT-03)	1	0.00	25.00	FHT	2.E-05	Bouwer-Rice	Unconfined, uniform flow
	2	35.66	57.00	SI	1.E-07	Bouwer-Rice	Confined, uniform flow
	3	52.25	131.00	SI	4.E-07	Bouwer-Rice	Confined, uniform flow
	4	227.35	250.00	CRI	3.E-05	Theis	Confined, estimated anisotropy
	5	131.45	225.00	CRI	1.E-05	Theis	Confined, estimated anisotropy
DH16-21 (GT-05)	1	0.00	31.50	FHT	9.E-06	Bouwer-Rice	Unconfined, uniform flow
	2	45.00	64.00	FHT	5.E-08	Bouwer-Rice	Unconfined, uniform flow
	3	204.79	249.00	SI	9.E-08	Bouwer-Rice	Confined, uniform flow
	4	84.79	249.00	NA	NA	NA	Unable to seat packers, test unsuccessful
	5	55.00	249.00	FHT	3.E-07	Bouwer-Rice	Confined, uniform flow
DH16-22 (GT-40)	1	0.00	32.00	FHT	4.E-06	Bouwer-Rice	Unconfined, uniform flow
	2	30.00	90.00	FHT	2.E-06	Bouwer-Rice	Confined, uniform flow
	3	92.25	150.00	SI	2.E-07	Bouwer-Rice	Confined, uniform flow
	4	147.30	250.00	SI	3.E-07	Bouwer-Rice	Confined, uniform flow
DH17-23 (GT-06)-B	1	0.00	32.00	FHT	5.E-06	Bouwer-Rice	Unconfined, uniform flow
	2	30.00	64.00	CRI	9.E-04	Theis	Confined, uniform flow, estimated anisotropy
	3	49.60	79.00	SI	3.E-06	Bouwer-Rice	Confined, uniform flow
	4	104.60	250.00	SI	2.E-06	Bouwer-Rice	Confined, uniform flow
DH17-24 (GT-40-2)	1	37.30	75.00	SI	3.E-07	Bouwer-Rice	Confined, uniform flow
DH17-25 (GT-37)	1	0.00	37.00	FHT	2.E-05	Bouwer-Rice	Unconfined, uniform flow
	2	59.00	102.00	SI	3.E-07	Bouwer-Rice	Confined, uniform flow
	3	109.00	249.00	SI	2.E-07	Bouwer-Rice	Confined, uniform flow
DH17-26 (GT-13)	1	0.00	12.00	FHT	2.E-04	Dagan Partial Submergence	Unconfined, estimated anisotropy
	2	16.30	67.00	SI	6.E-06	Bouwer-Rice	Confined, uniform flow
	3	65.78	162.00	SI	3.E-07	Bouwer-Rice	Confined, uniform flow
	4	166.45	250.00	SI	7.E-06	Hvorslev	Confined, uniform flow
DH17-27 (GT-12)	1	33.20	62.00	SI	5.E-05	Bouwer-Rice	Confined, uniform flow
	1	33.20	62.00	CRI	5.E-05	Theis	Confined, uniform flow, estimated anisotropy
	2	63.20	132.00	SI	9.E-08	Bouwer-Rice	Confined, uniform flow
	3	133.20	250.00	SI	3.E-06	Bouwer-Rice	Confined, uniform flow, matched late time data
	3	133.20	250.00	CRI	3.E-06	Theis	Confined, uniform flow, estimated anisotropy
	3	133.20	193.20	SI	4.E-06	Bouwer-Rice	Confined, uniform flow, matched late time data; with depth interval from test 4 omitted
	3	133.20	193.20	CRI	6.E-06	Theis	Confined, uniform flow, estimated anisotropy; with depth interval from test 4 omitted
	4	193.20	250.00	SI	4.E-08	Bouwer-Rice	Confined, uniform flow

TABLE 3: HYDROGEOLOGICAL TESTING RESULTS

Drillhole	Test Number	Test Interval (feet)		Packer Test Sequence Analyzed	Hydraulic Conductivity (cm/sec)	Analytical Solution Reference	General Assumptions/Notes
		Top	Bottom				
DH17-28 (GT-23)	1	0.00	32.00	FHT	1.E-05	Bouwer-Rice	Unconfined, uniform flow
	2	29.60	104.00	CRI	9.E-06	Theis	Confined, uniform flow, estimated anisotropy
	3	104.60	250.00	SI	5.E-08	Bouwer-Rice	Confined, uniform flow
DH17-29 (GT-14-2)	1	0.00	27.00	FHT	9.E-04	Hvorslev	Unconfined, b estimated at 1 ft based on field notes
	2	23.25	62.00	CRI	1.E-02	Gringarten (Horizontal)	Confined, estimated anisotropy
DH17-30 (GT-25)	1	0.00	32.50	FHT	2.E-05	Bouwer-Rice	Unconfined, uniform flow
	2	33.45	94.00	SI	2.E-06	Bouwer-Rice	Confined, uniform flow
	3	94.45	250.00	SI	1.E-08	Bouwer-Rice	Confined, uniform flow
DH17-31 (GT-34)	1	0.00	30.00	FHT	1.E-05	Bouwer-Rice	Unconfined, uniform flow
	2	22.85	67.00	CRI	2.E-04	Theis	Confined, uniform flow, estimated anisotropy
	3	62.75	111.00	CRI	3.E-01	Gringarten (Vertical)	Confined, uniform flow, estimated anisotropy, Open SB, not pressurized, match late time data only
	4	107.45	157.00	CRI	6.E-03	Theis	Confined, uniform flow, estimated anisotropy, Open SB, not pressurized
	5	156.45	231.00	CRI	2.E-05	Theis	Confined, uniform flow, estimated anisotropy
	6	232.05	249.00	SI	1.E-07	Bouwer-Rice	Confined, uniform flow
DH17-32 (GT-42)	1	0.00	32.50	FHT	1.E-03	Dagan Partial Submergence	Unconfined, matched to late time data
	2	34.75	58.00	FHT	2.E-03	Hvorslev	Confined, uniform flow
	3	53.95	144.00	SI	3.E-06	Hvorslev	Confined, uniform flow
	3	53.95	144.00	CRI	1.E-05	Theis	Confined, uniform flow, estimated anisotropy
	4	225.50	250.00	SI	9.E-07	Bouwer-Rice	Confined, uniform flow
DH17-33 (GT-29)	1	0.00	22.00	FHT	6.E-06	Bouwer-Rice	Unconfined, uniform flow
	2	557.15	87.00	CRI	7.E-04	Theis	Confined, uniform flow, estimated anisotropy
	3	17.95	87.00	GFI	4.E-03	Theis	Confined, uniform flow, estimated anisotropy, Open SB, not pressurized
	4b	82.95	152.00	CRI	2.E-04	Theis	Confined, uniform flow, estimated anisotropy
	5	151.45	250.00	SI	3.E-07	Bouwer-Rice	Confined, uniform flow
DH17-34 (GT-27)	1	8.95	19.00	FHT	3.E-06	Bouwer-Rice	Unconfined, uniform flow
	2	24.95	47.00	GFI	2.E-02	Theis	Confined, uniform flow, estimated anisotropy, Open SB, not pressurized
	3	44.95	104.00	GFI	2.E-02	Theis	Confined, uniform flow, estimated anisotropy, Open SB, not pressurized
	4	79.80	189.00	CRI	7.E-06	Theis	Confined, uniform flow, estimated anisotropy
	5	184.90	250.00	SI	3.E-08	Bouwer-Rice	Confined, uniform flow
DH17-35 (GT-30)	1	0.00	22.00	FHT	8.E-05	Bouwer-Rice	Unconfined, matched to late time data
	2	15.00	57.00	FHT	9.E-06	Dagan Partial Submergence	Unconfined, matched to late time data
	3	51.45	141.00	SI	5.E-07	Bouwer-Rice	Confined, uniform flow
	4	137.95	250.00	SI	2.E-08	Bouwer-Rice	Confined, uniform flow
DH17-36 (GT-14-3)	1	0.00	10.00	FHT	1.E-05	Bouwer-Rice	Unconfined, uniform flow
	2	14.80	100.00	SI	6.E-07	Bouwer-Rice	Confined, uniform flow, overnight test
DH17-37 (GT-28)	1	0.00	27.00	FHT	1.E-05	Bouwer-Rice	Unconfined, uniform flow
	2	32.95	121.00	CRI	3.E-04	Theis	Confined, uniform flow, estimated anisotropy
	3	112.95	250.00	SI	2.E-08	Bouwer-Rice	Unconfined, uniform flow
DH17-38 (GT-22)	1	0.00	16.00	FHT	1.E-05	Bouwer-Rice	Unconfined, uniform flow
	2	24.95	129.00	SI	5.E-07	Bouwer-Rice	Confined, uniform flow
	3	124.95	250.00	SI	5.E-07	Hvorslev	Confined, uniform flow, matched late time data
	4	184.85	250.00	SI	1.E-07	Bouwer-Rice	Confined, uniform flow

Notes:
FHT = Falling Head Test
SI = Slug Injection Test
CRI = Continuous Rate Injection Test
GFI = Gravity Feed Injection Test
cm/sec = centimeters per second

TABLE 4: GEOPHYSICAL SURVEY SUMMARY

Drillhole ID	Temp ID	Paired Site	Date	Gamma - Caliper	Optical Televiewer	Acoustic Televiewer	Dual Induction - Resistivity	Sonic	E-Logs	Other
DH16-01	GT-14	DS16-01	9/30/2016	X	X	X	X	X	X	
DH16-04	GT-41	-	10/8/2016	X	X	X	X			
DH16-05	GT-39	-	10/18/2016	X		X		X	X	
DH16-06	GT-21	-	10/23/2016	X	X	X	X	X	X	
DH16-07	GT-20	DS16-03	10/27/2016	X		X		X	X	
DH16-08	GT-15	DS16-04	11/1/2016	X		X		X	X	
DH16-09	GT-32	-	11/7/2016	X		X		X	X	
DH16-10	GT-31	-	11/11/2016	X	X	X				Fluid Conductivity
DH16-14	GT-01	-	12/2/2016	X	X	X		X	X	
DH16-15	GT-16	-	12/4/2016	X	X	X		X	X	
DH16-19	GT-04	-	12/14/2016	X		X		X	X	
DH16-20	GT-03	DS16 -07	12/16/2016	X	X	X	X	X	X	
DH16-21	GT-05	-	12/21/2016	X		X		X	X	
DH16-22	GT-40	-	1/5/2017	X		X		X	X	
DH17-23	GT-06	-	1/8/2017	X	X	X		X	X	
DH17-25	GT-37	-	1/15/2017	X		X		X	X	
DH17-26	GT-13	-	1/13/2017	X	X		X	X	X	
DH17-27	GT-12	-	1/17/2017	X	X	X	X	X	X	
DH17-28	GT-23	-	1/19/2017	X	X	X		X	X	
DH17-30	GT-25	-	1/27/2017	X		X		X	X	
DH17-32	GT-42	-	2/1/2017	X		X		X	X	
DH17-35	GT-30	-	2/5/2017	X				X	X	
DH17-37	GT-28	-	2/9/2017	X		X		X	X	
DH17-38	GT-22	-	2/17/2017	X		X		X	X	

TABLE 5: PIEZOMETER CONSTRUCTION SUMMARY

DH	Screen 1 (ft-bgs)		Screen 2 (ft-bgs)		Filter Pack 1 (ft-bgs)		Filter Pack 2 (ft-bgs)		Bentonite Seal 1 (ft-bgs)		Bentonite Seal 2 (ft-bgs)		Bentonite Seal 3 (ft-bgs)		Surface Seal (ft-bgs)	
	From	To	From	To	From	To	From	To	From	To	From	To	From	To	From	To
DH16-01 (GT-14)	431	451	-	-	424.8	451	-	-	411.7	424.8	-	-	-	-	0	411.7
DH16-02 (GT-08)	24.8	84.5	-	-	21.8	87	-	-	17	21.8	-	-	-	-	0	17
DH16-03 (GT-07)	10.2	30.2	40.2	60.2	7.8	31.7	31.7	65.2	0	7.8	31.7	38.3	65.2	164	0	7.8
DH16-04 (GT-41)	169.6	189.6	-	-	164.4	195.2	-	-	148.2	164.4	189.6	220	-	-	0	148.2
DH16-05 (GT-39)	24	44	74	94	22.8	44.4	72.7	97.2	0	22	44.4	72.7	97.2	250	0	22
DH16-06 (GT-21)	125	195	-	-	121.8	197.2	-	-	116.6	121.8	197.2	249	-	-	0	116.6
DH16-07 (GT-20)	20	50	-	-	17	53.1	-	-	0	17	53.1	249	-	-	0	17
DH16-08 (GT-15)-B	20	110.2	-	-	18	111.2	-	-	0	18	111.2	249	-	-	0	18
DH16-09 (GT-32)	130.3	170.3	-	-	123.9	171.4	-	-	86.5	123.9	-	-	-	-	0	86.5
DH16-10 (GT-31)	230	250	-	-	200.1	254	-	-	174.9	200.1	-	-	-	-	0	174.9
DH16-11 (GT-18)	50	90	-	-	47.5	94.4	-	-	34	47.5	94.4	254	-	-	0	34
DH16-12 (GT-19)	182	272	-	-	151.2	282	-	-	140.7	151.2	282	293	-	-	0	140.7
DH16-13 (GT-17)	179	249	-	-	170.4	249	-	-	159.8	170.4	-	-	-	-	0	159.8
DH16-14 (GT-01)	65	125	-	-	61.3	126.7	-	-	49.2	61.3	126.7	217.7	-	-	0	49.2
DH16-15 (GT-16)	230	290	-	-	190	290	-	-	175.4	190	-	-	-	-	1	175.4
DH16-16 (GT-02)	30	120	-	-	25	122.8	-	-	0	25	122.8	250	-	-	0	25
DH16-17 (GT-36)	50	150	-	-	44.6	152.7	-	-	0	44.6	152.7	199	-	-	0	44.6
DH16-18 (GT-35)	25	85	-	-	22.0	88.0	-	-	0	22.0	88.0	249.5	-	-	0	22
DH16-19 (GT-4)	149	249	-	-	140.0	249.0	-	-	125.3	140	-	-	-	-	0	125.3
DH16-20 (GT-3)	65	115	-	-	60.1	120.0	-	-	0	60.1	-	-	-	-	0	60.1
DH16-21 (GT-5)	70	120	-	-	65.3	124.1			53.7	65.3	124.1	249			0	53.7
DH16-22 (GT-40)	115	215	-	-	109.1	215.9	-	-	92.1	109.1	215.9	239.5	-	-	0	92.1
DH17-23 (GT-6)	40	140	-	-	35.1	143.2	-	-	21.3	35.1	143.2	250	-	-	0	21.3
DH17-24 (GT-40-2)	27	67	-	-	25.2	67.0	-	-	0	25.2			-	-	0	25.2
DH17-25 (GT-37)	35	105	-	-	25.2	107	-	-	0	25.2	107	249			0	25.2
DH17-26 (GT-13)	190	250	-	-	177.8	250	-	-	164	177.8		-	-	-	0	164
DH17-27 (GT-12)	30	110	-	-	25	112	-	-	15	25	112	250	-	-	0	15
DH17-28 (GT-23)	25	105	-	-	22.1	107.2	-	-	0	22.1	107.2	250	-	-	0	22.1
DH17-29 (GT-14-2)	Drillhole Abandoned															
DH17-30 (GT-25)	35	95	-	-	33	97.3	-	-	0	33	97.3	249	-	-	0	33
DH17-31 (GT-34)	90	210	-	-	80.7	215	-	-	69.7	80.7	215	249	-	-	0	37.2
DH17-32 (GT-42)	40	200	-	-	37.2	202.2	-	-	28.6	37.2	202.2	247.8	-	-	0	28.6
DH17-33 (GT-29)	30	70	-	-	25	73	-	-	0	25	73	200	-	-	0	25
DH17-34 (GT-27)	Drillhole Abandoned															
DH17-35 (GT-30)	60	160	-	-	40.5	162.5	-	-	29	40.5	162.5	250	-	-	0	29
DH17-36 (GT-14-3)	22	92	-	-	21.3	100.3	-	-	0	21.3	-	-	-	-	0	21.3
DH17-37 (GT-28)	33	103	-	-	27.6	106.6	-	-	0	27.6	106.6	250	-	-	0	27.6
DH17-38 (GT-22)	22	122	-	-	19.7	124.9	-	-	15.6	19.7	125	250	-	-	0	15.6

Notes:
ft-bgs = feet below ground surface

TABLE 6: TEST PIT SUMMARY

Test Pit ID	Temp ID	Date Started	Date Completed	Northing[1]	Easting[1]	Elevation (ft-amsl)[2]	Depth (ft-bgs)[3]	Infiltration Testing	Notes
TP16-01	TP-10	10/24/2016	10/24/2016	834600.5	921637.5	2327.1	10	Yes	Ground refusal
TP16-02	TP-32	10/25/2016	10/25/2016	835966.4	922810.4	2351.5	7.5	Yes	Ground refusal
TP16-03	TP-11	10/25/2016	10/25/2016	836125.1	922950.1	2354.2	8	Yes	Ground refusal
TP16-04	TP-09	10/26/2016	10/26/2016	837235.4	921929.4	2351.4	4.5	Yes	Ground refusal
TP16-05	TP-08	10/27/2016	10/27/2016	837632.6	921190.7	2345.3	5	Yes	Ground refusal
TP16-06	TP-30	10/28/2016	10/28/2016	847387.1	928654.1	2633.0	9	Yes	Ground refusal
TP16-07	TP-31	11/2/2016	11/2/2016	845349.6	917532.3	2393.4	9	Yes	Equipment reach refusal
TP16-08	TP-06	11/2/2016	11/2/2016	844241.6	913961.2	2316.7	7	Yes	Ground refusal
TP16-09	TP-07	11/3/2016	11/3/2016	843939.3	913917.9	2307.2	7	Yes	Ground refusal
TP16-10	TP-05	11/3/2016	11/3/2016	845170.8	912879.8	2273.3	8	Yes	Ground refusal
TP16-11	TP-03	11/3/2016	11/3/2016	844417.0	911511.1	2250.8	10.5	Yes	Equipment reach refusal
TP16-12	TP-04	11/7/2016	11/7/2016	843840.9	911316.0	2242.1	13	Yes	Ground refusal
TP16-13	TP-01	11/7/2016	11/7/2016	842154.7	909538.7	2217.0	11	Yes	Ground refusal
TP16-14	TP-02	11/8/2016	11/8/2016	842064.6	909746.3	2208.0	14.5	Yes	Equipment reach refusal
TP16-15	TP-14	11/9/2016	11/9/2016	834508.4	923857.0	2373.5	5.5	No	Ground refusal
TP16-16	TP-15	11/9/2016	11/9/2016	834132.2	924736.7	2403.3	5.5	No	Ground refusal.
TP16-17	TP-16	11/9/2016	11/9/2016	833875.1	925733.4	2408.8	2.5	No	Ground refusal
TP16-18	TP-19	11/9/2016	11/9/2016	832690.5	930624.5	2458.4	15	No	Target Depth
TP16-19	TP-20	11/9/2016	11/9/2016	832629.9	930828.5	2445.8	14.5	No	Target Depth
TP16-20	TP-21	11/9/2016	11/9/2016	833496.8	931618.4	2477.4	8	No	Ground refusal.
TP16-21	TP-22	11/14/2016	11/14/2016	833442.6	931802.7	2470.2	11	No	Ground refusal
TP16-22	TP-24	11/15/2015	11/15/2016	835815.6	934410.9	2556.2	11	No	Hole caving
TP16-23	TP-23	11/15/2015	11/15/2016	835935.4	934229.4	2548.8	13	No	Ground refusal
TP16-24	TP-26	11/15/2015	11/15/2016	836446.1	940434.8	2744.0	13	No	Ground refusal
TP16-25	TP-25	11/15/2015	11/15/2016	837182.3	936863.4	2623.7	10	No	Ground refusal
TP16-26	TP-29	11/15/2015	11/15/2016	842383.3	937412.3	2702.9	10	No	Ground refusal
TP16-27	TP-27	11/15/2015	11/15/2016	839004.5	936129.1	2626.4	8	No	Ground refusal
TP16-28	TP-17	11/15/2015	11/15/2016	831625.6	927466.5	2389.8	3	No	Ground refusal
TP17-29	TP-13	1/26/2017	1/26/2017	837056.1	923562.3	2392.8	9	Yes	Ground refusal
TP17-30	TP-12	1/27/2017	1/27/2017	837446.7	923939.6	2402.7	10	Yes	Ground refusal

Notes:

1: Coordinates in NAD83 SPC Zone AZ C-0202 (US Survey Feet)

2: ft-amsl = feet above mean sea level

3: ft-bgs = feet below ground surface

TABLE 7: INFILTRATION TESTING SUMMARY

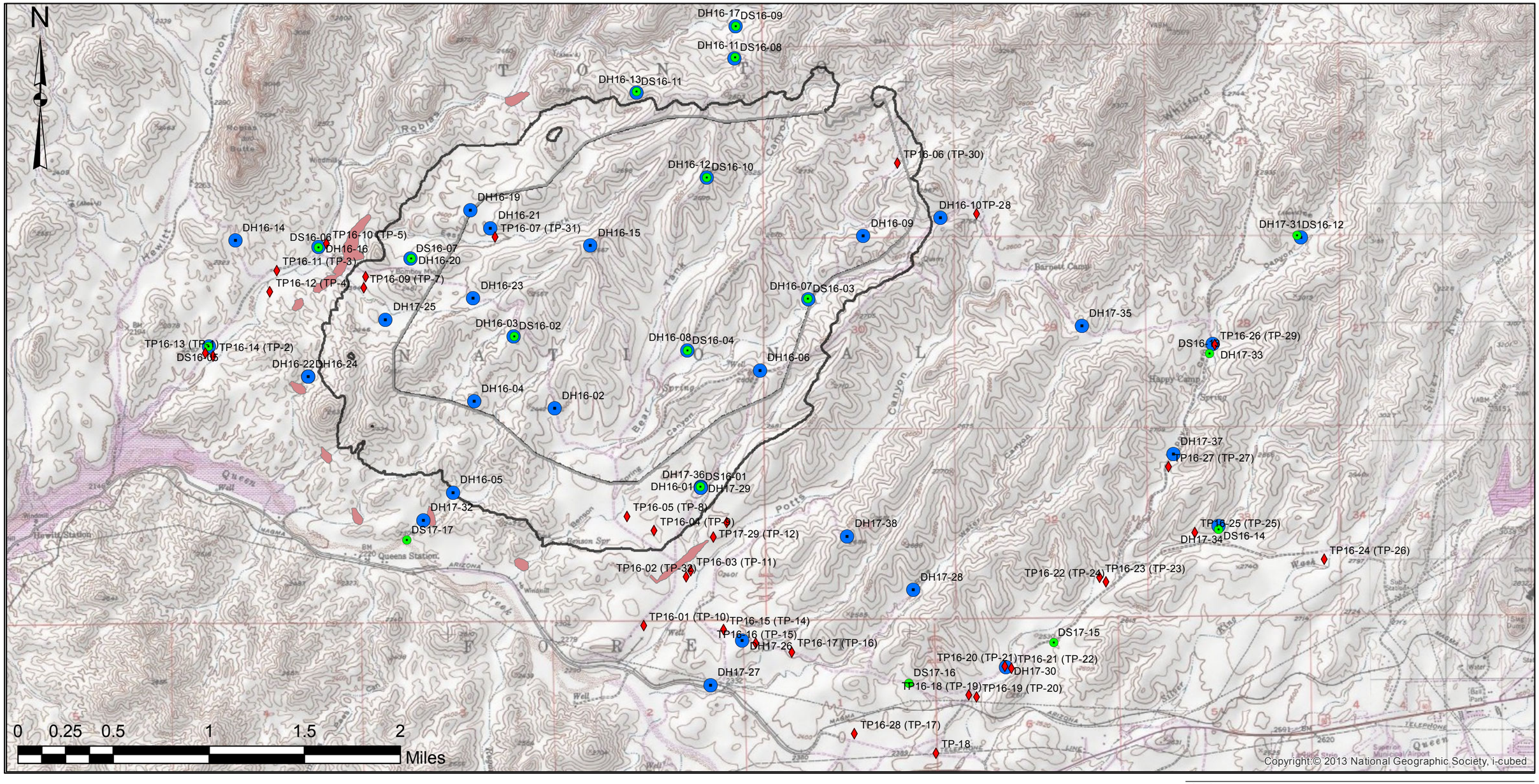
Test Pit	Date	Depth (ft-bgs)	Type	Kfs (cm/sec)	Material Type
TP16-01 (TP-10)	10/24/2016	3	BB	3.E-04	CH, moist with roots, firm
	10/24/2016	5	BB	4.E-05	ML, moist, strong HCl, stiff to v stiff
	10/24/2016	6	Perc	N/A	ML, moist, strong HCl, stiff to v stiff
TP16-02 (TP-32)	10/25/2016	2	BB	6.E-04	GC, hard to excavate, no HCl reaction
	10/25/2016	4.5	BB	4.E-04	GC, hard to excavate, no HCl reaction
TP16-03 (TP-11)	10/25/2016	2.5	BB	2.E-04	GC, hard to excavate, no HCl reaction
	10/25/2016	4.5	BB	1.E-04	GC, hard to excavate, no HCl reaction
TP16-04 (TP-09)	10/26/2016	2.5	BB	N/A	Test Unsuccessful. Weathered tuff
	10/26/2016	4.5	BB	6.E-04	Weathered tuff
TP16-05 (TP-08)	10/27/2016	2.5	BB	3.E-05	SM, Well cemented caliche, strong
	10/27/2016	4.5	BB	1.E-04	SM, Well cemented caliche, strong
TP16-06 (TP-30)	10/28/2016	2.5	BB	6.E-04	SM, Well cemented caliche, strong
	10/28/2016	5	BB	2.E-04	SM, Well cemented caliche, strong
TP16-07 (TP-31)	11/2/2016	2.5	BB	5.E-03	GW Sandy Gravel
	11/2/2016	5	BB	1.E-02	GW Sandy Gravel
TP16-08 (TP-06)	11/2/2016	2.5	BB	3.E-03	CH, Sandy Gravelly Clay
	11/2/2016	5	BB	2.E-05	Quartzite, weathered
TP16-09 (TP-07)	11/3/2016	2.5	BB	5.E-03	GW, Sandy Gravel, dense
	11/3/2016	5	BB	2.E-05	Quartzite, weathered
TP16-10 (TP-05)	11/3/2016	2.5	BB	5.E-03	GW, Sandy Gravel, loose
	11/3/2016	5	BB	3.E-02	GW, Sandy Gravel, compact
TP16-11 (TP-03)	11/3/2016	3	BB	6.E-03	SW, Gravelly sand, loose
	11/3/2016	5	BB	5.E-03	GW, Sandy Gravel, dense
TP16-12 (TP-04)	11/7/2016	3	BB	5.E-03	GW, Sandy Gravel, compact
	11/7/2016	5.5	BB	2.E-02	GP, Loose Gravel
TP16-13 (TP-01)	11/7/2016	3	BB	1.E-03	GW, Sandy Gravel, dense
	11/7/2016	5	BB	3.E-03	GW, Sandy Gravel, dense
TP16-14 (TP-02)	11/8/2016	2.5	BB	4.E-03	SW, Gravelly sand, loose
	11/8/2016	5	BB	2.E-02	GP, Gravel with sand, loose
TP17-29 (TP-13)	1/26/2017	2	BB	7.E-05	CH, Sandy Gravelly Clay
	1/26/2017	5	BB	2.E-03	GC, Sandy Clayey Gravel
	1/26/2017	2	CH	N/A	Test Unsuccessful. CH, Sandy Gravelly Clay
	1/26/2017	5	CH	1.E-03	GC, Sandy Clayey Gravel
TP17-30 (TP-12)	1/27/2017	2.5	BB	4.E-05	GC, Sandy Clayey Gravel
	1/27/2017	5	BB	5.E-05	GC, Sandy Clayey Gravel
	1/27/2017	2.5	CH	N/A	Test Unsuccessful. GC, Sandy Clayey Gravel
	1/27/2017	5	CH	N/A	Test Unsuccessful. GC, Sandy Clayey Gravel

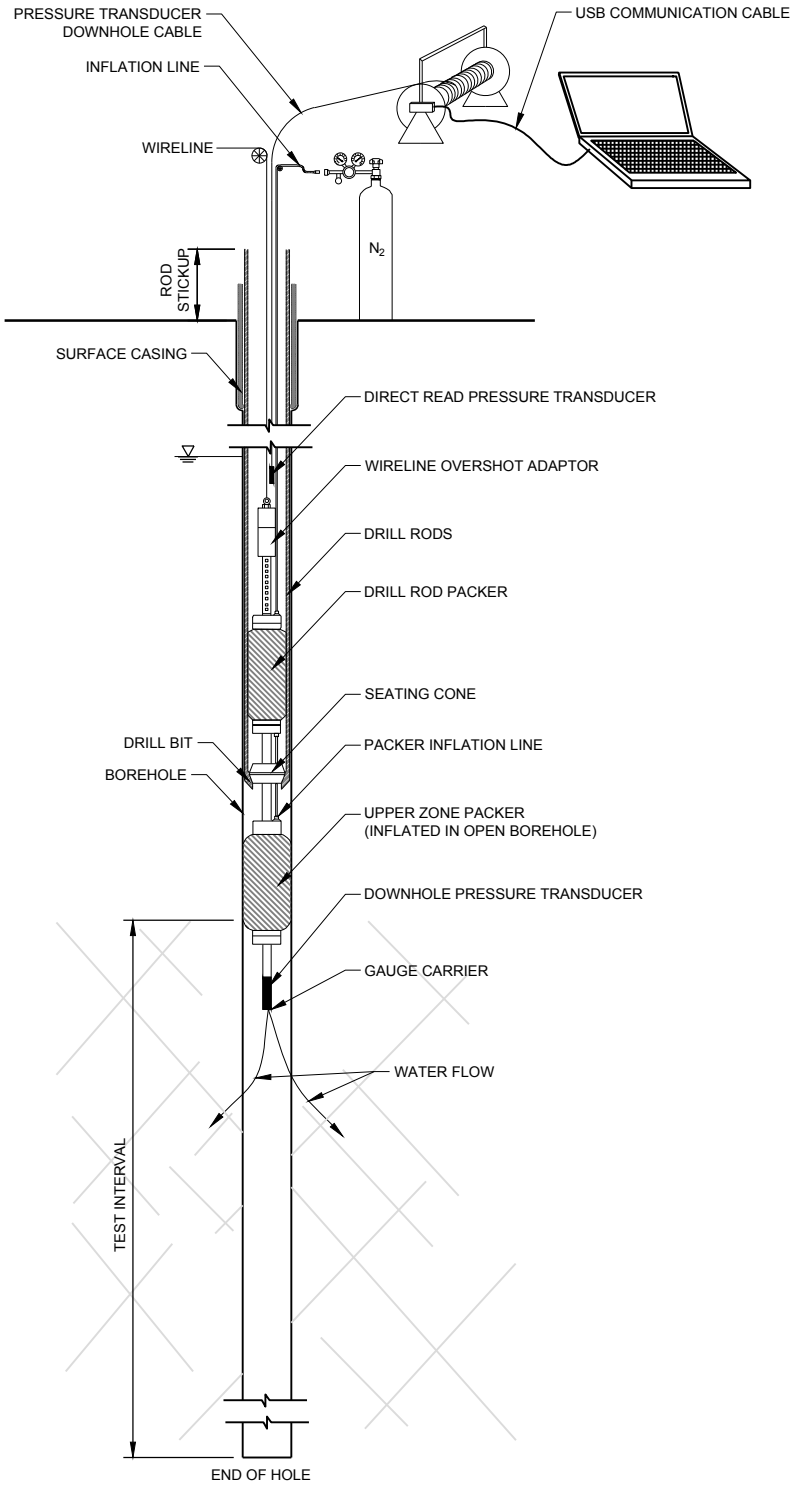
Notes:

ft-bgs = feet below ground surface

cm/sec = centimeters per second

FIGURES


N
DH16-17
DS16-09
DH16-11
DS16-08
DH16-13
DS16-11
DH16-12
DS16-10
TP16-06 (TP-30)
DH16-10
TP16-28
DH16-09
DH17-31
DS16-12
DH16-19
DH16-21
TP16-07 (TP-31)
DH16-15
DH16-14
DS16-06
TP16-10 (TP-5)
DH16-16
DS16-07
DH16-20
TP16-11 (TP-3)
TP16-12 (TP-4)
TP16-09 (TP-7)
DH16-23
DH16-07
DS16-03
DH17-25
DH17-35
DH16-03
DS16-02
TP16-13 (TP-1)
TP16-14 (TP-2)
DS16-05
DH16-08
DS16-04
TP16-26 (TP-29)
DS16-13
DH17-33
DH16-22
DH16-24
DH16-06
DH16-04
DH16-02
DH17-37
TP16-27 (TP-27)
DH16-05
DH17-36
DS16-01
DH16-01
DH17-29
DH17-32
TP16-05 (TP-8)
TP16-04 (TP-9)
DS17-17
TP17-29 (TP-12)
DH17-38
TP16-25 (TP-25)
DS16-14
DH17-34
TP16-24 (TP-26)
TP16-03 (TP-11)
TP16-02 (TP-32)
TP16-22 (TP-24)
TP16-23 (TP-23)
DH17-28
TP16-01 (TP-10)
TP16-15 (TP-14)
TP16-16 (TP-15)
DH17-26
TP16-17 (TP-16)
DS17-15
TP16-20 (TP-21)
TP16-21 (TP-22)
DH17-30
DS17-16
TP16-18 (TP-19)
TP16-19 (TP-20)
DH17-27
TP16-28 (TP-17)
TP-18
Hewitt Canyon
Robles Canyon
Tank
Barnett Camp
Happy Camp
Spring
Bear Canyon
Potts Canyon
Queens Wash
Hewitt Station
Queens Station
Benson Spr
Windmill
Well
Dam
Water
Sump
Sub Station
Slag Dump
Ball Park
Airport
Cemetery
Mine
Quarry
Ruins
Tank
Windmill
Spring
Wash
Canyon
Creek
Butte
Mesa
Hill
Ridge
Valley
Flat
Basin
Trail
Road
Fence
Pipeline
Power Line
Telephone Line
Railroad
Building
Cabin
Corral
Shaft
Adit
Pit
Dump
Tailings
Monument
Survey Marker
Benchmark
Elevation
Contour
Index Contour
Intermediate Contour
Depression Contour
Supplementary Contour
Cliff
Escarpment
Rock
Boulder
Talus
Scree
Alluvium
Colluvium
Landslide
Fault
Lineament
Geologic Contact
Geologic Unit
Geologic Symbol
Geologic Age
Geologic Period
Geologic Era
Geologic Eon
Geologic Group
Geologic Formation
Geologic Member
Geologic Bed
Geologic Lens
Geologic Vein
Geologic Dike
Geologic Sill
Geologic Intrusion
Geologic Extrusion
Geologic Metamorphism
Geologic Sedimentation
Geologic Erosion
Geologic Deposition
Geologic Structure
Geologic Feature
Geologic Process
Geologic Event
Geologic History
Geologic Time
Geologic Scale
Geologic Map
Geologic Cross Section
Geologic Column
Geologic Stratigraphy
Geologic Correlation
Geologic Age Dating
Geologic Fossil
Geologic Mineral
Geologic Rock
Geologic Soil
Geologic Water
Geologic Resource
Geologic Hazard
Geologic Risk
Geologic Mitigation
Geologic Monitoring
Geologic Investigation
Geologic Report
Geologic Data
Geologic Model
Geologic Software
Geologic Hardware
Geologic Equipment
Geologic Personnel
Geologic Training
Geologic Education
Geologic Research
Geologic Publication
Geologic Conference
Geologic Organization
Geologic Society
Geologic Association
Geologic Institute
Geologic Museum
Geologic Park
Geologic Monument
Geologic Site
Geologic Area
Geologic Region
Geologic Province
Geologic Basin
Geologic Range
Geologic Plateau
Geologic Mesa
Geologic Butte
Geologic Canyon
Geologic Valley
Geologic Plain
Geologic Desert
Geologic Forest
Geologic Grassland
Geologic Wetland
Geologic Lake
Geologic River
Geologic Stream
Geologic Spring
Geologic Well
Geologic Dam
Geologic Reservoir
Geologic Pipeline
Geologic Power Line
Geologic Telephone Line
Geologic Railroad
Geologic Road
Geologic Trail
Geologic Fence
Geologic Building
Geologic Cabin
Geologic Corral
Geologic Shaft
Geologic Adit
Geologic Pit
Geologic Dump
Geologic Tailings
Geologic Monument
Geologic Survey Marker
Geologic Benchmark
Geologic Elevation
Geologic Contour
Geologic Index Contour
Geologic Intermediate Contour
Geologic Depression Contour
Geologic Supplementary Contour
Geologic Cliff
Geologic Escarpment
Geologic Rock
Geologic Boulder
Geologic Talus
Geologic Scree
Geologic Alluvium
Geologic Colluvium
Geologic Landslide
Geologic Fault
Geologic



SCHEMATIC ONLY
NOT TO SCALE

CLIENT
RESOLUTION COPPER MINING LLC

PROJECT
NEAR WEST TSF GEOTECHNICAL INVESTIGATION
SUPERIOR MINE, SUPERIOR, ARIZONA

CONSULTANT

Golder Associates

YYYY-MM-DD	YYYY-MM-DD
DESIGNED	GS
PREPARED	JHR
REVIEWED	MG
APPROVED	RB

TITLE
SINGLE PACKER WIRELINE DOWNHOLE ASSEMBLY SCHEMATIC

PROJECT NO.	CONTROL	REV.	FIGURE
1531436	0001	----	2

Last Edited By: jrangel Date: 2017-03-21 Time:1:11:10 PM | Printed By: JRangel Date:2017-03-24 Time:12:45:36 PM
Path: \\tucsoncadd\RCM\Superior\99_PROJECTS\1531436_WestTailingsSiteInv\0001_TechMemo\02_PRODUCTION\DWG\ | File Name: 1531436_0001_FIG_002.dwg

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
0 1 in

APPENDIX A
DRILLHOLE INFORMATION

APPENDIX A-1
RECORDS OF DRILLHOLE

RECORD OF DRILLHOLE DH16-01 (GT-14)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 21, 2016 15:26
DRILLING END: September 26, 2016 16:26
COORDINATES: N: 838,455 E: 923,219

SHEET: 1 of 12
GS ELEV.: 2406.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
0	0.0	Gila Sandstone (Tss): completely weathered surface materials.	2406.7		HQ3	1	33	0	0		10		5			
	1.5	Gila Sandstone (Tss): brown, medium bedded, fine to coarse SANDSTONE, trace fine gravel, clasts of quartzite, tuff, basalt, moderate HCl reaction, small roots in discontinuities.	2405.2								10					
	4.0	Moderately weathered, thinly bedded, brown, medium grained to very coarse grained, weak rock, CALCAREOUS SANDSTONE, As above.	2402.7			2	84	16	84	2 - 4: 85.0°, B x 8 spaced at 0.3 ft, PL, RO, Sa, CC <1mm	4		3			
5		As above, becomes more gravelly.				3	100	64	100	4.7: 85.0°, B, PL, SM, M, CC <1mm 4.8: 85.0°, B, PL, SM, M, CC <1mm 5.1: 83.0°, B, PL, SM, CN 5.2: 80.0°, B, PL, VR, CN 6.1: 85.0°, B, PL, RO, CN	4 2 2 1 0		2			0.2
	8.5	Continues medium bedded SANDSTONE, fine to coarse silty sand, thin interbeds with fine to coarse gravel, and thin silty interbeds, clasts of quartzite, tuff, schist, basalt, very weak HCl reaction, brown.	2398.2								0					
10						4	100	100	100	9: 78.0°, JN, ST, RO, M, PC 9.9: JN, ST, RO, partial iron staining 11.6: B, PL, SM, M, PC	2 0 1 1		1			
	13.5	As above, but slightly weathered with some lost core.	2393.2								1					
15						5	100	73	100	13.8: 78.0°, B, PL, RO, CN 15: 35.0°, JN, UN, VR, M, PC 16.6: 85.0°, B, PL, RO, Cl, IN <5mm, small roots 16.7: 83.0°, B, PL, SM, Cl, IN <5mm	0 1 2 3		2			
	18.0	As above, moderately weathered, very weak to no HCl reaction.	2388.7								2					
20						6	100	72	90	17: 85.0°, B, PL, SM, M, PC 17.1: 8.0°, B, PL, RO, M, CC <1mm 17.5: 80.0°, B, PL, RO, M, PC 18.2: 80.0°, FLT, PL, RO, Cl, IN >5mm, 1-cm sandy clay with roots 18.5: 82.0°, B, PL, RO, M, CC <1mm, small roots	2 2 1 0 1		2 - 3			
	23.0	Becomes Gila Conglomerate (Tcg): thickly bedded, matrix supported, slightly weathered polylithic CONGLOMERATE, coarse sand and some fine to coarse gravel, silty interbeds, clasts of tuff, quartzite, basalt, very weak to no HCl reaction, brown.	2383.7								1					
25						7	100	96	100	19: 85.0°, FLT, PL, RO, Bx, IN >5mm 19.6: 85.0°, FLT, PL, RO, Bx 20.3: 28.0°, JN, IR, VR, Sa, PC 22.7: 85.0°, B, PL, M, IN <5mm 24.4: 85.0°, JN, PL, SM, full iron staining 24.8: 80.0°, FLT, PL, SM, M, IN >5mm, silty fine sand	0 2 0 3		2			
	28.0	As above, becomes less gravelly.	2378.7								0					
30						8	100	94	100	26.3: 80.0°, JN, PL, SM, full iron staining 26.7: 85.0°, B, PL, SM, partial iron staining 26.9: 75.0°, JN, ST, SM, full iron staining 32.3: 85.0°, B, PL, SM, CN 32.4: 75.0°, JN, CU, RO, M, CC <1mm	0 3		2 - 1			
	33.0	As above.	2373.7			9	100	100	100	32.9: 80.0°, FLT, PL, SM, Sa, IN >5mm	0		1			
	34.0	Becomes SANDSTONE, thickly bedded, fine to coarse sand, trace fine to coarse gravel, clasts of tuff, quartzite, gneiss, weak to moderate HCl reaction, brown.	2372.7													
35						10	100	98	100	37.5: 80.0°, JN, IR, VR, CN, small vugs 37.6: 85.0°, B, PL, RO, CN	2 0		1			0.3
	39.0		2367.7													
40						11	100	100	100				1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER:
DRILL RIG: BK-30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:27
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RECORD OF DRILLHOLE DH16-01 (GT-14)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 21, 2016 15:26
DRILLING END: September 26, 2016 16:26
COORDINATES: N: 838,455 E: 923,219

SHEET: 2 of 12
GS ELEV.: 2406.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0	Becomes matrix supported, polylithic CONGLOMERATE, thickly bedded, fine to coarse gravel with fine to coarse sand matrix and silty interbeds, clasts of quartzite, tuff, basalt, diabase, schist, weak to moderate HCl reaction, brown. *(continued)*	2366.7		HQ3	11	100	100	100		0 1 0		1			
	43.0	As above, weak to no HCl reaction.	2363.7								0					
45						12	100	100	100	44.6: 82.0°, B, PL, RO, CN	1 0		1			
	48.0		2358.7													
		As above.									0					
50						13	100	100	100				1			
	53.0		2353.7							52.4: 85.0°, B, PL, SM, Sa, IN <5mm, clayey sand	1					
		Becomes SANDSTONE, thickly bedded, fine to coarse sand, trace fine to coarse gravel, clasts are tuff, quartzite, gneiss, weak to moderate HCl reaction, brown.														
55						14	100	100	100		0		1			
	58.0		2348.7													
		As above, silty interbeds, small fault.									0					
60						15	100	96	96	59.4: 80.0°, B, PL, VR, CN 60.3: 75.0°, B, PL, RO, M, PC 61.1: 85.0°, B, PL, SM, M, partial iron staining, PC	1 1 1		2			
	63.0		2343.7							62.6 - 62.8: 45.0°, FLT, UN, VR, Bx, clayey sand gouge	2					
		As above.									0					
65						16	100	100	100	64.8: 85.0°, B, PL, SM, partial iron staining	1 0		1 - 2			
	68.0		2338.7							67.1: 8.0°, B, PL, SM, CN	1					
		As above, more silty interbeds.											3			
70						17	100	100	100				1 - 2			
	73.0		2333.7													
		As above. Some FeOx staining on discontinuities.									0					
75						18	100	96	100	76.5: 85.0°, B, PL, SM, partial iron staining 76.7: 85.0°, B, partial iron staining	2 1		1			
	78.0		2328.7							77.5: 80.0°, B, CU, SM, partial iron staining						
		As above, fewer silty interbeds.				19	100	100	100		0		1			
80																

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER:
DRILL RIG: BK-30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:27
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RECORD OF DRILLHOLE DH16-01 (GT-14)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 21, 2016 15:26
DRILLING END: September 26, 2016 16:26
COORDINATES: N: 838,455 E: 923,219

SHEET: 3 of 12
GS ELEV.: 2406.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0	As above, fewer silty interbeds. *(continued)*	2326.7		HQ3	19	100	100	100		0		1			
	83.0	As above, few cobbles.	2323.7			20	100	100	100		0		1			
85	88.0	As above, some drilling damage to this run.	2318.7			21	100	100	100		0		1			
90	93.0	Becomes matrix supported, polylithic CONGLOMERATE, thickly bedded, fine to coarse gravel with fine to coarse sand matrix and silty interbeds, clasts of quartzite, tuff, basalt, diabase, schist, weak to moderate HCl reaction, brown.	2313.7			22	100	100	100	96.5: 64.0°, JN, PL, RO, M, PC 97.2: 75.0°, B, PL, SM, CN	0 1 1		1			
95	98.0	Becomes SANDSTONE, thickly bedded, fine to coarse sand, trace fine to coarse gravel, clasts of tuff, quartzite, gneiss, weak to moderate HCl reaction, brown.	2308.7			23	100	100	100		0		1			
100	103.0	As above, quartzite cobble.	2303.7			24	100	100	100		0		1			
105	108.0	As above, tuff cobble.	2298.7			25	100	100	100		0		1			
110	113.0	Becomes matrix supported, polylithic CONGLOMERATE, thickly bedded, fine to coarse gravel with fine to coarse sand matrix and silty interbeds, clasts of quartzite, tuff, basalt, diabase, schist, weak to moderate HCl reaction, brown.	2293.7			26	100	100	100		0		1			
115	118.0	As above, few cobbles.	2288.7			27	100	100	100		0		1			
120		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER:
DRILL RIG: BK-30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF DRILLHOLE DH16-01 (GT-14)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 21, 2016 15:26
DRILLING END: September 26, 2016 16:26
COORDINATES: N: 838,455 E: 923,219

SHEET: 4 of 12
GS ELEV.: 2406.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
120	120.0	As above, few cobbles. *(continued)*	2286.7		HQ3	27	100	100	100		0		1			
	123.0	Becomes SANDSTONE, thickly bedded, fine to coarse sand, trace fine to coarse gravel, clasts of tuff, quartzite, gneiss, weak to moderate HCl reaction, brown.	2283.7			28	100	100	100	123.3: 90.0°, B, PL, SM, Cl, CC <1mm 124.9: 90.0°, B, PL, SM, M, PC 126.6: 85.0°, B, PL, SM, partial iron staining 126.8: 80.0°, B, PL, SM, full iron staining 127.3: 85.0°, B, PL, SM, Cl, IN <5mm	1 1 0 2 1		1		
125																
	128.0	Becomes fine to coarse sand, trace fine to coarse gravel.	2278.7			29	100	100	100		0		1			
130																
	133.0	Becomes matrix supported, polylithic CONGLOMERATE, thickly bedded, fine to coarse gravel with fine to coarse sand matrix and silty interbeds, clasts of quartzite, tuff, basalt, diabase, schist, weak to moderate HCl reaction, brown.	2273.7			30	100	100	100		0		1			
135																
	138.0	As above.	2268.7			31	100	100	100		0		1			
140																
	143.0	As above.	2263.7			32	100	100	100		0		1			
145																
	148.0	Becomes SANDSTONE, fine to coarse sand, trace fine to coarse gravel, clasts of tuff, quartzite, gneiss, weak to moderate HCl reaction, brown.	2258.7			33	101	101	101		0		1			0.2
150																
	153.3	As above, gravel interbed at 154-155.5 ft-bgs.	2253.5			34	101	101	101		0		1			
155																
	158.0	As above, silty fine to coarse sand, trace fine to coarse gravel, silty interbeds.	2248.7			35	100	100	100		0		1			0.3
160																

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER:
DRILL RIG: BK-30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:27
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RECORD OF DRILLHOLE DH16-01 (GT-14)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 21, 2016 15:26
DRILLING END: September 26, 2016 16:26
COORDINATES: N: 838,455 E: 923,219

SHEET: 5 of 12
GS ELEV.: 2406.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index ● AX. □ DIAM. ▲ UCS (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
160	160.0	As above, silty fine to coarse sand, trace fine to coarse gravel, silty interbeds. *(continued)*	2246.7		HQ3	35	100	100	100		0		1			
	163.0	As above.	2243.7			36	100	100	100	167: 85.0°, B, PL, SM, M, CC <1mm	0 1		1			
165	168.0	As above.	2238.7			37	100	100	100		0		1			
170	173.0	As above, with few quartz and tuff cobbles, trace fine to coarse gravel, weak to no HCl reaction.	2233.7			38	100	100	100		0		1			
175	178.0	As above, gravelly.	2228.7			39	100	100	100		0		1			0.3
180	183.0	As above.	2223.7			40	100	100	100	186.8: 90.0°, B, PL, SM, M, CC <1mm	0 1 0		1			
185	188.0	As above.	2218.7			41	100	100	100		0		1			
190	193.0	As above.	2213.7			42	100	100	100	195.8: 85.0°, B, PL, SM, M, CC <1mm 197.3: 75.0°, B, PL, RO, M, CC <1mm	0 1 0 1		1			
195	198.0	As above.	2208.7			43	100	100	100		0		1			
200		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER:
DRILL RIG: BK-30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:27
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RECORD OF DRILLHOLE DH16-01 (GT-14)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 21, 2016 15:26
DRILLING END: September 26, 2016 16:26
COORDINATES: N: 838,455 E: 923,219

SHEET: 6 of 12
GS ELEV.: 2406.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
200	200.0	As above. *(continued)*	2206.7		HQ3	43	100	100	100		0		1					
	203.0	As above, silty interbeds, clasts of quartzite, tuff, schist, and few basalt.	2203.7			44	96	96	96	204.8: 85.0°, B, PL, SM, M, PC 206.2: 85.0°, B x 2 spaced at 0.03 ft, PL, SM, M, CC <1mm	0 1 0 2 0		1				
205																		
	208.0	As above.	2198.7			45	96	96	96		0		1					0.3
210																		
	213.0	As above.	2193.7			46	100	100	100		0		1					
215																		
	218.0	As above.	2188.7			47	100	100	100		0		1					
220																		
	223.0	As above.	2183.7			48	100	100	100	227.1: 80.0°, B, PL, SM, M, CC <1mm	0 1		1					
225																		
	228.0	As above.	2178.7			49	100	100	100		0		1					0.2
230																		
	233.0	Becomes matrix supported, polylithic CONGLOMERATE, thickly bedded, fine to coarse gravel with fine to coarse sand matrix and silty interbeds, clasts of quartzite, tuff, basalt, diabase, schist, weak to moderate HCl reaction, brown.	2173.7			50	100	100	100		0		1					
235																		
	238.0	As above, some coarse gravel.	2168.7			51	100	100	100		0		1					
240																		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER:
DRILL RIG: BK-30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:27
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RECORD OF DRILLHOLE DH16-01 (GT-14)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 21, 2016 15:26
DRILLING END: September 26, 2016 16:26
COORDINATES: N: 838,455 E: 923,219

SHEET: 7 of 12
GS ELEV.: 2406.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index: AX. / DIAM. / UCS (ksi) R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0	As above, some coarse gravel. *(continued)*	2166.7		HQ3	51	100	100	100		0		1			
	243.0	As above, silty fine to coarse sand.	2163.7			52	100	100	100		0		1			
245	248.0	As above, more coarse gravel and cobbles.	2158.7			53	100	100	100		0		1			
250	253.0	As above.	2153.7			54	100	100	100		0		1			
255	258.0	As above.	2148.7			54	100	100	100		0		1			0.2
260	263.0	Becomes SANDSTONE, poorly sorted, fine to coarse sand, silty matrix, trace fine gravel, trace coarse gravel, clasts of quartz, gneiss, schist, quartzite, very weak to no HCl reaciton, brown.	2143.7			55	100	100	100		0		1			
265	268.0	As above, few cobbles.	2138.7			56	100	100	100		0		1			
270	273.0	As above, gravel interbeds.	2133.7			57	100	100	100		0		1			
275	278.0	As above.	2128.7			58	100	100	100		0		1			
280		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER:
DRILL RIG: BK-30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:27
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RECORD OF DRILLHOLE DH16-01 (GT-14)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

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DRILLING END: September 26, 2016 16:26
COORDINATES: N: 838,455 E: 923,219

SHEET: 8 of 12
GS ELEV.: 2406.7
TOC ELEV.: na
DATUM:

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DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index: ● AX. ☐ DIAM. ▲ UCS (ksi) R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
280	280.0	As above. *(continued)*	2126.7		HQ3	58	100	100	100		0		1			
	283.0	As above.	2123.7			59	100	100	100		0		1			
285	288.0	As above, clasts of schist, quartzite, and tuff with trace other lithologies, very weak to no HCl reaction in matrix.	2118.7			60	100	100	100		0		1			
290	293.0	As above.	2113.7			61	100	100	100		0		1			
295	298.0	As above.	2108.7			62	100	100	100		0		1			
300	303.0	Gila Conglomerate (Tcg): fine sand to coarse gravel, poorly sorted, clasts are predominantly tuff, quartzite, and breccia, little schist, trace other lithics, weak to no HCl reaction, brown.	2103.7			63	100	100	100		0		1			
305	308.0	Gila Conglomerate (Tss): silty fine to coarse sand, trace fine gravel, silty interbeds, clasts are predominantly schist, tuff, quartzite, trace limestone and other lithics, weak to no HCl reaction, brown.	2098.7			64	100	100	100		0		1			
310	313.0	As above	2093.7			65	100	100	100	314.5: 80.0°, B, PL, SM, M, CC <1mm	0 0 0		1			
315	318.0	As above.	2088.7			66	100	100	100		0		1			
320		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER:
DRILL RIG: BK-30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:27
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RECORD OF DRILLHOLE DH16-01 (GT-14)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 21, 2016 15:26
DRILLING END: September 26, 2016 16:26
COORDINATES: N: 838,455 E: 923,219

SHEET: 9 of 12
GS ELEV.: 2406.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
320	320.0	As above. *(continued)*	2086.7		HQ3	66	100	100	100		0		1					
	321.5	Gravel and cobbles of tuff and schist, matrix supported.	2085.2															
	323.0	Becomes matrix supported, polylithic CONGLOMERATE, fine to coarse gravel with fine to coarse sand matrix and silty interbeds, clasts of quartzite, tuff, basalt, diabase, schist, weak to moderate HCl reaction, brown.	2083.7															
325						67	100	100	100		0		1					
	328.0	As above.	2078.7															
330						68	100	100	100		0							
	333.0	As above.	2073.7															
335						69	100	100	100		0		1					
	338.0	As above, with fine to coarse gravel interbeds.	2068.7															
340						70	100	100	100		0		1					
	343.0	Becomes SANDSTONE medium to thickly bedded, interbedded silty fine sand, silt beds, and fine to coarse sand with trace fine gravel, weak to no HCl reaction, brown.	2063.7							342.5: 75.0°, B, PL, SM, M, CC <1mm	2							
										342.8: 75.0°, B, PL, SM, M, CC <1mm	1							
345						71	100	94	100	343.3: 75.0°, B, PL, SM, M, CC <1mm 344.2: 75.0°, B, PL, SM, MnOx, SA 345.6: 75.0°, B, PL, SM, M, CC <1mm 345.7: 75.0°, B, PL, SM, M, CC <1mm	1 2 0		1					
	348.0	As above.	2058.7															
350						72	100	100	100	350.6: 75.0°, B, PL, SM, M, PC	0 1 0		1					
	353.0	Volcaniclastic sandstone (Lithic Tuff), fine to coarse sand, brown, moderate HCl reaction.	2053.7															
355						73	100	100	100		0		1					0.2
	358.0	Becomes BASALT, dark brown, vesicles infilled with quartz and calcite.	2048.7			74	100	100	100	357.9: 45.0°, CON	0		2					
	359.0		2047.7															
360						75	100	100	100		0		2					

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER:
DRILL RIG: BK-30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:27
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RECORD OF DRILLHOLE DH16-01 (GT-14)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 21, 2016 15:26
DRILLING END: September 26, 2016 16:26
COORDINATES: N: 838,455 E: 923,219

SHEET: 10 of 12
GS ELEV.: 2406.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
360	360.0	As above, with few voids and pockets of volcaniclastic sediments, dark brown to dark red brown. *(continued)*	2046.7		HQ3	75	100	100	100	362.4: 70.0°, VNO, IR, VR, Qtz, IN <5mm	0 1 0		2			
365	364.0	As above.	2042.7			76	100	100	100		0		2			
	367.0	Becomes flow brecciated BASALT, altered and weak, argillized, minor calcite stockwork, red brown.	2039.7										4			
370	369.0	As above with calcite stockwork.	2037.7			77	100	100	100		0		3			
375	374.0	As above.	2032.7			78	100	100	100		0		3			
	376.0	As above, vesicular with breccia veins.	2030.7										2			
380	379.0	Continues BASALT breccia, few voids, intermittent calcite stockwork, zeolites.	2027.7			79	100	100	100		0		2 - 3			0.2
385	384.0	As above.	2022.7			80	100	100	100		0		2			
390	389.0	As above, vesicular, calcite/quartz infilling and veining, few voids with zeolites.	2017.7			81	100	100	100		0		2			
395	394.0	As above.	2012.7			82	100	100	100		0		2			
400	399.0	As above.	2007.7			83	100	100	100		0		2			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER:
DRILL RIG: BK-30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:27
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RECORD OF DRILLHOLE DH16-01 (GT-14)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 21, 2016 15:26
DRILLING END: September 26, 2016 16:26
COORDINATES: N: 838,455 E: 923,219

SHEET: 11 of 12
GS ELEV.: 2406.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
400	400.0	As above. *(continued)*	2006.7		HQ3	83	100	100	100		0		2			
	404.0		2002.7													
405		Continues BASALT, dark brown, minor calcite stockwork and vesicles, few discontinuous voids.				84	100	100	100	407.9: 80.0°, VNO, UN, RO, Ca, CC <1mm	0		2			
	409.0		1997.7													
410		As above.				85	100	100	100		0		2 - 1			0.2
	414.0		1992.7													
415		As above.				86	100	86	86	414.7: 62.0°, JN, UN, SM, Ca, CC <1mm 415.8: 45.0°, JN, CU, SM, Ca, CC <1mm 417.6: 35.0°, JN, UN, SK, Chl, IN <5mm 418: 25.0°, JN, IR, VR, Chl, CC <1mm	1 1 0 1 1		2			
	419.0		1987.7													
420		As above.				86	100	92	92	419.5: 65.0°, JN, UN, RO, Ca, CC <1mm 422.5: 50.0°, JN, IR, RO, Ca, CC <1mm 422.7: 72.0°, JN, UN, VR, Ca	1 0 0 2 0		2			
	424.0		1982.7													
425	425.4	As above.	1981.3			87	100	92	98	424.3: 75.0°, VNO, IR, VR, Si, IN <5mm 424.9: 54.0°, JN, ST, RO, CN 425.4: 60.0°, CONO, CU, RO, CN	2 1 0		3 3 2			
	427.0	Becomes contact between SANDSTONE and BASALT, red brown, strong HCl reaction.	1979.7													
	429.0	Becomes volcaniclastic, orange brown SANDSTONE, poorly sorted, fine to coarse sand and fine gravel, CaCO3 cementation, clasts of weathered basalt and quartzite.	1977.7													
430		Becomes volcaniclastic CONGLOMERATE, altered, poorly sorted, fine gravel to cobbles, matrix (fine to coarse sand) supported, CaCO3 cementation, clasts are weathered basalt.				88	100	100	100		0		3			
	434.0		1972.7													
435		As above.									0		3			
	436.0		1970.7													
	438.0	Becomes Mescal Limestone (pCmls): pinkish gray brown, fine grained LIMESTONE, silicified.	1968.7			89	100	100	100	436: 55.0°, CON 437.8: 75.0°, CONO, IR, VR, vuggy	1		3			
440		As above, weakly calcareous sediments, zones of alteration and brecciation, little iron oxide staining.				90	100	74	74	438.2: 45.0°, JN, IR, VR, Ca, IN <5mm	1 6		3 4			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER:
DRILL RIG: BK-30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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COORDINATES: N: 838,455 E: 923,219

SHEET: 12 of 12
GS ELEV.: 2406.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2, R3 3.62, R4 7.25, R5 14.5, R6 36.2	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
440	440.0	As above, weakly calcareous sediments, zones of alteration and brecciation, little iron oxide staining. *(continued)*	1966.7		HQ3	90	100	74	74	439.6 - 441: FLT, VR, Bx, partial iron staining, IN >5mm 441.9 - 442: 60.0°, FLT, PL, VR, Bx, IN >5mm	>10 1 0		4 3					
445	446.0		1960.7			91	100	40	50	444.9 - 445.7: FLT, Bx, IN >5mm	1 >10		4					
		As above.				92	100	100	100	447.6: 75.0°, JN, IR, RO, Ca, IN <5mm 448.6: 65.0°, JN, PL, VR, Sa, PC 450: 75.0°, JN, IR, VR, Ca, IN <5mm	0 1 1 0 1		2					
450	451.0		1955.7															
		Bottom of borehole at 451.0 ft. Completed as well. Refer to diagram. Notes: 26: Lost circulation. 30: Drillers set casing to 30 ft-bgs, surface circulation returned. 44 - 303: Hydro test #1 SI 59: Core tube slipped, core is stuck inside the core barrel. Drillers trip out the core barrel to remove it. 148: Broken core at top of run from overdrilling. 254: Fracturing at 257 ft-bgs from overdrilling the run. 278: Fractures in core from overdrilling run. 354 - 424: Hydro test #2 SI 435 - 451: Hydro test #3 SI & CRI 445: Lost surface circulation.																
455																		
460																		
465																		
470																		
475																		
480																		

DRILLING CO.: Boart Longyear
DRILLER:
DRILL RIG: BK-30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:27
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RECORD OF DRILLHOLE DH16-02 (GT-8)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 28, 2016 07:15
DRILLING END: October 2, 2016 11:40
COORDINATES: N: 840,618 E: 919,190

SHEET: 1 of 7
GS ELEV.: 2391.1
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
0	0.0	Surface residual soil, no recovery.	2391.1		HQ3	1	0	0	0				6			
	4.5		2386.6													
5	5.0	Gila Sandstone (Tss): fine to coarse SANDSTONE, light brown, mainly schist, very weak to no HCL reaction	2386.1			2	100	0	40							
	6.0	As above.	2385.1			3	100	30	100	5.2: JN, CU, VR, Sa, PC 5.5 - 5.6: 80.0°, FLT, PL, VR, Bx, IN >5mm, sandy gravel	3					
		As above, some gravel.				4	50	0	33		>10 >10 >10		5			
	9.0		2382.1													
10		No recovery									>10		5			
	10.5		2380.6								>10					
		Continues fine to coarse SANDSTONE with some fine gravel, matrix supported, clasts of schist, gneiss, quartzite, light brown.				5	80	60	70	10 - 11.5: FLT, VR, Bx, IN >5mm, sandy gravel	5 0 0		3			
15											0					
	16.5		2374.6							15: JN, PL, VR, CN 15.7: 60.0°, JN, PL, RO, Cl, IN <5mm	2					
		Becomes Gila Conglomerate (Tcg): matrix supported, polylithic CONGLOMERATE, gravel to cobble clasts consisting of gneiss, quartzite, schist, tuff, matrix has moderate HCl reaction, light brown.				6	90	90	90		0		2 - 3			
	19.0		2372.1							18.7: 45.0°, JN, PL, VR, CN	0 1					
20		As above.									>10 >10		5			
						7	100	28	54		0		3			
	24.0		2367.1								>10 >10		4 - 5			
25		Washed-out coarse gravel with no matrix, clasts of quartzite, schist, tuff.				8	50	0	5		>10					
	26.0		2365.1								>10		5			
		As above.									>10					
	27.5		2363.6								>10					
		Becomes fine to coarse SANDSTONE with few clasts of gneiss, schist, quartz, weak to moderate HCl reaction, brown.				9	88	63	68		1		3			
30	30.0		2361.1							28.9: 80.0°, JN, PL, VR	0					0.8
		Becomes matrix supported, polylithic CONGLOMERATE, gravel to cobble sized clasts consisting of gneiss, quartzite, schist, tuff, matrix has moderate HCl reaction, light brown.								31.1: 20.0°, JN, IR, VR, CN	0 1 0 0					
35						10	100	100	100		0 0 0 0		3			
40	40.0		2351.1							39.2: 25.0°, JN, PL, VR, CN	1					

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK-30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-02 (GT-8)
1 of 7

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:27
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RECORD OF DRILLHOLE DH16-02 (GT-8)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 28, 2016 07:15
DRILLING END: October 2, 2016 11:40
COORDINATES: N: 840,618 E: 919,190

SHEET: 2 of 7
GS ELEV.: 2391.1
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0	As above.	2351.1		HQ3						1					
	42.1	As above.	2349.0			11	100	56	64	40.5: 75.0°, B, CU, SM, M, CC <1mm 42.1 - 44: FLT, clay sandy gravel	0 >10 >10		2 4			
45	45.0	As above.	2346.1								0		3			
						12	96	96	96	48.4: 75°, JN, IR, VR, Cl, CC <1mm	0 0 0 1 0		1			
50	50.0	As above.	2341.1								1					
						13	91	64	91	50.6: JN, IR, RO, CN 51.5: 70°, JN, PL, VR, Ca, CC <1mm 54.4: 60°, JN, PL, CN	1 1 0 0 1 0		1 - 2			
55		55.9 to 59 ft-bgs: rock is friable, weak, highly weathered. Lost recovery at 56 ft-bgs.									>10 >10 >10		4 - 5			
	59.0	As above.	2332.1								0					
60						14	96	96	96		0 0 0 0 0 0		1 - 2			
65	69.0	As above.	2322.1								0 0 0 0 0 0					
70						15	91	91	91		0 0 0 0 0 0 0 0 0 0		1			
75	79.0		2312.1								0		3			
80		Vertical fault zone, upper wall is highly weathered, clayey gouge infill.				16	95	85	85	79 - 80.2: 80°, FLT, IR, RO, M, IN >5mm	>10		4			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK-30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:27
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RECORD OF DRILLHOLE DH16-02 (GT-8)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 28, 2016 07:15
DRILLING END: October 2, 2016 11:40
COORDINATES: N: 840,618 E: 919,190

SHEET: 3 of 7
GS ELEV.: 2391.1
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0		2311.1													
	81.2	Vertical fault zone, upper wall is highly weathered, clayey gouge infill. *(continued)*	2309.9								>10					
		Becomes matrix supported, polylithic CONGLOMERATE, gravel to cobble sized clasts consisting of gneiss, quartzite, schist, tuff, matrix has moderate HCl reaction, light brown.									>10					
											0					
85						16	95	85	85		0		1 - 2			
											0					
											0					
											0					
	89.0		2302.1								0					
90		As above.									0					
											0					
											0					
											0					
						17	100	100	100		0		1			
95											0					
											0					
											0					
	99.0		2292.1								0					
100		As above.			HQ3						0					
											0					
											0					
											0					
						18	100	93	100		0		1			
105											0					
											1					
										106: 75°, JN, IR, VR, Bx, IN >5mm	1					
										107: 45.0°, JN, PL, VR, Bx, IN <5mm	6		4			
	109.0		2282.1								0		2			
110		As above.									0					
											0					
											0					
											0					
						19	100	93	95		0		1			
115											0					
											0					
											0					
										117.6: 80°, JN, IR, VR, Bx, IN <5mm	2					
	119.0		2272.1							118.1: 75°, JN, IR, VR, Bx, IN >5mm	2					
120		As above, few limestone clasts.				20	100	100	100		0		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK-30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-02 (GT-8)
3 of 7

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:27
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RECORD OF DRILLHOLE DH16-02 (GT-8)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 28, 2016 07:15
DRILLING END: October 2, 2016 11:40
COORDINATES: N: 840,618 E: 919,190

SHEET: 4 of 7
GS ELEV.: 2391.1
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
120	120.0	As above, few limestone clasts. *(continued)*	2271.1		HQ3	20	100	100	100	122.7: 85°, B, PL, RO, CN	0 0 1 0 0 0 0 0 0 0		1				
125	129.0	As above.	2262.1			21	100	100	100		0 0 0 0 0 0 0 0 0 0		1				
130	139.0	As above, large quartzite cobble.	2252.1			22	100	100	100	143.5: 90°, CON, PL, RO, CN	0 0 0 0 0 1 0		1 2				
135	144.5	As above, some cobbles, very weak to no HCl reaction.	2246.6			23	100	100	100		0 0 0 0 0 0 0		1				
140	150.0	As above, with some schist clasts.	2241.1			24	100	100	100		0 0 0 0 0 0 0 0 0 0		1				
145																	
150																	
155																	
160	160.0		2231.1														

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK-30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:27
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RECORD OF DRILLHOLE DH16-02 (GT-8)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 28, 2016 07:15
DRILLING END: October 2, 2016 11:40
COORDINATES: N: 840,618 E: 919,190

SHEET: 5 of 7
GS ELEV.: 2391.1
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
160	160.0	As above, with some basalt, rhyolite, chert clasts, weak HCl reaction.	2231.1		HQ3	25	100	100	100		0		1				
165											0						
170	170.0	As above, with some cobbles and clasts of basalt, quartzite, diabase, gneiss.	2221.1			26	100	100	100	170.2: 60°, JN, PL, SM, Qtz, CC <1mm	1		1				
175											0						
180	180.0	As above.	2211.1			27	100	100	100		0		1				
185											0						
190	190.0	Continues matrix supported, polylithic CONGLOMERATE, gravel to cobble sized clasts consisting of gneiss, quartzite, schist, tuff, matrix has moderate HCl reaction, light brown.	2201.1			28	100	100	100		0		1				
195											0						
200	200.0		2191.1							199.2: 80°, JN, IR, VR, CN	1						

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK-30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:27
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RECORD OF DRILLHOLE DH16-02 (GT-8)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 28, 2016 07:15
DRILLING END: October 2, 2016 11:40
COORDINATES: N: 840,618 E: 919,190

SHEET: 6 of 7
GS ELEV.: 2391.1
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact | VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical | PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular | PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough | Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge | Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide | MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index: ● AX. ☐ DIAM. ▲ UCS (ksi) R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
200	200.0	As above, few calcite veins.	2191.1		HQ3	29	99	99	99	206.8: 85°, B, PL, RO, CN 208.7: JN, PL, VR, CN	0 0 0 0 0 0 1 0 1 0		1				
205																	
210	210.0	As above, clasts of tuff, quartzite, chert, diabase.	2181.1			30	100	100	100	217: 80°, FLT, PL, VR, Bx, IN <5mm	0 0 0 0 0 0 0 0 1 0 0		1				
215																	
220	220.0	As above. Some diabase clasts.	2171.1			31	100	100	100	224.1: 75°, JN, PL, RO, CN 226.4: 45°, JN, PL, RO, partial iron staining	0 0 0 0 1 0 1 0 0 0		1				
225																	
230	230.0	As above.	2161.1			32	100	93	98	230.7: 75°, FLT, PL, VR, G, IN >5mm 235.5: 60°, JN, PL, RO, Sa, IN <5mm 236: 85°, FLT, IR, VR, G, IN >5mm	1 0 0 0 0 1 1 0 0 0		1				
235																	
240	240.0	Log continued on next page	2151.1														

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK-30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:27
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RECORD OF DRILLHOLE DH16-02 (GT-8)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 28, 2016 07:15
DRILLING END: October 2, 2016 11:40
COORDINATES: N: 840,618 E: 919,190

SHEET: 7 of 7
GS ELEV.: 2391.1
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
240	240.0	As above.	2151.1		HQ3	33	100	88	98	243 - 244: FLT, IR, VR, IN >5mm, gougey weathered rock	0 0 0 0 1 0 0 0 0		1 2 1				
245	248.2	Contact zone with Apache Leap Tuff (Talg), highly weathered, TUFF, clayey, friable and weak. Some iron oxide staining.	2142.9							248.2 - 251: CON, IR, VR, partial iron staining, IN >5mm, weathered contact 251: 90°, JN, IR, VR, Cl, CC <1mm	4 >10 >10 10 10		4 4				
250	251.5	As above, small vesicles, few quartz phenocrysts.	2139.6			34	67	37	37		1 0		3				
255	256.0	As above.	2135.1			35	100	85	95	256: 20°, JN, VR, Cl, full iron staining, IN <5mm 257.6: 75°, JN, IR, VR, Bx, IN >5mm 259.6: 65°, JN, IR, VR, Cl, IN <5mm	1 2 0 1		2				
260	260.0	Bottom of borehole at 260.0 ft. Completed as well. Refer to diagram. Notes: 24: Advanced surface casing to 15 ft-bgs (HW pipe). 55 - 99: Hydro test #1 SI 56: Lost circulation. 59: Core tube slipped, core is stuck inside the core barrel. Drillers trip out the core barrel to remove it. 105 - 250: Hydro test #2 SI & CRI 197 - 260: Hydro test #4 SI 237 - 250: Hydro test #3 SI	2131.1														
265																	
270																	
275																	
280																	

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK-30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:27
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RECORD OF DRILLHOLE DH16-03 (GT-7)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Up 252 from GT8

DRILLING START: October 2, 2016 14:45
DRILLING END: October 6, 2016 17:05
COORDINATES: N: 842,614 E: 918,055

SHEET: 1 of 5
GS ELEV.: 2487.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
0	0.0	No recovery, surface soils.	2487.7		HQ3												
	3.5		2484.2								5						
		Gila Conglomerate (Tcg): matrix supported, polylithic CONGLOMERATE, fine to coarse gravel, fine to coarse sandy matrix, clasts of gneiss, quartz, schist, no HCl reaction.									3						
5						1	100	70	76	4.2: 10.0°, B, PL, RO, Bx, IN >5mm	1		3				
										5.9: 15.0°, JN, PL, VR, Bx, IN <5mm	1						
											0						
	8.5		2479.2								>10		5				
		As above, with more fine to coarse sand.									1		4				
10						2	100	78	82	9.2: 30.0°, JN, IR, Bx, IN <5mm	2		3				
											0						
											0						
	13.5		2474.2							12.5: 15.0°, JN, IR, VR, Bx, IN >5mm	3						
		As above.									0						
15						3	100	96	100	14.2: 5.0°, B, PL, RO, CN	1		2				
											0						
											0						
	18.5		2469.2							18: 75.0°, JN, PL, RO, Bx, IN <5mm	1						
		As above, matrix is weathered and weak.								18.8: 10.0°, JN, PL, RO, Bx, IN <5mm	2						
20						4	91	58	58		0		2				
											0						
											0						
	24.0		2463.7								>10		5				
		Becomes faulted and completely weathered, matrix partially washed out from drilling.									>10						
25						5	100	0	20		>10		5				
	26.1		2461.6								>10		5				
		Continues matrix supported, polylithic CONGLOMERATE, fine to coarse gravel, fine to coarse sandy matrix, clasts of gneiss, quartz, schist, no HCl reaction, slightly weathered.									1						
						6	100	78	78		0		2				0.3
											0						
30	30.0		2457.7								0						
		As above, few tuff clasts.								30.4: 45.0°, JN, IR, VR, Bx, IN <5mm	1						
						7	100	100	100		0		2				
											0						
	34.0		2453.7								0						
		As above.								34.2: 90.0°, JN, PL, SM, CN 34.6: 85.0°, JN, PL, VR, CN	2						
35											0						
						8	100	72	80		0		2				
											8						
	39.0		2448.7								0						
		As above, predominantly coarse gravel, clast supported.															
40						9	100	76	76		0		2				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK-30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-03 (GT-7)
1 of 5

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF DRILLHOLE DH16-03 (GT-7)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Up 252 from GT8

DRILLING START: October 2, 2016 14:45
DRILLING END: October 6, 2016 17:05
COORDINATES: N: 842,614 E: 918,055

SHEET: 2 of 5
GS ELEV.: 2487.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

ISRM Strength Index: ● AX. □ DIAM. ▲ UCS (ksi) R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0	As above, predominantly coarse gravel, clast supported. *(continued)*	2447.7		HQ3	9	100	76	76	42.7: 85.0°, JN, PL, RO, Bx, IN <5mm 43.5: 60.0°, JN, PL, RO, Bx, IN <5mm	0 >10 2 1	2 4 2			
	44.0		2443.7												
45		Gila Conglomerate (Tcg): fine to coarse gravel with fine to coarse sand, matrix supported, clasts of gneiss, schist, quartzite, diabase, no HCl reaction, brown.				10	100	86	86	45.8 - 46.6: 80.0°, FLT, PL, VR, Bx, IN >5mm	0 1 >10 0 0	2			
	49.0		2438.7												
50		As above, with completely weathered zone, weak HCl reaction.				11	100	96	96	49.8: 90.0°, JN, PL, VR, Bx, IN >5mm	>10 0 1 0 0	4 3			
	54.0		2433.7												
55	55.0	Becomes completely weathered, fault zone, coarse gravel with partially washed out matrix.	2432.7			12	100	0	0		>10	5			
	56.5	Continues fault zone, matrix washed out.	2431.2			13	80	40	40	55 - 56.5: 85.0°, FLT, PL, RO, Bx, partial iron staining, IN >5mm	>10 5	5 3			
	58.5	Continues fault zone, corestones of Gila Conglomerate in loose gravel.	2429.2			14	50	0	0		>10	5			
60		Becomes matrix supported, polylithic CONGLOMERATE, fine to coarse gravel, fine to coarse sandy matrix, clasts of gneiss, quartz, schist, no HCl reaction, slightly weathered.				15	100	100	100	59: 80.0°, JN, PL, VR, Bx, IN <5mm	0 1 0 0 0	2			
	63.5		2424.2												
65		As above, matrix to clast supported, few cobbles.				16	100	100	100		0 0 0 0 0	1			
	68.5		2419.2												
70		As above, fine to coarse gravel and coarse sand, clast supported.				17	96	96	96		0 0 0 0 0	1			
	73.5		2414.2												
75		As above.				18	100	100	100		0 0 0 0 0	1			
	78.5		2409.2												
80		As above.				19	100	100	100		0	1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK-30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF DRILLHOLE DH16-03 (GT-7)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Up 252 from GT8

DRILLING START: October 2, 2016 14:45
DRILLING END: October 6, 2016 17:05
COORDINATES: N: 842,614 E: 918,055

SHEET: 3 of 5
GS ELEV.: 2487.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0	As above. *(continued)*	2407.7		HQ3	19	100	100	100		0					
											0		1			
											0					
	83.5		2404.2								0					
		As above.									0					
85						20	100	100	100		0		1			
											0					
											0					
	88.5		2399.2								0					
		As above, weak HCl reaction.									0					
90						21	100	100	100	89.5: 85.0°, JN, PL, RO, CN	1		1			
											0					
											0					
	93.5		2394.2								0					
		Continues matrix supported, polylithic CONGLOMERATE, fine to coarse gravel, fine to coarse sandy matrix, clasts of gneiss, quartz, schist, no HCl reaction, slightly weathered.									0					
95						22	100	80	80		0		1			
											>10		4			
											5					
	98.5		2389.2										2			
		Becomes fine to coarse SANDSTONE, trace gravel, tuff, quartz, chert, limestone, diabase, weak HCl reaction, brown.									0					
100						23	100	100	100		0		1			
											0					
											0					
	103.5		2384.2								0					
		Becomes matrix supported, polylithic CONGLOMERATE, fine to coarse gravel, fine to coarse sandy matrix, clasts of gneiss, quartz, schist, no HCl reaction, slightly weathered.									0					
105						24	100	100	100		0		1			
											0					
											0					
	109.0		2378.7								0					
		As above.									0					
110						25	100	90	90		0		1			
											3		4			
											3					
	114.0		2373.7								0		1			
		As above, few limestone clasts.									0					
115						26	100	100	100		0		1			
											0					
											0					
	119.0		2368.7								0					
		As above, few cobbles.									0					
120						27	100	100	100		0		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK-30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF DRILLHOLE DH16-03 (GT-7)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Up 252 from GT8

DRILLING START: October 2, 2016 14:45
DRILLING END: October 6, 2016 17:05
COORDINATES: N: 842,614 E: 918,055

SHEET: 4 of 5
GS ELEV.: 2487.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
120	120.0	As above, few cobbles. *(continued)*	2367.7		HQ3	27	100	100	100		0 0 0 0 0		1			
	124.0		2363.7													
125	126.0	As above, no cobbles.	2361.7			28	100	100	100		0 0 1		1			
		As above, weak HCl reaction.				29	100	100	100	127.7: 85.0°, JN, PL, VR, CN 129.9: 80.0°, JN, PL, VR, CN	0 1 0 0 1 0		1			
130	131.0		2356.7													
		As above, few limestone clasts.				30	100	100	100		0 0 0 0		1			
135	136.0		2351.7													
	139.0	Continues matrix supported, polylithic CONGLOMERATE, fine to coarse gravel, fine to coarse sandy matrix, clasts of gneiss, quartz, schist, no HCl reaction, slightly weathered.	2348.7			31	100	100	100		0 0 0 0 0 0		1			
140		As above.				32	100	100	100		0 0 0 0 0 0		1			
	144.0		2343.7													
145		As above.				33	100	100	100		0 0 0 0 0 0		1			
	149.0		2338.7													
150		As above.				34	100	100	100		0 0 0 0 0 0		1			
	154.5		2333.2													
155		As above.				35	96	96	96		0 0 0 0 0 0		1			
160						36	100	100	100		0					

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK-30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF DRILLHOLE DH16-03 (GT-7)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Up 252 from GT8

DRILLING START: October 2, 2016 14:45
DRILLING END: October 6, 2016 17:05
COORDINATES: N: 842,614 E: 918,055

SHEET: 5 of 5
GS ELEV.: 2487.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index ● AX. □ DIAM. ▲ UCS (ksi): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
160	160.0		2327.7														
	161.0	As above. *(continued)*	2326.7														
		Becomes Apache Leap tuff (Talg), fine grained, TUFF, whitish gray, fresh.			HQ3	36	100	100	100	161: 85.0°, CON, PL, RO, CN	1 0 0 0		1 1				
	164.0		2323.7														
165		Bottom of borehole at 164.0 ft. Completed as well. Refer to diagram. Notes: 45 - 59: Hydro test #2 SI & CRI 55.5 - 58: Drillers lose surface circulation, zone taking a lot of water. 64 - 164: Hydro test #1 SI & CRI 114 - 164: Hydro test #3 SI															
170																	
175																	
180																	
185																	
190																	
195																	
200																	

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK-30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-03 (GT-7)
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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
P:\2015 PROJECTS\1531436 RCML NEAR WEST TSF GEOTECH\GINT\FINAL GINT PROJECTS\FINAL_OCTOBER 2017\NWTSF_FINAL_DRILLHOLE.GPJ

RECORD OF DRILLHOLE DH16-04 (GT-41)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 6, 2016 14:10
DRILLING END: October 10, 2016 09:30
COORDINATES: N: 840,821 E: 916,971

SHEET: 1 of 6
GS ELEV.: 2429.4
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6 (ksi)	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
0	0.0	Completely weathered surface outcroppings of steeply dipping schist, iron oxide staining.	2429.4		HQ3	1	20	0	0	0 - 2.9: rubble 1.9: 52.0°, JN, PL, SM, CN	>10 >10 >10	R1	5		BC	
2.5		Pinal Schist (pCpi): interbedded SCHIST and METASILTSTONE, foliated, crenulated, weathered, jointed, iron oxide and manganese oxide staining, and faulting.	2426.9			2	100	73	83	2.9: 36.0°, FOLO, PL, RO, CN, full iron staining 4: 46.0°, FOLO, UN, RO, Sa, full iron staining, IN >5mm, 1-cm sand, small roots 4.7: 57.0°, FOLO, PL, SM, full iron staining	0 2 3	R2	3		LC	
5	6.5	As above.	2422.9			3	100	9	69	5.6: 43.0°, FLT, UN, SM, Sa, full iron staining, IN >5mm, 1-cm clayey sand with roots 5.7: 35.0°, FOLO, UN, SM, MnOx, full iron staining, SO 6.2: 47.0°, FOLO x 2, PL, SM, full iron staining	>10 9 8 10	R3	3			0.3
10	10.5	Continues gray, METASILTSTONE partial iron oxide staining, faulted and crushed.	2418.9			4	100	0	0	6.3 - 7.2: rubble, drill damage	>10	R4	3			
	13.5	Becomes entirely crushed, breccia and sand, trace clay, minor iron oxide staining. Drillers note they are losing some circulation.	2415.9			5	100	10	27	7.4: 45.0°, FOLO, PL, RO, MnOx, partial iron staining, SO 7.7: 50.0°, JN, PL, RO, MnOx, SO	>10 8	R5	3			
15	15.5		2413.9			6	100	0	0	8: 52.0°, FOLO, PL, SM, Sa, full iron staining, PC 8.3: 30.0°, JN, ST, RO, full iron staining	>10 >10	R6	3			
	19.0	Becomes gray METASANDSTONE, fine to medium grained, jointed with minor faulting, interbeds of METASILTSTONE are foliated and weak, trace iron oxide staining.	2410.4			7	100	63	80	8.4: 35.0°, FOLO, CU, RO, MnOx, SO 8.5 - 9.3: 45.0°, FLT, PL, RO, Bx, IN >5mm, 20-cm broken brecciated rock, FeOx 9.7 - 10: broken 10.5 - 10.8: FLT, Bx 11 - 11.3: 45.0°, FLT, Bx	>10 8 3 2		2 - 3			
20	24.0	As above.	2405.4			8	100	92	100	11.4: 55.0°, FOLO, PL, SM, M, partial iron staining, PC 11.5 - 12: FLT, Bx 12.3: 45.0°, FOLO, ST, SM, M, partial iron staining, PC 12.6 - 13.5: FLT, Bx 13.5 - 15.5: FLT, Bx 16: 48.0°, JN, PL, SM, partial iron staining 16.1: 33.0°, JN, UN, RO, Sa, PC	0 1 0 3 1		2			
25	29.0	As above, with faults, minor iron oxide staining across fault.	2400.4			9	100	50	50	16.4: 55.0°, FOLO, PL, SM, sericite, PC 16.6: 30.0°, JN, PL, RO, Sa, partial iron staining, PC 16.8 - 17.3: FLT, Bx, partial iron staining 18.3: 25.0°, JN, PL, RO, Bx, IN <5mm 20.4: 27.0°, B, PL, RO, sericite, PC 22.3: 47.0°, FLT, CU, RO, Bx, IN <5mm	>10 1 1 6 >10		3			
30	31.5	Continues METASILTSTONE, foliated, crenulated, fine grained, gray, brecciated and crushed, trace chloritic alteration, manganese oxide dendrites.	2397.9			10	100	24	56	22.4: 55.0°, JN, PL, SM, full iron staining, SO 22.7: 26.0°, B, PL, RO, Ca, PC 23.3: 64.0°, JN, PL, SM, sericite, PC	1 3 >10		3			
	33.5	As above, quartz veins.	2395.9			11	100	0	0	24 - 25: FLT, Bx 25.6: 34.0°, B, PL, VR, CN 26: 40.0°, JN, PL, VR, MnOx, SO	>10 >10		3			
35	35.0	As above.	2394.4			12	100	0	0	27.4 - 29: FLT, brecciated rock with sandy gouge and iron staining	>10		4			
	37.0	As above, with more clayey gouge.	2392.4			13	100	15	15	29.7: 30.0°, JN, PL, SM, M, PC 30.1: 27.0°, FOLO, IR, VR, MnOx, SO	>10 6		3 - 4			
40		As above.				14	100	71	71	30.2: 45.0°, JN, IR, VR, MnOx, CC <1mm 30.7 - 30.8: 30.0°, FLT, UN, SM, G 30.8 - 35: 30.0°, FLT, Bx, gougey sand and crushed rock	2 1 2		2 - 3			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 6, 2016 14:10
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COORDINATES: N: 840,821 E: 916,971

SHEET: 2 of 6
GS ELEV.: 2429.4
TOC ELEV.: na
DATUM:

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DEPTH (ft)	Depth	SOIL/ROCK PROFILE: DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC	LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0		2389.4															
	40.5		2388.9			14				37.5: 45.0°, B, PL, VR, partial iron staining	7		2 - 3					
		As above.				15	100	0	0	37.6: 45.0°, B, PL, SM, MnOx, SO	>10		3					
	42.0		2387.4							37.8: 38.0°, JN, PL, RO, M, PC	>10							
		As above.				16	50	0	0	38.5: 55.0°, B, PL, SM, MnOx, CC <1mm	>10		3					
45	45.0		2384.4							39.1: 63.0°, B, PL, SM, MnOx, PC	>10							
		As above.				17	100	0	0	39.7 - 40.5: FLT, Bx, little FeOx and MnOx	>10		3					
	47.0		2382.4							40.8: 45.0°, B, PL, VR, MnOx, SO	>10							
	47.5	As above.	2381.9			18	100	0	0	41: 5.0°, JN, UN, RO, clayey sand, IN <5mm	>10		3 - 4					
		Becomes purple gray, METASANDSTONE, fine to medium grained, calcite veining, extensive iron oxide staining on all discontinuities,				19	100	0	28	41.1: 45.0°, B, PL, RO, MnOx, CC <1mm	>10							
50	50.0	broken.	2379.4							41.3: 38.0°, B, PL, RO, MnOx, CC <1mm	5		3					
		Becomes fault gouge, sandy clay, some breccia.								41.35 - 45: FLT, Bx, some clayey gouge	7							
						20	38	8	8	45 - 48: FLT, Bx, partial iron staining	>10		5					
	53.0		2376.4							48.1: 30.0°, JN, CU, RO, partial iron staining	>10							
		Becomes METASANDSTONE brownish gray, fine to medium grained, foliated, boudined quartz veins, calcite veining,								48.2: 45.0°, JN, IR, VR, Ca, full iron staining, PC	>10							
55	55.0	fractured, iron oxide staining on discontinuities.	2374.4							48.3: 25.0°, B, ST, SM, full iron staining	>10		3					
		Fault gouge, sandy clay.								48.4: 45.0°, JN, IR, RO, full iron staining	2		3					
						21	50	10	25	48.7: 55.0°, JN, ST, RO, full iron staining	>10							
										49: 35.0°, JN, PL, RO, Ca, full iron staining, CC <1mm	>10		5					
	59.0		2370.4							49.2: 25.0°, JN, ST, RO, Ca, full iron staining, PC	>10							
		As above.								49.4: 46.0°, B, PL, SM, partial iron staining	>10							
60					HQ3					49.5: FLT, rubble	>10		5					
						21	75	20	20	50 - 53: FLT, G	3							
										53.4 - 54: FLT x 54, Bx, full iron staining, clayey infill of breccia	>10		4					
	62.0		2367.4							54.1: 25.0°, B, PL, VR, Cl, full iron staining, CC <1mm	>10							
		As above.								54.7: 65.0°, JN, PL, SM, Sa, full iron staining, PC	>10							
						22	75	0	0	55 - 59: FLT, G, sandy clay	>10		3 - 4					
	64.0		2365.4							59.4: 40.0°, B, PL, RO, partial iron staining	>10							
65		Becomes gray to brown gray, interbeds of SCHIST and METASANDSTONE, foliated along bedding, crenulated, boudined quartz, brecciated zones, few calcite veins.								59.9 - 64: FLT, weak, brecciated rock with clay infilling	1							
						23	100	30	43	64.6: 5.0°, FOLO, PL, PO, Cl, IN >5mm	>10		3					
										65.2 - 65.8: FLT, Bx, clay infilling	>10							
	68.0		2361.4							66.1 - 66.8: FLT, Bx, clay infilling	4							
		As above, brecciated.								67.5: 32.0°, JN, PL, SM, Cl, CC <1mm	2		3					
70						24	100	27	27	67.6: 65.0°, B, PL, PO, MnOx, CC <1mm	>10		4					
	71.0		2358.4							67.8 - 68: broke core, drilling damage	>10		5					
		As above.								68.4: 45.0°, FLT, PL, RO, G, IN <5mm	>10		5					
						25	75	0	20	68.9: 38.0°, B, PL, SM, Cl, CC <1mm	8		3					
	73.0		2356.4							69 - 70: FLT, Bx, clay infilling	>10							
		As above.								70 - 72: FLT, G, sandy clay	>10							
						26	80		12	72 - 73: broken core	>10		4 - 5					
75										73 - 74.5: FLT, Bx, with clay infilling	>10							
	75.5		2353.9							74.5 - 75.5: FLT, G, clayey sand gouge	>10							
		As above.				27	100	30	30	75.5 - 76.1: FLT, Bx	>10		3					
	76.5		2352.9							76.5 - 77.5: FLT, Bx, clay infilling	>10							
		As above, quartz vein.								77.5 - 78.2: VNO, broken quartz vein	>10		4					
	78.3		2351.1			28	100	40	49	78.2 - 78.5: FLT, Bx, crushed clayey sand and gravel	1							
80	80.0	Becomes gray, interbedded METASILTSTONE and METASANDSTONE, fine grained,	2349.4										2					
		Log continued on next page																

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
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Golder Associates

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RECORD OF DRILLHOLE DH16-04 (GT-41)

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COORDINATES: N: 840,821 E: 916,971

SHEET: 3 of 6
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DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (ksi): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0	boudined quartz veins, strong.	2349.4													
		As above, broken.				29	100	0	15	78.7: 48.0°, B, PL, SM, partial iron staining 79.3: 53.0°, JN, PL, RO, CN 80 - 82: FLT, Bx	>10 >10		5		
	82.0	Poor recovery, brownish gray breccia and sand, iron oxide staining on discotinuities.	2347.4			30	50	0	0	82 - 84: FLT, Bx, partial iron staining	>10 >10		4		
85	84.0	Becomes pinkish gray, medium grained, SCHIST, foliated along bedding, iron oxide staining throughout and on discontinuities, fractured, trace fine grained garnets.	2345.4			31	83	27	33	85.3: 40.0°, FOLO x 3, CU, VR, full iron staining 85.5: 22.0°, FLT, ST, RO, Bx, IN >5mm, full iron staining	5 9 4		2 - 3		
	87.0	As above, but with zone of gougey crushed rock.	2342.4			32	60	15	15	85.9: 55.0°, FOLO, PL, SM, full iron staining 86.1: 55.0°, FOLO, PL, SM, Cl, CC <1mm	6 >10		2 5		
90	89.0	As above.	2340.4			33	100	15	35	86.15: 80.0°, JN, CU, VR, full iron staining 86.3: 45.0°, JN, CU, RO, partial iron staining	>10 3		3		
	91.0	As above.	2338.4			34	100	0	0	86.5: 45.0°, FOLO, ST, RO, partial iron staining	>10		4		
	92.0	As above.	2337.4			35	100	55	70	87.4 - 89: FLT, G, gougey crushed rock, trace staining 89 - 90.3: FLT, Bx, partial iron staining, clean brecciated rock, some FeOx staining, quartz gravel	3 2		2		
	94.0	As above.	2335.4			36	100	27	27	90.3: 5.0°, JN, UN, RO, vertical fracture 90.5: 55.0°, B, PL, RO, full iron staining	>10 >10		3		
95	97.0	Becomes gray brown, interbedded METASANDSTONE and METASILTSTONE, foliated along bedding, quartz boudins, fractured, iron oxide haloes around joints.	2332.4			37	100	33	43	91 - 92: FLT, Bx, sandy clay infilling, trace staining 92.1 - 92.3: 15.0°, FLT, IR, RO, Bx 92.9: 70.0°, JN, PL, RO, CN 93.1: 57.0°, JN, PL, RO, partial iron staining 93.3: 20.0°, JN, ST, RO, MnOx, SA	0 0 5 >10		3		
100	100.0	Contact with intrusive, poor recovery.	2329.4		HQ3	38	67	0	10	94 - 96: FLT, Bx, brecciated, little clayey sand, little staining 98: 50.0°, B, PL, RO, MnOx, full iron staining, SA 98.4: 44.0°, B, PL, RO, Sa, full iron staining, PC	>10 >10 >10		3 - 4		
	103.5	Becomes dark greenish gray, DIABASE, aphanitic, foliated, brecciated, extensive iron oxide staining on fracture surfaces.	2325.9			39	60	0	0	98.6: 50.0°, JN, ST, RO, full iron staining 98.7 - 103.5: FLT, brecciated, clean fractures, FeOx staining, sand 103.5 - 107.5: FLT, Bx, extensive FeOx staining	>10 >10 >10 >10		4		
105	107.5	As above, some calcite.	2321.9			40	50	0	0							
	108.0	Continues dark greenish gray, DIABASE, aphanitic to very fine grained phaneritic, fabric slightly foliated, quartz veining, fractured with iron oxide (limonite and hematite) coating all fracture surfaces, with partial healing by calcite veins.	2321.4			41	100	0	0		>10					
	109.5	As above, trace calcite in fractures.	2319.9			42	100	0	13	107.5 - 109.5: FLT, Bx, full iron staining	>10		3		
110	113.5	As above, becomes less fractured.	2315.9			43	100	30	30	109.5 - 110.2: FLT, Bx, full iron staining, trace calcite and clay 111.1 - 112.5: FLT, Bx, full iron staining, partial healing of breccia with quartz 113 - 113.7: FLT, Bx, full iron staining, trace calcite, clay	5 2 9 5 7		3		
115	118.5	As above.	2310.9			44	100	88	94	114.3: 70.0°, JN, IR, VR, CN, full iron staining 115: 36.0°, JN, PL, SM, full iron staining 115.4: 62.0°, FOLO, CU, RO, partial iron staining 115.5: JN, PL, SM, sericite, partial iron staining, PC 115.6: 58.0°, FOLO, ST, SM, sericite, full iron staining, PC	1 4 2 0 1		2 - 3		
120						45	100	57	77	116.2: 30.0°, JN, PL, SM, Ca, full iron staining, CC	2		2		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT
120	120.0		2309.4								
		As above. *(continued)*				45	100	57	77	<1mm 116.7: 30.0°, JN, ST, SM, Ca, partial iron staining, CC <1mm	1 7
	122.0		2307.4								
		Becomes extensively fractured, but completely healed with calcite.				46	100	100	100	118.7: 61.0°, FOLO, PL, SM, full iron staining 119.2 - 119.3: 60.0°, FLT, PL, SM, Bx, full iron staining, IN >5mm	0 0
	124.0		2305.4								
125		Continues dark greenish gray, DIABASE, aphanitic, fabric slightly foliated, quartz veining, fractured with iron oxide coating all fracture surfaces, with zones of healing by calcite veins.				47	100	37	46	119.5: 45.0°, JN, IR, RO, Ca, full iron staining, PC 120.4: 18.0°, JN, PL, SM, M, full iron staining, CC <1mm 121.2: 68.0°, JN, PL, SM, Ca, full iron staining, CC <1mm	0 6 >10 >10
	127.5		2301.9								
		As above but becomes completely brecciated, partially healed.				48	100	0	12	121.4 - 122: fractured rock with drilling damage 125.4 - 127: FLT, Bx, full iron staining, breccia and sand, trace sericite	>10 >10
130	130.0		2299.4								
		As above.				49	100	55	65	127.1: 12.0°, JN, PL, SM, FeOx, CC <1mm 127.3: 45.0°, JN, ST, VR, Ca, full iron staining, PC 127.5 - 130: FLT, Bx, full iron staining, zones of partial healing 130.5: 50.0°, JN, PL, SM, full iron staining	4 >10 1 0
	134.0		2295.4								
135		As above, lightly fractured and jointed with iron oxide coating all fracture surfaces, completely healed with calcite veins.				50	100	62	62	130.8 - 131: FLT, Bx, full iron staining 131.2 - 132: FLT, Bx, full iron staining, breccia and sand 132.6: 50.0°, JN, ST, RO, Ca, full iron staining, CC <1mm 136: 38.0°, JN, PL, SM, Ca, partial iron staining, CC <1mm	0 0 >10 >10 >10
	137.8		2291.6								
	138.5	As above.	2290.9								
		As above, less brecciated.			HQ3	51	75	0	25	136.8 - 138: FLT, Bx, fractured with crushed sandy zones	10
140	140.5		2288.9								
		Contact with host rock, very poor recovery.				52	33	0	0	138.5 - 140.5: FLT, fractured core 140.5 - 142: CONO, poor recovery of silicic rubble	>10 >10
	142.0		2287.4								
	144.0	Becomes Pinal Schist (pCpi): METASILTSTONE, pinkish brown, fine grained, highly fractured, large quartz veins.	2285.4			53	100	0	20	142 - 143: CONO, contact zone continues, chunks of quartz and silicified rock 143.1: 25.0°, JN, PL, SM, full iron staining	
145		As above.				54	100	0	15	143.15: 55.0°, JN, PL, RO, full iron staining 143.6: 45.0°, JN, CU, RO, full iron staining	>10 >10
	148.0		2281.4			55	100	15	45	144 - 145.5: FLT, Bx, full iron staining 145.5 - 146.3: G 146.9: 54.0°, JN, PL, VR, partial iron staining	4 5
		As above.								147: 10.0°, JN, PL, RO, Ca, IN <5mm	6
150						56	91	43	54	147.3 - 147.5: 50.0°, FLT, G, IN >5mm, soft clay 148.4 - 149: FLT, poor recovery, washed out gravel	1 5
	151.5		2277.9								
		As above, highly fractured.				57	100	0	0	149.3: 46.0°, JN, PL, RO, Ca, full iron staining, CC <1mm 150.1: 40.0°, B x 3, PL, SM, full iron staining 150.4 - 150.5: 49.0°, FLT, PL, SM, G	>10 >10 >10
	154.0		2275.4								
155		As above, gougey fault zone.				58	100	0	0	150.9: 48.0°, FOLO, PL, SK, talc, full iron staining, CC <1mm 151.2 - 154: FLT, Bx, partial iron staining, fractured and crushed rock, little clay	>10 >10 8
	156.5		2272.9								
		Becomes gray, METASANDSTONE, lightly foliated, trace calcite veining, fractured zones.				59	100	40	52	154 - 156.7: Bx, gougey breccia, trace staining 157.3: 75.0°, JN, IR, RO, Cl, PC	2 >10
	159.0		2270.4								
160		As above.				60	100	32	52	157.6: 52.0°, FOLO, PL, PO, Cl, CC <1mm 158 - 159: FLT, Bx, little	4

Log continued on next page

ISRM Strength Index: ● AX. ☐ DIAM. ▲ UCS (ksi) — R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6

ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC	LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
2					
2					
2					
3					
3					
2 - 3					
2					
3					
3					
4					
4					
3					
3					
3					
4					
3					
2 - 3					

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF DRILLHOLE DH16-04 (GT-41)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 6, 2016 14:10
DRILLING END: October 10, 2016 09:30
COORDINATES: N: 840,821 E: 916,971

SHEET: 5 of 6
GS ELEV.: 2429.4
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (ksi): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
160	160.0	As above. *(continued)*	2269.4		HQ3	60	100	32	52	clay coating 159.3: 65.0°, FLT, IR, RO, Bx, IN >5mm	5		2 - 3					
	162.0		2267.4							159.6 - 159.9: FLT, Bx, partial iron staining	>10							
		As above, crushed gougey rock with minor iron oxide staining.				61	57	0	6	160.4: 55.0°, B, PL, SM, partial iron staining 160.6: 48.0°, B, PL, PO, Cl, partial iron staining, IN <5mm	>10 >10 >10		5					
	164.0		2265.4															
165	165.0	Continues gray, interbedded METASANDSTONE and METASILTSTONE, foliated, slightly crenulated, fractured zones.	2264.4							160.7 - 162: FLT, Bx, fractured, brecciated rock	>10		3					
		Becomes fault zone.				62	71	20	20	162 - 164: FLT, finely crushed rock and sand, little clay, poor recovery 164 - 165: FLT, highly fractured rock	>10 >10 >10		4					
										165.5 - 171: FLT, breccia, gouge and crushed rock	>10							
170						63	40	0	0		>10 >10		4					
	171.0		2258.4															
	172.5	Continues pink gray, interbedded METASANDSTONE and METASILTSTONE, foliated, slightly crenulated, fractured zones.	2256.9			64	100	0	40	171.2: 45.0°, JN, PL, RO, Ca, IN <5mm 171.4: 40.0°, FOLO, PL, RO, partial iron staining	7 >10		3					
	174.0	No recovery.	2255.4			65	20	0	20	171.5 - 172.5: FLT, broken/brecciated rock, little clay, trace staining	>10							
175		As above.				66	80	0	0	174.5 - 176.5: FLT, crushed clayey sand, fractured rock corestones	>10 >10		4					
	176.5		2252.9															
	177.5	As above.	2251.9			67	100	30	30	176.5 - 177.5: highly fractured rock	6 10		3					
		As above.				68	57	20	20	177.7: 58.0°, FOLO, PL, SK, Cl, CC <1mm 178.2: 54.0°, FOLO, PL, SK, Cl, CC <1mm 178.21 - 179.5: FLT, Bx, staining on fractures and through rock body	>10 >10 >10		3					
180	181.0		2248.4															
		Very poor recovery, rubble only, iron oxide staining.				69	33	0	0	179.5 - 183: FLT, no recovery	>10 >10							
	184.0		2245.4							183 - 184: FLT, Bx, full iron staining, some calcite	>10		4					
185		Becomes gray, fine grained, METASILTSTONE, foliated on bedding, some crenulations, some calcite and iron oxide along foliations.				70	75	13	48	184 - 185: FLT, no recovery 185 - 185.5: FLT, Bx, partial iron staining, rubble 185.6: 48.0°, FOLO, UN, RO, Cl, partial iron staining, PC 185.7: 55.0°, FOLO, UN, RO, full iron staining	>10 6 3 5		3					
	188.0		2241.4															
		As above.				71	100	30	83	185.9 - 186: 55.0°, FLT, PL, RO, Sa, partial iron staining, IN >5mm 186.1: 55.0°, FOLO, UN, SM, full iron staining 186.6: 65.0°, FOLO, PL, SK, Cl, partial iron staining, IN <5mm	3 2 2 5		3					
190	192.0		2237.4															
		As above.				72	100	60	100	186.8 - 186.9: 58.0°, FLT, UN, RO, Sa, partial iron staining, IN >5mm, clayey sand infill	2 1		2					
	194.0		2235.4							187.3 - 187.4: 54.0°, FLT, PL, SM, Bx, partial iron staining, IN >5mm	2							
195		As above.				73	100	60	76	187.6: 55.0°, FOLO, UN, SM, Cl, IN <5mm 187.8 - 188: FLT, G, IN >5mm, clayey sand 188.2: 37.0°, FOLO, PL, PO, Cl, CC <1mm, shear 188.6: 27.0°, FOLO, PL, PO, Cl, CC <1mm	0 5 1		2					
	198.5		2230.9															
		As above, but more fractured.				74	68	0	12	188.9: 51.0°, FLT, UN, VR, Cl, partial iron staining, CC <1mm	>10 >10		3					
200		Log continued on next page																

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF DRILLHOLE DH16-04 (GT-41)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 6, 2016 14:10
DRILLING END: October 10, 2016 09:30
COORDINATES: N: 840,821 E: 916,971

SHEET: 6 of 6
GS ELEV.: 2429.4
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT
200	200.0		2229.4								
		As above, but more fractured. *(continued)*				74	68	0	12	189.2 - 189.4: 32.0°, FLT, PL, SK, Bx, partial iron staining, shear	>10
	201.0		2228.4							190.6: 25.0°, FLT, PL, SM, Sa, CC <1mm	0
		As above.				75	100	33	47	190.8: 57.0°, FLT, PL, SK, Cl, IN <5mm, shear	5
	204.0		2225.4							191.1: 21.0°, JN, PL, RO, Sa, full iron staining, IN <5mm	7
205		As above, brecciated, trace staining on discontinuities.				76	100	0	15	191.4 - 191.5: 60.0°, FLT, PL, SK, G, partial iron staining, IN >5mm, shear	>10
	206.0		2223.4							191.7: 60.0°, FOLO, PL, SK, Cl, partial iron staining, CC <1mm	3
		Rock as above, but competent with gougey fault zone.				77	92	32	44	191.75: 19.0°, JN, PL, RO, Ca, IN <5mm	7
	208.5		2220.9							192.3: 47.0°, FOLO, PL, SK, Cl, partial iron staining, CC <1mm	>10
		Continues pinkish gray, fine to medium grained, METASANDSTONE foliated, sheared, brecciated and partially healed, some calcite stockwork, minor iron oxide staining.			HQ3	78	100	40	40	192.7: 53.0°, FOLO, PL, PO, Cl, partial iron staining, CC <1mm	1
210										193.7: 48.0°, FOLO, PL, SK, Cl, partial iron staining, PC	7
	211.5		2217.9							194.6 - 194.8: 35.0°, FLT, PL, RO, Bx, partial iron staining	6
		As above.				79	100	48	80	196 - 196.5: 45.0°, FLT, PL, RO, Bx, partial iron staining, IN >5mm, some calcite	2
	214.0		2215.4							197: 70.0°, JN, PL, SM, Ca, CC <1mm	5
		As above, increased quartz veining.				80	88	25	33	197.5 - 198.5: drilling damage	3
215										198.5 - 201: Bx, fractured, sheared, poor recovery	6
	218.0		2211.4							202.1: 45.0°, FOLO, ST, PO, Cl, CC <1mm	>10
		As above.				81	100	25	40	202.5: 35.0°, FOLO, PL, RO	>10
220	220.0		2209.4							202.8 - 203.3: 45.0°, FLT, SK, Bx, shear	5
		Bottom of borehole at 220.0 ft. Completed as well. Refer to diagram. Notes: 0 - 35: Hydro test #1 FHT 23 - 50: Hydro test #2 SI & CRI 35: Drillers set surface casing to 5 ft-bgs. 79 - 108: Hydro test #3 SI & CRI 87: Driller notes he is losing ~ 40% fluid circulation, and increasing. 177.5 - 181: Driller notes zone is taking some water, poor recovery. 189 - 220: Hydro test #4 SI									203.6 - 204: 50.0°, FLT, PL, SK, Bx, shear 204 - 206.3: FLT, Bx, fractured rock, clayey sand infill, little calcite, trace staining 207.1: 47.0°, FOLO, ST, PO, Cl, partial iron staining, CC <1mm 207.4 - 208.5: FLT, SK, G, clayey sandy crushed rock, trace staining 208.5 - 209.2: PL, SK, Bx, little clay infill, trace staining 210: 46.0°, FOLO, PL, VR, Cl, partial iron staining, PC 210.4: FLT, Bx, clay coatings, partial staining 211.9: 70.0°, JN, IR, RO, Ca, full iron staining, IN <5mm 212.5: 42.0°, FOLO, PL, SK, Cl, full iron staining, PC 213 - 213.4: 30.0°, FLT, PL, PO, G, partial iron staining, shear 213.7: 38.0°, VNO, IR, VR, Ca, partial iron staining, IN <5mm, vuggy calcite vein 214.6 - 215.4: FLT, Bx, partial iron staining, clay coatings 215.7 - 218: FLT, Bx, clayey sand infill 218: 40.0°, JN, PL, PO, Cl, full iron staining, CC <1mm 218.5: 75.0°, JN, IR, RO, Cl, partial iron staining, PC 218.8: 30.0°, VNO, UN, RO, Ca, IN <5mm 219.2 - 220: FLT, Bx, partial iron staining	
225											
230											
235											
240											

ISRM Strength Index: ● AX. ☐ DIAM. ▲ UCS (ksi)
R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6

ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
3					
2 - 3					
3					
3					
3					
3					
3					

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF BOREHOLE DH16-05 (GT-39)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 13, 2016 10:30
DRILLING END: October 18, 2016 11:30
COORDINATES: N: 838,291 E: 916,378

SHEET: 1 of 7
GS ELEV.: 2247.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in (Automatic hammer 140 lb Hammer, 30 inch drop)	REC / ATT (in)	PENETRATION RESISTANCE BLOWS / ft (20 40 60 80) / WATER CONTENT (%) (W_p W W_l)	NOTES	ADDITIONAL LAB TESTING
0		0.0	Alluvial material: washed gravels: schist, gneiss, quartzite, and quartz clasts.	2247.0								
5		6.0	Completely weathered DIABASE, clayey gravel with sand, mottled red brown, clasts are dark green, mafic.	2241.0			SS SPT-1	13-28-33 **(61)**	18/18	61		
		9.0	Becomes Pinal Schist (pCpi): completely weathered psammitic SCHIST, yellow brown, clayey sand and gravel, some dark green intrusive clasts. SPT blows @ 9 (per 3"): 7-50/3"	2238.0			SS SPT-2	50 **(50/")**	4/6			
10		14.0	Washed gravel, clasts are pinkish brown. SPT blows @ 14 (per 3"): 13-50/1"	2233.0			SS SPT-3	50/4" **(50/4")**	4/4	100		
15		17.0	As above.	2230.0								
		19.0		2228.0								
20	HQ3	19.5	Becomes dark greenish gray, DIABASE, aphanitic intrusive, abundant FeOx on discontinuities.	2227.5						100	20: Hole is caving and drillers can't get back to bottom. Cannot perform falling head test because of cave. Drillers to advance casing to 20. 21.5: Driller puts bag of holeplug down hole before start of drilling to help with hole washout. 22: Drillers add some polymer after setting casing to lift sand in hole. 29 - 44: Hydro test #1 FHT	
		20.5	No recovery.	2226.5								
		21.5	Continues dark greenish gray, DIABASE, aphanitic intrusive, abundant FeOx on discontinuities, siltstone gravel as well. As above.	2225.5								
25		24.5	As above, becomes weathered to clay.	2222.5								
		25.5	Becomes slightly foliated DIABASE, variably altered from very weak rock to soft clay.	2221.5								
30		30.0	Becomes contact DIABASE with Pinal Schist, soft clayey, sandy gouge.	2217.0								
		34.5	Becomes Pinal Schist (pCpi): light pinkish brown, medium grained, psammitic SCHIST, light foliation, fractured and jointed.	2212.5								
35		37.0	As above.	2210.0								
		39.0	As above.	2208.0								
40			Log continued on next page									

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 15:35
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RECORD OF DRILLHOLE DH16-05 (GT-39)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 13, 2016 10:30
DRILLING END: October 18, 2016 11:30
COORDINATES: N: 838,291 E: 916,378

SHEET: 1 of 8
GS ELEV.: 2247.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
0	0.0	Alluvial material: washed gravels: schist, gneiss, quartzite, and quartz clasts.	2247.0		HQ3	1	25	0	0							0.2
5	6.0		2241.0			2	50	0	0							
						3	50	0	0							
		Completely weathered DIABASE, clayey gravel with sand, mottled red brown, clasts are dark green, mafic.				4	17	0	0		>10					
	9.0		2238.0								>10					
10		Becomes Pinal Schist (pCpi): completely weathered psammitic SCHIST, yellow brown, clayey sand and gravel, some dark green intrusive clasts.				5	33	0	0		>10		5			
		SPT blows @ 9 (per 3"): 7-50/3"									>10					
						6	25	0	0		>10		5			
	14.0		2233.0								>10					
15		Washed gravel, clasts are pinkish brown.				7	33	0	0		>10		5			
		SPT blows @ 14 (per 3"): 13-50/1"									>10					
	17.0		2230.0								>10					
		As above.				8	15	0	0		>10		5			
	19.0		2228.0								>10					
	19.5	Becomes dark greenish gray, DIABASE,	2227.5			9	100	0	60		>10		4			
20	20.5	aphanitic intrusive, abundant FeOx on discontinuities.	2226.5			10	0	0	0		>10					
	21.5	No recovery.	2225.5			11	50	0	30		>10		5			
		Continues dark greenish gray, DIABASE, aphanitic intrusive, abundant FeOx on discontinuities, siltstone gravel as well.				12	67	10	17	23 - 23.4: FLT, Bx, full iron staining, crushed rock and sand	>10		4			
		As above.									5					
	24.5		2222.5							23.8: 30.0°, JN, ST, SM, Cl, full iron staining, PC	>10					
25		As above, becomes weathered to clay.				13	50	0	30	23.9 - 24.3: FLT, Bx, full iron staining	>10		4			
	25.5		2221.5							24.5 - 25.5: FLT, Bx, clay matrix	0					
		Becomes slightly foliated DIABASE, variably altered from very weak rock to soft clay.				14	86	31	43		0		4			
										28 - 29: FLT, Bx, matrix of breccia altered to soft clay	>10					
30	30.0		2217.0							29.5: 68.0°, JN, CU, RO, M, full iron staining, PC	2		4			
		Becomes contact DIABASE with Pinal Schist, soft clayey, sandy gouge.				15	20	14	14		>10					
											>10		5			
										29.9 - 35: CONO, contact between intrusive and schist	>10					
	34.5		2212.5								>10					
35		Becomes Pinal Schist (pCpi): light pinkish brown, medium grained, psammitic SCHIST, light foliation, fractured and jointed.				16	83	0	53	35 - 36: FLT, Bx, bottom of contact, breccia with clayey sand	>10		5			
	37.0		2210.0							36.1: 55.0°, JN, PL, SM, Cl, full iron staining, CC <1mm	7		3			
		As above.				17	100	70	85	36.2: 30.0°, JN, CU, RO, MnOx, partial iron staining, PC	2		2			
	39.0		2208.0							36.4: 32.0°, JN, PL, SM, Sa, PC	1					
40		As above.				18	100	56	86	36.7: 25.0°, JN, IR, RO, Ca,	1		2			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF DRILLHOLE DH16-05 (GT-39)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 13, 2016 10:30
DRILLING END: October 18, 2016 11:30
COORDINATES: N: 838,291 E: 916,378

SHEET: 2 of 8
GS ELEV.: 2247.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0	As above. *(continued)*	2207.0		HQ3	18	100	56	86	PC 36.8: 20.0°, JN, IR, RO, Ca, PC 36.9: 40.0°, JN, PL, RO, M, partial iron staining, PC 37.7 - 37.9: FLT, IR, RO, Bx, IN >5mm 38: 70.0°, JN, PL, RO, Cl, PC	5 1 3 1		2			
	44.0	As above.	2203.0			19	100	82	100	39.4: 44.0°, JN, PL, SM, partial iron staining 40: 42.0°, B, CU, RO, Cl, partial iron staining, PC 40.2: 61.0°, B, ST, RO, M, partial iron staining, PC 40.4: 70.0°, B, CU, VR, partial iron staining 40.6: 8.0°, JN, PL, RO, M, partial iron staining, PC	1 2 3 0 0		2			
45	48.5	As above.	2198.5			20	100	96	96	40.7: 54.0°, B, IR, RO, M, partial iron staining, PC 41: 63.0°, B, PL, SM, M, full iron staining, PC 42.1: 31.0°, JN, PL, SM, Cl, CC <1mm 42.4: 62.0°, B, PL, SM, partial iron staining 42.9: 60.0°, B, PL, RO, M, PC	2 0 1 2		2			
50	52.0	As above, becomes gray.	2195.0														
	53.5	As above.	2193.5			21	100	96	100	43.2: 26.0°, JN, PL, SM, MnOx, PC 44: 58.0°, B, PL, SM, M, PC 45.3: 25.0°, JN, CU, RO, M, partial iron staining, PC 45.5: 13.0°, JN, PL, SM, MnOx, CC <1mm 46.4: 49.0°, B, ST, SM, M, PC 46.7: 68.0°, B, PL, SM, M, PC	0 2 0 1 1		2			
55	58.5	As above.	2188.5			22	100	100	100	46.8: 30.0°, JN, PL, SM, MnOx, CC <1mm	1						
60	64.0	As above.	2183.0			23	100	96	100	49.6: 42.0°, JN, PL, RO, M, partial iron staining, PC 50: 38.0°, JN, PL, RO, partial iron staining 51.3: 28.0°, JN, CU, SM, full iron staining 52.7 - 52.8: 64.0°, FLT, IR, RO, Bx, full iron staining, staining halo around fault 54.2: 50.0°, B, PL, RO, partial iron staining	1 1 1 2 1		2			
65	69.0	As above, abundant fine grained boudins.	2178.0			24	100	92	96	54.4: 40.0°, JN, IR, RO, M, partial iron staining, PC 56.8: 37.0°, JN, CU, SM, MnOx, CC <1mm 57.6: 42.0°, B, CU, RO, MnOx, CC <1mm 58.4: 35.0°, JN, PL, SM, M, partial iron staining, PC 59.2: 64.0°, B, PL, RO, full iron staining 60.7: 55.0°, B, CU, RO, partial iron staining	0 2 4 1 1		2			
70	72.0	As above.	2175.0			25	93	70	70	61.8: 68.0°, JN, PL, RO, partial iron staining 62.7: 45.0°, JN, IR, RO, partial iron staining 62.9: 60.0°, JN, IR, RO, M, partial iron staining, PC	1 1 >10		3			
75	75.0	Continues light brown gray, fine to medium grained, psammitic SCHIST, slightly foliated, healed hairline fractures, trace FeOx staining, faulted.	2172.0			26	100	47	60	63.4: 29.0°, JN, PL, SM, M, PC 65.4: 74.0°, B, PL, RO, Cl, PC 65.8: 56.0°, JN, PL, VR, Cl, CC <1mm 66.2: 7.0°, JN, PL, VR, Cl, CC <1mm	>10 2 3		3			
	79.0	As above, fractured.	2168.0			27	100	25	45	66.4: 26.0°, JN, PL, RO, Cl, CC <1mm 66.5: 25.0°, JN, PL, VR, Cl, PC	>10 4		3			
80		As above.				28	100	23	49	66.6: 7.0°, JN, UN, RO, Cl, PC 67: 44.0°, JN, PL, RO, Cl, partial iron staining, CC <1mm 68.2: 50.0°, JN, PL, RO, M,	3 >10 3		3			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF DRILLHOLE DH16-05 (GT-39)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 13, 2016 10:30
DRILLING END: October 18, 2016 11:30
COORDINATES: N: 838,291 E: 916,378

SHEET: 3 of 8
GS ELEV.: 2247.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

ISRM Strength Index: ● AX. □ DIAM. ▲ UCS (ksi) R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6

DEPTH (ft)	Depth	SOIL/ROCK PROFILE: DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0		2167.0												
	80.5		2166.5			28				PC 69.4: 30.0°, JN, PL, RO, Cl,	5	3			
		Contact with intrusive, only washed-out gravel.				29	50	0	0	PC 70.9: 21.0°, JN, PL, RO, partial iron staining	>10	5			
	82.5		2164.5							71.2 - 72.8: FLT, Bx, broken rock with clayey gouge	>10				
		Contact continues as above.				30	67	0	0	73.1: 50.0°, FLT, PL, RO, Cl, CC <1mm	7	5			
85	84.0	Becomes dark green, DIABASE, aphanitic, fractured, extensive FeOx staining on discontinuities.	2163.0			31	100	20	40	73.9: 55.0°, JN, CU, SM, partial iron staining 74.8 - 76.1: 20.0°, FLT, PL, SM, G, IN >5mm, clayey sand gouge and broken rock	>10 >10	3			
	86.0		2161.0												
	87.0	As above, slightly phaneritic, slight foliation.	2160.0			32	100	0	0	76.2: 47.0°, B, PL, SM, FeOx, full iron staining, CC <1mm	>10	3			
		As above, becomes brecciated.				33	100	0	0	76.4: 50.0°, B, PL, SM, Cl, full iron staining, CC <1mm	>10	4			
	89.0		2158.0												
90		Continues dark green gray, DIABASE, aphanitic to very fine grained phaneritic, competent, closed calcite-quartz-epidote veining, calcite and FeOx coated discontinuities, healed fractures.				34	100	86	90	76.9: 62.0°, B, PL, SM, full iron staining 77.5: 50.0°, B, PL, SM, full iron staining 77.7 - 79: FLT, Bx, fractured and brecciated core, little iron staining 79.4: 65.0°, JN, PL, VR, full iron staining 79.9: 50.0°, JN, PL, VR, full iron staining	5 1 1 0 1	2			
	94.0		2153.0												
95		As above.				35	100	84	90	80: 10.0°, JN, UN, VR, Cl, partial iron staining, IN <5mm 80.5 - 84: CONO, Bx, contact between Pinal Schist and mafic intrusive 84 - 84.7: FLT, Bx, full iron staining 84.9: 10.0°, JN, PL, RO, FeOx, CC <1mm 85.2: 20.0°, JN, UN, RO, FeOx, full iron staining, CC <1mm	0 1 0 6 1 0	2			
	99.0		2148.0												
100		As above, some open calcite veining.			HQ3	36	100	100	100	85.5: 7.0°, JN, PL, RO, MnOx, full iron staining, CC <1mm 85.51 - 87: FLT, Bx, full iron staining, breccia with extensive FeOx 87 - 89: FLT, Bx, full iron staining, brecciated and crushed, extensive FeOx	1 0 1 1	2			
	104.0		2143.0												
105		As above.				37	100	52	68	89.5: 47.0°, FOLO, UN, RO, FeOx, full iron staining, CC <1mm 89.7: 50.0°, FOLO, PL, SM, FeOx, full iron staining, CC <1mm	0 8 2	2 - 3			
	106.5		2140.5												
		As above.				38	100	72	100	89.8: 80.0°, JN, CU, RO, FeOx, full iron staining 89.9: 20.0°, JN, IR, VR, Ca, full iron staining, IN <5mm 90.1: 35.0°, JN, PL, RO, Ca, full iron staining, IN <5mm	3 3	2			
	109.0		2138.0												
110		As above.				39	100	86	90	91.8: JN, PL, RO, Ca, full iron staining, IN <5mm, vuggy, large calcite crystals 93.5: 47.0°, JN, PL, RO, Ca, full iron staining, IN <5mm 95.1: 73.0°, JN, PL, SM, FeOx, full iron staining, CC <1mm	5 1 0 1 2	2			
	114.0		2133.0												
115		As above.				40	100	73	73	97.1 - 97.15: FLT, PL, SM, Bx, full iron staining, IN >5mm 97.4 - 97.9: 70.0°, FLT, IR, RO, Bx, full iron staining, brecciated with vuggy calcite 98.4: 55.0°, PL, SM, Ca, full iron staining, CC <1mm 100.7: 76.0°, JN, PL, RO, full iron staining	>10 7 0 0 5	2 - 3			
	118.7		2128.3												
120		Faulted, contact zone between diabase and schist.				41	100	0	0	102.7: 44.0°, JN, UN, RO, Ca, full iron staining, PC	5	3			
						42	50	40	40	103.1: 61.0°, FOLO, PL,		3			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF DRILLHOLE DH16-05 (GT-39)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 13, 2016 10:30
DRILLING END: October 18, 2016 11:30
COORDINATES: N: 838,291 E: 916,378

SHEET: 4 of 8
GS ELEV.: 2247.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT
120	120.0		2127.0								
	120.5		2126.5			42				VR, FeOx, full iron staining, CC <1mm	>10
		As above.				43	40	0	0	105.2 - 106: FLT, Bx, full iron staining, breccia, extensive FeOx and open calcite veining	>10
	123.0		2124.0							106.3: 67.0°, JN, PL, SM, Ca, full iron staining, CC <1mm	>10
		As above, large quartz vein.				44	33	20	20	106.7: 85.0°, JN, PL, SM, Ca, full iron staining, PC	>10
125	125.5		2121.5			45	100	0	0	107 - 107.05: 77.0°, FLT, PL, RO, Bx, full iron staining, IN >5mm	5
		Becomes Pinal Schist (pCpi): olive gray, fine to medium grained, foliated, SCHIST, small boudined quartz veins and large				46	80	60	60	107.4 - 107.5: 75.0°, FLT, ST, RO, Bx, full iron staining, IN >5mm	1
	127.5	quartz veins, faults.	2119.5							107.8: 57.0°, JN, PL, RO, Ca, partial iron staining, PC	>10
		As above with 6-in. thick quartz vein.				47	100	33	33	108.6: 72.0°, JN, PL, RO, Ca, partial iron staining, IN <5mm	5
	129.0		2118.0							108 - 109.5: FLT, Bx, full iron staining, fractured rock, FeOx staining	>10
130		Becomes psammitic METASILTSTONE, slightly foliated, quartz and calcite veining, fractured, crushed and gougey.				48	63	0	0	110: 70.0°, FOLO, PL, RO, Ca, full iron staining, CC <1mm	>10
										112.9: 56.0°, JN, PL, SM, Ca, full iron staining, CC <1mm	>10
	133.0		2114.0							113.4: 80.0°, JN, UN, RO, Ca, partial iron staining, PC	2
		As above.				49	100	42	48	113.8: 38.0°, JN, CU, RO, Ca, partial iron staining, CC <1mm	5
135										114 - 115.7: FLT, Bx, breccia, calcite, some FeOx	4
										118.7 - 125.5: CONO, Bx, contact zone between intrusive and Pinal Schist	>10
	138.0		2109.0							126.4 - 126.45: 60.0°, FLT, IR, RO, Bx, IN >5mm	1
		As above, brownish gray and pinkish gray, calcite crystals on fractures.				50	100	46	51	127 - 127.5: FLT, Bx, crushed rock and sand	3
140					HQ3					127.5 - 128.5: Bx, fractured rock	2
	141.5		2105.5							128.5 - 129.5: VN, quartz vein	>10
		Continues interbedded METASILTSONE and METASANDSTONE, foliated and faulted along bedding, fractured with little calcite healing.				51	100	22	22	129.5 - 131: FLT, lost recovery	>10
										131 - 131.5: FLT, fractured rock	>10
145										131.5 - 132.1: gougey crushed rock	>10
	146.0		2101.0							132.1 - 132.6: FLT, fractured rock	1
		As above.				52	100	33	73	132.6 - 133: FLT, soft clay gouge	5
										133.7 - 133.9: 55.0°, FLT, IR, RO, Bx, partial iron staining, fractured rock	4
	149.0		2098.0							134.4 - 135.2: 45.0°, FLT, fractured and crushed rock	3
150		As above, weak and fractured throughout.				53	100	0	0	136 - 137: FLT, fractured rock	>10
	151.0		2096.0							137.5: 10.0°, JN, UN, VR, Ca, PC	>10
		As above, becomes more schistose.				54	100	0	32	138 - 138.3: 25.0°, FLT, CU, VR, Ca, IN <5mm, fractured rock with open calcite veining	8
										139.1: 75.0°, JN, IR, SM, partial iron staining	7
	153.5		2093.5							139.2: 47.0°, JN, PL, PO, Cl, IN <5mm	7
		As above.				55	100	10	40	140 - 140.8: Bx, very weak crushed rock with clay	8
155										140.8 - 141.5: FLT, Bx, fractured rock, open calcite veining, clay coatings	5
	156.5		2090.5							141.5 - 143.7: FLT, clayey crushed rock	>10
		Continues gray, medium grained METASANDSTONE, foliated along bedding, schistose, competent.				56	100	78	96	143.7 - 145: FLT, fractured rock, little calcite healing	5
										145.7: 54.0°, FOLO, UN, SM, CN	3
160										146 - 146.5: FLT, Bx, clay and calcite infilling	2

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ISRM Strength Index: ● AX. ☐ DIAM. ▲ UCS (ksi) R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6

ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
3					
3					
2 - 3					
4					
3					
3					
3					
2 - 3					
3					
3					
2					

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF DRILLHOLE DH16-05 (GT-39)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 13, 2016 10:30
DRILLING END: October 18, 2016 11:30
COORDINATES: N: 838,291 E: 916,378

SHEET: 5 of 8
GS ELEV.: 2247.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
160	160.0	Continues gray, medium grained METASANDSTONE, foliated along bedding, schistose, competent. *(continued)*	2087.0		HQ3	56	100	78	96	147.3: 72.0°, FOLO, UN, SM, partial iron staining 147.4: 44.0°, FLT, UN, SK, Cl, partial iron staining, IN <5mm	0 0		2				
	163.0	As above, crenulated.	2084.0			57	100	36	52	147.7: 45.0°, FLT, PL, SK, Cl, partial iron staining, IN <5mm 147.8: 61.0°, B, PL, PO, Cl, full iron staining, CC <1mm	5 7		2 4				
165						58	50	0	0	148.3: 26.0°, JN, UN, RO, Cl, partial iron staining, IN <5mm 148.6: 53.0°, FOLO, UN, RO, Ca, partial iron staining, IN <5mm 148.8: 72.0°, FOLO, UN, SM, partial iron staining	>10 >10 >10 >10		4 5				
	168.0	As above, entirely fractured and crushed, some quartz veining.	2079.0			59	100	0	0	149 - 151: FLT, Bx, weak, fractured rock, clay and calcite infilling 151.1: 58.0°, FOLO, PL, SK, Cl, partial iron staining, CC <1mm 151.3 - 152.3: FLT, Sa, partial iron staining, crushed rock	>10 >10 >10 >10		4				
170	172.0	As above.	2075.0			60	100	0	20	152.4: 31.0°, JN, PL, RO, Ca, partial iron staining, CC <1mm 152.6: 85.0°, JN, PL, SK, Cl, partial iron staining, CC <1mm	>10 4 >10		3				
	174.5	As above, quartz vein.	2072.5			61	100	40	73	152.8: 55.0°, FOLO, PL, SK, Cl, CC <1mm	3		3				
175	176.0	Becomes brecciated dark gray SCHIST, quartz veining.	2071.0			62	100	0	17	152.9 - 153.2: 60.0°, FLT, PL, SK, G, IN >5mm 153.3: 59.0°, FOLO, PL, PO, partial iron staining 153.7: 65.0°, FOLO x 4, PL, SK, Cl, partial iron staining, CC <1mm	>10 >10 5		3 - 4				
	179.0	Continues dark gray and pinkish gray, fine grained METASILTSTONE, laminated, tightly folded, foliated, minor FeOx staining, quartz veins.	2068.0			63	100	74	88	154.2 - 154.4: 65.0°, FLT, PL, RO, Bx, crushed rock 154.7: 80.0°, FOLO x 3, PL, SK, Cl, partial iron staining, CC <1mm 155 - 155.05: 80.0°, FLT, PL, PO, Bx, partial iron staining 155.1: 69.0°, B, PL, SM, partial iron staining 155.5 - 156.7: 65.0°, FLT, PL, SM, weak fractured rock, clayey	5 4 2 2 2		2				
180	184.0	Becomes pinkish gray to pink, SCHIST, sheared, quartz veins.	2063.0			64	100	56	66	157: 68.0°, FOLO, UN, RO, partial iron staining 157.1: 65.0°, FOLO, PL, SK, Cl, partial iron staining, CC <1mm 157.4: 85.0°, JN, UN, PO, Cl, full iron staining, CC <1mm 157.45: 68.0°, FOLO, PL, PO, Cl, full iron staining, CC <1mm	1 1 5 8 1 3		3				
	189.0	Becomes pinkish brown to gray, schistose METASANDSTONE, sheared and foliated along bedding.	2058.0			65	100	49	77	157.6: JN, UN, PO, FeOx, full iron staining, CC <1mm 158.1: 65.0°, FOLO, PL, SK, MnOx, CC <1mm 158.7: 50.0°, FOLO, PL, SM, MnOx, CC <1mm	2 3 >10		3				
185	192.5	Becomes gray, SCHIST, brecciated with bands of sheared gouge.	2054.5			66	100	0	10	159.2: 52.0°, FOLO, PL, SK, Cl, full iron staining, CC <1mm 159.4: 51.0°, FOLO, PL, SK 160: 55.0°, JN, PL, SM, Cl, full iron staining, PC	>10 >10 >10		4				
	195.5	As above.	2051.5			67	100	0	32	162: 22.0°, JN, PL, RO, partial iron staining 162.3 - 162.4: FLT, Bx 163.6: 10.0°, JN, UN, RO, Ca, PC	>10 >10		3 - 4				
190	198.0	As above.	2049.0			68	100	86	86	163.8: 58.0°, FOLO, UN, SK 163.3 - 168: FLT, very weak, sheared and crushed rock, vertical folding 168 - 172: FLT, weak rock, crushed and brecciated	>10 2 1		2				
		Log continued on next page																

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF DRILLHOLE DH16-05 (GT-39)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 13, 2016 10:30
DRILLING END: October 18, 2016 11:30
COORDINATES: N: 838,291 E: 916,378

SHEET: 6 of 8
GS ELEV.: 2247.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC LC	ADVANCEMENT RATE ft/min
200	200.0	As above. *(continued)*	2047.0		HQ3	68	100	86	86	172 - 173: FLT, breccia and quartz vein 173.3: 13.0°, JN, IR, VR, Cl, CC <1mm 173.6 - 174.5: FLT, Bx, clay infilling 174.6: 26.0°, JN, PL, RO, Cl, IN <5mm 175: 27.0°, JN, IR, VR	3 2 0 >10		2			
	203.0	As above, but fractured and faulted throughout.	2044.0			69	80	12	24	175.3: 65.0°, JN, UN, SM, Cl, CC <1mm 175.9: 57.0°, JN, PL, SM, MnOx, full iron staining, CC <1mm	>10 >10 >10		3			
205	205.5	As above.	2041.5			70	60	0	12	176 - 178.3: FLT, brecciated schist and quartz 178.4: 12.0°, JN, PL, VR, Bx, IN <5mm	>10 >10		3 - 4			
	208.0	As above.	2039.0			71	100	28	28	178.6 - 178.65: 55.0°, FLT, PL, SK, Bx, IN >5mm 179.4: 15.0°, JN, PL, VR, Ca, PC 179.6: 55.0°, FOLO, PL, SK, CN	5 >10 5		4			
210	210.5	Becomes gray, medium grained METASANDSTONE with zones of silicification, lightly foliated.	2036.5			72	80	69	77	179.7: 50.0°, FOLO, PL, SK, partial iron staining 180: 57.0°, FOLO, UN, SK, Ca, PC 180.2: 65.0°, FOLO, UN, SK, partial iron staining 180.5: 58.0°, JN, PL, SM, Cl, PC	2 2 >10		3			
	214.0	As above.	2033.0			73	67	27	33	180.6: 45.0°, FLT, PL, SK, Cl, IN <5mm 180.8: 25.0°, JN, CU, VR, Ca, PC 181.1: 42.0°, FLT, PL, SK, partial iron staining	>10 >10 2		3			
215	217.0	As above.	2030.0			74	100	0	0	181.6: 62.0°, JN, PL, RO, Ca, partial iron staining, PC 182.2: 60.0°, FOLO, PL, SK, Hem, partial iron staining, CC <1mm	>10 >10		2			
	219.0	As above with zones of clayey gouge.	2028.0			75	100	0	0	182.6: 75.0°, JN, UN, SK, Hem, partial iron staining, CC <1mm 183.5: 48.0°, FOLO, CU, PO, Ca, full iron staining, CC <1mm	>10 >10		3			
220	221.0	As above, fractured and crushed.	2026.0			76	100	0	0	183.8: 52.0°, FOLO, PL, SM, Ca, full iron staining, CC <1mm	>10		3			
	222.5	As above.	2024.5			77	100	0	0	184.9: 50.0°, FOLO, UN, SM, Cl, full iron staining, IN <5mm	>10		3			
	224.0	As above, fractured and crushed.	2023.0			78	100	0	0	185.8 - 186.3: 55.0°, FLT, PL, SK, Bx, partial iron staining, sheared zone 186.5 - 186.55: 56.0°, FLT, PL, VR, Bx, IN >5mm	>10 >10 >10		3			
225	226.5	As above, clayey gougey crushed rock.	2020.5			79	80	0	0	186.9 - 187.4: FLT, G, partial iron staining, IN >5mm, sheared zone 187.5: 45.0°, JN, PL, RO, Cl, CC <1mm	>10 >10		4			
	229.0	Becomes olive gray, SCHIST, foliated, faulted and crushed with clayey gouge.	2018.0			80	100	0	36	187.6: 55.0°, FOLO, PL, PO, Cl, partial iron staining, CC <1mm 188.7: 58.0°, FOLO, PL, SM, Cl, partial iron staining, CC <1mm	6 9 >10		3			
230	231.5	As above.	2015.5			81	100	0	0	189.2: 50.0°, FOLO, PL, PO, Cl, partial iron staining, IN <5mm 189.6: 46.0°, FLT, PL, SK, Cl, partial iron staining, IN <5mm	>10 >10 6		3 - 4			
	234.5	As above, fractured, less faulted.	2012.5			82	100	29	29	189.7: 85.0°, JN, UN, PO, Cl, partial iron staining, IN <5mm 190 - 190.1: 80.0°, FLT, IR, SK, Bx, partial iron staining, IN >5mm 190.8: 58.0°, FOLO, PL, SK, Cl, partial iron staining, IN <5mm	3 2 >10 >10		3			
235	238.0	As above, gray to olive gray, fractured throughout.	2009.0			83	100	0	0	191.5: 58.0°, FOLO, PL, PO, Cl, CC <1mm 191.8: FOLO, UN, SK, Cl,	>10 >10		3			
240		Log continued on next page															

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF DRILLHOLE DH16-05 (GT-39)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 13, 2016 10:30
DRILLING END: October 18, 2016 11:30
COORDINATES: N: 838,291 E: 916,378

SHEET: 7 of 8
GS ELEV.: 2247.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 / R2 / R3 3.62 / R4 7.25 / R5 14.5 / R6 36.2	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
240	240.0		2007.0		HQ3	83	100	0	0	partial iron staining, CC <1mm	>10		3					
	241.0		2006.0							192.1 - 195.5: FLT, Bx, fractured weak rock with gouge								
		As above.				84	100	40	40	195.5: 55.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm	2		2 - 3					
	243.0		2004.0							195.51 - 195.9: FLT, Bx, fractured rock	>10							
		As above.								196.2: 12.0°, JN, UN, VR, Ca, PC	0							
245						85	100	18	18	196.3 - 197.4: 55.0°, FLT, PL, SK, Bx, IN >5mm, brecciated rock with clay	>10		2 - 3					
	247.0		2000.0							197.4: 62.0°, FOLO, PL, PO, Cl, CC <1mm	>10							
		As above.								197.6: 65.0°, FOLO, PL, SK, Cl, CC <1mm	>10							
	249.0		1998.0			86	100	0	0	197.7 - 198: FLT, Bx, crushed rock	>10		3 - 4					
		As above.								198.4: 61.0°, FOLO, PL, PO, Cl, CC <1mm	>10							
250	250.0		1997.0			87	100	0	0	198.7: 62.0°, FOLO, PL, SK, Cl, CC <1mm	>10		4					
		Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram. Notes: 20: Hole is caving and drillers can't get back to bottom. Cannot perform falling head test because of cave. Drillers to advance casing to 20. 21.5: Driller puts bag of holeplug down hole before start of drilling to help with hole washout. 22: Drillers add some polymer after setting casing to lift sand in hole. 29 - 44: Hydro test #1 FHT 49 - 62: Hydro test #5 SI 69 - 99: Hydro test #2 SI & CRI 80.5 - 82: Driller notes that zone is taking water. 86: Driller notes zone taking water. 99 - 189: Hydro test #3 SI & CRI 153.5 - 156.5: Driller notes losing some circulation. 163 - 168: Driller notes almost full circulation. 168 - 172: Driller notes zone taking a little water. 184 - 250: Hydro test #4 SI									199.4: 61.0°, FOLO, PL, SK, Cl, CC <1mm 200 - 200.2: FLT, IR, SK, Bx, IN >5mm 200.6: 62.0°, JN, UN, RO, Ca, PC 201.1: 30.0°, JN, ST, VR, Cl, PC 201.2: 68.0°, FO, PL, PO, Cl, CC <1mm 203 - 208.5: FLT, fractured rock with clayey gouge 209.1 - 210.5: FLT, clayey gouge with crushed rock 211.2: 68.0°, JN, PL, SM, full iron staining 211.5: 71.0°, FOLO, PL, PO, full iron staining 212.1: 5.0°, JN, UN, VR, Cl, partial iron staining, PC 212.4: 52.0°, B, PL, SM, CN 213.3 - 215: no recovery 215 - 216: FLT, Bx, brecciated 216.7 - 216.8: 55.0°, FLT, IR, RO, Bx 217 - 219: FLT, fractured rock, clay/calcite coatings, staining 219 - 221: FLT, brecciated with bands of clay gouge 221 - 222.5: FLT, brecciated, clay infilling, trace staining 222.5 - 224: FLT, fractured and crushed, clayey coatings, trace staining 224 - 226.5: FLT, fractured and crushed, clayey infill trace staining 226.5 - 229.5: FLT, clayey gouge and crushed rock 229.8: 62.0°, FOLO, PL, PO, Cl, partial iron staining, CC <1mm 230: 60.0°, FOLO, PL, SM, Cl, partial iron staining, IN <5mm 230.2 - 231.5: FLT, clayey crushed rock 231.5 - 234.5: FLT, fractured rock and rubbly gouge 235.3: 13.0°, JN, UN, VR, Sa, PC 235.4 - 236: FLT, Bx, fractured 236.5: 25.0°, JN, IR, VR, Cl, PC 236.6: 58.0°, FOLO, PL, SK, Cl, CC <1mm 237 - 238: FLT, fractured 238 - 241: FLT, fractured 241.5: 57.0°, JN, PL, SM,								
255																		
260																		
265																		
270																		
275																		
280																		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF DRILLHOLE DH16-05 (GT-39)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 13, 2016 10:30
DRILLING END: October 18, 2016 11:30
COORDINATES: N: 838,291 E: 916,378

SHEET: 8 of 8
GS ELEV.: 2247.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi)	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
280	280.0		1967.0							Ca, PC 241.6: 51.0°, FOLO, PL, PO, Cl, IN <5mm 242 - 243: FLT, fractured, foliations 244: 52.0°, FOLO, PL, PO, partial iron staining 245: 5.0°, JN, UN, VR, Ca, PC 244.1 - 247: FLT, fractured, foliated with vertical jointing, little calcite 247 - 249: FLT, fractured with clayey coatings 249 - 250: FLT, crushed, sheared rock, clayey infilling		R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6				
285																
290																
295																
300																
305																
310																
315																
320																

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF DRILLHOLE DH16-05 (GT-39) Soil

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 13, 2016 10:30
DRILLING END: October 18, 2016 11:30
COORDINATES: N: 838,291 E: 916,378

SHEET: 1 of 1
GS ELEV.: 2247.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT
0	0.0	Washed out by drilling. Recover washed gravel, multi-lithic, schist, quartz, quartzite, gneiss. Alluvial material: poor recovery, washed gravels only. Mixed lithics: schist, gneiss, quartzite, quartz.	2247.0			1	25	0	0		
5						2	50	0	0		
	6.0		2241.0			3	50	0	0		
		(GC), CLAYEY GRAVEL, fine to coarse, subrounded to subangular, medium to coarse subrounded to subangular sand, medium plasticity fines, gray-green mottled orange-brown, ALLUVIUM;				4	17	0	0		
	9.0	non-cohesive, dense, w < PL, 2-11-14-14-17-16; dark green clasts, aphanitic. Completely weathered bedrock: clayey gravel with sand, mottled red brown, clasts are dark green, mafic, aphanitic intrusive.	2238.0								
10		SPT blows @ 6 (per 3")': 2-11-14-14-17-16				5	33	0	0		
	14.0	Becomes completely weathered psammitic schist, yellow brown, clayey sand and gravel, some dark green intrusive clasts.	2233.0			6	25	0	0		
15	15.0		2232.0			7	33	0	0		
		SPT blows @ 9 (per 3"): 7-50/3"									
	19.0	(SC), CLAYEY SAND, medium to coarse, subangular to angular, medium plasticity fines, some fine subangular to angular gravel, yellow-brown mottled olive-brown;	2228.0			8	15	0	0		
	19.5	cohesive, w > PL, 13-50/1", Poor recovery, returns are washed gravel, clasts are pinkish brown silicified metasiltstone.	2227.5			9	100	0	60		
20	20.5		2226.5			10	0	0	0		
	21.5		2225.5			11	50	0	30		
		SPT blows @ 14 (per 3"): 13-50/1"									
		As above.									
25		Poor recovery, washed gravel, clasts are dark greenish gray, mafic, aphanitic intrusive, abundant FeOx on discontinuities.									
		No recovery.									
		Poor recovery, clasts mixed intrusive and pinkish gray silicified siltstone.									
		Bottom of borehole at 21.5 ft. Completed as well. Refer to diagram.									
30											
35											
40											

ISRM Strength Index: ● AX. ☐ DIAM. ▲ UCS (ksi)

R1	R2	R3	R4	R5	R6
0.725	3.62	7.25	14.5	36.2	

ISRM WEATHERING INDEX | FAULT BRECCIA /GOUGE | BC | LC | BROKEN CORE /LOST CORE | ADVANCEMENT RATE ft/min

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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DH16-05 (GT-39) Soil

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF DRILLHOLE DH16-06 (GT-21)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 21, 2016 07:55
DRILLING END: October 23, 2016 11:30
COORDINATES: N: 841,669 E: 924,865

SHEET: 1 of 7
GS ELEV.: 2561.6
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact | VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical | PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular | PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough | Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge | Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide | MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
0	0.0	Surficial soils, no recovery.	2561.6		HQ3	1	13	0	0				6				
	4.0	Gila Conglomerate (Tcg): no matrix recovered, clasts of gneiss, schist, and quartz.	2557.6			2	33	0	0		>10 >10 >10 >10		5				
5	8.5	Gila Conglomerate (Tcg): slightly weathered, matrix dominant, brown CONGLOMERATE, gravel clasts consisting of schist, gneiss, quartz, diabase, weak HCl reaction.	2553.1			3	90	24	24		>10 >10 >10 2 >10		4				
10	13.5	As above.	2548.1			4	88	58	58	15: 90.0°, JN, PL, VR, CN 17.5: 70.0°, JN, IR, VR, CN	>10 >10 >10 1 1 0		4				
15	18.5	As above, becomes clast dominant.	2543.1			5	100	51	51	20.3: 80.0°, JN, PL, RO, CN	0 1 >10 >10 >10		3				
20	24.0	As above, moderate HCl reaction.	2537.6			6	100	80	86		>10 0 0 0 0		5				
25	29.0	As above, matrix dominant.	2532.6			7	100	100	100	30.1: 80.0°, JN, PL, VR, CN 32.3: 75.0°, JN, PL, RO, CN	0 1 0 1 0		5				
30	34.0	As above.	2527.6			8	96	96	96		0 0 0 0 0		2				
35	39.0	As above, some diabase clasts.	2522.6			9	100	98	98		0		2				
40		Log continued on next page															

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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DH16-06 (GT-21)
1 of 7

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF DRILLHOLE DH16-06 (GT-21)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 21, 2016 07:55
DRILLING END: October 23, 2016 11:30
COORDINATES: N: 841,669 E: 924,865

SHEET: 2 of 7
GS ELEV.: 2561.6
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE (BC / LC)	ADVANCEMENT RATE ft/min
40	40.0	As above, some diabase clasts. *(continued)*	2521.6		HQ3	9	100	98	98	40.3: 80.0°, FLT, PL, VR, Bx, IN >5mm	1 0 0 0		2			
	44.0		2517.6													
45		As above.				10	100	100	100	46.1: 85.0°, JN, PL, RO, CN	0 0 1 0 0		2			
	49.0		2512.6													
50		As above.				11	100	100	100		0 0 0 0 0		2			
	54.0		2507.6													
55		As above, strong HCl reaction.				12	100	100	100		0 0 0 0 0		1			
	59.0		2502.6													
60		As above.				13	100	100	100		0 0 0 0 0		1			
	64.0		2497.6													
65		Continues slightly weathered, matrix dominant, brown CONGLOMERATE, gravel clasts consisting of schist, gneiss, quartz, diabase, weak HCl reaction.				14	100	100	100		0 0 0 0 0		1			
	69.0		2492.6													
70		As above.				15	100	96	96		0 0 0 0 0		1			
	74.0		2487.6							73.6: 70.0°, JN, IR, CN	2					
75		As above.				16	100	100	100		0 0 0 0 0		1			
	79.0		2482.6													
80		As above, clast dominant.				17	100	100	100	79.2: 90.0°, JN, PL, VR, CN	0		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF DRILLHOLE DH16-06 (GT-21)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 21, 2016 07:55
DRILLING END: October 23, 2016 11:30
COORDINATES: N: 841,669 E: 924,865

SHEET: 3 of 7
GS ELEV.: 2561.6
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0	As above, clast dominant. *(continued)*	2481.6		HQ3	17	100	100	100		0 0 0 0 0		1			
	84.0		2477.6													
85		As above.				18	100	100	100		0 0 0 0 0		1			
	89.0		2472.6													
90		As above.				19	100	100	100		0 0 0 0 0		1			
	94.0		2467.6													
95		As above, becomes matrix dominant, no HCl reaction.				20	100	100	100		0 0 0 0 0		1			
	99.0		2462.6													
100		As above, no cobbles, some schist clasts.				21	100	100	100		0 0 0 0 0		1			
	104.0		2457.6													
105		As above.				22	100	100	100		0 0 0 0 0		1			
	109.0		2452.6													
110		Continues slightly weathered, matrix dominant, brown CONGLOMERATE, gravel clasts consisting of schist, gneiss, quartz, diabase, weak HCl reaction.				23	100	100	100		0 0 0 0 0		1			
	114.0		2447.6													
115		As above.				24	100	100	100		0 0 0 0 0		1			
	119.0		2442.6													
120		As above, some calcite veins.				25	100	100	100		0		1			
		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF DRILLHOLE DH16-06 (GT-21)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 21, 2016 07:55
DRILLING END: October 23, 2016 11:30
COORDINATES: N: 841,669 E: 924,865

SHEET: 4 of 7
GS ELEV.: 2561.6
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE (BC, LC)	ADVANCEMENT RATE ft/min
120	120.0	As above, some calcite veins. *(continued)*	2441.6													
	124.0		2437.6			25	100	100	100		0 0 0 0 0		1			
125	129.0	Gila Conglomerate (Tcg): matrix dominant, some gravel, schist, tuff, chert, gneiss, diabase, limestone, weak HCl reaction, brown.	2432.6			26	100	90	90	125.3 - 125.8: 80.0°, FLT, IR, VR, Bx, IN >5mm	0 6 0 0 0		1			
130	134.0	As above.	2427.6			27	100	90	90	132.4: 70.0°, JN, PL, VR, Sa, IN <5mm	0 0 0 6 0		2			
135	139.0	As above.	2422.6			28	100	96	96	136: 80.0°, JN, PL, RO, CN	0 0 1 0 0		1			
140	144.0	Continues slightly weathered, matrix dominant, brown CONGLOMERATE, gravel clasts consisting of schist, gneiss, quartz, diabase, weak HCl reaction.	2417.6		HQ3	29	100	100	100		0 0 0 0 0		1			
145	149.0	As above.	2412.6			30	100	100	100		0 0 0 0 0		1			
150	154.0	As above.	2407.6			31	100	100	100		0 0 0 0 0		1			
155	159.0	As above, some cobbles.	2402.6			32	100	100	100		0 0 0 0 0		1			
160		As above.				32	100	100	100		0		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF DRILLHOLE DH16-06 (GT-21)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 21, 2016 07:55
DRILLING END: October 23, 2016 11:30
COORDINATES: N: 841,669 E: 924,865

SHEET: 5 of 7
GS ELEV.: 2561.6
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
160	160.0	As above. *(continued)*	2401.6		HQ3	32	100	100	100		0 0 0 0 0		1			
	164.0	As above.	2397.6			33	100	100	100		0 0 0 0 0		1			
165	169.0	As above, some cobbles.	2392.6			34	100	100	100		0 0 0 0 0		1			
170	174.0	Continues matrix dominant, brown CONGLOMERATE, gravel clasts consisting of schist, gneiss, quartz, diabase, weak HCl reaction.	2387.6			35	100	100	100		0 0 0 0 0		1			
175	179.0	As above.	2382.6			36	100	100	100	180.1: 85.0°, JN, PL, CN	0 1 0 0 0		1			
180	184.0	As above.	2377.6			37	100	100	100		0 0 0 0 0		1			
185	189.0	As above.	2372.6			38	100	100	100		0 0 0 0 0		1			
190	194.0	As above.	2367.6			39	100	100	100		0 0 0 0 0		1			
195	199.0	As above.	2362.6			40	100	90	90		0		1			
200		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF DRILLHOLE DH16-06 (GT-21)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 21, 2016 07:55
DRILLING END: October 23, 2016 11:30
COORDINATES: N: 841,669 E: 924,865

SHEET: 6 of 7
GS ELEV.: 2561.6
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact | VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical | PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular | PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough | Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge | Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide | MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 1.45, R4 1.45, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE (BC / LC)	ADVANCEMENT RATE ft/min
200	200.0	As above. *(continued)*	2361.6		HQ3	40	100	90	90	203.2: 75.0°, JN, IR, VR, CN	0 0 0 0 5		1			
	204.0		2357.6													
205		As above.				41	100	80	80		0 0 0 0 4		1			
	209.0		2352.6								>10		4			
210		Continues matrix dominant, brown CONGLOMERATE, gravel to cobble sized clasts consisting of schist, gneiss, quartz, diabase, weak HCl reaction.				42	100	100	100		0 0 0 0 0		1			
	214.0		2347.6													
215		As above.				43	100	100	100		0 0 0 0 0		1			
	219.0		2342.6													
220		As above, no cobbles.				44	100	100	100		0 0 0 0 0		1			
	224.0		2337.6													
225		As above, some gneiss clasts.				45	100	100	100		0 0 0 0 0		1			
	229.0		2332.6													
230		As above.				46	100	86	86	229.8: 85.0°, JN, PL, VR, CN 231: 80.0°, JN, IR, VR, CN	1 0 1 0 0		1			
	234.0		2327.6													
235		As above.				47	100	96	96	237.4: 85°, JN, IR, CN	0 0 2 0 0		1			
	239.0		2322.6													
240		As above.				48	100	96	96		0		2			
		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF DRILLHOLE DH16-06 (GT-21)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 21, 2016 07:55
DRILLING END: October 23, 2016 11:30
COORDINATES: N: 841,669 E: 924,865

SHEET: 7 of 7
GS ELEV.: 2561.6
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0		2321.6													
		As above. *(continued)*			HQ3	48	100	96	96	240.9: 70.0°, JN, PL, VR, CN 241.5: 85°, JN, PL, VR, CN 242.5: 90.0°, JN, PL, VR, CN	1 1 3 0		2			
	244.0		2317.6													
245		As above.				49	100	100	100		0 0 0 0 0		1			
	249.0		2312.6													
250		Bottom of borehole at 249.0 ft. Completed as well. Refer to diagram. Notes: 0 - 29: Hydro test #1 FHT 34 - 64: Hydro test #2 SI 64 - 109: Hydro test #3 SI 114 - 139: Hydro test #4 SI & CRI 125: Started losing mud around 125 ft-bgs, where fault was observed. 139 - 249: Hydro test #5 SI														
255																
260																
265																
270																
275																
280																

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF DRILLHOLE DH16-07 (GT-20)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 23, 2016 00:00
DRILLING END: October 27, 2016 00:00
COORDINATES: N: 843,640 E: 926,191

SHEET: 1 of 7
GS ELEV.: 2496.6
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
0	0.0	Surficial soils, no recovery.	2496.6													
	3.5		2493.1								>10					
5		Gila Conglomerate (Tcg): weathered, brown CONGLOMERATE, washed out from drilling.				1	60	0	0		>10		5			
	6.0		2490.6								>10					
		As above.				2	50	0	0		>10		5			
	8.0		2488.6								>10					
10		Gila Conglomerate (Tcg): matrix dominant, brown CONGLOMERATE, gravel clasts consisting of schist, gneiss, quartz, diabase, matrix is weak, no HCl reaction.				3	60	0	0		>10		5			
	10.0		2486.6								>10					
		As above, matrix to clast dominant.				4	95	35	45		>10		5			
	14.0		2482.6								4					
15		As above, completely weathered, matrix is weak and friable.				5	67	0	0		2		5			
	17.0		2479.6								>10					
		As above.				6	80	55	55	17.7: 80.0°, JN, ST, VR, CN	>10		5			
	19.0		2477.6								5					
20		As above.			HQ3	7	96	82	94	22.8: 90.0°, JN, PL, RO, CN 23.4: 90.0°, JN, PL, VR, CN	0		3			
	24.0		2472.6								0					
25		As above.				8	96	90	90	24.4: 70.0°, JN, IR, VR, CN 27.8: 75.0°, FLT, PL, VR, Bx, IN >5mm	0		3			
	29.0		2467.6								0					
30		As above, becomes slightly weathered.				9	100	94	94	29.5: 80.0°, JN, PL, VR, CN 30.9: 85.0°, JN, PL, CN	0		2			
	34.0		2462.6								0					
35		Continues slightly weathered, matrix dominant, brown CONGLOMERATE, gravel clasts consisting of schist, gneiss, quartz, diabase, matrix is weak, no HCl reaction.				10	100	100	100		0		1			
	39.0		2457.6								0					
40		As above, large cobbles with gravel.				11	100	100	100		0		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF DRILLHOLE DH16-07 (GT-20)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 23, 2016 00:00
DRILLING END: October 27, 2016 00:00
COORDINATES: N: 843,640 E: 926,191

SHEET: 2 of 7
GS ELEV.: 2496.6
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0	As above, large cobbles with gravel. *(continued)*	2456.6		HQ3	11	100	100	100		0 0 0 0 0		1				
	44.0		2452.6														
45	49.0	As above.	2447.6			12	100	100	100		0 0 0 0 0		1				
50	54.0	As above, becomes clast dominant.	2442.6			13	100	96	96	50.3: 75.0°, JN, ST, VR, CN 51.7: 80.0°, JN, PL, RO, CN	0 1 1 0 0		1				
55	59.0	Continues slightly weathered, matrix dominant, brown CONGLOMERATE, gravel clasts consisting of schist, gneiss, quartz, diabase, no HCl reaction.	2437.6			14	100	100	100		0 0 0 0 0		1				
60	64.0	As above.	2432.6			15	100	100	100		0 0 0 0 0		1				
65	69.0	As above, becomes clast dominant.	2427.6			16	100	100	100		0 0 0 0 0		1				
70	74.0	As above.	2422.6			17	100	100	100		0 0 0 0 0		1				
75	79.0	As above.	2417.6			18	100	100	100		0 0 0 0 0		1				
80		As above.				19	100	96	96		0		1				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF DRILLHOLE DH16-07 (GT-20)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 23, 2016 00:00
DRILLING END: October 27, 2016 00:00
COORDINATES: N: 843,640 E: 926,191

SHEET: 3 of 7
GS ELEV.: 2496.6
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0		2416.6													
		As above. *(continued)*				19	100	96	96		0		1			
	84.0		2412.6							83.4: 75.0°, JN, ST, VR, CN	1					
85		As above.				20	100	96	96	84.3: 75.0°, JN, PL, RO, CN	1		1			
	89.0		2407.6								0					
		Becomes fresh, clast dominant CONGLOMERATE, some gravel, schist, quartz, diabase, tuff, limestone, weak HCl reaction, brown.				21	100	100	100		0		1			
90	94.0		2402.6								0					
		As above.				22	100	96	96	97.5: 75.0°, JN, PL, RO, CN	3		1			
95	99.0		2397.6								0					
		As above.			HQ3	23	100	100	100		0		1			
100	104.0		2392.6								0					
		As above.				24	100	100	100		0		1			
105	109.0		2387.6								0					
		As above.				25	100	100	100		0		1			
110	114.0		2382.6								0					
		As above.				26	100	100	100		0		1			
115	119.0		2377.6								0					
120		Log continued on next page				27	100	100	100		0		1			

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF DRILLHOLE DH16-07 (GT-20)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 23, 2016 00:00
DRILLING END: October 27, 2016 00:00
COORDINATES: N: 843,640 E: 926,191

SHEET: 4 of 7
GS ELEV.: 2496.6
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE: DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
120	120.0	Continues fresh, clast dominant CONGLOMERATE with gravel to fine to coarse sand, clasts of rhyolite, diabase, tuff, no HCl reaction, brown. *(continued)*	2376.6		HQ3	27	100	100	100	122.7: 85.0°, CON, PL, RO, CN, SO	0 0 0 0 0		1			
	122.7		2373.9													
	124.0	Becomes perlitic, pale grayish brown RHYOLITE, aphanitic, some autobreccia, matrix is light brown, weak, fine grained.	2372.6													
125		As above, perlite is fractured and vitreous.				28	100	100	100		0 0 0 0 0		2			
	129.0		2367.6													
		As above.				29	100	100	100		0 0 0 0 0		2			
130	134.0		2362.6													
		Continues perlitic RHYOLITE moderately weathered, zones of very weak, friable, argillic rock, some flow banding.				30	100	94	94	134.5 - 135.5: FLT, IN >5mm, fracture, weak, friable 136: 85.0°, JN, IR, VR, CN 136.8: 85.0°, JN, IR, RO, CN	0 2 2 0 0		2			
135	139.0		2357.6													
		As above.				31	100	100	100		0 0 0 0		1			
140	142.5		2354.1													
		As above.				32	88	36	38	143 - 143.3: Bx, IN >5mm, very weak 143.6 - 143.9: Bx, IN >5mm, very weak 145.8: 75.0°, JN, IR, RO, CN 147.2: 65.0°, JN, IR, VR, CN	0 >10 6 0 0 0		4 2			
145	147.5		2349.1													
		As above.				33	94	86	86	149.7: 85.0°, JN, IR, VR, CN 150.6: 90.0°, FLT, PL, VR, Bx, IN >5mm	0 0 0 2 0		3			
150	152.5		2344.1													
		As above, becomes highly brecciated, matrix dominant, matrix is white, weak.				34	92	84	84	152.8: IR, VR, CN 153.8: 85.0°, FLT, PL, VR, Bx, IN >5mm	0 3 0 0 0		2			
155	157.2		2339.4													
		As above.				35	53	53	53		0 0		2			
	159.0		2337.6													
160		As above, zones of very weak matrix.				36	100	100	100		7		1			
		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF DRILLHOLE DH16-07 (GT-20)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 23, 2016 00:00
DRILLING END: October 27, 2016 00:00
COORDINATES: N: 843,640 E: 926,191

SHEET: 5 of 7
GS ELEV.: 2496.6
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
160	160.0	As above, zones of very weak matrix. *(continued)*	2336.6		HQ3	36	100	100	100		1 0 0 0		1			
	164.0		2332.6													
165		Becomes perlitic RHYOLITE breccia, perlite is highly vitreous, gray brown, in matrix.				37	100	100	100	165.1: 75.0°, JN, IR, VR, CN 166.7: 45.0°, JN, PL, VR, CN	0 3 3 0 0		2			
	169.0		2327.6													
170		As above.				38	100	96	96	169.5: 70.0°, JN, IR, VR, CN 170.6 - 173.4: 75.0°, B, PL, RO, CN	1 2 1 0 1		1			
	174.0		2322.6													
175		Continues perlitic RHYOLITE breccia, perlite is highly vitreous, gray brown, in matrix.				39	100	100	100		0 0 0 0 0		1			
	179.0		2317.6													
180		As above.				40	100	100	100	179.4 - 184: 65.0°, B, PL, SM, CN	2 0 0 1 1		1			
	184.0		2312.6													
185		As above.				41	100	100	100	185.1: 75.0°, JN, IR, RO, CN 186.2: 65.0°, B, PL, VR, Qtz	1 1 0 0 0		1			
	189.0		2307.6													
190		As above.				42	100	86	86	192.5 - 194: 65.0°, B, PL, VR, CN	0 0 0 2 0		1			
	194.0		2302.6													
195		As above.				43	100	100	100	194 - 197.5: 85.0°, B, PL, SM, CN	1 1 1 2		1			
	197.5		2299.1													
200		Becomes brown RHYOLITE breccia with white matrix, brittle and ductile deformation, matrix is very soft and soapy.				44	100	100	100		0		2			
						45	100	96	96	199.3: 65.0°, B, PL, SM, CN	1					

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF DRILLHOLE DH16-07 (GT-20)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 23, 2016 00:00
DRILLING END: October 27, 2016 00:00
COORDINATES: N: 843,640 E: 926,191

SHEET: 6 of 7
GS ELEV.: 2496.6
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE (BC, LC)	ADVANCEMENT RATE ft/min
200	200.0		2296.6													
		Becomes brown RHYOLITE breccia with white matrix, brittle and ductile deformation, matrix is very soft and soapy. *(continued)*				45	100	96	96		0 0 0		2			
	204.0		2292.6													
205		Becomes more matrix dominant with corestones, soft, white, soapy, talc.				46	100	43	43	204 - 204.7: FLT, G, IN >5mm 205.8 - 207: FLT, G, IN >5mm	7 5 >10		2			
	207.0		2289.6													
		As above vesicular, less white matrix.				47	50	50	50		0 0		2			
	209.0		2287.6													
210		As above.				48	100	70	70	210 - 212: FLT, Bx, IN >5mm, fractured, weak	0 >10 >10 1		2 4			
	214.0		2282.6													
215		As above.				49	100	100	100		0 0 0 0 0		1			
	219.0		2277.6													
220		As above, white soapy matrix.			HQ3	50	100	100	100	219.6: 85.0°, JN, PL, VR, CN 219 - 220.7: FLT, G, IN >5mm, very weak rock 221.8: 80.0°, JN, IR, VR, CN	>10 7 1 0 0		2			
	224.0		2272.6													
225	225.3	Becomes brown and white RHYOLITE breccia, fault zone rock with secondary alteration, weak.	2271.3			51	100	100	100	225.3: 65.0°, CON, PL, RO, CN	0 0 0 0 0		2			
		As above.														
	229.0		2267.6													
230		As above.				52	100	100	100		0 0 0 0 0		1			
	234.0		2262.6													
235		As above.				53	100	100	100		0 0 0 0 0		1			
	239.0		2257.6													
240		As above.				54	100	100	100		0		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF DRILLHOLE DH16-07 (GT-20)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 23, 2016 00:00
DRILLING END: October 27, 2016 00:00
COORDINATES: N: 843,640 E: 926,191

SHEET: 7 of 7
GS ELEV.: 2496.6
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0		2256.6													
		As above. *(continued)*			HQ3	54	100	100	100		0 0 0 0		1			
	244.0		2252.6													
245		As above.				55	100	100	100				1			
	249.0		2247.6													
250		Bottom of borehole at 249.0 ft. Completed as well. Refer to diagram. Notes: 24 - 49: Hydro test #1 SI 49 - 104: Hydro test #2 SI 124 - 152.5: Hydro test #3 SI 194 - 249: Hydro test #4 SI & CRI 205.5 - 207: At 205.5 ft-bgs water presure got blocked, chewed up core from 205.5 to 207 ft-bgs.														
255																
260																
265																
270																
275																
280																

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:28
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RECORD OF BOREHOLE DH16-08 (GT-15)-A

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 29, 2016 11:08
DRILLING END: October 29, 2016 18:05
COORDINATES: N: 842,211 E: 922,848

SHEET: 1 of 1
GS ELEV.: 2441.6
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLES: SAMPLE TYPE & NUMBER	BLOWS per 6 in (140 lb Hammer, 30 inch drop)	REC / ATT (in)	PENETRATION RESISTANCE BLOWS / ft (20 40 60 80) / WATER CONTENT (%) (W_p W W_l) (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
0		0.0	(SW-SM), SAND, well graded, trace fine angular gravel, trace low plasticity fines, brown, weathered, no odor, COLLUVIUM; Schist, gneiss, quartz gravel; moist, SPT @ 6ft: 29-50/1"	2441.6	SW-SM							
5		6.0	Gila Conglomerate (Tcg): slightly weathered, matrix dominant, brown CONGLOMERATE, gravel clasts consisting of schist, gneiss, quartz, diabase, matrix is weak, no HCl reaction.	2435.6			SS S-01	29-50/2" **(50/2")**	7 / 8		100	
10		8.5	As above.	2433.1								
15		13.5	As above.	2428.1								
20		18.0	As above.	2423.6								
25		23.0	As above.	2418.6								
30		24.0	As above.	2417.6								
35		29.0	As above.	2412.6								
40		34.0	Bottom of borehole at 34.0 ft. Completed as well. Refer to diagram.	2407.6								

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-08 (GT-15)-A
1 of 1

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 15:36
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RECORD OF DRILLHOLE DH16-08 (GT-15)-A

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 29, 2016 11:08
DRILLING END: October 29, 2016 18:05
COORDINATES: N: 842,211 E: 922,848

SHEET: 1 of 1
GS ELEV.: 2441.6
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
0	0.0	(SW-SM), SAND, well graded, trace fine angular gravel, trace low plasticity fines, brown, weathered, no odor, COLLUVIUM; Schist, gneiss, quartz gravel; moist, SPT @ 6ft: 29-50/1"	2441.6														
5	6.0		2435.6														
	8.5	Gila Conglomerate (Tcg): slightly weathered, matrix dominant, brown CONGLOMERATE, gravel clasts consisting of schist, gneiss, quartz, diabase, matrix is weak, no HCl reaction.	2433.1			1	52	12	28		>10 >10 3		5				
10		As above.				2	54	16	16		>10 >0 >10 6		5				
	13.5		2428.1														
		As above.				3	64	29	29		>10 >10 2 4 3		4				
15	18.0		2423.6														
		As above.				4	14	0	0				5				
20	23.0		2418.6														
	24.0	As above.	2417.6			5	100	100	100		0		2				
		As above.				6	90	76	76	26: 85.0°, JN, IR, VR, CN 26.5: 55.0°, JN, PL, VR, CN	0 0 2 0 0		2				
25	29.0		2412.6														
		As above.				7	100	56	80	29.9: 75.0°, JN, PL, VR, CN 31.1: JN, IR, VR, CN 32.5: 80.0°, JN, PL, VR, CN	3 0 2 2 0		2				
30	34.0		2407.6														
35		Bottom of borehole at 34.0 ft. Completed as well. Refer to diagram.															
40																	

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-08 (GT-15)-A
1 of 1

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-08 (GT-15)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 30, 2016 09:23
DRILLING END: November 1, 2016 08:25
COORDINATES: N: 842,211 E: 922,848

SHEET: 1 of 7
GS ELEV.: 2441.6
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index ● AX. □ DIAM. ▲ UCS (ksi): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
0	0.0	Drillhole GT-15-B is the continuation of GT-15-A.	2441.6		Tricone											
30	30.0		2411.6													
		Gila Conglomerate (Tcg): slightly weathered, matrix dominant, CONGLOMERATE, gravel clasts consisting of schist, gneiss, quartz, diabase, matrix is weak, no HCl reaction, brown.			HQ3	1	100	95	95	31: 85.0°, JN, IR, VR, CN 32.9: 80.0°, PL, VR, CN	0 1 2 0		2			
	34.0		2407.6													
35		As above, core pitted.				2	100	92	92	35.1: 75.0°, JN, IR, VR, CN	0 1 0 0 0		2			
	39.0		2402.6													
40						3	100	90	90		0		2			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-08 (GT-15)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 30, 2016 09:23
DRILLING END: November 1, 2016 08:25
COORDINATES: N: 842,211 E: 922,848

SHEET: 2 of 7
GS ELEV.: 2441.6
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0	As above. Highly weathered core with fractured/weak zone from 56 to 57.5. Slightly weathered 57.5-59 ft. *(continued)*	2401.6		HQ3	3	100	90	90	40.4: 85.0°, JN, PL, VR, CN 42.3: 80.0°, JN, PL, SM, Qtz, IN <5mm	1 0 1 0		2			
	44.0		2397.6													
45	44.0	As above, becomes clast dominant, weak, fracture zone.				4	90	84	84	45.8: 75.0°, JN, PL, RO, CN	>10 1 0 0 0		4 2			
	49.0		2392.6													
50	49.0	As above, matrix dominant, competent.				5	100	100	100	50.2: 885.0°, JN, IR, VR, CN, partial iron staining	0 1 0 0 0		1			
	54.0		2387.6													
55	54.0	As above.				6	100	100	100		0 0 >10 4 0		1 4 2			
	59.0		2382.6													
60	59.0	Continues slightly weathered, matrix dominant, CONGLOMERATE, large gravel clasts, clasts consist of schist, gneiss, diabase, tuff, quartz, no HCl reaction, brown.				7	96	84	84	61.4: 90.0°, PL, VR, CN	0 0 2 0 0		2			
	64.0		2377.6													
65	64.0	As above, some limestone clasts.				8	100	94	94	65.7: 80.0°, JN, IR, VR, CN	0 3 0 0 0		2			
	69.0		2372.6													
70	69.0	As above.				9	100	100	100		0 0 0 0 0		1			
	74.0		2367.6													
75	74.0	As above.				10	100	100	100		0 0 0 0 0		1			
	79.0		2362.6													
80	79.0	As above, slightly weathered, pitted.				11	100	100	100		0		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-08 (GT-15)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 30, 2016 09:23
DRILLING END: November 1, 2016 08:25
COORDINATES: N: 842,211 E: 922,848

SHEET: 3 of 7
GS ELEV.: 2441.6
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0	As above, slightly weathered, pitted. *(continued)*	2361.6		HQ3	11	100	100	100	82.6: 80.0°, JN, PL, VR, CN	0 0 1 0		1			
85	84.0	As above.	2357.6			12	100	70	70		0 0 0 5 0		1 4			
90	89.0	As above.	2352.6			13	94	86	86		0 0 0 0 0		1			
95	94.0	As above.	2347.6			14	100	100	100		0 0 0 0 0		1			
100	99.0	Continues slightly weathered, matrix dominant, CONGLOMERATE, large gravel clasts, clasts consist of schist, gneiss, diabase, tuff, quartz, weak HCl reaction, brown.	2342.6			15	100	100	100		0 0 0 0 0		1			
105	104.0	As above, moderate HCl reaction.	2337.6			16	100	84	84	106.6: 90.0°, JN, IR, VR, Sa, altered	0 0 1 0 0		1			
110	109.0	As above, weak HCl reaction.	2332.6			17	100	96	96	111.7: 85.0°, JN, PL, VR, CN 112.5: 90.0°, JN, PL, VR, CN	0 0 1 3 0		1			
115	114.0	As above, lenses of fine grained sandstone, competent, no clasts.	2327.6			18	100	100	100		0 0 0 0 0		1			
120	119.0		2322.6			19	100	96	96	119.3: 85.0°, JN, IR, VR,	1		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-08 (GT-15)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 30, 2016 09:23
DRILLING END: November 1, 2016 08:25
COORDINATES: N: 842,211 E: 922,848

SHEET: 4 of 7
GS ELEV.: 2441.6
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi): R1 0.725, R2 3.62, R3 1.45, R4 1.45, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
120	120.0	As above. 116.5-117 sand lens: fine grained sand no clasts, very competent *(continued)*	2321.6		HQ3	19	100	96	96	CN	0 0 0 0 0		1			
	124.0		2317.6													
125		As above.				20	100	100	100		0 0 0 0 0		1			
	129.0		2312.6													
130		As above, no HCl reaction.				21	100	100	100		0 0 0		1			
	132.0		2309.6													
		As above.				22	100	100	100		0 0 0 0 0		1			
135	137.0		2304.6													
		As above.				23	100	100	100		0 0		1			
	139.0		2302.6													
140		Continues fresh, matrix dominant, CONGLOMERATE, gravel clasts of diabase, quartz, schist, limestone, gneiss, tuff, matrix is fine to coarse sand, no HCl reaction, brown.				24	100	100	100		0 0 0 0 0		1			
	144.0		2297.6													
145		As above.				25	100	100	100		0 0 0 0 0		1			
	149.0		2292.6													
150		As above.				26	100	100	100		0 0 0 0		1			
	154.0		2287.6													
155		As above.				27	100	100	100		0 0 0 0 0		1			
	159.0		2282.6													
160		As above, weak HCl reaction.				28	100	100	100		0		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-08 (GT-15)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 30, 2016 09:23
DRILLING END: November 1, 2016 08:25
COORDINATES: N: 842,211 E: 922,848

SHEET: 5 of 7
GS ELEV.: 2441.6
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
160	160.0	As above, weak HCl reaction. *(continued)*	2281.6		HQ3	28	100	100	100		0		1				
	164.0		2277.6								0						
165		As above, clast dominant, some oxidation.				29	100	100	100		0		1				
	169.0		2272.6								0						
170		As above.				30	100	100	100		0		1				
	174.0		2267.6								0						
175		As above.				31	100	100	100	175.5: 65.0°, JN, PL, VR, CN, partial iron staining, diabase clast	0		1				
	179.0		2262.6								0						
180		As above.				32	100	100	100		0		1				
	184.0		2257.6								0						
185		Continues fresh, matrix dominant, CONGLOMERATE, gravel clasts of diabase, quartz, schist, limestone, gneiss, tuff, no HCl reaction, brown.				33	100	100	100		0		1				
	189.0		2252.6								0						
190		As above.				34	100	100	100	189.5: 50.0°, JN, IR, VR, Sa	1		1				
	194.0		2247.6								0						
195		As above.				35	100	100	100		0		1				
	199.0		2242.6								0						
200		As above, clast dominant.				36	100	100	100		0		1				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-08 (GT-15)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 30, 2016 09:23
DRILLING END: November 1, 2016 08:25
COORDINATES: N: 842,211 E: 922,848

SHEET: 6 of 7
GS ELEV.: 2441.6
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index ● AX. □ DIAM. ▲ UCS (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
200	200.0	As above, clast dominant. *(continued)*	2241.6		HQ3	36	100	100	100	201: 90.0°, JN, PL, RO, matte, quartz	0 1 1 0		1			
	204.0		2237.6													
205	209.0	As above.	2232.6			37	100	100	100		0 0 0 0 0		1			
210	214.0	As above.	2227.6			38	100	100	100		0 0 0 0 0		1			
215	219.0	Continues fresh, matrix dominant, CONGLOMERATE, gravel clasts of diabase, quartz, schist, limestone, gneiss, tuff, no HCl reaction, brown.	2222.6			39	100	100	100		0 0 0 0 0		1			
220	224.0	As above.	2217.6			40	100	100	100		0 0 0 0 0		1			
225	229.0	As above, clast dominant.	2212.6			41	100	96	96	228.2: 50.0°, JN, IR, VR, Sa	0 0 0 0 0		1			
230	234.0	As above.	2207.6			42	100	100	100	232.2: 80.0°, JN, PL, VR, CN	0 0 0 1 1		1			
235	239.0	As above, matrix dominant.	2202.6			43	100	100	100		0 0 0 0 0		1			
240		As above.				44	100	100	100		0		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF DRILLHOLE DH16-08 (GT-15)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 30, 2016 09:23
DRILLING END: November 1, 2016 08:25
COORDINATES: N: 842,211 E: 922,848

SHEET: 7 of 7
GS ELEV.: 2441.6
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0		2201.6													
		As above. *(continued)*				44	100	100	100		0 0 0 0 0		1			
	244.0		2197.6													
245		As above.			HQ3	45	100	100	100	248: 85.0°, JN, IR, VR, Sa	0 0 0 0 0		1			
	249.0		2192.6													
250		Bottom of borehole at 249.0 ft. Completed as well. Refer to diagram. Notes: 0 - 30: Continuation of DH16-08 (GT-15)-A. Tri-cone down to 30 ft-bgs. 34 - 69: Hydro test #1 SI 74 - 139: Hydro test #2 SI 139 - 249: Hydro test #3 SI														
255																
260																
265																
270																
275																
280																

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF DRILLHOLE DH16-09-(GT-32)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 2, 2016 16:58
DRILLING END: November 6, 2016 15:45
COORDINATES: N: 845,384 E: 927,715

SHEET: 1 of 13
GS ELEV.: 2619.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
0	0.0	Dark gray, perlitic, RHYOLITE, glassy, flow-banded.	2619.7		HQ3	1	83	50	58	0 - 1.3: weathered surface, gravel	>10		3			
											3					
										2.5: 70.0°, UN, RO, Sa, full iron staining, PC, small roots	1		2			
										3.2: 60.0°, JN, IR, VR, Sa, partial iron staining, PC, roots	3					
	4.0		2615.7							3.5: 80.0°, FOLO, IR, VR, Sa, partial iron staining, PC						
5		As above, flow banding is alternating gray, pale pink, orange red, some crenulation, jointed, slightly weathered.				2	100	80	96	3.7: 80.0°, FOLO, IR, VR, partial iron staining	4		2			
										4.2: 30.0°, JN, PL, RO, partial iron staining						
										4.5: 57.0°, FOLO, PL, VR, Sa, CC <1mm	1					
										4.8: 65.0°, FLT, IR, RO, Bx						
										5.2: 45.0°, JN, UN, SM, CN						
										6.5: 55.0°, FOLO, CU, RO	1					
										7: 70°, FOLO, PL, RO, partial iron staining	1					
										8: 70.0°, FOLO, PL, RO, partial iron staining						
	9.0		2610.7							8.4: 72.0°, FOLO, PL, RO	2					
10		Continues perlitic RHYOLITE, flow-banded, aphanitic rhyolite, red brown, vesicles infilled with quartz, FeOx, and dark gray and white perlitic rock, webbed texture, glassy, crenulated.				3	100	40	76	9.9: 80.0°, FOLO, CU, RO, Sa, IN <5mm	1		2 - 3			
										10.2 - 10.3: FLT, CU, RO, Bx, IN >5mm	2					
										10.6: 80.0°, FOLO, PL, VR, CN	0					
										12.4: 85.0°, FOLO, PL, RO, Sa, CC <1mm	4					
	13.5		2606.2							12.5 - 12.6: 70.0°, FLT, PL, RO, Sa, partial iron staining, IN >5mm, crushed rock	1					
		As above.								12.8: 40.0°, FOLO, PL, RO, CN						
										12.9 - 13: 45.0°, FLT, IR, RO, Sa, partial iron staining, IN >5mm	3					
15										13.2: 56.0°, JN, CU, RO, CN						
										13.3 - 13.5: broken, drill damage	1					
						4	100	66	82	14: 55.0°, JN, IR, VR, CN			3			
										14.6 - 14.8: drill damage						
										15.6: 62.0°, FOLO, PL, RO, sericite, partial iron staining, PC	2					
										16.1: 58.0°, FOLO, PL, VR, sericite, partial iron staining, CC <1mm						
										16.5: 72.0°, FOLO, PL, RO, CN	8					
	18.5		2601.2							17: 62.0°, FOLO, PL, SM, Qtz, PC						
		As above, folded and crenulated.								17.2 - 17.8: 70.0°, FOLO x 8, PL, RO, sericite, partial iron staining, IN <5mm	0					
						5	100	60	73	18.3: 80.0°, FOLO, CU, RO, Sa, full iron staining, IN <5mm	5		3			
20										18.4: 50.0°, FOLO, PL, RO,						

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-09-(GT-32)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 2, 2016 16:58
DRILLING END: November 6, 2016 15:45
COORDINATES: N: 845,384 E: 927,715

SHEET: 2 of 13
GS ELEV.: 2619.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
20	20.0	As above, folded and crenulated. *(continued)*	2599.7		HQ3	5	100	60	73	Sa, full iron staining, IN <5mm 18.9: 85.0°, FOLO, CU, RO, partial iron staining 20.1: 75.0°, JN, CU, RO, Sa, partial iron staining, IN <5mm 20.2: 60.0°, JN, IR, RO, Sa, IN <5mm 20.4: 68.0°, JN, CU, RO, Sa, partial iron staining, IN <5mm 20.6: 55.0°, FLT, PL, RO, Bx, IN >5mm 21.1: 60.0°, JN, ST, VR, CN 22.1: 65.0°, JN, PL, RO, partial iron staining 23.3: 45.0°, JN, PL, VR, Sa, CC <1mm 23.5: 15.0°, JN, PL, SM, CN 23.7: 55.0°, JN x 2, CU, RO, partial iron staining 24 - 24.5: lost core, returns pebbles	5 0 1 4 >10		3 2				
	24.0	As above.	2595.7			6	90	36	46	24.8: 55.0°, JN, IR, RO 25: 10.0°, JN, UN, SM, Sa, partial iron staining, PC 25.4 - 25.7: FLT, Bx, IN >5mm 26: 10.0°, JN, UN, SM, Sa, partial iron staining, PC 26.3: 35.0°, FLT, CU, RO, Sa, partial iron staining, IN <5mm 26.7: 10.0°, JN, UN, SM, Cl, PC 27.7: 40.0°, JN, CU, VR, CN 28: 52.0°, JN, ST, RO, partial iron staining	4 2 1 1		2				
30	29.0	As above.	2590.7			7	100	78	82	29.1: 20.0°, JN, UN, SM, MnOx, SA 29.8: 31.0°, JN, PL, VR, Qtz, partial iron staining, IN <5mm 30.3: 10.0°, JN, UN, SM, MnOx, SO 30.8 - 30.85: 55.0°, FLT, PL, VR, Bx, IN >5mm 31.2: 60.0°, JN, CU, RO, MnOx, SO 31.4: 5.0°, JN, UN, SM, MnOx, SO 32.7: 5.0°, JN, UN, SM, MnOx, SO 33: 30.0°, JN, UN, SM, MnOx, SO	2 2 2 2 1		2				
	34.0	As above.	2585.7			8	100	64	70	33.8: 50.0°, JN, ST, SM, CN 34.8: 50.0°, JN, PL, VR, partial iron staining 37.1: 41.0°, JN, ST, SM, MnOx, SO 37.3: 63.0°, JN, PL, SM, MnOx, SO 37.4: 49.0°, JN, PL, RO, Sa, CC <1mm 37.7: 55.0°, FOLO, IR, RO, CN 38.3: 10.0°, JN, UN, SM, ser, PC	2 2 0 0 4 2		2				
40	39.0	As above.	2580.7			9	100	66	88	38.7: 45.0°, FOLO, PL, RO, Sa, CC <1mm 39 - 39.6: broken, drill	5		2				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-09-(GT-32)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 2, 2016 16:58
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COORDINATES: N: 845,384 E: 927,715

SHEET: 3 of 13
GS ELEV.: 2619.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0	As above. *(continued)*	2579.7		HQ3	9	100	66	88	damage 39.6: 50.0°, FOLO, IR, RO, MnOx, SO 40: 45.0°, JN, ST, RO, MnOx, SO 40.9: 51.0°, FOLO, PL, SM, ser, partial iron staining, PC 41.5: 49.0°, FOLO, PL, RO, Qtz, CC <1mm 42.4: 58.0°, FOLO, PL, RO, ser, CC <1mm 42.9: 58.0°, FOLO, PL, RO, ser, IN <5mm 43: 55.0°, FOLO, PL, SM, ser, PC 43.2: 60.0°, FOLO, PL, SM, ser, PC	2 1 2 3		2			
	44.0	As above, becomes more jointed along the flow banding.	2575.7			10	100	30	67	43.5: 55.0°, FOLO, PL, RO, Sa, partial iron staining, IN <5mm 44 - 44.4: 52.0°, FOLO x 9, PL, SM, FeOx, full iron staining, CC <1mm 44.6 - 44.7: 54.0°, PL, SM, ser, PC 45.4: 57.0°, JN, CU, RO, MnOx, SA 46: 42.0°, JN, CU, SM, MnOx, SO 46.8 - 47: broken, drill damage	9 1 2		2			
45	47.0	As above, jointed fractured.	2572.7			11	100	46	66	47.2: 42.0°, FOLO, PL, PO, talc, IN >5mm 47.6: 50.0°, FOLO, PL, RO, talc, IN <5mm 47.8: 47.0°, JN, PL, SM, ser, CC <1mm 49.2: 15.0°, JN, ST, SM, ser, PC 49.5: 52.0°, JN, PL, RO, CN 49.8: 30.0°, JN, IR, VR, MnOx, SO 49.9: 48.0°, JN, PL, RO, Qtz, PC 50.3: 51.0°, JN, CU, VR, MnOx, SO 50.6 - 50.7: 55.0°, FLT, IR, RO, fractured rock 51.5 - 51.6: 42.0°, FOLO x 2, PL, RO, ser, PC	3 0 3 4 2		2			
50	52.0	As above.	2567.7			12	75	15	40	52.6 - 52.9: 51.0°, FOLO x 3, PL, RO, ser, PC 53.5: 45.0°, FOLO, PL, SM, ser, PC 53.6: 38.0°, FOLO, CU, RO, ser, CC <1mm	8 2		2			
55	54.0	Becomes aphanitic white and brown RHYOLITE, flow banding, layered and boudined, few vesicles.	2565.7			13	100	86	86	54.4: 31.0°, FOLO, PL, SM, ser, PC 55: 29.0°, FOLO, PL, RO, talc, partial iron staining, CC <1mm, waxy 57.1: 45.0°, FOLO, PL, SM, ser, PC 58.6: 47.0°, FOLO, PL, SM, ser, CC <1mm	1 1 0 1 1		2			
60	59.0	As above.	2560.7			14	100	84	96		0		2			

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DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-09-(GT-32)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 2, 2016 16:58
DRILLING END: November 6, 2016 15:45
COORDINATES: N: 845,384 E: 927,715

SHEET: 4 of 13
GS ELEV.: 2619.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
60	60.0	As above. *(continued)*	2559.7		HQ3	14	100	84	96	60.4: 30.0°, FOLO, UN, RO, serr, PC 61.5: 37.0°, FOLO, PL, SM, ser, CC <1mm 62.1: 68.0°, JN, PL, VR, CN 62.7: 34.0°, FOLO, PL, SM, ser, partial iron staining, PC 63: 35.0°, JN, PL, RO, Qtz, CC <1mm	1 1 2 1		2		
	64.0	As above.	2555.7			15	90	60	60	64.4: 19.0°, JN, CU, SM, ser, PC 64.41 - 65: broken core 65.9: 30.0°, PL, RO, Qtz, CC <1mm 67.9: 24.0°, JN, PL, RO, ser, PC 68: 58.0°, JN, PL, RO, CN 68.1 - 68.5: broken, drill damage	5 0 0 1 1		2		
65																
70	69.0	As above, brittle and fractured throughout.	2550.7			16	58	0	15	69 - 71.3: FLT, fracture	10 >10 3 0		2			
	73.0	Continues brown and gray flow-banded RHYOLITE, crenulated, oxidized phenocrysts, vesicular and pitted, returns to perlitic, glassy texture.	2546.7			17	90	64	76	73.9 - 74.3: FLT, Bx, broken 76.5 - 76.8: 54.0°, FLT, IR, VR, Bx 77.1: 50.0°, JN, IR, RO, CN	5 3 0 3 1		3			
75																
80	78.0	As above, fractured and sheared.	2541.7			18	100	12	22	78 - 79: FLT, fractured 79.7: 43.0°, FOLO, PL, RO,	>10 1		3			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF DRILLHOLE DH16-09-(GT-32)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 2, 2016 16:58
DRILLING END: November 6, 2016 15:45
COORDINATES: N: 845,384 E: 927,715

SHEET: 5 of 13
GS ELEV.: 2619.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6 (ksi)	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0	As above, fractured and sheared. *(continued)*	2539.7		HQ3					SA	>10					
						18	100	12	22	80 - 83: FLT, Bx, fractured, sericite and sand and broken rock	>10		3			
											>10					
	83.0	As above, weak and altered.	2536.7							83.2: 42.0°, FOLO, UN, RO, SA	2					
										83.8: 40.0°, FLT, IR, RO, sand&ser, IN >5mm	3					
85										84.7 - 85: x 4, IR, VR, ser, IN <5mm, sericite filled						
						19	100	64	76	85: 57.0°, JN, PL, VR, CN 85.5 - 85.6: FLT, Bx	2		3			
										86.4: 25.0°, JN, IR, VR, Sa, PC	2					
	88.0		2531.7							86.6: 45.0°, JN, ST, VR, SA 87: 24.0°, JN, PL, RO, Qtz, CC <1mm	1					
		As above.														
										88.3 - 88.8: FLT, Bx	5					
											4					
90										89.6 - 90.1: FLT, Bx, fractured						
						20	100	66	76		1		2			
											1					
										91.8: 55.0°, JN, CU, SM						
	93.0		2526.7							92.7 - 93: drill damage	0					
		As above, fault zone.									0					
										94: 26.0°, JN, PL, PO 94.1: 25.0°, JN, CU, SM, CN	3					
95										94.2: 46.0°, JN, CU, RO, CN						
						21	75	50	50		4		2			
										95.4 - 97: FLT, Bx, lost circulation	>10					
	97.0		2522.7													
		Continues RHYOLITE, orange brown with light gray, flow banding, aphanitic, oxidized biotites, pitted.								97.3: 27.0°, FOLO, PL, RO, CN 97.6: 67.0°, JN, CU, RO, CN	6					
						22	100	20	80	97.9: 48.0°, FOLO, PL, VR, Bx, IN <5mm	10		2			
	99.0		2520.7							98.4: 60.0°, JN, CU, RO, Qtz, CC <1mm						
		As above.								98.7: 52.0°, FOLO, PL, RO, SA						
100						23	100	18	56	99 - 99.3: broken, drill damage	4		2 - 3			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-09-(GT-32)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 2, 2016 16:58
DRILLING END: November 6, 2016 15:45
COORDINATES: N: 845,384 E: 927,715

SHEET: 6 of 13
GS ELEV.: 2619.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
100	100.0		2519.7		HQ3											
		As above. *(continued)*				23	100	18	56	99.6: 36.0°, FOLO, PL, RO, Sa, IN <5mm 99.8: 55.0°, JN, UN, VR, CN 100.7: 50.0°, FOLO, PL, RO, ser, IN <5mm 101.1 - 101.6: FLT, Bx, broken 101.6: 15.0°, JN, PL, SM, ser, PC 101.8 - 102: 40.0°, FLT, IR, RO, Bx 102.2: 50.0°, JN, ST, RO, CN 102.6: 56.0°, JN, PL, RO, Sa, PC 102.9: 38.0°, FOLO, PL, VR, Bx	1 8 3 3		2 - 3			
	104.0		2515.7													
		As above.				24	100	78	82	103.3: 46.0°, FOLO, PL, RO, Qtz, CC <1mm 103.4: 50.0°, FOLO, PL, VR, SA 104 - 104.6: broken 104.6: 65.0°, JN, PL, SM, CN 105: 40.0°, FOLO, CU, RO, Qtz, SA 105.6: 53.0°, FOLO, PL, RO, Bx, IN <5mm 105.9 - 106.1: 45.0°, FLT, IR, VR, Bx 106.8: 75.0°, JN, ST, RO, Sa, PC	6 3 2 0 0		2 1			
105	106.0		2513.7													
		As above.														
	109.0		2510.7													
		As above, near vertical joint set, fresh and competent.				25	100	100	100	109.8: 7.0°, JN, PL, RO, CN 110.9: 37.0°, FOLO, PL, RO, Bx, IN <5mm 111.6: 8.0°, JN, UN, RO, CN 113.2: 72.0°, JN, PL, RO, CN	1 1 1 0 1		1			
110																
115										114.4: 16.0°, JN, UN, SM, CN 114.5: 61.0°, JN, CU, RO, Sa, PC 115.2: 68.0°, FOLO, ST, RO, ser, PC	2 1		1			
	116.0		2503.7													
		As above.				26	100	36	44	116: 76.0°, FOLO, IR, VR, CN 116.2 - 119: FLT, fractured and crushed rock	>10 >10 >10		3			
	119.0		2500.7													
120						27	90	44	44	119 - 120.7: FLT, Bx, rubble	>10		2 - 3			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF DRILLHOLE DH16-09-(GT-32)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 2, 2016 16:58
DRILLING END: November 6, 2016 15:45
COORDINATES: N: 845,384 E: 927,715

SHEET: 7 of 13
GS ELEV.: 2619.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC	LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
120	120.0	Becomes predominantly orange brown, RHYOLITE gray boudins, flow laminations, gray rock is very weak and argillized. *(continued)*	2499.7		HQ3	27	90	44	44	119 - 120.7: FLT, Bx, rubble 121.1 - 121.2: 75.0°, FLT, IR, VR, Bx 121.6: 61.0°, FOLO, UN, RO, G, IN <5mm 122.3 - 122.5: FLT, PL, RO, G, sericite and sand 123.2 - 124: FLT, Bx, rubble	5 2 2 >10		2 - 3				
	124.0	As above.	2495.7															
125						28	100	0	30	125.4 - 125.5: 75.0°, JN x 2, PL, SM, partial iron staining 125.6 - 126.4: 75.0°, JN x 3, ST, RO, partial iron staining 124 - 129: fractured 125 - 128.3: 65.0°, FOLO x 5, PL, RO, CN 126 - 129: 20.0°, JN x 5, PL, SM, partial iron staining	>10 5 8 6 3		2				
	129.0	As above.	2490.7															
130						29	100	86	86	129.3 - 130: FLT, Bx, fractured	7 0 0 0 0		2				
	134.0	As above, sheared zones along foliation	2485.7															
135						30	100	78	82	134.3: 56.0°, FOLO, CU, SM, SA 135.1 - 136.2: FLT, IR, RO, Bx, broken and weak 138.5: 66.0°, FOLO, CU, RO, G, IN <5mm	1 >10 3 0 1		2				
	139.0	As above, more crenulated, brown with gray.	2480.7															
140						31	90	32	44	139.8: 72.0°, FOLO, CU,	1		2 - 3					

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
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RECORD OF DRILLHOLE DH16-09-(GT-32)

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PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

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DRILLING END: November 6, 2016 15:45
COORDINATES: N: 845,384 E: 927,715

SHEET: 8 of 13
GS ELEV.: 2619.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
140	140.0	As above, more crenulated, brown with gray. *(continued)*	2479.7		HQ3	31	90	32	44	RO, G, IN <5mm 140.3 - 142.5: FLT, fractured 142.6: 76.0°, JN, PL, VR, CN 142.9: 75.0°, JN, CU, VR, partial iron staining 143.1: 50.0°, FOLO, UN, VR, G, IN <5mm	>10 >10 1		2 - 3				
	144.0	As above.	2475.7			32	88	0	18	144 - 145.1: FLT, Bx 145.2: 27.0°, JN, PL, VR, CN 145.5: 24.0°, JN, PL, VR 145.6: 60.0°, JN, ST, VR, CN 145.7: 32.0°, JN, PL, VR, Bx, IN <5mm 146.2: 52.0°, JN, CU, VR, CN 146.3: 20.0°, JN, UN, SM, Bx, IN <5mm 146.7: 70.0°, JN, IR, VR, Sa, PC	>10 6 5 5		2 - 3				
145																		
	148.0	As above.	2471.7			33	100	42	46	146.75: 54.0°, FOLO, PL, RO, G, IN <5mm 146.8: 63.0°, FOLO, PL, SM, CN 147: 19.0°, JN, UN, SM, Bx, IN <5mm 147.2: 55.0°, FOLO, ST, RO, G, IN <5mm 147.3: 54.0°, FOLO, CU, RO, CN 147.6: 22.0°, JN, UN, VR, CN 147.7 - 148: broken, drill damage 148 - 148.8: FLT, Ca, highly jointed, rubble 150.1: 72.0°, FOLO, CU, RO, partial iron staining 150.6: 15.0°, JN, UN, RO, partial iron staining 150.8 - 150.9: 75.0°, FOLO x 2, IR, RO, G, CC <1mm	>10 0 3 3 3		2				
150																		
	153.0	As above.	2466.7			34	100	56	80	151.5: 5.0°, JN, UN, SM, partial iron staining 151.55: 80.0°, FOLO, ST, VR, G, IN <5mm 151.6: 5.0°, JN, UN, SM, partial iron staining 152.3 - 152.4: 70.0°, FOLO x 3, IR, RO, partial iron staining 154.6: 25.0°, JN, UN, VR, Bx, IN <5mm 155.1 - 155.2: 68.0°, FLT, PL, RO, Bx, IN >5mm 155.9 - 156.2: 60.0°, FLT, PL, RO, Bx, IN >5mm 156.5: 60.0°, FOLO, PL, SM, CN 156.8: 60.0°, FOLO, PL, SK, Qtz, CC <1mm 157: 60.0°, FOLO, PL, RO, Qtz, SA 157.7 - 158: 75.0°, FLT, IR, VR, Bx, IN >5mm	0 1 2 4 4		2				
155																		
	158.0	Continues RHYOLITE, moth eaten texture, flow-banded, folded brown and gray, weak.	2461.7			35	100	52	60	158.6: 51.0°, JN, CU, RO, SA 158.9 - 159.4: FLT, Bx 159.4: 64.0°, FOLO, PL, RO, Sa, CC <1mm 159.6: 80.0°, FOLO, PL,	2 6		3				
160		Log continued on next page																

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF DRILLHOLE DH16-09-(GT-32)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 2, 2016 16:58
DRILLING END: November 6, 2016 15:45
COORDINATES: N: 845,384 E: 927,715

SHEET: 9 of 13
GS ELEV.: 2619.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC LC	ADVANCEMENT RATE ft/min
160	160.0	Continues RHYOLITE, moth eaten texture, flow-banded, folded brown and gray, weak. *(continued)*	2459.7		HQ3	35	100	52	60	RO, CN 160.1: 80.0°, FOLO, CU, SK, SA 160.3: 64.0°, FOLO, IR, RO, Sa, CC <1mm 160.5: 58.0°, FLT, IR, RO, Bx, IN >5mm 161: 65.0°, FOLO, CU, RO, G, IN <5mm 161.4 - 162: 45.0°, FLT, IR, VR, Bx 162.3: 60.0°, FOLO, CU, RO, Sa, CC <1mm	3 5 6		3			
	163.0	As above.	2456.7			36	100	74	74	162.5 - 163: FLT, Bx, fractured 163.5: 61.0°, FOLO, CU, RO, G, CC <1mm 163.8: 75.0°, JN, PL, VR, CN 164.1: 70.0°, JN, IR, VR, CN 164.3: 57.0°, FOLO, PL, SM, G, SA 164.7: 58.0°, FOLO, PL, SM, Sa, PC 164.8: 60.0°, FOLO, PL, RO, Sa, CC <1mm 165: 60.0°, FOLO, PL, VR, Bx, IN <5mm	3 3 0 0 0		3			
165																	
	168.0	As above.	2451.7			37	100	50	78	168.5: 58.0°, FOLO, PL, SM, Qtz, CC <1mm 168.7: 30.0°, JN, UN, SM, Qtz, CC <1mm 168.8: 54.0°, FOLO, CU, SM, Qtz, CC <1mm 169.2: 66.0°, FOLO, UN, RO, Sa, IN <5mm 170: 66.0°, FOLO, PL, RO, G, IN <5mm 170.2: 58.0°, FOLO, UN, SM, G, CC <1mm 170.55: FOLO, PL, RO, CN 170.6: 20.0°, JN, PL, RO, Sa, CC <1mm 172: 46.0°, JN, CU, SM, CN 172.1: 18.0°, JN, UN, RO, Sa, PC	3 1 4 0 5		2 - 3			
170																	
	173.0	As above, becomes more pinkish brown and gray, coarser, anhedral phenocrysts, trace FeOx.	2446.7			38	100	29	40	172.7 - 173.5: FLT, iron staining, sand 173.7 - 174: FLT, Bx, partial iron staining, fractured 174.2: 30.0°, JN, UN, VR, Sa, partial iron staining, PC 174.6: 57.0°, FOLO, PL, RO, Bx, CC <1mm 174.9: 34.0°, JN, PL, RO, partial iron staining 175: 72.0°, FOLO, PL, RO, G, SA 175.1: 15.0°, JN, IR, RO, Sa, PC	8 4 7		2			
175																	
	176.5	As above.	2443.2			39	100	86	92	175.2: 30.0°, JN, PL, VR, CN 175.6: 72.0°, FOLO, UN, VR, G, CC <1mm 175.7: 28.0°, FLT, PL, SM, Bx, IN >5mm 175.9: 17.0°, JN, UN, VR, CN 176.1 - 176.7: FLT, Bx, fractured, drill damage 176.9: 12.0°, JN, UN, VR, Qtz, CC <1mm 177.1: 72.0°, FOLO, UN, VR, G, IN <5mm 178.4: 80.0°, FOLO, PL, RO, G, CC <1mm	>10 1 1 0		2			
180																	

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-09-(GT-32)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 2, 2016 16:58
DRILLING END: November 6, 2016 15:45
COORDINATES: N: 845,384 E: 927,715

SHEET: 10 of 13
GS ELEV.: 2619.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
180	180.0	As above. *(continued)*	2439.7		HQ3	39	100	86	92		0		2			
	181.5	As above.	2438.2								0					
						40	100	100	100	182.1: 29.0°, JN, PL, VR, partial iron staining	1		2			
	184.0		2435.7								0					
185		Becomes RHYOLITE, moth eaten zone, flow-banded brown and gray, folded and crenulated, gray rock vesicular, weaker, and slightly porous.				41	100	54	54	184.3: 38.0°, JN, PL, SM, Qtz, CC <1mm 184.8: 38.0°, JN, PL, SM, partial iron staining 185.4: 54.0°, FOLO, PL, SM, G, CC <1mm 186 - 187: FLT, fractured 186.9: 49.0°, FOLO, PL, RO, Bx, IN <5mm 187.8: 39.0°, FOLO, PL, SK, Sa, PC 188: 45.0°, FOLO, PL, VR, Sa, IN <5mm 188.3: 48.0°, PL, SM, Qtz, CC <1mm	2 1 10 1 5		2			
	189.0		2430.7													
190		As above.				42	100	38	65	188.5: 28.0°, JN, UN, RO 188.6: 15.0°, JN, UN, VR, CN 188.7: 50.0°, FOLO, CU, RO, G, CC <1mm 189 - 189.2: broken, drill damage 189.3: 58.0°, FOLO, PL, SK, Qtz, SA 189.7: 27.0°, JN, PL, RO, CN 189.8 - 190.2: FLT, fractured 190.2: 47.0°, FOLO, PL, SM, Qtz, CC <1mm 190.3: 50.0°, JN, IR, VR, G, IN <5mm	5 5 3 5		2			
	193.0		2426.7													
195		As above.				43	100	64	74	191.2: 58.0°, FOLO, PL, RO, G, CC <1mm 191.3: 52.0°, FOLO, PL, RO, Sa, CC <1mm 191.7: 60.0°, FOLO, PL, RO, G, PC 192: 57.0°, JN, IR, VR, CN 192.2: 58.0°, FOLO, PL, SM, G, full iron staining, CC <1mm 192.3: 10.0°, JN, UN, RO, Qtz, CC <1mm 192.4: 44.0°, FOLO, PL, RO, Sa, PC 192.7: 22.0°, JN, PL, VR, Sa, IN <5mm 192.9 - 193.4: FLT, Bx, weak, fractured 193.7: 14.0°, JN, PL, VR, Qtz, CC <1mm 194: 57.0°, FOLO, PL, RO, G, IN <5mm	7 3 1 1 1		2			
	198.0		2421.7													
200		As above.				44	100	96	96	194.2: 62.0°, FOLO, PL, SK, CN 194.8: 70.0°, FOLO, PL, SM, G, CC <1mm 194.9: 71.0°, FOLO, PL, SM, G, CC <1mm 195.7: 20.0°, JN, IR, VR, Bx, IN <5mm 196.4: 58.0°, FOLO, PL, VR, G, IN <5mm	0 1		2			
		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-09-(GT-32)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 2, 2016 16:58
DRILLING END: November 6, 2016 15:45
COORDINATES: N: 845,384 E: 927,715

SHEET: 11 of 13
GS ELEV.: 2619.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
200	200.0	As above. *(continued)*	2419.7		HQ3	44	100	96	96	197.5: 27.0°, FLT, UN, VR, G, IN >5mm 199.6: 74.0°, JN, PL, RO, G, IN <5mm 200.3: 45.0°, FOLO, PL, RO, G, IN <5mm 200.35: 45.0°, FOLO, PL, RO, G, IN <5mm 200.5: 45.0°, FOLO, PL, RO, G, IN <5mm 201.6: 56.0°, FOLO, UN, RO, G, IN <5mm 202.1: 65.0°, FOLO, UN, VR, G, IN <5mm	3 1 1		2		
	203.0	As above, but gray rock more vesicular to pumaceous.	2416.7								1					
205						45	100	96	96	203.9: 47.0°, FOLO, PL, RO, Bx, IN <5mm 204: 32.0°, JN, CU, VR, Qtz, CC <1mm 204.1: 46.0°, FOLO, UN, VR, G, IN <5mm 205.2: 50.0°, FOLO, PL, VR, Sa, IN <5mm 205.9: 53.0°, FOLO, PL, SK, G, IN <5mm	2 2 0		2		
	208.0	As above, zones of weak, rubbly rock.	2411.7							207: 48.0°, FOLO, CU, SM, G, CC <1mm 207.3: 49.0°, FOLO, IR, VR, G, IN >5mm	1					
210						46	100	36	40	208 - 209.6: FLT, fractured, foliated 209.6: 32.0°, JN, UN, RO, Qtz, CC <1mm 210: 17.0°, JN, IR, VR, Qtz, CC <1mm 210.6 - 211.3: 11.0°, FLT, IR, VR, Bx, weak and broken 211.4: 59.0°, JN, UN, RO, Qtz, CC <1mm	>10 7 5 4		2		
	213.0	As above.	2406.7							212.5: 10.0°, JN, UN, VR, Qtz, CC <1mm	1					
215						47	90	70	74	213 - 213.8: FLT, Bx 214.8: 38.0°, JN, PL, SM, Qtz, CC <1mm 215 - 215.2: FLT, Bx	>10 3 2		2		
	218.0	As above, fractured.	2401.7								0 0					
220						48	100		56	218.7 - 220.2: FLT, Bx, fractured	3 >10		2			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-09-(GT-32)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 2, 2016 16:58
DRILLING END: November 6, 2016 15:45
COORDINATES: N: 845,384 E: 927,715

SHEET: 12 of 13
GS ELEV.: 2619.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC	LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
220	220.0	As above, fractured. *(continued)*	2399.7		HQ3	48	100		56	220.2: 64.0°, FOLO, PL, RO, G, IN <5mm 220.7: 10.0°, JN, PL, SM, Qtz, CC <1mm 221: 40.0°, FOLO, PL, RO, G, IN <5mm	>10 1 0		2				
	223.0	As above.	2396.7			49	100	52	58	223.9: 12.0°, JN, ST, SM, Qtz, CC <1mm 224.8 - 226.5: FLT, rubble zone	1 2 >10 5 0		2				
225	228.0	As above.	2391.7			50	100	72	72	229.2 - 229.5: FLT, Bx 230.4 - 230.6: 58.0°, FLT, PL, RO, Bx 232.2 - 233: FLT, Bx, highly fractured	0 3 3 0 >10		2				
230	233.0	As above.	2386.7			51	100	66	66	234.5: 40.0°, FOLO, UN, SM, G, CC <1mm 235.6 - 237: FLT, Bx, fractured	0 1 4 >10 0		2				
235	238.0	As above, more brittle deformation and fracturing.	2381.7			52	100	36	72	238.4: 40.0°, FOLO, PL, RO, G, CC <1mm 239.1: 52.0°, FOLO, ST, RO, G, CC <1mm 239.2: 71.0°, FOLO, PL, RO, CN	1 4		2 - 3				
240		Log continued on next page																

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-09-(GT-32)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 2, 2016 16:58
DRILLING END: November 6, 2016 15:45
COORDINATES: N: 845,384 E: 927,715

SHEET: 13 of 13
GS ELEV.: 2619.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
240	240.0	As above, more brittle deformation and fracturing. *(continued)*	2379.7		HQ3	52	100	36	72	239.6: 54.0°, FOLO, PL, VR, G, IN <5mm 239.8: 59.0°, FOLO, UN, RO, G, IN <5mm 240.2: 64.0°, FOLO, PL, VR, G, PC 240.5: 63.0°, FOLO, PL, SM, Qtz, CC <1mm 240.8: 62.0°, FOLO, PL, RO, Sa, CC <1mm 241.1: 60.0°, FOLO, PL, SM, Qtz, CC <1mm 241.3: 50.0°, FOLO, UN, RO, Sa, CC <1mm	3 8 8		2 - 3				
	243.0	As above.	2376.7			53	100	62	66	241.5: 52.0°, FOLO, PL, RO, Qtz, CC <1mm 241.6: 10.0°, JN, UN, SM, Qtz, CC <1mm 241.7: 55.0°, FOLO, PL, RO, Sa, CC <1mm 241.9 - 242.2: FLT, Bx 242.5 - 244.2: FLT, Bx, weak, spongy 244.4: 20.0°, JN, UN, RO, Qtz, CC <1mm 244.7: 65.0°, FOLO, PL, RO, G, CC <1mm 246.8: 46.0°, JN, UN, RO, Qtz, CC <1mm 247.7: 24.0°, JN, UN, RO, Qtz, CC <1mm	>10 3 0 1 1		2				
245	248.0	As above.	2371.7			54	100	55	55	248 - 248.9: FLT, Bx, highly fractured 248.9: 16.0°, JN, UN, SM, Qtz, CC <1mm 249.4: 62.0°, FOLO, PL, RO, G, IN <5mm	>10 2		2				
250	250.0	Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram. Notes: 0 - 24: Hydro test #1 FHT 24: Set casing. 54 - 97: Hydro test #2 SI & CRI 69: Poor recovery, driller notes ~40% fluid return. 94 - 109: Hydro test #3 SI & CRI 95: Fault zone, lost circulation. 97: At 97 ft-bgs hole goes completely dry. Packer test fails. 99: Circulation returns, remains ~ 60% 114 - 168: Hydro test #4 SI & CRI 161: Lost circulation. 183 - 250: Hydro test #5 SI & CRI	2369.7														
255																	
260																	

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-10 (GT-31)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 8, 2016 12:02
DRILLING END: November 11, 2016 17:30
COORDINATES: N: 845,877 E: 929,847

SHEET: 1 of 7
GS ELEV.: 2699.5
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
0	0.0	Perlitic, aphyric, gray RHYOLITE breccia with aphanitic rhyolite inclusions, shattered, highly vitreous, roots and iron staining.	2699.5		HQ3	1	88	28	33	0.5 - 2: FLT, Bx, partial iron staining, small roots 2.6: 80.0°, JN, ST, VR, roots 2.9: 75.0°, JN, UN, VR, Sa, partial iron staining, IN <5mm	>10 >10 2 3		3				
	4.0		2695.5															
5		As above.				2	70	16	44	3.3 - 3.4: 20.0°, FLT, UN, VR, Bx, partial iron staining, IN >5mm 3.9: 26.0°, JN, UN, RO, Sa, partial iron staining, IN <5mm 4 - 4.7: FLT, Bx 5: 62.0°, JN, UN, VR, Sa, CC <1mm	5 8 >10 4 >10		3				
	9.0		2690.5															
10		Continues perlitic aphyric RHYOLITE breccia, highly vitreous, shattered texture and brecia zones, abundant voids on veining, botryoidal opal in voids				3	100	60	76	5.1 - 6.6: FLT, Bx, shattered rock and sand 7: 74.0°, JN, ST, SM, CN 7.4: 82.0°, JN, PL, RO, CN 7.7 - 9: FLT, Bx, shattered rock 9 - 10.8: FLT, Bx, shattered rock	>10 8 0 0 0		3				
	14.0		2685.5															
15		As above, rock is extremely brittle, with weak zones and full of voids.				4	100	50	82	14.1: 78.0°, JN, ST, SM, Qtz, IN <5mm 15.5: 72.0°, JN, UN, SM, CN 18.1: 75.0°, JN, UN, SM, Qtz, CC <1mm	1 0 0 0 1		3				
	19.0		2680.5															
20		As above, abundant voids, more brown rhyolite veins/inclusions, still highly shattered texture.				5	100	100	100	19.7: 75.0°, JN, IR, VR, Sa, PC 23.1: 67.0°, JN, CU, VR, sericite, PC	1 1 0 0 1		3				
	24.0		2675.5															
25		Becomes matrix dominant RHYOLITE breccia, clasts of perlite and brown rhyolite, fewer voids, massive.				6	100	100	100	28.6: 45.0°, JN, PL, VR, Sa, CC <1mm	0 0 0 0 1		3				
	29.0		2670.5															
30		Becomes flow-banded, perlitic RHYOLITE, highly vitreous, some voids with botryoidal opal and chalcedony, some FeOx, some brown rhyolite inclusions, very brittle.				7	100	96	96	29.6: 83.0°, FOLO, UN, RO, Qtz, CC <1mm 32.4 - 32.6: FLT, Sa, IN >5mm	1 0 0 3 0		3				
	34.0		2665.5															
35		As above.				8	100	70	70	35.2 - 35.4: FLT, Bx 36.2 - 36.8: 30.0°, FLT, PL, VR, Bx, IN >5mm	0 3 8 0 0		3				
	39.0		2660.5															
40		As above.				9	100	54	74	39.3: 87.0°, JN, UN, RO,	4		2 - 3					
		Log continued on next page																

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-10 (GT-31)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 8, 2016 12:02
DRILLING END: November 11, 2016 17:30
COORDINATES: N: 845,877 E: 929,847

SHEET: 2 of 7
GS ELEV.: 2699.5
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0	As above. *(continued)*	2659.5		HQ3	9	100	54	74	Qtz, PC 39.4: 69.0°, JN, CU, VR, Sa, CC <1mm 39.6: 76.0°, JN, UN, RO, PC 39.9: 34.0°, JN, UN, RO, Qtz, CC <1mm 40.2: 70.0°, FOLO, CU, SM, Bx	5 4 1 0		2 - 3		
45	44.0	As above.	2655.5			10	100	58	95	40.4: 54.0°, JN, UN, SM, CN 40.5: 70.0°, JN, UN, RO, CN 40.8 - 41.3: FLT, Bx 41.6: 67.0°, JN, PL, VR, Qtz, PC 42.5: 60.0°, FOLO, PL, RO, Qtz, CC <1mm	2 2 2 3		2 - 3		
50	48.0	As above	2651.5			11	100	35	50	44.3: 82.0°, FOLO, PL, RO, Qtz, PC 44.4: 72.0°, FOLO, PL, RO, Qtz, CC <1mm	2 >10		2		
	50.0	Continues flow-banded, perlitic RHYOLITE, highly vitreous, some voids with botryoidal opal and chalcedony, some FeOx, some brown rhyolite inclusions, very brittle.	2649.5			12	40	0	0	45.2: 37.0°, JN, UN, RO, Qtz, CC <1mm	6		3		
						13	100	57	74	45.6: 45.0°, FOLO, UN, SM, Qtz, PC 46.2: 82.0°, JN, IR, RO, Qtz, IN <5mm 46.6: 74.0°, FOLO, UN, SM, Qtz, CC <1mm 46.8: 80.0°, FOLO, UN, SM	4 2 2		2		
55	54.0	As above.	2645.5			14	100	50	70	47.1: 78.0°, FOLO, PL, SM, Qtz, CC <1mm 47.4: 80.0°, FOLO, PL, SM, Qtz, CC <1mm 47.7: 75.0°, FOLO, PL, RO, Qtz, CC <1mm 48.1: 70.0°, FOLO, PL, SM, Qtz, CC <1mm 48.4: 65.0°, FOLO, PL, SM, Qtz, CC <1mm	2 6 8 4 1		2		
60	59.0	As above.	2640.5			15	100	42	96	49 - 50: FLT, breccia and gouge 51: 64.0°, FOLO, PL, SM, Qtz, CC <1mm 51.1: 55.0°, FOLO, PL, SM, Qtz, IN <5mm 51.3 - 51.4: VNO, IR, VR, Qtz, IN >5mm 51.8: 62.0°, FOLO, PL, RO, Qtz, IN >5mm 52.3: 50.0°, JN, UN, VR, Qtz, IN <5mm	3 4 4 2 3		2		
65	64.0	As above.	2635.5			16	100	16	46	52.9: 22.0°, JN, IR, VR, Qtz, CC <1mm 53.3: 55.0°, JN, ST, VR, Qtz, CC <1mm 53.8: 48.0°, JN, IR, VR, Qtz, CC <1mm 54.3: 54.0°, FOLO, ST, RO, Qtz, PC 54.5: 62.0°, FOLO, IR, VR, Qtz, PC 55.5 - 56.6: FLT, Bx	4 5 3 6 >10		2		
70	69.0	As above.	2630.5			17	78	27	40	56.6: 56.0°, FOLO, UN, VR, Qtz, PC 56.8: 66.0°, FOLO, UN, RO, Qtz, CC <1mm 57.1: 60.0°, FOLO, PL, RO, Qtz, IN <5mm 57.3: 54.0°, FOLO, PL, RO, Qtz, CC <1mm 57.6: 55.0°, FOLO, PL, RO, Qtz, CC <1mm	3 6 3 5		2		
75	73.5	Continues flow-banded, perlitic RHYOLITE, highly vitreous, some voids with botryoidal opal and chalcedony, some FeOx, some brown rhyolite inclusions, very brittle.	2626.0			18	100	34	52	57.8: 50.0°, FOLO, PL, SM, Qtz, CC <1mm 58.2: 67.0°, FLT, PL, SM, Sa, IN >5mm 59.4 - 60.3: 65.0°, FOLO x 5, PL, RO, Qtz, CC <1mm 60.9 - 61: 72.0°, FLT, PL, RO, Bx 61.4 - 62.4: 70.0°, FOLO x 5, PL, SM, Qtz, CC <1mm 62.8 - 63.2: 50.0°, FOLO x 2, UN, SM, Qtz, CC <1mm	4 0 2 5 7 7		2		
80	78.5	As above.	2621.0			19	100	40	70	63.7 - 64: 70.0°, FOLO x 2, PL, SM, Qtz, CC <1mm 64 - 65: 70.0°, FOLO x 4,	6		2		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-10 (GT-31)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 8, 2016 12:02
DRILLING END: November 11, 2016 17:30
COORDINATES: N: 845,877 E: 929,847

SHEET: 3 of 7
GS ELEV.: 2699.5
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0		2619.5		HQ3	19				PL, SM, Qtz, CC <1mm	2		2				
	80.5		2619.0							65.3 - 65.7: FLT, Bx	4						
		As above.								66 - 66.2: 70.0°, FOLO x 2, PL, SM, Qtz, CC <1mm	5						
						20	100	69	86	66.3: 20.0°, JN, IR, RO, Qtz, PC	2		2				
										67 - 67.4: 75.0°, FOLO x 3, PL, SM, Qtz, CC <1mm	1						
	84.0		2615.5							67.6 - 69: FLT, PL, RO, Bx							
85		As above.								69.2: 68.0°, FOLO, PL, SM, Qtz, CC <1mm	3						
										69.7: 60.0°, JN, IR, VR, CN							
										69.9: 64.0°, FOLO, PL, SM, Qtz, CC <1mm	3						
						21	100	76	86	70.1: 15.0°, JN, ST, SM, Qtz, CC <1mm	2		2				
										70.3: 65.0°, JN, UN, RO, CN	3						
										70.5: 66.0°, FOLO, PL, SM, Qtz, CC <1mm	1						
	89.0		2610.5							70.7: 66.0°, FOLO, PL, SM, Bx, IN <5mm	1						
90		As above.								71.3: 30.0°, JN, UN, VR, Qtz, PC	2						
										71.6: 65.0°, FOLO, PL, RO, Qtz, CC <1mm	8						
						22	100	28	52	71.9: 65.0°, FOLO, PL, RO, Qtz, IN <5mm	5		2				
										72: 65.0°, FOLO, ST, RO, Qtz, CC <1mm	1						
										72.4: 15.0°, JN, UN, RO, Bx, IN <5mm	1						
	94.0		2605.5							72.7: 55.0°, FOLO, PL, RO, Qtz, IN <5mm	3						
95		As above.								72.9: 25.0°, JN, UN, RO, Qtz, PC	3						
						23	100	84	88	73: 65.0°, FOLO, PL, RO, Qtz, CC <1mm	1		2				
										73.1: 10.0°, JN, UN, RO, Qtz, CC <1mm	1						
										73.8: 48.0°, FOLO, CU, SM, Qtz, CC <1mm	1						
	99.0		2600.5							75.5: 67.0°, FOLO, PL, SK, Qtz, IN <5mm	1						
100		Continues flow-banded, perlitic RHYOLITE, highly vitreous, some voids with botryoidal opal and chalcedony, some FeOx, some brown rhyolite inclusions, very brittle.								75.8: 67.0°, FOLO, PL, SM, Qtz, IN <5mm	0						
						24	100	100	100	76.1: 54.0°, FOLO, PL, RO, Qtz, IN <5mm	0		2				
										76.3: 85.0°, JN, PL, RO, Qtz, CC <1mm	1						
										76.5: 59.0°, FOLO, UN, RO, Qtz, CC <1mm	0						
	104.0		2595.5							76.8: 13.0°, JN, CU, RO, MnOx, PC	0						
105		As above.								76.9: 74.0°, FOLO, PL, RO, Qtz, CC <1mm	1						
										77.2: 73.0°, FOLO, PL, SM, Qtz, IN <5mm	1						
						25	100	100	100	77.3: 78.0°, FOLO, UN, RO, Qtz, IN <5mm	1		2				
										77.5: 8.0°, JN, ST, VR, Qtz, CC <1mm	2						
										77.6: 18.0°, JN, UN, RO, Qtz, CC <1mm	0						
										77.61: 80.0°, FOLO, PL, SK, Qtz, PC	1						
110										77.7: 72.0°, FOLO, UN, SK, Qtz, IN <5mm	1						
										77.9: 73.0°, FOLO, PL, SK, Qtz, IN <5mm	3						
	111.3		2588.2			26	100	94	94	78 - 78.3: 45.0°, FLT, Bx			2				
		As above, folded and crenulated.								78.4: 80.0°, FOLO, UN, RO, Qtz, IN <5mm	0						
										78.8: 79.0°, FOLO, UN, RO, Qtz, CC <1mm	0						
	114.0		2585.5							79: 84.0°, FOLO, UN, RO, Qtz, CC <1mm	0						
115		As above.				27	100	100	100	79.3 - 79.6: 72.0°, FOLO x 5, PL, SM, Qtz, CC <1mm	0						
										79.9: 70.0°, FOLO, PL, RO, Qtz, CC <1mm	0						
						28	100	100	100	80.1 - 80.4: 65.0°, FOLO x 3, PL, SM, Qtz, CC <1mm	1		1				
										81.1: 69.0°, FOLO, UN, SM, Qtz, CC <1mm	1						
	119.0		2580.5							81.3: 76.0°, FOLO, PL, RO, Qtz, PC	1						
120		Becomes silicified brown RHYOLITE with softer white laminations, vesicles.				29	100	86	92	81.5: 68.0°, FOLO, PL, SK, Qtz, CC <1mm	2		2				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-10 (GT-31)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 8, 2016 12:02
DRILLING END: November 11, 2016 17:30
COORDINATES: N: 845,877 E: 929,847

SHEET: 4 of 7
GS ELEV.: 2699.5
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
120	120.0	Becomes silicified brown RHYOLITE with softer white laminations, vesicles. *(continued)*	2579.5		HQ3	29	100	86	92	81.6: 71.0°, FOLO, UN, SK, Qtz, CC <1mm 82.4 - 82.5: FLT, Bx 83.7: 69.0°, FOLO, PL, SM, Qtz, CC <1mm 84.2: 72.0°, FOLO, PL, SM, Qtz, CC <1mm 84.3: 72.0°, FOLO, PL, SK, Qtz, CC <1mm	3 1 0 0		2			
	124.0	As above.	2575.5			30	100	80	80	84.9: 73.0°, FOLO, PL, SK, Qtz, CC <1mm 85: 71.0°, FOLO, UN, SK, Qtz, IN <5mm 85.2: 74.0°, FOLO, PL, SK, Qtz, CC <1mm 85.9: 21.0°, JN, UN, RO, Qtz, PC 86: FOLO, ST, SK, Qtz, IN <5mm 86.8: 52.0°, FOLO, PL, RO, Qtz, IN <5mm	1 1 0 2 0 0		2			
125																
	128.0	Becomes flow-banded, perlitic RHYOLITE, highly vitreous, some voids with botryoidal opal and chalcedony, some FeOx, some brown rhyolite inclusions, very brittle.	2571.5			31	100	100	100	87.6: 71.0°, FOLO, PL, SK, Qtz, CC <1mm	0		1			
130						32	100	100	100	87.8: 31.0°, JN, PL, RO, Qtz, PC 87.9: 73.0°, JN, ST, RO, Qtz, PC	0 1					
						33	100	100	100	88.1: 74.0°, JN, PL, SM, Qtz, CC <1mm 89.9: 64.0°, FOLO, ST, RO, Qtz, CC <1mm 90.5: 15.0°, JN, IR, VR, Qtz, PC	1 0 0		1			
135	135.3	As above.	2564.2			34	100	96	96	90.8: 68.0°, JN, IR, RO, Sa, IN <5mm 91: 57.0°, FOLO, UN, SM, Qtz, CC <1mm 91.2: 20.0°, JN, UN, SM, Qtz, CC <1mm 91.3 - 91.6: FLT, Bx 91.8: 76.0°, FOLO, PL, RO, Qtz, IN <5mm	0 0 1 0		2			
	139.0	As above.	2560.5			35	100	92	96	91.9 - 92.3: FLT, Bx 92.5: 74.0°, FOLO, PL, RO, Qtz, IN <5mm 93.3: 69.0°, FOLO, UN, SK, Qtz, IN <5mm 94.9: 68.0°, FOLO, PL, SM, Qtz, CC <1mm 95: 70.0°, FOLO, PL, RO, Qtz, CC <1mm 95.4: 74.0°, FOLO, ST, RO, Qtz, CC <1mm	0 1 1 1 2		2			
140																
	144.0	As above.	2555.5			36	100	100	100	95.7: 80.0°, JN, IR, RO, Qtz, CC <1mm	0					
145						37	100	100	100	96.4: 64.0°, FOLO, PL, RO, Qtz, CC <1mm 96.7: FOLO, PL, RO, Qtz, IN <5mm 96.9: 57.0°, FOLO, UN, RO, Qtz, CC <1mm 97.8: 50.0°, FOLO, ST, SM, Qtz, CC <1mm 98.3: 62.0°, FOLO, PL, RO, Qtz, CC <1mm	0 0 0 2		2			
	149.0	As above.	2550.5			38	100	100	100	99.8: 63.0°, FOLO, PL, SM, Qtz, IN <5mm 102.9: 60.0°, FOLO, IR, SK, Qtz, IN <5mm 105.5: 68.0°, FOLO, PL, SM, Qtz, PC 106.6: 66.0°, FOLO, UN, SK, Qtz, CC <1mm 107.2: 62.0°, FO, PL, RO, Qtz, CC <1mm	0 0 0 0 0		2			
150																
	154.0	As above, brecciated.	2545.5			39	100	100	100	107.7: 60.0°, FOLO, PL, SM, Qtz, CC <1mm 109.6: 75.0°, FOLO, ST, RO, Qtz, CC <1mm 110.6: 88.0°, FOLO, CU, SK, Qtz, CC <1mm 111.1 - 111.3: 75.0°, FLT, Bx 118.7: 64.0°, FOLO, PL, SM, Qtz, CC <1mm 119.2: 74.0°, FOLO, PL, SM, Qtz, CC <1mm	0 0 0 0 0 0		2			
155																
	159.0	As above.	2540.5			40	100	100	100	119.4: 80.0°, FOLO, PL, SM, Qtz, CC <1mm	0		2			
160		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-10 (GT-31)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 8, 2016 12:02
DRILLING END: November 11, 2016 17:30
COORDINATES: N: 845,877 E: 929,847

SHEET: 5 of 7
GS ELEV.: 2699.5
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
160	160.0	As above. *(continued)*	2539.5		HQ3	40	100	100	100	120: 57.0°, FOLO, UN, RO, Qtz, IN <5mm 120.5: 69.0°, FOLO, UN, RO, Qtz, IN <5mm 121.1: 60.0°, FOLO, PL, SM, Qtz, IN <5mm 124.3: 78.0°, FOLO, PL, SM, Qtz, CC <1mm 125.6: 10.0°, JN, IR, RO, Qtz, PC	1 1 0 0		2		
165						41	100	100	100	127.2: 45.0°, JN, IR, VR, Qtz, PC 127.6: 40.0°, JN, UN, VR, Qtz, PC 131.4: 20.0°, JN, UN, RO, Qtz, CC <1mm	0 1 0		1		
	167.3	Becomes highly vesicular, weak.	2532.2							132.9: JN, ST, RO, Qtz, CC <1mm 135.3: 42.0°, CONO, PL, RO, Qtz, IN <5mm	0 0		2		
170	169.0	As above.	2530.5			42	100	100	100	137.6: 45.0°, FOLO, PL, RO, Sa, CC <1mm 140.2: 44.0°, FOLO, ST, RO, Qtz, PC 141.2: 65.0°, FOLO, UN, RO, Qtz, CC <1mm 142.5: 75.0°, FO, PL, RO, Qtz, CC <1mm 143.2: 77.0°, FOLO, PL, RO, Qtz, IN <5mm 143.4: 75.0°, FOLO, ST, RO, Qtz, CC <1mm	0 0 0 0 0		2		
	174.0	RHYOLITE breccia, abundant quartz, trace opal.	2525.5							148.2: 37.0°, JN, UN, SM, Qtz, PC 148.5: 72.0°, FOLO, UN, RO, Qtz, CC <1mm 160.8: 75.0°, JN, PL, RO, Qtz, PC	0 0 0		2		
175	177.0	As above, large voids.	2522.5			43	100	100	100	161.3: 75.0°, JN, UN, RO, Qtz, PC 165: 45.0°, FOLO, UN, VR, Bx, IN >5mm	0 0		2		
180						44	100	100	100		0 0 0		2		
	182.0	RHYOLITE breccia, brown "thundereggs" inclusion of chalcedony, in gray perlitic matrix.	2517.5			45	100	100	100		0 0		2		
185	186.0	Becomes RHYOLITE, brown, brecciated texture, completely silicified, vesicles infilled with chalcedony.	2513.5			46	100	100	100		0 0 0 0 0		2		
190	191.0	Becomes perlitic, dark gray RHYOLITE, highly vitreous, little brown rhyolite stockwork.	2508.5			47	100	100	100	193: 47.0°, JN, PL, RO, CN	0 0 0 0 1		2		
	194.0	As above.	2505.5								0				
195						48	100	100	100		0 0 0 0		2		
	199.0	As above.	2500.5								0				
200		Log continued on next page				49	100	100	100		0		2		

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-10 (GT-31)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 8, 2016 12:02
DRILLING END: November 11, 2016 17:30
COORDINATES: N: 845,877 E: 929,847

SHEET: 6 of 7
GS ELEV.: 2699.5
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index: ● AX. □ DIAM. ▲ UCS (ksi) R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
200	200.0	As above. *(continued)*	2499.5		HQ3	49	100	100	100		0 0 0 0		2					
	203.5	As above.	2496.0								0							
205						50	100	94	96	205: 75.0°, JN, IR, RO, Sa, PC 206.9: 11.0°, JN, CU, RO, CN 207.1: 61.0°, CONO, CU, RO, Bx, IN >5mm	1 0 1 2		2					
	207.0	As above.	2492.5								0							
210						52	100	94	96	207.3: 31.0°, CONO, UN, RO, Sa, IN <5mm	0 0 0		2					
	211.0	Continues gray perlitic RHYOLITE, highly vitreous, little brown inclusions are FeOx stained.	2488.5								0							
	212.9	Becomes brown RHYOLITE, brecciated texture, completely silicified, slightly vesicular, large pink inclusions.	2486.6							212.1: 75.0°, JN, CU, RO 212.2 - 213: CONO, IR, RO, Bx	3							
	214.0		2485.5							213.2: 57.0°, JN, UN, RO, Sa, IN <5mm	1							
215		Becomes gray perlitic RHYOLITE, highly vitreous, little brown inclusions are FeOx stained.				53	100	96	100	215.1: 68.0°, JN, PL, RO, CN 217.7: 72.0°, JN, CU, RO, Qtz, CC <1mm	0 1 0 1		2					
	219.0		2480.5							218: 76.0°, JN, PL, RO, Sa, CC <1mm	1							
220		As above.				54	100	98	98	221.2: 55.0°, JN, PL, VR, Sa, PC 221.7 - 221.8: 32.0°, FLT, UN, RO, Bx, IN >5mm	0 0 2 0 0		2					
	224.6		2474.9								0							
225		As above.				55	100	100	100	225.6 - 225.7: 47.0°, FLT, ST, VR, Bx 226.5: 52.0°, JN, UN, RO, CN	2 1 0 0		2					
	229.0	As above.	2470.5								0							
230						56	100	100	100	230.3: 50.0°, JN, IR, VR, Sa, PC 231.4: 7.0°, JN, UN, VR, CN	0 1 1 0 0		2					
	234.0	Continues RHYOLITE breccia, becomes matrix dominant, pinkish gray, slightly vitreous rhyolite clasts in dark pinkish-orange red matrix, angular clasts, sand to cobble sized, weak and massive.	2465.5								0							
235						57	100	100	100		0 0 0 0		2 - 3					
	239.0	As above, breccia clasts, sand to gravel sized.	2460.5								0							
240		Log continued on next page				58	100	100	100		0		2 - 3					

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-10 (GT-31)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 8, 2016 12:02
DRILLING END: November 11, 2016 17:30
COORDINATES: N: 845,877 E: 929,847

SHEET: 7 of 7
GS ELEV.: 2699.5
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0	As above, breccia clasts, sand to gravel sized. *(continued)*	2459.5		HQ3	58	100	100	100	240.1: 27.0°, JN, UN, RO, Sa, PC	1 0 0 1		2 - 3			
	244.0		2455.5							243.9: 45.0°, JN, PL, VR, Sa, IN <5mm						
245	244.0	As above.	2455.5			59	100	100	100		0 0 0 0 0		2 - 3			
	249.0		2450.5													
250	249.0	As above.	2450.5			60	100	100	100		0 0 0 0 0		2 - 3			
	254.0		2445.5													
255	254.0	Bottom of borehole at 254.0 ft. Completed as well. Refer to diagram. Notes: 0 - 24: Hydro test # 1 FHT 43 - 109: Hydro test #2 SI 48 - 50: Mislatch with core tube, drilling damage. 104 - 208.5: Hydro test #3 SI 214 - 254: Hydro test #4, 5 SI & CRI 244 - 249: Drillers note losing some water.														
260																
265																
270																
275																
280																

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF BOREHOLE DH16-11 (GT-18)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 12, 2016 14:10
DRILLING END: November 16, 2016 08:45
COORDINATES: N: 850,299 E: 924,156

SHEET: 1 of 7
GS ELEV.: 2704.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in (Automatic 140 lb Hammer, 30 inch drop)	REC / ATT (in)	PENETRATION RESISTANCE BLOWS / ft (20 40 60 80) / WATER CONTENT (%) (W_p W W_l) (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
0	HQ3	0.0	(SP-SM), SAND, poorly graded, some low plasticity fines, trace gravel, brown, weathered, friable, iron oxide staining; moist	2704.0	SP-SM						0 - 29: Hydro test #1 FHT	
5		7.5		2696.5			SS S-01	20-63-60 **(123)**	18/18			
10		11.0	Highly weathered DIABASE, phaneritic, medium grained, mm-scale plagioclase lathe phenocrysts, pervasive oxidation throughout groundmass, calcite veins. Rubble.	2693.0								
		14.0	As above.	2690.0								
15		17.5	Continues highly weathered DIABASE, pervasisve oxidation, slightly fractured, two joint sets with calcite infilling.	2686.5								
20		22.5	As above.	2681.5								
		24.0	As above.	2680.0							24 - 69: Hydro test #2 SI & CRI	
25		29.0	As above.	2675.0								
30		34.0	As above.	2670.0								
35		39.0	As above.	2665.0								
40			Log continued on next page									

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-11 (GT-18)
1 of 7

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 15:38
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RECORD OF DRILLHOLE DH16-11 (GT-18)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 12, 2016 14:10
DRILLING END: November 16, 2016 08:45
COORDINATES: N: 850,299 E: 924,156

SHEET: 1 of 7
GS ELEV.: 2704.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC LC	ADVANCEMENT RATE ft/min
0	0.0	(SP-SM), SAND, poorly graded, some low plasticity fines, trace gravel, brown, weathered, friable, iron oxide staining; moist	2704.0														
5	7.5		2696.5														
10	11.0	Highly weathered DIABASE, phaneritic, medium grained, mm-scale plagioclase lathe phenocrysts, pervasive oxidation throughout groundmass, calcite veins. Rubble.	2693.0			1	31	0	0		>10, >10, >10, >10		5				
	14.0	As above.	2690.0			2	43	0	0		>10, >10, >10, >10		5				
15	17.5	Continues highly weathered DIABASE, pervasisve oxidation, slightly fractured, two joint sets with calcite infilling.	2686.5			3	100	57	83	15.5: 35.0°, JN, PL, SM, Ca, CC <1mm 14.5 - 17.5: 50.0°, JN x 4, PL, SM, Ca, CC <1mm	>10, 3, 5, 6		3				
20	22.5	As above.	2681.5			4	80	56	56	20.2: 45.0°, JN, PL, RO, FeOx, partial iron staining, CC <1mm 21.1: 55.5°, JN, PL, SM, Ca, CC <1mm 21.6: 80.0°, JN, PL, SM, Ca, IN <5mm	>10, >10, 2, 2, 0		5, 3				
	24.0	As above.	2680.0			5	100	100	100		0, 0		3				
25	29.0	As above.	2675.0			6	100	66	90	25 - 29: 60.0°, JN x 8, PL, SM, Ca, CC <1mm	0, 3, 2, 2, 2		3				
30	34.0	As above.	2670.0			7	100	94	94	29 - 34: 60.0°, JN x 15, PL, SM, CN, mostly clean joints, few have calcite infilling 32: 30.0°, JN, PL, RO, CN	3, 3, 3, 3, 3		2				
35	39.0	As above.	2665.0			8	92	76	86	34 - 39: 40.0°, JN x 5, PL, SM, CN 35 - 39: 45.0°, JN x 5, PL, SM, CN	2, 3, 2, 2, 3		2				
40		Log continued on next page				9	100	100	100	39 - 44: 60.0°, JN x 6, PL, SM, CN, partial iron staining	1		2				

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-11 (GT-18)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 12, 2016 14:10
DRILLING END: November 16, 2016 08:45
COORDINATES: N: 850,299 E: 924,156

SHEET: 2 of 7
GS ELEV.: 2704.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE: DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0	Continues slighty weathered DIABASE, light iron oxide staining, phaneritic, medium grained, mm-scale plagioclase lathe phenocrysts, some calcite veins. *(continued)*	2664.0		HQ3	9	100	100	100	41.3: 30.0°, JN, PL, SM, CN 39 - 44: 60.0°, JN x 6, PL, SM, CN, partial iron staining	2 1 1 2		2				
	44.0		2660.0														
45		As above, less calcite.				10	96	86	96	44.8 - 49: 60.0°, JN x 4, PL, CN 45 - 49: 40.0°, JN x 4, PL, SM, CN	2 2 2 1 2		2				
	49.0		2655.0														
50		As above.				11	100	90	100	49 - 54: 60.0°, JN x 4, PL, RO, CN 49.8 - 54: 40.0°, JN x 4, PL, SM, CN	2 1 2 2 2		2				
	54.0		2650.0														
55		As above, becomes fresh.				12	100	94	94	55.8 - 59: 60.0°, JN x 2, PL, RO, CN 56 - 59: 40.0°, JN x 4, PL, RO, CN	0 1 2 1 1		1				
	59.0		2645.0														
60		As above, only one joint set.				13	100	94	100	60 - 64: 60.0°, JN x 3, PL, SM, CN	0 1 0 1 1		1				
	64.0		2640.0														
65		As above, two joint sets.				14	100	96	100	65.4 - 66.2: 30.0°, JN x 2, PL, SM, CN 64 - 69: 60.0°, JN x 5, PL, SM, CN	1 2 2 1 1		1				
	69.0		2635.0														
70		Continues slightly weathered DIABASE, phaneritic, medium grained, mm-scale plagioclase lathe phenocrysts, penetrative oxidation, some calcite veins.				15	96	82	82	72.8: 30.0°, JN, PL, SM, CN	0 0 0 1 1		1				
	73.5		2630.5														
75		As above.				16	100	100	100	76: 65.0°, JN, PL, SM, CN 77.5: 40.0°, JN, PL, SM, CN 78.4: 50.0°, JN, PL, SM, CN	0 0 1 1 2		1				
	78.5		2625.5														
80		As above.				17	100	100	100		0		1				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF DRILLHOLE DH16-11 (GT-18)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 12, 2016 14:10
DRILLING END: November 16, 2016 08:45
COORDINATES: N: 850,299 E: 924,156

SHEET: 3 of 7
GS ELEV.: 2704.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0	As above. *(continued)*	2624.0		HQ3	17	100	100	100	81.6 - 82.1: 65.0°, JN x 2, PL, SM, CN	1 1 0 0		1			
	83.5	As above.	2620.5			18	100	96	100	84.7: 60.0°, JN, PL, SM, CN 85.1: 30.0°, JN, PL, SM, CN 86.8 - 87.8: 75.0°, JN x 3, PL, SM, Ca, CC <1mm	1 1 1 2 0		1			
85	88.5	As above.	2615.5			19	100	100	100		0 0 0 0 0		1			
90	93.5	As above.	2610.5			20	100	100	100	97.3 - 97.6: 30.0°, JN x 2, PL, SM, CN	0 0 0 0 2		1			
95	98.5	As above.	2605.5			21	100	96	96	99: 60.0°, JN, PL, SM, CN 100.3 - 103.5: 60.0°, JN x 5, PL, SM, CN	0 1 1 2 0		1			
100	103.5	As above.	2600.5			22	100	100	100	105.5: 60.0°, JN, PL, SM, CN 108.1: 55.0°, JN, PL, SM, CN	2 0 1 0 0		1			
105	108.5	Continues slightly weathered DIABASE, phaneritic, medium grained, mm-scale plagioclase lathe phenocrysts, penetrative oxidation, some calcite veins.	2595.5			23	100	100	100	109: 60.0°, JN, PL, SM, CN 111.2: 30.0°, JN, PL, SM, CN 113.5: JN, PL, SM, CN	1 0 1 0 1		1			
110	113.5	As above.	2590.5			24	100	100	100	114.7 - 118.5: 60.0°, JN x 6, PL, SM, CN	1 1 1 1 2		1			
115	118.5	As above.	2585.5			25	100	100	100		0		1			
120		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-11 (GT-18)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 12, 2016 14:10
DRILLING END: November 16, 2016 08:45
COORDINATES: N: 850,299 E: 924,156

SHEET: 4 of 7
GS ELEV.: 2704.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2, R3 3.62, R4 1.45, R5, R6 36.2	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
120	120.0		2584.0													
		As above. *(continued)*				25	100	100	100	120.5 - 122.2: 60.0°, JN x 3, PL, SM, CN	2 1 0		1			
	123.5		2580.5							123.2: 35.0°, JN, PL, SM, CN	1					
		As above.				26	100	100	100		0 0 0 0		1			
125	128.5		2575.5								0					
		As above.				27	100	100	100	130.2: 50.0°, JN, PL, SM, CN	0 0 1 0 0		1			
130	133.5		2570.5								0					
		As above.				28	100	100	100	136 - 138.5: 60.0°, JN x 4, PL, SM, CN	0 0 0 2 2		1			
135	138.5		2565.5								0					
		As above.				29	100	100	100	140.5: 60.0°, JN, PL, SM, CN	0 1 0 0		1			
140	143.5		2560.5								0					
		As above.				30	100	100	100		0 0 0 0		1			
145	148.5		2555.5								0					
		As above.				31	100	100	100	148.7 - 153.5: 60.0°, JN x 10, PL, SM, CN	2 1 1 3		1			
150	153.5		2550.5								2					
		Continues slightly weathered DIABASE, phaneritic, medium grained, mm-scale plagioclase lathe phenocrysts, penetrative oxidation, some calcite veins.				32	100	100	100		0 0 0 0		1			
155	158.5		2545.5								0					
		As above.				33	96	96	96	159.7: 60.0°, JN, PL, SM,	1		1			
160																

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-11 (GT-18)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 12, 2016 14:10
DRILLING END: November 16, 2016 08:45
COORDINATES: N: 850,299 E: 924,156

SHEET: 5 of 7
GS ELEV.: 2704.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
160	160.0	As above. *(continued)*	2544.0		HQ3	33	96	96	96	CN 162.3 - 162.8: 30.0°, JN x 2, PL, SM, CN	0 0 2 0		1				
	163.5	As above.	2540.5			34	100	87	87	164.6 - 166.5: 60.0°, JN x 3, PL, SM, CN	1 1 1		1				
165	166.5	As above.	2537.5			35	100	100	100	168.6 - 169.6: 65.0°, JN x 2, PL, SM, CN 170.5: 45.0°, JN, PL, SM, CN	0 1 1 0 1		1				
170	171.5	As above.	2532.5			35	100	100	100		0 0 0		1				
	174.0	As above.	2530.0			36	100	100	100	176.9 - 179: 60.0°, JN x 6, PL, SM, CN 178: 45.0°, JN, PL, SM, CN	0 0 1 4 2		1				
175	179.0	As above.	2525.0			37	100	100	100	179.3 - 182: 60.0°, JN x 3, PL, SM, CN	1 1 1 0 0		1				
180	184.0	As above.	2520.0			38	100	100	100		0 0 0 0 0		1				
185	189.0	As above.	2515.0			39	100	100	100	190.5: 40.0°, JN, PL, SM, CN 191.5 - 193.6: 60.0°, JN x 3, PL, SM, CN	0 1 1 2 1		1				
190	194.0	As above.	2510.0			40	100	100	100	195 - 196: 40.0°, JN x 2, PL, SM, Ca, CC <1mm 197.7 - 199: 60.0°, JN x 3, PL, SM, CN	0 2 0 1 2		1				
195	199.0	As above.	2505.0														
200		As above, less calcite.				41	100	100	100		0		1				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-11 (GT-18)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 12, 2016 14:10
DRILLING END: November 16, 2016 08:45
COORDINATES: N: 850,299 E: 924,156

SHEET: 6 of 7
GS ELEV.: 2704.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
200	200.0	As above, less calcite. *(continued)*	2504.0		HQ3	41	100	100	100	200.9: 40.0°, JN, PL, SM, CN	1 0 0 0		1				
	204.0		2500.0														
205	209.0	Continues slightly weathered DIABASE, phaneritic, medium grained, mm-scale plagioclase lathe phenocrysts, penetrative oxidation, some calcite veins.	2495.0			42	100	100	100	206.1: 50.0°, JN, PL, CN	0 0 1 0 0		1				
210	214.0	As above, no joints.	2490.0			43	100	100	100		0 0 0 0 0		1				
215	219.0	As above.	2485.0			44	100	100	100	214.8: 25.0°, JN, PL, SM, Ca 215.8: 55.0°, JN, PL, SM, CN	1 1 0 0 0		1				
220	224.0	As above.	2480.0			45	100	100	100	219.4 - 224: 60.0°, JN x 5, PL, SM, CN 222.5 - 224: 50.0°, JN x 3, PL, SM, CN	1 1 3 2 2		1				
225	229.0	As above.	2475.0			46	100	100	100	224.7 - 229: 65.0°, JN x 4, PL, SM, CN	1 1 0 1 1		1				
230	234.0	As above.	2470.0			47	100	100	100		0 0 0 0 0		1				
235	239.0	As above, interval of fault infilled with breccia, minor fault gouge and some iron oxide staining.	2465.0			48	96	82	86	236 - 236.6: 80.0°, FLT, PL, RO, Bx, IN >5mm 236.7: 45.0°, JN, PL, SM, Ca, CC <1mm 237 - 239: 60.0°, JN x 3, PL, SM, Ca, CC <1mm	0 4 4 2 2		1	■			
240		As above.				49	100	100	100		0		1				
		Log continued on next page															

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF DRILLHOLE DH16-11 (GT-18)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 12, 2016 14:10
DRILLING END: November 16, 2016 08:45
COORDINATES: N: 850,299 E: 924,156

SHEET: 7 of 7
GS ELEV.: 2704.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0		2464.0														
		As above. *(continued)*			HQ3	49	100	100	100	242: 30.0°, JN, PL, SM, CN 243.7: 60.0°, JN, PL, SM, Ca, CC <1mm	0 1 0 1		1				
	244.0		2460.0														
245		As above.				50	100	100	100		0 0 0 0 0		1				
	249.0		2455.0														
250		As above.				51	100	100	100		0 0 0 0 0		1				
	254.0		2450.0														
255		Bottom of borehole at 254.0 ft. Completed as well. Refer to diagram. Notes: 0 - 29: Hydro test #1 FHT 24 - 69: Hydro test #2 SI & CRI 74 - 133.5: Hydro test #3 SI 154 - 254: Hydro test #4 SI															
260																	
265																	
270																	
275																	
280																	

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-11 (GT-18)
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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:29
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RECORD OF BOREHOLE DH16-12 (GT-19)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 16, 2016 15:51
DRILLING END: November 19, 2016 17:00
COORDINATES: N: 847,002 E: 923,396

SHEET: 1 of 8
GS ELEV.: 2669.1
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLES SAMPLE TYPE & NUMBER	BLOWS per 6 in (Automatic hammer 140 lb Hammer, 30 inch drop)	REC / ATT (in)	PENETRATION RESISTANCE BLOWS / ft (20 40 60 80) WATER CONTENT (%) (W_p W W_l) (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
0		0.0	Surficial soils.	2669.1							0 - 31: Hydro test #1 FHT	
		4.0		2665.1								
5		6.0	Gila Conglomerate (Tcg): only recovered gravel with few broken pieces of matrix, clasts consist of schist, tuff, and quartz.	2663.1								
		9.0	Poor recovery, as above.	2660.1								
10			(SM), SILTY SAND, fine to coarse, angular, medium plasticity fines, trace gravel, brown, weathered, lense; Ran SPT after 0 recovery core run fron 9' to 12', probably just a more weathered zone in the gila with less gravel. No recovery.		SM							
		14.0	Gila Conglomerate (Tcg): highly weathered, matrix dominant, brown CONGLOMERATE, few gravel clasts consisting of schist, tuff, quartz, diabase, gneiss.	2655.1			SS S-01	23-50/5" **(50/5")**	11 / 11	100		
15		17.5	Poor recovery, as above.	2651.6								
		20.0	Poor recovery, as above.	2649.1								
20		21.5	Continues Gila Conglomerate (Tcg): highly weathered, clast dominant, brown CONGLOMERATE, gravel clasts consisting of schist, tuff, quartz, diabase, gneiss.	2647.6								
		23.0	As above.	2646.1								
25			Continues highly weathered, brown CONGLOMERATE, matrix dominant with gravel, few cobbles, and clasts consisting of schist, tuff, quartz, and gneiss, friable and weak matrix.									
		27.0	As above, becomes clast dominant.	2642.1								
30		31.0	As above.	2638.1								
		34.0	As above, weak HCl reaction.	2635.1							34 - 69: Hydro test #2 SI	
35		39.0	As above, becomes matrix dominant.	2630.1								
40			Log continued on next page									

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 15:38
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RECORD OF DRILLHOLE DH16-12 (GT-19)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 16, 2016 15:51
DRILLING END: November 19, 2016 17:00
COORDINATES: N: 847,002 E: 923,396

SHEET: 1 of 8
GS ELEV.: 2669.1
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact | VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical | PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular | PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough | Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge | Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide | MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi))	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
0	0.0	Surficial soils.	2669.1													
	4.0		2665.1													
5	6.0	Gila Conglomerate (Tcg): only recovered gravel with few broken pieces of matrix, clasts consist of schist, tuff, and quartz.	2663.1			1	50	0	0		>10		6			
	9.0	Poor recovery, as above.	2660.1			2	43	0	0				6			
10	14.0	(SM), SILTY SAND, fine to coarse, angular, medium plasticity fines, trace gravel, brown, weathered, lense; Ran SPT after 0 recovery core run fron 9' to 12', probably just a more weathered zone in the gila with less gravel. No recovery. Gila Conglomerate (Tcg): highly weathered, matrix dominant, brown CONGLOMERATE, few gravel clasts consisting of schist, tuff, quartz, diabase, gneiss.	2655.1				0	0	0							
15	17.5	Poor recovery, as above.	2651.6			3	43	0	0		>10 >10 >10 >10		5			
20	20.0	Poor recovery, as above.	2649.1			4	40	0	0		>10 >10		5			
	21.5	Continues Gila Conglomerate (Tcg): highly weathered, clast dominant, brown CONGLOMERATE, gravel clasts consisting of schist, tuff, quartz, diabase, gneiss.	2647.6			5	87	0	33		>10 >10		5			
	23.0	As above.	2646.1			6	67	0	0		>10		5			
25	27.0	Continues highly weathered, brown CONGLOMERATE, matrix dominant with gravel, few cobbles, and clasts consisting of schist, tuff, quartz, and gneiss, friable and weak matrix.	2642.1			7	85	63	63		3 2 2 2		4			
30	31.0	As above, becomes clast dominant.	2638.1			8	88	13	13		<10 >10 >10 >10		5			
	34.0	As above.	2635.1			9	73	67	67	31.7: 85.0°, JN, IR, VR, CN 32.8: 80.0°, JN, IR, VR, CN	2 2 0		3			
35	39.0	As above, weak HCl reaction.	2630.1			10	86	78	78	34.6: 75.0°, JN, IR, VR, CN 37.8: 90.0°, JN, PL, VR, CN	1 0 1 1 0		3			
40		As above, becomes matrix dominant.				11	100	96	96		0		2			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-12 (GT-19)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 16, 2016 15:51
DRILLING END: November 19, 2016 17:00
COORDINATES: N: 847,002 E: 923,396

SHEET: 2 of 8
GS ELEV.: 2669.1
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0	As above, becomes matrix dominant. *(continued)*	2629.1			11	100	96	96	41.2: 75.0°, FLT, PL, VR, Bx, IN <5mm	0 2 0 0		2				
	44.0		2625.1														
45	49.0	As above, clasts of schist, quartz, and tuff.	2620.1			12	100	100	100	45.8: 75.0°, JN, IR, VR, CN 46.7: 65.0°, JN, IR, RO, CN	0 1 2 0 0		2				
50	54.0	As above, no HCl reaction, slightly weathered but competent and unjointed.	2615.1			13	100	100	100		0 0 0 0 0		2				
55	59.0	As above.	2610.1			14	100	100	100	55.2: 85.0°, JN, IR, RO, CN 56: 85.0°, JN, IR, VR, CN 58.7: 80.0°, JN, IR, RO, CN	1 1 0 0 1		2				
60	64.0	Continues fresh, matrix dominant, brown CONGLOMERATE, gravel to cobble sized clasts consisting of schist, tuff, quartz, gneiss, chert, no HCl reaction, competent and unjointed.	2605.1			15	100	100	100		0 0 0 0 0		1				
65	69.0	As above, clasts of schist, tuff, quartz, gneiss, limestone, weak HCl reaction.	2600.1			16	100	100	100		0 0 0 0 0		1				
70	74.0	As above.	2595.1			17	100	100	100		0 0 0 0 0		1				
75	79.0	As above, clasts of tuff, quartz, gneiss, limestone.	2590.1			18	100	100	100		0 0 0 0 0		1				
80		As above.				19	100	100	100		0		1				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-12 (GT-19)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 16, 2016 15:51
DRILLING END: November 19, 2016 17:00
COORDINATES: N: 847,002 E: 923,396

SHEET: 3 of 8
GS ELEV.: 2669.1
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE (BC / LC)	ADVANCEMENT RATE ft/min
80	80.0		2589.1													
		As above. *(continued)*				19	100	100	100		0					
											0					
											0		1			
											0					
	84.0		2585.1								0					
85		As above.				20	100	100	100		0					
											0					
											0		1			
											0					
	89.0		2580.1								0					
90		As above, becomes very fine grained matrix, more friable, slightly weathered.				21	100	100	100		0					
											0					
											0		2			
											0					
	94.0		2575.1							93.4: 80.0°, JN, IR, VR, CN	2					
95		Continues CONGLOMERATE highly weathered, very weak, can indent matrix with thumb, matrix dominant with few brown gravel sized clasts consisting of schist, tuff, quartz, gneiss, limestone, granite, no HCl reaction.				22	94	82	82	94.7: 60.0°, JN, IR, VR, CN	2					
											1					
											6					
											6		4			
											>10					
100	100.0		2569.1								>10					
		As above, slightly weathered.				23	100	90	90		0					
											0					
											0		2			
											0					
	104.0		2565.1								0					
105		As above, fresh.				24	100	100	100		0					
											0					
											0		1			
											0					
	109.0		2560.1								0					
110		As above, clasts of tuff, quartz, gneiss, limestone, diabase.				25	100	100	100		0					
											0					
											0		1			
											0					
	114.0		2555.1								0					
115		As above.				26	100	100	100		0					
											0					
											0		1			
											0					
	119.0		2550.1								0					
120		As above.				27	100	100	100		0		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-12 (GT-19)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 16, 2016 15:51
DRILLING END: November 19, 2016 17:00
COORDINATES: N: 847,002 E: 923,396

SHEET: 4 of 8
GS ELEV.: 2669.1
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
120	120.0	As above. *(continued)*	2549.1														
	124.0		2545.1			27	100	100	100		0 0 0 0 0		1				
125	124.0	As above.	2545.1							124.3 - 124.9: 80.0°, FLT, IR, RO, CN	6 0 0 0 0		1				
	129.0		2540.1			28	90	90	90		0						
130	129.0	Continues fresh, matrix dominant CONGLOMERATE, gravel clasts consisting of tuff, quartz, gneiss, limestone, diabase, weak HCl reaction, competent and unjointed.	2535.1								0 0 0 0 0		1				
	134.0		2535.1			29	100	100	100	133.6: 70.0°, JN, IR, RO, CN							
135	134.0	As above, competent.	2530.1			30	100	96	96	134 - 134.5: 10.0°, JN, IR, VR, Ca, IN >5mm, large low angled joint with calcite infill	6 0 0 0 0		1				
	139.0		2530.1														
140	139.0	As above.	2525.1			31	100	100	100		0 0 0 0 0		1				
	144.0		2525.1														
145	144.0	As above.	2520.1			32	100	100	100		0 0 0 0 0		1				
	149.0		2520.1														
150	149.0	As above.	2515.1			33	100	94	96	149.8: 75.0°, JN, IR, VR, CN 151: 65.0°, JN, IR, VR, CN 152.7: 70.0°, JN, IR, VR, CN	2 1 2 3 0		2				
	154.0		2515.1														
155	154.0	As above.	2510.1			34	100	94	94	155.7: 85.0°, JN, PL, VR, CN	2 2 1 0 6		4				
	159.0		2510.1														
160	159.0	As above.	2510.1			35	100	100	100		0		1				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-12 (GT-19)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 16, 2016 15:51
DRILLING END: November 19, 2016 17:00
COORDINATES: N: 847,002 E: 923,396

SHEET: 5 of 8
GS ELEV.: 2669.1
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE (BC, LC)	ADVANCEMENT RATE ft/min
160	160.0	As above. *(continued)*	2509.1			35	100	100	100		0 0 0		1			
	164.0		2505.1													
165		As above.				35	100	100	100		0 0 0 0 0		1			
	169.0		2500.1													
170		As above.				35	100	100	100	172.2: 80.0°, JN, IR, VR, CN	0 0 0 0 0		1			
	174.0		2495.1													
175		As above, becomes slightly weathered, slightly weaker matrix.				36	100	94	94	176.8: 90.0°, JN, IR, VR, Cl, IN >5mm 177.6: 80.0°, JN, PL, VR, CN	0 0 2 1 0		2			
	179.0		2490.1													
180		Continues fresh, matrix dominant CONGLOMERATE, gravel and few cobble sized clasts consisting of tuff, schist, quartz, gneiss, limestone, diabase, weak HCl reaction, competent and unjointed.				37	97	90	90	181.4: 75.0°, IR, VR, CN	0 0 3		1			
	182.0		2487.1													
		As above.				37	100	100	100		0 0		1			
	184.0		2485.1													
185		As above.				38	100	100	100		0 0 0 0 0		1			
	189.0		2480.1													
190		As above.				39	100	95	95		0 0 3		1			
	193.0		2476.1													
195		As above.				40	100	100	100	193.8: 75.0°, JN, IR, VR, CN	0 0 0 0 0		1			
	198.0		2471.1													
200		As above, very fine grained and friable matrix.				41	100	100	100		0 0		1			
		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-12 (GT-19)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 16, 2016 15:51
DRILLING END: November 19, 2016 17:00
COORDINATES: N: 847,002 E: 923,396

SHEET: 6 of 8
GS ELEV.: 2669.1
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
200	200.0	As above, very fine grained and friable matrix. *(continued)*	2469.1														
	203.0	As above.	2466.1			41	100	100	100		0 0 0		1				
205						42	100	92	100	205.9: 80.0°, JN, IR, VR, CN	0 0 2 2 0		1				
	208.0	Continues slightly weathered, matrix dominant CONGLOMERATE, gravel and few cobble sized clasts consisting of tuff, schist, quartz, gneiss, limestone, diabase, weak HCl reaction.	2461.1														
210						43	100	94	96	210.5: 75.0°, JN, IR, VR, CN 211.2: 55.0°, JN, IR, VR, CN	0 0 2 1 0		2				
	213.0	As above.	2456.1														
215						44	96	86	86	213.6: 75.0°, JN, IR, VR, CN	5 0 0 0 0		2				
	218.0	As above.	2451.1														
220						45	100	86	86	218.7: 80.0°, FLT, IR, VR, Bx, IN >5mm 221.3: 85.0°, JN, IR, VR, CN	6 1 0 2 0		2				
	223.0	As above.	2446.1														
225						46	100	100	100		0 0 0 0 0		2				
	228.0	As above.	2441.1														
230						47	100	100	100		0 0 0 0 0		2				
	233.0	As above.	2436.1														
235						48	100	100	100		0 0 0 0 0		1				
	238.0	As above.	2431.1														
240						49	100	100	100		0 0		1				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-12 (GT-19)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 16, 2016 15:51
DRILLING END: November 19, 2016 17:00
COORDINATES: N: 847,002 E: 923,396

SHEET: 7 of 8
GS ELEV.: 2669.1
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE (BC / LC)	ADVANCEMENT RATE ft/min
240	240.0	As above. *(continued)*	2429.1													
	243.0		2426.1			49	100	100	100		0 0 0		1			
		As above, clasts of tuff, schist, chert, quartz, limestone.									0 0 0					
245						50	100	100	100		0 0 0		1			
	249.0		2420.1								0					
		As above.									0					
250						51	96	84	84	250.5: 80.0°, JN, IR, VR, CN 251.2: 85.0°, JN, IR, VR, CN 252.4: 70.0°, JN, IR, VR, CN	3 1 4		2			
	253.0		2416.1													
		As above.									0 0 0					
255						52	100	100	100		0 0 0		1			
	258.0		2411.1													
		As above.									0					
260						53	100	100	100		0 0 0		1			
	263.0		2406.1													
		As above.									0					
265						54	100	100	100		0 0		2			
	268.0		2401.1								0					
		As above.									0					
270						55	96	86	86		0 0 0		1			
	273.0		2396.1								2					
		As above,									0					
275						58	70	60	60		0 0 0		2			
	278.0		2391.1													
						59	100	100	100		0 0		1			
280																

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-12 (GT-19)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 16, 2016 15:51
DRILLING END: November 19, 2016 17:00
COORDINATES: N: 847,002 E: 923,396

SHEET: 8 of 8
GS ELEV.: 2669.1
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index ● AX. □ DIAM. ▲ UCS (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
280	280.0		2389.1														
		Continues slightly weathered, matrix dominant CONGLOMERATE, gravel and few cobble sized clasts consisting of tuff, schist, quartz, gneiss, limestone, diabase, weak HCl reaction. *(continued)*				59	100	100	100		0 0 0		1				
	283.0		2386.1														
		As above.									1		1				
	284.0		2385.1														
285		Gradational contact with Apache Leap Tuff (Talg), contact is closed.				60	100	100	100		0 0 0 0		2				
290						61	100	100	100		0 0 0 0 0		1				
	293.0		2376.1							293: 85.0°, CON, PL, VR, CN							
295		Bottom of borehole at 293.0 ft. Completed as well. Refer to diagram. Notes: 0 - 31: Hydro test #1 FHT 34 - 69: Hydro test #2 SI 74 - 119: Hydro test #3 SI 109 - 174: Hydro test #4 SI & CRI 124: At 124.3 ft-bgs drill head dropped 4-6 in., started losing water. 194 - 293: Hydro test #5 SI 273: Lost core, possibly due to mis-seated core tube.															
300																	
305																	
310																	
315																	
320																	

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-13 (GT-17)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 28, 2016 12:12
DRILLING END: November 28, 2016 12:12
COORDINATES: N: 849,357 E: 921,449

SHEET: 1 of 7
GS ELEV.: 2733.8
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC LC	ADVANCEMENT RATE ft/min
0	0.0		2733.8														
		Gila Conglomerate (Tcg): clast dominant, brown CONGLOMERATE, some gravel and few cobbles, clasts consisting of schist, quartz, gneiss.				1	38	13	18		5		5				
	4.0		2729.8								>10						
5		As above, becomes matrix dominant.				2	60	35	38		>10		3				
											>10						
											4						
	8.0		2725.8								2						
		As above, matrix washed out, poor recovery.				3	3	0	0				5				
10											>10						
	12.0		2721.8														
		As above, matrix washed out, poor recovery.				4	5	0	0		>10		5				
	14.0		2719.8								>10						
		As above, weak HCl reaction.				5	43	10	10		>10		5				
15											>10						
											>10						
	18.0		2715.8								>10						
		Continues brown CONGLOMERATE, matrix dominant, gravel to cobble sized clasts consisting of schist, quartz, gneiss, tuff, no HCl reaction.				6	90	76	84	18.4: 75.0°, JN, PL, VR, CN	4		3				
20											0						
											0						
											0						
	23.0		2710.8								5						
		As above.				7	100	96	96		2		2				
25											0						
											0						
											0						
	28.0		2705.8								0						
		As above.				6	78	78	78		0		2				
30											0						
											0						
	32.0		2701.8								0						
		As above.				7	90	90	90		10		2				
	34.0		2699.8								0						
35		As above.									0						
											0						
						8	100	100	100		0		2				
											0						
											0						
	39.5		2694.3			9	100	100	100		0		2				
40		As above.				10	100	69	69				2				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-13 (GT-17)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 28, 2016 12:12
DRILLING END: November 28, 2016 12:12
COORDINATES: N: 849,357 E: 921,449

SHEET: 2 of 7
GS ELEV.: 2733.8
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0	As above. *(continued)*	2693.8														
	44.0		2689.8			10	100	69	69	43.2: 80.0°, JN, IR, VR, CN	1 4 >10 4		2				
45	49.0	As above.	2684.8			11	100	100	100		0 0 0 0 0		1				
50	54.0	As above.	2679.8			12	100	100	100		0 0 0 0 0		1				
55	59.0	As above, cobble-rich.	2674.8			13	100	100	100		0 0 0 0 0		1				
60	64.0	As above, no cobbles.	2669.8			14	100	96	96		0 0 0 0 0		1				
65	69.0	As above.	2664.8			15	100	100	100		0 0 0 0 0		1				
70	74.0	As above.	2659.8			16	100	100	100		0 0 0 0 0		1				
75	79.0	Continues brown, CONGLOMERATE, matrix dominant, some gravel, clasts consist of schist, quartz, gneiss, tuff, weak HCl reaction.	2654.8			17	100	100	100		0 0 0 0 0		1				
80		Becomes clast dominant.				18	100	100	100		0		1				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-13 (GT-17)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 28, 2016 12:12
DRILLING END: November 28, 2016 12:12
COORDINATES: N: 849,357 E: 921,449

SHEET: 3 of 7
GS ELEV.: 2733.8
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0		2653.8													
		Becomes clast dominant. *(continued)*				18	100	100	100		0		1			
	84.0		2649.8								0					
85		Continues brown, CONGLOMERATE, matrix dominant, some gravel, clasts consist of schist, quartz, gneiss, tuff, weak HCl reaction.				19	100	100	100		0		1			
	89.0		2644.8								0					
90		As above.				20	100	100	100		0		1			
	94.0		2639.8								0					
95		As above.				21	100	100	100		0		1			
	99.0		2634.8								0					
100		As above.				22	100	100	100		0		1			
	104.0		2629.8								0					
105		As above.				23	100	100	100		0		1			
	108.0		2625.8								0					
110		As above.				24	100	80	80		0		1			
	113.0		2620.8								0					
115		As above.				25	100	90	90		0		1			
	118.0		2615.8							117.4: JN, IR, VR, CN	6					
120		As above.				26	100	100	100		0		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-13 (GT-17)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 28, 2016 12:12
DRILLING END: November 28, 2016 12:12
COORDINATES: N: 849,357 E: 921,449

SHEET: 4 of 7
GS ELEV.: 2733.8
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
120	120.0		2613.8														
		As above. *(continued)*				26	100	100	100		0						
	122.0		2611.8								0		1				
		As above.									0						
											0						
125						27	100	100	100		0		1				
											0						
	127.0		2606.8								0						
		As above.									0						
											0						
130						28	100	100	100		0		1				
											0						
						29	100	100	100		0		1				
	134.0		2599.8								0						
135		Continues brown CONGLOMERATE, matrix dominant, some gravel, clasts consist of schist, quartz, gneiss, tuff, weak HCl reaction.				30	100	100	100		0		1				
	139.0		2594.8								0						
140		Competent CONGLOMERATE consists primarily of underlying tuff material, gray matrix, clasts consist of tuff, quartz, feldspars, beginning of transition to tuff unit below.				31	100	100	100		0		1				
	144.0		2589.8								0						
145		Continues gradational contact with Apache Leap tuff (Talg), contact is closed, possible rip-up chips.				32	100	100	100	148.8: 75.0°, CON, IR, VR, CN	0		1				
											0						
150	150.2		2583.6								0						
		Becomes Apache Leap tuff (Talg): moderately to strongly welded TUFF, gray, with some small black phenocrysts, competent and unjointed.				33	100	100	100		0		2				
	154.0		2579.8								0						
155		As above.				34	100	100	100		0		1				
											0						
	159.0		2574.8								0						
160		As above, gray to white.				35	100	100	100	159.9: 70.0°, JN, IR, RO,	1		1				
	Log continued on next page																

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-13 (GT-17)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 28, 2016 12:12
DRILLING END: November 28, 2016 12:12
COORDINATES: N: 849,357 E: 921,449

SHEET: 5 of 7
GS ELEV.: 2733.8
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
160	160.0	As above, gray to white. *(continued)*	2573.8							CN	0					
						35	100	100	100		0		1			
	164.0		2569.8								0					
165		As above.									0					
						36	100	100	100		0		1			
	169.0		2564.8								0					
170		As above.									0					
						37	100	100	100		0		1			
	174.0		2559.8								0					
175		As above.									0					
						38	100	100	100		0		1			
	179.0		2554.8								0					
180		As above.									0					
						39	100	100	100		0		1			
	184.0		2549.8								0					
185		Continues TUFF moderately to strongly welded, gray to white, with some small black phenocrysts, few lithic clasts, competent and unjointed.									0					
						40	100	100	100		0		1			
	189.0		2544.8								0					
190		As above.									0					
						41	100	100	100		0		1			
	194.0		2539.8								0					
195		As above.									0					
						42	100	100	100		0		1			
	199.0		2534.8								0					
200		As above.				43	100	100	100		0		1			0.5

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-13 (GT-17)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 28, 2016 12:12
DRILLING END: November 28, 2016 12:12
COORDINATES: N: 849,357 E: 921,449

SHEET: 6 of 7
GS ELEV.: 2733.8
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
200	200.0	As above. *(continued)*	2533.8			43	100	100	100		0 0 0 0 0		1			0.5
	204.0		2529.8													
205		As above, no lithic clasts.				44	100	100	100		0 0 0 0 0		1			
	209.0		2524.8													
210		Continues TUFF, moderately to strongly welded, gray to white, with some small black phenocrysts, competent. Subhorizontal jointing may be mechanical.				45	100	100	100	210.4: 80.0°, JN, IR, RO, CN	0 1 0 0 0		1			
	214.0		2519.8													
215		As above.				46	100	100	100		0 0 0 0 0		1			
	219.0		2514.8													
220		As above.				47	100	100	100	219.8 - 223.2: 0.0°, JN x 5 spaced at 0.7 ft, PL, RO, CN	0 1 1 1		1			
	224.0		2509.8													
225		As above.				48	100	78	90	224 - 229: 90.0°, JN x 13 spaced at 0.1 ft, PL, RO, CN	3 2 3 5 4		1			
	229.0		2504.8													
230		As above.				49	100	92	100	232.4 - 234: 90.0°, JN x 6 spaced at 0.3 ft, PL, RO, CN	0 0 2 2 5		1			
	234.0		2499.8													
235		As above.				50	100	100	100	237.7: 90.0°, JN, PL, RO, CN 238.3: 90.0°, JN, PL, RO, CN	0 0 0 1 1		1			
	239.0		2494.8													
240		As above.				51	100	100	100		0		1			
		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-13 (GT-17)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 28, 2016 12:12
DRILLING END: November 28, 2016 12:12
COORDINATES: N: 849,357 E: 921,449

SHEET: 7 of 7
GS ELEV.: 2733.8
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index ● AX. □ DIAM. ▲ UCS (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0		2493.8													
		As above. *(continued)*				51	100	100	100		0					
											0					
											0		1			
											0					
	244.0		2489.8													
245		As above.									0					
											0					
						52	100	100	100		0		1			
											0					
											0					
	249.0		2484.8													
250		Bottom of borehole at 249.0 ft. Completed as well. Refer to diagram. Notes: 0 - 28: Hydro test #1 FHT 29 - 59: Hydro test #2 SI 64 - 154: Hydro test #3 SI 164 - 249: Hydro test #4 SI & CRI														
255																
260																
265																
270																
275																
280																

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-13 (GT-17)
7 of 7

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF BOREHOLE DH16-14-(GT-1)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 29, 2016 13:23
DRILLING END: November 29, 2016 13:23
COORDINATES: N: 845,266 E: 910,365

SHEET: 1 of 12
GS ELEV.: 2316.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLES SAMPLE TYPE & NUMBER	BLOWS per 6 in (Automatic hammer 140 lb Hammer, 30 inch drop)	REC / ATT (in)	PENETRATION RESISTANCE BLOWS / ft (20 40 60 80) WATER CONTENT (%) (W_p W W_l) (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
0	HQ3	0.0	(GP), GRAVEL, fine to coarse, poorly graded, subangular to angular, some fine subangular to angular sand, trace non plastic fines, very dark gray-brown, weathered; schist gravel; very loose to loose, moist to wet, 6-50/2 (3 intervals) Surficial soils, no recovery.	2316.0	GP						0 - 38: Hydro test #1 FHT	
		4.5		2311.5			SS S-1	50	5 / 5			
5			Pinal Schist (pCpi): dark green to gray, METASANDSTONE, fine-grained, foliated, brecciated with heavy oxidization.									
		8.0		2308.0								
10			As above, very poor recovery.									
		11.0		2305.0								
			As above.									
		12.0		2304.0								
			As above.									
15												
		17.0		2299.0								
			No recovery.									
		18.0		2298.0								
			No recovery.									
20												

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-14-(GT-1)
1 of 12

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 15:39
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RECORD OF DRILLHOLE DH16-14-(GT-1)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 29, 2016 13:23
DRILLING END: November 29, 2016 13:23
COORDINATES: N: 845,266 E: 910,365

SHEET: 1 of 13
GS ELEV.: 2316.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact | VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical | PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular | PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough | Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge | Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide | MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
0	0.0	(GP), GRAVEL, fine to coarse, poorly graded, subangular to angular, some fine subangular to angular sand, trace non plastic fines, very dark gray-brown, weathered; schist gravel; very loose to loose, moist to wet, 6-50/2 (3 intervals) Surficial soils, no recovery.	2316.0		HQ3	1	0	0	0				6				
	4.5	Pinal Schist (pCpi): dark green to gray, METASANDSTONE, fine-grained, foliated, brecciated with heavy oxidization.	2311.5			2	88	0	0	4.5 - 8: FLT, Cl, partial iron staining, fractured and gouge	>10 >10 >10 >10		5				
5	8.0	As above, very poor recovery.	2308.0			3	25	0	0		>10 >10 >10 >10		5				
10	11.0	As above.	2305.0							11 - 12: FLT, Cl, full iron staining, fractured, gougey infill	>10						
	12.0	As above.	2304.0			4	30	0	0		>10 >10 >10 >10		5				
15	17.0	No recovery.	2299.0							16.1 - 17: FLT, Cl, full iron staining, fractured, gougey infill, heavy iron oxide staining	>10						
	18.0	No recovery.	2298.0			5	0	0	0		>10						
20						6	0	0	0		>10						

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-14-(GT-1)
1 of 13

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-14-(GT-1)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 29, 2016 13:23
DRILLING END: November 29, 2016 13:23
COORDINATES: N: 845,266 E: 910,365

SHEET: 2 of 13
GS ELEV.: 2316.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
20	20.0	No recovery. *(continued)*	2296.0		HQ3	6	0	0	0		>10					
	22.0		2294.0								>10					
		Continues METASANDSTONE dark green to gray, fine-grained, rock fragments with quartz and quartz veining, foliated and brecciated, heavy oxidation, very poor recovery.				7	33	0	0		>10		5			
25	25.0		2291.0								>10					
		As above.				8	43	0	0		>10		5			
	28.5		2287.5							27 - 28.5: FLT, fractured and crushed, gougey infill, iron oxide staining, quartz vein	>10					
		As above.									>10					
30						9	100	11	51	28.5 - 30: FLT, partial iron staining, fractured and crushed, iron oxide staining	>10		4			
	32.0		2284.0							31: 72.0°, JN, PL, RO, Cl, IN <5mm 31.5: 72.0°, JN x 2 spaced at 0.1 ft, PL, RO, Sa, CC <1mm, rough joints with some sand	4					
		As above.								31.6: 29.0°, JN, PL, RO, partial iron staining, CC <1mm	>10					
						10	60	0	8		>10		5			
	34.5		2281.5							34 - 34.5: FLT, rock fragments with sand and clayey infill, some iron oxidation	>10					
35		As above.									>10					
											>10					
						11	71	0	49	36.5: 61.0°, JN, UN, SM, FeOx, full iron staining, CC <1mm	3		4			
	38.0		2278.0							36.7 - 37: 59.0°, FLT, PL, SM, sand with clay, full iron staining, IN >5mm 37.4: 45.0°, JN x 2 spaced at 0.05 ft, PL, SM, FeOx, partial iron staining, PC	>10					
		As above, many unopened/healed fractures between discontinuities.								37.5: 23.0°, JN, PL, SM, FeOx, full iron staining, CC <1mm	>10					
						12	100	0	53	37.6: 56.0°, JN, PL, SM, CN, partial iron staining, SO 39.4: 48.0°, JN x 2, PL, RO, FeOx, full iron staining, CC	4		4			
40																

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-14-(GT-1)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 29, 2016 13:23
DRILLING END: November 29, 2016 13:23
COORDINATES: N: 845,266 E: 910,365

SHEET: 3 of 13
GS ELEV.: 2316.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0		2276.0		HQ3											
		As above, many unopened/healed fractures between discontinuities. *(continued)*				12	100	0	53	<1mm 39.5: 37.0°, JN, PL, RO, FeOx, full iron staining, CC <1mm 39.7: 56.0°, JN, PL, RO, FeOx, full iron staining, CC <1mm	6		4		
	41.0		2275.0													
		As above, poor recovery.								39.8: 44.0°, JN x 2, IR, RO, Cl, full iron staining, CC <1mm	>10					
										40.4: 55.0°, JN, PL, RO, Cl, full iron staining, CC <1mm 40.5: 61.0°, JN, PL, SM, Cl, full iron staining, CC <1mm	>10					
						13	60	0	48	43.4 - 43.6: 70.0°, JN x 3, PL, SM, Cl, full iron staining, CC <1mm	6		4			
45										44.3: 46.0°, JN, PL, SM, clayey sand, full iron staining, CC <1mm 44.7: 79.0°, JN, PL, SM, Cl, full iron staining, CC <1mm	6					
	46.0		2270.0							45 - 46: FLT, PL, SM, clayey crushed rock, full iron staining, IN >5mm, fault zone, gouge and broken rock	>10					
		No recovery.									>10					
											>10					
						14	0	0	0		>10					
50											>10					
	51.0		2265.0								>10					
		Continues METASANDSTONE, dark red to gray, fine-grained, heavy oxidation, many unopened/healed fractures between discontinuities, poor recovery.									>10					
											>10					
						15	50	8	40		>10		4			
55										54.1 - 54.6: FLT, clay with gravel, IN >5mm	>10					
										55.2: 43.0°, JN, PL, SM, partial iron staining 55.5: 75.0°, JN, PL, SM, Cl, full iron staining, CC <1mm	4					
	56.0		2260.0													
		As above.								55.7: 45.0°, JN, PL, SM, Cl, full iron staining, CC <1mm						
						16	100	0	100	56.1 - 56.3: 80.0°, FO x 3, PL, SM, Cl, full iron staining, CC <1mm	>10		4			
										56.4: 43.0°, JN, UN, SM, CN, partial iron staining, SO 56.7: 66.0°, FO x 2, PL, SM, CN, partial iron staining, SO	>10					
	58.0		2258.0													
		As above.								57 - 57.1: 69.0°, FO x 4, PL, SM, Cl, full iron staining, PC	1					
						17	100	35	100	57.2 - 57.6: 68.0°, FO, PL, SM, FeOx, partial iron staining, PC, broken core zone on foliation			4			
60										57.7: 60.0°, JN x 2, PL, SM, FeOx, partial iron staining,	3					

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-14-(GT-1)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 29, 2016 13:23
DRILLING END: November 29, 2016 13:23
COORDINATES: N: 845,266 E: 910,365

SHEET: 4 of 13
GS ELEV.: 2316.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
60	60.0	As above. *(continued)*	2256.0		HQ3	17	100	35	100	PC 58.2: 65.0°, JN, PL, SM, Cl, PC 59.2: 34.0°, JN x 3, PL, SM, CN 60: 63.0°, JN x 2, UN, SM, Cl, partial iron staining, CC <1mm	2 4		4			
	62.0	As above.	2254.0			18	75	0	28	60.5 - 61: VN, Qtz, IN >5mm, quartz, broken rock 61 - 61.4: 47.0°, FLT, clayey gouge with rock fragments, IN >5mm 64.5: 82.0°, FO, PL, SM, Cl, PC 64.9: 48.0°, JN, CU, SM, Cl, partial iron staining, PC 65.1: 38.0°, JN, PL, RO, Cl, partial iron staining, CC <1mm	>10 >10 8 >10		4			
65	66.0	As above.	2250.0			19	88	30	88	65.4 - 65.7: FLT, SM, clayey gravel with sand, IN >5mm 67: 60.0°, JN, CU, SM, FeOx, full iron staining, PC 67.4: 60.0°, FO, PL, SM, Cl, full iron staining, CC <1mm 67.6: 70.0°, FO, PL, SM, Cl, partial iron staining, PC 68.1: 54.0°, JN, PL, SM, FeOx, full iron staining, CC <1mm 68.5: 65.0°, FO, PL, SM, FeOx, partial iron staining, PC 68.7: 67.0°, FO, PL, SM, Cl, full iron staining, CC <1mm	>10 6 7 >10		4			
70	70.0	As above.	2246.0			20	100	20	100	68.9: 13.0°, JN, PL, SM, Cl, full iron staining, CC <1mm 69 - 70: FLT, clayey crushed rock, partial iron staining, IN >5mm 70.2: 57.0°, JN, PL, SM, Cl, partial iron staining, PC 70.4: 56.0°, JN, PL, SM, FeOx, full iron staining, CC <1mm	7 4		3			
75	72.0	As above.	2244.0			21	67	20	67	70.5: 70.0°, FO, PL, SM, CN, partial iron staining, SA 70.7 - 70.8: 43.0°, JN, PL, SM, clayey gravel and crushed rock, IN >5mm 71.1: 76.0°, FO, PL, SM, FeOx, full iron staining, CC <1mm 71.6: 49.0°, PL, SM, FeOx, partial iron staining, PC 74.7: 74.0°, JN, PL, SM, clayey gravel, CC <1mm 74.8: 55.0°, JN, PL, SM, Cl, PC 75.4: 60.0°, JN, PL, SM, Cl, CC <1mm	>10 >10 4 >10		4			
	76.5	As above.	2239.5			22	100	28	100	75.6 - 76.5: FLT, crushed rock with clayey sand and gravel, partial iron staining, IN >5mm 76.5: 33.0°, JN, PL, SM, partial iron staining, SA 77.2: 82.0°, FO, PL, SM, partial iron staining, SA 78.6: 65.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm 79.2: 44.0°, JN, PL, SM, FeOx, full iron staining, CC <1mm 79.3: 13.0°, JN, PL, SM, Cl,	>10 5 1 4		3			
80		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-14-(GT-1)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 29, 2016 13:23
DRILLING END: November 29, 2016 13:23
COORDINATES: N: 845,266 E: 910,365

SHEET: 5 of 13
GS ELEV.: 2316.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
80	80.0	As above. *(continued)*	2236.0		HQ3					partial iron staining, CC <1mm							
	80.6		2235.4							79.9: 57.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm	2		3				
		Becomes brecciated METASANDSTONE, dark gray green with some reddish brown, schist fragments with gouge and clay, some oxidation.				22	100	28	100	80.1: 55.0°, FO, PL, SM, Cl, partial iron staining, CC <1mm	>10		5				
	81.5		2234.5							80.6 - 81.5: FLT, gouge. brecciated rock with clay, partial iron staining, IN >5mm	>10						
		As above.									>10						
						23	80	0	80		>10		5				
85										82.5 - 86.5: FLT, gouge. brecciated rock with clay, partial iron staining, IN >5mm	>10						
											>10						
	86.5		2229.5								>10						
		No recovery.								87: 50.0°, JN, CU, SM, Cl, full iron staining, CC <1mm			5				
	87.5		2228.5							87.3: 45.0°, JN, PL, SM, crushed rock and clay, IN >5mm	2						
		As above.								88 - 88.2: FLT, SM, G, partial iron staining, IN >5mm	3						
						24	80		80	88.3: 64.0°, JN, PL, SM, CN, partial iron staining, SA	>10		4				
90										89.9: 47.0°, JN, CU, SM, Cl, full iron staining, CC <1mm							
										90.1 - 90.4: 44.0°, FLT, PL, SM, highly weathered rock and clay, full iron staining, IN >5mm	>10						
	91.5		2224.5							90.55: 45.0°, FO, PL, SM, Cl, partial iron staining, IN <5mm	>10						
		As above.								90.6 - 91.5: FLT, crushed rock and clay, IN >5mm							
										92 - 92.6: FLT, SM, rock fragments withe clayey gravel	>10						
						25	88	0	88	92.7 - 93.2: 17.0°, FLT, PL, SM, G, full iron staining, IN >5mm	3		4				
										93.7: 64.0°, JN, PL, SM, CN, partial iron staining, SA							
95										93.9: 86.0°, FO, PL, SM, CN, partial iron staining, SA	4						
										94.1: 18.0°, JN, PL, SM, Cl, full iron staining, CC <1mm							
	95.5		2220.5							94.2 - 94.3: 65.0°, FO, PL, SM, G, full iron staining, IN >5mm	>10						
		Continues METASANDSTONE, dark greenish gray, fine-grained, foliated, highly jointed, some oxidation.								94.7: 70.0°, JN x 2, PL, SM, Cl, full iron staining, CC <1mm							
										95 - 95.5: FLT, Bx, IN >5mm	3						
										96: 30.0°, JN, PL, SM, CN, partial iron staining, SA							
						26	100	0	100	96.7: 34.0°, JN, PL, SM, Cl, full iron staining, CC <1mm	5		3				
										97: 27.0°, JN, PL, SM, Cl, full iron staining, CC <1mm							
										97.2: 82.0°, JN, PL, SM, FeOx, full iron staining, CC <1mm	>10						
										97.5: 83.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm							
100										98.2 - 99.8: JN x 16, Cl, partial iron staining, CC	>10						

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-14-(GT-1)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 29, 2016 13:23
DRILLING END: November 29, 2016 13:23
COORDINATES: N: 845,266 E: 910,365

SHEET: 6 of 13
GS ELEV.: 2316.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
100	100.0	Continues METASANDSTONE, dark greenish gray, fine-grained, foliated, highly jointed, some oxidation.	2216.0		HQ3	26	100	0	100	<1mm, multiple breaks in zone	3		3			
	101.0	*(continued)*	2215.0													
		No recovery.									>10					
	102.5		2213.5			27	50	0	0		>10					
		Continues METASANDSTONE, dark greenish gray, fine-grained, foliated, highly jointed, some oxidation.									>10					
	104.0		2212.0													
105		As above, discontinuous fractures.				28	100	17	93	104.3: 52.0°, JN, PL, SM, Cl, full iron staining, CC <1mm 104.7: 24.0°, JN x 2, PL, RO, CN, partial iron staining, SO 105.4: 20.0°, JN x 2, PL, SM, Cl, full iron staining, CC <1mm 106.3: 21.0°, PL, SM, Cl, partial iron staining, CC <1mm	6 4 4		3			
	107.0		2209.0													
		As above.				29	100	20	100	106.5: 20.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm 107.3: 77.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm 107.8 - 109.5: JN x 15, SM, Cl, partial iron staining, CC <1mm, multiple fractures in zone	7 >10		3			
	109.5		2206.5								>10					
110		As above.				30	80	16	80	110.2 - 110.4: 74.0°, FO x 6, PL, SM, Cl, partial iron staining, CC <1mm 110.6: 40.0°, JN, PL, SM, Chl, partial iron staining, CC <1mm, white infill, no HCl reaction 110.8: 52.0°, JN, CU, SM, Cl, partial iron staining, CC <1mm	7 6		3			
	112.0		2204.0													
		Continues METASANDSTONE, dark greenish gray, fine-grained, foliated, highly jointed, some oxidation.				31	83	0	27	111.5: 33.0°, JN, CU, Cl, partial iron staining, CC <1mm	>10 >10		3			
115	115.0		2201.0								>10					
		As above.				32	100	0	100	115 - 116.5: JN x 15, PL, SM, Cl, no iron staining, CC <1mm, multiple fractures	>10		4			
	116.5		2199.5								>10					
		As above, interval of breccia and washed out gouge.				33	75	0	10	117.8 - 118.5: FLT, rock fragments with clayey gravel with sand, partial iron staining, IN >5mm	>10		4			
	118.5		2197.5								>10					
		As above.				34	100	29	100	119: 10.0°, JN, PL, SM, Cl, full iron staining, CC <1mm 119.3 - 119.4: 74.0°, FO x 2 spaced at 0.1 ft, PL, SM, Cl, partial iron staining, CC	4		3			
120																

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-14-(GT-1)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 29, 2016 13:23
DRILLING END: November 29, 2016 13:23
COORDINATES: N: 845,266 E: 910,365

SHEET: 7 of 13
GS ELEV.: 2316.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
120	120.0	As above. *(continued)*	2196.0			34	100	29	100	<1mm 119.8: 62.0°, FO, PL, SM, CN, no iron staining 120.2: 34.0°, JN, PL, SM, Cl, full iron staining, CC <1mm 120.4 - 120.5: 74.0°, FO x 2 spaced at 0.1 ft, PL, SM, Cl, full iron staining, CC <1mm	6 8		3			
	122.0	As above.	2194.0			35	100	0	100	120.8: 12.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm 121.1 - 121.5: 77.0°, FO x 5, PL, SM, Cl, partial iron staining, CC <1mm 121.8 - 121.9: 44.0°, JN x 2 spaced at 0.1 ft, PL, SM, Cl, partial iron staining, CC <1mm 122 - 125: JN x 30, Cl, partial iron staining, CC <1mm, hightly fractured zone	>10 >10 >10		3			
125	125.0	As above.	2191.0			36	100	0	73	125.8: 20.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm 126.7 - 127: 77.0°, FO x 5, PL, SM, Cl, partial iron staining, CC <1mm 127.3: 14.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm	7 8 >10		3			
	128.0	Continues METASANDSTONE, dark greenish gray, foliated and highly fractured, some quartz veining with chloritic alteration.	2188.0		HQ3	37	100	28	100	128.5: 56.0°, JN, PL, SM, Cl, full iron staining, CC <1mm 128.7: 25.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm 129.1: 76.0°, x 2 spaced at 0.1 ft, PL, SM, Cl, partial iron staining, CC <1mm 129.2 - 129.6: 13.0°, JN x 2 spaced at 0.2 ft, PL, SM, Cl, CC <1mm 130.2: 69.0°, FO, PL, SM, Cl, partial iron staining, CC <1mm 130.4: 12.0°, JN, PL, SM, clay with quartz, partial iron staining, CC <1mm	4 6 5 2		3			
130	132.0	As above.	2184.0			38	100	13	100	130.6: 29.0°, JN, PL, SM, Cl, full iron staining, CC <1mm 130.9: 84.0°, FO, PL, SM, CN, possibly mechanical 131.5: 29.0°, VN, PL, SM, Qtz, CC <1mm 132.3 - 134.5: JN x 22, SM, Cl, partial iron staining, CC <1mm, highly fractured zone	>10 >10 >10		3			
135	135.0	As above.	2181.0			39	100	36	100	135.6: 13.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm 136.4: 19.0°, JN x 2, PL, SM, FeOx, partial iron staining, SO 136.7: 45.0°, JN x 2, PL, SM, CN, partial iron staining, SO 136.8: 75.0°, FO, PL, SM, FeOx, partial iron staining, SO 137.3: 48.0°, JN x 2, PL, SM, CN 137.8: 63.0°, FO x 2, PL, SM, Cl, partial iron staining, PC 138.3: 17.0°, JN, PL, SM, Cl, full iron staining, CC <1mm	4 5 4 1 4		3			
140	140.0	Log continued on next page	2176.0														

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-14-(GT-1)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 29, 2016 13:23
DRILLING END: November 29, 2016 13:23
COORDINATES: N: 845,266 E: 910,365

SHEET: 8 of 13
GS ELEV.: 2316.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
140	140.0	As above.	2176.0		HQ3	40	100	0	100	139.2: 13.0°, JN, PL, SM, CN, partial iron staining, SO 139.8: 70.0°, FO, PL, SM, Cl, partial iron staining, PC 140.2: 18.0°, JN, PL, SM, CN 140.4 - 140.6: 60.0°, JN x 2, PL, SM, Cl, partial iron staining, PC 141.2: 34.0°, JN, PL, SM, Cl, partial iron staining, PC	3 4 5		2		
	142.5	As above.	2173.5			41	100	40	100	141.4: 33.0°, JN, PL, SM, Cl, partial iron staining, PC 142 - 142.2: 71.0°, FO x 3, PL, SM, Cl, partial iron staining, CC <1mm 142.5: 21.0°, JN, PL, SM, Cl, partial iron staining, PC 142.6: 43.0°, JN, PL, SM, Cl, full iron staining, CC <1mm 142.9: 40.0°, JN, PL, SM, Cl, partial iron staining, PC 143: 49.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm 144.6 - 144.8: 77.0°, FO x 2 spaced at 0.2 ft, PL, SM, CN, partial iron staining, SA 145.2 - 145.8: JN x 6, PL, SM, Cl, partial iron staining, PC, multple joint zone, two sets	4 3 7 7		3		
145	147.5	As above.	2168.5			42	89	20	73	146.3: 30.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm 146.7: 76.0°, FO, PL, SM, Cl, partial iron staining, PC 147: 46.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm 148 - 148.4: 46.0°, JN x 2 spaced at 0.4 ft, PL, SM, Cl, partial iron staining, CC <1mm 149.1: 68.0°, FO, PL, SM, Cl, partial iron staining, PC 149.7: 23.0°, VN, CU, SM, Qtz, partial iron staining, IN <5mm 150.8: 28.0°, FLT, PL, SM, G, partial iron staining, IN >5mm	>10 4 6 7 >0		4		
150	152.0	Continues METASANDSTONE, dark greenish gray, fine-grained, foliated and higly fractured with moderate oxidation.	2164.0			43	100	14	86	151.1: 68.0°, FO, PL, SM, G, partial iron staining, IN <5mm 151.5 - 152: FLT, PL, RO, crushed rock with clayey gravel, partial iron staining, IN >5mm 152.5 - 155.5: JN x 30, SM, Cl, CC <1mm, fractured zone	4 >10 >10 >10		3		
155	155.5	As above, quartz veining, highly fractured.	2160.5			44	86	0	31	155.5 - 159: JN, SM, Cl, CC <1mm, highly fractured zone	>10 >10 >10 >10		4		
	159.0	As above.	2157.0			45	100	47	83	159.2: FO, FeOx, CC <1mm	1		3		
160		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-14-(GT-1)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 29, 2016 13:23
DRILLING END: November 29, 2016 13:23
COORDINATES: N: 845,266 E: 910,365

SHEET: 9 of 13
GS ELEV.: 2316.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact | VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical | PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular | PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough | Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge | Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide | MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
160	160.0	As above. *(continued)*	2156.0		HQ3	45	100	47	83	160.2: 80.0°, FO, PL, SM, Cl, full iron staining, CC <1mm 160.6: 74.0°, JN, PL, SM, Cl, PC 161.2 - 161.8: SM, partial iron staining	2 >10		3	BC LC	
	162.0	As above, very weathered, poor recovery.	2154.0			46	60	20	36	161.9: 83.0°, JN, IR, SM, partial iron staining, SA 162.3: 82.0°, JN, IR, RO, CN 162.9 - 164.5: FLT, G, partial iron staining, IN >5mm, crushed rock with clayey gravel	2 >10 >10		4 5		
	164.5	As above.	2151.5													
165						47	100	48	100	165.2: 79.0°, JN, CU, SM, Cl, CC <1mm 165.3: 47.0°, JN, PL, SM, Cl, CC <1mm 165.8: 75.0°, JN, PL, SM, Cl, CC <1mm 166.1: 67.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm 166.7 - 166.8: 68.0°, JN, IR, SM, crushed rock, IN >5mm 167.2: 75.0°, JN, PL, SM, Cl, full iron staining, CC <1mm 168.1: 45.0°, JN, PL, SM, Cl, full iron staining, CC <1mm 168.4 - 169.5: x 11, Cl, CC <1mm, broken core zone	6 2 3 >10 >10		4		
	169.5	As above.	2146.5													
170						48	100	28	100	170.2: 66.0°, VN, PL, SM, Qtz, IN >5mm 170.6: 74.0°, VN, PL, SM, Qtz, IN >5mm 170.8: 73.0°, VN, UN, SM, Qtz, IN >5mm 171.2: 25.0°, JN x 2 spaced at 0.05 ft, PL, SM, Cl, partial iron staining, CC <1mm	5 2		3		
	172.0	As above.	2144.0													
175						49	70	10	70	173.5 - 175.5: x 20, SM, Cl, partial iron staining, CC <1mm, highly fractured random sets 176: 76.0°, JN, PL, SM, Cl, CC <1mm 176.3: 75.0°, FO, PL, SM, CN 176.5: 69.0°, JN, PL, SM, CN	>10 5 5		3		
	177.0	Continues METASANDSTONE, dark greenish gray, quartz veining, fine-grained, foliated, lightly to moderately fractured, moderate oxidation.	2139.0													
180						50	100	46	100	177 - 178.7: JN, SM, Cl, partial iron staining, CC <1mm, highly jointed, random sets 179.6: 74.0°, JN, PL, SM, FeOx, CC <1mm	>10 5 2		2		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-14-(GT-1)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 29, 2016 13:23
DRILLING END: November 29, 2016 13:23
COORDINATES: N: 845,266 E: 910,365

SHEET: 10 of 13
GS ELEV.: 2316.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
180	180.0	Continues METASANDSTONE, dark greenish gray, quartz veining, fine-grained, foliated, lightly to moderately fractured, moderate oxidation. *(continued)*	2136.0		HQ3	50	100	46	100	179.7: 54.0°, JN, PL, SM, Cl, CC <1mm 180.7: 54.0°, JN, PL, SM, FeOx, CC <1mm 181.1: 49.0°, JN, PL, SM, FeOx, CC <1mm 181.4 - 181.7: 55.0°, JN x 2 spaced at 0.3 ft, PL, SM, Cl, partial iron staining, CC <1mm	1 4		2		
	182.0	As above.	2134.0			51	100	40	100	182.5: 74.0°, JN, PL, SM, FeOx, PC 182.9: 73.0°, VN, PL, SM, Qtz, IN <5mm 183: 31.0°, JN, PL, SM, FeOx, PC 183.4: 79.0°, FO, PL, SM, Cl, partial iron staining, CC <1mm 184: 14.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm 184.4: 38.0°, JN x 3, PL, SM, Cl, CC <1mm 184.7: 68.0°, JN, PL, SM, FeOx, CC <1mm 184.9: 36.0°, JN, PL, SM, Cl, CC <1mm 185.5 - 185.7: 43.0°, JN x 2 spaced at 0.2 ft, PL, SM, Cl, PC	4 2 4 3 2		3		
185																
	187.0	As above.	2129.0			52	100	36	100	186.4 - 186.5: 48.0°, JN x 2 spaced at 0.1 ft, PL, SM, FeOx, PC 187 - 190.2: JN x 30, SM, Cl, full iron staining, CC <1mm, broken core zone, fairly consistant low angle set 191.3: 22.0°, JN, ST, RO, FeOx, CC <1mm	8 7 10 2 1		3		
190																
	192.0	As above.	2124.0			53	100	15	100	192.5: 69.0°, JN, PL, SM, Cl, partial iron staining, PC 193.1: 38.0°, JN, PL, SM, Cl, full iron staining, CC <1mm 193.2 - 196: SM, Cl, full iron staining, CC <1mm, broken core zone, random set, clayey gravel	1 7 8 9		2		
195																
	196.0	As above.	2120.0			54	100	43	100	196.1: 40.0°, VN, PL, SM, Qtz, partial iron staining, IN >5mm 196.5: 49.0°, JN, PL, SM, FeOx, CC <1mm 197.1: 59.0°, VN, PL, SM, Qtz, full iron staining, IN >5mm 197.5: 27.0°, JN, PL, SM, Cl, partial iron staining, PC 198: 35.0°, JN x 2, PL, SM, FeOx, PC 198.2: 58.0°, JN, PL, SM, Cl, partial iron staining, PC 198.9: 65.0°, JN, PL, SM, Cl, full iron staining, CC <1mm	2 4 3 2		3		
	199.5	As above.	2116.5			55	100	20	100	199.9: 74.0°, FO, PL, SM,			2			
200		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-14-(GT-1)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 29, 2016 13:23
DRILLING END: November 29, 2016 13:23
COORDINATES: N: 845,266 E: 910,365

SHEET: 11 of 13
GS ELEV.: 2316.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT
200	200.0	As above. *(continued)*	2116.0		HQ3	55	100	20	100	CN 200 - 200.8: 29.0°, JN x 4 spaced at 0.1 ft, PL, SM, FeOx, CC <1mm 201.2 - 201.6: 34.0°, x 3 spaced at 0.1 ft, PL, SM, CN, partial iron staining, SA	4 3
	202.0	As above.	2114.0			56	100	36	100	203.2: 37.0°, JN, PL, SM, FeOx, SO 204 - 204.4: 59.0°, x 3 spaced at 0.1 ft, PL, SM, Cl, partial iron staining, CC <1mm 202 - 207: SM, FeOx, PC, broken core zone, random set 204.7: 54.0°, JN, PL, SM, Cl, CC <1mm 205.4: 33.0°, JN, PL, SM, FeOx, SA 205.6 - 205.8: 78.0°, FO x 2 spaced at 0.2 ft, PL, SM, Cl, partial iron staining, CC <1mm	>10 2 3 3 1
205	207.0	As above.	2109.0			57	100	54	100	206.4: 24.0°, JN, PL, SM, FeOx, PC 207.7: 52.0°, JN, PL, SM, Cl, full iron staining, CC <1mm 208.1: 48.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm 209.3: 17.0°, JN, PL, SM, FeOx, SA 210.1: 28.0°, JN, ST, SM, FeOx, SO	1 3 3 1 0
210	212.0	As above.	2104.0			58	100	44	100	212 - 212.8: 76.0°, FO x 4 spaced at 0.2 ft, PL, SM, Cl, PC 213.1 - 213.3: 41.0°, JN x 2 spaced at 0.2 ft, PL, SM, Cl, partial iron staining, CC <1mm 214.7 - 214.9: 68.0°, JN x 2 spaced at 0.2 ft, PL, SM, Cl, partial iron staining, PC 215.8 - 216.4: 82.0°, JN x 3 spaced at 0.3 ft, PL, SM, Cl, partial iron staining, CC <1mm	4 2 2 1 3
215	217.0	Becomes METASANDSTONE, dark greenish gray, quartz veining, fine-grained, foliated, moderately fractured, moderate oxidation, fault gouge consists of rock fragments and clay, poor recovery.	2099.0			59	70	12	70	218.8: 40.0°, JN, PL, SM, Cl, full iron staining, CC <1mm 219.6 - 222: FLT, brecciated	>10 6 4
220		Log continued on next page									

ISRM Strength Index: ● AX. □ DIAM. ▲ UCS (ksi) R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6

ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC	LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
2					
2					
3					
2					
5					

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-14-(GT-1)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 29, 2016 13:23
DRILLING END: November 29, 2016 13:23
COORDINATES: N: 845,266 E: 910,365

SHEET: 12 of 13
GS ELEV.: 2316.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
220	220.0	Becomes METASANDSTONE, dark greenish gray, quartz veining, fine-grained, foliated, moderately fractured, moderate oxidation, fault gouge consists of rock fragments and clay, poor recovery. *(continued)*	2096.0		HQ3	59	70	12	70	core and rock fragments 219.6 - 222: FLT, brecciated core and rock fragments	>10 >10		5				
	222.0	As above, no gouge.	2094.0			60	100	0	88	222 - 223.5: x 15, SM, Cl, CC <1mm, broken core with quartz fragments 223.6 - 223.9: 52.0°, JN x 2 spaced at 0.3 ft, PL, SM, Cl, partial iron staining, CC <1mm	>10 8 >10		4				
225	224.5	Becomes METASANDSTONE, dark greenish gray, quartz veining, fine-grained, foliated, moderately fractured, moderate oxidation, fault gouge consists of rock fragments and clay, poor recovery.	2091.5			61	88	23	88	225 - 225.4: FLT, clayey gravel, IN >5mm 226.3 - 226.8: Cl, partial iron staining, broken core 227.2 - 227.4: 38.0°, JN x 2 spaced at 0.2 ft, PL, SM, Cl, partial iron staining, CC <1mm 227.6 - 228.5: FLT, Cl, IN >5mm, crushed rock, clayey gravel	>10 3 6 >10 1		4				
230	228.5	As above, no gouge, oxidized	2087.5			62	86	43	86	228.9: 62.0°, JN, PL, SM, CN 230.6 - 230.8: 66.0°, B x 2 spaced at 0.2 ft, PL, SM, Cl, full iron staining, CC <1mm 231.1 - 231.3: 55.0°, JN x 2 spaced at 0.2 ft, PL, SM, Cl, CC <1mm	0 2 3		3				
	232.0	As above.	2084.0			63	100	0	92	232 - 234.5: SM, Cl, full iron staining, broken core zone, random sets	>10 >10		4				
235	234.5	As above.	2081.5			64	100	18	100	234.5 - 235.6: SM, Cl, full iron staining, CC <1mm, broken core zone 236.5: 22.0°, JN, PL, RO, FeOx, SO 236.6 - 237: 74.0°, FO x 3 spaced at 0.1 ft, PL, SM, Cl, PC 236.8: 19.0°, JN, PL, RO, FeOx, CC <1mm 237.5 - 237.8: 52.0°, JN x 2 spaced at 0.3 ft, PL, SM, Cl, partial iron staining, CC <1mm 237.9: 55.0°, JN, PL, SM, Cl, full iron staining, CC <1mm	>10 6 4 3 0		3				
240	238.5	Bottom of borehole at 238.5 ft. Completed as well. Refer to diagram. Notes: 0 - 38: Hydro test #1 FHT 38: Set casing to 30 ft-bgs.	2077.5														

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-14-(GT-1)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 29, 2016 13:23
DRILLING END: November 29, 2016 13:23
COORDINATES: N: 845,266 E: 910,365

SHEET: 13 of 13
GS ELEV.: 2316.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi)	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0		2076.0									R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6			
		77.5 - 91.5: Hydro test #2 SI 77.6 - 238.5: Hydro test #3 SI													
245															
250															
255															
260															

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-14-(GT-1)
13 of 13

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-15-(GT-16)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 2, 2016 11:52
DRILLING END: December 2, 2016 11:52
COORDINATES: N: 845,116 E: 920,176

SHEET: 1 of 8
GS ELEV.: 2667.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
0	0.0		2667.7														
5	6.0		2661.7														
	6.0	Gila Conglomerate (Tcg): completely weathered, CONGLOMERATE, recovered only gravel and matrix fragments, clasts consist of schist, gneiss, quartz.				1	37	0	10		>10		5				
	9.0		2658.7								>10						
10		As above, recovered some intact matrix.									>10						
						2	40	0	14		>10		5				
	14.0		2653.7								>10						
15		Continues CONGLOMERATE, matrix dominated, some gravel, clasts consist of diabase, gniess, schist, quartz, weak HCl reaction, matrix poorly cemented sand, very friable, moderately weathered,									0						
						3	96	82	82		0		3				
	19.0		2648.7							17.6: 80.0°, JN, PL, VR, CN	1						
										18.6: JN, IR, VR, CN	2						
20		As above.									0						
											0						
						4	98	86	86	21.4: 85.0°, JN, IR, VR, CN	3		3				
											0						
	24.0		2643.7								0						
25		As above.								24.5: 75.0°, JN, IR, VR, CN	3						
											0						
						5	96	86	86		0		2				
											0						
	29.0		2638.7							28.6: 80.0°, JN, IR, VR, CN	2						
30		As above.									0						
											0						
						6	96	84	84		0		2				
											0						
	34.0		2633.7							33.2: 40.0°, JN, PL, VR, CN	3						
35		As above, weak HCl reaction.								35: JN, IR, VR, CN	1						
											1						
						7	100	96	96		1		2				
											0						
	39.0		2628.7								2						
40		As above.				8	96	96	96		0		2				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-15-(GT-16)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 2, 2016 11:52
DRILLING END: December 2, 2016 11:52
COORDINATES: N: 845,116 E: 920,176

SHEET: 2 of 8
GS ELEV.: 2667.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0	As above. *(continued)*	2627.7			8	96	96	96		0 0 0 0 0		2			
	44.0		2623.7													
45	49.0	Continues CONGLOMERATE, slightly weathered, matrix dominated, some gravel with cobbles, brown, clasts consist of schist, gneiss, diabase, quartz, few calcite veins, moderate HCl reaction.	2618.7			9	100	94	94	45.2: 65.0°, JN, IR, VR, CN	0 0 0 0 0 0		2			
50	54.0	As above.	2613.7			10	100	100	100		0 0 0 0 0		2			
55	59.0	As above.	2608.7			11	100	100	100	56.3: 60.0°, JN, PL, VR, CN	0 0 1 0 0		2			
60	64.0	As above.	2603.7			12	100	100	100		0 0 0 0 0 0		1			
65	69.0	As above.	2598.7			13	100	100	100		0 0 0 0 0 0		1			
70	74.0	As above, moderate HCl reaction.	2593.7			14	100	100	100		0 0 0 0 0 0		1			
75	79.0	Continues CONGLOMERATE, fresh, matrix dominated, some gravel, brown, clasts consist of schist, gneiss, quartz, weak HCl reaction, competent.	2588.7			15	100	100	100	74.3: 55.0°, JN, IR, VR, CN	1 0 0 0 0 0		1			
80		As above.				16	100	100	100		0		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-15-(GT-16)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 2, 2016 11:52
DRILLING END: December 2, 2016 11:52
COORDINATES: N: 845,116 E: 920,176

SHEET: 3 of 8
GS ELEV.: 2667.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0	As above. *(continued)*	2587.7														
						16	100	100	100	80.4: 80.0°, JN, IR, VR, CN	3 0 0 0		1				
	84.0		2583.7														
85		As above.				17	100	100	100		0 0 0 0 0		1				
	89.0		2578.7														
90		As above.				18	100	100	100		0 0 0 0 0		1				
	94.0		2573.7														
95		As above.				19	100	100	100		0 0 0 0 0		1				
	99.0		2568.7														
100		As above.				20	100	100	100		0 0 0 0 0		1				
	104.0		2563.7														
105		As above.				21	100	92	100	106.5: 85.0°, JN, IR, VR, CN 106.9: 70.0°, JN, IR, VR, CN	0 0 2 0		1				
	109.0		2558.7														
110		As above.				22	100	100	100		0 0 0 0 0		1				
	114.0		2553.7														
115		As above.				23	100	100	100	116.1: 85.0°, JN, IR, VR, CN 116.6: JN, IR, VR, CN 117.7: 75.0°, JN, IR, VR, CN	0 0 4 0 1		1				
	119.0		2548.7														
120		As above.				24	100	90	90	119.4: 75.0°, JN, IR, VR,	4		1				
		Log continued on next page															

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-15-(GT-16)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 2, 2016 11:52
DRILLING END: December 2, 2016 11:52
COORDINATES: N: 845,116 E: 920,176

SHEET: 4 of 8
GS ELEV.: 2667.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
120	120.0	As above. *(continued)*	2547.7							CN 119.8: JN, IR, VR, CN	0 0 0 0 0					
	124.0		2543.7			24	100	90	90				1			
125		As above.									0 0 0 0 0					
	129.0		2538.7			25	100	100	100				1			
130		As above.									0 0 0 0 0					
	134.0		2533.7			26	100	90	90				2			
135		As above.									0 0 4 0 0					
	139.0		2528.7			27	100	100	100	136.3: JN, IR, VR, CN			2			
140		As above, weak friable matrix.									0 0 0 0 6					
	144.0		2523.7			28	100	92	92				2			
145		As above, weak matrix.									0 0 0 8 0					
	149.0		2518.7			29	100	80	80	146.2: 70.0°, JN, IR, VR, CN 147.8: 75.0°, FLT, PL, VR, Bx, IN >5mm			2			
150		Continues CONGLOMERATE, slightly to moderately weathered, clast dominated, gravel with few cobbles, matrix is fine grained, poorly cemented clasts consist of schist, gneiss, quartz, tuff, weak HCl reaction.									4 0 0 0 5					
	154.0		2513.7			39	100	76	76				2			
155		As above.									0 0 4 0 0					
	159.0		2508.7			40	100	100	100				1			
160		As above.									0					
		Log continued on next page				41	100	100	100				1			

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-15-(GT-16)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 2, 2016 11:52
DRILLING END: December 2, 2016 11:52
COORDINATES: N: 845,116 E: 920,176

SHEET: 5 of 8
GS ELEV.: 2667.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
160	160.0	As above. *(continued)*	2507.7			41	100	100	100		0 0 0 0 0		1			
	164.0		2503.7													
165		As above.				42	100	100	100		0 0 0 0 0		1			
	169.0		2498.7													
170		As above, moderate HCl reaction.				43	100	100	100	171.6: 90.0°, JN, PL, RO, CN	0 0 1 0 0		1			
	174.0		2493.7													
175		As above, few mechanical breaks on ends.				44	100	100	100		0 0 0 0 0		1			
	179.0		2488.7													
180		As above.				45	100	100	100		0 0 0 0 0		1			
	184.0		2483.7													
185		Continues CONGLOMERATE fresh, matrix dominated some gravel, brown, clasts consist of schist, gneiss, quartz, tuff, diabase, weak HCl reaction.				46	100	100	100		0 0 0 0 0		1			
	189.0		2478.7													
190		As above.				47	100	100	100	191.2: 75.0°, JN, IR, VR, CN	0 0 1 0 0		1			
	194.0		2473.7													
195		As above.				48	100	94	94	195.3: 65.0°, FLT, PL, VR, Bx, IN >5mm	0 4 0 0 0		1			
	199.0		2468.7													
200		As above.				49	100	100	100		0		1			
		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-15-(GT-16)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 2, 2016 11:52
DRILLING END: December 2, 2016 11:52
COORDINATES: N: 845,116 E: 920,176

SHEET: 6 of 8
GS ELEV.: 2667.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
200	200.0	As above. *(continued)*	2467.7													
	204.0		2463.7			49	100	100	100		0 0 0 0 0		1			
205	209.0	As above.	2458.7			50	100	100	100		0 0 0 0 0		1			
210	214.0	As above.	2453.7			51	60	60	60		0 0 0 0 0		1			
215	215.0	As above.	2452.7			52	100	100	100		0					
	220.0	As above.	2447.7			53	100	100	100		0 0 0 0 0		1			
220	224.0	As above.	2443.7			53	100	100	100		0 0 0 0 0		1			
225	229.0	Becomes CONGLOMERATE, fresh, clast dominated, some gravel, brown, clasts consist of schist, gneiss, quartz, tuff, diabase, weak HCl reaction, competent.	2438.7			54	100	100	100		0 0 0 0 0		1			
230	234.0	Becomes CONGLOMERATE fresh, matrix dominated, some gravel and few cobbles, brown, clasts consist of schist, gneiss, quartz, tuff, diabase, moderate HCl reaction, competent.	2433.7			55	100	100	100		0 0 0 0 0		1			
235	239.0	As above.	2428.7			56	100	100	100	236.7: 80.0°, JN, IR, VR, CN	0 0 2 0 0		1			
240		As above.				57	100	100	100		0		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF DRILLHOLE DH16-15-(GT-16)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 2, 2016 11:52
DRILLING END: December 2, 2016 11:52
COORDINATES: N: 845,116 E: 920,176

SHEET: 7 of 8
GS ELEV.: 2667.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0	As above. *(continued)*	2427.7													
	244.0		2423.7			57	100	100	100		0 0 0 0 0		1			
245	249.0	As above.	2418.7			58	50	50	50		0 0 0 0 0		1			
250	250.0	As above.	2417.7			59	100	100	100		0		1			
	254.0	As above.	2413.7			60	100	93	100	251.2: 80.0°, JN, IR, VR, CN	0 0 0 0 0		1			
255	259.0	As above.	2408.7			61	100	100	100		0 0 0 0 0		1			
260	264.0	As above.	2403.7			62	100	100	100		0 0 0 0 0		1			
265	272.5	As above.	2395.2			63	100	90	90	266.3: 80.0°, JN, IR, VR, CN	0 0 4 0 0		1			
270	277.5	Becomes CONGLOMERATE, fresh, clast dominated, some gravel, brown, clasts consist of schist, gneiss, quartz, tuff, diabase, weak HCl reaction, competent.	2390.2			64	100	100	100		0 0 0 0 0		1			
275						65	100	88	88	274.3: 90.0°, JN, IR, VR, CN	0 0 6 0 0		1			
280						66	100	100	100		0 0 0		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-15-(GT-16)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 2, 2016 11:52
DRILLING END: December 2, 2016 11:52
COORDINATES: N: 845,116 E: 920,176

SHEET: 8 of 8
GS ELEV.: 2667.7
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index ● AX. □ DIAM. ▲ UCS (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
280	280.0		2387.7													
	282.5	Becomes CONGLOMERATE fresh, matrix dominated, some gravel and few cobbles, brown, clasts consist of schist, gneiss, quartz, tuff, diabase, moderate HCl reaction, competent. *(continued)*	2385.2			66	100	100	100		0 0 0		1			
		As above.									0 0 0 0 0					
285	287.5		2380.2			67	100	100	100		0 0 0		1			
		As above.				68	100	100	100		0 0 0		1			
290	290.0		2377.7													
		Bottom of borehole at 290.0 ft. Completed as well. Refer to diagram. Notes: 0 - 29: Hydro test #1 FHT 25 - 74: Hydro test #2 SI 80 - 124: Hydro test #3 SI 135 - 250: Hydro test #4 SI 250 - 290: Hydro test #5 SI														
295																
300																
305																
310																
315																
320																

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:30
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RECORD OF DRILLHOLE DH16-16 (GT-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 6, 2016 14:45
DRILLING END: December 6, 2016 14:45
COORDINATES: N: 845,081 E: 912,658

SHEET: 1 of 7
GS ELEV.: 2284.5
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT
0	0.0	Washed gravel, alluvium, pieces of sandstone and quartz	2284.5		HQ3	1	25	0	0		>10
	2.0	Unconsolidated alluvium rubble. sandstone, tuff, quartz, schist rubble	2282.5			2	60	0	0		>10
5	4.5	Surficial alluvium, clasts of tuff and quartz	2280.0			3	80	0	80	4.5 - 5.7: Qtz, IN >5mm, broken core with large chunk of quartz	>10
	5.0		2279.5							6.2 - 7: FLT, Sa, crushed rock with clayey sand and gravel	5
	7.0	Pinal Schist (pCpi): dark green to gray, METASANDSTONE, fine-grained, foliated and brecciated, light oxidation.	2277.5							7: 57.0°, FO, PL, SM, infill washed	>10
10						4	89	11	47	7.5: 57.0°, FO, PL, SM, FeOx, SO	4
										7.7 - 7.9: 47.0°, JN x 2 spaced at 0.2 ft, PL, SM, FeOx, SO	>10
	11.5		2273.0							8.1 - 11.5: FLT, clayey sand, IN >5mm, crushed rock, gravel	>10
	12.0	As above, rubble.	2272.5			5	100	0	0		>10
		As above.								12 - 13.5: partial iron staining, broken core along foliation	5
15						6	100	32	84	14.3: 37.0°, FO, PL, RO, Cl, CC <1mm	5
										14.8: 14.0°, JN x 2, PL, RO, FeOx, SA	3
	17.0		2267.5							15.6: 49.0°, FO, PL, RO, FeOx, CC <1mm	1
		As above.								16.1 - 16.4: 64.0°, FO x 2 spaced at 0.3 ft, PL, SM, Cl, IN <5mm	4
						7	100	36	100	17.3: 51.0°, FO, PL, RO, FeOx, SO	3
	19.5		2265.0							17.7: 56.0°, FO x 2 spaced at 0.1 ft, PL, RO, Cl, PC	>10
20		As above.				8	100	20	32	18.3 - 19.5: RO, Cl, partial iron staining, broken core along foliation	>10
	22.0		2262.5							19.5 - 20: FO, PL, SM, Cl, PC, broken core zone	5
		As above.								20.5 - 22: FO, PL, SM, Cl, PC, broken core	7
						9	67	23	43	23 - 23.7: Cl, partial iron staining, broken core, gravel	>10
25	25.0		2259.5							23.9: 74.0°, FO, PL, SM, Cl, PC	>10
		As above.								24.6: 34.0°, JN, PL, SM, Cl, PC	2
						10	83	0	77	24.8: JN, PL, SM, CN	>10
	28.0		2256.5							26.3 - 26.8: 62.0°, FO x 3, PL, SM, Cl, CC <1mm	4
		As above.								26.9: 41.0°, JN, PL, SM, Cl, PC	1
	29.5		2255.0			11	100	0	67	27.3: 16.0°, JN, PL, SM, CN	>10
30		As above.								28 - 29.5: PL, SM, Cl, PC, broken core	>10
						12	100	0	100	29.5 - 31.5: PL, SM, Cl, broken core zone, breaks along foliation with high angle joints	>10
	31.5		2253.0								>10
		Continues dark green to gray, METASANDSTONE, fault zone with rubble and plastic clay, foliated, fractured, light oxidation.				13	83	30	83		>10
	34.5		2250.0							33 - 34.5: FLT, Cl, IN >5mm, crushed rock and clay	>10
35		As above, oxidized.				14	100	0	65	35 - 36.5: FLT, Cl, IN >5mm, crushed rock, clay with gravel	>10
	36.5		2248.0								>10
		As above.				15	100	0	13	36.5 - 38: FLT, Cl, IN >5mm, crushed rock with clay	>10
	38.0		2246.5								>10
		As above.				16	40	0	0	38 - 40.5: FLT, Cl, crushed rock with clay	>10
40											>10

Log continued on next page

ISRM Strength Index: ● AX. ☐ DIAM. ▲ UCS (ksi)
R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6

ISRM WEATHERING INDEX | FAULT BRECCIA /GOUGE | BROKEN CORE /LOST CORE | BC | LC | ADVANCEMENT RATE ft/min

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-16 (GT-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 6, 2016 14:45
DRILLING END: December 6, 2016 14:45
COORDINATES: N: 845,081 E: 912,658

SHEET: 2 of 7
GS ELEV.: 2284.5
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
40	40.0		2244.5															
	40.5		2244.0			16					>10		5					
		As above.									>10							
						17	44	0	22	40.5 - 45: FLT, Cl, crushed rock with clay	>10		5					
											>10							
45	45.0		2239.5								>10							
		As above.									>10							
						18	40	10	16	45 - 49.2: FLT, Cl, crushed rock with clay	>10		5					
											>10							
50	50.0		2234.5								2		2					
		As above.									>10							
						19	71	0	17	50 - 53.5: FLT, Cl, crushed rock with clay	>10		5					
	53.5		2231.0								>10							
		As above.				20	67	0	0	53.5 - 55: FLT, Cl, crushed rock with clay, clay washed out	>10		5					
55	55.0		2229.5								>10							
		Continues dark green to gray, METASANDSTONE with quartz veining, fine grained, fault zone continues, fractured and foliated, infill washed out.				21	20	0	0	55 - 60: FLT, Cl, crushed rock with clay, clay washed out	>10		5					
											>10							
60	60.0		2224.5		HQ3						>10							
	61.0	As above.	2223.5			22	100	0	60		>10		3					
	63.0	As above.	2221.5			23	100	0	80		>10		3					
		As above.									>10							
65						24	57	0	29		>10		3					
	66.5		2218.0							65.5 - 66.5: VN, Qtz, IN >5mm, crushed quartz vein	>10							
	68.0	As above.	2216.5			25	100	0	67	66.5 - 67.3: VN, Qtz, IN >5mm, crushed quartz vein	>10		3					
	69.5	Continues METASANDSTONE, dark green to gray, fine-grained, foliated, some oxidation, highly fractured.	2215.0			26	100	0	20		>10		3					
70		As above.									>10							
						27	100	0	72	70.5: SHR, ST, RO, CN, possibly mechanical	3		3					
	72.0		2212.5								>10							
		As above.									4							
										73.3: 54.0°, FO, PL, SM, Cl, PC	1							
						28	100	80	100	74: 43.0°, JN, PL, SM, Cl, PC	4		2					
75										74.4 - 74.7: 56.0°, JN x 3 spaced at 0.1 ft, PL, SM, Cl, CC <1mm	0							
										76: 64.0°, FO, PL, SM, Cl, CC <1mm	4							
	77.0		2207.5								0							
		As above.								76.5 - 76.8: 61.0°, FO x 3, PL, SM, CN	1							
						29	100	100	100	78.5: 84.0°, FO, PL, SM, Cl, partial iron staining, SA	0		2					
80																		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-16 (GT-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 6, 2016 14:45
DRILLING END: December 6, 2016 14:45
COORDINATES: N: 845,081 E: 912,658

SHEET: 3 of 7
GS ELEV.: 2284.5
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0	As above. *(continued)*	2204.5		HQ3	29	100	100	100	81: 68.0°, FO, PL, SM, Cl, PC	0		2		BC	
	82.0	As above.	2202.5							82.2: 82.0°, JN, PL, SM, FeOx, SA	0				LC	
										82.4: 40.0°, FO, PL, SM, FeOx, SA	4					
85						30	90	18	80	82.7 - 84.1: SM, partial iron staining, broken core along foliation	7		3			
										84.6: 70.0°, FO, PL, SM, Cl, CC <1mm	3					
	87.0	As above.	2197.5							85 - 85.9: SM, Cl, partial iron staining, PC, broken core along foliation	>10					
										85.9 - 87: FLT, crushed rock and gravel	>10					
						31	100	0	100	87 - 89.5: Cl, partial iron staining, broken core, crushed rock and gravel with clay	>10		4			
	89.5	As above.	2195.0								>10					
90						32	100	27	80	89.5 - 91: SM, broken core, crushed rock with large quartz pieces	>10		3			
	91.0	As above.	2193.5								6					
						33	100	17	100	91.2 - 91.3: 30.0°, JN x 3, PL, SM, Cl, CC <1mm	6		3			
										91.6: 43.0°, JN x 2, PL, SM, Chl, CC <1mm	>10					
	94.0	As above.	2190.5							91.9: 45.0°, FO, PL, SM, Qtz, IN <5mm	8					
95						34	100	32	100	92.6: 24.0°, JN, PL, SM, Cl, CC <1mm	3		3			
										94.7: 21.0°, JN, PL, SM, Cl, CC <1mm	7					
										95 - 95.1: 64.0°, FO x 2, PL, SM, FeOx, PC	3					
	99.0	Continues METASANDSTONE, dark green to gray, fine-grained, foliated, jointed, little to no oxidation.	2185.5							95.7: 56.0°, FO, PL, RO, Cl, CC <1mm	9					
										96.2 - 97.1: 73.0°, FO x 5, PL, SM, Cl, CC <1mm	3					
100						35	100	83	100	97.6 - 99: Cl, partial iron staining, broken core, random sets	1		3			
										99.3 - 99.6: 64.0°, JN x 2, PL, SM, Cl, CC <1mm, weak rock	1					
	102.0	As above.	2182.5							99.8: 71.0°, JN, PL, SM, FeOx, SO	0					
										100.5: 36.0°, JN, PL, SM, FeOx, SO	3					
						36	100	66	100	101.6: 21.0°, JN, UN, RO, CN	2		2			
105										103.3 - 103.7: 77.0°, JN x 3, PL, SM, FeOx, SA	4					
										104.3: 79.0°, JN, CU, SM, Cl, PC	7					
	107.0	As above.	2177.5							104.9: 33.0°, JN, PL, SM, Cl, CC <1mm	>10					
										105.1 - 105.6: FLT, SM, Cl, IN >5mm	>10					
						37	100	0	100	105.7: 44.0°, JN, PL, SM, Cl, CC <1mm	>10		3			
110										107: 60.0°, JN, PL, SM, FeOx, SO	>10					
										107.6 - 111: SM, Cl, CC <1mm, broken core zones random sets	>10					
	111.0	As above.	2173.5								>10					
											0					
						38	100	36	89	113.2: 57.0°, JN, PL, SM, Cl, PC	5		3			
										113.7: 71.0°, JN, PL, SM, Cl, CC <1mm	5					
115										114.3: 75.0°, JN, PL, SM, Cl, CC <1mm	5					
	115.5	As above foliated, highly fractured.	2169.0							114.7: 53.0°, JN, PL, SM, Cl, CC <1mm	>10					
						39	67	0	67	115.5 - 118.5: SM, Cl, CC <1mm, broken core	>10		3			
	118.5	As above, quartz veins.	2166.0								>10					
120						40	80	0	60	118.5 - 121: SM, Cl, CC <1mm	>10		3			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-16 (GT-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 6, 2016 14:45
DRILLING END: December 6, 2016 14:45
COORDINATES: N: 845,081 E: 912,658

SHEET: 4 of 7
GS ELEV.: 2284.5
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
120	120.0		2164.5															
	121.0	As above, quartz veins. *(continued)*	2163.5			40	80	0	60		>10		3					
		As above, quartz veins.				41	75	0	30	121 - 125: SM, Cl, CC <1mm, broken core	>10 >10 >10 >10		3					
125	125.0		2159.5															
	126.0	As above.	2158.5			42	100	0	40	125 - 126: SM, Cl, CC <1mm, broken core	>10		3					
		As above.				43	100	0	91	126 - 128.1: SM, Cl, CC <1mm, broken core 128.5: 40.0°, JN, PL, SM, Cl, CC <1mm	>10 >10 3		3					
	129.5		2155.0							128.7: 56.0°, FO, PL, SM, Cl, full iron staining, CC <1mm	>10							
130		As above.				44	100	0	100	129 - 129.5: SM, Cl, CC <1mm, broken core 129.5 - 132: SM, Cl, CC <1mm, broken core	>10 >10		4					
	132.0		2152.5															
		Continues METASANDSTONE, dark green to gray, fine-grained, foliated, highly fractured, lost and broken core, possibly fault zone with infill washed out.				45	50	13	38	132 - 134.5: SM, Cl, CC <1mm, broken core 135.1: 45.0°, JN, PL, SM, CN 135.5: 42.0°, JN, PL, SM, FeOx, PC	>10 >10 5 4 >10		3					
135	136.0		2148.5															
	139.0	As above, highly fractured.	2145.5			46	100	27	100	136 - 138.2: SM, Cl, PC, broken core	>10 >10 1		3					
140		As above.			HQ3	47	100	50	100	140 - 140.9: SM, Cl, broken core	0 >10 0		3					
	142.0		2142.5															
	143.0	As above, quartz veins.	2141.5			48	100	0	40	142 - 143: SM, Chl, PC, broken core, white infill, no reaction to HCl	>10		4					
		As above, some oxidation.				49	100	36	100	143.2: 49.0°, FO, CU, SM, Cl, PC 143.4: 80.0°, JN, PL, SM, FeOx, PC 143.6 - 144.3: 36.0°, FO x 3, PL, SM, FeOx, CC <1mm 145.4 - 145.7: 74.0°, JN x 3, PL, SM, Cl, PC 146 - 148: SM, Cl, full iron staining, broken core zone, includes quartz	4 1 3 >10 >10		3					
145	148.0		2136.5															
		As above.				50	50	0	50	148 - 152: SM, Cl, partial iron staining, broken core zone, some quartz	>10 >10 >10		4					
150	152.0		2132.5															
	154.0	As above.	2130.5			51	100	0	70	152 - 154: 15.0°, FO, SM, Cl, partial iron staining, CC <1mm, broken core, primarily high angle foliation	>10 >10		4					
		As above.				52	100	17	100	154 - 155.4: FO, SM, Cl, partial iron staining, CC <1mm, broken core, primarily foliation 155.6: 58.0°, FO, PL, SM, Cl, PC	>10 5 2		3					
155	157.0		2127.5															
	158.5	As above.	2126.0			53	40	0	24	155.8: 70.0°, FO, PL, SM, Cl, PC 156.3: 42.0°, FO, PL, SM, Cl, PC 156.6: 50.0°, FO, PL, SM, FeOx, SA	>10 8		5					
160		Continues METASANDSTONE, dark green to gray, fine-grained, foliated, fractured, gouge, little to no oxidation.								157 - 157.7: SM, Cl, CC	>10							

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-16 (GT-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 6, 2016 14:45
DRILLING END: December 6, 2016 14:45
COORDINATES: N: 845,081 E: 912,658

SHEET: 5 of 7
GS ELEV.: 2284.5
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE: DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
160	160.0	Continues METASANDSTONE, dark green to gray, fine-grained, foliated, fractured, gouge, little to no oxidation. *(continued)*	2124.5			53	40	0	24	<1mm, broken core 157.9 - 158.4: 56.0°, FO x 4, PL, SM, Cl, CC <1mm 158.5 - 162: FLT, sandy clay, IN >5mm	>10 >10		5					
	162.0	As above.	2122.5			54	100	0	67	162 - 162.9: SM, partial iron staining, broken core 163.2: 53.0°, JN, PL, SM, Cl, CC <1mm 163.4: 52.0°, JN, PL, SM, Cl, CC <1mm	>10 6 >10		4					
165	163.8 165.0	As above, becomes fault breccia and gouge, crushed rock in clay matrix.	2120.7 2119.5			55	63	0	55	163.8 - 165: FLT, Cl, IN >5mm, fault breccia, crushed rock and clay 165 - 169: FLT, Bx, crushed rock with clay matrix	>10 >10 >10 >10		5					
	169.0	As above.	2115.5			56	100	17	100	169.3: 62.0°, JN, PL, SM, FeOx, SO 169.9: 82.0°, JN, PL, SM, FeOx, SO 170: 51.0°, JN, PL, SM, FeOx, SO	2 6 3		4					
170	172.0	Becomes METASANDSTONE, dark green to gray, fine-grained, foliated, little to no oxidation, crushed zones.	2112.5			57	78	0	60	170.2 - 170.6: FLT, clay with gravel, IN >5mm 170.8 - 170.9: 77.0°, JN x 2, PL, SM, Cl, PC 171.4: 74.0°, JN, PL, SM, Cl, PC 171.6: 30.0°, JN, PL, SM, Cl, CC <1mm 172 - 175.45: 21.0°, JN x 5, PL, SM, Cl, CC <1mm	4 3 >10 >10		4					
175	176.5	As above.	2108.0			58	100	36	98	174 - 176.5: SM, Cl, broken core with clay infill 178.2: 56.0°, PL, SM, FeOx, SO 178.6: 25.0°, JN, UN, SM, Cl, CC <1mm 178.9 - 179.2: 26.0°, FLT, PL, SM, clayey gravel, IN >5mm	>10 3 5 4 2		3					
180	181.0	Becomes contact with DIABASE, highly oxidized, dark green to gray with dark red, drillers note improvement with fluid circulation.	2103.5		HQ3	59	100	88	100	180.3: 27.0°, JN, PL, SM, Cl, CC <1mm 181.9 - 182: 56.0°, FO x 2 spaced at 0.1 ft, PL, FeOx, CC <1mm 182.3: 25.0°, FO, PL, SM, FeOx, IN <5mm 183: 23.0°, FO, PL, SM, FeOx, CC <1mm	1 2 1 1		3					
185	185.0	Becomes DIABASE (Yd): dark brownish red, highly oxidized, fine to medium grained, jointed.	2099.5			60	100	96	100	184.4: 25.0°, FO, PL, SM, FeOx, IN <5mm 187.1: 54.0°, JN, PL, SM, FeOx, CC <1mm 187.3: 36.0°, JN, PL, SM, FeOx, CC <1mm 188.3: 71.0°, JN, PL, SM, FeOx, PC 188.8: 57.0°, JN, PL, SM, FeOx, PC	0 0 2 2 0 1		3					
190	190.0	As above.	2094.5			61	100	94	100	190.8: 64.0°, FO, PL, SM, Ca, PC 191.2 - 191.6: 28.0°, FO x 2, PL, SM, FeOx, CC <1mm 191.9: 36.0°, JN, PL, SM, FeOx, CC <1mm 192.9: 30.0°, FO, PL, SM, FeOx, CC <1mm 193.1: 60.0°, JN, PL, SM, FeOx, PC	3 1 1 1		2					
195	195.0	As above.	2089.5			62	100	80	100	194.5: 18.0°, JN, PL, SM, FeOx, PC	1		2					
	196.0	As above.	2088.5			63	100	80	100	195.3: 17.0°, FO, PL, SM, FeOx, PC 196.1: 18.0°, JN, PL, SM, FeOx, CC <1mm 196.3: 64.0°, JN, PL, SM, FeOx, PC 197: 74.0°, JN, PL, SM, FeOx, CC <1mm 197.2: 26.0°, JN, PL, SM,	2 2 0 0		2					
200		Log continued on next page																

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-16 (GT-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 6, 2016 14:45
DRILLING END: December 6, 2016 14:45
COORDINATES: N: 845,081 E: 912,658

SHEET: 6 of 7
GS ELEV.: 2284.5
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
200	200.0		2084.5		HQ3											
	201.0	As above. *(continued)*	2083.5			63	100	80	100	FeOx, CC <1mm 200: 62.0°, JN, PL, SM, FeOx, PC	4		2			
		As above.								200.1: 30.0°, JN, PL, SM, FeOx, CC <1mm	1					
										200.2: 77.0°, JN, PL, SM, FeOx, PC	1					
						64	100	100	100	200.5: 52.0°, JN, PL, SM, FeOx, CC <1mm	0		2			
205										201.3: 60.0°, JN, PL, SM, FeOx, IN <5mm	1					
	206.0		2078.5							202.7: 80.0°, JN, PL, SM, FeOx, PC	1					
		As above.								204.6: 21.0°, JN, IR, SM, FeOx, PC	0					
										205.6: 80.0°, JN, PL, SM, FeOx, PC	2					
										207.1: 41.0°, JN, PL, SM, FeOx, PC	1					
						65	100	90	100	207.6: 30.0°, JN, PL, SM, FeOx, PC	1		2			
210										208.8: 35.0°, JN, PL, SM, FeOx, PC	3					
										209.3: 45.0°, JN, PL, SM, FeOx, PC	1					
	211.0		2073.5							209.5: 65.0°, JN, PL, SM, FeOx, PC	1					
		As above.								209.8: 30.0°, JN, PL, SM, FeOx, PC	1					
										211.1: 13.0°, JN, PL, SM, FeOx, PC	0					
						66	100	100	100	212.9: 73.0°, JN, PL, SM, FeOx, CC <1mm	1		2			
215										214.1: 64.0°, JN, PL, SM, FeOx, CC <1mm	0					
	216.0		2068.5							216.1: 24.0°, JN, PL, SM, FeOx, PC	2					
		Continues DIABASE, dark brownish red, highly oxidized, fine to medium grained, jointed, competent.								216.8: 78.0°, JN, PL, SM, FeOx, SA	0					
										218: 22.0°, JN, PL, SM, FeOx, PC	3					
						67	100	94	100	218.8 - 219: 60.0°, JN x 2, PL, RO, Cl, CC <1mm	0		2			
220										220.3: 85.0°, JN, PL, SM, FeOx, PC	1					
	221.0		2063.5								5					
		As above.									0					
						68	100	94	94		0		2			
225										224.1: 57.0°, JN, PL, SM, FeOx, CC <1mm	4					
										224.5: 77.0°, JN, PL, RO, FeOx, PC	1					
	226.0		2058.5							224.9: 61.0°, JN, PL, RO, FeOx, CC <1mm	1					
		As above.								226.9: 60.0°, JN, PL, SM, FeOx, CC <1mm	2					
						69	100	76	100	227.9: 50.0°, JN x 2, PL, SM, FeOx, CC <1mm	1		2			
230										228.4: 51.0°, JN, PL, SM, FeOx, CC <1mm	1					
										229.6: 37.0°, JN, PL, SM, FeOx, CC <1mm	3					
	231.0		2053.5							230.2: 64.0°, JN, PL, SM, FeOx, IN <5mm	0					
		As above.								230.4 - 230.8: 44.0°, JN x 2 spaced at 0.4 ft, PL, SM, FeOx, IN <5mm	1					
										232.4: 63.0°, JN, PL, SM, FeOx, PC	2					
						70	100	96	100	233.4: 60.0°, JN, PL, SK, FeOx, PC	1		2			
235										233.6: 50.0°, JN, PL, SM, FeOx, PC	1					
	236.0		2048.5							234.6: 54.0°, JN, ST, SM, FeOx, PC	1					
		Becomes some calcite veining.								235.4: 54.0°, JN, PL, SM, FeOx, SA	1					
						71	100	100	100	236.2: 50.0°, JN, PL, SM, FeOx, SA	1		2			
	239.0		2045.5							237.1: 26.0°, JN, PL, SM, FeOx, PC	1					
240						72	100	93	100	238: 54.0°, JN, PL, SM, Ca, IN <5mm	2		2			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-16 (GT-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 6, 2016 14:45
DRILLING END: December 6, 2016 14:45
COORDINATES: N: 845,081 E: 912,658

SHEET: 7 of 7
GS ELEV.: 2284.5
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0	Continues DIABASE, dark brownish red, highly oxidized, fine to medium grained, jointed. *(continued)*	2044.5		HQ3	72	100	93	100	239.3: 70.0°, JN, PL, SM, FeOx, PC 239.4: 79.0°, JN, PL, SM, FeOx, PC	0 0		2			
	242.0	As above.	2042.5								0					
245						73	100	100	100	243.9: 69.0°, JN, PL, SM, FeOx, SA 244.6: 57.0°, JN, PL, SM, FeOx, PC 245.2: 75.0°, JN, PL, SM, FeOx, PC 245.8: 73.0°, JN, PL, SM, FeOx, PC	1 2 2 1		2			
	247.0	As above.	2037.5													
250	250.0	Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram. Notes: 0 - 17: Hydro test #1 FHT 5 - 185: Drillers noticed some circulation loss throughout zone. 17 - 77: Hydro test #2 SI & CRI 113 - 142: Hydro test #3 SI & CRI 183 - 250: Hydro test #4 SI	2034.5			74	100	100	100	246.5: 25.0°, JN, PL, SM, FeOx, PC 247.8 - 248.1: 79.0°, JN x 2, PL, SM, FeOx, SO 249.2: 54.0°, JN, PL, SM, Ca, PC 249.7: 35.0°, JN, PL, SM, FeOx, SO	1 1 2		2			
255																
260																
265																
270																
275																
280																

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-16 (GT-2)
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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-17-(GT36)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 6, 2016 13:50
DRILLING END: December 6, 2016 13:50
COORDINATES: N: 851,184 E: 924,180

SHEET: 1 of 6
GS ELEV.: 2671.9
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
0	0.0	Pinal Schist (pCpi): grayish orange, SCHIST, foliated, completely weathered, very highly fractured and argillized, some iron staining.	2671.9							0 - 4: weathered to clay						
	4.0		2667.9													
5		As above, clayey.				1	75	75	75	4 - 6: regolith	>10		5			
	6.0		2665.9								>10					
		As above.									>10					
						2	100	100	100	6 - 9: FLT, crushed, gougey	>10		5			
	9.0		2662.9								>10					
10		As above, rubbly.									>10					
						3	77	0	0	9 - 12.5: FLT, full iron staining, brecciated, clayey coatings	>10		5			
	12.5		2659.4							12: 45.0°, JN, IR, VR, FeOx, partial iron staining, CC <1mm	>10					
		As above.				4	100	0	27	12.5 - 14: FLT, partial iron staining, brecciated and crushed, sheared	7		4			
	14.0		2657.9								>10					
15		As above, rubble.									>10					
						5	34	0	0	14 - 19: FLT, partial iron staining, rubble	>10		5			
	19.0		2652.9								>10					
		As above, rubble.									>10					
20											>10					
						6	20	0	0	19 - 24: FLT, partial iron staining, breccia and clayey gouge, poor recovery	>10		5			
	24.0		2647.9							23.6: 30.0°, FLT, PL, SK, G, CC <1mm	>10					
25		Continues SCHIST, fault zone, reddish gray, highly weathered, foliated, some oxidation, gougey zones, few calcite veins.				7	65	0	30	24 - 25.5: FLT, clayey gouge	>10		4			
	26.0		2645.9								6					
		As above, rubble.									>10					
						8	25	0	0	26 - 28: FLT, full iron staining, soft clayey gouge and breccia	>10		5			
	28.0		2643.9													
	29.0	As above.	2642.9			9	30	0	0	28 - 29: FLT, rubble	>10		5			
30		As above.									>10					
						10	75	0	15	29 - 31: FLT, broken rock and rubble	>10		4			
	31.0		2640.9													
		As above.				11	100	67	67	31.5: 45.0°, JN, PL, SM, Ca, CC <1mm	2		3			
	32.5		2639.4							32.2: 45.0°, JN, PL, RO, Ca, CC <1mm	2					
		As above.									0					
35						12	95	88	88	34.3 - 36: 60.0°, JN x 3 spaced at 0.6 ft, PL, SM, Ca, partial iron staining, CC <1mm	2		3			
	36.5		2635.4								1					
		As above.									3					
	38.0		2633.9			13	67	0	20	36.5 - 38: FLT, partial iron staining, brecciated and crushed rock	>10		3			
		Continues SCHIST, green to greenish gray, foliated, rubbly with corestones, calcified, weak HCl reaction, large quartz														
40	40.0		2631.9			14	50	15	15	38 - 40: FLT, partial iron staining, quartz rubble and breccia	>10		3			
											6					

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-17-(GT36)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 6, 2016 13:50
DRILLING END: December 6, 2016 13:50
COORDINATES: N: 851,184 E: 924,180

SHEET: 2 of 6
GS ELEV.: 2671.9
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE: DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6 (ksi)	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
40	40.0	vein, poor recovery.	2631.9															
		As above.				15	75	25	25	41 - 42: FLT, partial iron staining, fractured rock	4 >10		2					
	42.0		2629.9															
		As above.				16	85	30	40	42 - 44: FLT, broken rock	6 6		2					
	44.0		2627.9															
45		As above.				17	87	40	40	44 - 46: FLT, broken rock	5 8		2					
	45.5		2626.4															
		As above.				18	92	48	56	46.3: 43.0°, JN, PL, SM, Ca, CC <1mm 46.8: 65.0°, JN, PL, RO, Ca 47.5: 55.0°, JN, PL, RO, Ca, CC <1mm	2 1		2					
	48.0		2623.9															
		As above.									>10							
50						19	33	18	18	48 - 52: FLT, partial iron staining, rubble and gouge	>10 >10 6		3					
	52.0		2619.9															
		As above, rubble.				20	25	0	0	52 - 54: FLT, crushed rock	>10 >10		5					
	54.0		2617.9															
55		As above.				21	77	50	67	55.5 - 57: FLT, partial iron staining, fractured and crushed rock	6 1 8		2					
	57.0		2614.9															
		Continues SCHIST green to greenish gray, foliated, moderate iron staining, weak HCl reaction, rubble throughout.				22	100	0	0	57 - 59: FLT, partial iron staining, crushed, brecciated	>10 >10		3					
	59.0		2612.9															
60		As above.				23	100	20	20	59 - 60.5: FLT, full iron staining, brecciated and broken rock	>10 7		3					
	60.5		2611.4															
		As above.				24	90	40	40	60.5 - 62.5: FLT, partial iron staining, broken rock 62: 40.0°, JN, PL, SM, Ca, CC <1mm	7 5		2					
	62.5		2609.4															
		As above.				25	100	67	100		2		2					
	64.0		2607.9															
65		As above.				26	60	32	32	64 - 65: FLT, broken rock 65.4: 70.0°, JN, PL, RO, CN	>10 5		2					
	66.5		2605.4								6							
		As above.				27	63	29	29	66.5 - 70: FLT, broken rock	6 5		2					
70	70.0		2601.9								>10							
		Continues SCHIST, green to greenish gray, foliated and fractured throughout, some oxidation, some calcite/quartz veins, moderate HCl reaction, rubbly and broken, poor recovery.				28	57	11	11	70 - 73.5: FLT, partial iron staining, rubble	>10 >10 >10		4					
	73.5		2598.4															
		As above.				29	100	76	76		2 1		2					
75	76.0		2595.9															
		As above.				30	30	0	0		>10 >10		4					
	78.0		2593.9							77.5 - 78: FLT, rubble								
		As above.				31	90	70	70	79.4: 75.0°, FLT, PL, SK,	0 3		2					
80	80.0		2591.9															

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-17-(GT36)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 6, 2016 13:50
DRILLING END: December 6, 2016 13:50
COORDINATES: N: 851,184 E: 924,180

SHEET: 3 of 6
GS ELEV.: 2671.9
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0		2591.9				20 40 60 80	20 40 60 80	20 40 60 80							
	81.0	As above, some broken core.	2590.9			32	100	50	70	Bx, partial iron staining, IN <5mm 80.5 - 81: FLT, rubble	6		2			
	84.0	As above, rubble zones.	2587.9			33	67	57	57		>10 0 0		2			
85	88.0	As above.	2583.9			34	90	75	75	84 - 84.5: FLT, partial iron staining, crushed rock	>10 0 0 0		2			
	90.0	As above.	2581.9			35	80	0	15	88.5: 30.0°, JN, IR, VR, CN 88.6 - 90.5: FLT, rubble	>10 >10		3			
90	91.5	As above.	2580.4			36	100	33	67	90.3: 70.0°, JN, IR, RO, CN 90.9: 65.0°, JN, PL, RO, CN, partial iron staining	7 8		2			
	94.0	As above.	2577.9			37	88	52	56	91.2: 65.0°, JN, PL, VR, CN 91.4: 40.0°, PL, SM, CN, partial iron staining 91.5: 37.0°, JN, PL, SM, CN, partial iron staining	4 7		2			
95	96.5	As above.	2575.4			38	92	24	60	92.2: 53.0°, JN, PL, RO, CN 92.6: 80.0°, JN, PL, RO, CN 92.9: 88.0°, JN, PL, VR, CN 93.3: 70.0°, JN, PL, SM, CN 94.2: 72.0°, JN, PL, VR, CN	3 2		3			
	99.0	Continues SCHIST, greenish gray to brown, foliated and brecciated texture, moderately fractured, veining, calcified, some iron staining, moderate HCl reaction.	2572.9			39	80	40	68	94.8: 63.0°, JN, PL, SM, CN 94.9: 60.0°, JN, PL, SM, CN 95.1: 50.0°, JN, ST, SM, CN 95.4: 85.0°, JN, PL, RO, CN, partial iron staining 97.3: 85.0°, JN, PL, RO, CN, partial iron staining	4 3 4		3			
100	102.0	As above.	2569.9			40	87	77	77	97.6: 80.0°, JN, PL, RO, CN, partial iron staining 98: 64.0°, JN, PL, SM, CN 98.2 - 98.4: 45°, FLT, IR, VR, Bx 98.6: 85.0°, JN, PL, VR, CN, partial iron staining	5 2 0		3			
	104.0	As above.	2567.9			41	60	0	0	99.6: 10.0°, JN, PL, SM, CN 100: JN, PL, VR, CN 100.8: 75.0°, JN, PL, RO, CN	>10 >10		3			
105	106.0	As above.	2565.9			42	65	35	65	102 - 104: FLT, broken rock 104.9: 70.0°, JN, PL, RO, CN 105.2: 60.0°, JN, PL, RO, CN	6 2		3			
	107.5	As above.	2564.4			43	87	0	20	105.4: 25.0°, JN, PL, RO, CN	>10		3			
	109.5	As above, folded.	2562.4			44	75	20	45	106 - 107.5: FLT, broken rock 107.7: 35.0°, JN, CU, SM, CN	>10 6		2			
110	111.0	As above.	2560.9			45	87	0	20	108.1: 55.0°, JN, PL, SM, CN 108.3: 55.0°, JN, PL, SM, CN	>10 >10		2			
	113.5	As above.	2558.4			46	100	40	52	112.2: 45.0°, JN, IR, RO, CN, partial iron staining 113: 15.0°, JN, PL, SM, CN, partial iron staining	0 >10 >10		3			
115	115.5	As above.	2556.4			47	85	30	70	113.8: 75.0°, JN, IR, RO, CN 113.1 - 115.5: FLT, breccia and gouge	3 7		3			
	117.5	As above.	2554.4			48	100	15	75	114.4: 70.0°, JN, PL, SM, CN 114.5: 80.0°, JN, PL, RO, CN 114.8: 90.0°, JN, PL, RO, CN	4 8		3			
120		As above.				49	73	20	35	116: 45.0°, JN, PL, VR, CN, partial iron staining 115.5 - 117.5: FLT, rubble 116.5: 50.0°, PL, SM, CN	10 5		3			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-17-(GT36)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 6, 2016 13:50
DRILLING END: December 6, 2016 13:50
COORDINATES: N: 851,184 E: 924,180

SHEET: 4 of 6
GS ELEV.: 2671.9
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
120	120.0		2551.9															
	121.5	As above. *(continued)*	2550.4			49	73	20	35	117.1: 40.0°, JN, PL, SM, CN 117.5 - 119.5: FLT, breccia 119.4: 83.0°, JN, PL, SM, CN	>10 >10		3				
	124.0	Continues SCHIST, dark green to greenish gray, foliation is subvertical and curving, fractured, light oxidation, weak HCl reaction.	2547.9			50	52	0	48	120.1: 55.0°, JN, PL, RO, CN 120.3: 82.0°, JN, IR, RO, CN, partial iron staining	>10 4		2				
125		As above.				51	91	37	49	120.31 - 121.5: FLT, broken and brecciated rock 122.7: 35.0°, JN, PL, SM, CN 122.8: 50.0°, JN, PL, SM, CN	>10 3 4		2				
	127.5		2544.4							123.4: 5.0°, FO, CU, SM, CN	>10						
		As above, brecciated and crushed.				52	90	0	13	124.4: 45.0°, JN, PL, SM, CN, partial iron staining 124 - 125: FLT, broken rock 126.1: 45.0°, JN, PL, SM, CN	>10 >10		3				
130	130.5		2541.4							126.3: 50.0°, JN, PL, SM, CN	>10						
	132.0	As above.	2539.9			53	100	0	0	127.1: 75.0°, JN, PL, SM, CN, partial iron staining	>10		2 - 3				
	133.0	As above, broken core.	2538.9			54	50	0	0	129.4 - 131: FLT, crushed rock	>10		3				
		As above, brecciated.				55	87	0	10	130.9: 45.0°, JN, PL, RO, CN, full iron staining 130.95: 60.0°, JN, PL, SM, CN, partial iron staining 131.4: 30.0°, JN, PL, SM, CN, partial iron staining 132 - 133: FLT, broken rock	4 >10 >10		3				
135	136.0		2535.9							133.2: 75.0°, JN, PL, SM, CN	7						
	139.5	As above, moderately fractured.	2532.4			56	91	34	63	134: 30.0°, JN, PL, SM, CN, partial iron staining 134.9: 45.0°, JN, PL, RO, CN, partial iron staining 134.5 - 136: FLT, broken rock	4 4		2				
140	140.5	As above, highly fractured.	2531.4			57	100	0	0	136.5: 80.0°, JN, PL, SM, CN 136.7: 90.0°, JN, PL, SM, CN	8 >10		3				
	143.5	As above, moderately fractured.	2528.4			58	77	27	63	136.9: 75.0°, JN, PL, SM, CN 137.5: 45.0°, JN, PL, SM, CN, partial iron staining 137.7: 35.0°, JN, PL, SM, CN, partial iron staining	5 4 5		3				
145		As above, no iron staining.				59	90	56	66	138.3: 50.0°, JN, PL, SM, CN 138.6: 15.0°, JN, PL, SM, CN, partial iron staining 138.8: 45.0°, JN, PL, SM, CN, partial iron staining 139.5 - 141: FLT, rubble	3 5 2		2				
	148.5		2523.4							141.6: 80.0°, JN, PL, SM, CN 141.7: 65.0°, JN, UN, SM, CN	>10 >10						
150		As above.				60	100	56	90	142.3: 70.0°, JN, PL, SM, CN 142.4: 80.0°, JN, IR, SM, CN 142.7: 90.0°, JN, PL, RO, CN	2 2		3				
	151.3		2520.6							143.3: 60.0°, JN, PL, RO, CN	>10						
	153.5	FAULT ZONE, crushed rock with clayey gouge, moderate iron staining, extremely weak.	2518.4							143.7 - 146.4: 85.0°, x 7 spaced at 0.3 ft, PL, SM, CN	>10		5				
155		As above.								145.3: 45.0°, JN, UN, SM, CN 145.8: 60.0°, JN, IR, RO, CN	>10 >10						
	158.5		2513.4			61	24	0	0	147 - 148.5: FLT, crushed, gougey rock 149.4: 75.0°, FLT, PL, SK, Bx, partial iron staining, IN <5mm	>10 >10		5				
		As above, becomes greenish gray.								149.7: 70.0°, JN, PL, SM, CN 150.7: 90.0°, JN, PL, SM, CN	>10 >10						
160						62	100	0	0	151.3 - 158.5: FLT, G,			5				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-17-(GT36)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 6, 2016 13:50
DRILLING END: December 6, 2016 13:50
COORDINATES: N: 851,184 E: 924,180

SHEET: 5 of 6
GS ELEV.: 2671.9
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (ksi): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
160	160.0		2511.9															
	160.5		2511.4			62				crushed rock and clayey gouge	>10		5					
		Becomes faulted SCHIST, dark gray to greenish gray, foliated, crushed, and brecciated, weak HCl reaction.								158.5 - 160.5: FLT, gouge and crushed rock	>10							
						63	57	0	0	160.5 - 164: FLT, broken rock	>10		4					
	164.0		2507.9								>10							
165		As above.								164.3: 40.0°, JN, IR, RO, CN	4							
						64	86	31	31	165: 50.0°, JN, IR, RO, CN	5		3					
										164 - 167.5: FLT, broken rock								
										166.2: 70.0°, FLT, PL, SM, G, IN <5mm	7							
	167.5		2504.4								>10							
		As above.								168: 45.0°, JN, PL, SM, CN								
										168.7: 90.0°, JN, IR, VR, CN	>10							
170						65	67	0	9	169.5: 50.0°, JN, PL, RO, CN	5		4					
										167.5 - 172: FLT, broken rock	>10							
	172.0		2499.9								>10							
		Becomes SCHIST, corestones with breccia and crushed rock, foliated, brecciated texture, weak HCl reaction,								172: 45.0°, JN, PL, SM, CN								
						66	100	65	65	172.8: 60.0°, JN, IR, RO, CN	2		2					
	174.0	quartz veining.	2497.9							173.6: 90.0°, JN, IR, RO, CN	4							
175		As above.								173.7 - 174.5: FLT, brecciated	>10							
						67	66	29	29	175.7: 40.0°, JN, PL, SM, CN, partial iron staining	7		2					
										176.3: 80.0°, JN, IR, RO, CN, partial iron staining	3							
	177.5		2494.4							176.7: 40.0°, JN, PL, SM, CN	>10							
		As above.									>10							
						68	83	20	43	178.2 - 179.5: FLT, brecciated	>10		4					
180										179.2: 50.0°, JN, PL, RO, CN	>10							
	181.5		2490.4								>10							
		Continues SCHIST, dark gray to greenish gray, foliated, crushed and brecciated throughout, gouge zones, weak HCl reaction, few large pieces of quartz.				69	100	0	0	181 - 183: FLT, brecciated	>10		4					
	183.0		2488.9															
	184.5	As above, massive quartz vein.	2487.4							183.9: 60.0°, JN, PL, VR, CN, quartz boulder	1							
185		As above, crenulated, small zones of breccia.								184.5: 45.0°, JN, IR, VR, CN, quartz boulder	1							
						70	92	82	82	185.4: 35.0°, FLT, PL, SM, G, IN >5mm	2		2					
										186.1: 50.0°, JN, IR, RO, CN	2							
	188.0		2483.9							186.7: 60.0°, JN, IR, VR, CN	0							
		As above.								188: 40.0°, PL, RO, CN								
										188.5: 45.0°, FLT, PL, Bx, IN >5mm	5							
190						71	78	10	10		>10		4					
										188.4 - 192: FLT, brecciated	>10							
	192.0		2479.9								>10							
		As above.																
						72	100	85	100	192.7: 45.0°, PL, SM, CN, partial iron staining	2		2					
	194.0		2477.9							192.9: 45.0°, JN, PL, SM, CN	1							
195		As above.								193.6: 60.0°, JN, PL, RO, CN	0							
										195.4: 40.0°, JN, PL, SM, CN	2							
						73	100	84	84	195.6: 40.0°, JN, PL, SM, CN, partial iron staining	1		2					
										197.3: 75.0°, JN, IR, RO, CN	3							
	199.0		2472.9							197.7: 45.0°, FLT, PL, SM, G, IN <5mm	5							
200		Bottom of borehole at 199.0 ft. Completed as well. Refer to diagram.								198: 45.0°, FLT, PL, SM, G, IN <5mm								

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-17-(GT36)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 6, 2016 13:50
DRILLING END: December 6, 2016 13:50
COORDINATES: N: 851,184 E: 924,180

SHEET: 6 of 6
GS ELEV.: 2671.9
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi)	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE (BC / LC)	ADVANCEMENT RATE ft/min
200	200.0		2471.9							198.5: 55.0°, JN, PL, SM, CN		R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6				

Notes:
0 - 38: Hydro test #1 FHT
39 - 70: Hydro test #2 SI
70 - 139.5: Hydro test #3 SI
140 - 199: Hydro test #4 SI

205
210
215
220
225
230
235
240

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF BOREHOLE DH16-18 (GT-35)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 8, 2016 09:14
DRILLING END: December 11, 2016 14:26
COORDINATES: N: 842,319 E: 909,644

SHEET: 1 of 7
GS ELEV.: 2222.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLES SAMPLE TYPE & NUMBER	BLOWS per 6 in (Automatic hammer 140 lb Hammer, 30 inch drop)	REC / ATT (in)	PENETRATION RESISTANCE BLOWS / ft (20 40 60 80) WATER CONTENT (%) (W_p W W_l) (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
0		0.0	(SW), SAND, well graded, fine to coarse; quartz, schist gravel; unconsolidated alluvium, washed gravel,	2222.0	SW						0 - 24: Hydro test #1 FHT	
5		5.0		2217.0								
		7.5	(SW-SC), SAND, well graded, fine to coarse subrounded to subangular gravel, some medium plasticity fines, dark brown-red, weathered; loose, moist	2214.5	SW-SC		SS S-1	8-10-11	12/18			
10		12.2	(SW-SC), SAND, well graded, some medium plasticity fines, trace fine rounded to subrounded gravel, dark brown, weathered; compact, moist, 5-11-16-41-50/2" (3" spacing)	2209.8	SW-SC		SS S-2	16-57-50	12/14			
		13.5	(SW-SC), SAND, well graded, fine to coarse subrounded to subangular gravel, some plasticity fines; washed gravel. estimated from S-2	2208.5	SW-SC							
15		15.5	Pinal Schist (pCpi): dark greenish grey, METASANDSTONE, foliated, highly weathered, some oxidation.	2206.5								
			As above.									
20		20.5		2201.5								
		22.0	As above.	2200.0								
		24.0	As above.	2198.0								
25		27.0	As above.	2195.0							27 - 80.5: Hydro test #2 SI	
		31.0	As above.	2191.0								
30												
35		35.0	As above.	2187.0								
		38.0	As above.	2184.0								
40												

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 15:40
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RECORD OF DRILLHOLE DH16-18 (GT-35)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 8, 2016 09:14
DRILLING END: December 11, 2016 14:26
COORDINATES: N: 842,319 E: 909,644

SHEET: 1 of 7
GS ELEV.: 2222.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
0	0.0	(SW), SAND, well graded, fine to coarse; quartz, schist gravel; unconsolidated alluvium, washed gravel,	2222.0													
						1	20	0	0							
5	5.0		2217.0													
		(SW-SC), SAND, well graded, fine to coarse subrounded to subangular gravel, some medium plasticity fines, dark brown-red, weathered; loose, moist				2	70	0	0							
	7.5		2214.5													
		(SW-SC), SAND, well graded, some medium plasticity fines, trace fine rounded to subrounded gravel, dark brown, weathered; compact, moist, 5-11-16-41-50/2" (3" spacing)				3	20	0	0							
10																
	12.2		2209.8													
	13.5	(SW-SC), SAND, well graded, fine to coarse subrounded to subangular gravel, some plasticity fines; washed gravel. estimated from S-2	2208.5			4	67	0	44		>10		5			
											>10					
15	15.5	Pinal Schist (pCpi): dark greenish grey, METASANDSTONE, foliated, highly weathered, some oxidation.	2206.5							13.5 - 15.5: FLT, Cl, fault breccia, highly weathered rock	>10					
		As above.									>10					
											>10					
						5	80	0	80	15.5 - 20.5: FO, PL, SM, Cl, IN <5mm, highly foliated zone	>10		5			
20											2					
	20.5		2201.5								>10					
		As above.				6	100	0	100	20.5 - 22: SM, Cl, CC <1mm, broken core zone	>10		4			
	22.0		2200.0													
		As above.				7	50	0	50	22 - 24: SM, Cl, partial iron staining, CC <1mm, broken core zone	>10		4			
	24.0		2198.0								>10					
25		As above.									5					
						8	83	13	83	25: 41°, JN, PL, SM, Cl, CC <1mm	5		3			
										25.5: 53°, JN, PL, SM, FeOx, SO	4					
	27.0		2195.0							25.6: 26°, JN, CU, SM, Cl, PC						
		As above.								26.5: 18°, JN, PL, SM, Cl, PC	1					
						9	88	53	88	27.9: 57°, JN, PL, SM, FeOx, SO	>10		4			
30										28.5 - 28.9: FLT, SM, G, IN >5mm	0					
	31.0		2191.0							30 - 31: 28°, FO x 10, PL, SM, Cl, full iron staining, CC <1mm	>10					
		As above.									>10					
						10	75	10	63	31 - 33.9: SM, Cl, partial iron staining, CC <1mm, broken core zone	>10		4			
											8					
35	35.0		2187.0							34.3 - 35: SM, Cl, partial iron staining, CC <1mm, broken core zone	7					
		As above.									>10					
						11	33	0	7		>10		5			
	38.0		2184.0								>10					
		As above.				12	100	0	100	38 - 42: FO, PL, SM, Cl, partial iron staining, CC <1mm, highly foliated but not open fractures	>10		5			
40											>10					

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-18 (GT-35)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 8, 2016 09:14
DRILLING END: December 11, 2016 14:26
COORDINATES: N: 842,319 E: 909,644

SHEET: 2 of 7
GS ELEV.: 2222.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6 (ksi)	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0		2182.0													
		As above. *(continued)*				12	100	0	100	38 - 42: FO, PL, SM, Cl, partial iron staining, CC <1mm, highly foliated but not open fractures	>10		5			
	42.0		2180.0								>10					
		As above.				13	100	94	100	42.3: 31°, JN, PL, SM, Cl, PC	2		4			
										42.8: 63°, JN, PL, SM, Cl, PC	1					
45										43.3: 38°, JN, PL, SM, Cl, PC	0					
										44.4: 41°, FO, PL, SM, Cl, partial iron staining, PC	1					
	47.0		2175.0							45.9: 66°, JN, PL, SM, Cl, PC	2					
		As above.				14	72	66	72	46.2: 33°, FO, PL, SM, Cl, CC <1mm	>10		4			
										48.7: 18°, FO, PL, SM, Cl, PC	6					
50										50: 53°, FO, PL, SM, Cl, partial iron staining, PC	2					
										50.2: 36°, FO, PL, SM, FeOx, SA	3					
	52.0		2170.0							51 - 51.4: 47°, FO x 2 spaced at 0.4 ft, PL, SM, FeOx, SA	1					
		As above.				15	50	0	0	52 - 54: FLT, SM, G, full iron staining, broken core, brecciated zone	>10		4			
	54.0		2168.0							54.4: 42°, JN, PL, SM, Cl, CC <1mm	>10					
55		As above.				16	100	37	100	55.1 - 55.2: 60°, FO x 2 spaced at 0.1 ft, PL, SM, Cl, PC	1		4			
	57.0		2165.0							55.6 - 57: FLT, crushed rock, quartz, clayey sand infill	5					
	58.0	Pinal Schist (pCpi): quartz vein with some oxidation.	2164.0			17	100	100	100	57 - 57.6: VN, PL, Qtz, IN >5mm, hard infill	>10		2			
		Pinal Schist (pCpi): dark greenish grey, METASANDSTONE, with quartz, foliated, some oxidation.								58.9 - 59.4: 68°, JN x 3, PL, SM, FeOx, PC	1					
60						18	100	50	100	59.8: 48°, JN, PL, SM, Cl, PC	3		3			
										60.2 - 60.6: 74°, FLT, PL, SM, G, IN >5mm	3					
	62.0		2160.0							61.2: 54°, JN, PL, SM, Cl, PC	4					
		As above.				19	100	36	100	61.5: 53°, JN, PL, SM, Cl, PC	2		3			
	64.5		2157.5							62.4: 54°, JN, PL, SM, CN	2					
65		As above.				20	100	100	100	63 - 63.5: 24°, FO x 5, PL, SM, Cl, PC	6		3			
	66.3		2155.7							63.9 - 64: 60°, JN x 2, PL, SM, Cl, CC <1mm	1					
		As above, becomes brecciated.				20	100	0	100	66.3 - 68: FLT, partial iron staining, IN >5mm, crushed rock and clay	0		3			
	68.0		2154.0							68.2: 8°, JN, PL, SM, FeOx, CC <1mm	>10		5			
		Pinal Schist (pCpi): dark greenish grey, METASANDSTONE, foliated, minor oxidation.								69: 47°, JN, PL, SM, CN	>10					
70						21	100	53	100	69.5: 65°, JN, PL, SM, Cl, PC	2		3			
										70.2: 72°, JN, PL, SM, CN	1					
										70.8: 46°, JN, PL, RO, CN	2					
	72.0		2150.0							71.3: 38°, JN, PL, SM, Cl, PC	3					
		As above.				22	100	17	100	72.6: 18°, FO, PL, SM, Cl, CC <1mm	2		4			
										73.4 - 73.8: FLT, SM, Cl, partial iron staining, IN >5mm	5					
75											3					
	75.5		2146.5								10					
		As above, some oxidation.				23	100	70	100	75.5 - 77: FO, PL, SM, FeOx, SA, primarily foliation	2		3			
											2					
										78.2: 33°, JN x 2, PL, SM, Cl, CC <1mm	3					
80										79: 83°, JN, PL, SM, FeOx, PC	2					

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-18 (GT-35)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 8, 2016 09:14
DRILLING END: December 11, 2016 14:26
COORDINATES: N: 842,319 E: 909,644

SHEET: 3 of 7
GS ELEV.: 2222.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0		2142.0														
	80.5		2141.5			23				79.5: 12°, FO, PL, SM, Cl, CC <1mm	1		3				
		As above.				24	100	48	100	79.3 - 79.8: 27°, FO x 2, PL, SM, Cl, full iron staining, CC <1mm 80.7: 48°, JN, PL, SM, FeOx, SA	4 2		3				
	83.0		2139.0														
		As above.				25	100	25	100	81.1: 24°, JN, PL, SM, FeOx, SA 81.4: 14°, JN, PL, SM, FeOx, PC 81.6: 26°, JN, PL, SM, FeOx, SA 81.9: 24°, JN, PL, SM, FeOx, SA 82.1: 44°, JN, PL, SM, CN	2 2 2 2		3				
85	87.0		2135.0														
		As above.				26	100	0	100	82.7: 44°, JN, PL, SM, CN 83.5: 35°, JN, PL, SM, FeOx, SA 83.6: 41°, JN, PL, SM, FeOx, CC <1mm	3 1		3				
	89.0		2133.0														
		As above, high angle joints sub-parallel to core axis.				27	100	0	100	84.2: 84°, JN, PL, SM, FeOx, SA 85: 40°, JN, PL, SM, FeOx, SA	5 6		3				
90	91.5		2130.5														
		Pinal Schist (pCpi): dark greenish grey, METASANDSTONE, fine grained, highly foliated, some oxidation.				28	100	23	100	85.1: 47°, JN, PL, SM, FeOx, PC 85.2: 16°, FO, PL, SM, FeOx, SA 86.3: 11°, FO, PL, SM, FeOx, SA 87.5 - 87.9: 44°, JN x 2, PL, SM, Cl, CC <1mm	>10 6 5 6		4				
	94.5		2127.5														
95		As above.				29	86	40	86	87 - 89: 10°, JN x 3, PL, SM, FeOx, PC, near parallel fractures 89.7: 73°, JN, PL, SM, FeOx, PC 90: 49°, JN, PL, SM, FeOx, SA	4 4 >10		4				
	98.0		2124.0														
		As above.				30	100	29	100	90.7 - 91.5: SM, FeOx, PC, broken core zone 91.5 - 94.4: 30°, FO, PL, SM, Cl, CC <1mm, highly foliated zone 94.9: 32°, FO, PL, SM, Cl, CC <1mm	2 3 4		3				
100	101.5		2120.5														
		As above.				31	100	54	100	95.3 - 95.8: FLT, Cl, IN >5mm 96.6: 46°, JN, PL, SM, FeOx, SA 96.7: 22°, FO, PL, SM, Cl, CC <1mm 98.4: 47°, JN, PL, SM, FeOx, PC 99.3: 48°, JN, PL, SM, FeOx, PC 99.8: 49°, JN, PL, SM, Cl, PC	3 4 1 0 0 >10		2				
105	106.5		2115.5														
		As above.				32	30	0	0	100.3: 42°, JN, PL, SM, FeOx, PC 102: 30°, JN x 2 spaced at 0.1 ft, PL, SM, FeOx, PC 102.3: 24°, JN, PL, SM, Cl, PC 102.6 - 103.6: 35°, JN x 4, PL, SM, Cl, PC 110 - 111.5: SM, FeOx, PC, broken core	>10 >10 >10 >10 >10 >10		4				
110	111.5		2110.5														
		As above.				33	50	0	0	112.5 - 113.5: SM, FeOx, PC, broken core	>10 >10		4				
	113.5		2108.5														
		As above, becomes less foliated.				34	100	40	71	113.5 - 114.2: PL, SM, Cl, PC, broken core 115: 8°, JN, UN, SM, Cl, CC <1mm 115.8 - 117: SM, FeOx, SA, broken core	3 2 >10		3				
115	117.0		2105.0														
		As above.				35	100	0	72	117 - 119.5: SM, Cl, partial iron staining, PC, broken core along foliation	5 >10 >10		3				
	119.5		2102.5														
120		As above.				36	100	0	80				3				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-18 (GT-35)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 8, 2016 09:14
DRILLING END: December 11, 2016 14:26
COORDINATES: N: 842,319 E: 909,644

SHEET: 4 of 7
GS ELEV.: 2222.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
120	120.0	As above. *(continued)*	2102.0													
	122.0	As above.	2100.0			36	100	0	80	119.5 - 122: SM, FeOx, SO, broken core	7 8		3			
	124.0	As above.	2098.0			37	100	0	30	122 - 124: SM, FeOx, SO, broken core, some near parallel joints	>10 >10		3			
125	126.0	As above.	2096.0			38	100	0	75	124 - 126: SM, FeOx, SO, broken core, primarily low angle foliation	7 >10		3			
	130.0	As above.	2092.0			39	100	25	100	126 - 127.2: 20°, FO x 3 spaced at 0.2 ft, PL, SM, FeOx, SO 128.1 - 129: 16°, FO x 3, PL, SM, FeOx, SO 129.5: 76°, JN, PL, SM, FeOx, SO	3 1 3 2		2			
130	133.0	As above.	2089.0			40	100	0	100	129.9: 40°, JN, PL, SM, FeOx, SO 130.3 - 130.7: 53°, JN, PL, SM, FeOx, SO 131.3: 15°, FO, PL, SM, Cl, CC <1mm	4 3 5		3			
	135.5	As above, becomes faulted.	2086.5			41	100	24	36	131.7: 16°, FO, UN, SM, Cl, CC <1mm 132.4: 26°, FO, PL, SM, Cl, IN <5mm 133 - 134.1: FLT, Bx, no iron staining, IN >5mm, crushed rock with infill	>10 >10 1		4			
135	140.0	Pinal Schist (pCpi): dark greenish grey, METASANDSTONE, fine grained, foliated, some oxidation.	2082.0			42	100	49	100	134.7 - 135.5: FLT, Bx, no iron staining, IN >5mm, crushed rock with infill 135.9: 50°, JN, PL, SM, FeOx, SO 136.9: 44°, JN, PL, SM, FeOx, CC <1mm 138.2: 50°, JN, PL, SK, FeOx, PC	2 0 2 7		2			
	143.5	As above.	2078.5			43	100	57	100	138.8: 24°, JN, PL, SM, FeOx, PC 139.2: JN, SM, FeOx, PC, broken core 140.8: 58°, JN, PL, SM, FeOx, SO 141.3: 65°, JN, PL, SM, FeOx, SO	1 1 >10 8		3			
145	148.5	As above.	2073.5			44	80	8	80	142.2: 32°, JN, PL, SM, Cl, PC 142.5 - 143.5: SM, FeOx, SO, broken core 144.8 - 145.1: 32°, JN x 2, PL, SM, FeOx, CC <1mm 145.4: 49°, JN, PL, SM, FeOx, PC 145.6: 50°, JN, PL, SM, FeOx, PC	>10 3 4 2		3			
150	151.5	As above.	2070.5			45	100	33	100	146.2 - 146.9: 48°, JN x 3, PL, SM, Cl, PC 147.4 - 148.5: 64°, FO x 7, PL, SM, FeOx, PC 148.7 - 150.5: 50°, FO x 9, PL, SM, Cl, partial iron staining, PC	7 3 6		3			
155	155.0	As above.	2067.0			46	86	0	37	151.7: 15°, JN, PL, SM, FeOx, CC <1mm 152 - 153: SM, Cl, PC, broken core 153.1 - 153.7: 41°, FO x 5, PL, SM, FeOx, SA 153.7 - 154.5: SM, Cl, no iron staining, broken core	0 5 >10 >10		3			
160	160.0	As above.	2062.0			47	100	38	100	155.5: 50°, JN, PL, SM, FeOx, PC 156.1: 29°, JN, PL, SM, FeOx, PC 156.5: 67°, JN, PL, SM, FeOx, CC <1mm 157: 12°, FO, CU, SM, FeOx, SA 157.6 - 158.1: 45°, FO x 4, CU, SM, FeOx, PC	1 2 5 2 1		3			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-18 (GT-35)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 8, 2016 09:14
DRILLING END: December 11, 2016 14:26
COORDINATES: N: 842,319 E: 909,644

SHEET: 5 of 7
GS ELEV.: 2222.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
160	160.0	As above.	2062.0			48	100	13	100	158.4: 43°, JN, PL, SM, FeOx, SA 158.6: 60°, JN, CU, SM, FeOx, SA 159.2: 46°, JN, PL, SM, FeOx, SO 161: 34°, FO, PL, SM, Cl, PC	2 >10 >10		3				
	163.0	As above.	2059.0			49	100	26	100	161.1 - 163: SM, Cl, partial iron staining, PC, broken core 163.2 - 164: 48°, FO x 3, PL, SM, Cl, PC 164.3: 60°, JN, ST, SM, FeOx, SA	3 2 6 4		3				
165	166.5	As above.	2055.5			50	100	30	100	165.3 - 166.5: 40°, FO x 9, PL, SM, Cl, partial iron staining, PC 166.9: 22°, FO, PL, SM, Cl, PC 167.3: 73°, JN, PL, SM, Cl, PC	2 >10 >10		3				
170	170.5	As above.	2051.5			51	100	56	100	168 - 170.5: SM, Cl, partial iron staining, PC, multiple near parallel joints, splintering 171.3 - 171.7: 35°, JN x 2 spaced at 0.4 ft, PL, SM, FeOx, SA 173: 18°, JN, PL, SM, FeOx, CC <1mm 173.4: 33°, JN, PL, SM, FeOx, CC <1mm	3 2 1 2 2		3				
175	175.5	As above, slight weathering.	2046.5			52	100	90	100	174.5: 23°, JN x 2, PL, SM, Cl, CC <1mm 175: 28°, JN, PL, SM, FeOx, SO 175.6: 54°, JN, PL, RO, Ca, PC 176.2: 27°, JN, PL, SM, Ca, PC 177.5: 41°, JN, PL, RO, CN 178.7: 50°, JN, PL, RO, Ca, PC	2 2 1 2 1		1				
180	179.5	As above.	2042.5			53	100	80	100	179.1: 40°, JN, PL, RO, Ca, PC 180.5 - 180.8: 40°, FO x 2 spaced at 0.3 ft, PL, SM, Ca, PC 181.1: 83°, JN, PL, SM, Ca, PC 182.1: 47°, JN, PL, SM, Ca, SA 182.9 - 183.2: 66°, JN x 2, PL, SM, Cl, PC	2 1 4 2 1		1				
185	184.5	As above.	2037.5			54	100	71	100	183 - 183.3: 59°, JN x 2, PL, SM, Cl, PC 183.9 - 184.3: 48°, JN x 2, PL, SM, Ca, PC 185.5: 55°, JN, PL, SM, FeOx, SA 185.9: 55°, JN, PL, SM, FeOx, SA 187.7 - 188.6: SM, Cl, PC, broken core	1 0 2 2 5		1				
190	189.0	As above.	2033.0			55	100	73	100	189.6: 38°, FO, PL, SM, Cl, PC 190.2: 14°, JN, UN, SM, FeOx, SA 190.4: 28°, FO, PL, SM, CN 191.1: 36°, FO x 2, PL, SM, FeOx, SA	1 2 3 2		1				
195	192.0	As above.	2030.0			56	100	60	100	191.6: 23°, FO, PL, SM, Ca, PC 192.2 - 192.4: 30°, JN x 2, PL, SM, FeOx, SA 193.3: 41°, JN, PL, SM, Cl, CC <1mm 193.5: 44°, JN, PL, SM, Cl, PC 194.2: 32°, JN, PL, SM, FeOx, SA	2 4 2 2		2				
200	197.0	As above, some oxidation.	2025.0			57	78	9	78	194.6: 29°, FO, PL, SM, FeOx, SA 194.9: 54°, JN, PL, SM, FeOx, SA 195.6 - 195.7: 42°, JN x 2, PL, SM, Cl, PC 196.4 - 196.6: 34°, FO x 2,	2 >10 >10		4				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-18 (GT-35)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 8, 2016 09:14
DRILLING END: December 11, 2016 14:26
COORDINATES: N: 842,319 E: 909,644

SHEET: 6 of 7
GS ELEV.: 2222.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE: DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
200	200.0	As above, some oxidation. *(continued)*	2022.0			57	78	9	78	PL, SM, FeOx, PC 197.5: 32°, FO, PL, SM, FeOx, CC <1mm	>10		4			
	201.5	As above, no oxidation.	2020.5							197.8: 58°, JN, PL, RO, FeOx, SO	>10					
						58	100	17	100	198.4 - 198.7: FLT, Cl, IN >5mm	4		3			
	204.5		2017.5							198.7 - 201.5: SM, Cl, PC, broken core, along near parallel joint	>10					
205		As above, some oxidation.									6					
						59	100	11	100	202: 58°, FO, PL, SM, FeOx, SA 202.6: 29°, JN, PL, RO, CN 203.1: 43°, JN, PL, SM, FeOx, SO	3		3			
											4					
	208.0		2014.0							203.3 - 204.5: SM, FeOx, SA, broken core	>10					
		As above.								204.5 - 205.9: SM, Cl, PC, broken core with some clayey sand	>10					
210						60	77	0	66	206.3: 58°, VN, PL, SM, Qtz, IN <5mm	6		4			
										206.7 - 208: SM, Cl, PC, broken core	5					
	211.5		2010.5							208 - 211.5: SM, Cl, partial iron staining, PC, broken core	>10					
		As above.				61	100	0	100	211.5 - 214: SM, Cl, partial iron staining, PC, broken core	>10		4			
	214.0		2008.0								>10					
215		As above.								214 - 215.5: SM, Cl, partial iron staining, PC, broken core	>10					
						62	100	23	100	216.2: 16°, FO, PL, SM, FeOx, CC <1mm	3		3			
										216.6: 25°, JN, PL, SM, Cl, PC	2					
	218.0		2004.0							217.2: 19°, JN, PL, SM, Cl, PC	5					
	218.7	As above.	2003.3							217.4 - 218: 24°, FO x 4, PL, SM, FeOx, PC	4		3			
		Fault gouge.				63	67	23	67	218.6: 51°, FO, PL, SM, Cl, PC	>10		6			
220										218.7 - 221: FLT, Cl, IN >5mm	>10					
	221.0		2001.0							221.3: 74°, JN, PL, SM, Cl, full iron staining, IN >5mm	2		4			
		Pinal Schist (pCpi): dark greenish grey with dark red, METASANDSTONE, fine				64	100	40	100	221.7: 62°, JN, PL, SM, FeOx, CC <1mm	1					
	222.5	grained, with some quartz, foliated, highly oxidatized.	1999.5							223.2: 76°, JN, PL, SM, FeOx, PC	1					
		As above, becomes slightly brecciated.									4					
225						65	100	38	100		>10		4			
										224.2 - 227: Bx, IN >5mm, partially brecciated zone, clast dominated, some infill	>10					
	227.0		1995.0								>10					
		Pinal Schist (pCpi): dark greenish grey, METASANDSTONE, fine grained, foliated, oxidized.								227.2 - 227.5: 55°, JN x 3, PL, SM, Cl, PC	>10					
						66	100	11	100	227.8 - 228: FLT, G, IN >5mm	4		3			
230										228.5 - 230.5: SM, Cl, partial iron staining, PC, broken core	>10					
	230.5		1991.5								>10					
		As above.				67	100	0	100	230.5 - 233: SM, Cl, partial iron staining, PC, broken core	7		4			
											9					
	233.0		1989.0								7					
		As above.				68	100	0	100	233 - 233.7: SM, FeOx, CC <1mm, broken core			3			
235	235.0		1987.0							233.7 - 234.6: FLT, G, partial iron staining, IN >5mm, crushed rock, clay with sand	>10					
		Fault gouge, intervals of competent rock within zone of clayey gouge.				69	100	0	60	234.6 - 235: 35°, FO, SM, Cl, PC, broken core	>10		5			
	237.5		1984.5							235 - 237.5: FLT, Bx, partial iron staining, IN >5mm, crushed rock with clayey sand	>10					
		As above.									>10					
						70	78	16	78	237.5 - 238.2: FLT, G, IN >5mm, crushed rock, clayey gravel with sand,	0		5			
240											>10					

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-18 (GT-35)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 8, 2016 09:14
DRILLING END: December 11, 2016 14:26
COORDINATES: N: 842,319 E: 909,644

SHEET: 7 of 7
GS ELEV.: 2222.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0		1982.0							quartz fragments						
		As above. *(continued)*				70	78	16	78	239.2 - 242: FLT, G, partial iron staining, IN >5mm, crushed rock, sandy clay	>10 >10		5			
	242.0		1980.0													
		Pinal Schist (pCpi): dark greenish grey with dark red, METASANDSTONE, fine grained, foliated, intervals of gouge, highly fractured, oxidatized.				71	83	0	83	242 - 244: SM, Cl, full iron staining, PC, broken core	>10 >10		4			
245	245.0		1977.0							244 - 245: FLT, G, IN >5mm, sandy clay	>10					
		As above, becomes highly oxidized.				72	100	20	80	245.5 - 246: SM, FeOx, CC <1mm, broken core	5		4			
	247.0		1975.0							246.2 - 247: 43°, FO x 7, PL, SM, Cl, full iron staining, PC	7 7					
		As above, highly foliated and broken.				73	80	0	80	247.3 - 249.5: SM, Cl, full iron staining, CC <1mm, broken core	>10		4			
	249.5		1972.5								>10					
250		Refusal at 12.2 ft. Bottom of borehole at 249.5 ft. Completed as well. Refer to diagram. Notes: 0 - 24: Hydro test #1 FHT 27 - 80.5: Hydro test #2 SI 83 - 184.5: Hydro test #3 SI 183 - 249.5: Hydro test #4 SI														
255																
260																
265																
270																
275																
280																

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-19-(GT-4)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 11, 2016 12:43
DRILLING END: December 15, 2015 12:15
COORDINATES: N: 846,101 E: 916,859

SHEET: 1 of 7
GS ELEV.: 2443.4
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
0	0.0	BASALT (TB): dark green to black, aphanitic groundmass with epidote filled amygdules, olivine phenocrysts, oxidation on discontinuity surfaces.	2443.4													
						1	100	0	12		>10		5			
5	5.0		2438.4								>10					
		As above, calcite veins, moderatly fractured, strong HCl reaction.				2	95	60	85	5.2: 30.0°, JN, PL, SM, Ca, partial iron staining, IN <5mm	2		3			
										5.6: 25.0°, JN, PL, SM, Ca, partial iron staining, IN <5mm	2					
										6.4: 45.0°, JN, PL, VR, CN, partial iron staining	3					
	9.0		2434.4							6.8: 80.0°, IR, VR, Ca, partial iron staining, CC <1mm	3					
10		As above.				3	67	0	0	7.4: 70.0°, FLT, PL, VR, Bx, partial iron staining, IN >5mm	>10		3			
	10.5		2432.9								>10					
	12.0	BASALT (TB): dark green to green, phaneritic ground mass with pyroxene phenocrysts, discontinuities surfaces are oxidized, weak HCl reaction.	2431.4			4	80	0	0	8.7: 40.0°, PL, SM, CN	>10		4			
		As above, mostly rubble highly fractured				5	65	0	15		>10					
	14.0		2429.4								>10		4			
15		As above, groundmass becomes aphanitic, highly fractured, minor breccia with calcite inifill.									>10					
						6	86	20	43		>10					
	17.5		2425.9								>10					
		As above, highly oxidized.				7	88	12	12		>10		4			
20	20.0		2423.4								>10					
		As above, moderately fractured and brecciated.								20.6: 40.0°, FLT, IR, SK, CN, full iron staining	2					
						8	95	43	70	20.9: 80.0°, JN, IR, VR, CN, full iron staining	3		3			
										21.1: 70.0°, JN, IR, VR, CN, partial iron staining	1					
	24.0		2419.4							21.4: 40.0°, FLT, PL, SK, Ca, partial iron staining, CC <1mm	6					
25		As above.								21.7: 70.0°, JN, PL, SM, Ca, partial iron staining	0					
						9	78	16	26	22.8: 40.0°, JN, IR, VR, CN, full iron staining	0		4			
											0					
	29.0		2414.4								>10		5			
30		As above.									0					
											0					
						10	80	36	64	31: 10.0°, JN, PL, SM, CN, polished	0		4			
										31.8: 85.0°, JN, IR, RO, Ca, CC <1mm	0					
										32: 75.0°, JN, IR, RO, CN, partial iron staining	0					
	34.0		2409.4							32.3: 50.0°, JN, IR, VR, CN						
										33.6: 78.0°, JN, IR, RO, CN						
35		As above.								33.9: 70.0°, IR, CN	7					
										34.9: 85.0°, JN, IR, VR, CN						
										35.6: 70.0°, JN, IR, VR, CN	2					
						11	94		84	36.2: 20.0°, JN, PL, SM, Ca, IN <5mm	1		2			
										36.6: 60.0°, JN, PL, RO, CN						
										37.5: 65.0°, JN, IR, VR, CN	1					
	39.0		2404.4													
										38.6: 25.0°, JN, PL, SM, CN, partial iron staining	2					
40		As above, breccia				12	98	50	50		>10		3			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-19-(GT-4)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 11, 2016 12:43
DRILLING END: December 15, 2015 12:15
COORDINATES: N: 846,101 E: 916,859

SHEET: 2 of 7
GS ELEV.: 2443.4
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE: DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0	As above, breccia *(continued)*	2403.4								>10					
	42.3		2401.1			12	98	50	50	42.3: 43.0°, CON, PL, VR, CN	>10		3			
	44.0	Mescal Limestone (pCmls): LIMESTONE, light gray to pink, very fine grained, light iron staining, few healed fractures infilled with calcite.	2399.4								7					
45		As above									0		2			
										44.8: 80.0°, JN, PL, RO, CN	1					
						13	100	90	100	45.2: 75.0°, JN, PL, SM, CN	1					
											0					
	49.0		2394.4								0		2			
	49.7	As above	2393.7							48.7: 70.0°, JN, PL, RO, CN, partial iron staining	1					
50										49.7: 70.0°, CON, PL, VR, Bx, partial iron staining, IN >5mm	3					
	51.0	DIABASE (pCdiab): dark gray to black, fine grained, moderatly fractured, few calcite veins, layer of clay and breccia at contact 1" thick. Drillers notice some circulation loss at limestone-diabase contact at 49 ft-bgs.	2392.4			14	100	55	60		5		2			
										50.2: 70.0°, JN, PL, SM, Ca, partial iron staining, CC <1mm	1					
						15	100	60	77	51.6: 80.0°, JN, PL, VR, CN	2		2			
										52.4: 40.0°, JN, PL, RO, CN	2					
		As above, becciated.								53.2: 85.0°, JN, PL, RO, CN	2					
	54.0		2389.4							53.6: 55.0°, IR, VR, CN	4					
55		As above, brecciated.									>10					
						16	94	23	23		>10		3			
	57.5		2385.9								>10					
	58.5	As above, broken core.	2384.9								>10					
		As above.									>10					
60						17	60	0	0		>10		5			
										60.3: 85.0°, JN, IR, VR, CN, partial iron staining	>10					
											>10					
	63.0		2380.4			18	80	0	0		>10		5			
	64.0	DIABASE (pCdiab): dark gray to black, fine grained, highly fractured, few calcite veins, brecciated texture, some fractures infilled with calcite, moderate oxidation around fractures.	2379.4			19	100	100	100		1		3			
65						20	100	50	50		>10		4			
	66.0	As above.	2377.4								>10					
		As above.				21	100	100	100	66.3: 80.0°, JN, PL, VR, CN, partial iron staining	1		4			
	67.5		2375.9								0					
		As above.								68.3: 75.0°, JN, IR, VR, CN, partial iron staining	3					
70						22	96	56	82	68 - 71.7: 60.0°, JN x 8 spaced at 0.4 ft, PL, SM, Ca, partial iron staining, CC <1mm	3		3			
											1					
											3					
	72.5		2370.9								1					
		As above, healed fractures with calcite.									6					
75						23	94	84	90	73 - 75: 50.0°, x 3 spaced at 0.7 ft, PL, SM, CN, partial iron staining	3		2			
										72.8 - 76: 60.0°, JN x 6, PL, SM, CN, partial iron staining	3					
											1					
	77.5		2365.9								0					
		As above.									1					
						24	100	86	100	77.9 - 82: 60.0°, x 7 spaced at 0.7 ft, PL, SM, CN, partial iron staining	1		2			
80											3					

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-19-(GT-4)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 11, 2016 12:43
DRILLING END: December 15, 2015 12:15
COORDINATES: N: 846,101 E: 916,859

SHEET: 3 of 7
GS ELEV.: 2443.4
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE: DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0	As above. *(continued)*	2363.4			24	100	86	100	79.1: 85.0°, PL, SM, CN, partial iron staining 79.5: 90.0°, JN, PL, SM, CN, partial iron staining 79.7: 35.0°, JN, PL, SM, CN, partial iron staining	3 3 0		2			
	82.5		2360.9													
	83.0	As above.	2360.4			25	60	0	0	77.9 - 82: 60.0°, x 7 spaced at 0.7 ft, PL, SM, CN, partial iron staining	2		2			
85		As above.				26	100	100	100	83.5: 70.0°, JN, IR, VR, CN, partial iron staining 83.3 - 84.3: 50.0°, JN x 2 spaced at 1 ft, PL, RO, CN, partial iron staining 84.2 - 87.3: 60.0°, x 4 spaced at 1 ft, PL, SM, CN, partial iron staining	2 1 0 1		2			
	88.0		2355.4													
90		As above.				27	90	70	70	89 - 89.7: 50.0°, x 2 spaced at 0.7 ft, PL, RO, CN, partial iron staining 90.8 - 91.6: 45.0°, JN x 3 spaced at 0.4 ft, PL, SM, CN, partial iron staining	1 2 1 2 >10		2			
	93.0		2350.4													
95		DIABASE (pCdiab): red to brownish black, coarse grained, calcite veining, fractured with breccia zones, partially oxidized, oxidation on discontinuities.				28	100	58	66	93.8: 47.0°, JN, CU, RO, FeOx, partial iron staining, SA 94.4 - 95.3: FLT 95.9: 75.0°, JN, IR, VR, Sa, partial iron staining, PC 96.5: FLT, IR, VR, Bx, IN >5mm 97.3: 65.0°, JN, ST, RO, Sa, partial iron staining, PC	1 4 4 1 2		3			
	98.0		2345.4													
100		As above, less fractured				29	100	45	45	97.8: 51.0°, JN, PL, SM, Ca, partial iron staining, CC <1mm 98.5: 56.0°, JN, ST, SM, Chl, partial iron staining, PC 98.7: 15.0°, JN, UN, VR, Ca, full iron staining, PC	2 1 >10 1		2 - 3			
	102.0		2341.4													
	104.0	DIABASE (pCdiab): pinkish brown to dark brown, coarse to pegmatitic, minor calcite stockwork, abundant oxidation.	2339.4			30	100	45	60	99.1: 32.0°, JN, PL, RO, FeOx, partial iron staining, PC 100 - 101: FLT, partial iron staining	6 2		2			
105		As above, pegmatitic vein, breccia and rubble.				31	96	56	62	101.6: 58.0°, JN, PL, SM, CN, partial iron staining 102 - 102.4: FLT, partial iron staining 102.5: 22.0°, JN, PL, RO, Bx, partial iron staining, IN <5mm 102.6: JN, PL, SM, Chl, partial iron staining, CC <1mm 103.2: 33.0°, JN, CU, SM, Chl, partial iron staining, PC	2 >10 6 0 4		2 - 3			
	109.0		2334.4													
110		DIABASE (pCdiab): red to brownish black, medium grained, few calcite veins, highly fractured, minor oxidation,				32	100	40	55	103.5: 50.0°, JN, PL, RO, FeOx, partial iron staining, PC 103.6: 61.0°, JN, PL, RO, FeOx, partial iron staining, PC	3 >10 1		4			
	111.0	brecciated.	2332.4													
		As above, becomes coarser grained.				33	90	90	90	104.8 - 106.4: FLT 106.8: 70.0°, FLT, IR, RO, Bx, IN >5mm 108: 25.0°, JN, IR, VR, Sa, full iron staining, CC <1mm	2 2		2			
	114.0		2329.4													
115		As above, no oxidation.				34	100	100	100	108.6: 62.0°, PL, VR, Ca, full iron staining, CC <1mm 108.7: 50.0°, JN, PL, RO, Sa, partial iron staining, CC <1mm 108.8: 52.0°, JN, IR, VR, Sa, full iron staining, IN <5mm 109.6: 55.0°, JN, PL, SM, CN, partial iron staining 109.9 - 111: FLT	1 1 0 3 1		1			
	119.0		2324.4													
120		As above, dark grey to black, slight oxidation.				35	96	96	96	111.6: 85.0°, JN, PL, VR, CN, partial iron staining	1		1			
		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-19-(GT-4)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 11, 2016 12:43
DRILLING END: December 15, 2015 12:15
COORDINATES: N: 846,101 E: 916,859

SHEET: 4 of 7
GS ELEV.: 2443.4
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
120	120.0	As above, dark grey to black, slight oxidiation. *(continued)*	2323.4													
						35	96	96	96	112.6: 30.0°, JN, PL, SM, CN, partial iron staining 112.9: 45.0°, JN, PL, RO, CN, partial iron staining 115.7: 35.0°, JN, PL, RO, Ca, IN <5mm 117.1: 45.0°, JN, IR, RO, CN 117.3: 60.0°, JN, PL, SM, CN	1 1 3 1		1		
	124.0		2319.4													
125		As above.				36	100	100	100	117.6: 45.0°, JN, PL, RO, Ca, CC <1mm 120.8: 45.0°, JN, PL, SM, CN, partial iron staining 119.7 - 123.2: 55.0°, JN x 5 spaced at 0.7 ft, PL, SM, CN, partial iron staining 126.7: 40.0°, JN, PL, SM, Ca, partial iron staining, CC <1mm	0 0 1 1 3		1		
	129.0		2314.4													
130		As above.				37	100	100	100	127.3 - 128.5: 45.0°, JN x 2 spaced at 1.2 ft, PL, SM, CN, partial iron staining 128.2: 85.0°, JN, IR, RO, Ca, IN <5mm 128.4: 55.0°, JN, IR, RO, CN 129.3: 30.0°, JN, PL, SM, CN 132.2: 30.0°, JN, ST, RO, Ca	1 0 0 1 1		1		
	134.0		2309.4													
135		As above, very broken.				38	56	16	16	133.9: 60.0°, JN, PL, VR, CN	>10 >10 >10 >10 >10		1			
	139.0		2304.4													
140		DIABASE (pCdiab): dark gray to black, coarse grained, few calcite veins, no oxidation.				39	100	100	100	143.1: 60.0°, JN, IR, RO, CN	0 0 0 0 1		1			
	144.0		2299.4													
145		As above, moderately fractured.				40	100	66	84	145.7: 80.0°, JN, PL, RO, CN, partial iron staining 146.1: 70.0°, FLT, PL, VR, Bx, IN <5mm 146.6: 10.0°, JN, PL, SM, CN, partial iron staining 147.5: 15.0°, JN, PL, RO, Ca, partial iron staining, CC <1mm	0 1 2 2 1		2		
	149.0		2294.4													
150		As above.				41	100	100	100	147.9: 60.0°, JN, PL, SM, CN, partial iron staining 148.4: 80.0°, JN, PL, SM, CN 150.2: 10.0°, JN, IR, RO, Ca 151 - 152.5: 60.0°, x 2 spaced at 1.5 ft, PL, SM, Ca, IN <5mm	0 1 0 1 0		1		
	154.0		2289.4													
155		As above, minor oxidation on discontinuties.				42	100	96	100	155.3: 30.0°, JN, PL, RO, CN, partial iron staining 156: 70.0°, FLT, IR, VR, Bx, partial iron staining, IN >5mm 157.2: 85.0°, JN, PL, SM, CN, partial iron staining 158.2 - 159: 65.0°, JN x 4 spaced at 0.3 ft, PL, SM,	0 1 1 1 4		1		
	159.0		2284.4													
160		As above.				43	100	100	100	CN, partial iron staining 159.4: 35.0°, JN, PL, SM,	3		1			
		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-19-(GT-4)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 11, 2016 12:43
DRILLING END: December 15, 2015 12:15
COORDINATES: N: 846,101 E: 916,859

SHEET: 5 of 7
GS ELEV.: 2443.4
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
160	160.0	As above. *(continued)*	2283.4			43	100	100	100	Ca, partial iron staining, CC <1mm 159.8: 60.0°, JN, PL, SM, CN, partial iron staining 161.8: 70.0°, JN, IR, VR, CN 162.2: 60.0°, JN, IR, VR, CN	0 1 1 0		1				
	164.0		2279.4														
165		As above.				44	100	100	100	166.8: 75.0°, JN, IR, RO, CN 167.5: 80.0°, JN, PL, RO, CN 168.6: 60.0°, JN, IR, VR, CN	0 0 1 1 1		1				
	169.0		2274.4														
170		As above, becomes brecciated with quartz and calcite infill.				45	100	100	100	172.7: 90.0°, JN, IR, VR, CN 173.6: 65.0°, JN, PL, RO, CN, partial iron staining	0 0 0 1 0		2				
	174.0		2269.4														
175		DIABASE (pCdiab): dark gray to black, medium grained, few calcite veins, slight iron staining in joints, few joints, brecciated texture.				46	100	96	96	175.3: 75.0°, FLT, IR, RO, Bx, IN >5mm 176.8: 40.0°, JN, PL, SM, CN, full iron staining 177: 80.0°, IR, VR, CN	0 1 2 0 0		2				
	179.0		2264.4														
180		As above.				47	100	100	100	180.5: JN, PL, SM, CN 182.3: 75.0°, JN, IR, RO, CN, partial iron staining 183.3: 60.0°, JN, PL, SM, CN, partial iron staining	0 1 0 1 2		1				
	184.0		2259.4														
185		As above, becomes coarse grained.				48	100	100	100	183.6: 65.0°, JN, PL, SM, CN, partial iron staining 186.8: 35.0°, JN, PL, RO, CN 188.2: 60.0°, IR, RO, CN	0 1 1 0 1		1				
	189.0		2254.4														
190		As above, becomes red brown to black, medium grained.				49	96	88	96	190.9: 90.0°, JN, IR, RO, CN 191.1: 90.0°, JN, IR, RO, CN 191.8: 50.0°, JN, PL, SM, CN, partial iron staining 192.7: 40.0°, FLT, PL, SK, FeOx, full iron staining, CC <1mm	0 1 2 3 0		1				
	194.0		2249.4														
195		As above.				50	100	100	100	194.5: 60.0°, JN, PL, RO, CN 195.8: 40.0°, FLT, PL, SK, FeOx, full iron staining, CC <1mm 196.8: 65.0°, JN, IR, RO, CN 197.8: JN, IR, RO, CN	1 1 1 1 0		1				
	199.0		2244.4														
200		As above.				51	100	100	100		1		1				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-19-(GT-4)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 11, 2016 12:43
DRILLING END: December 15, 2015 12:15
COORDINATES: N: 846,101 E: 916,859

SHEET: 6 of 7
GS ELEV.: 2443.4
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
200	200.0	As above. *(continued)*	2243.4													
						51	100	100	100	200: 80.0°, JN, IR, VR, CN 201.6: 40.0°, JN, PL, SM, CN	1 1 0 0		1			
	204.0		2239.4													
205		As above.				52	100	92	100	205.9: 80.0°, JN, IR, RO, CN 206.2 - 206.4: 60.0°, x 2 spaced at 0.2 ft, PL, RO, CN 206.8: 90.0°, JN, IR, RO, CN	0 1 3 1 1		1			
	209.0		2234.4													
210		As above, becomes coarse with calcite filled voids.				53	100	100	100	207.8: 35.0°, JN, PL, SM, CN, partial iron staining 208.8: 60.0°, JN, PL, RO, CN 210: 30.0°, JN, PL, RO, Ca, IN <5mm 211.7: 60.0°, JN, PL, SM, CN	1 0 1 0 0		1			
	214.0		2229.4													
215		As above.				54	100	100	100	215.2: 45.0°, JN, PL, SM, CN 216: 65.0°, JN, PL, SM, CN 216.7: 50.0°, JN, PL, SM, CN, partial iron staining 217.4: 75.0°, JN, PL, RO, CN 217.9: 70.0°, JN, IR, RO, CN	0 1 1 2 1		1			
	219.0		2224.4													
220		As above				55	100	100	100	218.4: 70.0°, JN, IR, CN 219.7 - 221.7: 60.0°, spaced at 1 ft, PL, SM, CN 220.6 - 223.7: 55.0°, x 3, PL, SM, Ca, IN <5mm	1 1 3 0 1		1			
	224.0		2219.4													
225		As above.				56	100	94	100	224.5: 60.0°, JN, PL, SM, CN, partial iron staining 226.6: 30.0°, JN, IR, RO, CN 227.8: 75.0°, JN, PL, SM, CN 228: 40.0°, JN, PL, RO, CN	1 0 1 1 1		1			
	229.0		2214.4													
230		As above.				57	100	86	86	231.3: 60.0°, PL, SM, CN 232.2: 60.0°, PL, SM, Chl, partial iron staining, CC <1mm 232.4 - 233.2: 60.0°, FLT, IR, VR, Chl, CC <1mm	0 0 1 7 0		2			
	234.0		2209.4													
235		As above, 2 joint sets.				58	100	100	100	235.1 - 236.9: 45.0°, x 3 spaced at 0.9 ft, PL, SM, CN, partial iron staining 237.3 - 238.4: 60.0°, x 3 spaced at 0.6 ft, PL, SM, CN, partial iron staining	0 1 2 2 1		1			
	239.0		2204.4													
240		As above				59	100	100	100		1		1			
		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-19-(GT-4)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 11, 2016 12:43
DRILLING END: December 15, 2015 12:15
COORDINATES: N: 846,101 E: 916,859

SHEET: 7 of 7
GS ELEV.: 2443.4
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT
240	240.0	As above *(continued)*	2203.4			59	100	100	100	240.6 - 241.6: 40.0°, JN, ST, SM, CN, partial iron staining 239.6 - 242.6: 45.0°, JN x 2 spaced at 3 ft, PL, RO, CN	1 1 1 0
	244.0		2199.4								
245		As above				60	100	88	100	244.3: 70.0°, JN, PL, SM, CN 244.6 - 246.1: 60.0°, x 3 spaced at 0.5 ft, PL, RO, CN 246.9: 45.0°, JN, PL, SM, CN 247.6: 40.0°, JN, IR, RO, Ca 248.4: 70.0°, JN, PL, RO, CN, partial iron staining	2 1 2 1 1
	249.0		2194.4								
250		Bottom of borehole at 249.0 ft. Completed as well. Refer to diagram. Notes: 0 - 39: Hydro test #1 FHT 9 - 10.5: Drill blocked, resulted in broken core. 40 - 57.5: Hydro test #2 SI & CRI 49: Drillers noted some circulation loss at limestone-diabase contact. 55 - 139: Hydro test #3 SI 57.5 - 58.5: Drill blocked, broken core. 58.5 - 63: Misslatch- replacing landing shoulder and springs. 134 - 139: Drill misslatch, broken. 139 - 189: Hydro test #4 SI 190 - 249: Hydro test #5 SI									
255											
260											
265											
270											
275											
280											

ISRM Strength Index: ● AX. ☐ DIAM. ▲ UCS (ksi)
R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6

ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
1					
1					

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-19-(GT-4)
7 of 7

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF BOREHOLE DH16-20 (GT-03)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 13, 2016 07:40
DRILLING END: December 17, 2016 11:00
COORDINATES: N: 844,754 E: 915,215

SHEET: 1 of 7
GS ELEV.: 2369.5
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLES SAMPLE TYPE & NUMBER	BLOWS per 6 in (Automatic hammer 140 lb Hammer, 30 inch drop)	REC ATT (in)	PENETRATION RESISTANCE BLOWS / ft (20 40 60 80) WATER CONTENT (%) (W_p W W_l) (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
0		0.0	(CH), CLAY, medium plasticity, coarse subangular gravel, fine to coarse subangular to angular sand, red-brown, stratified, moderate HCL reaction; diabase gravel; wet	2369.5	CH						0 - 23.5: Hydro test #1 FHT	
5		5.0	(SP-SC), SAND, fine to medium, poorly graded, angular, some non plastic fines, trace gravel, dark red-brown, weathered, iron oxide staining, moderate HCL reaction; moist, diabase regolith, SPT (3" int): 9-38-50/2"	2364.5	SP-SC		SS S-1	47-50	8 8			
10		8.5	DIABASE (pCdiab): red brown, completely to moderately weathered, friable and weak, weathered to sand, oxidized.	2361.0								
15		10.0	As above.	2359.5								
20		15.0	As above, rubble.	2354.5								
25		20.0	DIABASE (pCdiab): red-brown, completely to highly weathered, brecciated, oxidized, calcite veins present.	2349.5								
30		23.5	As above.	2346.0							25 - 28: Rock in bit causes mis-latch, poor recovery.	
35		25.0	As above.	2344.5								
40		28.0	As above, mislatch, recovered rubble, oxidized with thin calcite veining.	2341.5								
		30.0	DIABASE (pCdiab): red brown, completely to highly weathered, strong oxidation, brecciated, moderate reaction to HCl, calcite cementation, rubble.	2339.5								
		32.0	As above.	2337.5							36 - 57: Hydro test #2 SI	
		37.0	As above.	2332.5								
		40.0		2329.5								

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 15:41
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RECORD OF DRILLHOLE DH16-20 (GT-03)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 13, 2016 07:40
DRILLING END: December 17, 2016 11:00
COORDINATES: N: 844,754 E: 915,215

SHEET: 1 of 7
GS ELEV.: 2369.5
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
0	0.0		2369.5														
		(CH), CLAY, medium plasticity, coarse subangular gravel, fine to coarse subangular to angular sand, red-brown, stratified, moderate HCL reaction; diabase gravel; wet															
5	5.0		2364.5														
		(SP-SC), SAND, fine to medium, poorly graded, angular, some non plastic fines, trace gravel, dark red-brown, weathered, iron oxide staining, moderate HCL reaction; moist, diabase regolith, SPT (3" int): 9-38-50/2"											3				
	8.5		2361.0														
		DIABASE (pCdiab): red brown, completely to moderately weathered, friable and weak, weathered to sand, oxidized.				2	93	27	73	9: 68.0°, JN, PL, RO, MnOx, partial iron staining, SA 9.2: 60.0°, JN, PL, RO, Sa, PC	6 5						
10	10.0		2359.5														
		As above.				3	60	0	0	9.4: 48.0°, JN, PL, RO, FeOx, SA 9.6 - 9.9: 76.0°, FLT x 4 spaced at 0.1 ft, ST, RO, Sa, PC	10 10 >10 3 5		5 - 4				
15	15.0		2354.5														
		As above, rubble.				4	60	0	2		>10 >10		5 - 4				
20	20.0		2349.5														
		DIABASE (pCdiab): red-brown, completely to highly weathered, brecciated, oxidized, calcite veins present.				5	86	0	0		>10 >10 >10 >10		5 - 4				
	23.5		2346.0														
		As above.				6	100	0	0		>10 >10		5 - 3				
25	25.0		2344.5														
		As above.				7	10	0	0		>10 >10 >10						
	28.0		2341.5														
		As above, mislatch, recovered rubble, oxidized with thin calcite veining.				8	50	0	0		>10 >10		5 - 4				
30	30.0		2339.5														
		DIABASE (pCdiab): red brown, completely to highly weathered, strong oxidation, brecciated, moderate reaction to HCl, calcite cementation, rubble.				9	85	0	15		>10 >10		5 - 4				
	32.0		2337.5														
		As above.				10	90	68	80	33.4 - 33.7: 64.0°, FLT, IR, VR, Sa, partial iron staining, SA 33.9: 61.0°, JN, IR, VR, Sa, partial iron staining, SA 34.5: 80.0°, JN, IR, VR, Sa, partial iron staining, SA 34.9: 45.0°, JN, IR, RO, Sa, partial iron staining, SA	1 4 2 1 2		3				
35																	
	37.0		2332.5														
		As above.				11	100	13	30	35.3: 65.0°, JN, IR, RO, Sa, partial iron staining, SA 36.3: 60.0°, JN, ST, RO, Ca, SA 37.6: 14.0°, FLT, UN, SK, FeOx, full iron staining, CC	1 3 3		2 - 3				
40	40.0		2329.5														

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-20 (GT-03)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 13, 2016 07:40
DRILLING END: December 17, 2016 11:00
COORDINATES: N: 844,754 E: 915,215

SHEET: 2 of 7
GS ELEV.: 2369.5
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE: DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT
40	40.0		2329.5								
	41.0	As above, becomes faulted, brecciated and crushed with sandy gouge, highly oxidized.	2328.5			12	100	0	0	<1mm 38.4: 80.0°, JN, PL, RO, Cl, full iron staining, PC	>10
		FAULT: contact with limestone is brecciated with gouge zones, mixed diabase and limestone clasts.				13	100	50	50	38.8 - 39.1: 70.0°, FLT, PL, SM, Bx 39.2: 75.0°, JN, CU, RO, Cl, full iron staining, PC	>10 >10
	43.0	As above.	2326.5							39.5: 65.0°, JN, PL, RO	>10
45						14	100	54	54	40 - 41: FLT, Bx 41 - 43: FLT, G 43.3 - 44: 17.0°, CON, G, partial iron staining, IN >5mm 44.1: 45.0°, JN, IR, RO, Sa 44.5: 30.0°, JN, IR, VR, Bx	2 1 0
	47.3		2322.2							45.2 - 47.3: 8.0°, CON, Bx, IN >5mm	0
	48.0	Mescal Limestone (pCmls): pink LIMESTONE calcite veining, strong rock, faulted zones.	2321.5								3
		As above.				15	100	88	88	49.6 - 50.1: 75.0°, FLT, UN, RO, G, matte, IN >5mm 51.1: 45.0°, JN, ST, RO, FeOx, partial iron staining, SO	0 4 1 1
50	52.0		2317.5								
		As above, fault gouge 56.5-57ft.				16	100	86	90	53.4: 62.0°, JN, IR, RO, Ca 54.1: 82.0°, JN, PL, RO, FeOx, partial iron staining, SA 56.3: 78.0°, JN, PL, SM, FeOx, partial iron staining, SA	0 1 1 0 2
55	57.0		2312.5								
		As above, moderately weathered sections of gouge.				17	100	40	44	56.5 - 57: 80.0°, FLT, IR, VR, G, IN >5mm 57.7 - 58.1: 60.0°, IR, VR, G, IN >5mm	5 10 2
60										60.6 - 62: 47.0°, FLT, PL, RO, G, IN >5mm	5 >10
	62.0		2307.5								
		Becomes GOUGE, light pink sandy clay with gravel sized clasts.				18	100	40	44	62 - 64.5: 51.0°, FLT, IR, RO, G, IN >5mm	>10 >10 8
65	65.5		2304.0							65.6: JN, IR, RO, G, CC <1mm	3
	67.0	Mescal Limestone (pCmls)): dark pink LIMESTONE moderately weathered, very strong to strong.	2302.5							65.9: 90.0°, JN, IR, RO, G, IN <5mm	3
		As above, fractures coated with gouge.				19	100	60	96	68.5: 73.0°, JN, IR, RO, Bx, IN <5mm 68.9: 55.0°, JN, IR, RO, Bx, IN <5mm 69.2: 42.0°, JN, PL, RO, G, IN <5mm	1 4 7 10
70	71.0		2298.5							69.6: 50.0°, JN, IR, RO, G, IN <5mm, coarse sand in joint	>10
	72.0	As above, becomes highly weathered, brecciated.	2297.5								
		As above, gouge.				20	100	94	100	69.8: 52.0°, JN, PL, RO, Sa, CC <1mm 70: 52.0°, JN, PL, RO, Sa 70.9 - 72: 83.0°, FLT, IR, RO, Bx, IN >5mm 72 - 72.4: 62.0°, FLT, IR, VR, Bx, IN >5mm, gouge 73.8: 78.0°, JN, CU, RO 75.6: 82.0°, JN, IR, RO, Sa 76.6: 66.0°, JN, PL, RO, Sa	4 1 0 1 1 1
	73.8		2295.7								
75		Mescalero Limestone (pCmls): light gray LIMESTONE, highly weathered, oxidized.									
	77.0		2292.5								
		As above, highly weathered.				21	100	62	70	77.6 - 77.7: 54.0°, B, ST, RO, Cl, IN >5mm, brecciated bedding infill 78.5: 58.0°, JN, IR, VR, Bx 79.2: 75.0°, JN, IR, VR, Sa, partial iron staining	5 6 4
80											

Log continued on next page

ISRM Strength Index: ● AX. ☐ DIAM. ▲ UCS (ksi); R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6

ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
4					
5					
5 - 4					
3					
2					
2					
3					
6					
3 - 4					
3					
4					
5					
3 - 4					
2					
4					

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-20 (GT-03)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 13, 2016 07:40
DRILLING END: December 17, 2016 11:00
COORDINATES: N: 844,754 E: 915,215

SHEET: 3 of 7
GS ELEV.: 2369.5
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0	As above, highly weathered. *(continued)*	2289.5			21	100	62	70	80.3 - 81.4: 68.0°, FLT, RO, Bx, IN >5mm	3 >10		4			
	82.0	Mescalero Limestone (pCmls): pink LIMESTONE, highly weathered, oxidized.	2287.5			22	100	64	94	82.4: 49.0°, JN, ST, SM, FeOx, partial iron staining, SO 82.7: 49.0°, JN, PL, SM, partial iron staining 83.3: 65.0°, JN, IR, RO, Cl, SA 84.4: 74.0°, JN, PL, RO, partial iron staining, SO 84.6 - 84.8: 56.0°, B, IR, VR, Bx, IN >5mm	4 >10 >10 >10 5		4			
85	87.0	As above, highly fractured, chlorite infill.	2282.5			23	100	76	96	85: 62.0°, JN, IR, Sa, partial iron staining 85.2 - 85.8: 44.0°, FLT, IR, VR, Bx, IN >5mm 88 - 88.3: 32.0°, JN, PL, VR, Bx, partial iron staining, IN >5mm 88.5: 54.0°, JN, PL, RO, Sa, partial iron staining, CC <1mm 89.5: 64.0°, JN, IR, VR, Sa, CC <1mm	5 4 3 2 3		4			
90	92.0	Becomes light pink, and dark gray LIMESTONE, foliated and folded, sheared, altered, and boudined.	2277.5			24	50	40	42	90: 68.0°, PL, RO, Cl, CC <1mm 90.3: 72.0°, JN, IR, VR 91: 38.0°, JN, PL, RO, Bx, IN <5mm 91.8: 41.0°, JN, IR, RO, Sa 92.5: 39.0°, FO, PL, PO, CN, partial iron staining, IN >5mm 94.5 - 97: FLT	1 0 5 >10 >10		2 - 3			
95	97.0	As above, fault zone, breccia, crushed rock and sand and little clay, some oxidation and silicification.	2272.5			25	100	0	20	97 - 99: FLT, Bx, partial iron staining	>10 >10		4			
	99.0	As above, transitions out of fault zone.	2270.5			26	100	25	50	100.4 - 100.8: 45.0°, JN, PL, VR, Bx, partial iron staining, SA	>10 5		5 4			
100	101.0	Becomes brown LIMESTONE, highly weathered, highly fractured, oxidized.	2268.5			27	100	45	65	102 - 102.5: 27.0°, FLT, ST, RO, Bx, IN >5mm	10 >10		4			
	103.0	As above.	2266.5			28	75	10	23	104.6: 46.0°, JN, PL, VR, Cl, IN <5mm 104.8: 45.0°, JN, PL, VR, Sa, IN <5mm 106: 64.0°, JN, ST, RO, Sa, CC <1mm	>10 >10 >10 >10		4			
105	107.0	Becomes pink LIMESTONE, black stratified chert inclusions, cemented gouge at bottom 1 ft of run.	2262.5			29	80	11	20	108.3: 72.0°, JN, IR, RO, Sa 108.6: 72.0°, JN, IR, RO, Sa 108.9: 64.0°, JN, ST, RO, G, IN <5mm 109.3: 52.0°, JN, IR, RO, G	0 3 1 0		4 6			
110	110.5	Continues cemented GOUGE, highly weathered.	2259.0			30	100	78	84	111.2: 74.0°, B, IR, RO 112.9: 83.0°, JN, PL, RO, Bx, partial iron staining, IN >5mm 113.7: 60.0°, JN, IR, VR, Sa, partial iron staining, SA 114: 40.0°, JN, ST, RO, Sa, partial iron staining, SA	1 1 1 1 6		4 3			
	112.3	Becomes pink LIMESTONE, moderately weathered, highly fractured.	2257.2													
115	115.5	Becomes orange gray to dark gray LIMESTONE, foliated and boudined, broken with rubbly zones, highy oxidized.	2254.0			31	100	38	86	115.6: 48.0°, JN, PL, SM, partial iron staining, SA 115.7: 34.0°, JN, PL, SM, partial iron staining, SA 115.8: 6.0°, JN, ST, SM, partial iron staining, SA 116.1: 57.0°, JN, PL, RO, partial iron staining, SO 116.4: 42.0°, JN, PL, RO, Bx, IN >5mm	6 6 >10 >10 >10		3 - 4			
120		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-20 (GT-03)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 13, 2016 07:40
DRILLING END: December 17, 2016 11:00
COORDINATES: N: 844,754 E: 915,215

SHEET: 4 of 7
GS ELEV.: 2369.5
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
120	120.0		2249.5													
	120.5		2249.0			31				117: 60.0°, JN, PL, SM, Bx, partial iron staining, IN <5mm	2		3 - 4			
		As above, brecciated.								117.3: 28.0°, JN, PL, VR, partial iron staining, CC <1mm	1					
						33	100	96	98	117.4: 66.0°, JN, PL, VR, Bx, partial iron staining, IN >5mm	0		3			
125										117.7: 65.0°, JN, ST, SM, Sa, matte, CC <1mm	0					
	125.5		2244.0							118.3: 50.0°, JN, PL, RO, Sa, CC <1mm	1					
		As above, highly oxidized with MnOx dendrites.								118.5: 18.0°, JN, PL, SM, partial iron staining, SA	0					
										118.8: 55.0°, JN, PL, RO, G	1					
						34	100	76	78	119.6: 58.0°, JN, PL, SM, Cl, matte, CC <1mm	0		3			
130										120.1 - 120.3: 76.0°, FLT, PL, RO, Bx, IN >5mm	>10					
										121.3: 70.0°, FLT, UN, RO, Bx, full iron staining, IN <5mm	>10					
	131.0		2238.5							121.5: 68.0°, JN, PL, VR, Cl, full iron staining, PC	>10					
		Becomes light pink LIMESTONE, moderately weathered, highly fractured, partially brecciated.								122.4: 64.0°, JN, ST, VR, M, full iron staining, PC	>10					
										123.4: 80.0°, JN, IR, VR, FeOx, full iron staining, CC <1mm	>10					
	133.5		2236.0			35	100	60	74	126.3: 58.0°, FOLO, PL, RO, Cl, full iron staining, IN <5mm	>10		3 - 2			
		Dripping Springs Quartzite (pCds): gray pink QUARTZITE, fine grained, many fractures near contact, moderately weathered, moderate HCl reaction.								128.3: 79.0°, FLT, IR, RO, G, IN <5mm	5					
135	136.0		2233.5							129.8 - 131: 60.0°, FLT, PL, SM	10					
		As above, liesegang banding present.								132.6: 71.0°, JN, IR, RO, Sa	3		2			
										133 - 133.1: 69.0°, FLT, IR, RO, G, IN >5mm	10					
						36	100	84	84	133.7 - 133.8: 64.0°, FLT, ST, VR, Bx, partial iron staining, SA						
140										134.2 - 134.6: 45.0°, FLT, PL, RO, Bx, thin calcite infill	>10		3			
										135.1: 33.0°, JN, ST, SM, partial iron staining, SA	>10					
	141.0		2228.5										5			
		As above								135.4: 34.0°, JN, ST, SM, partial iron staining, SO	0					
										136.7: 48.0°, JN, PL, RO, partial iron staining, SA	1					
						37	100	74	80	137.6: 68.0°, JN, ST, RO, partial iron staining, SA	0		2			
145										138.3 - 138.4: FLT, IR, RO, Bx	1					
										139.4 - 139.6: 35.0°, FLT, IR, SM, Bx	0		3 - 4			
	146.0		2223.5							140.6 - 141: 84.0°, FLT, IR, VR, Bx, partial iron staining, SA	3					
		Becomes pinkish orange BRECCIA, weak calcite matrix, clasts are quartzite with liesegang banding.								142.2: 62.0°, JN, PL, RO, partial iron staining, SA	0					
										144.7: 68.0°, JN, PL, partial iron staining, SA	2		4			
	149.0		2220.5			38	100	46	50	145 - 146: 66.0°, FLT, PL, RO, Ca, SA	>10					
150		Dripping Springs Quartzite (pCds): grayish black to brown QUARTZITE medium grained to silty, bedded, fractured thoughout, minor calcite stockwork.								146 - 146.3: FLT			3			
										148.9 - 149.1: CONO	>10					
										149.3 - 151: FLT	>10					
										151.1: 64.0°, JN, ST, RO, FeOx, partial iron staining, PC	>10		3			
	153.3		2216.2							151.4: 59.0°, B, UN, SM, FeOx, partial iron staining, PC	>10					
		Becomes pinkish orange, BRECCIA, weak calcite matrix, quartzite clast have liesegang banding.				39	100	66	78	151.8: 57.0°, B, PL, RO, FeOx, full iron staining, CC <1mm	1					
155										152 - 153.3: FLT	0		3			
	156.0		2213.5							153.3: 66.0°, CONO, PL, RO, FeOx, full iron staining, CC <1mm	0					
		Becomes FAULT, matrix is extremely weak, friable, gougey, and clayey, no HCl reaction.									>10					
						40	86	23	23	156.5 - 159.5: FLT, Bx	>10		5			
	159.5		2210.0								>10					
160		As above, slightly more competent.				41	64	44	60		>10		3 - 4			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-20 (GT-03)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 13, 2016 07:40
DRILLING END: December 17, 2016 11:00
COORDINATES: N: 844,754 E: 915,215

SHEET: 5 of 7
GS ELEV.: 2369.5
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
160	160.0	As above, slightly more competent. *(continued)*	2209.5			41	64	44	60	160.7: SHR, IR, G	>10 >10		3 - 4					
	162.0	Becomes orange-brown QUARTZITE, moderately weathered, zones of cemented breccia and beds of fine material.	2207.5			42	100	86	98	163.2 - 163.3: 78.0°, FLT, IR, RO, Bx, quartzite clasts, clay matrix 164.5: JN, IR, SM, Cl, PC 165.1: 68.0°, JN, ST, SM, Cl, PC 165.3: 71.0°, JN, ST, SM, Cl, PC 166.5: 55.0°, JN, PL, SM, Cl, PC	>10 3 3 3 4		2 3				
165	167.0	As above.	2202.5			43	88	88	88	166.6: 58.0°, JN, UN, RO, G, IN >5mm 168.3: 83.0°, JN, IR, VR 168.8: 74.0°, JN, UN, VR	>10 2 1 0 2		3				
170	172.0	As above.	2197.5			44	100	70	86	172.4 - 172.7: 68.0°, FLT, UN, VR, Bx, IN >5mm 175.7: 66.0°, JN, ST, RO, Bx, IN >5mm 176.2 - 176.5: 58.0°, FLT, IR, VR, IN >5mm	3 2 1 0 3		3				
175	177.0	As above.	2192.5			45	100	82	92	180.2 - 180.5: 50.0°, FLT, ST, RO, G, IN >5mm 180.7: JN, IR, RO, G, IN >5mm	1 1 0 5 2		3				
180	182.0	As above, intervals of cemented breccia throughout.	2187.5			46	100	74	94	181.4: 40.0°, JN, IR, RO, partial iron staining, SA 181.6: 76.0°, JN, IR, SM, no iron staining 183.6: 52.0°, JN, IR, VR, partial iron staining, SA 183.9: 30.0°, JN, PL, RO, Cl, partial iron staining, PC 184.1 - 184.4: 56.0°, IR, RO, Bx, partial iron staining, IN >5mm	0 2 1 1 4		3				
185	187.0	Becomes BRECCIA, red oxide matrix, clasts are gravel sized and oxidized.	2182.5			47	100	88	96	185.2: 90.0°, JN, ST, RO, partial iron staining, SA 186: 84.0°, JN, IR, RO, partial iron staining, SA 186.4: 82.0°, JN, PL, RO, Cl, partial iron staining, PC 186.6: 73.0°, JN, IR, RO, Cl, partial iron staining, PC 187.4: 68.0°, JN, IR, VR, Bx, partial iron staining, PC, thin clay coatings	2 1 1 3 1		3				
190	192.0	As above with intervals of unbrecciated fine material.	2177.5			48	100	82	94	188.3: JN, IR, VR, partial iron staining, SA 189.6: 84.0°, JN, IR, VR, Bx, partial iron staining, IN <5mm 190.5: 80.0°, JN, PL, RO, partial iron staining, SA 191.7: 78.0°, JN, IR, VR, partial iron staining, SA 192.1: 78.0°, JN, ST, VR, partial iron staining, SA 193.3: 62.0°, JN, UN, VR, partial iron staining, SA	0 3 1 1 3 2		3				
195	197.0	Becomes orange brown QUARTZITE, moderately weathered.	2172.5			49	100	62	82	193.6 - 193.8: 72.0°, FLT, IR, VR, G, IN >5mm 195.4: 61.0°, JN, ST, RO, Cl, PC 196.3: 41.0°, JN, IR, RO,	3 2		3				
200		Log continued on next page																

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-20 (GT-03)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 13, 2016 07:40
DRILLING END: December 17, 2016 11:00
COORDINATES: N: 844,754 E: 915,215

SHEET: 6 of 7
GS ELEV.: 2369.5
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT
200	200.0		2169.5								
		Becomes orange brown QUARTZITE, moderately weathered. *(continued)*				49	100	62	82	partial iron staining, SA 196.5: 45.0°, JN, CU, VR, Bx, partial iron staining, SA 198.1: 70.0°, JN, IR, VR, Bx, partial iron staining, SA	3 >10
	202.0		2167.5								
		As above.				50	94	70	82	198.7 - 198.8: 70.0°, FLT, IR, RO, Bx, partial iron staining, SA 199.2: 71.0°, JN, UN, VR, G, IN >5mm 199.9: 74.0°, JN, PL, RO, full iron staining, SA 200.1: 74.0°, JN, ST, RO, G, IN <5mm 200.5: 75.0°, JN, PL, RO, full iron staining, SA	4 1 2 0 1
205											
	207.0		2162.5								
		Becomes BRECCIA.									
	208.0		2161.5			51	80	60	60	202.6 - 203.2: 55.0°, FLT, IR, RO, Bx, partial iron staining, IN >5mm 204.2: 82.0°, JN, ST, RO, full iron staining, SA 204.5: 82.0°, JN, PL, RO, full iron staining, SA	>10 >10 >10
		As above, completely weathered, no HCl reaction.									
	209.5		2160.0								
210		As above.				52	100	32	52	208.6: 83.0°, JN, IR, VR, G, IN <5mm 211: 82.0°, JN, IR, VR, Cl, PC	>10 >10
	212.0		2157.5								
		As above.				53	100	0	0	211.3: 82.0°, JN, IR, VR, Cl, PC	>10 1
	214.5		2155.0								
215		As above, more competent.				54	100	84	90	214.6: 80.0°, JN, IR, VR, G, IN >5mm 215.8 - 215.9: 33.0°, IR, VR, G, IN >5mm 214.9 - 217.5: 12.0°, PL, SK, G, IN <5mm 216.2: JN, PL, VR 218.2: 81.0°, JN, IR, VR, G, CC <1mm 219.3: 82.0°, JN, UN, VR, G, CC <1mm	3 4 2 1 1 1
	219.5		2150.0								
220		As above, brecciated quartzite, intervals of gouge.				55	100		68	220.4: 47.0°, JN, UN, RO, Cl, PC 221.8: 83.0°, JN, UN, Cl, PC 220.3 - 224: 7.0°, JN, PL, SK 222.9 - 223.4: 52.0°, FLT, IR, VR, G, IN >5mm	3 3 >10 >10 5
	224.5		2145.0								
225		As above.				56	100	91	91	228.9: 68.0°, JN, ST, VR, Bx, IN <5mm	0 0 0 2 1
230	230.0		2139.5								
		As above.				57	100	48	54	232.6 - 232.7: 62.0°, JN, UN, VR, Bx	0 0 2
	233.0		2136.5								
		Becomes highly fractured dark red and orange QUARTZITE bedded, highly oxidized.								233 - 235: 80.0°, FLT, IR, VR, Bx	>10 >10
235	235.0		2134.5								
		As above. Drillers noticed circulation loss at 237 ft-bgs.				58	87	53	60	236.1 - 236.3: 46.0 - 85.0°, FLT, IR, RO, Bx, IN >5mm 237.2 - 237.9: 82.0°, FLT, ST, VR, Bx, IN >5mm	0 1 >10
	238.0		2131.5								
		As above, becomes less fractured.				59	87	0	0		>10
	239.5		2130.0								
240		As above.				60	100	0	28		>10
		Log continued on next page									

ISRM Strength Index: ● AX. □ DIAM. ▲ UCS (ksi) R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6

ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
3			
3			
3			
4 - 5			
3 - 5			
4 - 5			
3			
3			
2			
3			
5			
2			
3			
5			
5			

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF DRILLHOLE DH16-20 (GT-03)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 13, 2016 07:40
DRILLING END: December 17, 2016 11:00
COORDINATES: N: 844,754 E: 915,215

SHEET: 7 of 7
GS ELEV.: 2369.5
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0		2129.5													
		As above. *(continued)*				60	100	0	28	241.1: 78.0°, JN, PL, RO, partial iron staining	>10					
	242.0		2127.5							241.4 - 241.7: 56.0°, FLT, PL, RO, Bx	>10					
		As above.								241.9 - 244: 86.0°, FLT, PL, RO, Bx	>10		5			
	244.0		2125.5			61	63	48	48		1					
245		Becomes BRECCIA, strong, well cemented, quartzite clasts are altered and oxidized.								244.6: JN, IR, RO, G, IN <5mm	1		2			
	246.0		2123.5								0					
		As above.				62	100	50	50		3		2			
	247.0		2122.5							247.2: 71.0°, JN, ST, RO, Sa, CC <1mm	1					
		Becomes less brecciated.				63	100	67	73	248.1 - 248.4: 75.0°, FLT, IR, SM, Bx, IN >5mm	>10		2			
250	250.0		2119.5							249.1: 75.0°, JN, PL, SM, FeOx, SA	5					
		Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram. Notes: 0 - 23.5: Hydro test #1 FHT 25 - 28: Rock in bit causes mis-latch, poor recovery. 36 - 57: Hydro test #2 SI 52 - 131: Hydro test #3 SI 131 - 225: Hydro test #5 SI & CRI 227 - 250: Hydro test #4 SI & CRI 237: Circulation lost at 237 ft-bgs.									249.5 - 249.7: 73.0 - 46.0°, JN, UN, RO, partial iron staining, SA 249.9: 55.0°, JN, PL, SM, partial iron staining, PC						
255																
260																
265																
270																
275																
280																

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:31
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RECORD OF BOREHOLE DH16-21-(GT-05)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: December 16, 2016 11:31
DRILLING END: December 16, 2016 11:31
COORDINATES: N: 845,595 E: 917,417
SHEET: 1 of 7
GS ELEV.: 2406.9
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLES SAMPLE TYPE & NUMBER	BLOWS per 6 in (Automatic hammer 140 lb Hammer, 30 inch drop)	REC / ATT (in)	PENETRATION RESISTANCE BLOWS / ft (20 40 60 80) WATER CONTENT (%) (W_p W W_l) (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
0		0.0	(CL), SILTY CLAY, medium plasticity, fine to coarse subrounded to subangular sand, trace fine to coarse subrounded to subangular gravel, brown-red, COLLUVIUM; Quartzite gravel; cohesive, stiff, w ~ PL, Bolsa quartzite colluvium, patches of mod HCl reaction	2406.9	CL							0 - 31.5: Hydro test #1 FHT	
		4.0	Poor recovery, washed gravel, mixed quartzites and diabase.	2402.9								
5		6.0	(SP-SC), SAND, medium, poorly graded, subangular to angular, some low plasticity fines, trace fine angular gravel, dark pink-brown, RESIDUUM; Diabase gravel; non-cohesive, dry to moist, Residual weathered diabase, 3" int blows: 3-6-5-11-16-22. Recovery from split spoon only, no core.	2400.9	SP-SC		SS S-1	9-16-38 **(54)**	12/18	54		
10		11.0	(SP-SM), SAND, medium, poorly graded, subangular to angular, trace low plasticity fines, trace gravel, brown-black, RESIDUUM; non-cohesive, wet, 3" blows: 1-1-1-1-2-12; residual weathered diabase, moisture content from drill fluid, recovery from split spoon only.	2395.9	SP-SM		SS S-2	2-2-14 **(16)**	18/18	16		
15		15.0	Continues DIABASE, residual soil to completely weathered, poorly graded sand, becomes little gravel, trace calcite.	2391.9								
		16.0	(SP-SM), SAND, medium, poorly graded, subangular to angular, trace non plastic fines, trace gravel, dark brown, weak cementation, strong HCL reaction, RESIDUUM; non-cohesive, dry to moist, Weakly cemented completely weathered diabase, little FeOx staining, weathered calcite veining. 3" blows: 5-8-14-21-23-25	2390.9	SP-SM		SS S-3	13-35-48 **(83)**	14/18	83		
20		18.5	DIABASE: brown, completely weathered to sandy gravel with trace silt, weakly to moderately cemented, strong HCl reaction, weathered calcite veins, some FeOx staining.	2388.4								
		21.0	Becomes dark gray brown, DIABASE, moderately weathered, medium to coarse grained, irregular calcite veining, FeOx staining, fractured, no HCl reaction in rock body, just veins.	2385.9			SS S-4	31-50/0" **(50/0")**	5/6	100		
25		24.0	As above.	2382.9								
		29.0	As above, becomes highly weathered and fractured.	2377.9								
30		31.5	No recovery.	2375.4							31.5: Set surface casing to 25 ft-bgs.	
		33.0	Becomes brownish black DIABASE aphanitic, slight foliation, calcite and quartz veining, FeOx staining, returns are washed gravel only.	2373.9							33: Drilling difficulties, hole cave and recovery problems.	
35		34.0	As above.	2372.9								
		35.0	No recovery.	2371.9								
		36.5	Mafic intrusive: dark greenish black DIABASE, aphanitic, slight foliation, calcite and quartz veining, FeOx staining, returns are washed gravel only.	2370.4							36.5 - 40: Drilling dfifficulties, hole washing out and producing lots of sand but no core. Drillers stop to advance surface casing.	
40		40.0		2366.9								

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30
LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 15:42
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RECORD OF DRILLHOLE DH16-21-(GT-05)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 16, 2016 11:31
DRILLING END: December 16, 2016 11:31
COORDINATES: N: 845,595 E: 917,417

SHEET: 1 of 8
GS ELEV.: 2406.9
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
0	0.0		2406.9													
		(CL), SILTY CLAY, medium plasticity, fine to coarse subrounded to subangular sand, trace fine to coarse subrounded to subangular gravel, brown-red, COLLUVIUM; Quartzite gravel; cohesive, stiff, w ~ PL, Bolsa quartzite colluvium, patches of mod HCl reaction				1	88	0	0							
	4.0		2402.9													
5		Poor recovery, washed gravel, mixed quartzites and diabase.				2	25	0	0							
	6.0		2400.9													
		(SP-SC), SAND, medium, poorly graded, subangular to angular, some low plasticity fines, trace fine angular gravel, dark pink-brown, RESIDUUM; Diabase gravel; non-cohesive, dry to moist, Residual weathered diabase, 3" int blows: 3-6-5-11-16-22. Recovery from split spoon only, no core.				3	20	0	0				6			
10	11.0		2395.9													
		(SP-SM), SAND, medium, poorly graded, subangular to angular, trace low plasticity fines, trace gravel, brown-black, RESIDUUM; non-cohesive, wet, 3" blows: 1-1-1-1-2-12; residual weathered diabase, moisture content from drill fluid, recovery from split spoon only.				4	40	0	0				5			
15	15.0		2391.9													
	16.0	Continues DIABASE, residual soil to completely weathered, poorly graded sand, becomes little gravel, trace calcite.	2390.9													
	18.5	(SP-SM), SAND, medium, poorly graded, subangular to angular, trace non plastic fines, trace gravel, dark brown, weak cementation, strong HCL reaction, RESIDUUM; non-cohesive, dry to moist, Weakly cemented completely weathered diabase, little FeOx staining, weathered calcite veining. 3" blows: 5-8-14-21-23-25	2388.4			5	80	0	0				5			
20	21.0		2385.9													
	24.0	DIABASE: brown, completely weathered to sandy gravel with trace silt, weakly to moderately cemented, strong HCl reaction, weathered calcite veins, some FeOx staining.	2382.9			6	100	0	40	21 - 22.8: weathered rock, sandy gravel 22.8: 70.0°, JN, CU, VR, Sa, full iron staining, PC 23: 30.0°, JN, UN, VR, Ca, full iron staining, PC	>10 >10 5		4 - 5 3			
25		Becomes dark gray brown, DIABASE, moderately weathered, medium to coarse grained, irregular calcite veining, FeOx staining, fractured, no HCl reaction in rock body, just veins.				7	96	20	26	23.2: 28.0°, JN, UN, VR, Sa, full iron staining, PC, calcite infill 23.4: 75.0°, HVN, IR, VR, Sa, full iron staining, PC 23.7: 75.0°, JN, PL, VR, Sa, full iron staining, PC, calcite infill 23.9: 47.0°, JN, ST, SM, Ca, partial iron staining, PC 24 - 25.4: FLT, broken rock	>10 5 >10 5 >10		3			
		As above.														
	29.0		2377.9													
30		As above, becomes highly weathered and fractured.				8	80	0	0	26 - 27: FLT, fractured rock and sub-vertical joint set, FeOx staining, calcite 27.4 - 27.5: FLT, Sa, full iron staining, IN >5mm	>10 >10		3 - 4			
	31.5		2375.4													
		No recovery.				9	0	0	0	27.6: 5.0°, JN, UN, SM, Ca, partial iron staining, IN <5mm						
	33.0		2373.9													
	34.0	Becomes brownish black DIABASE aphanitic, slight foliation, calcite and quartz veining, FeOx staining, returns are washed gravel only.	2372.9			10	50	0	10	27.5 - 29: FLT, fractured rock with subvertical joint, calcite, some FeOx staining	>10		4			
35	35.0		2371.9			11	100	0	20	29.5 - 31: FLT, fractured rock, FeOx staining	>10		3 - 4			
		As above.								31 - 31.5: FLT, gravelly sand						
	36.5	No recovery.	2370.4			12	0	0	0	33 - 34: FLT, rubble 34 - 35: FLT, fractured rock						0.1
		Mafic intrusive: dark greenish black DIABASE, aphanitic, slight foliation, calcite and quartz veining, FeOx staining, returns are washed gravel only.				13	29	0	0							
40	40.0		2366.9							39 - 40: only washed gravel	>10		5			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH16-21-(GT-05)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 16, 2016 11:31
DRILLING END: December 16, 2016 11:31
COORDINATES: N: 845,595 E: 917,417

SHEET: 2 of 8
GS ELEV.: 2406.9
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0	No recovery.	2366.9			14	0	0	0					BC		
45	45.0	Continues no core recovery.	2361.9			15	0	0	0							
	48.0	Continues washed gravel and redrill.	2358.9			16	40	0	0	48 - 50.5: washed gravel only	>10		5			
50	50.5	Mafic intrusive: dark greenish gray DIABASE, aphanitic, slight lustrous sheen, FeOx staining on discontinuities, broken core and redrill.	2356.4			17	67	0	0	50.5 - 52.5: returns are rubble and broken core, FeOx coatings	>10		4			0.1
	52.5	As above, becomes coarser grained. Fractured and brecciated.	2354.4			18	100	0	0		>10		4			
	54.0	As above.	2352.9			19	100	0	13	52.5 - 54: FLT, fractured rock, breccia, FeOx coatings	>10		3			
55	54.5	As above, rubbly breccia zones.	2352.4			20	100	0	0	54 - 54.5: FLT, fractured rock and redrill, FeOx coatings	>10		3			
	56.5	As above, fractured and highly jointed, subvertical joint set, FeOx coatings on discontinuities.	2350.4			21	100	15	20	54.5 - 56.5: FLT, fractured rock with bx zones, FeOx coatings	>10		3			
	58.0	As above.	2348.9			22	100	0	0	56.7: 8.0°, JN, UN, VR, CN, partial iron staining	>10		3			
	59.5	As above.	2347.4			23	100	0	0	57.2: 65.0°, JN, ST, SM, FeOx, full iron staining, CC <1mm	4		3			
60	62.0	As above.	2344.9			24	60	0	8	57.3: 15.0°, JN, UN, RO, Bx, full iron staining, IN >5mm, 1-cm breccia infill 57.4: 40.0°, JN, UN, RO, CN, full iron staining	>10		3 - 4			
	64.0	As above.	2342.9			25	35	0	10	57.6: 5.0°, JN, UN, RO, FeOx, full iron staining, CC <1mm 58 - 59.5: FLT, fractured rock and breccia, some FeOx staining	>10		4			
65	67.0	No recovery.	2339.9			26	0			59.5: 12.0°, JN, PL, SM, FeOx, full iron staining, CC <1mm 59.6: 61.0°, JN, UN, RO, CN, partial iron staining 59.7: 75.0°, JN, IR, VR, CN, partial iron staining	>10					
	67.5	No recovery, slow advancement.	2339.4			27	0			59.8: 45.0°, JN, PL, RO, FeOx, full iron staining, CC <1mm						
	68.5	No recovery.	2338.4			28	0									
	69.0	Mafic intrusive: dark greenish gray DIABASE, aphanitic, some oxidation in rock body, foliated, some alteration, FeOx staining on discontinuities, only washed gravel redrill recovered.	2337.9			29	0	0	0	60: 80.0°, JN, ST, RO, FeOx, partial iron staining, PC	10					
70	70.0		2336.9			30	0	0	0		>10		4			
	71.0		2335.9			31	100	0	0	60.1: 5.0°, JN, UN, RO, Bx, partial iron staining, IN <5mm	>10		4			
	73.0	As above. As above with fragments of weakly cemented sandy breccia matrix and calcite veining.	2333.9			32	75	20	20	60.4: FLT, breccia, sand, and little clay 62 - 63.3: FLT, no recovery, likely clayey sand as above	>10		4			
	75.0	As above with trace strong cemented breccia matrix.	2331.9			33	0	0	0	63.4: 28.0°, JN, UN, RO, FeOx, full iron staining, CC <1mm	>10		4			
75						34	10	0	0	63.6: 15.0°, JN, UN, VR, FeOx, full iron staining, CC <1mm	>10		4			
	79.5	Mafic intrusive: dark greenish gray, DIABASE, aphanitic, some oxidation in rock body, foliated, FeOx coatings, only redrill recovered (gravel), thought to be similar to above with weak breccia matrix lost in drilling process. As above, with few chunks of matrix recovered - matrix is soft, silty clay, purple brown. Clasts continue mafic intrusive as above, gravel and corestones.	2327.4			35	33	9	9	63.8 - 64: FLT, Bx, partial iron staining 68.5 - 69: FLT, Bx 70 - 75.9: FLT, Bx	>10		4			
80						36	67	47	47		>10		4			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH16-21-(GT-05)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 16, 2016 11:31
DRILLING END: December 16, 2016 11:31
COORDINATES: N: 845,595 E: 917,417

SHEET: 3 of 8
GS ELEV.: 2406.9
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE: DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
80	80.0		2326.9															
	81.0	Mafic intrusive: dark green and red, DIABASE, aphanitic, altered, epidote amygdules and oxidation. Brecciated with corestones. *(continued)*	2325.9			36	67	47	47	80.4 - 80.6: FLT, IR, RO 80.5 - 81: FLT, Bx	5		4					
											0							
		Becomes red, white, and black, BRECCIA, diabase and limestone clasts, well cemented and massive matrix, strong HCl reaction.				37	100		100		0		2 - 3					
	84.0		2322.9								0							
85		Continues BRECCIA, well cemented and				38	100	100	100		0		2 - 3					
	85.5	massive, clast-supported, diabase clasts.	2321.4								3							
		Becomes Mescal Limestone (pCmls): pink, gray, yellow, and white LIMESTONE BRECCIA, variably cemented with calcite and stiff clay, gougey fault zones, few mafic intrusive clasts incorporated.				39	100	56	62	85.5 - 85.7: FLT, weak breccia 85.8: 62.0°, JN, ST, RO, Cl, full iron staining, CC <1mm 86.2 - 87.3: 50.0°, FLT, gouge, weak rock, slickensides 88.2: 45°, JN, UN, RO, Cl, full iron staining, IN <5mm	3 >10 2 1		3					
90											1							
	90.5		2316.4							89.9 - 90.5: FLT, broken rock and sand	5							
		Continues light gray to pinkish gray LIMESTONE, with oxidized red zones, weak, healed breccia texture, weak altered/fault zones. Brecciated at contact with diabase below.				40	100	94	97	91: 78.0°, JN, ST, RO, FeOx, partial iron staining, CC <1mm 93 - 93.4: 65.0°, FLT, broken rock with clayey infill	0 0 3		2					
95	95.0		2311.9								3							
		Becomes DIABASE (pCdiab) dark gray with little red mottling, coarse-grained (sub-ophitic), fractured and highly jointed,				41	100	33	33	94.7 - 95.4: FOLO, weak breccia and rubble	6		3					
	97.0	FeOx coatings, trace calcite coatings.	2309.9							95.8 - 97: FLT, heavily jointed and fractured	>10							
		As above, with healed breccia and open brecciated zones.				42	93		33	97.5: 74.0°, JN, IR, RO, FeOx, partial iron staining, PC	1 >10		4					
100	100.0		2306.9							98 - 100.3: FLT, broken rock, breccia and sand	>10							
		As above.				43	95	75	75	101.5 - 102: FLT, brecciated fault zone, broken rock, sand	0 4 4		3					
	104.0		2302.9								0							
105		Becomes BRECCIA, matrix supported, dark gray diabase clasts in very weak, red, highly oxidized matrix, some calcification, zone of extremely weak rock.				44	100	66		104.4 - 104.7: FLT, clayey sand 105.8 - 106: FLT, PL, SK, Sa, SA	3 2 0		4					
	106.5		2300.4								0							
		Becomes DIABASE (pCdiab): very dark gray, coarse to very coarse grained, calcite veins, little oxidation, some zones of open and irregular fractures.								108.2 - 108.4: FLT, highly fractured rock with clayey sand matrix	0 3		3					
	109.0		2297.9								0							
110		Becomes reddish black with greenish black, DIABASE, chloritic and hematitic alteration, quartz/calcite veining, FeOx haloes around faults, healed (calcite and weak rock) fractures, brecciated throughout.				45	96	86	90	110.5: 32.0°, JN, UN, VR, Sa, full iron staining, PC 110.65 - 110.7: 22.0°, FLT, UN, SK, Bx, full iron staining, IN >5mm 110.9 - 111: 30.0°, FLT, UN, VR, Sa, full iron staining, IN >5mm	3 0 0 0		3					
	114.0		2292.9								0							
115		Becomes reddish black DIABASE BRECCIA, clast supported, very weak matrix, clasts are coarsely								113.1: 57.0°, JN, PL, RO, Sa, partial iron staining, PC 115.3: 51.0°, JN, ST, PO, Cl, full iron staining, CC <1mm	0 2		3					
	116.0	crystaline/porphyritic with hematitic alteration, calcite veining, weak HCl reaction, jointed.	2290.9			46	100	36	100	115.8: 69.0°, JN, ST, RO, Sa, partial iron staining, PC 116.1: 85.0°, JN, PL, RO, Cl, partial iron staining, PC 116.2: 70.0°, FLT, PL, SK, Cl, full iron staining, CC <1mm	2 0 1		4					
	119.0	Becomes dark reddish brown BRECCIA matrix supported, matrix is extremely weak, subvertical faulting.	2287.9															
120		As above.				47	70	54	60	118.5: 5.0°, FLT, UN, SK,			4					

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH16-21-(GT-05)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 16, 2016 11:31
DRILLING END: December 16, 2016 11:31
COORDINATES: N: 845,595 E: 917,417

SHEET: 4 of 8
GS ELEV.: 2406.9
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE: DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
120	120.0	As above. *(continued)*	2286.9							Cl, full iron staining, CC <1mm								
										121.2 - 121.3: 42.0°, FLT, CU, VR, Bx, full iron staining, IN >5mm	1							
						47	70	54	60		0		4					
	124.0		2282.9								0							
125		Continues DIABASE BRECCIA, matrix variably extremely weak to weak, oxidized throughout, jointed and sheared, some drilling damage to extremely weak rock.									>10		4					
										125.6: 75.0°, FLT, CU, SK, Cl, full iron staining, IN <5mm	8							
						48	88	26	42	125.8: 57.0°, FLT, CU, SK, Cl, full iron staining, CC <1mm	3		3					
										126.2: 44.0°, JN, UN, SM, Ca, partial iron staining, CC <1mm	2							
	129.0		2277.9								>10		4					
130		Becomes reddish black DIABASE (pCdiab), coarse grained, healed fracture texture throughout, weak, oxidation throughout, weak HCl reaction.								126.5: 48.0°, JN, ST, RO, Sa, partial iron staining, CC <1mm	3							
										126.6: 66.0°, JN, ST, SM, Cl, full iron staining, CC <1mm	0							
						49	100	82	94		0		3					
										127: 50.0°, JN, UN, SK, Cl, full iron staining, CC <1mm	3							
										128: 32.0°, JN, PL, PO, Cl, full iron staining, IN <5mm	2							
	134.0		2272.9															
135		As above.								128.5: 23.0°, JN, PL, PO, Cl, full iron staining, IN <5mm								
	135.5		2271.4															
		Becomes DIABASE BRECCIA, subrounded diabase clasts in fine matrix grades into zone of intense calcite viening and fracturing with less matrix.								129.3 - 129.6: 45.0°, FLT, IR, RO, Bx, full iron staining, IN >5mm	0							
										132.2: 72.0°, JN, ST, RO, FeOx, full iron staining, CC <1mm	1							
	137.5		2269.4			50	98	96			1		3 - 4					
		Becomes reddish gray, DIABASE (pCdiab), aphanitic, abundant calcite veining.								132.3: 52.0°, JN, CU, SM, Cl, partial iron staining, CC <1mm	3							
	139.0		2267.9															
140		Becomes DIABASE BRECCIA, matrix dominated, subround to subangular diabase clasts up to 1.5", friable matrix, minor calcite vieing.								132.5: 35.0°, JN, UN, RO, Cl, full iron staining, IN <5mm	2							
										133: 65.0°, JN, ST, SM, Ca, partial iron staining, PC	0							
						51	96	94		133.7: 70.0°, JN, PL, SM, FeOx, partial iron staining, PC	0		3 - 4					
										134.7: 65.0°, JN, PL, SM, FeOx, partial iron staining, SA	0							
	144.0		2262.9								2							
145		As above, intervals where veining and fractures dominate to zones of matrix dominant breccia, subround diabase clasts.								136.7: 70.0°, JN, ST, RO, Ca, partial iron staining, PC	1							
										137.6: 25.0°, JN, PL, SK, Ca, partial iron staining, PC	4							
						52	100	72		138.4: 55.0°, JN x 2, ST, SM, Ca, partial iron staining, PC	0		3 - 4					
										139: 50.0°, JN, PL, SM, Hem, partial iron staining, SA	5							
	149.0		2257.9								4							
150		Becomes reddish gray DIABASE (pCdiab), fine grained, phaneritic diabase intense calcite veining and fracturing.								139.5: 25.0°, JN, PL, PO, Cl, full iron staining, PC	2							
										139.8: 65.0°, JN, ST, RO, Hem, partial iron staining	2							
						53	100	82		143: 30.0°, JN x 2, UN, SM, Hem, full iron staining	2		3					
										144: 35.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm	3							
	154.0		2252.9							145: 55.0°, JN x 2, PL, SM, Hem, partial iron staining, SA	4							
155		Becomes DIABASE BRECCIA, poorly cemented clay rich matrix, diabase clasts subrounded, calcite veins.								145.2: 60.0°, JN, PL, SM, Hem, partial iron staining, SA	6							
										145.6: 65.0°, JN x 2, ST, RO, Ca, partial iron staining, PC	2							
						54	100	66		147.6: 75.0°, JN x 2, PL, SM, Ca, partial iron staining, SA	5		4 - 3					
										149.8: 50.0°, JN, PL, SM, Ca, partial iron staining, CC <1mm	0							
	159.0		2247.9								0							
160		As above.				55	100	90		150: 50.0°, JN, UN, SM,	1		4 - 5					
		Log continued on next page																

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH16-21-(GT-05)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 16, 2016 11:31
DRILLING END: December 16, 2016 11:31
COORDINATES: N: 845,595 E: 917,417

SHEET: 5 of 8
GS ELEV.: 2406.9
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC	LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
160	160.0	As above. *(continued)*	2246.9			55	100	90		Hem, partial iron staining, SA 150.4: 30.0°, HVN, UN, SM, Ca, partial iron staining, CC <1mm 150.7: 85.0°, JN, IR, RO, Hem, partial iron staining, SA 151.2: 48.0°, JN, PL, SM, Hem, partial iron staining, SO	1 2 0 1		4 - 5				
	164.0		2242.9															
165		Becomes reddish gray DIABASE (pCdiab), fine grained, phaneritic diabase euhedral phenocrysts, moderate clay and oxidation alteration.				56	100	84		151.8: 45.0°, JN, PL, SM, Hem, partial iron staining, SA 152.1: 45.0°, JN x 2, PL, SM, Hem, partial iron staining, SO 152.8: 75.0°, JN, PL, SM, Hem, partial iron staining 153.4: 25.0°, JN, PL, SM, Hem, partial iron staining, SA	0 3 2 1 2		5 - 4				
	169.0		2237.9															
170		As above, minor interval of pegmatite, coarse lathes of plagioclse.				57	100	86		153.6: 70.0°, JN x 2, PL, SM, Hem, partial iron staining, SO 154.1: 65.0°, JN, PL, SM, Hem, partial iron staining, SA 154.4: 40.0°, JN, PL, PO, Hem, partial iron staining, SA	1 1 4 1 0		3				
	174.0		2232.9															
175		As above, fine to medium grained, moderate clay and iron oxide alteration present.				58	100	100		160.1: 65.0°, JN, PL, SM, Hem, partial iron staining, SO 160.6: 55°, JN, PL, SM, Cl, partial iron staining, PC 162: 50.0°, JN x 2, PL, SM, Hem, partial iron staining, SA 165.3: 75.0°, JN, IR, RO, Hem, partial iron staining, SA	1 0 3 0 2		3				
	179.0		2227.9															
180		As above, minor zone of pegmatitic diabase.				59	100	100		166.5: 25.0°, JN, PL, SM, G, partial iron staining, IN >5mm 167.5: 60.0°, JN, PL, SM, Ca, partial iron staining, CC <1mm 168.4: 60.0°, JN, ST, SM, Hem, partial iron staining, SA 168.7: 60.0°, JN, PL, SM, Hem, full iron staining, SA	0 3 1 2 1		3				
	184.0		2222.9															
185	185.0	Becomes DIABASE BRECCIA, subround clasts, matrix supported, weakly cemented, clasts to 1.5".	2221.9			60	100	96		169.3: 35.0°, JN, PL, SM, Ca, partial iron staining, SA 170.4: 80.0°, JN, UN, SM, Hem, full iron staining 171.4: 20.0°, JN x 3, PL, PO, Hem, partial iron staining, SO 171.8: 70.0°, JN, PL, SM, Hem, full iron staining, SA 172.3: 20.0°, HVN, PL, SM, Ca, partial iron staining, IN >5mm	0 2 1 2 2		3 - 4				
		Becomes reddish gray DIABASE (pCdiab) with minor zone of pegmatite, moderate clay and oxide alteration present.																
	189.0		2217.9															
190		As above, intervals of stockwork calcite veining and interval of coarser grained diabase.				61	100	100		172.5: 40.0°, JN, PL, SM, Hem, partial iron staining, SO 175: 60.0°, JN, UN, PO, Hem, full iron staining, SA 176.2: 70.0°, JN, UN, SM, Hem, partial iron staining 177.2: 38.0°, JN x 2, PL, PO, G, full iron staining, IN >5mm 178: 45.0°, JN x 2, PL, SM, Hem, full iron staining, SA	1 0 0 1 1 1		3 - 4				
	194.0		2212.9															
195		As above, becomes fine grained, fractured, calcite veins.				62	100	96		180.5: 45.0°, JN, ST, PO, Hem, full iron staining, SA 181.1: 40.0°, JN x 2, PL, SM, Hem, partial iron staining, SO 181.8: 50.0°, JN, PL, SM, G, full iron staining, IN >5mm 182.4: 50.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm	1 1 0 1 1						
	199.0		2207.9															
200		As above				63	100	94		182.9: 40.0°, JN, PL, SM,	1		4					

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH16-21-(GT-05)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 16, 2016 11:31
DRILLING END: December 16, 2016 11:31
COORDINATES: N: 845,595 E: 917,417

SHEET: 6 of 8
GS ELEV.: 2406.9
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
200	200.0	As above *(continued)*	2206.9							Cl, partial iron staining, CC <1mm	2						
	202.0		2204.9							184.6: 30.0°, JN, PL, SM, Hem, partial iron staining, SO	1						
	204.0	Becomes DIABASE BRECCIA, clast supported subangular to subround, matrix is clay-rich and has hematite present.	2202.9	△		63	100	94		185.5: 30.0°, JN x 2, PL, SM, Cl, full iron staining, CC <1mm	1		4				
205		Beomes reddish gray DIABASE (pCdiab), fine to medium grained, moderate clay and oxide alteration present.								186.4: 70.0°, JN, ST, SM, Hem, partial iron staining, SO	1						
										187.2: 90.0°, JN, PL, SM, Hem, partial iron staining, SO	0						
						64	96	90		187.8: 55.0°, JN, IR, SM, Hem, partial iron staining, SA	3		3 - 4				
										188.7: 35.0°, JN x 2, PL, SM, Hem, full iron staining, SA	0						
	209.0		2197.9							189.7: 25.0°, JN, PL, PO, Cl, full iron staining, CC <1mm	3						
210		As above, minor interval of breccia around calcite vein.								192: 36.0°, JN, ST, SM, Hem, full iron staining, SA	2						
	212.0		2194.9			65	100	90		193: 25.0°, JN, PL, SM, Hem, full iron staining	3		3 - 4				
		As above, becomes medium grained, plagioclase lathes.								194: 70.0°, JN, ST, SM, Hem, partial iron staining, SA	1						
	214.0		2192.9			66	95	95		195.1: 55.0°, JN, PL, SM, Hem, full iron staining, SA	1		3 - 2				
		As above.								197.8: 55.0°, JN, UN, SM, Hem, partial iron staining, SO	1						
215										198.4: 37.0°, JN, PL, PO, Hem, partial iron staining, SA	5						
	217.0		2189.9			67	100	67		198.8: 47.0°, JN, PL, SM, Hem, partial iron staining	2		3				
		As above.								199: 30.0°, JN, PL, SM, Hem, partial iron staining, SO	2						
										200.7: 20.0°, JN x 2, PL, SM, Cl, full iron staining, CC <1mm	1						
220										202: 27.0°, JN, PL, SM, Cl, full iron staining, CC <1mm	3						
						68	100	90		202.4: 33.0°, JN, UN, SM, Cl, full iron staining, CC <1mm	3		3				
	222.0		2184.9							204: 40.0°, JN, PL, SM, Cl, full iron staining, CC <1mm	2						
		As above, abundant iron oxide alteration.								205.2: 75.0°, JN, IR, RO, Cl, full iron staining, SA	2						
	224.0		2182.9			69	90	90		205.6: 70.0°, JN, PL, SM, Hem, partial iron staining, SA	1		3				
225		As above.								205.8: 35.0°, JN, PL, SM, Hem, partial iron staining, SA	3						
										207.1: 20.0°, JN, PL, SM, Hem, full iron staining	1						
						70	98	82		207.4: 45.0°, JN x 2, PL, SM, Hem, partial iron staining, SO	5		3				
	229.0		2177.9							208.4: 55.0°, JN x 2, PL, SM, Hem, partial iron staining, SA	1						
230		Continues red gray DIABASE (pCdiab), medium to fine grained, competent, phaneritic, euhedral.								209.2: 34.0°, JN, PL, SM, Ca, partial iron staining, SO	2						
						71	100	63		209.4: 55.0°, JN, PL, SM, Hem, partial iron staining, SA	2		2 - 3				
	232.0		2174.9							209.8: 45.0°, JN, PL, SM, Hem, partial iron staining, SO	3						
		As above.								211.6: 25.0°, JN, PL, SM, Cl, full iron staining, CC <1mm	1						
						72	85	85		212: 45.0°, JN, PL, SM, Hem, partial iron staining, SA	2		3 - 2				
	234.0		2172.9							212.8: 50.0°, HVN, PL, SM, Ca, IN >5mm	2						
235		As above.								213.1: 65.0°, JN, PL, SM, Hem, partial iron staining, SO	0						
						73	95	38		214.5: 15.0°, JN, PL, SM,	5		3				
	238.0		2168.9								>10						
		As above.				74	50	0					3				
240	240.0		2166.9														

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DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH16-21-(GT-05)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 16, 2016 11:31
DRILLING END: December 16, 2016 11:31
COORDINATES: N: 845,595 E: 917,417

SHEET: 7 of 8
GS ELEV.: 2406.9
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 R3 3.62 R4 1.45 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0		2166.9				20 40 60 80	20 40 60 80	20 40 60 80							
	241.0	As above.	2165.9							Ca, partial iron staining, CC <1mm 215.4: 30.0°, JN, ST, SM, Hem, partial iron staining, SA						
		Continues dark gray DIABABSE (pCdiab), fine to medium grained, iron oxide and clay alteration.				75	88	20		215.7: 40.0°, JN x 2, ST, SM, Hem, partial iron staining, SA 216.1: 25.0°, JN, UN, SM, Hem, partial iron staining, SA	1 5 4		3			
	244.0		2162.9													
245		As above, clay and iron oxide alteration selveges around calcite veins.				76	98	92		216.5: 25.0°, JN, PL, SM, partial iron staining, SA 216.9: 20.0°, JN, PL, SK, Cl, full iron staining, CC <1mm 217.5: 60.0°, JN, PL, SM, Hem, partial iron staining, SO 217.9: 50.0°, JN, PL, SM, Ca, partial iron staining, SA	2 2 3 2 2		3			
	249.0		2157.9													
250		Bottom of borehole at 249.0 ft. Completed as well. Refer to diagram. Notes: 0 - 31.5: Hydro test #1 FHT 31.5: Set surface casing to 25 ft-bgs. 33: Drilling difficulties, hole cave and recovery problems. 36.5 - 40: Drilling dfifficulties, hole washing out and producing lots of sand but no core. Drillers stop to advance surface casing. 40 - 45: Drillers advance hole with rock bit in attempt to find solid rock to set casing on. Driller notes harder material from 42 to 44 ft-bgs, but soft drilling again from 44 to 45 ft-bgs. 45 - 64: Hydro test #2 FHT 55 - 249: Hydro test #4 FHT 55.1 - 69: Borehole walls are covered in bentonite. 119 - 124: Lost core from core tube mislatch. 205 - 249: Hydro test #3 SI 238 - 240: Mislatch core out of order and jumbled. 240 - 242: Redrill from mislatch.								218.4: 20.0°, HVN, PL, SM, Ca, partial iron staining, IN >5mm 219.3: 65.0°, JN x 2, PL, SM, Hem, partial iron staining, SA 220.2: 45.0°, JN x 2, UN, SM, partial iron staining, CC <1mm 220.8: 65.0°, JN, PL, SM, Cl, partial iron staining, SA 221.2: 20.0°, JN, PL, SM, Hem, partial iron staining, SA 221.8: 30.0°, HVN, PL, SM, Ca, partial iron staining, IN >5mm 223.2: 50°, JN, PL, SM, Hem, partial iron staining, SA 224: 50.0°, JN, PL, SM, Cl, partial iron staining, SA 225: 45°, JN, PL, SM, Cl, partial iron staining, SA 225.5: 20.0°, JN, UN, SM, Ca, partial iron staining, CC <1mm 226.8: 65.0°, JN, PL, SM, Hem, partial iron staining, SO 227.5: 40.0°, JN x 3, PL, SM, Cl, partial iron staining, PC 227.8: 60.0°, JN x 2, PL, PO, Cl, partial iron staining, PC 228.5: 70.0°, JN, UN, RO, Hem, partial iron staining, SO 229.5: 60.0°, JN, PL, SM, Ca, partial iron staining, SA 229.9: 24.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm 230.2: 55.0°, JN, UN, SM, Ca, partial iron staining, CC <1mm 230.6: 65.0°, JN, PL, SM, Hem, partial iron staining, SA 231: 22.0°, JN, PL, SM, Cl, full iron staining, CC <1mm 231.2: 68.0°, JN, PL, SM, Hem, partial iron staining, SO 231.7: 25.0°, JN x 2, PL, SM, Cl, partial iron staining, CC <1mm 232.7: 60.0°, JN, PL, SM, Hem, partial iron staining, SO 233: 65.0°, JN x 2, PL, SM, Hem, partial iron staining, SA 233.7: 70.0°, JN, PL, SM, Hem, partial iron staining, SA 234.5: 65.0°, JN, PL, SM,						
255																
260																
265																
270																
275																
280																

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DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH16-21-(GT-05)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 16, 2016 11:31
DRILLING END: December 16, 2016 11:31
COORDINATES: N: 845,595 E: 917,417

SHEET: 8 of 8
GS ELEV.: 2406.9
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth / DESCRIPTION / Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi)	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
280	280.0 / 2126.9							Hem, full iron staining, SA 234.8: 20.0°, JN, PL, SM, Cl, partial iron staining, PC 236.7: 10.0°, JN x 2, PL, SM, Cl, partial iron staining, PC 241.1: 80.0°, JN, PL, SM, Hem, partial iron staining, SA 242: 80.0°, JN, PL, SM, Cl, partial iron staining, PC 242.3: 35.0°, JN x 2, PL, SM, Cl, partial iron staining, PC 242.5: 80.0°, JN, PL, SM, Cl, partial iron staining, PC 242.7: 25.0°, JN, UN, SM, Cl, partial iron staining, CC <1mm 243: 80.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm 243.1: 25.0°, JN, PL, SM, Cl, partial iron staining, PC 243.3: 80.0°, JN x 2, PL, SM, Hem, partial iron staining, SA 244.3: 30.0°, JN, PL, SM, Cl, partial iron staining, PC 245.6: 25.0°, JN, PL, SM, Cl, full iron staining, CC <1mm 245.7: 60.0°, JN, PL, SM, Cl, full iron staining, PC 246.3: 58.0°, JN, PL, SM, Cl, partial iron staining, PC 246.5: 20.0°, JN, PL, SM, Ca, partial iron staining, CC <1mm 247.1: 25.0°, JN, UN, SM, Cl, full iron staining, PC 247.2: 80.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm 247.8: 55.0°, JN, PL, SM, Cl, partial iron staining, PC 248.5: 80.0°, JN, UN, SM, Cl, partial iron staining, PC		R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6			
285													
290													
295													
300													
305													
310													
315													
320													

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH16-22 (GT-40)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 18, 2016 16:14
DRILLING END: December 18, 2016 16:14
COORDINATES: N: 841,495 E: 912,378

SHEET: 1 of 8
GS ELEV.: 2303.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
0	0.0	(GW), GRAVEL, fine to coarse, well graded, subangular, trace sand; oxidized schist and quartz gravel; washed in sampler, surface material has sand and fines.	2303.0											BC		
	3.0		2300.0			1	33	0	0					LC		
	4.0	Transitions to fractured, weathered schist in sample.	2299.0			2	50	0	0		>10					
5		Pinal Schist (pCpi): grey, micaceous fine grained SCHIST, thick pink quartz veining to 0.5 inches, highly fractured and weathered, red-brown oxidation throughout.				3	8	0	0		>10					
	8.0		2295.0								>10					
		As above.									>10					
10						4	50	0	0		>10		4			
	12.0		2291.0								>10					
		As above, foliated.									>10					
						5	71	26	31	14: 77.0°, JN, IR, RO, Bx, IN <5mm	5		3			
15										14.3: 15.0°, JN, PL, RO, partial iron staining, SA, subvertical	3					
	15.5		2287.5								>10					
		As above.								14.5 - 14.6: 30.0°, FLT, PL, RO, Bx, partial iron staining, IN >5mm	>10					
						6	56	0	0	14.9 - 15.5: 44.0°, FLT, Bx	>10		4 - 5			
											5					
20										18.9 - 19.1: 63.0°, FLT, IR, RO, G, IN >5mm	5					
	20.0		2283.0							19.4 - 19.6: 63.0°, FLT, IR, RO, G, IN >5mm						
		As above, predominately quartz veins with oxidation.									>10					
						7	50	0	0	20 - 22: FLT, Bx, small section of quartz core	>10		4			
	22.0		2281.0								>10					
		Becomes gray METASANDSTONE, fine to medium grained crushed/brecciated throughout, FeOx staining on discontinuities.									>10					
25						8	60	0	0	22 - 27: FLT, crushed rock, sand, broken rock			4			
											>10					
	27.0		2276.0								>10					
		Becomes predominantly large quartz vein, FeOx staining, fractured and rubbly.				9	100	0	50	27.4: 45.0°, FLT, IR, VR, partial iron staining, SA	6		4 - 3			
	29.0		2274.0							28 - 28.25: 40.0°, FLT, IR, VR, Bx	>10					
30		Pinal Schist (pCpi): grey to red, fine to medium grained, healed fracture texture, and gougey fault, oxidation selveges around fault zones, very weak HCl reaction.								28.6 - 29.6: 40.0°, FLT, IR, VR, Bx, SA	4					
						10	90	37	53	30: 18.0°, FLT, UN, SK, Cl, full iron staining, CC <1mm	3		3			
	32.0		2271.0							30.3: 34.0°, JN, CU, SM, CN, partial iron staining	>10					
	33.0	As above: some re-drill, breccia with gouge matrix.	2270.0			11	50	0	0	31.4: 33.0°, JN, ST, RO, CN, partial iron staining	>10		5			
		Pinal Schist (pCpi): grey to red, fine to medium grained, healed fracture texture, and gougey fault, oxidation haloes around fault zones, very weak HCl reaction.								32.2: 12.0°, FLT, G, sandy clay, broken rock	>10					
35										32 - 33: FLT, G, most washed out	>10					
						12	100	18	22		>10		3			
										36 - 36.5: FLT, Bx	6					
	38.0		2265.0							36.7 - 36.9: 40.0°, FLT, IR, RO, Bx, soft schist infill	1					
		As above.								37.3 - 37.4: 42.0°, FLT, IR, SM, Bx, weak schist	>10					
						13	100	0	0	38 - 41: FLT, entire run is broken core with weakly cemented gouge at bottom	>10		5			
40																

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH16-22 (GT-40)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 18, 2016 16:14
DRILLING END: December 18, 2016 16:14
COORDINATES: N: 841,495 E: 912,378

SHEET: 2 of 8
GS ELEV.: 2303.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
40	40.0	As above. *(continued)*	2263.0														
	41.0		2262.0			13	100	0	0		>10		5				
		Pinal Schist (pCpi): gray, METASANDSTONE, fine to medium grained, crushed/brecciated throughout, some quartz, FeOx staining on discontinuities.				14	50	0	0	41 - 46: FLT, Bx, thin gouge	>10		5 - 4				
45	46.0		2257.0														
		As above.				15	57	0	0	46 - 49.5: FLT, Bx, very weak schist	>10		4 - 5				
	49.5		2253.5														
50		As above.				16	80	16	28	50.6: 11.0°, JN, PL, SM, partial iron staining, SA	3		3				
	52.0		2251.0							50.7: 43.0°, JN, IR, SM, Bx, partial iron staining, IN <5mm	8						
		As above.				17	100	0	0	50.9: 59.0°, PL, SM, Bx, partial iron staining, IN <5mm	>10		4				
55	55.0		2248.0							51.2 - 52: FLT, Bx 52 - 55: FLT, Bx, some areas of rock have weakly cemented, healed fractures	>10						
		As above.				18	100	27	40		6		4				
	56.5		2246.5							55.7 - 56.7: FLT, Bx	4						
		As above.				19	100	27	50	56.5 - 57: 85.0°, JN, IR, SM, FeOx, partial iron staining, SA 57 - 57.7: FLT, Bx, breccia and sand	9 6		3				
	59.5		2243.5							57.9: 40.0°, JN, IR, SM, FeOx, partial iron staining, SA	6						
60		As above.				20	100	0	15	58.1: 60.0°, JN, IR, SM, FeOx, partial iron staining, SA	5		3				
	61.5		2241.5							58.11 - 58.25: FLT, Bx	>10						
		As above.				21	100	0	0	58.4 - 59.5: 70.0°, JN, PL, SM, G, polished, IN <5mm	>10		4				
	62.5		2240.5							59.7: 85.0°, JN, ST, VR, FeOx, partial iron staining, SA	4						
		Pinal Schist (pCpi): pinkish gray, METASANDSTONE, fine to medium grained, highly jointed and foliated, some crushed rock, FeOx selveges and on				22	100	28	52	59.9 - 60.35: FLT, Bx	>10		3				
65	65.0	discontinuity surfaces.	2238.0							60.35 - 60.75: 30.0°, JN, IR, SM, FeOx, SA	3						
		Becomes foliated, crenulated.				23	70	13	18	60.85 - 61.1: 15.0°, JN, IR, SM, FeOx, polished, CC <1mm	>10		4				
										61.2 - 63: FLT, Bx 63.2: 40.0°, JN, IR, SM, FeOx, partial iron staining, SA	>10						
										63.7 - 63.9: FLT, Bx	>10						
70	70.0		2233.0			24	100	0	20	63.95: 45.0°, JN, ST, SM, FeOx, matte, SA	>10		3				
	71.0	As above.	2232.0							64.15 - 65: FLT, Bx, sandy breccia	5						
		As above.				25	100	0	20	65.2: 70.0°, FOLO, UN, SM, full iron staining, SA	>10		3				
	72.5		2230.5							65.8 - 69: FLT, gouge, crushed rock and weak corestones	>10						
		As above.								69 - 70: FLT, broken foliated rock, FeOx staining	>10						
75						26	50	0	0	70: 35.0°, FOLO, UN, RO, Cl, partial iron staining, SA	>10		4				
	76.5		2226.5							70.1: 22.0°, FOLO, UN, RO, Cl, partial iron staining, CC <1mm	>10						
		As above..								70.3: 34.0°, FOLO, UN, RO, partial iron staining, SA	5						
										70.5: 37.0°, FOLO, UN, SM, Cl, partial iron staining, IN <5mm	2		3				
						27	100	43	50		2						
80										70.8: 32.0°, FOLO, UN, SM, Cl, full iron staining, PC 71 - 72: FLT, broken,	>10		4				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH16-22 (GT-40)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 18, 2016 16:14
DRILLING END: December 18, 2016 16:14
COORDINATES: N: 841,495 E: 912,378

SHEET: 3 of 8
GS ELEV.: 2303.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT
80	80.0		2223.0								
	80.5		2222.5			27				foliated and fractured, little FeOx staining	>10
		As above								72: 38.0°, FOLO, UN, PO, Cl, partial iron staining, SA	>10
						28	93	0	0	72.1: 35.0°, FOLO, CU, SM, Cl, full iron staining, PC	>10
	83.5		2219.5							72.2: 32.0°, FOLO, ST, RO, partial iron staining, SA	5
		Pinal Schist (pCpi): pinkish gray, SCHIST, fine to medium grained foliated, quartz and calcite veining, fractured or crushed throughout, weak HCl reaction, FeOx staining.								72.4: 41.0°, FOLO, UN, SM, Cl, partial iron staining, SA	1
85										72.5 - 76.5: FLT, crushed rock, clayey infilling	1
						29	100	64	64	77.2 - 77.4: 75.0°, FLT, IR, VR, Bx, full iron staining, IN >5mm	7
	88.0		2215.0							78.2: 44.0°, FO, PL, SM, Bx, full iron staining, IN <5mm, trace clay	>10
		As above, becomes more fractured and oxidized.				30	100	0	10	78.5: 56.0°, FOLO, UN, SM, Bx, partial iron staining, IN <5mm, thin clay coating	
90	90.0		2213.0							79.1 - 80.5: FLT, crushed rock, clay infill, FeOx staining	7
	91.0	As above.	2212.0			31	100	40	40	80.5 - 83.5: FLT, fractured and crushed, some soft clay gouge	1
		As above.								84.5: 18.0°, JN, PL, SM, Ca, full iron staining, CC <1mm	1
						32	100	58	58	85.2: 50.0°, JN, UN, VR, FeOx, full iron staining, SA	5
95										86.3 - 88: FLT, broken, FeOx staining, trace clay	3
	95.5		2207.5							88 - 90: broken, FeOx staining	7
		As above.				33	100	36	52	89.9: 44.0°, JN, CU, SM, FeOx, full iron staining, CC <1mm	1
	98.0		2205.0							90.2: 50.0°, FOLO, CU, SM, FeOx, full iron staining, CC <1mm	5
		As above, becomes more fractured.				34	100	40	40	90.3: 20.0°, JN, PL, SM, FeOx, full iron staining, CC <1mm	8
100	100.0		2203.0							90.4: 12.0°, JN, PL, SM, FeOx, full iron staining, CC <1mm	6
		Pinal Schist (pCpi): greenish gray, SCHIST, medium grained, foliated, crushed and gouged, no HCl reaction, FeOx staining and coatings.				35	100	0	0	90.5: 35.0°, FOLO, ST, SM, FeOx, full iron staining, CC <1mm	>10
	103.0		2200.0							90.7: 47.0°, FOLO, PL, RO, FeOx, full iron staining, CC <1mm	>10
		Becomes pinkish gray, METASANDSTONE, medium grained, foliated, crushed zones, FeOx coatings, weak HCl reaction.								90.71 - 91.2: FLT, breccia, FeOx coatings	>10
105						36	85	23	33	91.4: 40.0°, JN, ST, RO, FeOx, full iron staining, CC <1mm	6
	107.0		2196.0							92.3: 45.0°, FOLO, ST, PO, Cl, full iron staining, CC <1mm	3
		Becomes, pink and gray, METASILTSTONE, foliation follows bedding planes, faulted, very weak HCl reaction.								93.2: 35.0°, FOLO, CU, RO, Bx, partial iron staining, IN <5mm	>10
110	109.8		2193.2			37	100	58	66	93.3: 10.0°, JN, IR, RO, Cl, partial iron staining, SA	3
		Becomes, gray METASANDSTONE, medium grained, foliated, comptent, no HCl reaction.								93.4: 37.0°, FOLO, UN, SM, FeOx, full iron staining, CC <1mm, some calcite	10
	112.0		2191.0							93.7: 44.0°, FOLO, PL, PO, Cl, partial iron staining, SA	3
		As above.								93.9: 22.0°, FLT, UN, SK, FeOx, full iron staining, CC <1mm	0
						38	100	51	86	94.1: 42.0°, FOLO, UN, RO, FeOx, partial iron staining, PC	0
115										94.3: JN, PL, SM, FeOx, full iron staining, CC <1mm	2
	115.5		2187.5							94.8: 28.0°, FLT, UN, SK, Cl, full iron staining, CC <1mm	3
		Pinal Schist (pCpi): dark gray to reddish gray, METASANDSTONE/METASILTSTONE, fine to medium grained, foliated, fractured, sheared, FeOx coatings and staining haloes.				39	100	0	48	95: 28.0°, JN, CU, RO, FeOx, full iron staining, CC <1mm	8
	118.0		2185.0							95.1: 52.0°, FOLO, UN, RO, FeOx, full iron staining, CC <1mm	>10
		As above, zones of gouge.				40	83	40	55		3
120											3
		Log continued on next page									1

ISRM Strength Index: ● AX. ☐ DIAM. ▲ UCS (ksi) — R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6

ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
4			
4			
2			
3 - 4			
3			
2			
3			
2			
4			
3			
3			
2			
2			
3			
3			

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH16-22 (GT-40)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 18, 2016 16:14
DRILLING END: December 18, 2016 16:14
COORDINATES: N: 841,495 E: 912,378

SHEET: 4 of 8
GS ELEV.: 2303.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT
120	120.0	As above, zones of gouge. *(continued)*	2183.0			40	83	40	55	95.3: 13.0°, JN, UN, RO, FeOx, full iron staining, CC <1mm	>10
	122.0		2181.0							95.5 - 96: breccia, drilling damage	3
		As above, highly foliated and crenulated.								96.4: 48.0°, FOLO, ST, SM, FeOx, full iron staining, CC <1mm	0
										97.1: 35.0°, FOLO, UN, RO, Bx, full iron staining, IN <5mm	4
125						41	100	64	72	97.3: 50.0°, JN, ST, RO, FeOx, full iron staining, CC <1mm	6
										97.4: 38.0°, JN, IR, RO, FeOx, full iron staining, CC <1mm	3
	127.0		2176.0							97.5: 34.0°, FOLO, PL, RO, Cl, full iron staining, CC <1mm	1
		Becomes fault zone, gouge and rubble.								97.8: 37.0°, FOLO, UN, SK, Cl, full iron staining, CC <1mm	0
						42	100	24	24	98.1: 49.0°, FOLO, ST, SM, Cl, partial iron staining, CC <1mm	>10
	129.5		2173.5							98.3 - 99.6: FLT, broken rock, foliated, FeOx coatings	>10
130		Pinal Schist (pCpi), brownish gray, SCHIST, foliated, fractured, quartz vein with gouge, Feox staining.				43	100	13	20	100 - 104.5: FLT, crushed rock and clayey sand gouge	>10
										104.7: 84.0°, JN, ST, SK, Cl, full iron staining, CC <1mm	>10
	132.5		2170.5							105: FOLO, PL, RO, Cl, partial iron staining, PC	>10
		As above.								105.2: 60.0°, FOLO, UN, SM, Cl, partial iron staining, PC	0
						44	100	32	32	105.25: 85.0°, JN, PL, SK, Cl, full iron staining, CC <1mm	3
135	135.0		2168.0							106: 20.0°, MECH, IR, RO, FeOx, full iron staining, CC <1mm	6
		As above.								106.3: FLT, breccia and crushed rock, FeOx staining and clay	6
						45	100	10	50	107 - 107.8: FLT, breccia, some FeOx staining	8
	139.0		2164.0							108.3: 79.0°, FLT, PL, RO, Bx, full iron staining, IN <5mm, some clay	>10
		As above, highly jointed, broken core.				46	80	0	0	108.7: 75.0°, FLT, PL, RO, full iron staining, 1-cm clayey sand infill	7
140	140.0		2163.0							109.2 - 109.3: 57.0°, FLT, PL, RO, Bx, full iron staining, IN >5mm	3
		Becomes gray to brownish gray, METASILTSTONE, fine to medium grained foliated and jointed, slightly silicified, little FeOx coatings.								109.4: 24.0°, JN, PL, RO, Bx, full iron staining, IN <5mm	2
						47	100	48	60	109.7 - 109.9: 80.0°, FLT, PL, RO, Bx, full iron staining, IN >5mm	3
										110.3: 40.0°, FOLO, UN, RO, FeOx, partial iron staining, SA	2
145	145.0		2158.0							110.6: 70.0°, JN, UN, RO, Bx, partial iron staining, IN <5mm	>10
		As above.								110.65: 58.0°, JN, UN, RO, FeOx, partial iron staining, PC	4
						48	100	56	70	113: 65.0°, JN, PL, RO, Cl, full iron staining, CC <1mm	3
										113.5: JN, PL, RO, Bx, full iron staining, IN <5mm	2
150	150.0		2153.0							114.1: 28.0°, JN, IR, RO, FeOx, full iron staining, CC <1mm	2
		As above, folded.								114.2: 57.0°, JN, PL, RO, FeOx, partial iron staining, PC	3
						49	93	37	47	114.7: 60.0°, JN, PL, SM, Bx, full iron staining, IN <5mm	2
										115.1: 35.0°, FOLO, UN, PO, FeOx, full iron staining,	4
	153.0		2150.0								2
		As above, large quartz vein and poor recovery, gouge zones bracketing vein washed out in drilling, strong HCl reaction.									>10
155						50	37	20	20		>10
											7
	156.5		2146.5								5
		As above, schistose, foliated, broken and brecciated, FeOx coatings on all discontinuities, no HCl reaction.				51	100	0	15		>10
	158.5		2144.5								>10
		Becomes FAULT GOUGE.				52	100	20	29		2
160											

Log continued on next page

ISRM Strength Index	R1	R2	R3	R4	R5	R6
● AX. □ DIAM. ▲ UCS (ksi)	0.725		3.62	7.25	14.5	36.2

ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC	LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
3					
3					
4					
4					
3					
2 - 3					
2 - 3					
2					
2					
2 - 3					
4					
3					

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH16-22 (GT-40)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 18, 2016 16:14
DRILLING END: December 18, 2016 16:14
COORDINATES: N: 841,495 E: 912,378

SHEET: 5 of 8
GS ELEV.: 2303.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC LC	ADVANCEMENT RATE ft/min
160	160.0	Becomes FAULT GOUGE. *(continued)*	2143.0			52	100	20	29	CC <1mm 115.4: 30.0°, UN, RO, FeOx, full iron staining, CC <1mm	>10 >10		4				
	162.5		2140.5							115.5: 40.0°, FOLO, PL, RO, FeOx, full iron staining, CC <1mm	>10						
		As above with sand and rubble.				53	100	0	4	115.6: 32.0°, FOLO, UN, SK, FeOx, full iron staining, CC <1mm	>10 >10		5				
165						54	100	0	0	115.8: 52.0°, FOLO, PL, PO, FeOx, full iron staining, CC <1mm	2						
						55	90	16	22	115.9: 39.0°, FOLO, UN, SM, Bx, partial iron staining, IN <5mm 116.1 - 117: FLT, brecciated shear zone, clay coatings	>10 >10		5				
	168.3		2134.7							117.2 - 117.3: 44.0°, FLT, UN, SM, Bx, partial iron staining, IN >5mm, clay coatings	5 >10		3				
170	170.0	Becomes Pinal Schist (pCpi): pinkish gray, SCHIST, foliated and fractured, FeOx and clay coatings.	2133.0														
		As above.				56	100	0	10	117.4: 45.0°, FOLO, UN, RO, Cl, partial iron staining, CC <1mm	>10		3				
	172.0		2131.0							118.4 - 118.8: 55.0°, FOLO x 3 spaced at 0.2 ft, PL, RO, Cl, partial iron staining, SA	>10 >10						
		As above, becomes more crushed and gougey.				57	100	0	10	119.7: 52.0°, FLT, PL, VR, Bx, full iron staining, IN <5mm	>10		4				
	174.0		2129.0														
175	175.0	Recover only rubble/redrill.	2128.0			58	50	0	0	120 - 121: FLT, corestones in sandy clay gouge	>10						
		Pinal Schist (pCpi): grayish red, SCHIST, fault, gouge with crushed rock, FeOx staining throughout.								121.3: 11.0°, FOLO, UN, PO, Cl, full iron staining, SA	>10		4				
	177.3		2125.7							121.4: 39.0°, JN, IR, VR, Sa, full iron staining, IN <5mm	>10						
		Pinal Schist (pCpi): gray to reddish gray, METASANDSTONE, fine to medium grained, bedded, lightly foliated, fractured- both healed and open, quartz veining, moderate HCl reaction, FeOx staining and coating.				59	100	48	48	123 - 123.1: 15.0°, FOLO x 2 spaced at 0.1 ft, UN, SM, Cl, partial iron staining, CC <1mm	3 3		2 - 3				
180										123.15: 62.0°, JN, ST, RO, Cl, partial iron staining, PC	1						
						60	100	50	58	123.7: 30.0°, FLT, PL, SK, Cl, full iron staining, CC <1mm	6 1		2 - 3				
										124 - 124.5: 36.0°, FLT, shear zone, breccia and broken rock, clay coatings	4						
										124.9 - 125: 36.0°, FLT, PL, SM, Bx, full iron staining, IN >5mm, clay coatings	>10						
185	185.0		2118.0							126.1: 30.0°, FOLO, PL, SM, Cl, partial iron staining, IN <5mm	>10						
		As above.				61	100	44	44	128 - 134.2: FLT, breccia, crushed rock, sandy clay, quartz veins	0 0		2 - 3				
										135.3 - 135.9: 50.0°, FOLO x 3 spaced at 0.25 ft, UN, PO, Cl, partial iron staining, CC <1mm	>10 5		3 - 4				
190	190.0		2113.0							136.1: 33.0°, FLT, UN, SK, Cl, full iron staining, IN <5mm	>10						
		As above.				62	96	18	32	136.2: 30.0°, JN, PL, SM, Bx, partial iron staining, IN <5mm	5 >10		3				
										137.3: 65.0°, FLT, ST, VR, Sa, full iron staining, IN <5mm	5						
										136.7 - 138.1: FLT, shear zone along foliation, clay infill	6						
195	195.0		2108.0							137.5: 37.0°, FOLO, ST, SM, G, full iron staining, IN <5mm	>10						
		As above, poor recovery, gouge.				63	50	30	34	137.7: 48.0°, JN, PL, SM, Cl, partial iron staining, PC	>10		4				
										137.9: 55.0°, FOLO, ST, SM, Cl, partial iron staining, CC <1mm	>10						
										138.1: 47.0°, JN, PL, SM, Cl, partial iron staining, PC	0						
200	200.0		2103.0							138.3 - 138.8: highly jointed, broken core 138.9: 15.0°, FLT, UN, SK,	7						

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH16-22 (GT-40)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 18, 2016 16:14
DRILLING END: December 18, 2016 16:14
COORDINATES: N: 841,495 E: 912,378

SHEET: 6 of 8
GS ELEV.: 2303.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (ksi): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
200	200.0		2103.0													
		Becomes FAULT GOUGE, light greenish gray, soft clay with crushed rock fragments.				64	100	0	15	FeOx, full iron staining, CC <1mm	>10					
	202.0		2101.0							139 - 140.5: FLT, broken core, FeOx coatings	>10		5			
		Continues FAULT.								140.7 - 141.4: 65.0°, FOLO x 3 spaced at 0.3 ft, UN, RO, Bx, partial iron staining, IN <5mm	>10					
											>10		5			
	204.7		2098.3			65	100	32	38	142.5: 57.0°, FOLO, PL, RO, Cl, partial iron staining, IN <5mm	>10					
205		Becomes Pinal Schist (pCpi): pinkish gray, SCHIST, sheared rock fabric and closed brecciated texture, clay and FeOx.								142.6: 68.0°, JN, PL, RO, Bx, IN <5mm	3					
	207.0		2096.0							143.1: 58.0°, FLT, PL, SM, Cl, partial iron staining, IN <5mm	4		3			
		As above with gouge and rubble.								143.7 - 145: FLT, broken core, breccia, and clayey sand, some FeOx staining	>10					
						66	100	30	30	145.3: 36.0°, FOLO, UN, PO, FeOx, full iron staining, CC <1mm	4					
210											>10		4			
	211.0		2092.0							145.6: 42.0°, JN, UN, VR, full iron staining, SA	>10					
		As above.								145.8 - 145.85: 85.0°, FLT, IR, VR, Bx, full iron staining, IN >5mm	>10					
						67	100	0	10	146.3 - 146.4: 45.0°, FOLO x 2 spaced at 0.1 ft, PL, PO, FeOx, full iron staining, CC <1mm	>10		4			
	214.0		2089.0								>10					
		As above.								146.6: 60.0°, JN, ST, RO, FeOx, partial iron staining, PC	5					
215											>10		4			
						68	100	11	31	147.5 - 147.6: 46.0°, FLT, PL, PO, Bx, partial iron staining, IN >5mm	4					
										148.2: 48.0°, FLT, UN, SK, Bx, partial iron staining, IN <5mm	6		3			
	218.5		2084.5							148.5: 45.0°, JN, UN, VR, FeOx, full iron staining, CC <1mm	>10		4			
		Continues Pinal Schist (pCpi): light greenish gray, SCHIST, highly foliated, crenulated and sheared, clay coatings and infill.				69	100	0	27	149.2: 25.0°, JN, CU, VR, FeOx, partial iron staining, PC	>10		4			
220	220.0		2083.0								>10					
		As above.				70	65	0	20	149.5: 60.0°, JN, IR, RO, FeOx, partial iron staining, SA	>10		3			
	222.0		2081.0													
		Becomes FAULT.								150.5: 46.0°, JN, IR, RO, FeOx, full iron staining, CC <1mm	>10					
						71	86	0	0	150.9: 57.0°, JN, ST, RO, FeOx, full iron staining, CC <1mm	>10		4			
225											>10					
	225.5		2077.5							151: 20.0°, IR, VR, FeOx, full iron staining, CC <1mm	>10					
		As above, mostly gouge, sandy clay with gravel.								151.1: 70.0°, FLT, IR, VR, Bx, partial iron staining, IN <5mm	>10					
						72	100	0	0	151.5: 35.0°, JN, ST, RO, Cl, IN <5mm	>10		5			
	229.0		2074.0							151.9: 30.0°, FOLO, UN, RO, Cl, IN <5mm	>10					
		As above.								152.5: 29.0°, FOLO, UN, RO, Bx, partial iron staining, IN <5mm	>10					
230						73	100	0	0	153 - 155.7: FLT, no recovery, likely gouge around vein	>10		4			
	232.0		2071.0							156.5 - 158.5: FLT, fractured, foliated, brecciated, FeOx coatings	>10					
		As above.								157.8: 68.0°, FOLO, PL, RO, Cl, full iron staining, CC <1mm	>10					
						74	100	0	0		>10		4 - 5			
235	235.0		2068.0							158.7 - 158.9: FLT, broken rock, FeOx coatings	>10					
		As above.								159.7: 60.0°, FOLO, ST, SM, Cl, full iron staining, CC <1mm	2					
											4					
						75	100	20	27	160.1 - 177.4: FLT, rubbly clay gouge and broken rock			4			
										178: 39.0°, FOLO, CU, SM, Cl, full iron staining, CC <1mm	>10					
	239.5		2063.5								>10					
240										178.5: 45.0°, JN, PL, RO, Cl, full iron staining, CC <1mm	>10					
						76	100	40	40							

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH16-22 (GT-40)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 18, 2016 16:14
DRILLING END: December 18, 2016 16:14
COORDINATES: N: 841,495 E: 912,378

SHEET: 7 of 8
GS ELEV.: 2303.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 R3 3.62 R4 7.25 R5 14.5 R6 36.2	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0		2063.0														
	240.5	Continues Pinal Schist (pCpi): light greenish gray, SCHIST, highly foliated, crenulated, brecciated and sheared, FeOx and clay coatings and infill. *(continued)*	2062.5			76				178.8: 58.0°, JN, PL, SM, Cl, full iron staining, CC <1mm	10						
						77	100	0	16	179.6: 22.0°, JN, UN, RO, Cl, partial iron staining, PC	10		1				
	243.0	As above.	2060.0							180 - 180.9: FLT, fractured rock, FeOx coatings	10						
		As above, faulted, weak HCl reaction.				78	100	40	50	181.9: 20.0°, JN, IR, RO, FeOx, full iron staining, CC <1mm	7		2				
245	245.0		2058.0							182.3: 40.0°, JN, ST, SM, CN, partial iron staining	2						
		As above.				79	100	0	45	182.8 - 185: FLT, highly jointed, FeOx and clay coatings	3		2				
	247.0		2056.0								5						
		As above, broken core, fracture surfaces have full FeOx.				80	67	0	0	187.3 - 188: 44.0°, FLT, PL, SK, G, partial iron staining, IN >5mm	4		2				
	248.5		2054.5							188.6 - 189: 45.0°, FLT, IR, SK, G, IN >5mm	4						
	249.0	As above.	2054.0			81	100	0	0	189 - 190: FLT, fractured rock, FeOx coatings			2				
250	250.0	As above, highly fractured, FeOx staining on clean surfaces.	2053.0			82	100	0	0	190.1 - 190.3: 58.0°, FLT, CU, SK, Bx, partial iron staining, IN >5mm	6		2				
		Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram. Notes: 0 - 32: Hydro test #1 FHT 30 - 90: Hydro test #2 FHT 32: Drillers advance surface casing to 25 ft-bgs. 92 - 150: Hydro test #3 SI 100 - 103: Split was dropped, core broken. 127 - 129: Driller notes slight loss of drill fluid in zone. 147 - 250: Hydro test #4 SI								190.5: 65.0°, FLT, IR, SK, Cl, full iron staining, IN <5mm 190.7: 23.0°, FLT, PL, SK, Cl, full iron staining, CC <1mm 191.2 - 192.3: FLT, breccia, crushed rock, quartz, clay infill 192.6: 24.0°, JN, CU, RO, Cl, PC 192.7: 58.0°, JN, UN, VR, Cl, PC 193.1: 21.0°, FLT, PL, SM, Sa, partial iron staining, IN <5mm 193.3 - 193.6: FLT, IR, VR, Bx, partial iron staining, IN >5mm 193.7: 20.0°, JN, CU, SM, Cl, PC 193.9 - 195: FLT, breccia and broken rock, some sand and clay 195 - 197.5: FLT, lost core, likely sandy gouge 199.2 - 199.3: 85.0°, FLT, PL, SM, Bx, full iron staining, IN >5mm 199.5 - 200: FLT, breccia and sand, FeOx staining and some clay 200 - 202: FLT, G, soft clay with rubble 202 - 204.7: FLT, G, stiff clay with rubble 205.7 - 205.8: 55.0°, FLT, IR, RO, Cl, IN >5mm 206.2: JN, ST, SM, Cl, partial iron staining, CC <1mm 206.5 - 206.6: 65.0°, FLT, IR, RO, Bx, IN <5mm 206.7: 61.0°, FLT, UN, SK, Cl, partial iron staining, CC <1mm 207 - 207.8: FLT, clay and breccia 208.2 - 208.4: 45.0°, FLT, UN, SK, Bx, some clay 209 - 214: FLT, clayey breccia with quartz corestones 214.2: 70.0°, FOLO, CU, RO, Cl, PC 214.6 - 216: FLT, sheared rock, sand and clay 216.2: 15.0°, JN, UN, RO, Cl, CC <1mm 216.4: 57.0°, FOLO x 2 spaced at 0.1 ft, PL, SK, Cl, CC <1mm 216.7: JN, UN, VR, Bx, IN <5mm							
255																	
260																	
265																	
270																	
275																	
280																	

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DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH16-22 (GT-40)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 18, 2016 16:14
DRILLING END: December 18, 2016 16:14
COORDINATES: N: 841,495 E: 912,378

SHEET: 8 of 8
GS ELEV.: 2303.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi)	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
280	280.0		2023.0							217.1: 55.0°, FOLO, UN, SK, Cl, CC <1mm 217.4 - 218.5: FLT, breccia with bands of gouge 218.5 - 220: 50.0°, FLT, PL, SK, sheared, breccia and clay 221.1 - 221.2: 45.0°, FLT, UN, SK, Bx, IN >5mm 220.7 - 222: 60.0°, FOLO x 5 spaced at 0.3 ft, UN, PO, Cl, CC <1mm 221.5: 3.0°, JN, ST, PO, Cl, CC <1mm 221.7 - 222: 45.0°, FLT, UN, SK, Bx, IN >5mm 222 - 235: FLT, shear zone, breccia and gouge, slickedsides 235.6: 64.0°, FOLO, UN, SK, Cl, CC <1mm 236: 42.0°, JN, IR, VR, CN 236.7 - 239.5: FLT, gouge and breccia 239.9: 30.0°, JN, UN, SM, Cl, full iron staining, CC <1mm 240 - 240.5: FLT, breccia and quartz, clayey infill 240.5 - 243: FLT, breccia and sand, clay infilling, some FeOx staining, quartz veining 243.3: 38.0°, FOLO, CU, SM, Bx, partial iron staining, IN <5mm 243.4 - 243.9: FLT, breccia with clay infill 244.3: 20.0°, FOLO, UN, RO, Cl, full iron staining, IN <5mm 244.7: 39.0°, JN, PL, RO, Cl, full iron staining, IN <5mm 245.4: 46.0°, FOLO, UN, SK, Cl, partial iron staining, PC 245.7: 59.0°, JN, CU, SM, Cl, partial iron staining, PC 245.8: 56.0°, JN, ST, RO, Ca, partial iron staining, PC 246.1: 53.0°, JN x 2 spaced at 0.05 ft, UN, SK, Cl, partial iron staining 246.3: 68.0°, UN, SM, Cl, partial iron staining, PC 246.5: 32.0°, JN, UN, SK, Cl, full iron staining, CC <1mm 246.8: 44.0°, FOLO, IR, SK, Cl, full iron staining, IN >5mm 247.5: 49.0°, FLT, CU, FeOx, partial iron staining, SA 248.5: 22.0°, JN, UN, SM, FeOx, partial iron staining, SA 248.6: 35.0°, JN, ST, SM, FeOx, full iron staining, CC <1mm 249: 35.0°, JN x 2, UN, SM, CN, full iron staining, CC <1mm 249.1 - 249.5: 43.0°, JN x 2 spaced at 0.4 ft, UN, SM, CN, full iron staining, SO 249.6: 47.0°, JN x 2, UN, SM, CN, full iron staining, SO		R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6			
285															
290															
295															
300															
305															
310															
315															
320															

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-23-(GT-6)-A

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 5, 2017 00:00
DRILLING END: January 5, 2017 00:00
COORDINATES: N: 843,658 E: 916,937

SHEET: 1 of 1
GS ELEV.: 2419.8
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
0	0.0		2419.8														
	4.0	Apache Leap tuff (Talg): light gray to whitish pink, ash flow TUFF, biotite and feldspar phenocrysts, highly weathered.	2415.8			1	100	0	0		>10 >10		4				
5	6.0	As above.	2413.8			2	100	0	40		>10 >10		4				
	11.0	As above, less weathered.	2408.8			3	100	76	82	6.7 - 11: 85.0°, B x 6 spaced at 0.7 ft, PL, VR	3 1 1 1		4				
10	14.0	As above, horizontal discontinuities along bedding.	2405.8			4	100	93	100	11.7: 90.0°, JN, IR, VR, CN 12.1: 85.0°, JN, IR, VR, CN	1 1 0		3				
15	19.0	As above, becomes more competent, highly welded.	2400.8			5	100	100	100	14.7: 75.0°, JN, IR, VR, CN 15.2: 70.0°, PL, VR, CN 16.1: 85.0°, JN, PL, VR, CN 16.8: 80.0°, JN, PL, VR, CN	1 1 2 0 0		2				
20	24.0	As above.	2395.8			6	100	94	100	20.5: 45.0°, JN, PL, RO, CN 22.2: 70.0°, JN, PL, CN 22.6: 85.0°, JN, PL, VR, CN 23.5: 70.0°, JN, IR, VR, CN	0 1 0 2 2		2				
25	29.0	As above	2390.8			7	100	94	94	23.7: 5.0°, IR, VR, CN 26.5: 75.0°, JN, IR, VR, CN 27.1: 80.0°, JN, IR, VR, CN 27.4: 65.0°, JN, PL, RO, CN	0 0 1 2 1		2				
30		Bottom of borehole at 29.0 ft.Lost hole at 29' Notes: 29: Hole Lost at 29 ft-bgs.															
35																	
40																	

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK 30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH17-23-(GT-6)-A
1 of 1

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-23-(GT-6)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 6, 2017 11:03
DRILLING END: January 6, 2017 11:03
COORDINATES: N: 843,658 E: 916,937

SHEET: 1 of 7
GS ELEV.: 2419.8
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact | VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical | PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular | PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough | Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge | Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide | MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
0	0.0		2419.8								>10					
											>10					
											>10		4			
											>10					
5											3					
											1		4			
											1					
											1					
											1					
											1		4			
10											1					
											1					
											0					
											1		3			
											1					
15											2					
											0					
											0		2			
											0					
											0					
20											0					
		Apache Leap tuff (Talg): light gray, ash flow TUFF, feldspar and biotite phenocrysts, highly welded, few calcite veins, few lithic fragments.				1	100	100	100	20.5: 45.0°, JN, PL, RO, CN	0					
											0		2			
						2	100	80	90	22.2: 70.0°, JN, PL, CN 22.3: 65.0°, JN, PL, VR, Ca, CC <1mm	2					
	24.0		2395.8							22.6: 85.0°, JN, PL, VR, CN	3					
25		As above.								22.8: 80.0°, JN, IR, VR, CN 23.1: 75.0°, JN, IR, VR, CN 23.4: 85.0°, JN, IR, VR, CN 23.5: 70.0°, JN, IR, VR, CN 23.7: 5.0°, JN, IR, VR, CN	1					
											1					
						3	100	100	100	24.3: 85.0°, JN, PL, VR, CN 25.9: 90.0°, JN, PL, VR, CN 26.5: 75.0°, JN, IR, VR, CN 27.1: 80.0°, JN, IR, VR, CN 27.3: 65.0°, JN, PL, RO, CN 27.4: 65.0°, JN, PL, RO, CN	0		2			
											1					
	29.0		2390.8								1					
30		As above.								28.1: 80.0°, JN, IR, VR, CN 29.5: 85.0°, JN, PL, VR, CN	3					
											2					
						4	98	80	90	31: 75.0°, JN, PL, RO, CN 31.6: 35.0°, JN, PL, RO	2		2			
											0					
	34.0		2385.8								0					
35		As above.									1					
										35.6: 75.0°, JN, IR, VR, CN	1					
						5	100	90	90	36.7: 85.0°, JN, IR, VR, CN	1		2			
										37.7: 80.0°, JN, IR, VR, CN	1					
	39.0		2380.8							38.2: 75.0°, FLT, IR, VR, Bx, IN <5mm	7					
40		As above.				6	100	90	100	39.5: 80.0°, JN, IR, VR, CN	1		2			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK 30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-23-(GT-6)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 6, 2017 11:03
DRILLING END: January 6, 2017 11:03
COORDINATES: N: 843,658 E: 916,937

SHEET: 2 of 7
GS ELEV.: 2419.8
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT
40	40.0	As above. *(continued)*	2379.8								0
						6	100	90	100	41.4: 65.0°, JN, PL, VR, CN	1
											0
	44.0		2375.8								4
		As above, becomes friable.								43.8: 75.0°, JN, IR, VR, CN	3
45										44.9: 80.0°, JN, PL, RO, CN	0
						7	94	76	86	46.1: 75.0°, JN, PL, RO, CN	2
										46.8: 70.0°, JN, IR, VR, CN	
										47.2: 85.0°, JN, IR, VR, CN	2
										47.8: 85.0°, JN, IR, VR, CN	
	49.0		2370.8							48.4: 80.0°, JN, PL, VR, CN	4
		As above, moderately fractured.								49.3: 80.0°, JN, IR, VR, CN	2
50										49.8: 75.0°, JN, IR, VR, CN	1
										50.8: 70.0°, JN, PL, VR, CN	
						8	100	84	90	51.1: 85.0°, JN, PL, RO, CN	5
										51.5: 80.0°, FLT, PL, RO, CN	
										51.8: 85.0°, JN, PL, VR, CN	2
	54.0		2365.8							52.4: 55.0°, FLT, PL, SM, G, full iron staining, IN <5mm	0
		As above.									0
55										55.5: 80.0°, JN, PL, VR, CN	1
						9	100	86	86		0
										57.5: 85.0°, JN, PL, RO, CN	1
										58.2: 70.0°, JN, IR, RO, CN	
	59.0		2360.8							58.6: 25.0°, JN, PL, VR, Ca, IN >5mm	4
		As above, becomes massive and competent.									0
60											0
						10	100	90	90		0
										62.5: 85.0°, JN, PL, RO, CN	2
										62.8: 45.0°, JN, PL, VR, CN	
	64.0		2355.8							63.7: 55.0°, JN, IR, Ca, IN <5mm	2
		As above, becomes reddish brown.									1
65										64.7: 65.0°, JN, PL, RO, CN	1
						11	100	94	94	65.8: 85.0°, JN, IR, VR, CN	0
										67.1: 70.0°, JN, PL, RO, CN	1
	69.0		2350.8							68.2: 75.0°, JN, IR, VR, CN	1
		As above, minor fractured zone. 2" lens of fine grained sandstone at 69.8 ft-bgs.									0
70										70.4: 80.0°, JN, IR, VR, CN	1
						12	100	70	70	71.3 - 72.8: 70.0°, FLT, IR, VR, CN, friable fracture zone	7
											8
	74.0		2345.8							73.8: 65.0°, JN, IR, RO, CN	1
		As above.									4
75										74.7: 85.0°, JN, PL, VR, CN	
						13	100	84	100	75.1: 85.0°, JN, IR, VR, CN	2
										75.5: JN, IR, RO, CN	0
										77.5: 80.0°, JN, PL, RO, CN	1
	79.0		2340.8								0
		As above, continues massive and competent.				14	100	100	100		0
80		Log continued on next page									

ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6

ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC	LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
2					
3					
2					
1					
1					
3					
2					
1					

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK 30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-23-(GT-6)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 6, 2017 11:03
DRILLING END: January 6, 2017 11:03
COORDINATES: N: 843,658 E: 916,937

SHEET: 3 of 7
GS ELEV.: 2419.8
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index ● AX. □ DIAM. ▲ UCS (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0		2339.8														
		As above, continues massive and competent. *(continued)*				14	100	100	100	80.4: 85.0°, JN, PL, RO, CN	1 0 0 0		1				
	84.0		2335.8														
85		As above.				15	100	100	100	85.8: 45.0°, JN, PL, SM, CN, partial iron staining	0 1 0 0		1				
	89.0		2330.8							88.2: 80.0°, JN, IR, RO, CN	1						
90		As above.				16	100	100	100	92.7: 40.0°, JN, PL, RO, CN	0 0 0 1 0		1				
	94.0		2325.8														
95		As above, few lithic clasts some with an iron staining halo around them.				17	100	100	100	97.5: 35.0°, JN, PL, RO, CN	0 0 0 1 0		1				
	99.0		2320.8														
100		As above.				18	100	100	100	103.1: 80.0°, JN, IR, VR, CN	0 0 0 0 1		1				
	104.0		2315.8														
105		Apache Leap tuff (Talg): light gray, ash flow TUFF, feldspar and biotite phenocrysts, highly welded, few calcite veins, auto-breccia texture, few lithic clasts with iron staining				19	100	92	100	105.9: 85.0°, JN, IR, RO, CN 107.4: 45.0°, JN, PL, RO, CN 108.4: 35.0°, JN, PL, RO, CN	0 1 0 1 2		1				
	109.0		2310.8														
110		As above.				20	100	100	100	108.6: 45.0°, JN, PL, RO, CN 110.2: 75.0°, JN, PL, RO, CN 111.8: 85.0°, JN, IR, VR, CN 112.5: 55.0°, JN, PL, RO, CN 113.6: 85.0°, JN, IR, RO, CN	0 1 1 1 1		1				
	114.0		2305.8														
115		Apache Leap tuff (Talg): light gray to reddish brown, ash flow TUFF, feldspar and biotite phenocrysts, highly welded, few calcite veins.				21	100	84	90	115.2: 45.0°, JN, PL, RO, CN 116: 55.0°, JN, PL, RO, CN 116.8: 80.0°, FLT, IR, VR, G, IN >5mm 117.8: 80.0°, JN, PL, RO, CN	0 1 5 1 0		1				
	119.0		2300.8														
120		As above, intervals of auto-breccia texture present.				22	100	94	94		1		1				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK 30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-23-(GT-6)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 6, 2017 11:03
DRILLING END: January 6, 2017 11:03
COORDINATES: N: 843,658 E: 916,937

SHEET: 4 of 7
GS ELEV.: 2419.8
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
120	120.0	As above, intervals of auto-breccia texture present. *(continued)*	2299.8														
	124.0	As above.	2295.8			22	100	94	94	120.1: 80.0°, JN, IR, VR, CN 120.5: 65.0°, JN, PL, RO, CN 121.9: 75.0°, JN, IR, VR, CN 123.4: 75.0°, JN, PL, SM, CN	2 1 0 1		1				
125	129.0	As above.	2290.8			23	100	100	100	127.5: 35.0°, JN, PL, RO, CN	0 0 0 1 0		1				
130	134.0	As above.	2285.8			24	100	100	100	131.4: 80.0°, JN, PL, RO, CN 132.7: 75.0°, JN, PL, RO, CN	0 0 1 1 0		1				
135	139.0	As above.	2280.8			25	100	100	100	135.2: 70.0°, JN, PL, RO, CN 136.1: 80.0°, JN, CU, RO, CN 137.5: 55.0°, JN, PL, RO, CN 137.9: 80.0°, JN, IR, RO, CN	0 1 2 2 0		1				
140	144.0	As above.	2275.8			26	100	80	90	138.5: 75.0°, JN, CU, RO, CN 142.1: 90.0°, JN, IR, RO, CN	0 0 0 1 0		1				
145	149.0	As above.	2270.8			27	100	100	100	144: 37.0°, JN, IR, VR, CN 145: 90.0°, JN, IR, RO, CN 146.4: 85.0°, JN, PL, RO, CN 146.8: 75.0°, JN, IR, VR, CN 147.8: 85.0°, JN, PL, RO, CN	1 1 2 1 0		1				
150	154.0	As above.	2265.8			28	100	94	100	148.8: 65.0°, JN, PL, RO, CN 150.1: 85.0°, JN, IR, RO, CN 150.4: 80.0°, JN, IR, VR, CN	0 2 0 0 0		1				
155	159.0	As above.	2260.8			29	90	86	86	155.5: 85.0°, JN, ST, RO, CN 157.1: 80.0°, JN, PL, RO, CN 157.7: 45.0°, JN, PL, SM, CN 158.3: 75.0°, JN, PL, VR, CN	0 1 0 2 1		1				
160		As above.				30	100	100	100		0		1				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK 30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-23-(GT-6)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 6, 2017 11:03
DRILLING END: January 6, 2017 11:03
COORDINATES: N: 843,658 E: 916,937

SHEET: 5 of 7
GS ELEV.: 2419.8
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
160	160.0	As above. *(continued)*	2259.8			30	100	100	100	160.8: 75.0°, JN, CU, RO, CN 162.8: 65.0°, JN, CU, RO, CN	1 0 0 0		1				
165	164.0	As above.	2255.8			31	100	46	76		3 5 4 5 4		2				
170	169.0	As above, few large 1" calcite crystals.	2250.8			32	100	80	80	170.6: 85.0°, JN, IR, VR, CN 171.5: 80.0°, JN, IR, VR, CN 173.3: 65.0°, JN, PL, RO, CN	>10 1 1 0 0		1				
175	174.0	Apache Leap tuff (Talg): light gray to reddish brown, ash flow TUFF, feldspar and biotite phenocrysts, highly welded, auto-breccia texture.	2245.8			33	100	90	90	175.3: 45.0°, JN, PL, SM, CN 176.8: 75.0°, JN, PL, RO, CN 177.7: 10.0°, FLT, CU, SK, CN, partial iron staining 177.8: 85.0°, JN, IR, VR, CN	0 1 1 3 1		1				
180	179.0	As above.	2240.8			34	100	100	100	178.1: 75.0°, JN, PL, RO, CN 180.3: 90.0°, JN, RO, CN 180.9: 85.0°, JN, IR, VR, CN 182.7: 90.0°, JN, IR, RO, CN	0 2 0 1 0		1				
185	184.0	As above.	2235.8			35	100	100	100	185: 80.0°, JN, PL, RO, CN 187.3: 55.0°, JN, PL, RO, CN 187.5: 80.0°, JN, IR, VR, CN	0 1 0 2 0		1				
190	189.0	As above, few lithic clasts some with iron staining.	2230.8			36	100	100	100	190.1: 75.0°, JN, IR, VR, CN 191.2: 85.0°, JN, IR, VR, CN	0 1 1 0 0		1				
195	194.0	As above, some open voids not inter-conected.	2225.8			37	100	100	100	195.6: 75.0°, JN, IR, VR, CN 196.9: 65.0°, JN, PL, VR, CN 197.6: 75.0°, JN, IR, VR, CN 198.1: 80.0°, JN, IR, VR, CN	0 1 3 1 1		1				
200	199.0	Log continued on next page	2220.8			38	100	90	96	199.7: 90.0°, JN, IR, VR,	2		1				

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK 30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-23-(GT-6)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 6, 2017 11:03
DRILLING END: January 6, 2017 11:03
COORDINATES: N: 843,658 E: 916,937

SHEET: 6 of 7
GS ELEV.: 2419.8
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
200	200.0	Apache Leap tuff (Talg): light gray to reddish brown, ash flow TUFF, feldspar and biotite phenocrysts, highly welded, auto-breccia texture, most lithic clasts have iron staining. *(continued)*	2219.8			38	100	90	96	CN 201.2: 90.0°, JN, IR, RO, CN 203.8: 40.0°, JN, PL, RO, CN	0 1 0 2		1				
	204.0		2215.8														
205		As above.				39	100	90	90	205.2: 45.0°, JN, PL, RO, CN 205.6: 90.0°, JN, PL, RO, Ca, IN <5mm 207.6: 85.0°, JN, IR, VR	0 2 0 2 0		1				
	209.0		2210.8														
210		As above.				40	100	100	100	212.4: 45.0°, JN, PL, RO, CN	0 0 1 1 0		1				
	214.0		2205.8														
215		As above, some open voids, though not inter-conected.				41	100	96	96	215: 85.0°, JN, PL, VR, CN	1 1 0 0 0		1				
	219.0		2200.8														
220		As above.				42	100	100	100	221: 80.0°, JN, IR, RO, CN 221.3: 90.0°, JN, PL, RO, CN	0 0 2 0 0		1				
	224.0		2195.8														
225		As above, massive.				43	100	100	100	228.4: 80.0°, JN, PL, RO, CN	0 0 0 0 2		1				
	229.0		2190.8														
230		As above, many horizontal fractures along bedding planes.				44	100	58	90	228.8: 40.0°, JN, PL, RO, CN 230.2 - 233.6: 90.0°, B x 18 spaced at 0.1 ft, IR, RO, CN	4 2 1 8 3		2				
	234.0		2185.8														
235		As above, fewer fractures.				45	100	96	100	234.8: 75.0°, JN, PL, VR, CN 235.5: 90.0°, JN, PL, VR, CN 236.8: 80.0°, JN, PL, VR, CN 238.7: 65.0°, JN, IR, VR, CN	1 2 1 0 1		1				
	239.0		2180.8														
240		As above, few lithic clasts.				46	100	96	100	239.6: 80.0°, JN, IR, VR,	1		1				
		Log continued on next page															

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK 30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-23-(GT-6)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 6, 2017 11:03
DRILLING END: January 6, 2017 11:03
COORDINATES: N: 843,658 E: 916,937

SHEET: 7 of 7
GS ELEV.: 2419.8
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0		2179.8														
		As above, few lithic clasts. *(continued)*				46	100	96	100	CN 240.1: 75.0°, JN, IR, RO, CN 241.2: 60.0°, FLT, PL, RO, CN 241.9: 85.0°, JN, PL, RO, CN 242.6: 80.0°, JN, IR, VR, CN	1 2 1 1		1			
	244.0		2175.8														
245		As above.				47	100	86	100	243.1: 90.0°, JN, IR, RO, CN 244.5: 90.0°, JN, PL, RO, CN 245.4: 80.0°, JN, IR, RO, CN 245.6: 75.0°, JN, IR, RO, CN 246: 90.0°, JN, IR, RO, CN 247.7: 75.0°, JN, PL, RO, CN	1 2 1 1 2		1			
	249.0		2170.8														
250	250.0	As above.	2169.8			48	100	100	100	248.3: 75.0°, JN, IR, VR, CN 249.3: 80.0°, JN, IR, SM, CN 249.5: 75.0°, JN, PL, RO, CN	2		1			
		Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram.Start coring at 19' Notes: 0 - 32: Hydro test #1 FHT 20: Same pad as DH17-23-(GT-6)-A. Reamed down to 20 ft-bgs, began coring. 30 - 90: Hydro test #2 FHT 49 - 54: Circulation lost on this run. There are two small fracture zones around 52 ft-bgs. 92 - 150: Hydro test #3 SI 147 - 250: Hydro test #4 SI															
255																	
260																	
265																	
270																	
275																	
280																	

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK 30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-24(GT-40-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 7, 2017 14:33
DRILLING END: January 7, 2017 14:33
COORDINATES: N: 841,495 E: 912,378

SHEET: 1 of 5
GS ELEV.: 2303.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
0	0.0	Recovery is washed quartz gravel from surficial soils.	2303.0			1	13	0	0				6			
	4.0	Pinal Schist (pCpi): brownish gray, SCHIST, fine to medium grained, highly foliated, quartz veining, FeOx on discontinuities, clayey infill.	2299.0													
5						2	83	0	27	5.3: 45.0°, JN, PL, RO, Cl, partial iron staining, IN <5mm 5.5: 50.0°, JN, PL, VR, FeOx, partial iron staining, PC 5.8: 53.0°, FOLO, ST, RO, Bx, partial iron staining, IN <5mm	7 3		3			
	7.0	As above.	2296.0			3	100	28	40	6.1: 35.0°, JN, IR, RO, Cl, partial iron staining, PC 6.2: 42.0°, FOLO, UN, SK, Cl, full iron staining, IN >5mm 6.5: 18.0°, JN, IR, VR, FeOx, full iron staining, CC <1mm 7: 28.0°, FOLO, UN, VR, Bx, partial iron staining, IN >5mm	4 4 3		3			
10	9.5	As above.	2293.5			4	100	40	40	7.2: 20.0°, FLT, UN, SK, Cl, partial iron staining, IN <5mm 7.4: 38.0°, JN, IR, VR, Cl, partial iron staining, IN <5mm 8.1: 68.0°, FLT, IR, VR, Cl, IN >5mm 8.7 - 8.9: 75.0°, FLT, IR, VR, Bx, partial iron staining, IN >5mm	5 8		3			
	12.0	As above.	2291.0			5	100	0	0	8.9: 29.0°, JN, IR, RO, Sa, partial iron staining, PC 9: 10.0°, JN, IR, VR, Cl, partial iron staining, PC 9.1: 15.0°, JN, IR, VR, Cl, partial iron staining, PC 10.1: 40.0°, FOLO, UN, SK, Bx, partial iron staining, IN <5mm	>10 >10		4			
15	14.0	As above.	2289.0			6	100	0	0	10.2: 47.0°, JN, ST, RO, Bx, full iron staining, IN <5mm 10.4 - 10.6: 40.0°, FLT, IR, RO, Bx, partial iron staining, IN >5mm 10.6: 59.0°, JN, ST, RO, Bx, partial iron staining, IN <5mm	>10 >10		4			
	16.0	As above.	2287.0			7	50	0	0	11.1 - 11.3: 57.0°, FLT, IR, VR, Bx, partial iron staining, IN >5mm 11.4 - 11.5: 35.0°, JN x 2, PL, SM, Cl, partial iron staining, PC			4			
	17.0	As above.	2286.0			8	67	0	0	11.6: 10.0°, FOLO, CU, RO, Bx, full iron staining, IN <5mm 11.7: 32.0°, FOLO, UN, SK, Cl, partial iron staining, CC <1mm	>10		4			
	18.5	No recovery.	2284.5			9	0	0	0	11.8: 75.0°, JN, PL, RO, Cl, PC 11.9: 45.0°, JN, ST, RO, Cl, partial iron staining, PC 12 - 14: FLT, breccia, sand, and fractured quartz vein,			5			
20	20.0		2283.0													

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-24(GT-40-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 7, 2017 14:33
DRILLING END: January 7, 2017 14:33
COORDINATES: N: 841,495 E: 912,378

SHEET: 2 of 5
GS ELEV.: 2303.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC	LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
20	20.0		2283.0															
		Continues SCHIST, greenish gray, highly foliated and fractured, fine to medium grained, full FeOx coatings.				10	100	0	10	FeOx staining 14 - 18.5: FLT, breccia, broken rock, sand, and quartz, FeOx staining, trace clay	>10		3					
	22.0		2281.0							18.5 - 20: FLT, no recovery 20 - 22: FLT, fractured rock, brecciated, oxidized	>10							
		As above, large quartz vein.				11	100	0	0	20.7: 52.0°, FLT, ST, RO 21.1: 14.0°, FLT, ST, VR, full iron staining 21.2: 68.0°, FLT, PL, SM, full iron staining	6		3					
	23.5		2279.5							21.6: 13.0°, FLT, CU, SM, full iron staining	>10							
		As above.				12	33	0	20	22.1: 20.0°, JN, ST, RO, FeOx, full iron staining, CC <1mm 22.2: 44.0°, JN, IR, VR, FeOx, partial iron staining, PC	>10		4					
25	25.0		2278.0							22.4: 15.0°, IR, VR, FeOx, full iron staining, CC <1mm								
		Becomes brecciated SCHIST, quartz veins, FeOx on discontinuity surfaces.				13	29	0	0	22.6: 68.0°, FOLO, IR, RO, Cl, partial iron staining, PC 22.7: 19.0°, JN, IR, VR, CN, partial iron staining 22.8: 45.0°, ST, VR, FeOx, full iron staining, CC <1mm 23: 10.0°, JN, ST, RO, FeOx, full iron staining, CC <1mm	>10 >10		4 - 5					
	28.5		2274.5							23.3: 38.0°, JN, ST, RO, FeOx, partial iron staining, PC 23.4 - 23.5: FLT, Bx, full iron staining	>10							
		Becomes brownish gray SCHIST, highly foliated and faulted, gougey and very weak, FeOx staining.				14	100	0	0	23.5 - 25: FLT, breccia, poor recovery 25 - 28.5: FLT, breccia and quartz gravel, FeOx staining 28.5 - 29.1: FLT, breccia with clay infill	>10		4					
30	30.5		2272.5							29.1 - 29.7: 40.0°, FLT, UN, SM, G 29.7 - 30.5: FLT, breccia with clay infill	6							
		As above.				15	100	27	47	30.7: 65.0°, JN, IR, VR, Bx, partial iron staining, IN <5mm 31 - 31.4: 65.0°, FLT, UN, SM, G, full iron staining, gouge with breccia	4		3					
	32.0		2271.0															
		Becomes brownish gray, METASANDSTONE, fine to medium grained, jointed and lightly foliated, full FeOx coatings, weak HCl reaction.				16	100	40	97	32.4: 71.0°, JN, ST, RO, FeOx, full iron staining, CC <1mm 32.7: 79.0°, JN, ST, SM, FeOx, full iron staining, CC <1mm 33.1: 49.0°, JN, ST, RO, Sa, partial iron staining, PC 33.4: 63.0°, JN, ST, SM, FeOx, full iron staining, CC <1mm 33.6: 39.0°, FOLO, UN, SK, Cl, partial iron staining, CC <1mm	2 4 3		2					
35	35.5		2267.5							33.7: 68.0°, JN, ST, RO, FeOx, full iron staining, CC <1mm	7							
		As above.				17	100	0	0	34.1: 62.0°, PL, RO, FeOx, full iron staining, CC <1mm 34.2: 7.0°, JN, CU, PO, Cl, full iron staining, CC <1mm	8		2					
	37.0		2266.0							34.4: 74.0°, JN, ST, RO, FeOx, full iron staining, CC <1mm	2							
		As above, less jointed.				18	100	62	74	35 - 35.1: 46.0°, FOLO x 2, UN, SK, Cl, partial iron staining, PC 35.4: 11.0°, FOLO, PL, PO, Cl, full iron staining, IN <5mm	3		2					
40										35.7: 59.0°, JN, UN, RO, FeOx, full iron staining, CC <1mm 35.8: 60.0°, JN, ST, RO, FeOx, full iron staining, CC	1							

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-24(GT-40-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 7, 2017 14:33
DRILLING END: January 7, 2017 14:33
COORDINATES: N: 841,495 E: 912,378

SHEET: 3 of 5
GS ELEV.: 2303.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC	LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0	As above, less jointed. *(continued)*	2263.0															
						18	100	62	74	<1mm 35.9: 58.0°, JN, IR, RO, FeOx, partial iron staining, PC 36.4: 8.0°, FOLO, UN, SK, Cl, partial iron staining, CC <1mm 36.5: 70.0°, JN, ST, RO, FeOx, full iron staining, CC <1mm	6 1		2				
	42.0	As above.	2261.0			19	100	63	63	36.55 - 37: broken core, jointing, FeOx staining 37.7: 18.0°, FOLO, CU, PO, Cl, full iron staining, CC <1mm 37.9: 70.0°, JN, PL, SM, Ca, partial iron staining, PC 38.2: 52.0°, JN, CU, VR, FeOx, full iron staining, CC <1mm 38.7: 40.0°, JN, IR, VR, FeOx, partial iron staining, PC	3 6		2				
45	45.0	As above, becomes very highly jointed, broken and faulted.	2258.0			20	100	0	10	38.8: 60.0°, JN, IR, VR, FeOx, full iron staining, CC <1mm 39.9: 85.0°, JN, ST, SM, FeOx, full iron staining, CC <1mm 40: 71.0°, FLT, UN, SK, FeOx, full iron staining, CC <1mm	>10 >10		3				
	47.0	As above, calcite infill in fracture.	2256.0			21	100	14	14	40.3: 30.0°, JN, IR, VR, FeOx, full iron staining, CC <1mm 40.7: 52.0°, JN, ST, SM, FeOx, full iron staining, CC <1mm 40.9: 49.0°, JN, ST, SM, FeOx, full iron staining, CC <1mm 41: 24.0°, FOLO, PL, PO, Cl, partial iron staining, IN <5mm 41.1: 14.0°, FOLO, UN, PO, Cl, partial iron staining, CC <1mm	>10 >10 >10		3				
50	50.5	Becomes greenish gray with red SCHIST, fine grained, schistose, highly foliated, crenulations, minor FeOx coatings, no HCl reaction.	2252.5			22	100	38	45	41.4: 64.0°, FLT, UN, SK, FeOx, partial iron staining, PC 41.5: 61.0°, JN, PL, SM, FeOx, full iron staining, CC <1mm 42.7: 19.0°, FOLO, ST, SM, FeOx, full iron staining, CC <1mm 43.7 - 44.5: FLT, ST, SM, FeOx, full iron staining, CC <1mm, broken core, jointing 44.9: 40.0°, JN, PL, SM, FeOx, full iron staining, CC <1mm 45 - 47: FLT x 20, ST, RO, FeOx, full iron staining, CC <1mm, broken core, jointing	6		3				
55	54.5	As above.	2248.5			23	100	64	88	46 - 46.4: 35.0°, FLT, IR, RO, Sa, partial iron staining, IN >5mm, some clay 47 - 50.5: FLT, IR, RO, FeOx, full iron staining, CC <1mm, broken core, jointed and fractured 51: 68.0°, JN, ST, SM, FeOx, full iron staining, CC <1mm	4 3		2				
	57.0	As above.	2246.0			24	100	55	55	51.1: 27.0°, FOLO, ST, SM, Cl, partial iron staining, PC 51.2 - 51.3: 75.0°, JN x 2, ST, RO, FeOx, full iron staining, CC <1mm 51.8: 70.0°, JN, ST, RO, FeOx, full iron staining, CC <1mm 51.9: 60.0°, JN, ST, RO, Cl, partial iron staining, PC 52.1: 24.0°, FOLO, UN, RO, Bx, partial iron staining, IN <5mm	1 0 >10		2				
60		Log continued on next page																

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-24(GT-40-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 7, 2017 14:33
DRILLING END: January 7, 2017 14:33
COORDINATES: N: 841,495 E: 912,378

SHEET: 4 of 5
GS ELEV.: 2303.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC	LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
60	60.0	As above. *(continued)*	2243.0															
	61.0	As above.	2242.0			24	100	55	55	52.4: 62.0°, FLT, IR, SK, Bx, partial iron staining, IN <5mm 53.3: 48.0°, FOLO, IR, VR, FeOx, partial iron staining, PC 53.4 - 54.5: FLT, Bx, partial iron staining, IN >5mm, broken core, breccia, and sand 54.6: 45.0°, JN, UN, RO, Cl, partial iron staining, PC 54.9: 64.0°, FLT, ST, SK, FeOx, full iron staining, CC <1mm 55 - 55.2: 25.0°, FLT, UN, SK, Bx, partial iron staining, IN >5mm 55.2 - 57: 35.0°, FOLO x 5 spaced at 0.5 ft, UN, SK, Cl, partial iron staining, PC 57.6: 75.0°, JN, IR, RO, Bx, partial iron staining, IN <5mm	3 1 >10 >10 2		2				
65	65.5	As above.	2237.5			25	89	51	51		3		3					
	69.0	As above.	2234.0			26	100	43	43	59.3 - 60.1: 10.0°, FLT, UN, SK, Bx, partial iron staining, IN >5mm, clay infill 60.3: 35.0°, JN, ST, RO, FeOx, full iron staining, CC <1mm 60.9: 33.0°, JN, PL, RO, FeOx, partial iron staining, PC 61.6: 65.0°, JN, CU, RO, Cl, partial iron staining, PC 62.3 - 64.1: FLT, breccia and gouge 64.6: 55.0°, FOLO, UN, RO, FeOx, partial iron staining, PC	5 6 5		2				
70	72.0	As above.	2231.0			27	100	57	70	65.4: 20.0°, JN, PL, SM, FeOx, full iron staining, CC <1mm 66: 56.0°, FOLO, ST, VR, Cl, partial iron staining, PC 66.4: 38.0°, JN, PL, RO, Cl, partial iron staining, PC 66.6 - 67.6: 26.0°, FOLO x 11, UN, RO, FeOx, full iron staining, CC <1mm 66.61 - 67.61: 35.0°, JN x 4, ST, RO, FeOx, partial iron staining, CC <1mm	3 4 5		2				
75	75.0	As above.	2228.0			28	100	50	50	68.3 - 68.8: 35.0°, FLT, IR, RO, Bx, partial iron staining, IN >5mm 69.3: 52.0°, FOLO, ST, PO, Cl, full iron staining, CC <1mm 69.5 - 69.6: FLT, IR, VR, Bx, partial iron staining 70.1: 21.0°, FOLO, ST, RO, Cl, full iron staining, CC <1mm 70.2: 34.0°, FOLO, UN, RO, FeOx, full iron staining, CC <1mm	3 5 0		2				
80		Bottom of borehole at 75.0 ft. Completed as well. Refer to diagram. Notes: 0: Twinned hole with GT-40. Drilling optimized for hole quality and speed, not recovery. See hole DH16-22 (GT-40) for record of twinned hole. 37 - 75: Hydro test #1 FHT								70.6: 44.0°, FOLO, ST, RO, FeOx, full iron staining, CC <1mm 70.95 - 71: 35.0°, FOLO, UN, RO, Bx, full iron staining, IN >5mm 71.2 - 71.3: 52.0°, FLT, PL, RO, Bx, full iron staining, IN >5mm 71.8: 55.0°, JN, ST, RO, FeOx, full iron staining, CC <1mm 72.3: 64.0°, FOLO, UN, RO, Cl, partial iron staining, CC <1mm 72.9 - 73: 62.0°, FLT, UN, SK, Bx, full iron staining, IN >5mm 73.4: 60.0°, JN, ST, RO, FeOx, full iron staining, CC <1mm 73.5: 21.0°, JN, UN, RO,							

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-24(GT-40-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 7, 2017 14:33
DRILLING END: January 7, 2017 14:33
COORDINATES: N: 841,495 E: 912,378

SHEET: 5 of 5
GS ELEV.: 2303.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth / DESCRIPTION / Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi)	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE BROKEN CORE /LOST CORE (BC / LC)	ADVANCEMENT RATE ft/min
80	80.0 / 2223.0							FeOx, partial iron staining, PC 73.9 - 74: 58.0°, FLT, ST, RO, Bx, partial iron staining, IN >5mm		R1 - 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6 -			
85													
90													
95													
100													

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-25 (GT-37)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 9, 2017 14:24
DRILLING END: January 9, 2017 14:24
COORDINATES: N: 843,072 E: 914,519

SHEET: 1 of 7
GS ELEV.: 2350.4
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE: DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
0	0.0	Colluvium with sub-angular gravel and cobbles of shale.	2350.4														
	3.0	Pioneer Formation (pCp): dark gray SHALE, fine-grained, thinly bedded, highly weathered, highly fractured, complete FeOx staining on all surfaces, rubble.	2347.4			1	40	0	0		>10						
5	6.0	As above, interbeds of light siltstone.	2344.4			2	100	0	0		>10		5				
	7.5	As above.	2342.9			3	100	0	0	7.3: 49.0°, JN, ST, SM, CN, full iron staining	>10		5				
	8.5	As above, becomes less fractured, fine-grained siltstone interbeds, FeOx staining on fracture surfaces.	2341.9			4	57	0	0	10.9: 36.0°, JN, UN, SM, CN, partial iron staining	>10		4				
10	12.0	As above.	2338.4			5	100	0	0		>10		5				
	14.0	No recovery.	2336.4			6	0	0	0		>10		4				
15	17.0	As above.	2333.4			7	17	0	0		>10		5				
20	20.0	As above.	2330.4			8	100	0	0		>10		5				
	21.0	As above.	2329.4			9	100	0	0		>10						
	24.0	Continues dark reddish brown SHALE, completly weathered, very fine to fine-grained, moderate FeOx staining, highly fractured, siltstone interbeds, rubble.	2326.4			10	100	100	100		>10		5				
25	25.0	As above.	2325.4			11	100	100	100		>10						
	26.0	As above.	2324.4			12	100	0	0		>10		5				
	28.0	As above.	2322.4			13	90	0	0		>10		5				
	29.0	As above.	2321.4			14	100	0	0		>10		5				
30	30.5	As above.	2319.9			15	70	0	0		>10		5				
	34.0	As above.	2316.4			16	100	0	0		>10		5				
35	37.5	As above.	2312.9			17	43	0	34		>10		3				
	39.0	As above.	2311.4			18	40	0	0		>10		4				
40						19	33	0	0		>10		5				
						20	70	0	0		>10		5				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-25 (GT-37)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 9, 2017 14:24
DRILLING END: January 9, 2017 14:24
COORDINATES: N: 843,072 E: 914,519

SHEET: 2 of 7
GS ELEV.: 2350.4
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE: DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
40	40.0		2310.4															
	41.0	Continues dark reddish brown SHALE, completly weathered, very fine to fine-grained, moderate FeOx staining, highly fractured, siltstone interbeds, rubble. *(continued)*	2309.4			20	70	0	0		>10		5					
	43.0	As above.	2307.4			21	100	25	35	41.2: 45.0°, JN, PL, RO, CN 41.5 - 41.9: 75.0°, JN x 2, PL, RO, CN 42.2 - 42.8: 40.0°, JN x 3, PL, RO, CN	6 4		2					
	44.0	As above, rubble.	2306.4			22	50	0	0		>10		4					
	44.5	As above.	2305.9			23	60	0	0		>10		4					
45		As above, brecciated with rubble zones, intervals of brown clay.				24	86	20	37	45.4 - 45.8: 30.0°, x 2 spaced at 0.4 ft, PL, SM, CN	6 3 8		3					
	48.0	As above.	2302.4			25	90	60	70	48.5 - 50.2: 75.0°, JN x 4 spaced at 0.5 ft, IR, VR, CN	4 2 7		3					
50	51.0	As above.	2299.4			26	100	70	70	51.5 - 52.6: 70.0°, x 3 spaced at 0.5 ft, IR, VR, CN 53.6: 10.0°, FLT, PL, SM, G, partial iron staining, CC <1mm			3					
	54.0	As above.	2296.4			27	100	0	17		>10 >10 >10		3					
55	57.0	As above, rubble.	2293.4			28	50	0	0		>10 >10		4					
	59.0	Continues dark reddish brown to tan SHALE, moderately weathered, very fine to fine-grained, light FeOx staining, highly fractured, siltstone interbeds, few calcite veins, rubble zones.	2291.4			29	100	50	73	59.5: 60.0°, JN, PL, RO, CN 59.8 - 60.4: 40.0°, x 3 spaced at 0.3 ft, PL, SM, CN, partial iron staining	3 >10 >10		2					
60	62.0	As above.	2288.4			30	60	0	25		>10 >10		3					
	64.0	As above.	2286.4			31	60	0	0		>10 >10		4					
65	66.0	As above.	2284.4			32	100	20	47	66.4: 45.0°, JN, PL, SM, CN	>10 >10		3					
	67.5	As above.	2282.9			33	60	0	0		>10 >10 >10		4					
70	70.0	As above.	2280.4			34	100	0	0		>10 >10		3					
	71.5	As above.	2278.9			35	100	0	0		>10 >10 >10		3					
	74.0	As above.	2276.4			36	100	0	0		>10 >10		3					
75	75.5	As above.	2274.9			37	80	0	0		>10 >10 >10		3					
	78.0	As above.	2272.4			38	80	0	0		>10 >10		3					
80	79.5	As above.	2270.9			39	80	20	32		>10		2					

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-25 (GT-37)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 9, 2017 14:24
DRILLING END: January 9, 2017 14:24
COORDINATES: N: 843,072 E: 914,519

SHEET: 3 of 7
GS ELEV.: 2350.4
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index ● AX. □ DIAM. ▲ UCS (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0	As above. *(continued)*	2270.4													
	82.0	As above.	2268.4			39	80	20	32	80.3 - 82: 45.0°, x 5 spaced at 0.4 ft, PL, SM, CN	>10 >10		2			
	84.0	As above.	2266.4			40	100	0	85	82.3 - 84: 70.0°, JN x 8 spaced at 0.3 ft, PL, SM, Ca, CC <1mm	5 4		2			
85	88.0	As above.	2262.4			42	100	25	38	84 - 88: 60.0°, JN x 6 spaced at 0.7 ft, PL, SM, Ca, CC <1mm 86.2: 10.0°, JN, PL, SM, Ca 86.7: 75.0°, JN, IR, RO, CN	2 4 3 4		2			
90	90.0	As above.	2260.4			43	65	0	0	88.6 - 90: 75.0°, x 5 spaced at 0.4 ft, PL, SM, Ca, CC <1mm	5 >10		2			
	91.0	As above.	2259.4			44	100	0	0	89.7: 40.0°, JN, PL, SM, Ca, CC <1mm	>10		3			
	92.0	As above.	2258.4			45	70	0	0		>10		3			
	94.0	Continues reddish brown SHALE, moderately weathered, very fine to fine-grained, light FeOx staining, highly fractured, siltstone interbeds, few calcite veins, rubble zones.	2256.4			46	100	0	15		>10 >10		3			
95	97.0	As above.	2253.4			47	100	43	57	95.3 - 97: 40.0°, x 6 spaced at 0.3 ft, PL, SM, CN, partial iron staining	7 3 5		2			
	102.0	As above.	2248.4			48	20	0	0	101.9: 45.0°, JN, PL, RO, CN	>10 >10 >10 >10 >10		5			
	104.0	As above.	2246.4			49	65	50	50		>10 0		3			
105	106.5	As above.	2243.9			50	92	72	88	105.2: 80.0°, JN, IR, RO, CN 105.5: 45.0°, JN, ST, SM, CN, partial iron staining	0 3 5		2			
110	110.5	As above.	2239.9			51	93	40	58	105.9: 45.0°, JN, PL, SM, CN, partial iron staining 107.2 - 107.6: 75.0°, FLT, PL, RO, Bx, IN >5mm 108.6: 45.0°, JN, PL, SM, CN 107.6 - 110: 60.0°, x 7 spaced at 0.4 ft, PL, SM, CN, partial iron staining	>10 5 3 >10		2			
	114.0	As above.	2236.4			52	94	23	40	110.7 - 113: 30.0°, JN x 4 spaced at 0.6 ft, PL, SM, CN, partial iron staining 110.5 - 114: 70.0°, JN x 8, PL, SM, CN	7 5 4		3			
115	117.5	As above.	2232.9			53	97	29	74	114.4: 45.0°, JN, PL, SM, CN 115.1: 60.0°, JN, PL, SM, Ca 114.3 - 117.5: 70.0°, JN x 8 spaced at 0.4 ft, PL, SM, Ca, partial iron staining, CC <1mm	6 4 4 5		2			
120		As above.				54	91	64	76	119.6: 40.0°, JN, PL, SM,	1 4		2			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-25 (GT-37)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 9, 2017 14:24
DRILLING END: January 9, 2017 14:24
COORDINATES: N: 843,072 E: 914,519

SHEET: 4 of 7
GS ELEV.: 2350.4
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC LC	ADVANCEMENT RATE ft/min
120	120.0	As above. *(continued)*	2230.4			54	91	64	76	Ca, CC <1mm 119 - 121.2: 70.0°, x 6 spaced at 0.4 ft, PL, SM, CN 120.6 - 121.2: 60.0°, FLT, PL, SM, Bx, IN >5mm	3 5		2				
	122.0	As above.	2228.4			55	90	25	40	122.4: 40.0°, JN, PL, SM, Ca, CC <1mm 122.7: 50.0°, JN, PL, SM, Ca, CC <1mm	>10 5		2				
125	124.0	As above.	2226.4			56	100	27	33	122.6 - 123.2: 65.0°, JN x 3 spaced at 0.3 ft, PL, SM, Ca, CC <1mm 124 - 125.5: 60.0°, FLT, IR, RO, Bx, IN >5mm	>10 5 3		2				
	127.0	As above.	2223.4			57	82	66	72	125.9: 45.0°, JN, ST, RO, CN 126.4: 75.0°, JN, PL, RO, CN 127.8: 80.0°, JN, IR, RO, CN 128.4: 85.0°, JN, IR, RO, CN 129 - 131.8: 55.0°, JN x 4 spaced at 0.5 ft, PL, SM, Ca, CC <1mm	4 2 2 3 >10		2				
130	132.0	As above.	2218.4			58	90	0	0		>10 >10		5				
135	134.0	Continues dark reddish brown to tan SHALE, slightly weathered, very fine to fine-grained, light FeOx staining, slightly fractured, siltstone interbeds, few calcite veins, some rubble.	2216.4			59	100	73	78	134.5 - 136.1: 45.0°, JN x 3, PL, SM, Ca 134.1 - 138.2: 60.0°, JN x 9, PL, SM, Ca, CC <1mm	3 3 2 4 7		2				
	138.5	As above.	2211.9			60	100	40	64	138.5 - 141.3: 60.0°, x 9 spaced at 0.3 ft, PL, SM, CN 140.3: 85.0°, JN, IR, RO, Cl, IN <5mm	4 2 4 >10		2				
140	143.5	As above, rubble zone.	2206.9			61	94	37	37	143.2: 35.0°, JN, PL, RO, Ca, IN <5mm 146.2: 60.0°, JN, PL, SM, CN	>10 >10 >10 2 >10		4				
145	147.0	As above.	2203.4			62	100	54	72	147.5: 80.0°, IR, RO, CN 148.2: 65.0°, JN, CU, RO, CN 148.6: 75.0°, JN, IR, RO, CN 149.2: 85.0°, JN, IR, RO, CN 150.1: 45.0°, JN, PL, SM, CN 150.3 - 151: 60.0°, FLT, IR, VR, Bx, IN >5mm	2 2 1 >10 6		2				
150	152.0	As above.	2198.4			63	100	85	90	151.2: 40.0°, JN, PL, SM, CN 151.6: 75.0°, JN, PL, SM, CN	2 2		2				
	154.0	As above.	2196.4			64	80	40	71	152.4: 65.0°, JN, PL, SM, CN 153.2: 45.0°, JN, PL, SM, CN 153.6: 80.0°, JN, IR, VR, CN 154.3 - 157.5: 70.0°, JN x 6 spaced at 0.3 ft, PL, SM, CN 155.9: 30.0°, JN, PL, SM, CN	4 3 2 8 >10		2				
155	158.5	As above, rubble.	2191.9			65	51	0	0		>10		4				
160	160.0		2190.4														

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-25 (GT-37)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 9, 2017 14:24
DRILLING END: January 9, 2017 14:24
COORDINATES: N: 843,072 E: 914,519

SHEET: 5 of 7
GS ELEV.: 2350.4
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
160	160.0	As above.	2190.4												
	162.0	As above.	2188.4	65	51	0	0		>10		4				
									>10						
	164.0	As above.	2186.4	66	100	40	75	162 - 164: JN x 8 spaced at 0.2 ft, PL, SM, CN	6		2				
165									5						
	166.0	As above.	2184.4	67	90	45	65	164.1 - 165: 75.0°, JN x 4, PL, SM, CN	5		2				
									>10						
	169.0	As above.	2181.4	68	100	77	87	167.5: 55.0°, JN, PL, RO, CN 166.3 - 168.8: 75.0°, x 7 spaced at 0.3 ft, PL, SM, CN	3		2				
									2						
									5						
170		As above.						168.6: 20.0°, JN, PL, SM, CN	>10						
				69	83	0	11		>10		4				
	172.5		2177.9						>10						
		As above.							>10						
	174.0		2176.4	70	100	0	33		>10		4				
175		As above.							2						
				71	100	55	75	174 - 177.8: 75.0°, x 10 spaced at 0.3 ft, PL, SM, CN 177 - 177.4: 15.0°, JN x 2 spaced at 0.4 ft, PL, RO, CN	3		2				
									5						
	178.0		2172.4						7						
		As above.							2						
180				72	100	23	43		5		2				
	181.0		2169.4					179.7 - 180.4: 85.0°, JN x 3, IR, RO, CN 180.4 - 181: 20.0°, x 5 spaced at 0.1 ft, PL, SM, CN	7						
		As above, becomes brecciated.							3						
				73	87	53	67	181 - 183.4: 75.0°, x 7 spaced at 0.4 ft, PL, SM, CN	3		2				
	184.0		2166.4						7						
		As above, rubble.						184.3: 45.0°, JN, PL, SM, CN 184 - 187: 65.0°, x 6 spaced at 0.5 ft, PL, SM, CN	3						
185									2						
					100	52	58		4		3				
									>10						
	189.0		2161.4						>10						
		As above.							3						
190									4						
				75	75	40	45		>10		3				
	193.0		2157.4						>10						
		Continues dark reddish brown SHALE, moderately weathered, very fine to		76	87	0	20		>10		3				
	194.5	fine-grained, highly fractured, siltstone	2155.9						>10						
195		interbeds, few calcite veins, rubble.							>10						
		As above.		77	66	0	14		>10		3				
	198.0		2152.4						>10						
		As above.							>10						
				78	65	0	10		>10		3				
200	200.0		2150.4												

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-25 (GT-37)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 9, 2017 14:24
DRILLING END: January 9, 2017 14:24
COORDINATES: N: 843,072 E: 914,519

SHEET: 6 of 7
GS ELEV.: 2350.4
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
200	200.0	As above.	2150.4											
				79	100	83	88	201.1 - 201.4: 75.0°, FLT, IR, RO, Bx 202.2: 35.0°, JN, PL, SM, CN 201.4 - 203.6: 55.0°, JN x 5 spaced at 0.4 ft, PL, RO, CN	1 3 2 2		1		
	204.0		2146.4											
205		As above.							1					
				80	100	76	76	205.2 - 207.6: 35.0°, JN x 2 spaced at 2 ft, PL, SM, Ca, CC <1mm 208.2: 65.0°, JN, IR, RO, CN	1 0 1 2		2		
	209.0		2141.4											
210		As above.						208.6: 65.0°, JN, IR, RO, CN	4					
				81	100	43	58		>10 >10 >10		3			
	213.0		2137.4											
		As above.		82	90	20	40		>10 >10		3			
215	215.0		2135.4											
		As above.		83	73	23	43	215.8: 85.0°, JN, IR, VR, CN 216.4: 45.0°, JN, PL, SM, CN 216.8 - 217: 35.0°, JN x 2 spaced at 0.2 ft, PL, SM, CN	5 3 >10		2		
	218.0		2132.4											
		As above, becomes brecciated.							3					
220				84	100	68	68	218.2: 55.0°, JN, PL, SM, CN 218.8: 80.0°, JN, IR, VR, CN 219.4: 85.0°, JN, CU, RO, CN 221.2: 45.0°, JN, PL, SM, CN 221.5: 75.0°, JN, PL, SM, CN	1 4 2 >10		2		
	223.0		2127.4											
		As above.						222.1: 40.0°, JN, PL, SM, CN	>10					
225				85	71	34	34		>10 4		3			
	226.5		2123.9											
		As above.							3					
				86	88	60	73	227.5 - 229.4: 40.0°, JN x 3, PL, SM, CN 227.4 - 229.7: 70.0°, JN x 3, PL, SM, CN	3 3 4		2		
230	230.5		2119.9											
		As above, rubble.							>10					
				87	20	0	0		>10 >10		4			
	234.0		2116.4											
235		As above.							>10					
				88	46	0	0		>10 >10 >10		3			
	239.0		2111.4											
240		As above.		89	97	0	10		>10		4			
		Log continued on next page												

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-25 (GT-37)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 9, 2017 14:24
DRILLING END: January 9, 2017 14:24
COORDINATES: N: 843,072 E: 914,519

SHEET: 7 of 7
GS ELEV.: 2350.4
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0		2110.4													
		As above. *(continued)*				89	97	0	10		>10		4			
	242.0		2108.4								>10					
		As above.				90	100	0	25		>10		3			
	244.0		2106.4								>10					
245		As above.									4					
											3					
										244.2 - 248.7: 45.0°, JN x 12 spaced at 0.3 ft, PL, SM, CN	2		2			
											3					
	249.0		2101.4								3					
250		Bottom of borehole at 249.0 ft. Completed as well. Refer to diagram. Notes: 0 - 31: Hydro test #1 FHT 59 - 102: Hydro test #2 SI 109 - 249: Hydro test #3 SI														
255																
260																
265																
270																
275																
280																

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-26 (GT-13)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 10, 2017 17:00
DRILLING END: January 10, 2017 17:00
COORDINATES: N: 834,203 E: 924,372

SHEET: 1 of 7
GS ELEV.: 2383.8
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE: DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
0	0.0	(CL), CLAY, low plasticity, some fine to coarse subrounded to subangular gravel, dark red and dark brown, laminated; wet	2383.8														
	2.0	Gila Sandstone (Tss): medium to coarse-grained SANDSTONE with stiff clay lenses, thinly bedded, reddish to dark brown.	2381.8			1	100	35	60		>10 2 0 4		5				
5	5.0	As above.	2378.8														
	6.5	Becomes variably matrix supported CONGLOMERATE with subrounded-subangular clasts and thinly laminated SANDSTONE.	2377.3			2	100	56	68		3 5 2 3 4		5				
10	10.0		2373.8														
	10.7	Becomes reddish-brown Gila CONGLOMERATE, matrix supported, mostly gravel clasts.	2373.1			3	100	20	60	10.8 - 12: B x 8 spaced at 0.2 ft, UN, SM	2 6		5				
	12.0	Becomes thinly laminated, fine-grained, reddish brown SANDSTONE with alternating light and dark laminations.	2371.8			4	89	49	73	12.5 - 13.5: B x 5 spaced at 0.2 ft, UN, SM, Cl, SO 13.5 - 16.5: CON x 4, UN, SM, Cl, IN <5mm	2 3 2 3 4		4 - 3				
15		Becomes variably thinly bedded siltstone, coarse-grained sandstone, and matrix supported conglomerate.															
	16.5	As above.	2367.3			5	100	28	56	17 - 18.5: B x 11, UN, SM, Cl, IN <5mm 19.2 - 21.5: B x 9, UN, Cl, IN <5mm	6 4 3 4		5 - 3				
20																	
	21.5	As above.	2362.3			6	91	40	53	21.5 - 27: B x 16, UN, SM, Cl, IN >5mm	3 2 3 2 3 3		5				
25																	
	27.0	Continues interbedded CONGLOMERATE and thinly laminated medium- to coarse-grained SANDSTONE.	2356.8			7	100	58	74	27 - 32: B x 17, UN, SM, Cl, IN <5mm	5 2 2 5 4		5 - 3				
30																	
	32.0	As above.	2351.8			8	100	50	72	32 - 37: 90.0°, B x 14, UN, SM, Cl, partial iron staining, IN <5mm	3 8 3 3 2		5 - 3				
35																	
	37.0	As above, intervals of clay layers.	2346.8			8	72	18	50	37 - 40.6: 90.0°, B x 16, UN, SM, Cl, partial iron staining, CC <1mm	5 8 5		3				
40		Log continued on next page															

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-26 (GT-13)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 10, 2017 17:00
DRILLING END: January 10, 2017 17:00
COORDINATES: N: 834,203 E: 924,372

SHEET: 2 of 7
GS ELEV.: 2383.8
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE: DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0	As above, intervals of clay layers. *(continued)*	2343.8			8	72	18	50		3		3			
	42.0		2341.8								2					
		As above.				9	93	43	63	42 - 44.8: B x 10, UN, SM, Cl, partial iron staining, IN <5mm	4		3			
45											2					
											6					
	46.0		2337.8								>10		5			
		Becomes medium- to coarse-grained SANDSTONE, light brown-reddish brown, with interbedded clay lenses.				10	100	36	82	46 - 51: 90.0°, B x 26, UN, SM, Cl, IN <5mm	6		4			
											8					
50											5					
											7					
	51.0		2332.8								6					
	52.0	As above.	2331.8			11	100	0	90	51 - 52: 90.0°, B x 6, UN, SM, Cl, CC <1mm	6		3			
		As above, with interbeds of matrix supported conglomerate.				12	100	20	62	52.4: 51.0°, JN, CU, SM, Cl, CC <1mm 52.6: 61.0°, JN, ST, SK, Cl, PC 53.2: 32.0°, JN, UN, SK, Cl, partial iron staining, PC 54.2: 34.0°, JN, ST, SK, Cl, partial iron staining, PC 52 - 57: 90.0°, B x 20, UN, Cl, CC <1mm	4		3			
											6					
55											5					
											6					
	57.0		2326.8								>10					
		Continues interbedded thinly laminated, reddish-tan SANDSTONE and matrix supported CONGLOMERATE, predominantly gravel sized clasts, weak HCl reaction.				13	94	52	66	55.2: 66.0°, FOLO, UN, PO, CN, partial iron staining, SO 55.6: 38.0°, VNO, UN, ~.5-in. thick Ca vein 57 - 57.6: 29.0°, JN x 3 spaced at 0.05 ft, UN, SK, CN, partial iron staining, polished/slickensided surfaces 58.6 - 62: 90.0°, B x 19, UN, SM, Cl, partial iron staining, PC	3		3			
											3					
60											5					
											6					
	62.0		2321.8								6					
		As above.				14	100	16	66	62.5 - 62.8: 54.0°, JN x 9 spaced at 0.1 ft, UN, SK, G, partial iron staining, PC 63.6: 35.0°, JN, UN, SM, Cl, partial iron staining, CC <1mm 64.2: 26.0°, VN, UN, Ca, ~.25-in. thick Ca vein 64.5 - 67: 75.0°, B x 13, UN, PO, CN, partial iron staining, MnOx dendrites on surface, polished, smooth surfaces	>10		4			
											>6					
65											7					
											5					
											8					
	67.0		2316.8								3					
		As above.				15	100	64	88	67.5 - 71.5: 90.0°, B x 21, UN, SM, Cl, partial iron staining, CC <1mm	5		3			
70																
											6					
	72.0		2311.8								6					
		As above.				16	100	66	90	72 - 74.4: 90.0°, B x 15, UN, SM, Cl, IN <5mm	>10		3			
											>10					
75											2					
											0					
											1					
	77.0		2306.8								0					
		As above.				17	100	84	92	78 - 80: 90.0°, B x 11, UN, SM, Cl, partial iron staining, PC	6		3			
80											2					

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-26 (GT-13)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 10, 2017 17:00
DRILLING END: January 10, 2017 17:00
COORDINATES: N: 834,203 E: 924,372

SHEET: 3 of 7
GS ELEV.: 2383.8
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0	As above. *(continued)*	2303.8			17	100	84	92		3 0		3			
	82.0	As above.	2301.8			18	100	94	100	85.8: 90.0°, B, UN, RO, CN	0 0 0 1 0		1			
85	87.0	As above.	2296.8			19	100	63	90	87 - 91: 90.0°, B x 18, UN, SM, Cl, SA	0 0 0 0		3			
90	91.0	As above.	2292.8			20	100	16	80	91 - 96: 90.0°, B x 21, UN, Cl, IN >5mm, hard clay lenses	4 4 4 4 5		4			
95	96.0	As above.	2287.8			21	100	94	100		0 0 0 0 0		1			
100	101.0	As above.	2282.8			22	100	94	100	101 - 106: 90.0°, B x 9, UN, SM, CN, partial iron staining, SA, bedding in siltstone	2 2 1 3 1		2			
105	106.0	As above.	2277.8			23	100	62	100	106.5 - 106.9: 90.0°, B x 6 spaced at 0.06 ft, UN, VR, Cl, IN <5mm 107.2: 90.0°, B, UN, VR, CN 107.8 - 108.4: 90.0°, B x 5 spaced at 0.1 ft, PL, SM, Cl, CC <1mm 109.9 - 110.5: 90.0°, B x 5 spaced at 0.1 ft, UN, SM, Cl, polished, PC	6 3 3 1 4		3			
110	111.0	As above.	2272.8			24	100	80	86	111.7: 23.0°, JN, UN, SK, Cl, partial iron staining, PC 112.6: 90.0°, B, UN, VR, Cl, CC <1mm 115.4: 90.0°, B, UN, RO, Cl, partial iron staining, CC <1mm	1 1 0 4 1		3			
115	116.0	As above.	2267.8			25	100	72	100	117.2 - 121: 90.0°, B x 10, UN, RO, Cl, PC	0 1 5 1		2			
120		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-26 (GT-13)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 10, 2017 17:00
DRILLING END: January 10, 2017 17:00
COORDINATES: N: 834,203 E: 924,372

SHEET: 4 of 7
GS ELEV.: 2383.8
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
120	120.0		2263.8														
	121.0	As above. *(continued)*	2262.8			25	100	72	100		3		2				
	122.0	As above.	2261.8			26	100	100	100		0		3				
125		As above.				27	100	68	94	122.4 - 125.6: 90.0°, B x 15, UN, SM, Cl, partial iron staining, CC <1mm	6 4 2 3 0		3				
	127.0	As above.	2256.8			28	100	82	100	127.7 - 128.3: 73.0°, JN x 2 spaced at 0.6 ft, UN, SM, Cl, SA 129.9: 90.0°, JN, UN, SM, Cl, IN <5mm	1 1 2 3 1		2				
130		As above.															
	132.0	As above.	2251.8			29	100	72	96	132.6 - 132.8: 90.0°, B x 2 spaced at 0.1 ft, UN, SM, CN 133 - 133.6: 90.0°, B x 3 spaced at 0.2 ft, UN, VR, CN 134.5 - 136.5: 84.0°, B x 4 spaced at 0.5 ft, UN, SM, CN	2 3 1 2 1		2				
135																	
	137.0	Becomes volcaniclastic SANDSTONE, highly oxidized, reddish-brown to light brown, ash-rich, weak HCl reaction.	2246.8			30	100	100	100		0 0 0 0 0		1				
140																	
	142.0	As above.	2241.8			31	100	96	96		0 0 0 0 0		4				
145																	
	147.0	Becomes reddish-brown to black BASALT, calcite filled amygdales, auto-breccia, pervasive oxidation.	2236.8			32	100	80	100		0		3				
						33	100	83	90		0 0 0 >10		3				
150																	
	152.0	As above.	2231.8			34	100	100	100	153.2: 45.0°, JN, UN, VR, CN, full iron staining	0 1 0 0 0		3				
155																	
	157.0	As above.	2226.8			35	100	100	100	158.2: 71.0°, JN, UN, VR, Cl, full iron staining, SA 158.5: 60.0°, JN, UN, VR, CN, full iron staining, SA	1 1 0		2				
160																	

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-26 (GT-13)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 10, 2017 17:00
DRILLING END: January 10, 2017 17:00
COORDINATES: N: 834,203 E: 924,372

SHEET: 5 of 7
GS ELEV.: 2383.8
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
160	160.0		2223.8				20 40 60 80	20 40 60 80	20 40 60 80									
		As above. *(continued)*				35	100	100	100		0							
	162.0		2221.8								0		2					
		As above, FeOx staining decreases.									0							
										163.3: 48.0°, JN, ST, VR, CN, full iron staining, SA	1							
165						36	100	88	100	164.5: 48.0°, JN, UN, VR, CN, SA	1		2					
	165.4		2218.4								3							
	166.1	Continues heavily oxidized,	2217.7															
	167.0	auto-brecciated BASALT with calcite amygdales.	2216.8															
		As above.																
		As above.																
	169.0		2214.8								2							
		Becomes aphanitic dark gray BASALT, abundant thick calcite veins.				37	100	96	100	168.5 - 168.7: 60.0°, VN x 2 spaced at 0.2 ft, UN, Ca, IN <5mm	0		2					
170											0							
											0							
										172.6: 60.0°, JN, UN, VR, Ca, CC <1mm	2							
										173: 22.0°, JN, CU, SK, Ca, IN >5mm	3							
						38	100	72	94	173.4: 39.0°, JN, CU, SM, Ca, CC <1mm	0		3					
175										173.6: 22.0°, JN, PL, SM, Ca, CC <1mm	3							
										173.7: 41.0°, JN, UN, RO, Ca, CC <1mm	1							
	177.0		2206.8															
		As above.								174: 39.0°, FLT, PL, SK, Ca, IN <5mm, black stains, MnOx dendrite on surface	1							
										175: 38.0°, JN, CU, VR, Ca, CC <1mm	1							
						39	100	44	64	175.3: 23.0°, JN, UN, SM, Ca, IN <5mm	0		3					
180										176.7: 41.0°, JN, ST, VR, chlorite w/ yellow staining & green, IN <5mm	>10							
										177.7: 68.0°, VNO, UN, VR, dark yellow staining, no HCL rx, CC <1mm	>10							
	182.0		2201.8															
		As above.								178.1: 44.0°, JN, UN, VR, dark yellow staining, no HCL rx, IN <5mm	0							
										180.2: 50.0°, JN, UN, VR, Ca, CC <1mm	2							
						40	100	100	100	183.1: 51.0°, JN, CU, RO, Chl, IN <5mm	0		3					
185										184: 67.0°, JN, UN, RO, Chl, CC <1mm	1							
										185.1: 70.0°, JN, UN, RO, Chl, PC	0							
	187.0		2196.8															
		As above.								187.9: 20.0°, VNO, UN, RO, Chl, CC <1mm	1							
											0							
						41	100	94	100		0		3					
190										190.5: 61.0°, JN, ST, SM, Chl, IN <5mm	1							
										191.2: 37.0°, JN, UN, SM, Chl, IN <5mm	1							
	192.0		2191.8															
		As above.								192.1: 65.0°, JN, UN, RO, Chl, SA	1							
											0							
						42	100	92	92	194.8: 59.0°, JN, PL, SK, Chl, CC <1mm	1		2					
195											0							
										196.3: 65.0°, VNO, IR, VR, CN, SA	1							
	197.0		2186.8															
		As above.								197: 42.0°, JN, PL, SM, Chl, SA	2							
										197.3: 63.0°, JN, PL, SK, fiber like mineral, black & white, no HCL RX, CC <1mm	0							
						43	100	96	98		0		2					
200																		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-26 (GT-13)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 10, 2017 17:00
DRILLING END: January 10, 2017 17:00
COORDINATES: N: 834,203 E: 924,372

SHEET: 6 of 7
GS ELEV.: 2383.8
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
200	200.0	As above. *(continued)*	2183.8			43	100	96	98	200.3: 42.0°, VNO, PL, SM, Chl, IN >5mm	1		2			
	202.0	As above.	2181.8							202.1: 28.0°, JN, UN, SM, Chl, SA, black and green staining	0					
205						44	100	82	88	203.9: 67.0°, JN, ST, VR, white min. but no HCL rx, chlorite?, partial iron staining, SA	1		3			
	207.0	As above.	2176.8							205.3: 71.0°, JN, ST, VR, Chl, SA	1					
210						45	100	68	78	206.5: 54.0°, JN, UN, SK, Chl, SA	3		2			
	212.0	As above.	2171.8							206.6: 32.0°, JN, UN, SM, Chl, SA	0					
215						46	100	68	74	206.8: 55.0°, JN, UN, SM, Ca, SA	0		2			
	217.0	As above.	2166.8							208.5: 39.0°, VNO, UN, VR, Chl, IN <5mm	0					
220	220.0	As above.	2163.8			47	100	97	97	209.2: 64.0°, VNO, PL, SM, Chl, CC <1mm	0		2			
	222.0	As above.	2161.8			48	100	100	100	210.2: 40.0°, VNO, PL, SM, Chl, IN <5mm	0		2			
225						49	100	88	98	210.3 - 210.8: 21.0°, VNO, UN, SM, Chl, IN <5mm	0		2			
	227.0	As above.	2156.8							211: 34.0°, VNO, ST, VR, Chl, IN <5mm	1					
230						50	100	100	100	211.8: 74.0°, VNO, PL, SM, Chl, CC <1mm	3		2			
	232.0	As above.	2151.8							212.6: 61.0°, VNO, PL, RO, Chl, CC <1mm	1					
235						51	100	100	100	213.4: 49.0°, JN, IR, RO, Chl, CC <1mm	1		2			
	237.0	As above.	2146.8							213.45 - 213.8: 19.0°, VNO, PL, RO, Chl, IN <5mm	6					
240						52	100	100	100	213.9: 70.0°, JN, UN, SM, Chl, PC	1		2			
		Log continued on next page								214.9: 75.0°, JN, UN, RO, Chl, SA						
										215.6: JN, ST, VR, Chl, SA						
										216.3: 64.0°, VNO, PL, SM, Chl, IN <5mm	1					
										216.4: VNO, PL, SM, Chl, IN <5mm	0					
										217.1: 18.0°, VNO, ST, SM, Chl, CC <1mm	0					
										217.8: 46.0°, VNO, CU, SM, Chl, IN <5mm	1					
										219.5: 41.0°, VNO, PL, SM, Chl, IN <5mm	1					
										222.8: 70.0°, MECH, UN, VR, CN	0					
										223.7: 67.0°, VNO, PL, SM, Chl, CC <1mm	0					
										226: 78.0°, VNO, PL, SM, Chl, CC <1mm	3					
										226.5: 36.0°, JN, PL, SM, Chl, CC <1mm	0					
										226.8: 51.0°, JN, PL, SM, Chl, IN <5mm	0					
										229.5: 77.0°, JN, ST, RO, CN	1					
											0					
										232: 58.0°, VNO, PL, SM, Chl, CC <1mm	1					
											0					
											0					
											0					
											0					
											0					
											0					
											0					
											0					

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-26 (GT-13)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 10, 2017 17:00
DRILLING END: January 10, 2017 17:00
COORDINATES: N: 834,203 E: 924,372

SHEET: 7 of 7
GS ELEV.: 2383.8
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0		2143.8														
		As above. *(continued)*				52	100	100	100	240.3: 69.0°, VNO, UN, RO, Chl, IN <5mm	1 0		2				
	242.0		2141.8														
		As above.									0 1						
245						53	100	94	100	243.9: 66.0°, VNO, UN, RO, Chl, CC <1mm 245.5: 44.0°, VNO, ST, SM, Chl, PC	0 1		2				
	247.0		2136.8							246: 73.0°, VNO, UN, SM, Chl, CC <1mm	2						
		As above.								246.7: 59.0°, VNO, ST, VR, Chl, IN <5mm	0						
						54	100	100	100		0		2				
250	250.0		2133.8							249.6: 74.0°, VNO, UN, SM, Chl, CC <1mm	1						
		Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram. Notes: 0 - 12: Hydro test #1 FHT 16 - 67: Hydro test #2 SI 66 - 162: Hydro test #3 SI 162 - 250: Hydro test #4 SI															
255																	
260																	
265																	
270																	
275																	
280																	

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:32
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RECORD OF DRILLHOLE DH17-27 (GT-12)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 14, 2017 13:05
DRILLING END: January 14, 2017 13:05
COORDINATES: N: 832,977 E: 923,488

SHEET: 1 of 7
GS ELEV.: 2333.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE: DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
0	0.0	Dark brown gravelly clay, fragmented basalt with tuff, quartz, and other volcanic fragments.	2333.0		HQ3	1	20		0		>10		2				
5	5.0		2328.0														
	6.0	Rubble zone with basalt, tuff, quartz, and other volcanic fragments.	2327.0			2	100	0	0		>10		2				
	6.4	Fragmented pinkish-gray strongly welded tuff and some basalt.	2326.6			3	100	20	60	6.6: 16.0°, JN, PL, VR, Cl, partial iron staining, PC	>10		2				
	8.0	Light- to dark-gray aphanitic BASALT with small phenocrysts (1 to 0.5-mm) of hornblende, biotite, garnet, and olivine, pervasive FeOx staining.	2325.0							6.8: 77.0°, JN, UN, VR, Cl, CC <1mm	5						
	9.0		2324.0			4	30	0	0	7: 61.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm	>10		2				
10		As above, rubble.				5	100	36	52	7.4: 58.0°, JN, PL, SM, Cl, partial iron staining, PC	3		2				
	11.5	As above, at ~11 ft-bgs, yellowish-white staining begins to appear on fracture surfaces, no HCL reaction.	2321.5							7.6: 79.0°, JN, PL, SM, Cl, partial iron staining, PC	4						
	13.5	Continues light to dark gray aphanitic BASALT with small phenocrysts (1-mm) of hornblende, olivine, garnet, and biotite, fractures have less FeOx staining and are partially to fully-coated with talc.	2319.5			6	100	45	60	7.8 - 8: 78.0°, JN x 2 spaced at 0.2 ft, ST, RO, Cl, partial iron staining, SA	>10		2				
15										9.2: 77.0°, JN, UN, SM, Cl, full iron staining, SA	2						
	15.5	As above, abundant MnOx and talc on discontinuities, becomes more factured.	2317.5			7	100	0	30	9.4: 68.0°, JN, ST, RO, CN, full iron staining, SA	>10		2				
		As above.								9.75: 75.0°, JN, UN, RO, CN, full iron staining, SA	6						
	17.5		2315.5			8	100	0	40	10.4: 62.0°, JN x 2 spaced at 0.025 ft, UN, RO, CN, full iron staining, SA	4		2				
		As above.								10.7 - 11: 39.0°, JN, UN, SM, CN, partial iron staining, SA	3						
20	20.5		2312.5			9	100	30	47	11: 22.0°, JN, CU, SM, CN, partial iron staining, SA	2		2				
		As above, broken.								11.55: 23.0°, JN, UN, SM, Chl, partial iron staining, PC	5						
	22.0		2311.0							12.15: 81.0°, JN, UN, SM, CN, partial iron staining, SA	3						
	22.5	As above.	2310.5			10	100	0	13	12.8: 47.0°, JN, UN, SM, Chl, PC	>10		2				
		Continues aphanitic BASALT, dark gray with FeOx staining, small phenocrysts (<0.5-mm) of hornblende, garnet, FeOx staining and some chlorite coatings on fracture surfaces.				11	100	0	0	13.2: 29.0°, JN, PL, SK, white fiberous min. that feels like Talc, IN <5mm	>10		2				
										13.8: 43.0°, JN, ST, SM, CN, partial iron staining, SA	4						
25						12	100	43	50	14.1: 74.0°, JN, UN, SM, CN, partial iron staining, SA	2		2				
										14.6: 66.0°, JN, ST, SM, CN, partial iron staining, SA	6						
	26.5		2306.5							14.8 - 15: 16.0°, JN x 2 spaced at 0.2 ft, UN, SM, Chl, partial iron staining, CC <1mm	6						
	27.5	As above.	2305.5			13	100	40	60	14.9: 29.0°, JN, CU, SM, CN, partial iron staining, SA	3		2				
		As above, increase in FeOx staining.								14.95: 62.0°, JN, CU, SM, CN, partial iron staining, SA	5						
30						14	100	51	56	15.3: 63.0°, JN, UN, RO, Cl, partial iron staining, SA	1		2				
										15.4: 29.0°, JN, PL, SM, Chl, partial iron staining, PC	1						
	32.0		2301.0							15.7: 36.0°, JN, ST, RO, CN, partial iron staining, SA	>10						
		As above, rubble.								15.9: 68.0°, JN, UN, SM, CN, partial iron staining, SA	>10						
35						15	100	11	18	16: 28.0°, JN, UN, RO, Chl, partial iron staining, PC	3		2				
										16.5 - 16.8: 24.0°, VNO, UN, RO, Chl, partial iron staining, IN <5mm	3						
	36.5		2296.5							16.9: 72.0°, JN, UN, SM, CN, partial iron staining, SA	>10						
	37.0	As above.	2296.0			16	100	0	0	17.8: 34.0°, JN, PL, SM, CN, partial iron staining, SA	>10		2				
		As above, joints have thick (>5-mm) infill, white, soft, no HCL reaction, possibly chlorite or talc.								17.85: 70.0°, JN, PL, SM, CN, partial iron staining, SA	1						
	39.0		2294.0			17	100	35	45	18: 76.0°, JN, PL, SM, Chl, partial iron staining, SA	>10		1				
40		As above.								18.5: 34.0°, JN, CU, SM, CN, partial iron staining, SA	3						
						18	100	20	44	18.55: 65.0°, JN, ST, SM,			1				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-27 (GT-12)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 14, 2017 13:05
DRILLING END: January 14, 2017 13:05
COORDINATES: N: 832,977 E: 923,488

SHEET: 2 of 7
GS ELEV.: 2333.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC LC	ADVANCEMENT RATE ft/min
40	40.0	As above. *(continued)*	2293.0		HQ3	18	100	20	44	Chl, partial iron staining, PC 18.6: 43.0°, JN, PL, SM, Chl, IN <5mm	3		1				
	41.5	As above.	2291.5			19	100	27	33	18.8: 40.0°, JN, ST, RO, CN, partial iron staining, SA 19.1: 51.0°, JN, CU, SM, CN, partial iron staining, SA	2 4		1				
	43.0	As above, rubble.	2290.0			20	100	40	40	19.6: 55.0°, JN, UN, SM, CN, partial iron staining, SA	2		1				
45	44.0	As above.	2289.0			21	100	27	53	19.9: 41.0°, JN, PL, SM, CN, partial iron staining, SA 20 - 20.1: 54.0°, JN x 2 spaced at 0.05 ft, CU, SM, Chl, partial iron staining, CC <1mm	2 3		1				
	45.5	As above, rubble and gouge.	2287.5			22	100	0	15	22.3: 73.0°, JN, ST, RO, CN, partial iron staining, SA	>10		1				
	47.5	Continues aphanitic BASALT, dark gray, weak FeOx staining, small phenocrysts (<~0.5-mm) of hornblende, garnet, and biotite, some FeOx stained fractures, some fractures completely coated with chlorite/talc.	2285.5			23	100	49	76	22.8: 43.0°, JN, ST, RO, CN, partial iron staining, SA 23: 62.0°, JN, UN, SM, CN, partial iron staining, SA 23.6: 66.0°, JN, UN, SM, CN, partial iron staining, SA 23.7: 28.0°, JN, ST, RO, Chl, partial iron staining, PC 23.8: 81.0°, JN, UN, SM, CN, partial iron staining, SA	>10 3 5 1 1		1				
50	52.0	As above, calcite on fracture surfaces and open veins.	2281.0			24	100	86	86	24.2: 80.0°, JN, ST, RO, CN, partial iron staining, SA 24.9: 60.0°, JN, PL, SM, CN, partial iron staining, SA 25: 22.0°, JN, PL, SM, CN, partial iron staining, SA 25.1: 45.0°, JN, PL, SM, CN, partial iron staining, SA 25.4: 37.0°, JN, PL, SM, CN, partial iron staining, SA 25.5: 80.0°, JN, PL, SM, Chl, partial iron staining, IN <5mm	>10 1 1 0 2 0		1				
55	57.0	As above, increased calcite veining.	2276.0			25	100	96	96	25.8: 58.0°, JN, ST, SM, CN, partial iron staining, SA 25.9 - 26.1: 16.0°, JN x 2 spaced at 0.1 ft, UN, SM, CN, partial iron staining, SA 26: 57.0°, JN, ST, RO, CN, partial iron staining, SA 26.3: 29.0°, JN, UN, SM, CN, partial iron staining, SA	1 1 0 0		1				
60	62.0	As above.	2271.0			26	100	87	89	26.55: 36.0°, JN, PL, SM, Chl, partial iron staining, PC 26.7: 39.0°, JN, UN, RO, CN, partial iron staining, SA 27: 47.0°, JN, CU, SM, CN, partial iron staining, SA 27.2: 80.0°, JN, UN, SM, CN, partial iron staining, SA 27.3: 18.0°, JN, ST, SM, Chl, PC	1 1 2 0 1		1				
65	66.5	As above.	2266.5			27	100	80	98	27.7: 28.0°, JN, UN, RO, CN, partial iron staining, SA 27.8: 67.0°, JN, CU, RO, CN, partial iron staining, SA 27.85: 50.0°, JN, UN, SM, Chl, partial iron staining, PC 27.9: 44.0°, JN, PL, SM, Chl, partial iron staining, PC 28.2: 22.0°, JN, UN, SM, Chl, partial iron staining, SA 28.3: 43.0°, JN, PL, SM, Chl, partial iron staining, IN <5mm	1 1 2 2 2 3		1				
70	71.5	As above.	2261.5			28	100	56	66	28.7: 64.0°, JN, UN, SM, CN, partial iron staining, SA 28.8: 50.0°, JN, CU, SM, Chl, partial iron staining, PC 29.5: 60.0°, JN, CU, SM, Chl, partial iron staining, CC <1mm 30.8: 47.0°, JN, CU, SM, CN, partial iron staining, SA	1 0 0 2 0		1				
75	76.5	As above.	2256.5			29	100	62	69	31.1 - 31.4: 57.0°, JN x 2 spaced at 0.15 ft, UN, SM, CN, partial iron staining, SA 31.6: 20.0°, JN, UN, SM, Chl, partial iron staining, CC <1mm 32.7: 38.0°, JN, CU, RO, CN, SO	4 0 0		1				
80		Log continued on next page															

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-27 (GT-12)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 14, 2017 13:05
DRILLING END: January 14, 2017 13:05
COORDINATES: N: 832,977 E: 923,488

SHEET: 3 of 7
GS ELEV.: 2333.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact | VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical | PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular | PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough | Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge | Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide | MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0		2253.0		HQ3											
		As above. *(continued)*				29	100	62	69	32.8: 24.0°, JN, UN, SM, Chl, PC 32.9: 36.0°, JN, UN, SM, Chl, PC 33.3: 42.0°, JN, ST, RO, CN, partial iron staining, SA 33.8: 32.0°, JN, CU, SM, Chl, partial iron staining, SA 34.4 - 34.8: 73.0°, JN x 2 spaced at 0.4 ft, UN, RO, CN, partial iron staining, SA 35: 59.0°, JN, PL, SM, Chl, partial iron staining, IN <5mm 35.1: JN, CU, SM, Ca, partial iron staining, PC 35.9 - 36: 60.0°, JN x 2, ST, SM, Chl, partial iron staining, PC 37.05: 42.0°, JN, ST, SM, CN, partial iron staining, SA 38: 27.0°, JN, PL, RO, CN, SO 38.1: 41.0°, JN, ST, RO, CN, SO 38.2 - 38.8: 27.0°, JN x 3 spaced at 0.2 ft, UN, SM, Chl, partial iron staining, IN <5mm 38.9: 79.0°, JN, PL, SM, Chl, partial iron staining, IN >5mm 39.5: 47.0°, JN, CU, SM, CN, SA 39.6: 58.0°, JN, UN, RO, CN, SA 39.8: 59.0°, JN, UN, RO, CN, partial iron staining, SA 40.3: 35.0°, JN, ST, RO, CN, partial iron staining, SA 40.5: 33.0°, JN, UN, SM, Chl, partial iron staining, SA 40.8: 32.0°, JN, UN, SM, CN, partial iron staining, SA 41.8: 66.0°, JN, PL, SM, Chl, partial iron staining, PC 41.85: 25.0°, JN, ST, RO, CN, SO 42.1: 25.0°, JN, PL, RO, CN, SO 42.2 - 42.3: 67.0°, JN x 2 spaced at 0.1 ft, UN, RO, CN, SA 42.8: 45.0°, JN, UN, SM, Chl, partial iron staining, PC 43: 47.0°, JN, UN, RO, CN, partial iron staining, SA 43.4: 52.0°, JN, PL, SM, Chl, partial iron staining, PC 45.1: 64.0°, JN, PL, SK, Chl, partial iron staining, CC <1mm 45.5: 55.0°, JN, UN, RO, CN, partial iron staining, SA 45.55: 35.0°, JN, UN, SM, Chl, partial iron staining, CC <1mm 47.9 - 48.1: 72.0°, JN x 2, UN, SM, Chl, partial iron staining, CC <1mm 48.35: 57.0°, JN, ST, RO, CN, partial iron staining, SA 48.5: 65.0°, JN, ST, RO, CN, partial iron staining, SA 49.1 - 49.3: 74.0°, JN x 2 spaced at 0.2 ft, UN, SM, Chl, partial iron staining, PC 49.4: 48.0°, JN, ST, SM, Chl, partial iron staining, PC 49.5: 68.0°, JN, PL, SM, Chl, partial iron staining, SA 49.8: 74.0°, JN, UN, SM, Chl, partial iron staining, CC <1mm 50.6: 46.0°, JN, UN, RO, CN, SO 51.5: 62.0°, JN, ST, SM, Chl, SO 52.3: 22.0°, VNO, PL, SK,	0 0 1 1 1 1 0 1 3 0 2 1 0 2 2 0 0 1 0 1 4 3 7 1 1 1 1 0 0 1 1 2 1 0 1 1 0 1				
85	82.0	As above.	2251.0			30	100	76	80				1			
90	87.0	As above.	2246.0			31	100	64	68				1			
95	92.0	As above.	2241.0			32	100	56	84				1			
100	94.5	As above.	2238.5			33	100	100	100				1			
105	99.5	As above.	2233.5			34	100	76	76				1			
110	102.0	As above, mostly rubble.	2231.0			35	100	0	70				1			
115	103.0	Continues aphanitic BASALT, dark gray to black, weak FeOx staining, small phenocrysts (<~1.0-mm) of hornblende, garnet, and biotite, some FeOx/MnOx stained fractures, some fractures completely coated with chlorite/talc.	2230.0			36	100	100	100				1			
120	108.0	As above.	2225.0			37	100	100	100				1			
	112.0	As above.	2221.0			38	100	100	100				1			
	117.0	As above.	2216.0			39	100	100	100				1			
		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-27 (GT-12)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 14, 2017 13:05
DRILLING END: January 14, 2017 13:05
COORDINATES: N: 832,977 E: 923,488

SHEET: 4 of 7
GS ELEV.: 2333.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
120	120.0	As above. *(continued)*	2213.0		HQ3	39	100	100	100	Chl, CC <1mm 52.9: 69.0°, JN, UN, SM, Chl, partial iron staining, CC <1mm 53.3: 61.0°, VNO, UN, RO, Qtz, PC 54.9: FOLO, UN, RO, Qtz, SA	1 1 2 1		1			
125	122.0	As above.	2211.0			40	100	68	72	56: 65.0°, JN, UN, SM, Ca, CC <1mm 56.6: 69.0°, JN, CU, SM, Ca, partial iron staining, IN <5mm 58.4: 68.0°, JN, UN, SM, Ca, partial iron staining, IN <5mm	1 0 >10		1			
130	127.0	As above.	2206.0			41	100	100	100	59.9: 48.0°, JN, ST, SM, Ca, partial iron staining, PC 62.5: 68.0°, JN, ST, RO, CN, SA 63.3: 60.0°, JN, PL, SM, Ca, partial iron staining, IN <5mm 64.1: 44.0°, JN, PL, SM, Ca, partial iron staining, IN <5mm	1 0 1 0 0		1			
135	132.0	Becomes highly oxidized amygdaloidal BASALT, calcite amygdales and veins, completely oxidized phenocrysts, open veins have yellow-colored staining, bright rust to purple-blackish color.	2201.0			42	100	100	100	64.7: 55.0°, JN, ST, VR, Ca, partial iron staining, PC 66.2: 68.0°, JN, ST, RO, CN, partial iron staining, SA 67.8: 73.0°, JN, ST, SM, Ca, partial iron staining, PC 68.6: 76.0°, JN, UN, SM, Ca, partial iron staining, CC <1mm 68.9: 74.0°, JN, ST, RO, Ca, partial iron staining, PC	0 0 1 1 0		3			
140	136.5	As above.	2196.5			43	100	96	100	69.1: 76.0°, VNO, PL, SM, Ca, CC <1mm 69.4: 80.0°, JN, ST, SK, Ca, partial iron staining, IN <5mm 70: 69.0°, JN, UN, RO, Ca, partial iron staining, CC <1mm 70.5: 62.0°, JN, UN, RO, CN, partial iron staining, SA	1 1 2 1		3			
145	141.5	As above, decreasing FeOx staining.	2191.5			44	100	100	100	71.3: 75.0°, JN, CU, RO, CN, partial iron staining, SO 71.5: 62.0°, JN, PL, SM, Ca, partial iron staining, PC 71.8 - 72.2: 22.0°, JN, UN, SM, Ca, IN <5mm 72.3: 39.0°, JN x 2, UN, RO, Ca, partial iron staining, CC <1mm 75: 72.0°, JN, ST, SM, Ca, CC <1mm	1 1 0 1 1		3			
150	146.5	As above, increase in FeOx staining.	2186.5			45	100	100	100	75.9: 69.0°, JN, UN, SM, Ca, partial iron staining, CC <1mm 77.1: 34.0°, JN, PL, SM, Chl, CC <1mm 77.8 - 78.4: 69.0°, JN x 3 spaced at 0.2 ft, UN, SM, Chl, partial iron staining, CC <1mm 82.8: 53.0°, JN, UN, SM, Chl, CC <1mm	1 0 0 1 1		3			
155	151.5	As above.	2181.5			46	100	100	100	83.1 - 83.4: 24.0°, JN, UN, SM, Chl, partial iron staining, IN <5mm 84.1: 19.0°, JN, UN, SM, Chl, partial iron staining, CC <1mm 85.7: 41.0°, JN, PL, SM, Chl, partial iron staining, CC <1mm 87.7: 51.0°, JN, ST, SM, Chl, partial iron staining, CC <1mm	0 1 0 0		3			
160	156.5	As above, fractured surfaces completely covered in calcite and zeolite crystals.	2176.5			47	100	76	76	88.6 - 88.8: 64.0°, JN x 2 spaced at 0.2 ft, UN, SM, Chl, partial iron staining, CC <1mm 88.5 - 89.1: 18.0°, VNO, CU, SM, Chl, IN >5mm 90: 45.0°, JN, CU, SM, Chl, CC <1mm	0 0 0 0 1		3			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-27 (GT-12)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 14, 2017 13:05
DRILLING END: January 14, 2017 13:05
COORDINATES: N: 832,977 E: 923,488

SHEET: 5 of 7
GS ELEV.: 2333.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
160	160.0	As above, fractured surfaces completely covered in calcite and zeolite crystals. *(continued)*	2173.0		HQ3	47	100	76	76	90.7 - 92: 29.0°, JN x 3, CU, SK, Chl, partial iron staining, IN >5mm 93.5: 54.0°, JN, UN, RO, CN, full iron staining, SA	1 0		3			
	162.0	As above.	2171.0			48	100	100	100	93.9 - 94.2: 76.0°, JN x 2, UN, SM, Chl, partial iron staining, CC <1mm 97.3: 65.0°, JN, ST, RO, CN, SO 99.1: 81.0°, JN, UN, SM, Ca, full iron staining, PC 99.5: 40.0°, JN, PL, SM, Ca, CC <1mm 100.4: 65.0°, FLT, IR, VR, Chl, IN <5mm	0 0 1 0 0		3			
165	167.0	As above.	2166.0			49	100	88	94	101.1 - 101.5: 85.0°, JN, PL, RO, CN 101.3: 10.0°, FLT, PL, SK, Chl, IN <5mm 102 - 103: 80.0°, x 4 spaced at 0.3 ft, IR, RO, CN 103.4: 65.0°, JN, PL, SM, Ca, CC <1mm 104.7: 40.0°, JN, PL, SM, Ca, partial iron staining, CC <1mm	0 1 0 1 0		3			
170	172.0	As above.	2161.0			50	100	100	100	105.3: 50.0°, JN, PL, RO, Ca, IN <5mm 106.6 - 107.6: 75.0°, JN, IR, RO, CN 110.5 - 111.2: 45.0°, x 2 spaced at 0.7 ft, PL, RO, CN 112.4: 70.0°, JN, PL, RO, Ca, CC <1mm 112.7: 70.0°, JN, PL, CN	0 0 0 0 0		3			
175	177.0	As above.	2156.0			51	100	100	100	113.8: 40.0°, JN, PL, RO, Ca, IN <5mm 115.3: 85.0°, JN, PL, SM, Ca 116.1: 75.0°, JN, CU, SM, Ca, CC <1mm 118: 65.0°, JN, PL, SM, CN 119.7: 70.0°, JN, PL, RO, CN 120.1: 60.0°, JN, PL, RO, CN	0 0 0 0 0		3			
180	182.0	As above.	2151.0			52	100	100	100	120.9: 80.0°, JN, PL, RO, Ca, CC <1mm 121.7: 80.0°, JN, PL, Ca, CC <1mm 122.8: 65.0°, JN, UN, SM, Ca, partial iron staining, SA 122.9: 75.0°, JN, UN, SM, Chl, partial iron staining, CC <1mm 123 - 124: 25.0°, VNO, UN, SM, Chl, partial iron staining, IN <5mm	0 0 0 0 0		3			
185	185.6	Becomes completely oxidized BASALT, few amygdales, red brown.	2147.4			53	100	100	100	124.6: 67.0°, JN, UN, RO, Chl, partial iron staining, PC 127.4 - 129.3: 55.0°, JN x 2 spaced at 1.9 ft, UN, RO, CN, partial iron staining, SA 134: 45.0°, VNO, UN, SM, Ca, full iron staining, CC <1mm 135.1: 60.0°, JN, ST, RO, Ca, full iron staining, PC	0 0 0 0 0		3			
190	192.0	Becomes Apache Leap tuff (Talg): moderately welded, oxidized TUFF, light brown to pinkish-red, phenocrysts of biotite and quartz.	2141.0			54	100	100	100	137.3: 47.0°, JN, ST, RO, Ca, full iron staining, PC 138.9 - 141.2: 60.0°, JN x 4, UN, RO, Ca, full iron staining, PC 142.5: 30.0°, JN, PL, SM, Ca, partial iron staining, CC <1mm 144.3 - 145.1: 50.0°, JN x 2 spaced at 0.8 ft, UN, VR, Ca, partial iron staining, PC	0 0 0 2 0		2			
195	197.0	As above.	2136.0			55	100	100	100	145.9: 75.0°, JN, ST, VR, Ca, full iron staining, PC 149.3 - 150.5: 50.0°, JN x 2 spaced at 1.2 ft, ST, VR, Ca, partial iron staining, PC 152.8: 75.0°, JN, UN, RO, Ca, partial iron staining, SA	0 0 0		2			
200		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF DRILLHOLE DH17-27 (GT-12)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 14, 2017 13:05
DRILLING END: January 14, 2017 13:05
COORDINATES: N: 832,977 E: 923,488

SHEET: 6 of 7
GS ELEV.: 2333.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
200	200.0		2133.0		HQ3												
		As above. *(continued)*				55	100	100	100	159.3 - 160.3: 30.0°, VNO x 2 spaced at 1 ft, UN, VR, white hairy mineral with calcite, full iron staining, IN >5mm	0 0		2				
	202.0		2131.0														
		As above.				56	100	100	100	164.4: 80.0°, VNO, IR, VR, zeolite & calcite, full iron staining, IN <5mm 168.5: 40.0°, JN, ST, VR, zeolite & calcite 170.1 - 170.6: 30.0°, VNO, IR, VR, zeolite & calcite, full iron staining, IN >5mm 195.2: 55.0°, JN, UN, RO, CN, full iron staining, SO 195.5: 28.0°, JN, PL, RO, CN, full iron staining, SO	0 0 0 0 0		2				
205	207.0		2126.0														
		As above.				57	100	100	100		0 0 0 0 0		2				
210	212.0		2121.0														
		As above, increased weathering, weaker.				58	100	100	100		0 0 0 0 0		3				
215	217.0		2116.0														
		As above.				59	100	100	100		0 0 0 0 0		2				
220	222.0		2111.0														
		As above.				60	100	100	100		0 0 0 0 0		2				
225	227.0		2106.0														
		As above.				61	100	100	100		0 0 0 0 0		2				
230	232.0		2101.0														
		Becomes poorly welded TUFF, light brown to dark brown with high FeOx staining, clay alteration, weak.				62	100	96	96	235: 65.0°, JN, PL, VR, CN, full iron staining, SO	0 0 0 1 0		3				
235	237.0		2096.0														
		As above, phenocrysts larger than previous runs.				63	100	100	100		0 0 0		2				
240																	

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DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
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RECORD OF DRILLHOLE DH17-27 (GT-12)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 14, 2017 13:05
DRILLING END: January 14, 2017 13:05
COORDINATES: N: 832,977 E: 923,488

SHEET: 7 of 7
GS ELEV.: 2333.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index: ● AX. □ DIAM. ▲ UCS (ksi) R1 0.725, R2, R3 3.62, R4 7.25, R5 14.5, R6 36.2	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0	As above, phenocrysts larger than previous runs. *(continued)*	2093.0		HQ3	63	100	100	100		0		2				
	242.0		2091.0								0						
		Becomes highly weathered, heavily FeOx, non-welded TUFF, crystal rich, clay altered and weak.									0						
											0						
245						64	100	92	92		0		4				
	245.9		2087.1							245.9: 73.0°, CONO, IR, VR, Cl, full iron staining, CC <1mm	1						
	247.0	Massive, Contact with Pinal Schist at 246 ft-bgs. Schistose clasts in medium- to coarse-grained sandy clay, clast supported, clast size <~2.5-in., matrix has moderate HCL reaction.	2086.0								0						
										247.2: 51.0°, JN, ST, SM, Cl, partial iron staining, PC 247.4: 76.0°, JN, ST, SM, Cl, partial iron staining, PC 247.9: 39.0°, JN, PL, SM, Cl, partial iron staining, PC 248.5: 64.0°, JN, ST, RO, Cl, partial iron staining, PC 249: 82.0°, JN, ST, VR, Cl, partial iron staining, PC	3						
						65	100	70	77		2		4				
250	250.0	As above.	2083.0								1						
		Refusal at 5.0 ft. Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram. Notes: 33 - 62: Hydro test #1 SI & CRI 63 - 132: Hydro test #2 SI 132 - 192: Some circulation loss was noticed from 132 to 192 ft-bgs. 133 - 250: Hydro test #3 SI & CRI 193 - 250: Hydro test # SI																
255																	
260																	
265																	
270																	
275																	
280																	

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-28 (GT-23)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 17, 2017 07:13
DRILLING END: January 17, 2017 07:13
COORDINATES: N: 835,599 E: 929,090

SHEET: 1 of 7
GS ELEV.: 2516.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
0	0.0	Colluvium and weathered conglomerate.	2516.0													
	3.0		2513.0													
5	3.0	Gila Conglomerate (Tcg): completely weathered, matrix washed out, clasts consist of schist, quartz, and tuff, rubble zone.	2513.0			1	33	0	0		>10 >10 >10		5			
	6.0	As above.	2510.0			2	25	0	0		>10 >10 >10		5			
10	8.0	As above.	2508.0			3	33	0	0		>10 >10 >10		5			
	11.0	Gila Conglomerate (Tcg), brown, clast dominant, subangular to subrounded, fine sandy matrix, clasts of gneiss, schist, quartz, and tuff, weak HCl reaction, competent.	2505.0			4	68	0	0		>10 >10 >10		5			
15	13.5	As above.	2502.5			5	25	0	0		>10 >10 >10		5			
	15.5		2500.5													
	16.0	As above.	2500.0			6	100	0	0		>10					
20	16.0	As above. Drillers notice some circulation loss.	2500.0		HQ3	7	100	86	100	17.5: 80.0°, JN, PL, VR, CN 18.6: 70.0°, JN, IR, VR, CN 20.4: 80.0°, JN, IR, VR, CN	6 1 1 0 2		2			
	21.0	As above, moderately fractured.	2495.0			8	43	10	33	22.1 - 24: 75.0°, JN x 8 spaced at 0.2 ft, IR, VR, CN	0 4 4		2			
25	24.0	As above.	2492.0			9	100	90	100	24.4 - 28.6: 75.0°, JN x 6 spaced at 0.5 ft, IR, RO, CN	1 4 0 0 1		2			
30	29.0	As above, rubble.	2487.0			10	100	57	57	29.1 - 29.5: 80.0°, JN x 2, PL, VR, CN 30: 45.0°, JN, PL, RO, CN 30.2: 65.0°, JN, PL, RO, CN 31.2: 75.0°, JN, PL, RO, CN	3 2 8		2			
	32.0	As above, rubble.	2484.0			11	90	0	25		>10 >10		2			
35	34.0	As above.	2482.0			12	100	100	100	35.6 - 38.7: 75.0°, x 4 spaced at 1 ft, IR, RO, CN	1 0 0 0 1		2			
	39.0	As above. Drillers noticed some circulation loss from 16 to 39 ft-bgs.	2477.0			13	100	100	100		0		1			
40		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-28 (GT-23)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 17, 2017 07:13
DRILLING END: January 17, 2017 07:13
COORDINATES: N: 835,599 E: 929,090

SHEET: 2 of 7
GS ELEV.: 2516.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 / R2 / R3 3.62 / R4 1.45 / R5 / R6 36.2	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
40	40.0	As above. Drillers noticed some circulation loss from 16 to 39 ft-bgs. *(continued)*	2476.0		HQ3	13	100	100	100		0		1				
	44.0		2472.0							43.5: 65.0°, JN, IR, VR, CN	0						
											0						
											0						
											1						
45		As above.				14	100	100	100		0		1				
										46.1: 75.0°, JN, IR, VR, CN	1						
											1						
										47.9: 80.0°, JN, IR, VR, CN	1						
	49.0		2467.0								0						
50		As above.				15	100	100	100		0		1				
										51: 75.0°, JN, PL, VR, CN	1						
											0						
											0						
	54.0		2462.0								0						
55		As above.				16	100	86	90	54.5: 65.0°, JN, PL, RO, CN	1		1				
										55.8: 40.0°, JN, PL, RO, CN	1						
										56.6: 65.0°, JN, PL, RO, CN	1						
										57.6: 85.0°, JN, PL, RO, CN	1						
	59.0		2457.0							58.6: 60.0°, JN, PL, RO, CN	1						
60		As above.				17	100	100	100	59.4: 70.0°, JN, PL, SM, CN	1		1				
											0						
											0						
											0						
	64.0		2452.0								0						
65		As above.				18	100	100	100		0		1				
											0						
											0						
										67.8: 85.0°, JN, PL, VR, CN	1						
	69.0		2447.0								0						
70		As above.				19	100	100	100	69.9: 75.0°, JN, IR, RO, CN	1		1				
											0						
										71.8: 85.0°, JN, IR, VR, CN	1						
											0						
	74.0		2442.0								0						
75		As above.				20	100	96	100	74.3: 70.0°, JN, IR, RO, CN	1		1				
										75.6: 60.0°, JN, CU, RO, CN	1						
											0						
											0						
	79.0		2437.0							78.5: 65.0°, JN, PL, VR, CN	1						
80		As above, few cobbles.				21	100	100	100		0		1				
		Log continued on next page															

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-28 (GT-23)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 17, 2017 07:13
DRILLING END: January 17, 2017 07:13
COORDINATES: N: 835,599 E: 929,090

SHEET: 3 of 7
GS ELEV.: 2516.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2, R3 3.62, R4 1.45, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0	As above, few cobbles. *(continued)*	2436.0		HQ3	21	100	100	100		0 0 0 0 0		1			
	84.0		2432.0													
85		As above.				22	100	100	100	85.8: 75.0°, JN, IR, VR, CN 86.9: 85.0°, JN, PL, RO, CN 87.9: 90.0°, JN, PL, SM, CN	1 1 1 1 0		1			
	89.0		2427.0													
90		As above.				23	100	100	100	91.6: 80.0°, JN, PL, SM, CN	0 0 1 0 0		1			
	94.0		2422.0													
95		As above.				24	100	86	86	95.4: 85.0°, JN, IR, RO, CN 97.8 - 98.3: 65.0°, FLT, IR, VR, Bx, IN >5mm	0 1 0 2 3		1			
	99.0		2417.0													
100		As above.				25	100	100	100	99.7: 75.0°, JN, IR, RO, CN 103.5: 80.0°, JN, IR, VR, CN	1 0 0 0 1		1			
	104.0		2412.0													
105		As above.				26	100	94	94	106: 80.0°, JN, IR, VR, CN 106.3: 75.0°, JN, IR, VR, CN	0 0 2 0 0		1			
	109.0		2407.0													
110		Continues Gila Conglomerate (Tcg), brown, clast dominant, gravel with few cobbles, fine sandy matrix, clasts of schist, quartz, tuff, and diabase, weak HCl reaction, competent.				27	100	96	100	111.2: 75.0°, JN, IR, RO, CN 111.7: 70.0°, JN, PL, RO, CN 113.1: 65.0°, JN, IR, VR, CN	0 0 2 0 1		1			
	114.0		2402.0													
115		As above.				28	100	100	100	116.6: 60.0°, JN, IR, VR, CN	0 0 1 0 0		1			
	119.0		2397.0													
120		As above.				29	100	100	100	119.5: 80.0°, JN, IR, RO,	1		1			
		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-28 (GT-23)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 17, 2017 07:13
DRILLING END: January 17, 2017 07:13
COORDINATES: N: 835,599 E: 929,090

SHEET: 4 of 7
GS ELEV.: 2516.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
120	120.0	As above. *(continued)*	2396.0		HQ3					CN	0						
						29	100	100	100	121.7: 85.0°, JN, PL, RO, CN	1		1				
	124.0		2392.0								0						
125		As above.									1						
						30	100	94	94	125: 80.0°, FLT, PL, RO, Bx, IN >5mm	0		1				
	129.0		2387.0								0						
130		As above, one boulder.									1						
						31	100	90	94	129.8: 65.0°, JN, IR, RO, CN	0		1				
	134.0		2382.0							131.6: 75.0°, FLT, IR, VR, Bx, IN <5mm	1						
135		As above.									0						
						32	100	100	100		0		1				
	139.0		2377.0								0						
140		As above.									0						
						33	100	100	100		0		1				
	144.0		2372.0							142.6 - 143: 65.0°, FLT, IR, RO, Bx, IN >5mm	0						
145		As above.									0						
						35	100	96	96	145.1: 85.0°, JN, PL, SM, CN 145 - 145.3: 80.0°, JN, PL, RO, CN	2		1				
	149.0		2367.0								0						
150		As above.									0						
						36	100	96	96	150.3: 65.0°, JN, IR, RO, CN 151.3: 85.0°, JN, PL, RO, CN	1		1				
	154.0		2362.0								0						
155		As above.									0						
						37	100	100	100		0		1				
	159.0		2357.0							158: 55.0°, JN, PL, RO, Ca, CC <1mm 158.6: 85.0°, JN, PL, RO, CN	2						
160		As above.				38	100	100	100		0		1				
		Log continued on next page															

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-28 (GT-23)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 17, 2017 07:13
DRILLING END: January 17, 2017 07:13
COORDINATES: N: 835,599 E: 929,090

SHEET: 5 of 7
GS ELEV.: 2516.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2, R3 3.62, R4 1.45, R5, R6 36.2	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
160	160.0	As above. *(continued)*	2356.0		HQ3	38	100	100	100	160.2: 90.0°, JN, PL, RO, CN 161.3: 80.0°, JN, PL, RO, CN	1 1 0 0		1			
	164.0		2352.0													
165		As above.				39	100	100	100	165.5: 80.0°, JN, IR, VR, CN	0 1 0 0 0		1			
	169.0		2347.0													
170		As above.				40	100	100	100		0 0 0 0 0		1			
	174.0		2342.0													
175		As above.				41	100	100	100	175.8: 80.0°, JN, PL, RO, CN	0 1 0 0 0		1			
	179.0		2337.0													
180		As above.				42	100	100	100		0 0 0 0 0 0		1			
	184.0		2332.0													
185		As above.				43	100	100	100	187.4: 75.0°, JN, PL, RO, CN	0 0 0 1 0		1			
	189.0		2327.0													
190		As above.				44	100	100	100		0 0 0		1			
	191.5		2324.5													
		As above.				45	80	80	80		0 0		1			
	194.0		2322.0													
195		As above.				46	100	100	100		0 0 0 0 0		1			
	199.0		2317.0													
200		As above.				47	100	100	100		0		1			
		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-28 (GT-23)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 17, 2017 07:13
DRILLING END: January 17, 2017 07:13
COORDINATES: N: 835,599 E: 929,090

SHEET: 6 of 7
GS ELEV.: 2516.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
200	200.0		2316.0														
		As above. *(continued)*				47	100	100	100		0						
											0						
											0		1				
	204.0		2312.0								0						
205		As above.				48	100	100	100		0						
											0						
											0		2				
	208.0		2308.0								0						
		Continues Gila Conglomerate (Tcg), brown, clast dominant, gravel, fine-grained sandy matrix, clasts of schist, quartz, tuff, diabase, and basalt, weak HCl reaction, competent.				49	100	100	100		0						
210											0						
											0		1				
	213.0		2303.0								0						
		As above.				50	100	100	100		0						
215											0						
											0		1				
	218.0		2298.0								4						
		As above.				51	100	100	100	218.9: 85.0°, JN, IR, RO, CN 219.5: 90.0°, JN, PL, SM, CN	0						
220											1						
											1		1				
	223.0		2293.0								0						
		As above.				52	100	100	100		0						
225											0						
											0		1				
	228.0		2288.0								0						
		As above.				53	100	100	100	229.4: 60.0°, JN, IR, RO, CN	0						
230											1						
											0		1				
	233.0		2283.0								0						
		As above, few cobbles.				54	100	100	100		0						
235											0						
											0		1				
	238.0		2278.0								0						
		As above, few cobbles.				55	100	92	92		0						
240											0		1				
	Log continued on next page																

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-28 (GT-23)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 17, 2017 07:13
DRILLING END: January 17, 2017 07:13
COORDINATES: N: 835,599 E: 929,090

SHEET: 7 of 7
GS ELEV.: 2516.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi): R1 0.725, R2 1.45, R3 3.62, R4 7.25, R5 14.5, R6 36.2	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
240	240.0		2276.0															
		As above, few cobbles. *(continued)*				55	100	92	92	242.3: 45.0°, JN, PL, SM, CN	0 0 1		1					
	243.0		2273.0															
		As above, few cobbles.			HQ3	56	100	100	100		0 0 0 0 0		1					
245																		
	248.0		2268.0															
		As above, few cobbles.				56	100	100	100		0		1					
250	250.0		2266.0															
		Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram. Notes: 0 - 32: Hydro test #1 FHT 16 - 39: Drillers noted some circulation loss from 16 to 39 ft-bgs. 29 - 104: Hydro test #2 SI & CRI 109 - 250: Hydro test #3 SI 191.5: Bit went out at 191.5 ft-bgs, lost 0.5 ft. of core.																
255																		
260																		
265																		
270																		
275																		
280																		

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-29 (GT-14-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 23, 2017 09:30
DRILLING END: January 23, 2017 09:30
COORDINATES: N: 838,433 E: 923,220

SHEET: 1 of 2
GS ELEV.: 2405.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
0	0.0	Gila CONGLOMERATE (Tcg): polylithic subangular to subrounded gravel clasts in a silty sand matrix, weakly calcareous cement, variably clast or matrix dominant, no iron oxide staining.	2405.0			1	80	66		1.4: 90.0°, B, PL, Sa, IN >5mm 1.6: 85.0°, B, PL, SM, Cl, CC <1mm 2.5: 80.0°, JN, UN, SM, Cl, partial iron staining, SA 4.3: 75.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm	10 2 0 0 1		2			
5						2	100	90	94	5.7: 70.0°, CON, PL, SM, CN, partial iron staining, SO 7: 75.0°, x 2 spaced at 0.1 ft, PL, SM, Cl, CC <1mm 8.5: 85.0°, B, PL, SM, Sa, IN >5mm	1 0 3 1 0		2			
10	12.0		2393.0			3	100	100	100	11.8: 80.0°, B, UN, SM, Cl, SA	0 1		2			
15		Becomes Gila SANDSTONE (Tss): coarse to medium grained, bedding defined by grain size changes, subrounded gravel, slightly to moderately calcareous cement.				4	100	90	92	12.5: 80.0°, B x 2, PL, SM, Cl, SA 14.1: 70.0°, JN, UN, SM, Cl, CC <1mm 14.3: 75.0°, B, UN, SM, Cl, IN >5mm 14.9: 85.0°, B x 2 spaced at 0.1 ft, PL, SM, Cl, CC <1mm	2 0 4 0 1		2			
20	22.0		2383.0			5	100	88	96	16: 90.0°, B, PL, SM, CN 17.4: 85.0°, B, PL, SM, Sa, SO 18: 90.0°, B x 2, PL, SM, CN 18.3: 85.0°, B, PL, SM, Cl, CC <1mm 19.3: 75.0°, B, PL, SM, CN 20.6: 78.0°, B, PL, SM, Sa, IN >5mm 20.9: 85.0°, B, PL, SM, Sa, IN >5mm	2 2 1 2 0		2			
25	27.0	Becomes Gila CONGLOMERATE (Tcg): polylithic subangular to subrounded gravel clasts in silty sand matrix, weakly calcareous cement, variably clast or matrix dominant, no iron oxide staining.	2378.0			6	90	84	86	22.3: 90.0°, B x 4 spaced at 0.1 ft, PL, SM, Cl, CC <1mm 22.6: 83.0°, B, PL, SM, Cl, SA 23.9: 90.0°, JN, PL, SM, Cl, CC <1mm	0 0 0 0 0		2			
30		Continues Gila CONGLOMERATE, massive few discontinuities, variably matrix supported, intervals of medium to coarse sandstone, immature, variably thick bedding defined by grain size changes, weak HCl reaction throughout.				7	96	92	96	28.3: 74.0°, B, UN, SM, Cl, CC <1mm 28.6: 83.0°, B, PL, SM, Cl, CC <1mm 29.4: 85.0°, B x 2, PL, SM, Cl, SA 30.1: 90.0°, B, PL, SM, Sa	0 2 2 1		2			
35						8	100	96	98	32.1: 88.0°, B x 2, UN, SM, Cl, CC <1mm	2 0 0 0 0		2			
40						9	100	92	100		0 0 3		2			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-29 (GT-14-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 23, 2017 09:30
DRILLING END: January 23, 2017 09:30
COORDINATES: N: 838,433 E: 923,220

SHEET: 2 of 2
GS ELEV.: 2405.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
40	40.0		2365.0														
		Continues Gila CONGLOMERATE, massive few discontinuities, variably matrix supported, intervals of medium to coarse sandstone, immature, variably thick bedding defined by grain size changes, weak HCl reaction throughout. *(continued)*				9	100	92	100	39.7 - 40: 85.0°, B, PL, SM, Sa, IN >5mm, bed of weakly cemented fine sand 40.6: 90.0°, B x 2, PL, SM, CN, SA	2 0		2				
											0 0						
45						10	100	90	100	44.5: 75.0°, JN, UN, RO, CN, SA 44.8: 65.0°, JN x 2, IR, RO, Cl, SA 45.7: 72.0°, JN, UN, SM, CN, partial iron staining, SO	3 1 1		2				
										46.7: 80.0°, JN, UN, RO, Cl, SA	0 0 0						
50						11	100	98	100	51: 70.0°, VNO x 2, PL, Qtz, IN >5mm, two cross-cutting silica veins	0 2		2				
											0 0						
55						12	100	100	100		0 0 0		2				
											0 0 3						
60						13	100	92	100	59.6: 85.0°, B x 2, UN, SM, Cl, CC <1mm 59.9: 90.0°, B, PL, SM, Sa, PC 60.3: 90.0°, B, PL, SM, Sa, SA 61.6: 90.0°, B, PL, SM, Sa, PC	1 0 0		2				
	62.0		2343.0														
		Bottom of borehole at 62.0 ft. Backfilled with cement bentonite grout. Notes: 0 - 27: Hydro test #1 FHT 14.9: Lost circulation around this depth. 23 - 62: Hydro test #2 SI & CRI															
65																	
70																	
75																	
80																	

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH17-29 (GT-14-2)
2 of 2

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-30 (GT-25)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 24, 2017 13:45
DRILLING END: January 24, 2017 13:45
COORDINATES: N: 833,472 E: 931,659

SHEET: 1 of 7
GS ELEV.: 2472.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
0	0.0	Surface alluvium, washed gravel and some clayey sand, clasts of granodiorite, pink tuff, and schist.	2472.0			1	100	0	0				6					
	1.5	Continues alluvium, returns are washed cobbles and coarse gravel, clasts of quartz, granodiorite, and pink tuff.	2470.5			2	40	0	24				6					
5	4.0	As above, tuff and quartzite clasts.	2468.0			3	25	0	10				6					
	6.0	As above, returns are foliated chloritized fine grained diabase with epidote, granodiorite, quartz, and quartzite.	2466.0			4	75	0	0				6					
10	8.0	As above, predominantly coarse gravel sized clasts of foliated diabase, quartzite, rhyolite, and quartz.	2464.0			5	33	0	0				6					
	14.0		2458.0			6	67	0	0				5					
15	17.5	Becomes Gila Conglomerate (Tcg): slightly weathered, clast supported, coarse sand to cobbles in silty sand matrix, clasts are subrounded to subangular of foliated diabase, quartzite, schist, pink and white tuff, moderate to weak HCl reaction.	2454.5			6	100	94	100	14.3: 84.0°, JN, PL, VR, Sa, PC, small roots 14.6: 85.0°, JN, PL, VR, Sa, PC, small roots 16.7: 81.0°, JN, ST, RO, Cl, PC	2 0 1		2					
20	22.5	As above, no HCl reaction.	2449.5			7	100	64	76	17.8: 85.0°, JN, ST, RO, Cl, SA 18.2 - 18.4: 85.0°, JN, UN, RO, Cl, IN >5mm, soft clay layer 18.5: 80.0°, JN, IR, RO, Cl, PC 19: 80.0°, JN, ST, RO, Ca, SA 19.4 - 19.5: 75.0°, FLT, IR, VR, gravel, IN >5mm	1 3 2 1 6		3					
25	27.5	As above, with few vuggy quartz veins with crystals.	2444.5			8	100	84	96	20.8: 55.0°, JN, ST, RO, Ca, PC 21.4: 70.0°, JN, IR, RO, Cl, SA 21.7 - 22.1: 85.0°, FLT, IR, RO, Bx, IN >5mm, friable rock 23: 80.0°, JN, ST, RO, Cl, SA 23.4: 75.0°, JN, ST, RO, Cl, SA	0 2 1 1 3		2 - 3					
30	32.5	As above, no quartz veins, very weak HCl reaction.	2439.5			9	100	82	82	24.3: 85.0°, JN, UN, RO, Cl, partial iron staining, SA 25: 85.0°, JN, IR, VR, Cl, PC 25.3: 70.0°, JN, IR, RO, Cl, PC 26.4 - 26.5: 55.0°, FLT, ST, RO, Bx, IN >5mm, joint across friable matrix 27.3: 45.0°, VNO, IR, VR, Qtz, IN >5mm, vuggy with quartz crystals	0 1 4 0 0 1		2 - 3					
	33.0	As above.	2439.0			10	100	0	0	28.5: 85.0°, B, UN, SM, M, PC	0		2					
35	36.0	Continues CONGLOMERATE, slightly weathered, matrix supported, coarse sand to fine gravel in sandy clay matrix, subrounded to angular clasts of quartzite, schist, tuff, and diabase, weak HCl reaction, competent.	2436.0			11	100	100	100	29.6 - 29.9: 80.0°, FLT, IR, VR, Bx, IN >5mm	5							
		As above, trace vugs with quartz crystals, strong HCl reaction.				12	100	66	82	32.2: 75.0°, B, ST, SM, Cl, PC 34.5: 80.0°, JN, IR, RO, Bx, IN <5mm 34.8 - 35: 75.0°, FLT, UN, VR, Bx, IN >5mm, weak, friable matrix 35.7 - 36: 80.0°, FLT, UN, VR, Bx, IN >5mm, weak, friable matrix	4 4 0 0		2 - 3					
40						13	100	86	88	36.5: B, IR, RO, Cl, CC <1mm	2		2					

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-30 (GT-25)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 24, 2017 13:45
DRILLING END: January 24, 2017 13:45
COORDINATES: N: 833,472 E: 931,659

SHEET: 2 of 7
GS ELEV.: 2472.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0		2432.0													
	41.5	As above, trace vugs with quartz crystals, strong HCl reaction. *(continued)*	2430.5			13	100	86	88	36.7 - 36.9: 85.0°, FLT, IR, RO, Bx, IN >5mm, weak, friable matrix 39.2 - 39.4: 80.0°, JN x 2, IR, RO, Qtz, PC 40.7: 75.0°, JN, ST, RO, Cl, PC 41.4: 80.0°, UN, RO, Cl, CC <1mm	1 1 0 2		2		
45		Becomes matrix supported, brown CONGLOMERATE, moderate to strong HCl reaction, gravel and cobbles in sandy clay matrix, clasts of tuff, schist, quartzite, and subophitic diabase, vuggy zones with quartz crystals.				14	100	86	86	43.4: 62.0°, JN, PL, RO, Bx, IN <5mm 43.6: 65.0°, JN, PL, RO, Cl, CC <1mm 45: 75.0°, JN, IR, VR, Cl, PC 46: 76.0°, B, PL, RO, Cl, SA 47.9 - 48.7: FLT, IR, VR, Bx, IN >5mm, brecciated, vuggy with quartz crystals and calcite	0 1 0 1 >10		2 - 3		
	49.0		2423.0													
50		As above.				15	100	92	92	50.6 - 51: 75.0°, FLT, IR, VR, Bx, IN >5mm, weak, friable matrix	0 4 0 0 0		2			
	54.0		2418.0													
55		As above, zones of slightly more friable matrix, becomes clast supported.				16	100	100	100	57.4: 80.0°, B, ST, RO, Cl, SA	0 0 0 1 0		2			
	59.0		2413.0													
60		As above.				17	100	98	98	62.7 - 62.8: 75.0°, FLT, IR, VR, Bx, IN >5mm, weak friable matrix, quartz vugs	0 0 0 2 0		2			
	64.0		2408.0													
65		Continues CONGLOMERATE, slightly weathered, matrix supported, coarse gravel, cobbles, and boulders in sandy clay matrix, clasts of tuff, schist, diabase, and quartzite, weak to no HCl reaction.				18	100	98	98	68.3 - 68.5: 80.0°, FLT, ST, RO, Bx, fractured clast with friable matrix	0 0 0 0 2		2			
	69.0		2403.0													
70		Becomes moderately weathered, weak matrix, few vugs with some calcite and some quartz infill.				19	100	94	94	70.5: 75.0°, JN, PL, RO, CN 71: 70.0°, JN, IR, RO, Cl, PC 72.1 - 72.5: FLT, IR, RO, Bx, IN >5mm, friable matrix	0 1 1 5 0		2 - 3			
	74.0		2398.0													
75		As above, matrix becomes very weak, strong HCl reaction.				20	100	100	100	75.2: 75.0°, JN, IR, VR, Bx, IN <5mm	0 1 0 0		2 - 3			
	79.0		2393.0													
80		As above, matrix becomes very weak to weak.				21	100	100	100	79.7: 45.0°, JN, UN, SM, Cl,	1		2			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-30 (GT-25)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 24, 2017 13:45
DRILLING END: January 24, 2017 13:45
COORDINATES: N: 833,472 E: 931,659

SHEET: 3 of 7
GS ELEV.: 2472.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
80	80.0		2392.0														
		As above, matrix becomes very weak to weak. *(continued)*				21	100	100	100	PC	0 0 0 0 0		2				
	84.0		2388.0														
85		Becomes fresh, CONGLOMERATE, weak, matrix to clast supported, clayey sand matrix, fine gravel to cobbles, subrounded to subangular clasts of tuff, schist, granodiorite, and quartzite. Competent, weak to moderate HCl reaction, few large vugs with quartz crystals.				22	100	100	100	85.9: 85.0°, B, UN, SM, M, PC	0 1 0 0 0		1				
	89.0		2383.0														
90		As above, no vugs.				23	100	100	100		0 0 0 0 0		1				
	94.0		2378.0														
95		As above, few vugs with quartz, some clasts of rhyolite and diabase, small zones of calcite coatings on clasts.				24	100	96	100	95.7: 75.0°, JN, IR, VR, Qtz, PC 96.5: 85.0°, JN, IR, VR, Qtz, PC 96.8: 80.0°, JN, IR, VR, Qtz, PC	0 1 2 0 0		1				
	99.0		2373.0														
100		As above, no vugs, very weak HCl reaction.				25	100	100	100		0 0 0 0 0		1				
	104.0		2368.0														
105		As above, predominantly clast supported, moderate HCl reaction.				26	100	100	100	105.4: 85.0°, B, PL, RO, M, PC 105.8: 78.0°, JN, PL, RO, Ca, CC <1mm	0 2 0 0 0		1				
	109.0		2363.0														
110		As above.				27	100	100	100		0 0 0 0 0		1				
	114.0		2358.0														
115		As above.				28	100	100	100	115.9: 90.0°, B, PL, RO, M, SA	0 0 0 0 0		1				
	119.0		2353.0														
120		As above.				29	100	100	100		0		1				
		Log continued on next page															

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-30 (GT-25)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 24, 2017 13:45
DRILLING END: January 24, 2017 13:45
COORDINATES: N: 833,472 E: 931,659

SHEET: 4 of 7
GS ELEV.: 2472.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA / GOUGE	BROKEN CORE / LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
120	120.0	As above. *(continued)*	2352.0														
	124.0		2348.0			29	100	100	100		0 0 0 0 0		1				
125	129.0	As above, becomes matrix supported, weak HCl reaction, with a silty interbed.	2343.0			30	100	96	100	126.6: 75.0°, B, PL, SM, Cl, CC <1mm 126.9: 74.0°, B, PL, SM, Cl, CC <1mm	0 0 2 0 0		1				
130	134.0	As above.	2338.0			31	100	100	100		0 0 0 0 0		1				
135	139.0	As above, becomes clast supported, coarse gravel and tuff boulder, moderate HCl reaction.	2333.0			32	100	100	100	135.2: 80.0°, B, UN, RO, Cl, SA 138: 80.0°, B, PL, VR, Cl, SA	0 1 0 0 0		1				
140	144.0	As above.	2328.0			33	100	100	100		0 0 0 0 0		1				
145	149.0	As above.	2323.0			34	100	100	100		0 0 0 0 0		1				
150	154.0	As above.	2318.0			35	100	100	100	150.2: 70.0°, JN, UN, RO, Ca, CC <1mm 153.4: JN, UN, RO, FeOx, PC	0 1 0 0 1		1				
155	159.0	As above.	2313.0			36	100	100	100		0 0 0 0 0		1				
160		Log continued on next page				37	100	100	100		0		1				

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF DRILLHOLE DH17-30 (GT-25)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 24, 2017 13:45
DRILLING END: January 24, 2017 13:45
COORDINATES: N: 833,472 E: 931,659

SHEET: 5 of 7
GS ELEV.: 2472.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
160	160.0	Continues CONGLOMERATE, fresh, matrix to clast supported, fine to medium gravel with cobbles in clayey sand matrix, subrounded to angular clasts of diabase, quartzite, schist, tuff, and quartz. Competent and massive, moderate HCl reaction. *(continued)*	2312.0			37	100	100	100		0		1			
	164.0		2308.0								0					
165		Becomes slightly weathered CONGLOMERATE, matrix is very weak to weak, continues massive but more easily drilling damaged.				38	100	100	100		0		2			
	169.0		2303.0								0					
170		As above, becomes slightly weathered to fresh.				39	100	100	100		0		1 - 2			
	174.0		2298.0								0					
175		As above, becomes matrix supported.				40	100	100	100		0		1			
	179.0		2293.0								0					
180		As above.				41	100	100	100		0		1			
	184.0		2288.0								0					
185		As above.				42	100	100	100		0		1			
	189.0		2283.0								0					
190		As above.				43	100	100	100		0		1			
	194.0		2278.0								0					
195		As above.				44	100	100	100		0		1			0.3
	199.0		2273.0								0					
200		As above.				45	100	100	100		0		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-30 (GT-25)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 24, 2017 13:45
DRILLING END: January 24, 2017 13:45
COORDINATES: N: 833,472 E: 931,659

SHEET: 6 of 7
GS ELEV.: 2472.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2, R3 3.62, R4 1.45, R5, R6 36.2	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
200	200.0	As above. *(continued)*	2272.0													
	204.0		2268.0			45	100	100	100		0 0 0 0 0		1			
205	207.0	As above, weak HCl reaction.	2265.0			46	100	100	100		0 0 0 0		1			
210	212.0	As above, moderate HCl reaction.	2260.0			47	100	100	100		0 0 0 0 0 0		1			
	214.0	As above.	2258.0			48	100	100	100		0 0		1			
215	219.0	As above, with bed of slightly weathered, very weak to weak rock.	2253.0			49	100	98	98	215.3: 85.0°, B x 2, PL, SM, M, PC 217.7: 80.0°, B x 2, PL, SM, M, PC	2 0 2 0		2			
220	224.0	Becomes Gila SANDSTONE, fresh, weak, fine to coarse clayey sand with some fine to coarse subangular gravel, few fine sand interbeds, massive, weak to moderate HCl reaction, gradational contact.	2248.0			50	100	100	100		0 0 0 0 0 0		1			0.3
225	229.0	As above, bedded.	2243.0			51	100	100	100	224.3: 85.0°, B, PL, PO, Cl, SA 225.6: 85.0°, B, PL, SM, M, SA	1 1 0 0 0		1			
230	234.0	Becomes Gila CONGLOMERATE, fresh, weak, clast supported, fine to coarse gravel with cobbles, little sandy matrix, subrounded to angular clasts are schist, tuff, rhyolite, quartzite, diabase. Massive, strong HCl reaction.	2238.0			52	100	100	100		0 0 0 0 0		1			
235	239.0	As above, becomes matrix supported, with tuff boulder.	2233.0			53	100	100	100		0 0 0 0 0		1			
240		As above.				54	100	100	100		0		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-30 (GT-25)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 24, 2017 13:45
DRILLING END: January 24, 2017 13:45
COORDINATES: N: 833,472 E: 931,659

SHEET: 7 of 7
GS ELEV.: 2472.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0		2232.0													
		As above. *(continued)*				54	100	100	100		0 0 0 0		1			
	244.0		2228.0													
245		As above.				55	90	90	90	245: 85.0°, JN, PL, SM, M, SA 245.4: 85.0°, B, UN, SM, Cl, PC	2 0 0 0		1			0.3
	249.0		2223.0													
250		Bottom of borehole at 249.0 ft. Completed as well. Refer to diagram. Notes: 0 - 32: Hydro test #1 FHT 32.5: 1st run after setting casing, recover washed gravel. 33 - 94: Hydro test #2 SI 94 - 249: Hydro test #3 SI 109: Damage from overdrilling. 244: Bit wears out at 248 ft-bgs, last 0.5 ft. not recovered.														
255																
260																
265																
270																
275																
280																

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH17-30 (GT-25)
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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-31 (GT-34)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 25, 2017 00:00
DRILLING END: January 28, 2017 00:00
COORDINATES: N: 845,356 E: 939,790

SHEET: 1 of 11
GS ELEV.: 2877.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index ● AX. □ DIAM. ▲ UCS (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
0	0.0	Overburden, gravel to cobbles of limestone and volcanics, fines have been washed out.	2877.0													
						1	30	0	0		>10					
											>10					
											>10					
											>10					
5	5.0		2872.0								>10		5 - 6			
		Colluvium, limestone cobbles (3-in.), fines are clayey sand.				2	57	0	0		>10					
											>10					
	8.0		2869.0													
		As above, fines washed out.				3	80	0	0		>10					
	9.0		2868.0													
10		As above, weakly cemented colluvium at 10 ft-bgs, gravel to cobble clasts of limestone with clayey fines, strong HCl reaction.				4	83	0	0		>10		4			
	12.0		2865.0								>10					
		Colluvium limestone clasts (3-in.), fines are gravelly clay, strong HCl reaction.				5	50	0	0		>10		5 - 6			
15	15.0		2862.0								>10					
		Becomes Apache Leap Tuff (Talg): reddish-brown to gray TUFF, crystal rich, few lithics, phenocrysts of feldspars and euhedral biotite, weak HCl reaction.									0		5 - 4			
											0					
						6	100	90	100		0					
										18.4: 70.0°, JN x 2, UN, RO, Cl, PC	1		3			
										19.1: 70.0°, JN x 2, PL, RO, Cl, SA	1					
20	20.0		2857.0													
		As above.								20.2: 80.0°, JN, ST, RO, CN, SA	1					
										21.3 - 21.6: 75.0°, JN x 3, IR, RO, Cl, SA	3					
						7	100	84	100	22.1: 35.0°, JN, IR, RO, CN, SA	1		3 - 4			
										23.4: 80.0°, JN, PL, RO, CN, SA	2					
										23.8: 68.0°, JN, PL, RO, MnOx, partial iron staining, PC	2					
25	25.0		2852.0							24.5: 80.0°, JN, UN, RO, G,						

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-31 (GT-34)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 25, 2017 00:00
DRILLING END: January 28, 2017 00:00
COORDINATES: N: 845,356 E: 939,790

SHEET: 2 of 11
GS ELEV.: 2877.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
25	25.0	As above, less weathered.	2852.0			8	100	88	100	IN >5mm, highly weathered 24.7: 20.0°, JN, PL, SM, MnOx, partial iron staining, SO 25.5: 15.0°, JN x 2 spaced at 0.3 ft, PL, SM, MnOx, partial iron staining, PC 26.8: 60.0°, JN x 2, UN, SM, CN, SA 27.4: 35.0°, JN, UN, RO, G, partial iron staining, IN >5mm, weathered infill with clay and FeOx staining 28.2: 75.0°, JN, UN, RO, Cl, partial iron staining, PC 28.7: 85.0°, JN, PL, RO, Cl, partial iron staining, PC 29.5: 65.0°, JN, PL, SM, MnOx, partial iron staining, PC	2 2 1 2 1		2 - 3			
30	30.0	No recovery.	2847.0			9	0	0	0		>10					
	32.0	Continues slightly weathered, crystal rich TUFF, few lithics, minor silica veining, red brown.	2845.0			10	100	100	100		0		3 - 2			
35	33.0	As above.	2844.0			11	100	86	92	34.7: 70.0°, JN x 2, PL, RO, MnOx, partial iron staining, SO 35.8: 65.0°, JN, PL, SM, MnOx, partial iron staining, SO 35.9: 20.0°, JN, PL, SM, CN, SA 36.1: 85.0°, JN, PL, SM, CN 37.5: 50.0°, JN, IR, VR, CN	0 2 2 1 1		2 - 3			
40	38.0	As above, becomes more fractured.	2839.0			12	100	45	45	38 - 40: 0.0°, JN x 2, UN, RO, Qtz, CC <1mm, two parallel joints along the core axis creating a broken zone 40.2: 50.0°, JN, IR, RO, CN 40.6: 65.0°, JN, PL, RO, CN 40.9: 70.0°, JN, PL, RO, G, IN >5mm	10 10 3 0		2 - 3			
45	42.0	As above.	2835.0			13	100	80	86	42.5: 65.0°, JN, PL, RO, CN 43.7: 35.0°, JN x 4, PL, RO, MnOx, partial iron staining, SA, wall rock altered, gouge 46.2: 37.0°, JN, PL, SM, MnOx, partial iron staining, PC	1 4 0 0 2		3			
50	47.0	As above.	2830.0			14	100	48	48	47 - 48.8: 0.0°, JN x 3, UN, SM, G, CC <1mm, two sub-parallel joints down core axis causing broken zone 49: 25.0°, JN x 2, PL, SM, MnOx, partial iron staining, SA	2 3 2		3			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-31 (GT-34)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 25, 2017 00:00
DRILLING END: January 28, 2017 00:00
COORDINATES: N: 845,356 E: 939,790

SHEET: 3 of 11
GS ELEV.: 2877.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
50	50.0		2827.0													
		As above. *(continued)*				14	100	48	48		0		3			
	52.0		2825.0								0					
		As above, gouge from 52.5 to 55.5 ft-bgs.									3					
											>10					
55						15	100	42	42	52.5 - 55.8: FLT, joints parallel to core axis, lead into extremely weak gouge zone, broken rock	>10		4 - 5			
											3					
											0		2 - 3			
	57.0		2820.0													
		As above, becomes massive, competent.									0					
											0					
60						16	100	100	100	59.4: 35.0°, JN, UN, RO, CN	1		2			
											0					
										61.3: 62.0°, JN, PL, RO, MnOx, partial iron staining, SO	1					
	62.0		2815.0													
		As above.									0					
											1					
										63.8: 50.0°, JN, IR, RO, CN	0					
65						17	100	100	100				2			
										65.1: 70.0°, JN, PL, RO, CN	1					
											0					
	67.0		2810.0													
		As above.								67.4: 75.0°, JN, UN, SM, MnOx, partial iron staining, SO	2					
										67.7: 70.0°, JN, UN, SK, Ca, partial iron staining, PC						
										68.1: 85.0°, JN, PL, RO, MnOx, partial iron staining, SO	3					
70						18	100	82	88	68.5: 70.0°, JN x 2, UN, SM, Cl, PC	0		2			
										70: 68.0°, JN, PL, SM, MnOx, partial iron staining, SO	4					
										70.7 - 71.5: 45.0°, JN x 4, PL, SK, Cl, partial iron staining, CC <1mm, parallel joints separated by broken rock	0					
	72.0		2805.0													
		As above, interval of intense fracturing.									0		3 - 4			
						19	100	60	60	73.7: 78.0°, JN, ST, SM, MnOx, partial iron staining, SO	1					
75										74: 45.0°, JN, PL, RO, MnOx, partial iron staining, SA	5					

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DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-31 (GT-34)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 25, 2017 00:00
DRILLING END: January 28, 2017 00:00
COORDINATES: N: 845,356 E: 939,790

SHEET: 4 of 11
GS ELEV.: 2877.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index: AX. / DIAM. / UCS (ksi) R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
75	75.0	As above, interval of intense fracturing. *(continued)*	2802.0			19	100	60	60	74.4 - 76: broken core, slightly more altered and weaker than above	>10						
	76.0	As above.	2801.0							76.4: 47.0°, JN, PL, SM, MnOx, partial iron staining, SA	7						
						20	100	42	46	76.6 - 78: JN x 7, core parallel joints and other intersecting joints and fractures	0						
										78: 35.0°, JN x 3, PL, SM, MnOx, partial iron staining, SA	3		2				
80										78.5: 55.0°, JN x 2, PL, SM, MnOx, partial iron staining, SO	2						
										79: 65.0°, JN, PL, SM, MnOx, partial iron staining, SA	3						
	81.0	As above.	2796.0							79.6: 70.0°, JN, PL, SM, MnOx, partial iron staining, SO	2						
						21	100	0	33	80: 75.0°, JN, UN, SM, Cl, PC	0		3				
	82.5	As above.	2794.5							80.9: 65.0°, JN x 2, PL, SM, MnOx, full iron staining, SA	5						
										81.7: 42.0°, JN x 2, PL, SM, MnOx, partial iron staining, SA	4						
85						22	100	68	92	83 - 83.4: 20.0°, JN x 4, IR, SM, G, CC <1mm, axis parallel joint with gouge infill with several joints splaying off	1		2				
										83.6: 73.0°, JN, PL, SM, MnOx, partial iron staining, SA	4						
										84.3: 65.0°, JN, PL, SM, MnOx, partial iron staining, SA	2						
	87.5	As above.	2789.5							84.8 - 85.4: 33.0°, JN x 4, PL, SM, MnOx, partial iron staining, SA, several overlapping joints	2						
						23	100	80	82	85.5: 55.0°, JN, PL, RO, MnOx, partial iron staining, SA	2		2				
										86.4: 25.0°, JN x 3, PL, SM, MnOx, full iron staining, PC	2						
90										86.6: 75.0°, JN, PL, SM, MnOx, partial iron staining, SO	3						
										87.2: 45.0°, JN, IR, SM, MnOx, partial iron staining, SO	0						
	92.0	As above.	2785.0							87.8: 78.0°, JN, UN, SM, MnOx, partial iron staining, SO	5						
		Continues fresh to slightly weathered, red brown crystal rich TUFF, few lithics, weak fabric defined by phenocryst orientation, weathering increases around joints, manganese oxide coating.				24	100	80	80	88.2: 55.0°, JN, PL, SM, MnOx, partial iron staining, SO	1		2 - 3				
										88.7: 85.0°, JN, UN, SM, MnOx, partial iron staining, SO	1						
95										89.4: 60.0°, JN, PL, SM, MnOx, partial iron staining, SO	1						
										89.8: 60.0°, JN, PL, SM, MnOx, SO	0						
	97.0	As above.	2780.0							90: 34.0°, JN, UN, SM, Cl, partial iron staining, CC <1mm	1						
						25	100	73	78	90.5 - 90.8: 30.0°, JN x 2, UN, SM, G, partial iron staining, CC <1mm	2		2 - 3				
										92.7 - 93.5: x 5, G, PC, axis parallel joint with breaks splaying off	3						
100										93.7: 18.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm							
										94.5: 60.0°, JN, PL, RO, CN							
										95.8: 70.0°, JN, PL, RO, Qtz, PC							
										97.9: 28.0°, JN, PL, SM, Cl, partial iron staining, PC, weathered walls							
										98.6: 40.0°, JN x 2, PL, SM,							

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DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-31 (GT-34)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 25, 2017 00:00
DRILLING END: January 28, 2017 00:00
COORDINATES: N: 845,356 E: 939,790

SHEET: 5 of 11
GS ELEV.: 2877.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
100	100.0		2777.0													
		As above. *(continued)*				25	100	73	78	G, partial iron staining, PC, weathered walls 99.3: 25.0°, JN x 2, PL, SM, G, partial iron staining, IN <5mm	1		2 - 3			
	101.0		2776.0													
		As above, more jointed, more weathered along joints.								99.6: 65.0°, JN, PL, SM, Cl, partial iron staining, PC	>10					
										100.1 - 100.4: 10.0°, UN, RO, Cl, partial iron staining, CC <1mm	1					
						26	80	22	22	101 - 102.4: JN, MnOx, partial iron staining, SA, broken zone	>10		3			
										102.5: 50.0°, JN, PL, RO, Cl, partial iron staining, PC						
105										103.2: 60.0°, JN, UN, SM, MnOx, partial iron staining, PC	>10					
										103.5 - 106: 0.0°, JN, UN, SK, MnOx, partial iron staining, CC <1mm, axis parallel joint with slicks causing broken zone (probably where circulation was lost)	>10					
	106.0		2771.0													
		As above, fine veins with some open voids, silica and calcite infill, not interconnected.								106.3: 40.0°, JN x 2, PL, SM, Ca, full iron staining, IN <5mm	1					
										106.6: 40.0°, JN, PL, RO, MnOx, partial iron staining, SO	0					
						27	100	86	86	108 - 108.2: 27.0°, VNO x 3, PL, RO, Qtz, partial iron staining, PC, voids with silica infill along joint	4		2			
110										108.4: JN, open void, ~.2-in., washed out gouge, part of small vein system	0					
										108.6: 37.0°, JN, PL, SM, MnOx, partial iron staining, SA	2					
	111.0		2766.0													
		Continues light brown-red massive TUFF, ocassional vug with calcite infill.								110: 42.0°, JN, PL, SM, MnOx, SO	0					
										110.5 - 111: VNO, Qtz, very thin quartz veins with small voids, no clear orientation, not through going	1					
						28	100	100	100	112.1: 25.0°, JN, UN, RO, MnOx, partial iron staining, SO	0		2			
115										114 - 114.3: .2-in vugs with calcite, not interconnected	1					
										114.8: 40.0°, JN, PL, RO, MnOx, partial iron staining, SA	1					
	116.0		2761.0													
		As above.								115.7: 68.0°, JN, PL, RO, FeOx, partial iron staining, SA	1					
										116.1: 45.0°, JN, PL, SM, MnOx, partial iron staining, SO	1					
						29	100	100	100	117.3: 40.0°, JN, PL, SM, MnOx, partial iron staining, SO	1		2			
										118.5: 68.0°, JN, PL, RO, FeOx, partial iron staining, SO	1					
	119.0		2758.0													
		As above.								119.8: 28.0°, JN, PL, RO, MnOx, partial iron staining, SO	1					
120						30	100	80	97	120.1: 45.0°, JN, PL, SM, MnOx, partial iron staining, SO	5		2			
										120.5: 30.0°, JN x 2, PL, RO, MnOx, partial iron staining, SO	2					
	122.0		2755.0													
		As above.								120.9: 50.0°, JN x 2, UN, RO, MnOx, partial iron staining, SO	2					
										121.3: 45.0°, JN, PL, RO, MnOx, partial iron staining, SO	1					
						31	100	70	80	121.9: 45.0°, JN, PL, RO, CN	1		2 - 3			
125										122.5: 68.0°, JN x 2, PL, RO, MnOx, partial iron	1					

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DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF DRILLHOLE DH17-31 (GT-34)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 25, 2017 00:00
DRILLING END: January 28, 2017 00:00
COORDINATES: N: 845,356 E: 939,790

SHEET: 6 of 11
GS ELEV.: 2877.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
125	125.0	As above. *(continued)*	2752.0							staining, SO						
						31	100	70	80	123.6: 67.0°, JN, PL, RO, MnOx, partial iron staining, SO 124.2: 25.0°, JN, PL, RO, CN 124.7: 25.0°, JN, PL, VR, Cl, PC	>10 0		2 - 3			
	127.0	As above.	2750.0			32	100	30	60	125 - 126: broken zone 127.6: 25.0°, JN, UN, SM, Cl, PC	1		2			
130	128.0	As above, zones of highly weathered rock in broken zones, subtle hydrothermal breccia.	2749.0			33	86	0	31	128 - 129: broken zone with highly weathered rock, clay gouge, some FeOx staining 129.2: 35.0°, JN, UN, SK, Cl, partial iron staining, SA 129.4: 30.0°, JN, UN, SM, FeOx, partial iron staining, SA 129.8: 40.0°, JN, IR, RO, CN 130.2: 40.0°, JN, PL, RO, MnOx, SA	>10 3 1		3 - 4			
	131.5	As above.	2745.5							131.5: becomes highly weathered and broken at end of run	6		4			
						34	100	60	60	131.6 - 133: broken zone with gouge around a core axis parallel joint 132.8: 15.0°, JN, IR, RO, Cl, PC	>10 0 0		2 - 3			
135											0					
	136.5	As above.	2740.5							136 - 136.5: broken zone	5					
						36	100	100	100	137.4: 50.0°, JN, PL, SM, CN 140: 40.0°, JN x 2, PL, SM, Cl, partial iron staining, PC 140.8 - 141.5: 0.0°, JN, UN, SK, Ca, partial iron staining, CC <1mm, axis parallel joint with slicks, calcite and MnOx infill	1 0 0 1 0		2 - 3			
140	141.5	As above.	2735.5													
	142.0	Becomes white-orange TUFF, highly altered, groundmass is oxidized, fresh euhedral biotite, weathered feldspars.	2735.0			37	100	70	70		0		4			
	143.5	As above.	2733.5							144: 40.0°, JN, PL, SK, Cl, CC <1mm	0 1					
145										145.1: 60.0°, JN, UN, SM, CN	1					
							100	90	100	146 - 146.5: broken zone, weak rock, drill damage	5 0		4			
	148.5	As above.	2728.5								5					
150							100	43	43	148.5 - 149.5: broken zone with highly weathered rock	5		4 - 5			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-31 (GT-34)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 25, 2017 00:00
DRILLING END: January 28, 2017 00:00
COORDINATES: N: 845,356 E: 939,790

SHEET: 7 of 11
GS ELEV.: 2877.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
150	150.0	As above. *(continued)*	2727.0				100	43	43	150 - 151.5: broken zone in highly weathered gouge	>10		4 - 5					
	152.0	As above.	2725.0							152 - 153.5: broken rock, very weak, gouge	5							
155	155.0		2722.0				96	76	76	155: 40.0°, CONO, UN, SK, Ca, CC <1mm, contact intrusive and limestone, .5-ft zone of breccia adjacent to contact	>10		5					
		Becomes Mescal Limestone (pCmls): fine grained, yellow gray, thinly to moderately bedded fine-grained LIMESTONE, silica and calcite veining.								155.5: 52.0°, JN, ST, SK, Ca, partial iron staining, CC <1mm	5							
	157.0		2720.0								0							
		As above, abundant silica and calcite veins crosscutting bedding.									2		2 - 3					
											0							
										158.2: 45.0°, B, UN, SM, Ca, PC	0							
							96	96	96	159.2: 70.0°, JN, UN, RO, CN	1							
160											1		3					
											0							
	161.5		2715.5							161.5: 25.0°, JN, PL, SK, Cl, partial iron staining, IN <5mm, along bedding and calcite vein	1							
		Continues varicolored red and yellow-gray, bedded LIMESTONE, zones of stockwork calcite veining and hydrothermal breccia, intense silica and calcite veining.								162.5: 30.0°, JN, PL, SM, Ca, full iron staining, IN >5mm, calcite vein with weathered wall rock and FeOx staining	1							
											1							
							100	94	100	162 - 163.5: stockwork calcite and silica veining, hydrothermal breccia, closed	1		3					
165										163.6: 45.0°, JN, UN, SK, Cl, partial iron staining, CC <1mm	1							
										164.7: 47.0°, JN, PL, RO, Cl, PC	1							
	166.5		2710.5							165.2 - 165.4: zone of intense calcite stockwork veining	1							
	167.0	As above.	2710.0							165.7: 40.0°, JN, PL, SM, Cl, SA	1							
		Becomes red and black silica flooded brecciated LIMESTONE, FeOx stained strata of silica and carbonate, bands of hematite.								166: 40.0°, B, PL, SM, Ca, partial iron staining, CC <1mm, clay in joint	0							
							100	86	100	167 - 167.4: 35.0°, CON, PL, SM, Bx, full iron staining, IN >5mm, gouge zone, following contact	0		3 - 4					
170										170: 65.0°, JN, UN, RO, FeOx, full iron staining, SA	1							
										171: 40.0°, JN x 3, PL, SM, FeOx, full iron staining, CC <1mm	3							
	171.3		2705.7								0							
		Becomes white-gray with red and buff LIMESTONE, medium bedded, abundant silica veining, calcite veining, and hydrothermal breccia.									0							
							100	94	100		0		3					
										174.4: 40.0°, JN, PL, SM, G, partial iron staining, IN >5mm, highly weathered	1							
175																		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-31 (GT-34)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 25, 2017 00:00
DRILLING END: January 28, 2017 00:00
COORDINATES: N: 845,356 E: 939,790

SHEET: 8 of 11
GS ELEV.: 2877.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
175	175.0	SOIL/ROCK PROFILE	2702.0				20 40 60 80	20 40 60 80	20 40 60 80							
	176.5	Becomes white-gray with red and buff LIMESTONE, medium bedded, abundant silica veining, calcite veining, and hydrothermal breccia. *(continued)*	2700.5				100	94	100	wall rock 175.5: 35.0°, JN, PL, SK, Ca, partial iron staining, IN >5mm, weathered wall rock 176.3: 35.0°, JN, PL, SM, Hem, full iron staining, PC, follows bedding	1 1		3			
	179.0	As above.	2698.0				92	92	92	178.3: 37.0°, JN, PL, RO, G, partial iron staining, PC 178.8: 25.0°, JN, UN, SM, FeOx, full iron staining, SA	0 1		2 - 3			
180	182.0	As above.	2695.0				100	90	100	181.5: 50.0°, JN, PL, RO, FeOx, full iron staining, SA	0 0 2		3			
	187.0	As above, very thinly bedded interval of oxidized hydrothermal breccia.	2690.0				100	100	100	181.7: 60.0°, JN x 2, PL, RO, FeOx, partial iron staining, SO 183.8 - 184.3: zone of hydrothermal breccia, calcite matrix, cemented 185.3: 25.0°, JN, PL, RO, Ca, full iron staining, CC <1mm	0 0 0 1 0		3 - 4			
190	192.0	As above.	2685.0				100	92	100	187.5 - 188.4: breccia zone 189.2 - 189.5: zone of hydrothermal breccia with calcite infill 189.5: 30.0°, JN, PL, SM, Cl, full iron staining, IN >5mm, breccia and gouge in wall roclk	0 0 3 0 0		3 - 4			
195	197.0	As above, iron rich red-brown, calcareous, weak to non bedded, stockwork calcite veins.	2680.0				100	100	100	195: 40.0°, JN, PL, PO, Cl, full iron staining, CC <1mm 196.65: 25.0°, JN, PL, SK, G, full iron staining, IN <5mm	0 0 1 1 0		3			
	198.0	As above.	2679.0				100	90	100		0		3 - 4			
200	199.4	As above.	2677.6				100	90	100	199.4: 80.0°, VN x 2, PL, SK, Ca, CC <1mm	0 2		3 - 4			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF DRILLHOLE DH17-31 (GT-34)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 25, 2017 00:00
DRILLING END: January 28, 2017 00:00
COORDINATES: N: 845,356 E: 939,790

SHEET: 9 of 11
GS ELEV.: 2877.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
200	200.0	As above. *(continued)*	2677.0														
							100	90	100	200.9: 62.0°, JN, PL, SM, Ca, partial iron staining, PC	1		3 - 4				
	202.0		2675.0							201.7: 57.0°, JN, PL, RO, Ca, partial iron staining, PC	1						
		Continues LIMESTONE, mottled light red and black, irregular, wavey banding becomes fine and regularly banded.									0						
										203.7: 60.0°, VN, PL, SM, Ca, partial iron staining, IN <5mm	1		3				
							100	60	68	204.5: 25.0°, VN, UN, SM, Ca, IN >5mm	1						
205																	
											>10						
										205 - 207: broken zones with gouge			5				
	207.0		2670.0								>10						
		Continues varicolored white and red LIMESTONE, competent, medium bedded defined by color change (iron staining), intense calcite veining.								207.8: 35.0°, JN, UN, SM, Ca, PC, along bedding	1						
											1						
										208.9: 48.0°, PL, SM, FeOx, partial iron staining, SO							
							100	100	100		0		3				
210										210.3: 40.0°, JN, PL, SK, Ca, full iron staining, CC <1mm	1						
										211.2: 61.0°, JN, PL, SM, Ca, partial iron staining, PC	2						
	212.0		2665.0							211.5: 65.0°, JN, PL, SK, Ca, partial iron staining, CC <1mm							
		As above.									0						
										213: 65.0°, UN, SM, Ca, partial iron staining, CC <1mm	1						
										214: 45.0°, JN, PL, SM, Ca, CC <1mm, along bedding							
							100	92	98	214.8: 45.0°, JN, PL, SM, Ca, PC, along bedding	3		3 - 4				
215										214.9: 45.0°, JN, PL, SM, G, partial iron staining, IN >5mm, along bedding, highly weathered, weak wallrock forms infill	0						
										216.1: 40.0°, JN x 2, PL, SM, Ca, partial iron staining, CC <1mm, weathered wall rock	2						
	217.0		2660.0														
		As above.									0						
											0						
										219: 49.0°, B, PL, SM, CN							
							100	94	100		1		3				
220										220.4: 53.0°, JN, UN, SM, Ca, full iron staining, PC	1						
											3						
	222.0		2655.0							221.7 - 222: gouge, highly weathered							
		Becomes fine bedded LIMESTONE, predominantly iron rich red beds, highly fractured and weathered, calcite veining.								222 - 223: broken zone, weathered weak rock	>10						
										223.2 - 223.5: 45.0°, PL, SM, G, full iron staining, IN >5mm, zone of heavily weathered and fractured rock bound by two joints	3		3 - 4				
							100	78	80								
225										224.7: 50.0°, JN, PL, SM,	1						

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF DRILLHOLE DH17-31 (GT-34)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 25, 2017 00:00
DRILLING END: January 28, 2017 00:00
COORDINATES: N: 845,356 E: 939,790

SHEET: 10 of 11
GS ELEV.: 2877.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
225	225.0	Becomes fine bedded LIMESTONE, predominantly iron rich red beds, highly fractured and weathered, calcite veining. *(continued)*	2652.0				100	78	80	G, full iron staining, IN >5mm, infill is heavily weathered material 225.1: 50.0°, JN, PL, SM, G, full iron staining, IN >5mm, heavily weathered wall rock	1 0		3 - 4			
	227.3	Becomes dark gray-brown DIABASE, fine-grained, highly fractured, calcite veining with talc infill, extensive FeOx staining on discontinuities.	2649.7				75	20	30	227.3: 52.0°, CONO, PL, SM, G, partial iron staining, IN >5mm, weathered and fractured limestone at contact with diabase 227.7 - 228.5: 35.0°, x 6, PL, SK, Ca, full iron staining, CC <1mm, intesecting joints creating broken zone, infill is calcite and talc	4 3 5		3			
230	231.0	As above, extensive oxidation, abundant fracturing and veining.	2646.0				96	53	80	229.1 - 230: 40.0°, JN x 6, PL, SM, G, partial iron staining, CC <1mm, intersecting joints with calcite, talc and FeOx gouge, core axis parallel joint causing broken zone 231.3 - 232.2: 50.0°, PL, SM, Cl, partial iron staining, CC <1mm, several parallel joints plus cross-cutting creating broken zone 232.6: 45.0°, JN, PL, SM, Ca, partial iron staining, CC <1mm 233.4: 70.0°, JN, PL, SM, G, full iron staining, IN <5mm	1 >10 3 1 3		3			
235	235.5	Continues DIABASE, groundmass is extensively oxidized, coarse-grained mm-scale plagioclase lathes.	2641.5				100	48	74	234: 75.0°, JN x 2, PL, SM, Cl, partial iron staining, PC 234.5: 20.0°, JN, PL, SM, FeOx, full iron staining, SA 235.1: 65.0°, JN, PL, SM, FeOx, full iron staining, SA 236.1: 55.0°, JN, ST, SM, Cl, partial iron staining, PC 236.8 - 238: 50.0 - 15.0°, JN x 8, PL, SM, Cl, partial iron staining, PC, two sets of joints intersecting to create broken zone: 5 joints dipping 50 and 3 joints dipping 15 238.2: 40.0°, JN, PL, SK, Ca, partial iron staining, CC <1mm	1 3 4 4 2					
240	240.5	As above.	2636.5				100	57	100	238.4: 85.0°, JN, UN, SM, Ca, partial iron staining, CC <1mm 239.3: 35.0°, JN, PL, SM, Ca, partial iron staining, CC <1mm 239.9: 40.0°, JN, PL, SM, Ca, partial iron staining, CC <1mm 240: 40.0°, JN, PL, SM, Ca, partial iron staining, IN <5mm 241: 50.0°, JN, PL, SK, FeOx, full iron staining, PC	1 1 5 2		3 - 4			
245	244.0	As above.	2633.0				100	76	82	241.2: 40.0°, JN, PL, SK, Cl, full iron staining, CC <1mm 242: 48.0°, JN x 2, PL, SM, Ca, CC <1mm 242.3: 40.0°, JN, PL, SM, Ca, partial iron staining, CC <1mm 242.4: 65.0°, JN, UN, SM, FeOx, full iron staining, CC <1mm 242.8: 50.0°, JN, PL, SK, Cl, full iron staining, CC <1mm 243: 50.0°, JN, PL, SM, G, partial iron staining, IN <5mm	1 2 5 2 2					
250	249.0	Bottom of borehole at 249.0 ft. Completed as well. Refer to diagram. Notes: Log continued on next page	2628.0							243.4: 47.0°, JN, PL, SM, G, full iron staining, IN >5mm, weathered wall rock 243.7: 65.0°, JN, UN, SM,						

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
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REVIEWED: R Post

Golder Associates

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RECORD OF DRILLHOLE DH17-31 (GT-34)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 25, 2017 00:00
DRILLING END: January 28, 2017 00:00
COORDINATES: N: 845,356 E: 939,790

SHEET: 11 of 11
GS ELEV.: 2877.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi))	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE BROKEN CORE /LOST CORE (BC / LC)	ADVANCEMENT RATE ft/min
250	250.0	0 - 30: Hydro test #1 FHT 22 - 67: Hydro test #2 SI & CRI 62 - 111: Hydro test #3 SI & GF 104.5: Lost circulation. 107 - 157: Hydro test #4 SI & GF 141.5 - 142: Drilled without water creating a clay mush out of the core. 143 - 207: Some circulation loss from 143 to 207 ft-bgs. 156 - 231: Hydro test #5 SI & CRI 231 - 249: Hydro test #6 SI 246 - 249: Hole caved-in prior to well installation.	2627.0							Ca, partial iron staining, SA 244.9: 42.0°, JN, PL, SK, Ca, full iron staining, CC <1mm 245.4: 45.0°, JN, PL, SK, Ca, full iron staining, CC <1mm 245.7: 37.0°, JN x 2, PL, SM, Cl, partial iron staining, CC <1mm 246.3: 50.0°, JN, PL, SM, Ca, partial iron staining, CC <1mm 246.6 - 247: broken zone, calcite infill 247.2 - 248: 10.0°, JN, PL, SK, Ca, full iron staining, CC <1mm 248.3: 45.0°, JN x 2, PL, SM, Ca, partial iron staining, PC		R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6			
255															
260															
265															
270															
275															

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH17-31 (GT-34)
11 of 11

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:33
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RECORD OF BOREHOLE DH17-32 (GT-42)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 28, 2017 13:20
DRILLING END: February 1, 2017 10:00
COORDINATES: N: 837,520 E: 915,556

SHEET: 1 of 10
GS ELEV.: 2234.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLES: SAMPLE TYPE & NUMBER	BLOWS per 6 in (Automatic hammer 140 lb Hammer, 30 inch drop)	REC / ATT (in)	PENETRATION RESISTANCE BLOWS / ft (20 40 60 80) / WATER CONTENT (%) (W_p W W_l) (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
0		0.0	Surface alluvium, silty sandy gravel, only recover washed gravel.	2234.0							0 - 33.5: Hydro test #1 FHT	
		4.0	As above.	2230.0								
5		6.0	(GW), GRAVEL, brown, moderate HCL reaction, ALLUVIUM; Multi-lithic gravel; non-cohesive, compact, N(3"): 1-1-1-2-4-5	2228.0	GW		SS S-1	2-3-9	3/18			
		9.5	Surface alluvium, silty sandy gravel, only recover washed gravel.	2224.5								
10		12.0	(GM), SILTY GRAVEL, brown, weak HCL reaction, ALLUVIUM; Multi-lithic gravel; non-cohesive, moist, N(3"): 2-3-6-6-5-5	2222.0	GM		SS S-2	5-12-10	7/18			
		13.5	As above.	2220.5								
15		17.0	(GW-GC), GRAVEL, gray-brown, ALLUVIUM; Multi-lithic gravel; non-cohesive, compact, moist to wet, N(3"): 3-7-6-4-5-5	2217.0	GW-GC		SS S-3	10-10-10	10/18			
		18.5	No recovery after SPT.	2215.5								
20		19.5	No recovery.	2214.5								
		22.0	Recover only 1/2" of sand. N(3"): 2-2-2-2-9-10	2212.0			SS S-4	4-4-19	1/18			
		23.5	Recover washed gravels, quartz, schist, quartzite, diabase.	2210.5								
25		24.0	As above.	2210.0								

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 15:45
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RECORD OF DRILLHOLE DH17-32 (GT-42)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 28, 2017 13:20
DRILLING END: February 1, 2017 10:00
COORDINATES: N: 837,520 E: 915,556

SHEET: 1 of 11
GS ELEV.: 2234.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
0	0.0	Surface alluvium, silty sandy gravel, only recover washed gravel.	2234.0			1	18	0	0				6				
	4.0	As above.	2230.0			2	15	0	0				6				
5	6.0	(GW), GRAVEL, brown, moderate HCL reaction, ALLUVIUM; Multi-lithic gravel; non-cohesive, compact, N(3"): 1-1-1-2-4-5	2228.0			3	23	0	0				6				
	9.5	Surface alluvium, silty sandy gravel, only recover washed gravel.	2224.5			4	40	0	0				6				
10	12.0	(GM), SILTY GRAVEL, brown, weak HCL reaction, ALLUVIUM; Multi-lithic gravel; non-cohesive, moist, N(3"): 2-3-6-6-5-5	2222.0														
	13.5	As above.	2220.5			5	14	0	0				6				
15	17.0	(GW-GC), GRAVEL, gray-brown, ALLUVIUM; Multi-lithic gravel; non-cohesive, compact, moist to wet, N(3"): 3-7-6-4-5-5	2217.0			6	32	0	0				6				
	18.5	No recovery after SPT.	2215.5														
	19.5	No recovery.	2214.5			7	0	0	0				6				
20	22.0	Recover only 1/2" of sand. N(3"): 2-2-2-2-9-10	2212.0			8	25	0	0				6				
	23.5	Recover washed gravels, quartz, schist, quartzite, diabase.	2210.5														
	24.0	As above.	2210.0			9	33	0	0				6				
25		Log continued on next page															

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-32 (GT-42)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 28, 2017 13:20
DRILLING END: February 1, 2017 10:00
COORDINATES: N: 837,520 E: 915,556

SHEET: 2 of 11
GS ELEV.: 2234.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
25	25.0	As above. *(continued)*	2209.0			9	33	0	0				6				
	27.0	(GW), GRAVEL, gray-brown, ALLUVIUM; Multi-lithic gravel; compact, wet, Rock in shoe. N(3"): 4-8-8-6-5-6	2207.0			10	43	0	0				6				
	28.5	Recover washed gravels, quartz, schist, quartzite, diabase.	2205.5														
30	30.0	As above.	2204.0			11	25	0	0				6				
	32.0	(GW-GC), GRAVEL, gray-brown, ALLUVIUM; Multi-lithic gravel; non-cohesive, wet, N(3"): 1-3-6-4-9-32	2202.0			12	50	0	15				6				
	33.5	As above, schist and quartzite cobbles.	2200.5														
	34.7	Becomes Pinal Schist (pCpi), moderately weathered, fine to medium-grained, highly foliated, rubbly, no HCl reaction, brownish gray.	2199.3			13	100	0	12	34.7 - 36.5: FLT, sheared and rubbly	>10		3				
35	36.5	As above.	2197.5			14	100	15	15	36.8 - 38.5: FLT, sheared, some clayey sand	>10		4				
	38.5	No recovery.	2195.5			15	0	0	0		>10						
40	40.0	No recovery.	2194.0			16	0	0	0								
	41.0	Continues SCHIST, greenish-brownish gray, slightly weathered, fine- to medium-grained, foliated along bedding, jointed.	2193.0			17	67	27	40	41.6: 33.0°, FOLO, ST, RO, Cl, SA 42: 38.0°, JN, ST, VR, CN 42.1: 57.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm	5 7		2				
	42.5	As above, rubble zone.	2191.5			18	100	0	0	42.3: 37.0°, FOLO, PL, SM, Cl, partial iron staining, CC <1mm	>10		4				
45	44.0	As above.	2190.0			19	100	0	20	44 - 45: 25.0°, FLT, UN, SM, Bx, IN >5mm, sheared on foliation	>10		4				
	45.0	As above, with quartz veining.	2189.0			20	100	20	20	45 - 45.5: 35.0°, FLT, UN, RO, Bx, partial iron staining, IN >5mm 45.6: 34.0°, FOLO, ST, RO, Sa, partial iron staining, PC	>10 >10		3				
	46.5	As above.	2187.5			21	75	0	0	45.8: 57.0°, JN, UN, RO, Cl, partial iron staining, SA 45.9: 60.0°, JN, ST, RO, Cl, partial iron staining, PC 46 - 46.5: 35.0°, FLT, UN, RO, Bx, partial iron staining, IN >5mm	>10		3 - 4				
	48.5	As above, slightly oxidized.	2185.5			22	100	0	13	46.5 - 48.5: 35.0°, FLT, UN, RO, Bx, partial iron staining, IN >5mm, shear zone 48.5 - 50: FLT, IR, RO, Bx, partial iron staining, IN >5mm, brecciated, rubbly	>10 >10		3 - 4				
50	50.0		2184.0														

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-32 (GT-42)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 28, 2017 13:20
DRILLING END: February 1, 2017 10:00
COORDINATES: N: 837,520 E: 915,556

SHEET: 3 of 11
GS ELEV.: 2234.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
50	50.0	As above, slightly silicified, rubble, contact zone.	2184.0			23	50	0	0	50 - 52: FLT, ST, RO, Bx, partial iron staining, IN >5mm, breccia and rubble	>10		4			
	52.0		2182.0								>10					
		Becomes DIABASE, brownish orange, aphanitic groundmass with olivine phenocrysts, schist xenoliths, calcite stockwork veins, completely oxidized, massive, weak.				24	100	100	100	52.4: 7.0°, JN, UN, RO, Cl, PC	1		3			
											0					
55						25	100	100	100		0		3			
											0					
	56.5		2177.5								5					
		Becomes SCHIST, contact, almost no recovery, recovered material is gray, soft, sandy clay.				25	10	0	0	56.5 - 58.5: 15.0°, CONO, UN, RO, Cl, IN >5mm	>10		5			
	58.5		2175.5								>10					
		No recovery.				26	40	0	0	58.5 - 60: CONO, no recovery	>10		4 - 5			
60	60.0		2174.0													
		Continues SCHIST, greenish gray to grayish pink, quartz veins, all rubble.								60 - 61: FLT, IR, RO, Bx, IN >5mm, washed rubble	>10					
	61.0		2173.0													
		No recovery.				27	0	0	0							
65	65.0		2169.0													
		Continues SCHIST, gray, foliated, some quartz, rubble.				28	50	0	0	65 - 66: FLT, UN, RO, Bx, IN >5mm, rubble			4			
	66.0		2168.0													
		As above.				29	100	0	0	66 - 67.5: 6.0°, FLT, UN, SM, Bx, partial iron staining, IN >5mm, subvertical foliation or bedding, rubble	>10		4			
	67.5		2166.5								>10					
		No recovery.				30	0	0	0							
	69.5		2164.5								>10					
70		Continues SCHIST, greenish to brownish gray, schistose, fine- to medium-grained, fractured and sheared, rubble.				31	100	0	13	69.5 - 71: 50.0°, FLT, UN, RO, Bx, IN >5mm, sheared and brecciated	>10		3			
	71.0		2163.0													
		As above.				32	100	0	0	71 - 72: FLT, Bx, partial iron staining, IN >5mm, rubble	>10		4			
	72.0		2162.0													
		As above, more brownish gray.				33	100	0	0	72 - 73: 60.0°, FLT, UN, RO, Bx, IN >5mm, rubble, foliation dip ~60 degrees	>10		4			
	73.0		2161.0													
		As above, oxidized discontinuities, very weak HCl reaction.				34	88	20	23	74.4: 60.0°, FOLO, ST, RO, Cl, full iron staining, CC <1mm	>10		2 - 3			
75											4					

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-32 (GT-42)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 28, 2017 13:20
DRILLING END: February 1, 2017 10:00
COORDINATES: N: 837,520 E: 915,556

SHEET: 4 of 11
GS ELEV.: 2234.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
75	75.0	As above, oxidized discontinuities, very weak HCl reaction. *(continued)*	2159.0											BC / LC		
						34	88	20	23	74 - 75: FLT, ST, RO, Bx, partial iron staining, IN >5mm 74.5: 52.0°, JN, UN, SM, FeOx, full iron staining, CC <1mm 74.7: 60.0°, FOLO, PL, SM, FeOx, SA	>10 >10		2 - 3			
	77.0	As above, quartz veins, rubble.	2157.0													
						35	50	0	0	74.8: 80.0°, JN, ST, SM, FeOx, full iron staining, CC <1mm 75 - 77: FLT, Bx, partial iron staining, IN >5mm	>10 >10		4			
	79.0		2155.0													
80		Becomes chloritized metasiltstone, slightly weathered, green, lightly foliated with quartz/calcite veining, fine-grained, jointed, full FeOx coatings on all discontinuities.								78 - 79: FLT, Bx, partial iron staining, IN >5mm, brecciate and fractured, rubble						
						36	70	26	32	80.5 - 81: CONO, IR, VR, Bx, full iron staining, IN >5mm 81.2: 22.0°, JN, UN, VR, Qtz, full iron staining, PC 81.5: 74.0°, FOLO, UN, SK, FeOx, partial iron staining, PC 81.6: 23.0°, JN, UN, SM, Sa, full iron staining, IN <5mm	>10 3 3 >10		2			
	84.0		2150.0													
85		Continues SCHIST, slightly weathered, grayish pink, fine to med grained, metasandstone, some silica veining along bedding, slightly silicified, foliated along bedding, fractured and jointed.								82: 52.0°, FOLO, ST, SK, FeOx, full iron staining, CC <1mm						
						37	50	0	0	82.3: 62.0°, FOLO, ST, RO, FeOx, full iron staining, CC <1mm 82.9: 55.0°, FOLO, ST, RO, FeOx, full iron staining, CC <1mm	>10 >10		4			
	86.0		2148.0													
		As above.								83.2: 16.0°, JN, UN, RO, FeOx, full iron staining, CC <1mm	>10					
						38	50	0	0	83.5 - 84: FLT, Bx, full iron staining, IN >5mm, brecciated	>10		4			
	88.0		2146.0													
		As above.								84 - 86: CONO, Bx, partial iron staining, IN >5mm, rubble	>10					
										86 - 88: CONO, Bx, partial iron staining, IN >5mm						
90						39	100	9	17	88 - 91.5: 60.0°, FOLO x 12, PL, RO, Cl, partial iron staining, PC 88.1 - 91.5: 15.0°, JN x 5, ST, RO, Ca, partial iron staining, PC	>10 >10		2 - 3			
	91.5		2142.5													
		As above, becomes completely silicified, very strong.								90.2 - 91.5: 60.0°, FLT, ST, RO, Bx, IN >5mm, clayey sandy gouge	>10					
						40	100	0	12	91.5 - 94: FLT, Bx, IN >5mm, highly fractured or jointed, calcite coatings	>10 >10		2			
	94.0		2140.0													
		As above.									3					
95																
						41	100	8	33	94.4 - 96.5: 60.0°, FOLO x 10, ST, RO, Cl, partial iron staining, SA 94.5 - 96.5: 15.0°, JN x 3, ST, RO, partial iron staining	>10 >10		2			
										96.5 - 98: FLT, Bx, IN >5mm, brecciated and fractured	>10					
	98.0		2136.0													
		As above, with MnOx and crystalline calcite coatings on all discontinuities.								98 - 98.7: FLT, Bx, IN >5mm, calcite coatings, minor FeOx staining	>10					
						42	100	15	40	98.7: 68.0°, FOLO, ST, VR, MnOx, PC 98.8: 32.0°, JN, IR, VR, Ca, CC <1mm	5		2			
100	100.0		2134.0													

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-32 (GT-42)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 28, 2017 13:20
DRILLING END: February 1, 2017 10:00
COORDINATES: N: 837,520 E: 915,556

SHEET: 5 of 11
GS ELEV.: 2234.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
100	100.0	As above.	2134.0			43	100	23	50	99.2: 62.0°, FOLO x 2, PL, SM, Cl, full iron staining, CC <1mm 99.6: 63.0°, FOLO, ST, RO, MnOx, CC <1mm 99.7: 43.0°, JN, ST, RO, Ca, partial iron staining, IN <5mm 99.75: 36.0°, JN, ST, RO, Ca, partial iron staining, CC <1mm	5 8 5		2				
	103.0	As above.	2131.0			44	100	0	30	100.3: 47.0°, FOLO, ST, RO, MnOx, SA 100.6 - 100.8: 66.0°, FLT, PL, SM, Bx, full iron staining, IN >5mm 100.8: 37.0°, JN, PL, SM, Ca, full iron staining, IN <5mm	5 >10		2				
105	105.0	As above.	2129.0			45	100	27	27	101: 49.0°, JN, ST, SM, CN, full iron staining 101.2: 61.0°, FOLO, ST, RO, CN, full iron staining	6 >10		2				
	106.5	No recovery.	2127.5			45	0	0	0	101.3: 56.0°, FOLO, ST, RO, CN, full iron staining 101.5: 52.0°, FOLO, UN, RO, CN, full iron staining 101.7: 12.0°, JN, IR, RO, Ca, full iron staining, IN <5mm 101.75: 55.0°, FOLO, UN, SM, CN, full iron staining 101.8 - 102.1: FLT, ST, RO, Bx, full iron staining, IN >5mm, trace calcite							
110	110.0	Continues grayish pink, silicified SCHIST, very strong, all rubble and poor recovery.	2124.0			46	50	0	0	102.5 - 102.7: FLT, ST, RO, Bx, partial iron staining, IN >5mm, trace clay 103: 52.0°, JN, CU, SM, FeOx, full iron staining, PC 103.2: 54.0°, FOLO, ST, RO, CN, full iron staining	>10 >10		4				
	112.0	As above, rubble.	2122.0			47	33	0	0	103.5: 57.0°, FOLO, ST, VR, Cl, full iron staining, SA 103.6: 47.0°, JN, ST, RO, Ca, full iron staining, CC <1mm 103.8: 44.0°, JN, PL, RO, Ca, full iron staining, PC	>10 >10		4				
	113.5	No recovery.	2120.5			48	0	0	0	104 - 105: FLT, IR, VR, Bx, IN >5mm, trace calcite 105: 63.0°, FOLO, UN, RO, Cl, partial iron staining, CC <1mm 105.4: 54.0°, FOLO, PL, SM, Cl, full iron staining, CC <1mm							
115	116.0	As above, rubble and redrill.	2118.0			49	50	0	0	105.5 - 106.5: FLT, ST, RO, Bx, partial iron staining, IN >5mm	>10		4				
	117.0	As above.	2117.0			50	25	0	0	110 - 112: FLT, IR, VR, Bx, IN >5mm 112 - 113.5: FLT, IR, VR, Bx, partial iron staining, IN >5mm, poor recovery 116 - 117: FLT, IR, RO, Bx, IN >5mm, rubble	>10 >10		4				
	119.0	Continues SCHIST, grayish pink to pink, fine-grained, silicified, silica veins, foliated and sheared, FeOx staining and calcite on discontinuities, brecciated and rubbly.	2115.0			51	100	0	0	118.5 - 119: FLT, IR, RO, Bx, partial iron staining, IN >5mm, rubble 119 - 121: 35.0°, FLT, UN, VR, Bx, partial iron staining, IN >5mm, shear aong foliation	>10 >10		3				
120	121.0	As above, MnOx staining.	2113.0			52	80	0	0	121 - 123.5: 29.0°, FLT, UN, SM, Bx, polished, IN >5mm, FeOx staining, some clay coatings	>10 >10		3				
	123.5	As above.	2110.5			53	50	0	0	123 - 126.5: FLT, IR, RO, Bx, partial iron staining, IN >5mm, rubble, trace clay, trace calcite	>10 >10		4				
125		Log continued on next page																

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-32 (GT-42)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 28, 2017 13:20
DRILLING END: February 1, 2017 10:00
COORDINATES: N: 837,520 E: 915,556

SHEET: 6 of 11
GS ELEV.: 2234.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC	LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
125	125.0	As above. *(continued)*	2109.0			53	50	0	0	123 - 126.5: FLT, IR, RO, Bx, partial iron staining, IN >5mm, rubble, trace clay, trace calcite	>10		4					
	126.5	As above, rubble and redrill.	2107.5								>10							
						54	33	0	0	126.5 - 129.5: FLT, IR, RO, Bx, partial iron staining, IN >5mm, MnOx coatings	>10		4					
	129.5		2104.5								>10							
130		As above, continues pink silicified SCHIST, brecciated, calcite and MnOx coatings.				55	100	0	20	129.5 - 131: FLT, ST, RO, Bx, IN >5mm, trace calcite and oxide coatings	>10		3					
	131.0	No recovery.	2103.0			56	0	0	0									
						57	0	0	0									
135	135.0		2099.0															
	135.5	Rubble and corestone.	2098.5			58	100	0	40	135 - 135.5: FLT, IR, RO, Bx, IN >5mm	3		3					
	136.5	Becomes fresh, pinkish-brownish gray, highly silicified, METASANDSTONE and quartz vein, competent and unjointed, weak reaction HCl.	2097.5			59	100	100	100		0		1					
		As above, no HCl reaction.				60	100	40	65	137.3: 23.0°, JN, ST, VR, MnOx, SO 137.4: 37.0°, JN, ST, RO, MnOx, CC <1mm 137.5: 61.0°, FOLO, UN, RO, Cl, SA	5		1					
	138.5	No recovery.	2095.5								>10							
140						60	0	0	0	137.7 - 137.8: 60.0°, FLT, IR, RO, Bx, IN >5mm, FeOx and MnOx coatings 138 - 138.3: FLT, IR, RO, Bx, IN >5mm, trace MnOx coating								
	140.5	Continues pink, silicified SCHIST with boudinaged silica veins, only rubble.	2093.5			61	33	0	0	140.5 - 142: FLT, IR, RO, Bx, IN >5mm, MnOx coatings	>10		4					
	142.0	As above.	2092.0			62	33	0	0	142 - 143.5: FLT, Bx, IN >5mm, rubble	>10		4					
	143.5	As above.	2090.5			63	33	0	0	143.5 - 145: FLT, RO, Bx, IN >5mm, rubble	>10		4					
145	145.0		2089.0								4							
		Becomes brecciated SCHIST, matrix supported, sand to gravel sized clasts with calcite cementation, and soft gougey fault zone.				64	100	28	28	145.6 - 147.5: 45.0°, FLT, G, IN >5mm, soft sandy clay with gravel	>10		5					
											>10							
						65	50	0	0	147.5 - 150.7: FLT, Bx, IN >5mm, breccia, with clayey sand	>10		5					
150											>10							

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-32 (GT-42)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 28, 2017 13:20
DRILLING END: February 1, 2017 10:00
COORDINATES: N: 837,520 E: 915,556

SHEET: 7 of 11
GS ELEV.: 2234.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 / R2 / R3 3.62 / R4 1.45 / R5 / R6 36.2	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
150	150.0	Becomes brecciated SCHIST, matrix supported, sand to gravel sized clasts with calcite cementation, and soft gougey fault zone. *(continued)*	2084.0			65	50	0	0		>10		5				
						65	100	100	100		0		3 - 4				
	152.5		2081.5								>10						
		As above, rubbly.				66	100	33	33		6		4 - 3				
	154.0		2080.0														
		As above, gouge washed out.									>10						
155											>10						
						67	38	0	0		>10		4				
	158.0		2076.0								>10						
		As above.									9						
						66	100	0		159: 45.0°, FLT, RO, Qtz	9		4				
160	160.0		2074.0														
		As above.									>10						
						67	40	0	0		>10		4				
	162.5		2071.5							162.5 - 162.8: 43.0°, FLT, G, IN >5mm, fault with 0.3-in. grey, clayey sand gouge infill	3						
		Becomes massive BRECCIA, matrix is reddish-brown clayey gouge.				68	100	87	87		0		2				
	164.0		2070.0														
		As above.									0						
165											0						
						69	100	77	100		0		2 - 3				
	167.0		2067.0							166.5 - 167: 40.0°, FLT, G, IN >5mm, last 0.5-ft, gouge	5						
		Banded, Becomes gray SCHIST, competent, fractured, rubble with some gouge.									>10						
											>10						
						70	38	0	0		>10		4				
170											>10						
	171.0		2063.0														
		As above.									>10						
						71	67	17	17		>10		3				
										173: 45.0°, JN, RO, Qtz, IN >5mm	4						
										173.5: 40.0°, JN, IR, SM, FeOx, IN <5mm							
										173.6: 65°, JN, IR, SM, FeOx, full iron staining, IN <5mm							
						72	100	30	30		>10		2				
175										174.3: 33.0°, JN, IR, SM,							

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-32 (GT-42)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 28, 2017 13:20
DRILLING END: February 1, 2017 10:00
COORDINATES: N: 837,520 E: 915,556

SHEET: 8 of 11
GS ELEV.: 2234.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
175	175.0	As above. *(continued)*	2059.0			72	100	30	30	partial iron staining, IN <5mm 175.1: 38.0°, JN, IR, SM, FeOx, partial iron staining, IN <5mm	4		2			
	176.0	As above.	2058.0			73	100	30	37	175.6: 75°, JN x 2 spaced at 0.2 ft, PL, SM 175.7: 30.0°, JN, IR, SM, FeOx, full iron staining, IN <5mm 176 - 176.2: 22.0°, FLT, IR, G, IN >5mm, gouge	5 9		3			
	179.0	As above.	2055.0			74	100	0	0	177.1: 25.0°, JN, IR, SM, Qtz, partial iron staining, IN <5mm 177.5: 60°, JN, IR, SM, Qtz, partial iron staining, IN >5mm 177.7: 63.0°, JN, PL, SM, FeOx, partial iron staining	9 >10 >10		3			
180	181.0	As above.	2053.0			75	100	10	30	177.75 - 178.2: 2°, JN, IR, RO, FeOx, partial iron staining, IN <5mm 178.2: 55°, JN, IR, CN 179 - 181: FLT, breccia and gouge 181 - 182.5: FLT, breccia with 0.35-in. thick zone of angular sand and clay 182.55 - 182.85: 40°, FLT x 3 spaced at 0.2 ft, IR, SM, FeOx, partial iron staining, IN <5mm	>10 7 7		3			
	184.0	Becomes grayish-brown METASANDSTONE, fine scale banding, very competent.	2050.0			76	100		29	182.7 - 182.9: 30.0°, JN x 2 spaced at 0.15 ft, PL, SM, MnOx, PC 183.25: 70.0°, JN, ST, SM 183.5 - 184: FLT, G, breccia zone, with foliations, angular sand, some soft clay coatings 184.2 - 184.65: 55.0°, JN x 2 spaced at 0.5 ft, PL, SM, CN 185.15: 45.0°, JN, IR, SM, FeOx, partial iron staining, PC, breccia zone 185.6 - 185.9: 70.0°, JN, PL, SM, CN	7 >10 4 5 5		3			
185	188.5	As above.	2045.5			77	100	0	0	185.8: 65.0°, JN, IR, SM, Sa, partial iron staining, IN <5mm 186: 50.0°, JN, IR, SM, Cl, partial iron staining, PC 186.45: 45.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm	5 5		3			
190	190.5	As above, rubble.	2043.5			78	100	11	11	187.15: 30.0°, JN, PL, SM, Cl, partial iron staining, PC 187.8: 20.0°, JN, PL, SM, Sa, partial iron staining, SO 188: 50.0°, JN, PL, SM, MnOx, PC 188.1 - 188.5: JN, PL, SM, CN, near vertical jointing 188.5 - 189.35: VN, IR, SM, Bx, partial iron staining, PC	>10 >10 >10		4			
	194.0		2040.0													
	194.5	As above.	2039.5			79	100	0	0	189.6: 55.0°, FO, PL, SM, CN, IN <5mm	>10		4			
195		As above.				80	100	0	8	189.65 - 189.8: 55°, FLT x 3 spaced at 0.05 ft, PL, SM, Cl, partial iron staining, IN <5mm 190.5: 50.0°, JN, PL, SM, Cl, partial iron staining, PC 191 - 194: FLT, G, matte, rubble zone with gouge interval from 193.3 to 193.5-ft	7 >10		4			
	197.0	As above.	2037.0			81	75	0	0	194 - 194.5: FLT, Bx, rubble zone 194.5 - 196: FLT, Bx, rubble zone	>10 >10		4			
200						82	80	0	0	196.3: JN, IR, SM, Ca, partial iron staining, IN <5mm, near vertical joint, coated on one side with calcite 196.6: 35.0°, JN, PL, SM,	>10		4			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
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REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-32 (GT-42)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 28, 2017 13:20
DRILLING END: February 1, 2017 10:00
COORDINATES: N: 837,520 E: 915,556

SHEET: 9 of 11
GS ELEV.: 2234.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
200	200.0	As above. *(continued)*	2034.0			82	80	0	0	Sa, full iron staining, IN <5mm 196.65 - 197: FLT, rubble zone	>10		4			
	201.5	As above.	2032.5			83	100	0	0	197 - 199: FLT, rubble zone 199 - 201.5: FLT, rubble only	>10		4			
	202.5	As above.	2031.5			84	33	0	0	201.5 - 202.5: FLT, evidence of re-drill in this broken zone	>10		4			
	204.0	Becomes grey to brown SCHIST rubble.	2030.0								>10					
205						85	20	0	0	204 - 209: FLT, rubble only	>10		4			
	209.0	BECOMES gray METASANDSTONE, calcite veins, fractured.	2025.0								>10					
210						86	100	30	70	209.25: 70.0°, JN, PL, SM, Cl, PC 209.8: 48.0°, JN, IR, SM, Cl, PC 210: 70.0°, JN, ST, RO, clay and calcite partial, IN <5mm	5 9		3			
	211.0	As above.	2023.0			87	100	33	43	210.4: 35.0°, JN, IR, SM, Cl, IN <5mm 210.5 - 211: FLT, schist rubble 211.6 - 213.6: JN, IR, SM, MnOx, IN <5mm 212.3 - 213: 0.0°, FLT, IR, SM, G, IN >5mm, clayey sand and calcite infill	6 10 3		4			
	214.0	As above.	2020.0							213.2: 50.0°, FLT, IR, RO, Cl, IN <5mm						
215						88	100	65	70	214.35: 40.0°, JN, PL, SM, Cl, PC 214.7: 50.0°, JN, PL, SM, Ca, matte, PC 215.55: 60.0°, JN, PL, SM, Cl, partial iron staining, PC 216.25: 20°, FLT, ST, SM, Cl, full iron staining, IN <5mm 216.55 - 217.5: 60°, VN, PL, RO, Ca, IN >5mm, rubble zone around calcite vein	3 4 5 5		3			
	218.0	As above.	2016.0							217.05 - 217.25: 30°, FLT, IR, RO, Ca, matte, IN <5mm						
220						89	80	38	48	217.3 - 217.5: 65°, FLT, IR, RO, Ca, IN >5mm, rubble zone with calcite 217.45: 55°, FLT, IR, RO, Bx, partial iron staining, IN >5mm 219.1 - 219.9: 10°, VN, IR, RO, Ca, IN >5mm 220.45 - 220.95: 55.0°, JN, PL, SM, CN, matte, PC 220.9: 30.0°, JN, IR, SM, CN, partial iron staining, PC 221.3 - 221.7: 30.0°, JN, PL, SM, Ca, partial iron staining, PC	6 3 4 2		4			
	223.0	As above.	2011.0							221.7 - 222.2: 40.0°, FO x 3 spaced at 0.15 ft, PL, SM, Cl, PC						
225						90	100	76	88	222.6: 75.0°, JN, ST, SM, CN, partial iron staining, SO	0 1		2			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
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REVIEWED: R Post

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RECORD OF DRILLHOLE DH17-32 (GT-42)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 28, 2017 13:20
DRILLING END: February 1, 2017 10:00
COORDINATES: N: 837,520 E: 915,556

SHEET: 10 of 11
GS ELEV.: 2234.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
225	225.0	As above. *(continued)*	2009.0													
						90	100	76	88	225.2 - 225.6: 90.0°, JN, IR, VR, Ca, partial iron staining, PC	1					
										225.95 - 226.15: 30.0°, JN x 2 spaced at 0.15 ft, PL, SM, Ca, partial iron staining, PC	2		2			
	228.0		2006.0							227: 35.0°, JN, PL, SM, MnOx, PC	6					
		As above.								227.2 - 228: 58.0°, VN x 2 spaced at 0.25 ft, IR, VR, zone of bx due to and containing calcite veind, IN <5mm, calcite and veining	2					
230										228 - 228.6: 30.0°, VN x 3 spaced at 0.15 ft, UN, SM, Ca, matte, IN <5mm	2					
						91	100	38	56	229 - 230.2: 65.0°, VN x 4 spaced at 0.33 ft, IR, RO, Ca, partial iron staining, IN <5mm	7		3			
										230.25: 30.0°, JN, IR, SM, CN, partial iron staining, IN <5mm, smooth, silty FeOx stained coating	6					
	232.5		2001.5							230.9 - 231.8: JN, IR, SM, calcite, silt, partial iron staining, PC, broken zone of calcite veining; silt and partial Feox staining	>10					
		As above.								231.8 - 232.5: 50.0°, JN, IR, RO, Ca, partial iron staining, PC, broken interval of calcite veining	6					
	234.0		2000.0			92	100	27	37	234 - 234.5: 37.0°, HVN x 2 spaced at 0.5 ft, Ca, IN >5mm	7		4			
235		As above.								235.5 - 235.9: VNO, IR, VR, Ca, matte, IN >5mm, rubble zone around calcite vein	7					
	235.5		1998.5							236 - 236.3: 40.0°, VN x 3 spaced at 0.15 ft, IR, SM, Ca, partial iron staining, IN <5mm	0					
		As above.				93	100	58	78	237.8: 30.0°, VN, PL, SM, Ca, partial iron staining, SO	1		3			
	239.5		1994.5							237.95 - 238: MECH, VR, Ca, IN >5mm	0					
240		As above.								239.5 - 240: 5.0°, VN, PL, Ca, IN <5mm	10					
										240.2: 40.0°, JN, IR, SM, Ca, matte, PC	6					
						94	100	73		241.2: 30.0°, JN, IR, SM, Ca, IN <5mm	1		3			
										241.7 - 242.2: 60.0°, VN, IR, RO, bx by calcite, partial iron staining, IN <5mm	0					
	244.0		1990.0							243: 20.0°, JN, PL, SM, FeOx, matte, SO	4					
		As above.								243.1 - 243.7: 20.0°, JN, PL, SM, FeOx, matte, SO						
245	245.0		1989.0							244: 70.0°, JN, IR, SM, CN, matte	0					
		As above, grey to pink, silica banded.				95	100	45	45				3			
										245.1 - 246: 35.0°, JN x 2 spaced at 0.4 ft, IR, SM, CN	5					
											9					
						96	75	0	0	246 - 250: 0.0°, JN x 6, IR, VR, CN, broken zone, many vertical joints	5		3			
										248.6 - 249: 70.0°, JN, IR, RO, CN, matte	8					
250	250.0		1984.0								>10					

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-32 (GT-42)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 28, 2017 13:20
DRILLING END: February 1, 2017 10:00
COORDINATES: N: 837,520 E: 915,556

SHEET: 11 of 11
GS ELEV.: 2234.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi)	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE BROKEN CORE /LOST CORE (BC / LC)	ADVANCEMENT RATE ft/min
250	250.0	Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram. Notes: 0 - 33.5: Hydro test #1 FHT 38 - 58: Hydro test #2 FHT 38.1: Drillers set casing. Backfill with holeplug, ream with rockbit, then wash down with casing shoe to 35 ft-bgs. 38.5 - 40: First run after setting casing, no recovery. 54 - 145: Hydro test #3 SI & CRI 106.5 - 110: Driller notes soft drilling. 225 - 250: Hydro test #4 SI	1984.0									R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6			
255															
260															
265															
270															
275															

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-33 (GT-29)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 30, 2017 10:31
DRILLING END: January 30, 2017 10:31
COORDINATES: N: 842,391 E: 937,371

SHEET: 1 of 7
GS ELEV.: 2709.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
0	0.0		2709.0														
		Polylithic gravel to cobbles alluvium, fines washed out.					50	6	6								
5	5.0		2704.0														
		Gila Sandstone (Tss): red-brown, coarse, immature SANDSTONE, abundant diabase coarse sand to gravel, subangular, massive, some FeOx straining on joints, weakly cemented, no HCl reaction.					100	92	100	6.5: 45.0°, JN, PL, RO, Cl, SA, very weathered wall rock 7.2: 55.0°, JN, PL, RO, Sa, SA, very weathered wall rock 8: 75.0°, JN, PL, SM, Cl, SA 8.8: 55.0°, JN x 2, PL, SM, FeOx, partial iron staining, SA	0 1 1 2 1		3				
10	10.0		2699.0														
		As above, few cobbles.					100	100	100	9.3: 80.0°, JN, UN, SM, Cl, partial iron staining, SA 13.5: 33.0°, JN, PL, SM, MnOx, partial iron staining, SA	0 0 0 1 0		3 - 4				
15	15.0		2694.0														
		As above, interval of calcite cement.					100	60	88	17: 80.0°, JN x 3, PL, RO, FeOx, PC, very weathered joint walls 17.2: 55.0°, JN, PL, SM, FeOx, full iron staining, SA, contact with cobble 17.6: 35.0°, JN, PL, SM, Cl, SA	0 0 5 3 0		3 - 4				
20	20.0		2689.0														
	22.0	Continues very immature coarse SANDSTONE, angular gravel, abundant diabase clasts, moderate HCl reaction, calcite cement.	2687.0				100	50	75	18: 40.0°, JN x 2, PL, SM, Ca, partial iron staining, CC <1mm 18.9: 50.0°, JN, PL, RO, Ca, full iron staining, CC <1mm	3 0		3 - 4				
		As above.					93	51	80	20: 45.0°, JN, PL, RO, FeOx, partial iron staining, SA 20.3: 85.0°, JN x 2, PL, RO, FeOx, partial iron staining, SO 23.2: 63.0°, JN, PL, SM, FeOx, full iron staining, SA	0 1 5 5		3 - 4				
25	26.5		2682.5														
		As above, few cobbles, diabase dominant, weak HCl reaction.					100	70	100	24.4: 24.0°, JN, UN, RO, FeOx, full iron staining, SA, contact with cobble 24.6 - 25.5: very highly weathered and broken 28.6: 85.0°, JN, PL, RO, G, partial iron staining, PC 29.2: 65.0°, JN, PL, SM, G, full iron staining, IN >5mm 29.3 - 30.5: broken zone, highly weathered	0 0 1 8 0		3 - 4				
30	31.5		2677.5														
		As above.					100	73	100	32.4: 50.0°, JN x 2, PL, SM, FeOx, full iron staining, SA 33.9: 75.0°, JN, IR, RO, FeOx, full iron staining, SA 34.3: 72.0°, JN x 3, IR, RO, FeOx, full iron staining, SA 35: 65.0°, JN, UN, SM, MnOx, full iron staining, SA, contact with cobble 35.5 - 36.5: highly weathered, broken zone	0 2 1 3 6 5		3 - 4				
35	37.0		2672.0														
		As above, becoming more cobble rich.					100	50	50	37.6 - 38.2: broken weathered zone 39.4 - 40.3: many cobbles	4 2 6		3 - 4				
40																	

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-33 (GT-29)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 30, 2017 10:31
DRILLING END: January 30, 2017 10:31
COORDINATES: N: 842,391 E: 937,371

SHEET: 2 of 7
GS ELEV.: 2709.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0	As above, becoming more cobble rich. *(continued)*	2669.0							and weathered joints, at their contacts broken zone observed	3					
	42.0		2667.0				100	50	50	41 - 41.5: broken zone due to joints at cobble contacts, oxidized, weathered	5		3 - 4			
		As above, cobbley with many broken zones due to weathering.									>10					
											>10					
45							66	28	60		>10		3 - 4			
											>10					
	47.0		2662.0								>10					
		As above, very weathered, oxidized.									>10					
											>10					
50							40	0	14		>10		4 - 5			
	51.0		2658.0								>10					
	52.0	As above, large tuff cobble.	2657.0								>10					
		Continues SANDSTONE, very coarse, immature, competent, calcite cemented, massive.								53: 70.0°, JN, PL, SM, G, IN >5mm, contact of two cobbles, one weathered to clay	0		5			
										53.9: 36.0°, JN, UN, SM, MnOx, full iron staining, SA	2					
55							100	84	100	54.2: 60.0°, JN, IR, SM, FeOx, full iron staining, SA	1		3			
										55: 50.0°, JN, PL, SM, FeOx, partial iron staining, SA	1					
	57.0		2652.0								1					
		As above.								56.1: 70.0°, JN, PL, SM, Ca, partial iron staining, CC <1mm	0					
										58.5: 65.0°, JN, PL, SM, FeOx, partial iron staining, SA	9					
60							100	74	100	58.8 - 59.3: weathered and broken zone	3		3			
										61: 55.0°, JN, UN, RO, FeOx, partial iron staining, SA	0					
	62.0		2647.0								2					
		As above, poorly to moderately cemented.								61.5: 50.0°, JN, IR, SM, FeOx, partial iron staining, SA	0					
										63.2: 45.0°, JN, PL, RO, CN, partial iron staining	1					
65							100	80	100		0		3 - 4			
										65.7 - 66.7: 50.0°, JN x 7, PL, SM, FeOx, partial iron staining, SA	3					
	67.0		2642.0								4					
		Becomes very poorly cemented, weathered, and weak, resulting in broken zones.									0					
											0					
70							100	32	68		0		4 - 5			
										70: 45.0°, JN, UN, SM, CN, SA	2					
	72.0		2637.0							70.6: 30.0°, JN, PL, SM, Sa, full iron staining, SA, highly weathered wall rock	4					
		Continues SANDSTONE alternating between coarse and fine-grained intervals, highly fractured, weak to moderately cemented.								71 - 71.4: extremely weathered broken zone	0					
										73 - 74: 38.0°, JN x 4, UN, RO, FeOx, partial iron staining, SA	4					
75							100	36	62	74 - 74.6: weak and broken	6		4			
										75.1: 55.0°, JN, PL, SM, FeOx, partial iron staining, SA	6					
	77.0		2632.0							75.5: 40.0°, JN, IR, RO, FeOx, partial iron staining, SO	5					
		As above.								75.6 - 76.5: weak rock, broken zone	0					
										78.3: 35.0°, JN, PL, RO, MnOx, partial iron staining, SA	0					
80							80	28	46		2					

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-33 (GT-29)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 30, 2017 10:31
DRILLING END: January 30, 2017 10:31
COORDINATES: N: 842,391 E: 937,371

SHEET: 3 of 7
GS ELEV.: 2709.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6)	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0	As above. *(continued)*	2629.0				80	28	46	79: 20.0°, JN, ST, SM, MnOx, partial iron staining, SA 79.5: 25.0°, JN, IR, RO, MnOx, partial iron staining, SO	>10 >10					
	82.0	Becomes Apache Leap Tuff (Talg), mottled white and light brown TUFF intensely altered to clay, fine-grained, few lithics, euhedral biotite pheoncrysts.	2627.0							80 - 82: weak rock, broken zone	0					
85							100	100	100		0 0 0 0		5			
	87.0	Continues extremely weathered TUFF, mottled white and buff, altrered to clay, very few lithics.	2622.0								0					
90							72	72	72	90.5: 85.0°, JN, PL, SM, Cl, CC <1mm	0 0 1 0		4 - 5			
	92.0	Continues extremely weathered light pink TUFF, massive, crystal rich, lithic poor, fine euhedral and unweathered biotite, all feldspars altered to clay, no oxidation, no HCl reaction.	2617.0								0					
95							100	100	100		0 0 0 0		4 - 5			
	97.0	As above.	2612.0								0					
100							100	80	100	99.4 - 100.4: 50.0°, JN, UN, SM, Cl, IN >5mm, very weathered jointed zone	0 0 1 0		4 - 5			
	102.0	As above, mottled with rounded blebs of white tuff.	2607.0								0					
105							100	100	100	105.6: 60.0°, JN, PL, SM, CN	0 0 1 0		4 - 5			
	107.0	As above, slightly more lithics.	2602.0								0					
110							100	94	100	108.2: 55.0°, JN, PL, SM, CN 108.6: 40.0°, JN, PL, SM, CN 109.4: 55.0°, JN, PL, SM, FeOx, partial iron staining, SA	2 1 0 0		4 - 5			
	112.0	Continues mottled white and gray TUFF, highly weathered, few lithics, clay alteration, fairly fresh euhedral fine boitite.	2597.0								0					
115							100	100	100		0 0 0 0		4 - 5			
	117.0	As above.	2592.0							116.4: 45.0°, JN, PL, SM, CN	1 0					
120							100	100	100	118.6: 50.0°, JN, PL, SK, CN	1 0		4 - 5			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-33 (GT-29)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 30, 2017 10:31
DRILLING END: January 30, 2017 10:31
COORDINATES: N: 842,391 E: 937,371

SHEET: 4 of 7
GS ELEV.: 2709.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
120	120.0	As above. *(continued)*	2589.0														
	122.0		2587.0				100	100	100		0 0		4 - 5				
		As above.								122.6: 55.0°, JN, PL, SM, CN 123.3: 60.0°, JN, PL, SM, G, CC <1mm	1 1						
125							100	100	100	124: 55.0°, JN, PL, SM, CN	1 0 0		4 - 5				
	127.0		2582.0														
		As above.									0 0						
130							100	100	100		0 0		4 - 5				
	132.0		2577.0							131.2: 50.0°, JN, PL, SK, G, IN <5mm	0						
		As above.								132.6 - 133.2: weak, broken, and weathered 133.3: 30.0°, JN, PL, SK, Cl, CC <1mm	1 1						
135							100	82	100	134: 50.0°, JN, PL, SK, CN	1 0 0		4 - 5				
											0						
140							100	100	100		0 0 0		4 - 5				
	142.0		2567.0							141.3: 55.0°, JN, PL, SM, CN	1						
		Becomes pink, crystal rich TUFF, competent, less weathered but more fractured than above, more lithics, no oxidation.								142.5: 55.0°, JN, PL, RO, CN 142.8: 60.0°, JN, PL, SM, CN	2 >10						
145							100	56	100	143 - 144: broken zone 145.8: 87.0°, JN, PL, SM, FeOx, partial iron staining, SO	2 0		3 - 4				
	147.0		2562.0							146.5: 62.0°, JN, PL, RO, CN	0						
		As above.								146.7: 70.0°, JN, PL, RO, CN 148 - 150: 85.0°, MECH, UN, RO, CN, broken, many fractures orthogonal to core axis appear mechanical, no weathering on surface, sharp edges, etc.	0 0 0						
150							100	28	100		0		3				
	152.0		2557.0							150.4: 50.0°, JN, UN, RO, G, CC <1mm	1						
		As above.								151: 75.0°, JN, UN, SM, FeOx, partial iron staining, SO 153 - 154.2: broken zone, weathered, and weak	0 >10						
155							94	52	78	155: 10.0°, JN, UN, SM, G, CC <1mm 156: 30.0°, JN, IR, RO, Cl, PC	2 1 1		4				
	157.0		2552.0														
		Becomes completely weathered gray TUFF, massive, crystal rich, feldspars and groundmass altered to clay, no oxidaton.									0						
160							100	100	100		0 0		4 - 5				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-33 (GT-29)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 30, 2017 10:31
DRILLING END: January 30, 2017 10:31
COORDINATES: N: 842,391 E: 937,371

SHEET: 5 of 7
GS ELEV.: 2709.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
160	160.0		2549.0				100	100	100		0					
	162.0		2547.0								0		4 - 5			
		As above.									0					
										163: 55.0°, JN, PL, SK, Cl, PC	2					
165							100	64	100	163.2: 45.0°, JN, PL, SM, Cl, PC	6		4			
										164.4 - 165: broken zone, weak and weathered, some drill damage	0					
	167.0		2542.0								0					
		As above, mottled white and gray TUFF.								167.7: 30.0°, JN, PL, SM, G, IN >5mm	1					
											0					
170							80	80	80		0		4			
											0					
										171.1: 55.0°, JN, PL, SM, CN	1					
	172.0		2537.0								2					
		As above.								172.5: 60.0°, JN, PL, SM, CN	0					
										172.8: 80.0°, JN, PL, SM, CN	0					
175							100	91	98		>10		4 - 5			
										175 - 176: broken zone, weak rock	0					
	176.5		2532.5								1					
		As above.								177.3: 65.0°, JN, UN, SK, Cl, partial iron staining, CC <1mm	0					
											0					
180							92	92	92		0		4			
											0					
	181.5		2527.5								0					
		As above.									0					
										183: 15.0°, VNO, UN, SM, Si, IN >5mm, weathered out silica vein	5					
185							96	53	73	183.6 - 184.9: broken zone, weak	9		4			
										185.3: 25.0°, JN, PL, SK, Cl, CC <1mm	4					
	187.0		2522.0							185.6 - 186: broken	0					
		Becomes less weathered gray crystal rich TUFF, no lithics, weak fabric defined by phenocryst alignment, no oxidation, highly clay altered.									0					
										188: 25.0°, JN, UN, SK, G, IN >5mm	1					
190							100	100	100	189: 20.0°, JN, PL, SK, Cl, CC <1mm	1		3 - 4			
											0					
	192.0		2517.0								0					
		As above.									0					
											0		3 - 4			
195							100	52	82	194.5: 70.0°, JN, UN, RO, CN, partial iron staining, SO	1					
										195 - 196.3: broken zone in brittle weathered rock	>10					
	197.0		2512.0							196.5: 55.0°, JN x 2, PL, SM, CN	5					
		As above.									>10					
										197.2 - 199: broken zone	>10					
200							100	50	88	199.1: 60.0°, JN x 3, PL, SM, CN	4		3 - 4			
		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-33 (GT-29)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 30, 2017 10:31
DRILLING END: January 30, 2017 10:31
COORDINATES: N: 842,391 E: 937,371

SHEET: 6 of 7
GS ELEV.: 2709.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
200	200.0		2509.0													
		As above. *(continued)*					100	50	88	199.8: 70.0°, JN, PL, RO, G, PC	0		3 - 4			
	202.0		2507.0								0					
		Continues gray crystal rich TUFF, moderately weathered, moderate eutaxitic texture defined by flattened aligned inclusions of white tuff or possibly welded pumice.									0					
205							100	100	100	204.3: 55.0°, JN, PL, SM, G, PC	0		3			
	207.0		2502.0								1					
		As above.									0					
											0					
210							100	100	100		0		2 - 3			
											0					
	212.0		2497.0								0					
		As above, becomes slightly weathered.									0					
										213: 55.0°, VN, PL, Si, IN >5mm, closed vein	1					
215							100	100	100		0		2			
										215.5: 54.0°, VNO, PL, SM, Si, IN >5mm, joint along silica vein	1					
	217.0		2492.0								0					
		As above, more jointed.									0					
										218.5: 40.0°, JN, PL, SK, Cl, PC	1					
220							100	68	68	219 - 220: 10.0°, JN, UN, SK, Ca, CC <1mm	1		2 - 3			
										220 - 221.5: several low angle joints with slicks, create a broken zone	>10					
	222.0		2487.0							221.6: 48.0°, JN, PL, SK, G, IN >5mm	0					
		As above.								222.5: 20.0°, JN, UN, SK, G, partial iron staining, CC <1mm, calcite veins adjacent	0					
225							100	100	100	223.2: 40.0°, JN, PL, SK, Ca, partial iron staining, CC <1mm	1		2			
										224: 35.0°, VN, PL, Si, IN <5mm	0					
	227.0		2482.0							227.1: 50.0°, JN, PL, SK, Si, partial iron staining, CC <1mm	0					
		Continues massive, fresh, buff crystal rich TUFF, more lithic rich.								227.5: 43.0°, JN x 2, UN, SK, Si, partial iron staining, CC <1mm	4					
230							100	88	100	227.8: 27.0°, JN, UN, SK, Si, partial iron staining, CC <1mm	1		1 - 2			
										228.7: 55.0°, JN, UN, SK	0					
	232.0		2477.0								0					
		As above.									0					
											0					
235							100	100	100		0		2			
										235.6: 23.0°, JN, UN, SK, Cl, partial iron staining, CC <1mm	1					
	237.0		2472.0								0					
		As above.									0					
							100	100	100		0		1			
240										239.5: 55.0°, JN, UN, SM,	1					

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-33 (GT-29)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 30, 2017 10:31
DRILLING END: January 30, 2017 10:31
COORDINATES: N: 842,391 E: 937,371

SHEET: 7 of 7
GS ELEV.: 2709.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0		2469.0													
		As above. *(continued)*					100	100	100	CN	0					
	242.0		2467.0								0		1			
		As above.									0					
										243.4: 35.0°, JN, PL, SM, Si, partial iron staining, CC <1mm	1					
245							100	100	100		0		1			
										245.2 - 246: 15.0°, JN, UN, SM, Ca, CC <1mm	1					
	247.0		2462.0								0					
		As above.									0					
							100	100	100		0		1			
250	250.0		2459.0								0					
		Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram. Notes: 0 - 22: Hydro test #1 FHT 18 - 87: Hydro test #3 SI & GF 47 - 52: Lost circulation on this run. 57 - 87: Hydro test #2 SI & CRI 82 - 152: Hydro test #4a, b SI & CRI 151 - 250: Hydro test #5 SI														
255																
260																
265																
270																
275																
280																

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-34 (GT-27)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 17:00
DRILLING END: February 3, 2017 17:00
COORDINATES: N: 837,367 E: 937,530

SHEET: 1 of 7
GS ELEV.: 2648.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
0	0.0	Alluvium, loose, coarse sand to subrounded cobbles of schist, quartz, and diabase.	2648.0			1	0	0	0				3			
5	6.0		2642.0			2	75	15	15		>10 5		4			
		Gila Conglomerate (Tcg): tan, polylithic, CONGLOMERATE, clast supported, subrounded to subangular sand to gravel, clasts of diabase, vein quartz, schist, sandstone, and quartzite, sandy matrix, weak HCl reaction, competent.				3	100	60	84		>10 0 0 0 0		2 - 3			
10	11.0		2637.0													
		Poor recovery, redrill.				4	33	0	0							
15	14.0		2634.0													
		Gila Conglomerate (Tcg): tan, polylithic, CONGLOMERATE, clast supported, subrounded to subangular sand to gravel, clasts of diabase, vein quartz, schist, sandstone, and quartzite, sandy matrix, weak HCl reaction, competent.				5	100	76	96	17.45: 90°, B, PL, SM, Sa, IN >5mm 18.9: 30°, JN, IR, SM, FeOx, partial iron staining, PC, clast boundary with sand matrix, partial oxide coat	1 0 0 3 1		3			
	19.0		2629.0													
20		As above.				6	100	85	100	19.8: 90°, JN, IR, SM, FeOx, partial iron staining, PC 20: 30°, JN, PL, SM, FeOx, partial iron staining, PC	1 3 1 2		2 - 3			
	23.0		2625.0													
		As above.				7	100	100	100	22.6: 35°, JN, IR, SM, FeOx, partial iron staining, PC 24.15: 90°, JN, PL, SM, FeOx, partial iron staining, PC 24.5: 30°, JN, PL, SM, Hem, partial iron staining, PC	0 2 0 1		2			
25	28.0		2620.0							27.7: 35°, JN, IR, SM, FeOx, partial iron staining, PC	1					
		As above.				8	100	92	96	28.25 - 28.45: 90°, JN, IR, SM, FeOx, partial iron staining, PC 29.63: 90°, JN, PL, SM, MnOx, PC	1 1 1 0 0		2			
30	33.0		2615.0													
		As above.				9	100	60	85	33.5: 89°, JN, IR, SM, MnOx, PC, joint along foliated clast 34.7: 88°, FO, PL, SM, MnOx, PC, fractured along foliated clast	4 1 0 2		2			
35	37.0		2611.0													
		As above, weak HCl reaction.				10	60	30	38		>10 >10 3		2			
40										39.5 - 39.8: 90°, JN, IR, RO,						

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kerry Paul
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-34 (GT-27)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 17:00
DRILLING END: February 3, 2017 17:00
COORDINATES: N: 837,367 E: 937,530

SHEET: 2 of 7
GS ELEV.: 2648.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0	As above, weak HCl reaction. *(continued)*	2608.0			10	60	30	38	MnOx, partial iron staining, PC 40: 90°, JN, IR, SM, MnOx, partial iron staining, PC 40.2 - 41.2: 90°, JN, IR, SM, MnOx, partial iron staining, PC, lost matrix	9 0 2		2			
	42.0	As above.	2606.0			11	100	90	90	42.2: 90°, JN, IR, SM, FeOx, partial iron staining, PC 44: 65°, JN, PL, SM, MnOx, partial iron staining, PC	0 3		2			
45	44.0	As above.	2604.0			13	100	73	100	44.2: 90°, JN, PL, MnOx, PC 44.7 - 44.9: 90°, JN, IR, RO, MnOx, partial iron staining, SO	4 1		2			
	47.0	As above, no HCl reaction.	2601.0			14	100	98	100	45: 90°, JN, IR, SM, MnOx, partial iron staining, PC 45.7: 90°, JN, IR, SM, FeOx, partial iron staining, PC 45.8: 90°, JN, IR, SM, MnOx, PC 47.25: 90°, JN, IR, RO, MnOx, PC 47.8: 90°, JN, IR, RO, MnOx, SO	4 0 0 0 0		1 - 2			
50	52.0	As above.	2596.0			15	100	98	98		0 0 0 0 0		1 - 2			
55	57.0	As above.	2591.0			16	100	100	100		0 0 0 0 0		1			
60	62.0	As above.	2586.0			17	100	90	100	63.3: 70°, JN, IR, SM, MnOx, PC 63.75: 90°, JN, IR, SM, MnOx, PC 64.25: 35°, JN, IR, SM, CN	0 2 7 6		1 - 2			
65	64.0	As above.	2584.0			18	100	58	78	64.4 - 64.46: 90°, JN, IR, RO, MnOx, partial iron staining, SO 64.55 - 64.9: 30°, JN x 2 spaced at 0.4 ft, IR, SM, MnOx, PC 67.8: 55°, JN, PL, SM, MnOx, PC	0 1 0		2			
70	69.0	As above.	2579.0			19	100	88	88		0 0 0 0 0		2			
75	74.0	As above.	2574.0			20	100	100	100		0 0 0 0 0		1			
80	79.0 80.0	As above.	2569.0 2568.0			21	100	70	100	79 - 80: MECH, lost circulation: gummed up,	0		2			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kerry Paul
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-34 (GT-27)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 17:00
DRILLING END: February 3, 2017 17:00
COORDINATES: N: 837,367 E: 937,530

SHEET: 3 of 7
GS ELEV.: 2648.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
80	80.0	As above, weak HCl reaction.	2568.0			22	100	100	100	redrill	0 0 0		1					
	84.0		2564.0								0							
85	89.0	As above.	2559.0			23	100	100	100		0 0 0 0 0		1					
90	94.0	As above.	2554.0			34	100	100	100	89.25 - 89.3: 90°, B, PL, Cl, matte, IN >5mm, silty clay lense or bed	1 0 0 0 1		2					
95	96.0	As above.	2552.0			36	100	85	95	95.4: 90°, MECH, IR, SM, CN, matte, difficult drilling	0 2		1					
	97.0	As above.	2551.0			37	80	30	80	95.6 - 95.8: 90°, B, PL, SM, Cl, matte, IN >5mm	3		1					
100	102.0	As above.	2546.0			38	100	88	98	96.15: 20°, JN, IR, SM, FeOx, partial iron staining, SO 96.22: MECH, PL, RO, redrill 96.55: 30°, FO, PL, SM, CN 97.1: 90°, JN, IR, RO, MnOx, partial iron staining, PC 97.25: 90°, JN, IR, SM, MnOx, partial iron staining, PC	3 0 0 0 0		2					
	104.0	As above.	2544.0			39	100	75	100	97.51 - 97.58: 70°, JN x 2 spaced at 0.07 ft, IR, SM, MnOx, partial iron staining, PC	0 0		1					
105	109.0	Continues tan, polylithic, CONGLOMERATE, gravel to boulder clasts of diabase, vein quartz, schist, sandstone, and quartzite in sandy matrix, weak HCl reaction.	2539.0			40	100	76	88	107.5 - 107.8: 90°, JN, IR, RO, CN	0 0 0 3 0		1					
110	114.0	As above.	2534.0			41	100	96	96	108.9: 90°, JN, IR, RO, CN 111.5 - 111.7: 90°, JN, IR, RO, MnOx, PC 112: 90°, JN, IR, SM, CN	0 0 3 0 0		1					
115	119.0	As above.	2529.0			43	100	100	100		0 0 0 0 0		1					
120		As above.				44	100	100	100		0		1					

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kerry Paul
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-34 (GT-27)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 17:00
DRILLING END: February 3, 2017 17:00
COORDINATES: N: 837,367 E: 937,530

SHEET: 4 of 7
GS ELEV.: 2648.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
120	120.0	As above. *(continued)*	2528.0								0					
						44	100	100	100		0		1			
	124.0		2524.0								0					
125		As above.									0					
						45	100	100	100		0		1			
	129.0		2519.0								0					
130		As above.									0					
						46	100	100	100		0		1			
	134.0		2514.0								0					
135		As above.									0					
						47	100	100	100		0		1			
	139.0		2509.0								0					
140		As above.								139.2: 90°, FO, PL, SM, CN	1					
						48	100	96	100	140.6: FO, PL, SM, CN 140.75 - 140.95: VN, IR, RO, Ca, IN >5mm, calcite vein	1		1			
	144.0		2504.0								0					
145		As above.									0					
						49	100	100	100		0		1			
	149.0		2499.0								0					
150		As above, strong HCl reaction, some discontinuous coarse sand-sized voids with calcite infill.									0					
						50	100	100	100		0		1			
	154.0		2494.0								0					
155		As above, fewer micro-voids, moderate HCl reaction, with few thin fine sand interbeds.									0					
						51	100	100	100		0		1			
	159.0		2489.0								0					
160		As above, moderate to strong HCl reaction.				52	100	100	100		0		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kerry Paul
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-34 (GT-27)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 17:00
DRILLING END: February 3, 2017 17:00
COORDINATES: N: 837,367 E: 937,530

SHEET: 5 of 7
GS ELEV.: 2648.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
160	160.0	As above, moderate to strong HCl reaction. *(continued)*	2488.0			52	100	100	100		0 0 0		1			
	163.0	As above.	2485.0			53	100	100	100		0 0 0 0 0		1			
165	168.0	As Above.	2480.0			54	100	86	86	168.1 - 168.5: FLT, IR, RO, Cl, IN >5mm 171.7 - 171.8: 45.0°, FLT, IR, VR, Bx, IN >5mm	5 0 0 2 0		1			
170	173.0	As above.	2475.0			55	100	100	100	173.5: 72.0°, B, UN, RO, M, SA	1		1			
	174.0	As above.	2474.0			56	100	96	96	176.6 - 176.8: 85.0°, FLT, IR, VR, Bx, IN >5mm	0 0 3 0 0		1			
175	179.0	Continues Gila CONGLOMERATE, fresh, medium strong, clast supported in coarse sandy matrix, gravel is fine to coarse, subangular to subrounded, in coarse subangular sandy matrix, clasts of quartzite, schist, diabase, quartz, rhyolite, and limestone, moderate to strong HCl reaction, competent and massive.	2469.0			57	100	100	100		0 0 0 0 0		1			
180	184.0	As above, few cobbles.	2464.0			58	100	94	94	184.2 - 184.7: 75.0°, FLT, IR, VR, Bx, IN >5mm	6 0 0 0 0		1			
	189.0	As above, some cobbles, few small voids with calcite crystals.	2459.0			59	100	96	96	189.1 - 189.3: FLT, IR, VR, Bx, IN >5mm 191: 70.0°, JN, PL, SM, Cl, CC <1mm	3 0 1 0 0		1			
185	194.0	As above, massive and competent.	2454.0			60	100	100	100		0 0 0 0 0		1			
190	199.0	As above, few voids with calcite, pink tuff boulder.	2449.0			61	100	90	90	199.9 - 200: 85.0°, FLT, IR,	2		1			
195																
200		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kerry Paul
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-34 (GT-27)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 17:00
DRILLING END: February 3, 2017 17:00
COORDINATES: N: 837,367 E: 937,530

SHEET: 6 of 7
GS ELEV.: 2648.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
200	200.0	As above, few voids with calcite, pink tuff boulder. *(continued)*	2448.0			61	100	90	90	VR, Bx, IN >5mm 200.9 - 201.3: FLT, IR, VR, Bx, IN >5mm	4 0 0 0 0		1			
	204.0		2444.0													
205		As above.				62	100	98	98		0 0 0 0 0		1			
	209.0		2439.0							208.3 - 208.4: FLT, IR, VR, Bx, IN >5mm						
210		As above.				63	100	96	96	211: 80.0°, JN, IR, RO, Cl, CC <1mm 212.2 - 212.4: 80.0°, FLT, IR, VR, Bx, IN >5mm	0 0 1 2 0		1			
	214.0		2434.0													
215		As above.				64	100	100	100	215.1: 58.0°, JN, ST, RO, M, CC <1mm	0 1 0 0 0		1			
	219.0		2429.0													
220		As above.				65	100	100	100		0 0 0 0 0		1			
	224.0		2424.0													
225		As above.				66	100	100	100		0 0 0 0 0		1			
	229.0		2419.0													
230		As above, schist clast dominant.				67	100	100	100		0 0 0 0 0		1			
	234.0		2414.0													
235		As above, returns to polylithic, clasts of schist, tuff, diabase, rhyolite, quartzite, and limestone, interbed of matrix supported cobbles.				68	100	100	100		0 0 0 0 0		1			
	239.0		2409.0													
240		As above.				69	100	100	100		0		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kerry Paul
CHECKED: G Smith
REVIEWED: R Post

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02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-34 (GT-27)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 17:00
DRILLING END: February 3, 2017 17:00
COORDINATES: N: 837,367 E: 937,530

SHEET: 7 of 7
GS ELEV.: 2648.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0		2408.0													
		As above. *(continued)*				69	100	100	100		0					
											0		1			
											0					
	244.0		2404.0								0					
245		As above, with tuff boulder.				70	100	100	100		0					
											0		1			
											0					
	249.0		2399.0								0					
250						71	100	100	100		0		1			
		Bottom of borehole at 250.0 ft. Backfilled with cement grout. Notes: 0 - 19: Hydro test #1 FHT 11 - 14: Drill mislatch; lost core, redrill. 25 - 47: Hydro test #2 SI & GF 45 - 104: Hydro test #3 SI & GF 80 - 189: Hydro test #4 SI & CRI 185 - 250: Hydro test #5 SI														
255																
260																
265																
270																
275																
280																

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kerry Paul
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-35 (GT-30)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 09:32
DRILLING END: February 3, 2017 09:32
COORDINATES: N: 842,900 E: 933,749

SHEET: 1 of 7
GS ELEV.: 2710.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT
0	0.0	Colluvium, angular diabase gravel to cobbles, no fines.	2710.0			1	50	0	0		0
	2.0	Continues diabase colluvium, fines washed out.	2708.0			2	100	0	0		0
	3.0	DIABASE (pCdiab): dark gray, fine-grained, fractured with abundant FeOx staining and calcite veins.	2707.0			3	94	34	46	3.5: 19.0°, JN, UN, SM, FeOx, partial iron staining, SO 3.7: 30.0°, JN, PL, SM, Ca, partial iron staining, PC 3.8: 45.0°, JN, PL, SM, Ca, partial iron staining, PC	3 1 5
5	6.5	Becomes brecciated DIABASE, calcite cemented, hydrothermal breccia, highly fractured and oxidized.	2703.5			4	100	0	0	4.9: 30.0°, JN, PL, SM, Ca, partial iron staining, PC 5.2: 45.0°, JN x 3, PL, SM, Ca, partial iron staining, CC <1mm 5.4: 25.0°, JN, PL, SM, Ca, partial iron staining, CC <1mm	>10 >10 >10
	9.0	As above, broken zone.	2701.0			5	50	0	0		0
10	10.0	As above, broken zone continues in highly oxidized rock.	2700.0			6	100	0	0	5.8: 50.0°, JN, UN, SM, FeOx, partial iron staining, SO 6: 33.0°, JN, PL, SM, FeOx, partial iron staining, SO	>10 0
	11.5	Poor recovery, fracture zone continues in oxidized DIABASE.	2698.5			7	43	0	0	6.5 - 9: calcite cemented breccia and numerous calcite veins, heavily oxidized, broken zone 10 - 11.5: broken zone around calcite veins and weathered oxidized rock	0 0 0
15	15.0	Continues brecciated DIABASE, clast supported hydrothermal breccia, calcite infill, heavily oxidized.	2695.0			8	100	44	44	15 - 17.4: brecciated 16.4: 65.0°, JN x 3, PL, SM, Ca, full iron staining, CC <1mm 17.7: 65.0°, JN x 2, PL, SM, Ca, full iron staining, CC <1mm	3 2 0 2
	20.0	As above, with calcite cemented and oxidized gouge matrix.	2690.0			9	100	45	100	18 - 19: brecciated 19.3: 30.0°, JN x 2, PL, SM, Ca, full iron staining, CC <1mm 20.3: JN, IR, VR, G, partial iron staining, IN <5mm	0 1 1
20	22.0	As above.	2688.0			10	100	74	100	20.5: 85.0°, JN x 2, IR, VR, G, full iron staining, IN <5mm 20 - 22: breccia 21: 40.0°, JN, IR, RO, G, partial iron staining, IN <5mm 22.5: 60.0°, JN, PL, SM, G, partial iron staining, IN >5mm	1 2 3 2
	27.0	As above, with open voids containing crystallized calcite.	2683.0			11	100	60	100	23: 85.0°, JN, IR, RO, Ca, full iron staining, PC 24: 35.0°, JN, IR, SM, Ca, partial iron staining, PC 24.3: 75.0°, JN x 2, IR, SM, Ca, full iron staining, PC 25.2: 45.0°, JN, PL, SM, Ca, partial iron staining, IN <5mm 25.4: 20.0°, JN, PL, SM, FeOx, full iron staining, SA	>10 5 1 2 1
25	32.0	As above.	2678.0			12	100	100	100	25.6: 85.0°, JN, PL, SM, Ca, full iron staining, CC <1mm 26.2: 50.0°, JN, PL, RO, Ca, full iron staining, PC 26.8: 40.0°, JN, IR, RO, Ca, full iron staining, IN <5mm 27.3 - 28.4: broken zone, open voids, and calcite cemented breccia 28.4: 55.0°, JN, PL, SM, Ca, full iron staining, PC	0 1 1 2 0 2
	37.0	Becomes matrix dominant brecciated DIABASE, angular to subangular clasts, heavily oxidized matrix.	2673.0			13	100	80	100	29.4: 52.0°, JN, PL, SM, FeOx, full iron staining, SA 30: 60.0°, JN, PL, SM, FeOx, partial iron staining, SA 30.2: open void with large crystals of calcite	2 1 0
40		Log continued on next page									

ISRM Strength Index: ● AX. ☐ DIAM. ▲ UCS (ksi)
R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6

ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC	LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
3					
4					
3 - 4					
4					
3 - 4					
3 - 4					
4					

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-35 (GT-30)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 09:32
DRILLING END: February 3, 2017 09:32
COORDINATES: N: 842,900 E: 933,749

SHEET: 2 of 7
GS ELEV.: 2710.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0	Becomes matrix dominant brecciated DIABASE, angular to subangular clasts, heavily oxidized matrix. *(continued)*	2670.0			13	100	80	100	31.6: 50.0°, JN, PL, SM, Ca, partial iron staining, CC <1mm 33.9: 30.0°, PL, SM, FeOx, partial iron staining, SA	0 0		4			
	42.0	Becomes FAULT breccia, matrix supported, subrounded clasts, poorly cemented gouge matrix, heavily oxidized.	2668.0			14	84	38	52	34: 70.0°, JN, PL, RO, FeOx, full iron staining, SA 35.2: 65.0°, JN, PL, SM, Ca, full iron staining, IN >5mm, open void with calcite crystals 35.7: 50.0°, JN, PL, RO, G, partial iron staining, PC 37.5: 55.0°, JN x 2, PL, SM, FeOx, full iron staining, SA	0 2 0 0 1		4 - 5			
45	47.0	Becomes brown coarse-grained ophitic DIABASE with plagiolase lathes, heavily oxidized.	2663.0			15	90	78	90	38.1: 55.0°, JN, PL, SM, FeOx, full iron staining, SA 38.4: 55.0°, JN, PL, RO, G, full iron staining 39.7: 70.0°, JN, PL, RO, G, full iron staining, IN >5mm 40.5: 55.0°, JN, PL, RO, G, full iron staining, PC 44: 35.0°, JN, PL, SM, Ca, full iron staining, CC <1mm 44.5 - 47: broken weak matrix supported fault breccia	2 2 0 1 1		4			
50	52.0	Becomes brecciated, fine-grained DIABASE, oxidized calcite cemented matrix.	2658.0			16	100	92	100	47.6: 70.0°, JN, ST, SM, Ca, full iron staining, PC 48.2: 22.0°, JN, PL, SK, Cl, full iron staining, IN <5mm 48.5: 60.0°, JN, UN, SM, Ca, partial iron staining, CC <1mm 49.3: 50.0°, JN, PL, SK, Ca, full iron staining, CC <1mm	2 1 0 1 2		3 - 4			
55	57.0	Becomes coarse-grained ophitic DIABASE, minor brecciation and calcite veining.	2653.0			17	100	84	100	49.7: 37.0°, JN, UN, RO, Ca, partial iron staining, PC 50: 44.0°, VNO, PL, SM, Ca, partial iron staining, IN <5mm 52: 30.0°, VNO, PL, SM, Ca, IN <5mm 53.8: 50.0°, JN, UN, SM, Ca, partial iron staining, PC 54: 45.0°, JN, UN, SM, Ca, partial iron staining, PC	1 2 4 2 2		3			
60	62.0	As above.	2648.0			18	100	76	90	54.5: 60.0°, JN, PL, SM, Ca, full iron staining, CC <1mm 55: 80.0°, JN, PL, SM, Ca, full iron staining, PC 57.7: 87.0°, JN, IR, RO, FeOx, full iron staining, SA 58.1: 88.0°, IR, SK, FeOx, full iron staining, SA 58.8: 47.0°, UN, SM, FeOx, partial iron staining, SA	1 1 1 2 0		3			
65	67.0	Becomes brecciated DIABASE, fine-grained matrix, heavily oxidized with calcite veining.	2643.0			19	100	92	94	59.5: 75.0°, JN, PL, SM, FeOx, full iron staining, SA 61.1: 55.0°, JN, PL, SM, Cl, full iron staining, PC 61.2: 55.0°, JN, PL, SM, FeOx, full iron staining, SA 61.4: 55.0°, JN, PL, SM, Ca, full iron staining, PC 62.4: 80.0°, JN, UN, SM, Ca, full iron staining, PC 63.9: 40.0°, JN x 2, PL, SM, FeOx, partial iron staining, SO	2 0 1 1 2		3 - 4			
70	72.0	As above.	2638.0			20	100	100	100	64.1: 85.0°, JN, PL, SM, FeOx, full iron staining, SO 64.3: 75.0°, JN, PL, SM, FeOx, full iron staining, SA 64.5: 55.0°, x 2, UN, RO, FeOx, partial iron staining, SA 65.1: 62.0°, UN, RO, Ca, partial iron staining, PC	5 0 1 2 1		3 - 4			
75	77.0	As above, coarse calcite cemented matrix.	2633.0			21	100	80	100	65.5 - 66: 38.0°, JN, PL, SM, Ca, partial iron staining, IN <5mm, broken zone 66.2: 28.0°, JN x 2, PL, SM, FeOx, full iron staining, SA 67.7: 25.0°, JN, IR, RO, FeOx, full iron staining, SA	2 0 4		3 - 4			
80		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-35 (GT-30)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 09:32
DRILLING END: February 3, 2017 09:32
COORDINATES: N: 842,900 E: 933,749

SHEET: 3 of 7
GS ELEV.: 2710.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC	LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0		2630.0															
		As above, coarse calcite cemented matrix. *(continued)*				21	100	80	100	68.9: 75.0°, JN, IR, RO, FeOx, full iron staining, SA 69.8: 53.0°, JN, IR, RO, FeOx, full iron staining, SA 70: 45.0°, JN x 2, ST, SM, FeOx, full iron staining, SO 72.8: 38.0°, JN x 2, PL, SM, FeOx, partial iron staining, SA 74.1: 65.0°, IR, RO, FeOx, full iron staining, SA 75.3: 27.0°, JN, PL, SM, FeOx, full iron staining, SO 76: 40.0°, JN, UN, SM, FeOx, full iron staining, SO 76.7: 25.0°, JN, UN, SM, FeOx, full iron staining, SA 77.5 - 78: broken zone around coarse calcite infill 79: 76.0°, JN, IR, RO, Ca, full iron staining, SA 80.3: 77.0°, JN, IR, RO, FeOx, full iron staining, SA 80.6: 48.0°, JN, IR, RO, FeOx, full iron staining 81.4: 50.0°, JN, UN, RO, FeOx, full iron staining, SA 82.7: 65.0°, JN, IR, RO, FeOx, full iron staining, SA 84.4: 78.0°, JN, IR, RO, FeOx, partial iron staining, SO 86.3: 80.0°, JN, IR, RO, Ca, full iron staining, PC 90.3: 45.0°, JN, PL, SM, Ca, full iron staining, SA 90.8: 37.0°, JN, PL, SM, G, full iron staining, IN >5mm 93: 47.0°, JN, PL, SM, MnOx, partial iron staining, SO 93.5: 52.0°, JN, PL, SM, MnOx, partial iron staining, PC 95 - 95.3: broken zone in weakly cemented matrix 98.7: 74.0°, JN, PL, RO, FeOx, full iron staining, SO 99.8: 55.0°, JN, IR, RO, FeOx, full iron staining, SO 100.4: 60.0°, JN, PL, SM, G, partial iron staining, IN >5mm 101.3: 55.0°, JN, PL, SM, Bx, full iron staining, IN >5mm 102.5: 78.0°, JN, PL, RO, Cl, partial iron staining, PC 103.3 - 103.5: 80.0°, JN, PL, SM, G, full iron staining, IN >5mm 105: 54.0°, JN, IR, RO, G, partial iron staining, IN >5mm 106.2: 70.0°, JN, IR, RO, G, full iron staining, IN >5mm 106.5: 68.0°, JN, PL, RO, G, full iron staining, IN >5mm 107.5: 45.0°, JN, PL, SM, G, full iron staining, PC 108: 83.0°, JN, IR, RO, FeOx, full iron staining, SO 108.9: 65.0°, JN, PL, SM, G, full iron staining, IN >5mm 109.4: 60.0°, JN, IR, RO, Cl, full iron staining, PC 110.8 - 112: broken zone in weakly cemented breccia with clay rich matrix 115 - 116.5: broken zone, fractured diabase, oxidized fracture surfaces 116.5 - 117.5: broken	0 1 0 0 0 2 0 0 2 0 3 0 0 1 1 1 1 1 1 0 1 1 0 0 1 1 >10 >10 0 >10 >10 >10 >10		3 - 4				
	82.0		2628.0															
85		As above.				22	100	100	100				3 - 4					
	87.0		2623.0															
90		Becomes coarse-grained ophitic DIABASE with euhedral plagioclase lathes, heavily oxidized.				23	100	100	100				3 - 4					
	92.0		2618.0															
95		Becomes FAULT breccia, matrix dominant, subrounded diabase clasts, heavily oxidized.				24	100	92	100				4					
	97.0		2613.0															
100		As above.				25	100	94	100				4					
	102.0		2608.0															
105		As above.				26	100	88	100				4					
	107.0		2603.0															
110		FAULT, continues intermittant breccia, oxidized clay matrix, clast dominant.				27	100	76	82				4 - 5					
	112.0		2598.0															
115		FAULT, dark gray clay gouge, uncemented with fragments of solid diabase, very weak, completely weathered.				28	100	0	0				5					
	115.0		2595.0															
		Becomes fine-grained aphanitic dark green DIABASE with oxidized discontinuity surfaces, highly fractured.				29	100	0	0				3					
						30	100	0	0				3					
	118.5		2591.5			31	100	0	0									
		As above, highly fractured.				32	100	0	0				4 - 5					
120																		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-35 (GT-30)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 09:32
DRILLING END: February 3, 2017 09:32
COORDINATES: N: 842,900 E: 933,749

SHEET: 4 of 7
GS ELEV.: 2710.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE: DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC	LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
120	120.0		2590.0				20 40 60 80	20 40 60 80	20 40 60 80									
	121.0	As above, highly fractured. *(continued)*	2589.0			32	100	0	0		>10		4 - 5					
		As above.				33	100	0	0		>10		5					
	123.5		2586.5								>10							
		As above.				34	80	0	0		>10							
125	126.0		2584.0								>10		3 - 4					
		As above.				35	100	0	0		>10							
						36	100	0	0		>10		3 - 4					
130	130.0		2580.0								>10							
		As above, less fractured.				37	100	20	30		>10		3					
	132.0		2578.0							131.4: 55.0°, JN, PL, SM, FeOx, full iron staining, SO	>10							
		Becomes FAULT gouge and breccia, matrix dominant, weakly cemented, clay rich, rounded clasts of diabase.								131.6: 35.0°, JN, PL, SM, FeOx, full iron staining, SA	>10							
	134.4		2575.6			38	100	63	90	134.4: 68.0°, JN, PL, SK, Ca, partial iron staining, CC <1mm, contact between breccia and limestone	>10		5					
135		As above, includes clasts of limestone as well as fractured and weathered									0							
	136.0	limestone.	2574.0								0		3					
		Becomes Mescal Limestone (pCmls), rosey buff, fine-grained LIMESTONE with zones of breccia and intense calcite veining.									0							
											0							
						39	100	88	100	138.3: 40.0°, JN x 2, PL, SK, Ca, partial iron staining, CC <1mm	2		3					
140										139.7: 80.0°, JN, UN, SK, Cl, partial iron staining, CC <1mm	1							
	141.0		2569.0							140: 70.0°, JN, PL, SK, Cl, full iron staining, CC <1mm	2							
		As above.								140.8: 50.0°, JN, UN, RO, Cl, partial iron staining, PC	1							
										141.5: 40.0°, JN, PL, SK, Cl, full iron staining, IN >5mm	1							
						40	100	100	100		0		3					
145										142.2: 54.0°, JN, PL, SK, Cl, full iron staining, CC <1mm	1							
	146.0		2564.0							144.8: 34.0°, JN, UN, RO, G, full iron staining, IN <5mm	3							
		As above, contains intervals of breccia, some silicification.								145.4: 78.0°, JN, UN, RO, G, full iron staining, IN >5mm	1							
										145.6: 40.0°, JN x 2, PL, RO, G, full iron staining, IN >5mm	0							
						41	100	82	100		2		3 - 4					
150										146.2: 60.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm	2							
	151.0		2559.0							148: 60.0°, JN, PL, SK, G, partial iron staining, IN >5mm	1							
		Continues buff to pale green LIMESTONE, very competent, silty interbeds, variable bedding from medium to massive defined by color change.								148.3: 80.0°, JN, PL, SM, G, partial iron staining, IN >5mm, thick walls of clay gouge and breccia	1							
						42	100	100	100		1		3					
155										149: 75.0°, JN, PL, SM, G, partial iron staining, IN >5mm, thick walls of gouge and breccia	0							
	156.0		2554.0							149.7: 68.0°, JN, UN, SM, G, partial iron staining, IN >5mm	2							
		As above.								150: 60.0°, JN, UN, SM, Cl, partial iron staining, IN >5mm	1							
						43	100	88	100	151.7: 70.0°, JN, PL, SM, Cl, partial iron staining, PC	0		3 - 4					
160										152.5: 63.0°, JN, PL, SM, FeOx, partial iron staining,	2							
											6							

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DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-35 (GT-30)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 09:32
DRILLING END: February 3, 2017 09:32
COORDINATES: N: 842,900 E: 933,749

SHEET: 5 of 7
GS ELEV.: 2710.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
160	160.0	As above. *(continued)*	2550.0			43	100	88	100	SO 154.2: 68.0°, JN, UN, SM, Cl, partial iron staining, PC 154.9: 55.0°, JN, PL, SM, Cl, partial iron staining, IN >5mm 155.9: 65.0°, JN, PL, SM, Cl, partial iron staining, IN <5mm 156.5: 65.0°, B, PL, SM, Cl, partial iron staining, CC <1mm 158.8: 35.0°, JN, UN, SM, G, partial iron staining, IN >5mm 158.9 - 159.5: breccia and clay rich gouge zone 160: 25.0°, JN, PL, RO, G, partial iron staining, IN >5mm 160.7: 75.0°, JN, PL, SM, Cl, PC 162.4: 27.0°, JN, PL, SK, Cl, full iron staining, IN <5mm 162.8 - 163: 80.0°, B x 4, PL, SM, Cl, partial iron staining, PC 163 - 163.3: broken zone with gouge 164: 80.0°, JN, PL, SM, Cl, partial iron staining, PC 165: 78.0°, JN, PL, SM, G, partial iron staining, IN <5mm 165.7: 60.0°, JN, UN, SM, Cl, partial iron staining, CC <1mm 168: 76.0°, B, PL, SM, FeOx, partial iron staining, SA 168.6: 80.0°, JN, PL, SM, G, partial iron staining, IN >5mm 168.8: 77.0°, JN, PL, RO, G, partial iron staining, PC 169.3: 85.0°, JN, PL, SM, G, partial iron staining, IN >5mm 170 - 170.2: 55.0°, JN x 2, PL, SK, G, full iron staining, IN >5mm 170.5 - 171: 72.0°, B x 7, PL, SM, Cl, full iron staining, CC <1mm, joints along thin bedding 171.8: 75.0°, B, PL, SM, FeOx, partial iron staining, SO 172 - 173: 65.0°, B x 6, PL, SM, Cl, full iron staining, CC <1mm 173.5: 70.0°, B, PL, SM, Cl, full iron staining, CC <1mm 174: 70.0°, B, PL, SM, Cl, full iron staining, IN <5mm 174.6: 72.0°, JN, PL, SM, Cl, full iron staining, PC 175: 75.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm 175.9: 75.0°, JN, UN, SM, G, partial iron staining, IN <5mm 176 - 176.2: 80.0°, JN, PL, SM, G, partial iron staining, IN >5mm 176.3: 78.0°, B, PL, SM, Cl, CC <1mm 176.7 - 177.1: 82.0°, B x 4, PL, SM, Cl, CC <1mm 178.7 - 179: 79.0°, B x 4, PL, SM, Cl, partial iron staining, CC <1mm 179.5: 60.0°, JN, PL, SK, Cl, partial iron staining, CC <1mm 180.3: 60.0°, JN, PL, SK, Cl, full iron staining, CC	2 0 5 3 1 2 0 0 3 1 9 1 6 1 2 1 3 0 4 1 2 0 0 0 0 2 1 0 0 1 3 2 0 0 2 0 3 1 2 0		3 - 4			
165	166.0	As above.	2544.0			44	100	88	100				3 - 4				
170	171.5	Continues buff thinly bedded LIMESTONE with chert nodules and interbeds.	2538.5			45	91	55	91				3				
175	176.5	As above.	2533.5			46	100	74	94				3				
180	181.5	As above.	2528.5			47	100	72	100				3				
185	187.0	As above.	2523.0			48	100	89	100				3				
190	192.0	As above.	2518.0			49	100	88	100				3				
195	197.0	Continues buff, fine-grained LIMESTONE, heavily micro-fractured, with very hard siliceous interbeds.	2513.0			50	100	92	100				2 - 3				
200		As above.				51	100	88	100				3				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-35 (GT-30)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 09:32
DRILLING END: February 3, 2017 09:32
COORDINATES: N: 842,900 E: 933,749

SHEET: 6 of 7
GS ELEV.: 2710.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
200	200.0		2510.0															
		As above. *(continued)*				51	100	88	100	<1mm 180.6: 55.0°, JN, PL, SM, G, partial iron staining, IN	0		3					
	202.0		2508.0							>5mm 185.3: 68.0°, JN, PL, RO, Cl, partial iron staining, PC	3 0							
		Becomes brecciated LIMESTONE with limestone and siliceous clasts, siliceous cement, competent, variably oxidized.				52	100	100	100	185.5: 63.0°, JN x 2, UN, SK, Ca, partial iron staining, CC <1mm 186: 50.0°, JN, PL, SM, Ca, full iron staining, CC <1mm 189: 67.0°, JN, PL, SM, FeOx, full iron staining, SO	0 0 1 1		3					
205	207.0		2503.0							189.4: 76.0°, JN, PL, SM, G, IN >5mm	0							
		Continues silicified LIMESTONE and fault breccia, subrounded limestone clasts, heavily oxidized silica matrix, fine-grained and moderately cemented.				53	100	90	100	190: 40.0°, JN, PL, SM, G, partial iron staining, IN >5mm 190.5 - 190.7: gouge, broken zone 191: 82.0°, JN, PL, SM, Cl, partial iron staining, CC <1mm 191.6: 80.0°, JN, PL, SM, G, partial iron staining, CC <1mm	0 0 0 1 1		4					
210	213.0		2497.0							194.2: 57.0°, JN, PL, SM, Cl, full iron staining, CC <1mm	0							
		Becomes pink-gray, fine-grained LIMESTONE, medium to thinly bedded, with siliceous interbeds.				54	100	84	100	194.9: 75.0°, JN, PL, SM, FeOx, full iron staining, SA 196: 80.0°, JN, UN, SM, FeOx, partial iron staining, SO 196.7: 75.0°, JN, PL, SM, Cl, partial iron staining, PC 196.9: 75.0°, JN, PL, RO, Cl, partial iron staining, PC	1 2 2 2		3					
215	217.0		2493.0							197.8: 80.0°, JN, PL, SM, FeOx, full iron staining, SO	3							
		As above.				55	100	88	100	198.4: 80.0°, x 2, PL, RO, FeOx, full iron staining, SO 201: 67.0°, JN, PL, SK, Cl, full iron staining, CC <1mm 201.5: 50.0°, JN, UN, RO, G, full iron staining, IN <5mm 201.7: 70.0°, JN, PL, RO, FeOx, partial iron staining, SO	1 1 0 0		3 - 4					
220	222.0		2488.0							204: 35.0°, JN, PL, SK, Ca, CC <1mm	0							
		As above.				56	86	74	86	205: 45.0°, JN, IR, RO, Cl, partial iron staining, PC 210.8: 32.0°, JN, PL, SK, Ca, full iron staining, IN <5mm 211.5: 10.0°, JN, PL, SK, Ca, full iron staining, IN <5mm	3 3 1 3		3					
225	227.0		2483.0							213.5: 80.0°, JN, PL, RO, FeOx, partial iron staining, SO	0							
		As above.				57	100	86	100	214.2: 60.0°, JN, UN, SM, FeOx, partial iron staining, SO 214.8: 55.0°, JN, PL, SM, Cl, full iron staining, IN <5mm 215.1: 55.0°, JN x 2, PL, SM, FeOx, partial iron staining, SA	0 2 6 0		3					
230	232.0		2478.0							216: 33.0°, JN, PL, SK, Cl, full iron staining, PC	0							
		As above.				58	100	92	100	216.7: 65.0°, JN, PL, SM, FeOx, full iron staining, SO 217.2: 70.0°, JN, PL, SM, FeOx, partial iron staining, SA 217.4: 74.0°, JN, PL, SM, FeOx, full iron staining, SO 217.8: 75.0°, JN, PL, SM, Cl, full iron staining, PC	2 1 0 0		2 - 3					
235	237.0		2473.0							218.5: 85.0°, B, UN, SM, FeOx, partial iron staining, SO	0							
		As above.				59	100	98	100	219.6: 50.0°, JN, PL, SK, Cl, full iron staining, PC 223.2 - 223.5: 65.0°, B x 3,	2 1		2					
240		Log continued on next page																

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-35 (GT-30)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 09:32
DRILLING END: February 3, 2017 09:32
COORDINATES: N: 842,900 E: 933,749

SHEET: 7 of 7
GS ELEV.: 2710.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0	As above. *(continued)*	2470.0							PL, SM, Cl, full iron staining, CC <1mm	1					
	242.0		2468.0			59	100	98	100	224.1: 60.0°, B, PL, SM, FeOx, full iron staining, SO	1		2			
		As above.								224.4: 64.0°, B, UN, SM, FeOx, full iron staining, SO	0					
										224.9: 65.0°, B, PL, SM, FeOx, full iron staining, SO	1					
245						60	100	94	100	225.2: 55.0°, B, PL, SM, FeOx, full iron staining, SO	0		2			
										226 - 226.3: clay gouge zone						
										229.2: 75.0°, B, PL, SM, FeOx, full iron staining, SO	2					
	247.0		2463.0							229.7: 67.0°, B, PL, SM, FeOx, full iron staining, CC <1mm	1					
		As above.								230.1: 68.0°, JN, UN, SK, G, full iron staining, IN >5mm	1					
						61	100	100	100	230.6 - 231: 63.0°, B x 5, PL, SK, Cl, partial iron staining, PC	1		2 - 3			
250	250.0		2460.0							233.6: 65.0°, B, PL, SM, FeOx, partial iron staining, SO	1					
		Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram. Notes: 0 - 22: Hydro test #1 FHT 11.5 - 15: Poor recovery, core escaped core barrel into rods. 15 - 57: Hydro test #2 FHT 50 - 141: Hydro test #3 SI 137 - 250: Hydro test #4 SI								233.8: 58.0°, JN, PL, SM, Cl, CC <1mm						
										234.5: 63.0°, JN, UN, SK, Ca, full iron staining, IN <5mm						
255										238.2: 68.0°, B, PL, SM, Cl, partial iron staining, PC						
										238.7: 55.0°, JN, IR, RO, G, full iron staining, IN <5mm						
										239.8: 68.0°, B, PL, SM, FeOx, partial iron staining, SO						
260										240.8: 70.0°, JN, PL, SM, FeOx, partial iron staining, SO						
										242.8: 72.0°, B, PL, SM, FeOx, full iron staining, SO						
										244: 65.0°, JN, PL, SM, G, full iron staining, IN >5mm						
265										244.4: 70.0°, JN, PL, SM, Ca, full iron staining, CC <1mm						
										244.7: 70.0°, JN, PL, SM, Ca, full iron staining, IN <5mm						
										245.5: 70.0°, B, PL, SM, FeOx, full iron staining, SO						
270										246.2: 71.0°, B, PL, SM, G, full iron staining, CC <1mm						
										247.6: 77.0°, JN, PL, SM, FeOx, full iron staining, SO						
										248: 80.0°, JN, PL, SM, FeOx, full iron staining, SO						
275										249: 80.0°, B, PL, SM, G, full iron staining, IN >5mm						
280																

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-36 (GT-14-3)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 7, 2017 11:31
DRILLING END: February 7, 2017 15:59
COORDINATES: N: 838,433 E: 923,220

SHEET: 1 of 3
GS ELEV.: 2410.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	SOIL/ROCK PROFILE: DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
0	0.0	Surficial alluvium, silty sandy gravel, no recovery.	2410.0			1	0	0	0				6			
	2.0	Gila Sandstone (Tss): brown, moderately weathered, medium- to coarse-grained sand, subangular to angular, with trace fine to coarse gravel, clasts of quartzite, schist, quartz, diabase, and rhyolite, bedding defined by grain size changes, some small roots, strong HCl reaction.	2408.0			1	100	40	65	2: 82.0°, B, PL, SM, Sa, CC <1mm 2.1: 70.0°, B, IR, RO, Sa, CC <1mm 2.3: 79.0°, B, ST, RO, Cl, IN <5mm	8 2		3			
5	4.0	As above, clayey interbeds.	2406.0			2	100	84	94	2.4 - 2.9: 80.0°, FLT, IR, RO, Bx, IN >5mm 3: 85.0°, B, PL, SM, Cl, CC <1mm 3.2: 78.0°, JN, UN, VR, Sa, CC <1mm, small roots 4: 75.0°, JN, ST, RO, Cl, IN <5mm 6.9 - 7.1: 85.0°, B, PL, SM, Cl, IN >5mm, clay interbed	1 0 1 5 3		2			
	9.0		2401.0													
10	10.0	As above.	2400.0			3	100	70	100	7.5 - 7.55: 85.0°, B, PL, RO, R0 interbed, IN >5mm	2		2			
		As above.				4	100	100	100	8.2: 75.0°, JN, UN, RO, M, PC 8.35: 80.0°, B, UN, SM, M, CC <1mm 8.45: 85.0°, B, PL, SM, M, PC 10.9: 81.0°, B, UN, RO, Cl, IN <5mm 12.6: 80.0°, B, PL, SM, M, CC <1mm	1 0 2 1		1 - 2			
	14.0		2396.0													
15		As above.				5	100	70	94	12.9 - 13: 77.0°, B, UN, RO, Cl, IN >5mm, silt or clay interbed 13.7: 83.0°, B, PL, RO, Cl, IN <5mm 14.2: 80.0°, B, PL, RO, R0 siltbed, IN >5mm, 25-mm 14.6 - 14.7: 80.0°, B x 2, PL, SM, MnOx, PC, clay 15.1 - 15.2: 70.0°, B, UN, RO, Cl, IN >5mm, soft clay	4 4 2 4 0		3			
	19.0		2391.0													
20		As above.				6	100	66	70	15.5: 85.0°, B, UN, SM, Sa, PC, small roots 15.7: 82.0°, B, UN, SM, Sa, PC 16.8 - 16.9: 80.0°, B, UN, RO, R0 siltbed, IN >5mm 17.1: 80.0°, B, UN, RO, R0 siltbed, IN <5mm 17.4: 84.0°, B, PL, RO, Cl, IN >5mm, 10-mm	0 3 2 5 4		3			
	24.0		2386.0													
25		As above.				7	100	96	100	17.8: 82.0°, B, PL, SM, Sa, PC 20.1 - 20.2: 85.0°, B x 2, PL, RO, M, CC <1mm 20.8: 85.0°, B, PL, SM, M, IN >5mm, 10-mm 21.8 - 21.9: 80.0°, B x 2, PL, RO, M, IN <5mm 22.5 - 23.4: 85.0°, B, PL, SM, Cl, IN >5mm, soft clay or silt bed, extremely weak	0 0 0 1 2		2			
	29.0		2381.0													
30		As above.				8	100	96	96	27.2: 80.0°, B, UN, RO, M, IN <5mm 28.1: 85.0°, B, UN, RO, M, IN <5mm 28.4: 75.0°, B, UN, SM, M, IN <5mm 29.6 - 29.8: 85.0°, FLT, IR, RO, Sa, IN >5mm, some clay 30.3: 82.0°, B, PL, SM, M, IN <5mm	3 1 0 1 0		3			
	34.0		2376.0													
35		As above.				9	100	100	100	32.4: B, UN, RO, Cl, IN <5mm	0 0 0 0 0		2			
	39.0		2371.0													
40		As above.				10	100	96	100	39.1: 70.0°, B, UN, SM, Cl, IN <5mm	1		2			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-36 (GT-14-3)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 7, 2017 11:31
DRILLING END: February 7, 2017 15:59
COORDINATES: N: 838,433 E: 923,220

SHEET: 2 of 3
GS ELEV.: 2410.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS) (ksi) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0	As above. *(continued)*				10	100	96	100	40 - 40.2: 85.0°, B x 2, PL, RO, M, IN <5mm	2 0 0 0		2			
	44.0		2366.0													
45		As above.				11	100	100	100	45.9: 85.0°, B, PL, SM, Cl, IN <5mm	0 1 0 0 0		1 - 2			
	49.0		2361.0													
50		As above.				12	100	98	98	49.6 - 49.7: 85.0°, B x 2, ST, RO, M, CC <1mm	2 0 0 0 0		1			
	54.0		2356.0													
55		As above.				13	100	100	100	54.5: 85.0°, B, ST, SM, Cl, IN <5mm	1 0 0 0 0		1			
60	60.0		2350.0			14	100	100	100		0		2			
	61.5	Becomes highly weathered, extremely weak, fine sand to fine gravel with silty interbeds.	2348.5			14	100	0	0	60.1: 43.0°, JN, ST, VR, CN 60.15 - 61.5: B, extremely weak zone	>10 >10		4			
		As above.				14	100	100	100		0 0		3			
65						15	100	100	100	64.7: 85.0°, B, PL, SM, Cl, IN <5mm 66: 82.0°, B, PL, SM, M, CC <1mm 67.3: 77.0°, B, UN, RO, M, PC 67.8: 86.0°, B, PL, SM, M, CC <1mm	1 0 1 2 0		2 - 3			
	69.0		2341.0													
70		Becomes slightly weathered to fresh, zones of fine to coarse gravel, clasts of rhyolite, diabase, schist, quartzite, and gneiss.				16	100	100	100	73: 84.0°, B, ST, RO, M, IN <5mm	0 0 0 0 1		1 - 2			
	74.0		2336.0													
75		As above.				17	100	96	100	74.2: 88.0°, B, PL, SM, M, CC <1mm 75.1: 85.0°, B, PL, SM, M, IN <5mm 75.3: 85.0°, B, PL, SM, Cl, IN <5mm	1 2 0 0 0		1 - 2			
	79.0		2331.0													
80		As above.				18	100	100	100		0		1			
		Log continued on next page														

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-36 (GT-14-3)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 7, 2017 11:31
DRILLING END: February 7, 2017 15:59
COORDINATES: N: 838,433 E: 923,220

SHEET: 3 of 3
GS ELEV.: 2410.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
80	80.0		2330.0															
		As above. *(continued)*				18	100	100	100		0 0 0 0 0		1					
	84.0		2326.0															
85		As above.				19	100	100	100		0 0 0 0 0		1					
	89.0		2321.0															
90		As above.				20	100	100	100		0 0 0 0 0		1					
	94.0		2316.0															
95		As above.				21	100	96	96	95.3: 87.0°, B, PL, SM, M, CC <1mm 95.5: 88.0°, B, PL, RO, Cl, PC	0 2 0 0 0		1					
100	100.0		2310.0			22	100	100	100		0		1					
		Bottom of borehole at 100.0 ft. Completed as well. Refer to diagram. Notes: 0 - 10: Hydro test #1 FHT 15 - 100: Hydro test #2 SI																
105																		
110																		
115																		
120																		

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:34
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RECORD OF DRILLHOLE DH17-37 (GT-28)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 7, 2017 13:41
DRILLING END: February 7, 2017 13:41
COORDINATES: N: 839,358 E: 936,278

SHEET: 1 of 7
GS ELEV.: 2644.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
0	0.0	Colluvium, fines washed out, subangular to subrounded gravel to cobbles, polylithic but dominantly felsic volcanics, some quartz vein material.	2644.0													
						1	10	0	0							
5	5.0	Colluvium, unconsolidated subangular gravel to cobbles, fines are light brown silt with some sand, non plastic, moderate HCl reaction.	2639.0													
						2	17	0	0							
	8.0	Colluvium, unconsolidated multilithic subangular to subrounded cobbles and gravel, some fines which are coarse silty sands, strong HCl reaction.	2636.0													
10						3	25	0	0							
	11.0		2633.0													
	12.0	Becomes Gila Conglomerate (Tcg): gravel to cobble sized polylithic clasts of schist, tuff, and rhyolite, light brown fine-grained sand matrix, well cemented, no HCl reaction.	2632.0			4	100	40	40				3			
		As above.				5	60	40	40	15: 53.0°, JN, UN, SM, MnOx, partial iron staining, SO 15.4: 60.0°, JN, PL, SM, MnOx, partial iron staining, SO			2			
15	17.0		2627.0													
		As above, becomes more cobble rich, weak HCl reaction.				6	100	90	100	16: 70.0°, JN, PL, RO, MnOx, partial iron staining, SO 17.6: 84.0°, PL, SM, MnOx, partial iron staining, SO 18: 76.0°, JN, PL, SM, MnOx, partial iron staining, SO 18.5: 60.0°, JN, PL, RO, Cl, PC			2			
20																
	22.0		2622.0													
		As above, matrix becomes coarser sand, no HCl reaction.				7	100	80	92	19.1: 70.0°, JN, PL, RO, MnOx, partial iron staining, SO 20.5: 75.0°, JN, PL, RO, MnOx, partial iron staining, SO 21.5: 65.0°, JN, PL, SM, MnOx, partial iron staining, SO 21.7: 48.0°, JN, PL, SM, Cl, PC 22.4: 85.0°, JN x 2, PL, RO,			2			
25	27.0		2617.0													
		As above, clast dominant, weak matrix.				8	100	20	20	MnOx, partial iron staining, SO 23.6: 80.0°, JN x 2, PL, SM, MnOx, partial iron staining, SO	>10 >10		3			
	29.0		2615.0													
30		Continues Gila Conglomerate (Tcg), slightly weathered, weak, clast supported in sandy brown matrix, subrounded to subangular, clasts of diabase, tuff, schist, and quartzite, breaks easily along clast-matrix contact, weak HCl reaction.				9	100	100	100	24.5: 68.0°, JN, PL, RO, MnOx, partial iron staining, SO 25.2: 70.0°, JN, PL, RO, MnOx, partial iron staining, SO	0 0 0		2 - 3			
	32.0		2612.0													
		As above, moderate HCl reaction.				10	100	100	100	26: 80.0°, JN, PL, SM, MnOx, partial iron staining, SO 27 - 29: FLT, Bx, IN >5mm 35.7: 74.0°, JN, UN, RO, MnOx, SA	0 0 0 1 0		2 - 3			
35	37.0		2607.0													
		As above, weathered, weakly cemented matrix.				11	100	94	94	39.1 - 39.4: FLT, IR, RO, Bx, IN >5mm, weak, friable	0 0 0 4		3			
40																

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:35
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RECORD OF DRILLHOLE DH17-37 (GT-28)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 7, 2017 13:41
DRILLING END: February 7, 2017 13:41
COORDINATES: N: 839,358 E: 936,278

SHEET: 2 of 7
GS ELEV.: 2644.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC / LC	ADVANCEMENT RATE ft/min
40	40.0		2604.0														
		As above, weathered, weakly cemented matrix. *(continued)*				11	100	94	94	matrix	0 0		3				
	42.0		2602.0														
		As above.				12	100	100	100		0 0 0 0 0 0		3				
45	47.0		2597.0														
		As above.				13	100	100	100		0 0 0 0 0 0		2 - 3				
50	52.0		2592.0														
		As above.				14	100	100	100		0 0		2				
55						14	100	25	25	54 - 56: MECH, highly weathered, friable	>10 >10		4				
	57.0		2587.0			14	100	100	100		0		3				
		Becomes slightly weathered, weak, mostly massive, matrix supported, moderate HCl reaction.				15	100	100	100	58.8: 69.0°, JN, ST, RO, MnOx, SA	0 1 0 0 0		2				
60	62.0		2582.0														
		As above, with zone of extremely weak, poorly cemented, friable matrix.				16	100	96	96	65.1 - 65.3: 75.0°, JN x 2, IR, VR, MnOx, SA 66.1: 80.0°, JN, ST, RO, MnOx, SA	0 0 0 0 2 6		2				
65	67.0		2577.0			16	100	0	0	66.5 - 67: FLT, extremely weak, friable matrix			4				
		As above.				17	100	82	88	67.3: 85.0°, JN, IR, VR, MnOx, SA 67.5: 70.0°, JN, IR, VR, MnOx, SA 67.8 - 68.3: FLT, IR, VR, Bx, IN >5mm, some MnOx staining	5 4 0 0 0		3				
70	72.0		2572.0														
		Gila Conglomerate (Tcg), gray-brown, slightly weathered, weak, matrix supported, coarse gravel and cobbles in sandy matrix, clasts of diabase, schist, quartzite, and tuff, moderate HCl reaction.				18	100	100	100		0 0 0 0 0		2				
75	77.0		2567.0														
		As above, becomes highly weathered.				19	100	98	98		0 0		3				
80										79.6 - 79.7: FLT, IR, VR, Bx,	2						

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:35
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RECORD OF DRILLHOLE DH17-37 (GT-28)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 7, 2017 13:41
DRILLING END: February 7, 2017 13:41
COORDINATES: N: 839,358 E: 936,278

SHEET: 3 of 7
GS ELEV.: 2644.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0		2564.0													
		As above, becomes highly weathered. *(continued)*				19	100	98	98	partial iron staining, IN >5mm	0		3			
	82.0		2562.0								0					
		Becomes slightly weathered.				20	100	100	100		0		2			
	84.0		2560.0								0					
85		Becomes extremely to very weak, highly weathered, friable, with some rubble.				20	100	17	30	84 - 87: FLT, highly weathered, friable	>10		4			
	87.0		2557.0								>10					
		Becomes slightly weathered, weak, strong HCl reaction.				21	100	100	100		>10					
90											0		2			
											0					
											0					
	92.0		2552.0								0					
		As above.				22	100	80	86		0		2 - 3			
95											0					
											0					
	97.0		2547.0							96.3 - 97: FLT, IR, VR, friable	8					
		As above.				23	100	86	86	98.9: 80.0°, JN, IR, VR, FeOx, SA 99.1: 70.0°, JN, IR, VR, FeOx, SA	0		3			
100											1					
											1					
											0					
	102.0		2542.0							101.3 - 102.7: FLT, IR, RO, extremely weak, friable matrix and breccia	>10					
		Gila Conglomerate (Tcg): matrix poor, predominantly gravel, matrix is very brittle with few fines, breaks easily at clast contacts, strong HCl reaction, some FeOx staining.				24	100	84	84		>10		2			
105											0					
										105.4: 65.0°, JN, ST, RO, Sa, partial iron staining, PC 105.9 - 106: 80.0°, FLT, ST, VR, Bx, IN >5mm	0					
	107.0		2537.0								3					
		As above.				25	100	28	45	107 - 108: FLT, Bx, partial iron staining, IN >5mm 108.2: 90.0°, JN, IR, VR, partial iron staining 108.4: 85.0°, JN, IR, VR, partial iron staining 109 - 110: FLT, IR, VR, Bx, partial iron staining, IN >5mm	>10		3			
110											2					
											>10					
	111.0		2533.0								5					
		Becomes slightly weathered, weak to medium strong, matrix supported, silty sandy matrix, strong HCl reaction.				26	100	98	98	110.5 - 111: FLT, IR, RO, Bx, partial iron staining, IN >5mm, and sand 111.3: 80.0°, FLT, IR, RO, Bx, IN >5mm	2		2			
115											0					
											0					
	116.0		2528.0								0					
		As above.				27	100	100	100		0		2 - 3			
120											0					
											0					
											0					

Log continued on next page

DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION

FRAC PER FT

ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6

ISRM WEATHERING INDEX

FAULT BRECCIA /GOUGE

BC / LC BROKEN CORE /LOST CORE

ADVANCEMENT RATE ft/min

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:35
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RECORD OF DRILLHOLE DH17-37 (GT-28)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 7, 2017 13:41
DRILLING END: February 7, 2017 13:41
COORDINATES: N: 839,358 E: 936,278

SHEET: 4 of 7
GS ELEV.: 2644.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index: ● AX. ☐ DIAM. ▲ UCS (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
120	120.0		2524.0															
	121.0	As above. *(continued)*	2523.0			27	100	100	100		0		2 - 3					
		As above, zone of moderately to highly weathered rock, very weak, with extremely friable zones.				28	100	63	63		0 0 0		3 - 4					
	124.0		2520.0							123 - 124: FLT, extremely weak, friable	>10							
125		Becomes slightly weathered.				28	100	100	100		0 0		2					
	126.0		2518.0															
		As above.				29	100	100	100		0 0 0		2					
130										129.7: 60.0°, JN, PL, SM, M, PC	1 0							
	131.5		2512.5								0							
		As above.				30	100	100	100		0 0		2					
	134.0		2510.0															
135		As above, few small voids with calcite crystals.				31	100	100	100		0 0 0		2					
	137.5		2506.5								0							
		As above, becomes fresh, matrix supported.				32	100	100	100		0 0		1					
140	140.6		2503.4								2							
		As above, FeOx staining.				32	100	0	43	140.6 - 140.8: 85.0°, FLT, IR, RO, Bx, IN >5mm, with calcite	2		2					
	142.0		2502.0							141.1: 80.0°, JN, PL, SM, M, CC <1mm								
		Becomes clast supported, weakly cemented coarse sand matrix, weak iron staining.				33	100	100	100	141.2: 85.0°, JN, ST, RO, M, CC <1mm	0 0 0		2					
145											0 0							
	147.0		2497.0															
		As above, medium strong, moderate HCl reaction.				34	100	100	100		0 0 0		2					
150											0 0							
	152.0		2492.0															
		Becomes fresh, red brown to brown, matrix supported, strong HCl reaction.				35	100	100	100		0 0 0		1					
155											0 0							
	157.0		2487.0															
		As above.				36	100	100	100		0 0		1 - 2					
160											0							

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:35
P:\2015 PROJECTS\1531436 RCML NEAR WEST TSF GEOTECH\GINT\FINAL GINT PROJECTS\FINAL_OCTOBER 2017\NWTSF_FINAL_DRILLHOLE.GPJ

RECORD OF DRILLHOLE DH17-37 (GT-28)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 7, 2017 13:41
DRILLING END: February 7, 2017 13:41
COORDINATES: N: 839,358 E: 936,278

SHEET: 5 of 7
GS ELEV.: 2644.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index: AX. ☐ DIAM. ▲ UCS (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
160	160.0		2484.0													
		As above. *(continued)*				36	100	100	100		0		1 - 2			
	162.0		2482.0								0					
		As above.									0					
165						37	100	100	100		0		1			
											0					
	167.0		2477.0								0					
		As above.									0					
170						38	100	100	100		0		1			
											0					
	172.0		2472.0								0					
		As above, becomes clast supported, cobbly.									0					
175						39	100	100	100		0		1			
											0					
	177.0		2467.0								0					
		As above, few small voids with calcite infill.									0					
180						40	100	100	100		0		1			
											0					
	182.0		2462.0								0					
		As above.									0					
185						41	100	100	100		0		1			
											0					
	187.0		2457.0								0					
		As above.									0					
190						42	100	100	100		0		1			
											0					
	192.0		2452.0								0					
		As above.									0					
195						43	100	100	100		0		1			
											0					
	197.0		2447.0								0					
		As above.									0					
200						44	100	100	100		0		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF DRILLHOLE DH17-37 (GT-28)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 7, 2017 13:41
DRILLING END: February 7, 2017 13:41
COORDINATES: N: 839,358 E: 936,278

SHEET: 6 of 7
GS ELEV.: 2644.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index: ● AX. □ DIAM. ▲ UCS (ksi) R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
200	200.0	As above. *(continued)*	2444.0													
	202.0	As above.	2442.0			44	100	100	100		0 0		1			
205	207.0		2437.0			45	100	100	100		0 0 0 0 0 0		1			
		As above, becomes matrix supported, weak HCl reaction.				46	100	100	100		0 0 0 0 0 0		1			
210																
215	215.0		2429.0			47	100	100	100		0 0 0 0		1			
	217.0	Becomes clast supported Gila Conglomerate (Tcg), gray brown, angular to subangular clasts, predominantely cobbles, clasts of limestone, schist, quartzite, tuff, and diabase, matrix is fine gravel and coarse sand, strong HCl reaction, trace calcite crystals in small voids.	2427.0			47	100	100	100		0 0		1			
220		As above.				48	100	94	94	217.9 - 218.2: FLT, IR, RO, Bx, IN >5mm, with calcite crystals and trace FeOx staining	1 3 0 0 0		1			
	222.0	As above.	2422.0			49	100	100	100	225.6: 75.0°, FLT, IR, VR, Bx, IN <5mm, some calcite crystals	0 0 0 1 0		1			
225	227.0		2417.0													
		Becomes matrix supported, fresh, medium strong, weak HCl reaction.				50	100	100	100		0 0 0 0 0		1			
230	232.0		2412.0													
		Becomes clast supported, cobbly, strong HCl reaction.				51	100	100	100		0 0 0 0 0		1			
235	237.0		2407.0													
		As above.				52	100	100	100		0 0 0		1			
240																

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF DRILLHOLE DH17-37 (GT-28)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 7, 2017 13:41
DRILLING END: February 7, 2017 13:41
COORDINATES: N: 839,358 E: 936,278

SHEET: 7 of 7
GS ELEV.: 2644.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2, R3 3.62, R4 7.25, R5 14.5, R6 36.2	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0	As above. *(continued)*	2404.0			52	100	100	100		0					
	242.0		2402.0								0		1			
		As above.									0					
											0					
245						53	100	100	100		0		1			
											0					
	247.0		2397.0								0					
		As above.									0					
						54	100	100	100		0		1			
250	250.0		2394.0								0					
		Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram. Notes: 0 - 27: Hydro test #1 FHT 33 - 121: Hydro test #2 SI & CRI 67: Driller notes reduction in fluid returns. 82: Driller reports loss of circulation. 102 - 107: Driller reports loss of fluid returns. 113 - 250: Hydro test #3 SI														
255																
260																
265																
270																
275																
280																

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH17-37 (GT-28)
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RECORD OF DRILLHOLE DH17-38 (GT-22)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 8, 2017 12:00
DRILLING END: February 14, 2017 13:30
COORDINATES: N: 837,080 E: 927,269

SHEET: 1 of 7
GS ELEV.: 2406.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY %	RQD %	SOLID CORE RECOVERY %	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC LC	ADVANCEMENT RATE ft/min
0	0.0	Gravel and cobbles of FeOx stained quartzite, polylithic clasts of schist, quartzite, and volcanics at bottom of run.	2406.0			1	75	0	18	1.4 - 1.8: 57.0°, JN x 2 spaced at 0.4 ft, ST, SM, FeOx, partial iron staining, PC	2		5				
											>10		3				
	4.0		2402.0								>10						
5		Gila Conglomerate (Tcg): polylithic CONGLOMERATE, subrounded cobble sized clasts of quartzite, Pinal Schist, and marble, no HCl reaction, broken rubble zone.				2	80	16	16		>10		4				
	6.5		2399.5								>10						
		As above.				3	100	0	20		>10		4				
	8.0		2398.0								>10		4				
		As above.				4	33	0	0		0						
10											0						
	11.0		2395.0								1						
		Continues clast supported CONGLOMERATE, poorly sorted, subangular to subrounded polylithic clasts of quartzite, sandstone, and schist, calcareous matrix, strong HCl reaction.				5	100	87	100	11.9: 70.0°, JN, CU, SM, Cl, partial iron staining, CC <1mm	0		3				
	14.0		2392.0							13 - 13.2: 85.0°, JN x 2 spaced at 0.2 ft, UN, SM, Cl, CC <1mm	0						
		As above.									0						
15						6	100	72	88	14.3 - 14.7: 70.0°, JN x 3, UN, SM, Ca, SA	0						
										14.6: 50.0°, CONO, PL, SM, Ca, PC	0		3				
										15: 80.0°, JN, ST, SM, Ca, partial iron staining, SA	0						
	19.0		2387.0							15.7 - 16.2: 80.0°, JN x 3, UN, SM, FeOx, partial iron staining, PC	0						
		As above.								17.7 - 18.7: 70.0°, JN x 2 spaced at 1 ft, UN, RO, Ca, partial iron staining, SA	1						
20						7	100	68	70	19.5 - 20.4: 50.0°, JN x 2 spaced at 0.9 ft, ST, RO, FeOx, partial iron staining, SA	2						
										20.2: 54.0°, JN, UN, SM, CN, SO	4		1				
											3						
	24.0		2382.0								1						
		As above.								24.3: 58.0°, JN, UN, SM, Cl, partial iron staining, PC	1						
25											1						
						8	100	76	94	24.5 - 28.6: 82.0°, JN x 9, ST, RO, CN, partial iron staining, SA	2		1				
											0						
	29.0		2377.0								0						
		As above.								29.3: 59.0°, JN, PL, SM, CN, SO	0						
30										29.9: 90.0°, JN, UN, SM, Cl, partial iron staining, SA	0						
						9	100	76	86	31.3: 55.0°, JN, ST, SM, FeOx, partial iron staining, SA	2		1				
										31.9 - 32.2: 70.0°, JN x 2, UN, SM, CN, SO	3						
	34.0		2372.0							32.7 - 32.9: 48.0°, JN x 2 spaced at 0.2 ft, IR, SM, Cl, partial iron staining, SA	1						
		As above.								33.4: 80.0°, JN, PL, SM, CN, SO	2						
35										34.7 - 34.9: 75.0°, JN x 2 spaced at 0.2 ft, UN, SM, CN, SO	1						
						10	100	92	100	35.8: 80.0°, IR, RO, Cl, partial iron staining, PC	3		1				
										36.3: 90.0°, JN, UN, SM, CN, SO	2						
	39.0		2367.0							37.7 - 37.9: 65.0°, JN x 2 spaced at 0.2 ft, UN, SM, CN, SO	1						
40		As above.				11	100	90	100		1		1				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF DRILLHOLE DH17-38 (GT-22)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 8, 2017 12:00
DRILLING END: February 14, 2017 13:30
COORDINATES: N: 837,080 E: 927,269

SHEET: 2 of 7
GS ELEV.: 2406.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
40	40.0	As above. *(continued)*	2366.0			11	100	90	100	38.3: 85.0°, JN, IR, SM, CN, SO 39.5 - 42.9: 80.0°, JN x 6, IR, SM, CN, SO 43.2: 52.0°, JN, PL, SM, CN, full iron staining, SO	3 1 2 1		1			
45	44.0	Becomes matrix supported CONGLOMERATE, poorly sorted, subrounded to subangular clasts (~<.1-2 inches) of quartzite, arkose sandstone, poorly welded tuff, schist, FeOx volcanics, and chert, calcaerous cemented sandy matrix.	2362.0			12	100	76	82	46.4 - 48: 75.0°, JN x 7, UN, SM, Cl, partial iron staining, PC	0 0 4 3 0		2			
50	49.0	As above.	2357.0			13	100	90	90	50.2 - 52: 80.0°, JN x 2 spaced at 1.8 ft, IR, SM, CN, SO 53.7: 35.0°, JN, IR, SM, CN, SO	0 1 0 2 0		1			
55	54.0	As above.	2352.0			14	100	94	94	56.4: 70.0°, JN, IR, SM, CN, SO 58.3 - 58.7: 75.0°, JN x 2 spaced at 0.4 ft, IR, RO, CN, partial iron staining, SO	0 0 0 0 0		1			
60	59.0	As above.	2347.0			15	100	100	100	61.5: 62.0°, JN, IR, SM, Cl, partial iron staining, PC 63.5: 90.0°, JN, IR, RO, CN, SO	0 0 1 0 1		1			
65	64.0	As above.	2342.0			16	100	100	100	67.4: 45.0°, JN, IR, SM, CN, partial iron staining, SO 67.7 - 68.1: 70.0°, JN x 2 spaced at 0.4 ft, UN, SM, CN, partial iron staining, SO	0 0 0 2 1		1			
70	69.0	As above.	2337.0			17	100	100	100	73.4: 75.0°, JN, IR, SM, Cl, PC	0 0 0 0 1		1			
75	74.0	As above.	2332.0			18	100	100	100	77.2: 68.0°, JN, UN, SM, CN, partial iron staining, SO 78.4: 90.0°, JN, IR, SM, Cl, partial iron staining, SO	0 0 0 1 1		1			
80	79.0	As above.	2327.0			19	100	100	100		0		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF DRILLHOLE DH17-38 (GT-22)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 8, 2017 12:00
DRILLING END: February 14, 2017 13:30
COORDINATES: N: 837,080 E: 927,269

SHEET: 3 of 7
GS ELEV.: 2406.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 R2 3.62 R3 7.25 R4 14.5 R5 36.2 R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
80	80.0	As above. *(continued)*	2326.0			19	100	100	100	82.1: 90.0°, JN, UN, SM, CN, SO	0 0 1 0		1			
	84.0		2322.0													
85		As above, becomes clast supported.				20	100	100	100	85.6 - 87.6: 67.0°, JN x 4, UN, SM, CN, partial iron staining, SO	0 1 2 1 0		1			
	89.0		2317.0													
90		As above.				21	100	100	100	93.6: 52.0°, JN, UN, SM, CN, SO	0 0 0 0 1		1			
	94.0		2312.0													
95		As above.				22	100	84	84	94.1: 45.0°, JN, UN, SM, Cl, PC 95.3 - 97: 90.0°, JN x 2 spaced at 1.7 ft, IR, SM, Cl, partial iron staining, SA	1 1 1 0 0		1			
	99.0		2307.0													
100		As above.				23	100	84	88	99.3: 59.0°, JN, UN, SM, CN, partial iron staining, SA 99.8 - 102.5: 75.0°, JN x 5, IR, SM, CN, partial iron staining, SA	2 2 1 1 0		1			
	104.0		2302.0													
105		As above.				24	100	100	100	107.8 - 108.2: 70.0°, JN x 2 spaced at 0.4 ft, IR, SM, CN, SO	0 0 0 1 1		1			
	109.0		2297.0													
110		As above.				25	100	98	98	110 - 110.8: 63.0°, JN x 2 spaced at 0.8 ft, UN, SM, CN, SO	0 2 0 0 0		1			
	114.0		2292.0													
115		As above, cobble rich.				26	100	88	100	116.1 - 116.4: 76.0°, JN x 2 spaced at 0.3 ft, UN, SM, CN, SO 117.4: 52.0°, JN, PL, SM, CN, SO 117.8: 60.0°, JN, ST, SM, CN, SO	0 2 2 0		1			
	119.0		2287.0													
120		As above.				27	100	94	100	118.5 - 118.9: 80.0°, JN x 2 spaced at 0.4 ft, CU, SM,	0		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:35
P:\2015 PROJECTS\1531436 RCML NEAR WEST TSF GEOTECH\GINT\FINAL GINT PROJECTS\FINAL_OCTOBER 2017\NWTSF_FINAL_DRILLHOLE.GPJ

RECORD OF DRILLHOLE DH17-38 (GT-22)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 8, 2017 12:00
DRILLING END: February 14, 2017 13:30
COORDINATES: N: 837,080 E: 927,269

SHEET: 4 of 7
GS ELEV.: 2406.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. □ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC	BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
120	120.0	As above. *(continued)*	2286.0			27	100	94	100	CN, SO 120.2: 50.0°, JN, PL, SM, CN, SA 122 - 123.8: 80.0°, JN x 4, IR, RO, CN, partial iron staining, SA	1 0 2 2		1				
	124.0		2282.0														
125	129.0	Becomes matrix supported CONGLOMERATE, poorly sorted, subrounded to angular clasts, gravel to cobbles, clasts of quartzite, tuff, schist, and chert, weak HCl reation.	2277.0			28	100	96	96	126.5 - 127.9: 75.0°, JN x 4, IR, VR, Cl, partial iron staining, SA	0 0 1 3 0		2				
130	134.0	As above.	2272.0			29	100	100	100	129.8: 70.0°, JN, ST, SM, Cl, SA 130.7: 53.0°, JN, ST, SM, CN, SA 131.5 - 132.7: 73.0°, JN x 2 spaced at 1.2 ft, ST, SM, CN, SA	1 1 1 1 0		1				
135	139.0	As above.	2267.0			30	100	100	100	135.8 - 136.2: 66.0°, JN x 2 spaced at 0.4 ft, CU, SM, CN, partial iron staining, SA 137.6 - 138.6: 90.0°, JN x 2 spaced at 1 ft, UN, SM, CN, SO	0 1 1 1 1		1				
140	144.0	As above, becomes clast supported.	2262.0			31	100	100	100	140.6: 77.0°, JN, CU, SM, CN, partial iron staining, SA 143.3: 75.0°, JN, IR, SM, Cl, partial iron staining, SA	0 1 0 0 1		1				
145	149.0	As above.	2257.0			32	100	94	96	144.5: 53.0°, JN, IR, SM, CN, SA 145.3 - 146: CONO, IR, SM, Cl, IN >5mm	1 1 0 0 0		2				
150	154.0	As above.	2252.0			33	100	100	100	150.5 - 151.3: 75.0°, JN x 2 spaced at 0.8 ft, IR, SM, Cl, PC	0 1 1 0 0		1				
155	159.0	As above.	2247.0			34	100	100	100	157: 60.0°, JN, UN, SM, Cl, partial iron staining, CC <1mm 157.6 - 158.6: 68.0°, JN x 3, ST, SM, Cl, partial iron staining, PC	0 0 0 2 2		1				
160		As above.				35	100	100	100		0		1				

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:35
P:\2015 PROJECTS\1531436 RCML NEAR WEST TSF GEOTECH\GINT\FINAL GINT PROJECTS\FINAL_OCTOBER 2017\NWTSF_FINAL_DRILLHOLE.GPJ

RECORD OF DRILLHOLE DH17-38 (GT-22)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 8, 2017 12:00
DRILLING END: February 14, 2017 13:30
COORDINATES: N: 837,080 E: 927,269

SHEET: 5 of 7
GS ELEV.: 2406.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BROKEN CORE /LOST CORE	BC	LC	ADVANCEMENT RATE ft/min
160	160.0	As above. *(continued)*	2246.0															
	164.0		2242.0			35	100	100	100	160.9: 56.0°, JN, IR, SM, Cl, SA 162.3: 65.0°, JN, PL, SM, CN, SO	1 0 1 0		1				
165		As above.				36	100	100	100		0 0 0 0 0		1				
	169.0		2237.0															
170		As above, interbeds of coarse sandstone.				37	100	100	100	173.4: 65.0°, JN, CU, SM, CN, partial iron staining, SO	0 0 0 0 1		1				
	174.0		2232.0															
175		As above.				38	100	98	98	175.2: B, PL, SM, Cl, partial iron staining, IN >5mm	0 1 0 0 0		1				
	179.0		2227.0															
180		As above.				39	100	100	100		0 0 0 0 0		1				
	184.0		2222.0															
185		Continues clast supported CONGLOMERATE, poorly sorted, subrounded to angular clasts, gravel to cobbles, clasts of quartzite, tuff, schist, and chert, weak HCl reation.				40	100	100	100	187: 60.0°, JN, CU, SM, CN, partial iron staining, SO	0 0 0 0 0		1				
	189.0		2217.0															
190		As above.				41	100	94	94	193 - 193.6: 51.0°, JN x 2 spaced at 0.6 ft, CU, SM, Cl, partial iron staining, PC	0 1 1 1 2		1				
	194.0		2212.0															
195		As above.				42	100	100	100	196: 63.0°, JN, UN, SM, CN, partial iron staining, SO	0 0 1 0 0		1				
	199.0		2207.0															
200		As above.				43	100	100	100		0		1				
		Log continued on next page																

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:35
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RECORD OF DRILLHOLE DH17-38 (GT-22)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 8, 2017 12:00
DRILLING END: February 14, 2017 13:30
COORDINATES: N: 837,080 E: 927,269

SHEET: 6 of 7
GS ELEV.: 2406.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS (ksi)): R1 0.725, R2 3.62, R3 7.25, R4 14.5, R5 36.2, R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
200	200.0	As above. *(continued)*	2206.0													
	204.0		2202.0			43	100	100	100	202.8: 56.0°, JN, ST, SM, Cl, partial iron staining, PC	0 0 1 0		1			
205	209.0	As above.	2197.0			44	100	90	100	205.7 - 205.9: 73.0°, JN x 2 spaced at 0.2 ft, UN, RO, CN, SO 208.2 - 208.5: 63.0°, JN x 2 spaced at 0.3 ft, UN, SM, Cl, partial iron staining, SA	0 2 0 0 2		1			
210	214.0	As above.	2192.0			45	100	100	100	209.4: 64.0°, JN, CU, SM, CN, partial iron staining, SO 212.1: 54.0°, JN, PL, SM, Cl, partial iron staining, SA	0 0 0 0 0		1			
215	219.0	As above.	2187.0			46	100	100	100	217.6: 75.0°, JN, IR, RO, CN, partial iron staining, SO	0 0 0 0 0		1			
220	224.0	As above, cobble-rich.	2182.0			47	100	100	100	219.7: 70.0°, JN, PL, SM, CN, SO 220.9: 47.0°, JN, ST, SM, CN, partial iron staining, SO 223.8: 47.0°, CON, PL, SM, CN, SO	1 1 0 0 1		1			
225	229.0	As above.	2177.0			48	100	100	100	227.3: 71.0°, JN, IR, VR, Cl, SA	0 0 0 1 0		1			
230	234.0	As above.	2172.0			49	100	96	96	232: 60.0°, VNO, ST, SM, Cl, SA	0 0 0 1 0		1			
235	239.0	As above.	2167.0			50	100	100	100	237: 35.0°, JN, IR, RO, CN, SO	0 0 0 1 0		1			
240		As above.				51	100	100	100		0		1			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:35
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RECORD OF DRILLHOLE DH17-38 (GT-22)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 8, 2017 12:00
DRILLING END: February 14, 2017 13:30
COORDINATES: N: 837,080 E: 927,269

SHEET: 7 of 7
GS ELEV.: 2406.0
TOC ELEV.: na
DATUM:

B-Bedding, J-Joint, FLT-Fault, SHR-Shear, VN-Vein, CON-Contact; VNO-Vein Open, CONO-Contact Open, HVN-Healed Vein, FO-Foliation, FOLO-Foliation Open, MECH-Mechanical; PL-Planar, CU-Curved, UN-Undulating, ST-Stepped, IR-Irregular; PO-Polished, SK-Slickensided, SM-Smooth, RO-Rough, VR-Very Rough; Bx-Breccia, Ca-Calcite, Chl-Chlorite, Cl-Clay, CN-Clean, G-Gouge; Sa-Sand, Si-Silica, Qtz-Quartz, M-Silt, Hem-Hematite, FeOx-Iron Oxide; MnOx-Manganese Oxide, SO-Staining Only, SA-Surface Alteration, PC-Partially Coated, CC-Completely Coated, IN-Infilled

DEPTH (ft)	SOIL/ROCK PROFILE: Depth	DESCRIPTION	Elev	GRAPHIC LOG	BORING METHOD	RUN NO.	CORE RECOVERY % (20 40 60 80)	RQD % (20 40 60 80)	SOLID CORE RECOVERY % (20 40 60 80)	DISCONTINUITY DATA: DEPTH, DIP ANGLE FROM CORE AXIS, TYPE, AND SURFACE DESCRIPTION	FRAC PER FT	ISRM Strength Index (● AX. ☐ DIAM. ▲ UCS) (ksi) R1 0.725 / R2 3.62 / R3 7.25 / R4 14.5 / R5 36.2 / R6	ISRM WEATHERING INDEX	FAULT BRECCIA /GOUGE	BC / LC / BROKEN CORE /LOST CORE	ADVANCEMENT RATE ft/min
240	240.0		2166.0													
		As above. *(continued)*				51	100	100	100	240.8 - 241.3: 55.0°, JN x 2 spaced at 0.5 ft, PL, SK, CI, SA	1 1 0 0		1			
	244.0		2162.0													
245		As above.				52	100	98	98	245.6 - 248.6: 62.0°, JN x 2 spaced at 3 ft, UN, SM, CN, SO	0 1 0 0 1		1			
	249.0		2157.0													
250	250.0	As above.	2156.0			53	100	100	100	249.3: 63.0°, JN, UN, SM, CN, SO	1		1			
		Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram. Notes: 0 - 16: Hydro test #1 FHT 24 - 129: Hydro test #2 SI 124 - 250: Hydro test #3 SI 184 - 250: Hydro test #4 SI														
255																
260																
265																
270																
275																
280																

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012_01_22B E-M.GPJ - 10/24/17 12:35
P:\2015 PROJECTS\1531436 RCML NEAR WEST TSF GEOTECH\GINT\FINAL GINT PROJECTS\FINAL_OCTOBER 2017\NWTSF_FINAL_DRILLHOLE.GPJ

APPENDIX A-2
CORE BOX PHOTOGRAPHS (CD INCLUDED)

DH16-01 (GT-14)

HQ EZ-BOX
WWW.COREBOX.COM

WAX IMPREGNATED

DH16-01 (GT-14)
0 - 11.0 ft
Box: 1
9/22/16 M0944IA18
RCHL NEAR WEST TSF

1.5

SAMPLE
42 - 7.0

8.5

LOCATION: near west

DH16-01 (GT-14)
11.0-21.0 ft
Box: 2
9/22/16 M0944IA18
RCAL NEAR WEST TSF

HQ EZ-BOX
WWW.COREBOX.COM

WAX IMPREGNATED

Coeur Products

DH16-01 (GT-14)
21.0-30.5 ft
Box: 3
9/22/16 M09441A18
RCML NEAR WEST TSF

HQ EZ-BOX
WWW.COREBOX.COM

23

28


BOX # 4
FROM: 30.5
TO: 39.4
LOCATION: near west
DH16-Ø1 (GT-14)
30.5-39.4 ft
Box: 4
9/22/16 MØ9441A18
RCML NEAR WEST TSF
HQ EZ-BOX
WWW.COREBOX.COM
HQ DIVIDER
33
34
39

DH16-01 (GT-14)
39.4-49.0 ft
Box: 5
9/22/16 M09441A18
RC/L NEAR WEST TSE

HQ EZ-BOX
WWW.COREBOX.COM

13

8H

DH16-01(GT-14)
49.0-58.5 ft
Box: 6
9/22/16 M09441A18
RCML NEAR WEST TSE

HQ EZ-BOX
WWW.COREBOX.

THIS SIDE UP

53

54

56

58

LOCATION: NW TSE

DH16-01 (GT-14)
58.5-67.9 ft
Box: 7
9/22/16 M09441A18
RCML NEAR WEST TSE

LOCATION: NW TSF

DH16-01 (GT-14)
67.9-77.0 ft
Box: 8
9/22/16 M09441A18
RCML NEAR WEST TSF

HQ EZ-BOX

THIS SIDE UP

DH16-01 (GT-14)
77.0-86.4 ft
Box: 9
9/22/16 M0944IA18
RCML NEAR WEST TSF

HQ EZ-BOX
WWW.COREBOX.CO




DH16-Ø1 (GT-14)
86.4-95.6 ft
Box 10
9/22/16 MØ9441A18
RCML NEAR WEST TSF

DH16-01 (GT-14)
95.6-105.0ft
Box 11
9/22/16 M09441A18
RCML NEAR WEST TSF

HQ EZ-BOX
WWW.COREBOX.COM



DH16-01 (GT-14)
105.0-114.4 ft
Box 12
9/22/16 M09441A18
RCML NEAR WEST TSE

HQ EZ WWW

BOX NO:

THIS SIDE UP

DRILL # P
BOX # 14


DH16-Ø1 (GT-14)
114.4-123.5 ft
Box 13
9/22/16 MØ9441A18
RCML NEAR WEST TSF
AX IMPREGNATED
Products
118
123

TO: 132.9
LOCATION: NW TSF

DH16-01 (GT-14)
123.5 - 132.9 ft
Box 14
9/22/16 M09441A18
RCMC NEAR WEST TSF

HQ EZ-BOX
WWW.COREBOX.COM

IMPREGNATED

128

130


DH16-Ø1 (GT-14)
132.9-142.0 ft
Box: 15
9/23/16 MØ9441A18
RCML NEAR WEST TSF
HQ EZ-BOX
WWW.COREBOX.COM
133
134
135
136
137
138
139
140
141

DH16-01 (GT-14)
142.0 - 151.4 ft
Box: 16
9/23/16 M09441A18
RCML NEAR WEST TSF

HQ EZ-BOX
WWW.COREBOX.CO



DH16-01 (GT-14)
151.4-160.9 ft
Box: 17
9/23/16 M09441A18
RCML NEAR WEST TSF

153

158

160

HQ EZ-BOX
WWW.COREBOX.COM

DH16-01 (GT-14)
160.9-170.0 ft
Box: 18
9/23/16 M09441A18
RCML NEAR WEST TSF



DH16-01 (ST-14)
170.0-179.5 ft
Box:19
9/23/16 MØ9444A18
RCML NEAR WEST TSF

HQ
WWW.COREBOX.COM

HQ EZ-BOX
WWW.COREBOX.COM

DH16-01 (GT-14)
179.5-189.0 ft
Box: 20
9/23/16 M09441A18
RCML NEAR WEST TSF

HQ EZ-BOX
WWW.COREBOX.COM

WAX IMPREGNATED





HQ EZ-BOX
WWW.COR

DH16-01 (GT-14)
189.0-198.4 ft
Box: 21
9/23/16 M09441A18
RCML NEAR WEST TSF

HQ EZ-BOX
WWW.COREBOX.COM



DH16-01 (GT-14)
198.4-208.2 ft
Box 22
9/23/16 M09441A18
RCML NEAR WEST TSF

HQ EZ-BOX
WWW.COREBOX.COM



DH16-01 (GT-14)
208.2-218.0 ft
Box: 23
9/23/16 M09441A18
RCML NEAR WEST TSF

HQ EZ-BOX
WWW.COREBOX.COM



DH16-01 (GT-14)
218.0-227.4 ft
Box: 24
9/23/16 M09441A18
RCML NEAR WEST TSF

HQ EZ-BOX
WWW.COREBOX.COM

DH16-01 (GT-14)
227.4-236.8ft
Box: 25
9/23/16 M09441A18
RCML NEAR WEST TSF

DH16-01 (GT-14)
2368-246.3 ft
Box: 26
9/23/16 M09441A18
RCML NEAR WEST TSF

DH16-01 (GT-14)
246.3 - 255.4 ft
Box: 26
9/23/16 M09441A18
RCML NEAR WEST TSF



DH16-01 (GT-14)
255.4-264.4 ft
Box: 28
9/23/16 M09441A18
RCML NEAR WEST TSF

DH16-01 (GT-14)
2644-273.8 ft
Box: 29
9/23/16 M09441A18
RCML NEAR WEST TSF

DH16-01 (GT-14)
273.8-283.0 ft
Box: 30
9/24/16 M09441A18
RCML NEAR WEST TSF

THIS SIDE UP

DH16-01 (GT-14)
283.0-292.6 ft
Box: 31
9/24/16 M09441A18
RCML NEAR WEST TSF

DH16-01(GT-14)
292.6-302.0 m
Box: 32
9/24/16 M09441A18
RCML NEAR WEST TSF

DH16-01 (GT-14)
302.0-311.3 ft
Box: 33
9/24/16 M09441A18
RCML NEAR WEST TSF

303
304
305
306
307
308
309
310
311

DH16-01 (GT-14)
311.3-320.7 ft
Box: 34
9/24/16 M09441A18
RCML NEAR WEST TSF

To re-order call: 208-762-1376
Visit our website at www.corabox.com

DH16-01 (GT-14)
320.7-330.0ft
Box: 35
9/24/16 M09441A18
RCML NEAR WEST TSF

DH16-01 (GT-14)
330.0-339.2ft
Box: 36
9/24/16 M09441A18
RCML NEAR WEST TSF

330
331
332
333
334
335
336
337
338
339

DH16-01 (GT-14)
339.2-348.2ft
Box: 37
9/25/16 M09441A18
PCML NEAR WEST TSF

DH16-01 (GT-14)
348.2-357.7 ft
Box: 38
9/25/16 M09441A18
RCML NEAR WEST TSF

DH16-01(GT-14)
357.7-367.3 ft
Box: 39
9/25/16 M09441A18
PCML NEAR WEST TSF

358
359
360
361
363
364
365
366
361

DH16-01 (GT-14)
357.7-367.3 ft
Box: 39
9/25/16 M09441A18
PCML NEAR WEST TSF

358
359
360
361
362
363
364
365
366
367

DH16-01 (GT-14)
367.3-376.5 ft
Box: 40
9/25/16 M09441A18
RCML NEAR WEST TSF

DH16-01 (GT-14)
376.5-385.7 ft
Box: 41
9/25/16 MU9441AIR
RCML NEAR WEST TSF

DH16-01 (GT-14)
385.7-394.8 ft
Box: 42
9/25/16 M09441A18
PCML NEAR WEST TSF

DH16-01 (GT-14)
394.8-404.0 ft
Box: 43
9/25/16 M09441A18
RCML NEAR WEST TSF

394
395
396
397
398
399
400
401
402
403
404


DH16-Ø1 (GT-14)
404.0-412.7
Box: 44
9/25/16 MØ9441A18
RCML NEAR WEST TSF
405
406
407
408
409
410
411
412

DH16-01 (GT-14)
412.7 - 421.0 ft
Box: 45
9/25/16 M09441A18
RCML NEAR WEST TSF

413
414
415
416
417
418
419
420
421

DH16-01 (GT-14)
421.0 - 429.7 ft
Box: 46
9/26/16 M09441A18
RCML NEAR WEST TSF



DH16-01 (GT-14)
429.7-438.9 ft
Box: 47
9/26/16 M09441A18
RCML NEAR WEST TSF

TO: 47
BOX NO:

438.9 to ~448 ft.

DH16-01 (GT-14)
438.7-441.0 ft
Box: 48
9/26/16 MU9441A13
RCML NEAR WEST TSF

~448 to 451 ft.

DH16-01 (GT-14)
4410-451.0 ft
Box: 49 EOH
9/26/16 M09441A18
RCML NEAR WEST TSF

449

450

DH16-02 (GT-08)

DH16-02 (GT-8)
0.0-16.4ft
Box: 1
9/28/16 M09441A18
RCML NEAR WEST TSF

DH16-02 (GT-8)
164-260 ft
Box: 2
9/28/16 M09441A18
RCML NEAR WEST TSF


DH16-02 (GT-8)
26.0-35.0 ft
Box: 3
9/28/16 M09441A18
RCML NEAR WEST TSF


THIS SIDE UP
DH16-02 (GT-8)
260-350 ft
Box: 3
9/28/16 M09441A18
RCML NEAR WEST TSF

DH16-02 (GT-8)
35-44.5 ft
Box: 4
9/28/16 M09441A18
RCML NEAR WEST TSF

DH16-02 (GT-8)
44.5 – 53.5 ft
Box: 5
9/28/16 M09441A18
RCML NEAR WEST TSF

DH16-02 (GT-8)
53.5-63.5 ft
Box: 6
9/28/16 M09441A18
RCML NEAR WEST TSF

DH16-02 (GT-8)
53.5-63.5 ft
Box: 6
9/28/16 M09441A18
RCML NEAR WEST TSF

DH16-02 (GT-8)
635-735 ft
Box: 7
9/28/16 M09441A18
RCML NEAR WEST TSF

DH16-02 (GT-8)
735-84 ft
Box: 8
9/28/16 M09441A18
RCML NEAR WEST TSF

DH16-02 (GT-8)

84.0-93.2ft

Box: 9

9/29/16 M09441A18

RCML NEAR WEST TSF

DH16-02 (GT-8)
93.2-102.3 ft
Box: 10
9/29/16 M09441A18
RCML NEAR WEST TSF

DH16-02 (GT-8)
102.3 – 110.8 ft
Box: 11
9/29/16 M09441A18
RCML NEAR WEST TSF

DH16-02 (GT-8)
110.8 – 119.0 ft
Box: 12
9/29/16 M09441A18
RCML NEAR WEST TSF

DH16-53 (GT-8)
119.0 – 127.1 ft
Box: 13
9/29/16 M09441A18
RCML NEAR WEST TSF

DH16-52 (GT-8)
1290-1390 ft
Box: 14
9/29/16 M09441A18
RCML NEAR WEST TSF

DH16-02 (GT-8)
139.0-148.3 ft
Box: 15
9/29/16 M09441A18
RCML NEAR WEST TSF

DH16-02 (GT-8)
148.3 - 157.6 ft
Box: 16
9/29/16 M09441A18
RC ML NEAR WEST TSF

DH16-02 (GT-8)
157.6 - 166.8 ft
Box: 17
9/29/16 M09441A18
RCML NEAR WEST TSF

DH16-02 (GT-8)
166.8 - 175.2 ft
Box: 18
9/29/16 M09441A18
RCML NEAR WEST TSF

DH16-07 (GT-8)
175.2-184.0 ++
Box: 19
9/29/16 MD9441A18
RC.ML NEAR WEST TSF

DH16-02 (GT-8)
184.0 - 193.8 ft
Box: 20
9/29/16 M09441A18
RCML NEAR WEST TSF

DH16-02 (GT-8)
193.8 - 203.3 ft
Box: 21
9/29/16 M09441A18
RCML NEAR WEST TSF

DH16-02 (GT-8)
2033-212.4 ft
Box: 22
9/29/16 M09441A18
RCML NEAR WEST TSF

DH16-02 (GT-8)
212.4-220.2 ft
Box: 23
9/29/16 M09441A18
RCML NEAR WEST TSF


DH16-02 (GT-8)
220.2 - 230.0 ft
Box: 24
9/29/16 M09441A18
RCML NEAR WEST TSF

DH16-02 (GT-8)
230.0-239.5 ft
Box: 25
9/29/16 M09441A18
RCML NEAR WEST TSF

DH16-02 (GT-8)
239.5 - 248.2 ft
Box: 16
9/29/16 M09441A18
RCML NEAR WEST TSF

DH16-02 (GT-8)
1482-258.0 ft
Box: 26
10/01/16 M09441A18
RCML NEAR WEST TSF

DH16-02 (GT-8)
258.0-260.0 ft
Box: 27
10/01/16 M09441A18
RC/ML NEAR WEST TSF

DH16-03 (GT-07)


DH16-03-(GT7)
3.5 - 11.1 ft
Box: 1
10/02/16, M09441A18
RCML NEAR WEST TSF


DH16-03-(GT7)
11.1 -20.8 ft
Box: 2
10/02/16, M0944IA18
RCML NEAR WEST TSF


DH16-03-(GT7)
208-350'+
Box: 3
10/03/16, M0944A18
RCML NEAR WEST TSF


DH 16-03-(GT7)
30.0-39.0 ft
Box: 4
10/03/16, M0944118
RCML NEAR WEST TSF


DH16-03-(GT7)
39.0 - 49.0 ft
Box: 5
10/03/16, M0944IA18
RCML NEAR WEST TSF

DH16-03-(GT7)
49.0 - 59.4 ft
Box: 6
10/03/16, M09441A18
RCML NEAR WEST TSF


DH16-03-(GT7)
59.4 - 68.5 ft
Box: 7
10/03/16, M0944IA18
RCML NEAR WEST TSF
GLAD
ClingWrap
STANLEY 25'


73.5
86
DH16-03-(GT7)
68.5 - 78.5ft
Box: 8
10/03/16, M0944IA18
RCML NEAR WEST TSF


GLAD
ClingWrap
200
DH16-03-(GT7)
78.5 - 87.6 ft
Box: 9
10/03/16, M09441A18
RCML NEAR WEST TSF


DH16-03-(GT7)
87.6 - 97.5 ft
Box: 10
10/03/16, M0944A18
RCML NEAR WEST TSF


DH16-03-(GT7)
97.5-107.0ft
Box: 11
10/03/16, M0944IA18
RCML NEAR WEST TSF
98.5
103.5
GLAD
Cling Wrap


GLAD
ClingWrap
200
GLAD
ClingWrap
DH16-03-(GT7)
107.0-115.5 ft
Box: 12
10/03/16, M0944A18
RCML NEAR WEST TSF


DH16-03-(GT7)
115.5-125 ft
Box: 13
10/03/16, M0944IA18
RCML NEAR WEST TSF
D-2
R-2


DH16-03-(GT7)
1250-1340 ft
Box: 14
10/04/16, M0944/A18
RCML NEAR WEST TSF


DH16-03-(GT7)
134.0-143.4ft
Box: 15
10/04/16, M0944IA18
RCML NEAR WEST TSF


DH16-03-(GT7)
143.4 - ~151.5
Box: 16
10/04/16, M0944IA18
RCML NEAR WEST TSF


DH16-03-(GT7)
151.5 -160.4 ft
Box: 17
10/04/16, MØ9441A18
RCML NEAR WEST TSF
154.5
157.5
12ft.


DH16-03-(GT7)
160.4 - 164.0ft
Box: 18
10/04/16, M0944IA18
RCML NEAR WEST TSF

DH16-04 (GT-41)

DH16-04 (GT-41)
0-10.5 ft
Box: 1
10/6/16 M09144A18
RCML NEAR WEST TSF

DH16-04 (GT-41)
10.5-19.2 ft
Box: 2
10/6/16 MD9144A18
RCML NEAR WEST TSF


DH16-04 (GT-41)
192-285 ft
Box: 3
10/6/16 M09144A18
RCML NEAR WEST TSF
315


29
30
31.5
33.5
37
DH16-04 (GT-41)
28.5-37.4 ft
Box: 4
10/7/16 M09144A18
RCML NEAR WEST TSF

DH16-04 (GT-41)
37.4 - 48.0 ft
Box: 5
10/7/16 M09144A18
RCML NEAR WEST TSF

DH16-04 (GT-41)
48.0-63.0ft
Box: 6
10/7/16 M09144A18
RCML NEAR WEST TSF

DH16-04 (GT-41)
63.0-72.5 ft
Box: 7
10/7/16 M09144A18
RCML NEAR WEST TSF


DH16-04 (GT-41)
72.5 - 82.0 ft
Box: 8
10/7/16 M09144A18
RCML NEAR WEST TSF

DH16-04 (GT-41)
820-94.0 ft
Box: 9
10/7/16 MD9144A18
RCML NEAR WEST TSF


DH16-04 (GT-41)
94.0 -106.5 ft
Box: 10
10/7/16 M09144A18
RCML NEAR WEST TSF


THIS SIDE UP
DH16-04 (GT-41)
106.5-115.4 ft
Box: 11
10/9/16 MD9144A18
RCML NEAR WEST TSF


DH16-04 (GT-41)
115.4-124.3 ft
Box: 12
10/9/16 M09144A18
RCML NEAR WEST TSF
116
117
118
119
120
121
122
123
124


DH16-04 (GT-41)
124.3-133.8 ft
Box: 13
10/9/16 M09144A18
RCML NEAR WEST TSF
125
130

DH16-04 (GT-41)
191.6 - 201.0 ft
Box: 19
10/9/16 M09144A18
RCML NEAR WEST TSF

DH16-04
201-210.7
Box: 20
10/10/16 M09144A18
RCML NEAR WEST TSF


DH16-04 (GT-41)
210.7 2.0 ft
Box: 21 EOH
10/10/16 M09144A18
RCML NEAR WEST TSF


211.5
217
218
220
DH16-04 (GT-41)
210.7-220.0 ft
Box: 21 EOH
10/10/16 M09144A18
RCML NEAR WEST TSF

DH16-05 (GT-39)

distilled water

DH16-05(GT-39)

90-95'

14-14.5

DH16-05(GT-39)
0-19.5ft
Box: 1
10/13/16 MD9144A18
RCML NEAR WEST TSF


DH16-05(GT-39)
19.5-35.7FE
Box: 2
10/14/16 M09144A18
KCML NEAR WEST TSF
10.5
21.5
24.5
25.5
29
34
37

DH16-05(GT-39)
35.7-44.0 ft
Box: 3
10/14/16 M09144A18
KCML NEAR WEST TSF

DH16-05(GT-39)
44.0-52.8 ft
Box: 4
10/14/16 M09144A18
KCML NEAR WEST TSF


53
53.5
54
55
56
THIS SIDE UP
57
58
59
60
61
63
DH16-05(GT-39)
52.8-61.6 ft
Box: 5
10/14/16 M09144A18
KCML NEAR WEST TSF

DH16-05(GT-39)
61.6-70.6 FT
Box: 6
10/14/16 M09144A18
RCML NEAR WEST TSF

DH16-05(GT-39)
70.6-80.5 ft
Box: 7
10/14/16 M09144A18
KCML NEAR WEST TSF

DH16-05(GT-39)
80.5-71.4 +6
Box: 8
10/15/16 M09144A18
KCML NEAR WEST TSF


THIS SIDE UP
DH16-05(GT-39)
91.4-101.0 FE
Box: 9
10/15/16 M09144A18
KCML NEAR WEST TSF
102'
Lufkin
Quarter


THIS SIDE UP
DH16-05(GT-39)
101.0-110.0 +6
Box: 10
10/15/16 M09144A18
KCML NEAR WEST TSF

DH16-05(GT-39)
110.0-113.7 +E
Box: 12
10/15/16 M09144A18
KCML NEAR WEST TSF


DH16-05(GT-39)
118.7-129.5 +6
Box: 12
10/5/16 M09144A18
KCML NEAR WEST TSF


DH16-05(GT-39)
129.5-140 +6
Box: 13
10/16/16 M09144A18
KCML NEAR WEST TSF

DH16-05(GT-39)
140.0-149.2 +6
Box: 14
10/16/16 M09144A18
KCML NEAR WEST TSF

DH16-05(GT-39)
1492-1590 +76
Box: 15.
10/16/16 M09144A18
KCML NEAR WEST TSF


DH16-05(GT-39)
159-170.278
Box:16
16/16/18 M09144A18
KGML-NEAR WEST TSF


172
171.5
176
179
DH16-05(GT-39)
170.2-180.8+6
Box: 17
16/16/16 M09144A18
KCML NEAR WEST TSF


DH16-05(GT-39)
180.3-190.6+6
Box: 18
2016/18 M09144A18
KCML NEAR WEST TSF


DH16-05(GT-39)
190-199.4 +6
Box: 19
16/16 M09144A18
KCML NEAR WEST TSF


DH16-05(GT-39)
199.4-210.5+6
Box: 20
10/6/16 M09144A18
KCML NEAR WEST TSF

DH16-05(GT-39)
210.5-221.0m
Box: 21
10/17/16 M09144A18
KCML NEAR WEST TSF


DH16-05(GT 1)
221.0-231.5
Box: 22
10/17/16 M09144A18
KCML NEAR WEST TSF


DH16-05(GT-39)
231.5-241.0 m
Box: 23
10/17/16 M09144A18
KCML NEAR WEST TSF


DH16-05 (GT-39)
241.0-250.0 m EOH
Box: 24
10/17/16 M09144A18
KCML NEAR WEST TSF

DH16-06 (GT-21)


DH16-06-(GT21)
4.0'-12.5'
Box:
10/20/16 MD9144A18
RCML NEAR WEST TSF

DH16-06-(GT21)
17.5' - 27.0'
Box: 2
10/20/16 MD9144A18
RCML NEAR WEST TSF

DH16-06-(GT21)
27.0' - 36.2
Box: 3
10/21/16 MD9144A18
RCML NEAR WEST TSF

DH16-06-(GT21)
36.2 - 46.3'
Box: 4
10/21/16 MD9144A18
RCML NEAR WEST TSF

DH16-06-(GT21)
46.3 -54.0
Box: 5
10/21 16 MD9144A18
RCML NEAR WEST TSF


59
DH16-06-(GT21)
54.0-63.5
Box:6
10/21 16 MD9144A18
RCML NEAR WEST TSF
Quarter
69

DH16-06-(GT21)
63.5' - 72.5'
Box: 7
10/21 16 MD9144A18
RCML NEAR WEST TSF

DH16-06-(GT21)
72.5 - 81.5
Box: 8
10/21/16 MD9144A18
RCML NEAR WEST TSF

DH16-06-(GT21)
81.5' - 90.5'
Box: 9
10/21/16 M09144A18
RCML NEAR WEST TSF

DH16-06-(GT21)
90.5' - 99.8'
Box: 10
10/22/16 M09144A18
RCML NEAR WEST TSF


THIS SIDE UP
104
GLAD
Cling Wrap
DH16-06-(GT21)
99.8'-109.0'
Box: 11
10/22/16 M09144A18
RCML NEAR WEST TSF

DH16-06-(GT21)
109.0-118.2'
Box: 12
10/22/16 MD9144A18
RCML NEAR WEST TSF

DH16-06-(GT21)
118.2-127.6'
Box: 12
10/22 is MD9144A18
RCML NEAR WEST TSF

DH16-06-(GT21)
127.6'-136.3
Box: 14
10/22 is MD9144A18
RCML NEAR WEST TSF

DH16-06-(GT21)
136.3 - 145.4
Box: 15
10/22 16 MD9144A18
RCML NEAR WEST TSE

DH16-06-(GT21)
145.4'-154.0
Box: 16
10/22 16 MD9144A18
RCM.L NEAR WEST TSE


HQ DIVIDER
DH16-06-(GT21)
154.0-163.6
Box: 17
10/22 is MD9144A18
RCML NEAR WEST TSF

DH16-06-(GT21)
163.6 - 172.5
Box: 18
10/22 is MD9144A18
RCML NEAR WEST TSF

DH16-06-(GT21)
172.5 - 181.4
Box: 19
10/22 is MD9144A8
RCML NEAR WEST TSF

DH16-06-(GT21)
181.4' - 190.2'
Box: 20
10/23/16 MD9144A18
RCML NEAR WEST TSF

DH16-06-(GT21)
190.2 - 199.0
Box: 21
10/23/16 MD9144A18
RCML NEAR WEST TSF


DH16-06-(GT21)
199.0 - 208.6
Box 122
10/23/16 MD9144A18
RCML NEAR WEST TSF
Estwing

DH16-06-(GT21)
208.6 - 217.8
Box 123
10/23/16 MD9144A18
RCML NEAR WEST TSF

DH16-06-(GT21)
217.8 - 227.1
Box: 24
10/23/16 MD9144A18
RCML NEAR WEST TSF


DH16-06-(GT21)
227.1 - 235.9
Box: 25
10/23/16 MD9144A18
RCML NEAR WEST TSF
Quartet
Estwing
234
239

DH16-07 (GT-20)

DH16-07-(GT 20)
3.5' - 16.4'
Box: 1
10/24/16 MD9144A18
RC & L NEAR WEST TSF

DH16-07-(GT20)
16.4'-26.3'
Box: 2
10/24/16 MD9144A18
RC&L NEAR WEST TSF

DH16-07-(GT 20)
26.3 - 35.1
Box1
KV25/16 MD9144A18
RC&L NEAR WEST TSF


39
DH16-07-(GT20)
35.1 - 44.0
Box: 4
IGV24/16 MD9144A18
RCAL NEAR WEST TSF


DH16-07-(GT 20)
44.0'-52.5
Box 5
10/25/16 MD9144A18
RCML NEAR WEST TSF
49
54

DH16-0, (GT 20)
52.5 – 61.3
Box 16
KV26/16 MD9144A18
RCAL NEAR WEST TSF


DH16-07-(GT 20)
61.3 - 70.4
Box: 7
10/26/16 MD9144A18
RCML NEAR WEST TSF
Cling Wrap
GLAD
200
12 ft.


GLAD
ClingWrap
200
DH16-07-(GT 20)
70.4 – 79.0
Box 18
10/26/16 MD9144A18
RCML NEAR WEST TSF


DH16-07 (GT 20)
79.0-88.1
Box 19
IGV26/16 MD9144A18
RCAL NEAR WEST TSF


DH16-07-(GT20)
88.1 – 97.1
Box: 10
10/26/16 MD9144A18
RCML NEAR WEST TSF
Tight Seal for
LONG-LASTING
FRESHNESS
GLAD
Cling Wrap
200
WARNING-WEAR
SAFETY GOGGLES


DH16-07-(GT 20)
97.1 — 106.1
Box 11
10/26/16 MD9144A18
RCML NEAR WEST TSF


Coeur
Products
DRILL #
BOX #
FROM:
TO:
LOCATION:
THIS SIDE UP
109
DH18-07-(GT-20)
106.1'-115.6'
Box: 12
10/26/16 M0914A18
RCML NEAR WEST TSF


Rite in the Rain
ALL-WEATHER
FIELD BOOK
DH16-07-(GT-20)
115.6 — 124.8
Box: 13
10/26/16 M09144A18
RCML NEAR WEST TSF

DH16-07-(GT-20)
124.8 - 134.0
Box: 14
10/26/16 M09144A18
RCML NEAR WEST TSF


DH16-07-(GT-20)
134.0 -143.0
Box:15
10/26/16 MØ9144A18
RCML NEAR WEST TSF
147.5
GORILLA
BOX NO: 15


GORILLA
DH16-07-(GT-20)
143.0 -152.5
Box:16
10/27/16 MØ9144A13
RCML NEAR WEST TSF


DH16-07-
152.5 - 163.3
Box: 17
10/27/16 MØ9144A13
RCML NEAR WEST TSF
157.5
159
HQ DIVIDER
Estwing
Quarter
FIELD BOOK
Wrap in Freshness

DH16-07-(GT-20)
163.3 – 172.1
Box: 18
10/27/16 M09144A13
RCML NEAR WEST TSF



DH16-07-(GT-20)
172.3 - 181.5
Box: 19
10/27/16 MØ9144A13
RCML NEAR WEST TSF
HQ DIVIDER
GLAD
ClingWrap
Estwing


THIS SIDE UP
DH16-07-(GT-20)
181.5 - 190.2
Box: 20
10/27/16 MØ9144A13
RCML NEAR WEST TSF


194
197.5
199
DH16-07-(GT-20)
190.2 - 199.0
Box: 21
10/27/16 MØ914A13
RCML NEAR WEST TSF


DH16-07-(GT-20)
199.0-209.0
Box: 22
10/27/16 M09144A13
RCML NEAR WEST TSF


DH16-07-(GT-20)
209.0-219
Box: 23
10/27/16 MØ9144A13
RCML NEAR WEST TSF


WAX IMPREGNAT
224
DH16-07-(GT-20)
219.0 - 228.3
Box: 24
10/27/16 M09144A13
RCML NEAR WEST TSF


DH16-07-(GT-20)
228.3 - 237.1
Box: 25
10/27/16 MØ9144A13
RCML NEAR WEST TSF
GLAD
ClingWrap
200
MICROWAVE-SAFE | BPA-FREE
Tight Seal for LONG-LASTING FRESHNESS
HO EZ-BOX
WWW.COREBOX.COM
COMPANY: RCML
HQ HOLE NO: DH16-07-(GT-20)
INTERVAL:
PROPERTY: NWTSF
229
259


DH16-07-(GT-20)
228.3 - 247.3
Box: 26
10/27/16 MØ9144A13
RCML NEAR WEST TSF
Coeur Products
HQ EZ-BOX
WWW.COREBOX.COM
WAX IMPR
Tight Seal for
LONG-LASTING
FRESHNESS
ACE
249


DH18-07-(GT-20)
2473-249.0
Box: 27
10/27/16 MD9144A13
RCML NEAR WEST TSF
GLAD
ClingWrap
Tight Seal for
LONG-LASTING
FRESHNESS
249

DH16-08 (GT-15)

DH16-08-(GT15)
6.0 - 23.0
Box: 1
10/29/16 M@9144A18
RCML NEAR WEST TSF

DH16-08-(GT15)
230'-332'
Box: 2
10/30/16 MØ9HA/B
RCML NEAR WEST TSF

WAX IMPREGNATED
HD EZ-BOX
WWW.CORREBOX.COM
WAX IMPREGNATED
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WAX IMPREGNATED
WARNING WEAR SAFETY GOGGLES

Products

HQ EZ-BOX
WWW.COREBOX.COM

DH16-08-(GT 15)
332'-340'
Box: 3
10/30/16 M09144A19
RCML NEAR WEST TOF

DH16-08 (GT15)-B

Date: 10/30 - 11/01/2016


DH16-08-(GT15)-3
30.0' - 39.0
Box: 1
10/30/16 MØ9144A18
RCML NEAR WEST TSF
WAX IMPREGNATED
WAX IMPREGNATED
WAX IMPREGNATED
WAX IMPREGNATED
WAX IMPREGNATED
WWW.COREBOX.COM
WWW.COREBOX.COM
34
39

DH16-08-(GT 15)-B
39.0' - 48.2'
Box: 2
10/30/16 M0914A18
RCML NEAR WEST TSF

DH16-08-(GT 15)-B
48.6' - 56.7'
Box: 3
10/30/16 MØ9144/18
RCML NEAR WEST TSF


DH16-08-(GT15)-B
56.7 - 65.7
Box: 4
10/30/16 MØ9144A18
RCML NEAR WEST TSF

DH16-08 T15)-B
65.7 –
Box: 5
10/30/16 M09144A18
RCML NEAR WEST TSF


DH16-08-(GT15)-B
74.8 - 84.0
Box: 6
10/30/16 MØ9144A18
RCML NEAR WEST TSF

DH16-08-(GT15)-B
84.0-94.0
Box: 7
10/30/16 M09144A18
RCML NEAR WEST TSF

DH16-08-(GT 15)-B
94.0 - 103.2
Box: 8
10/30/16 M09144A18
RCML NEAR WEST TSF


DH16-08-(GT15)-B
103.2 - 112.6
Box: 9
10/31/16 M09144A18
RCML NEAR WEST TSF


DH16-08-(GT15)-B
112.6 – 121.3
Box: 10
10/31/16 M09144A19
RGML NEAR WEST TSF


DH16-08-(GT15)-B
121.3 – 130.5
Box: 11
10/31/16 MA0914HA19
RGML NEAR WEST TSF


DH16-08-RGT151-B
130.5' - 139'
Box: 12
10/31/16 M0914A19
BCAL NEAR WEST TSF


DH16-08-(GT15)-B
139' - 148'
Box: 13
10/31/16 M0914419
RCML NEAR WEST TSF


DH16-08-(GT15)-B
148' - 156.5
Box: 14
10/31/16 M0914419
BCAL NEAR WEST TSF


DH16-08-(GT15)1-B
1565' - 1665'
Box: 15
10/31/16 M09144A19
RCML NEAR WEST TSF


DH16-08-(GT15)-B
165.5' - 174.5'
Box: 16
10/31/16 M8914419


DH16-08-(GT15)-B
174.5' - 183'
Box: 17
10/31/16 M09H4A19
RGML NEAR WEST TSF


DH16-08-(GT15)-B
183' - 192'
Box: 18
10/31/16 M0914419
194


DH16-08-(GT15)-B
192' - 201.5'
Box: 19
10/31/16 M09HHA19
RCML NEAR WEST TSF


DH16-08-(GT15)-B
201.5' - 211'
Box: 20
10/31/16 M09144A19
RCML NEAR WEST TSF


DH16-08-(GT151)-B
211' - 219'
Box: 21
10/31/16 M09144A19
RCMA NEAR WEST TSF


DH16-08 (GT-15) B
219' — 228'
Box: 22
11-7-16 MB9144A19
BCHL NEAR WEST TSF


DH16-08 (GT-15) B
228' — 237'
Box: 23
11-7-16 M8914419
RCHL NEAR WEST TSF


DH16-08 (GT-15) B
237'— 246'
Box: 24
11-7-16 MB9144A19
RCHL NEAR WEST TSF


DH16-08 (GT-15) B
246' — 249'
Box: 25
11-7-16 M8914A19
RCHL NEAR WEST TSF

DH16-09 (GT-32)


DH16-09 (GT-32)
0-9.6 ft
Box: 1
11/2/16 M09441A18


DH16-09 (GT-32)
9.6-19.0 ft
Box: 2
11/2/16 M09441A
RC/ML NEAR WEST TSF


DH16-09 (GT-32)
19.0-29.0 ft
Box: 3
11/3/16 M09441A18
RCML NEAR WEST TSF

DH16-09 (GT-32)
290-38.2 ft
Box: 4
11/3/16 M09441A18
RCML NEAR WEST TSF

DH16-09 (GT-32)
38.2-47.2 ft

Box: 5
11/3/16 M09441A18
RCML NEAR WEST TSF


DH16-09 (GT-32)
47.2-56.5ft
Box: 6
11/3/16 M09441A18
RC ML NEAR WEST TSF

DH16-09 (GT-32)
565-659 ft
Box: 7
11/3/ M09441A18


DH16-0 ST-32)
65.9-77.7 ft
Box: 8
11/3/16 M09441A18
RML NEAR WEST TSF


DH16-09 (GT-32)
77.7-87.5 m
Box: 9
11/3/16 M09441A18
RCML NEAR WEST TSF


88
93
DH16-09 (GT-32)
87.5-97.3 ft
Box: 10
11/5/16 M09441A18
RC ML NEAR WEST TSF


DH16-09 (GT-32)
97.5-106.3 ft
Box.11
11/5/16 M09441A18
RC NEAR WEST TSF


DH16-09 (GT-32)
106.3-116.6 ft
Box. 12
11/5/16 M09441A18
RC ML NEAR WEST TSF


DH16-09 (GT-32)
116 -126.3 ft
Box.13
11/5/16 M09441A18
NEAR WEST TSF

DH16-09 (GT-32)
126.3-135.2 ft
Box. 14
11/5/16 MD9441A18
RC ML NEAR WEST TSF

DH16-09 (GT-32)
135.2-145.0 ft
Box. 15
11/5/16 MO9441A18
RC NEAR WEST TSF


DH16-09 (GT-32)
145.0-154.3 .ft
Box. 16
11/5/16 M09441A18
RC NEAR WEST TSF


154
163
DH16-09 (GT-32)
154.3 - 163.4 ft
Box: 17
11/5/16 M09441A18
*C ML NEAR WEST TSF


DH16-09 (GT-32)
163.4-173.5 ft
Box: 18
11/6/16 M09441A18
RCML NEAR WEST TSF


DH16-09 (GT-32)
173.5-182.7 ft
Box: 19
11/6/16 M09441A18
RCML NEAR WEST TSF


DH16-09 (GT-32)
182.7-192 ft
Box: 20
11/6/16 M09441A18
RCML NEAR WEST TSF


DH16-09 (GT-32)
192.0-201.0 ft
Box: 21
11/6/16 M09441A18
RCML NEAR WEST TSF


DH16-09 (GT-32)
201.0 - 210.0 ft
Box: 22
11/6/16 M09441A18
RCML NEAR WEST TSF

DH16-09 (GT-32)
210-220 ft
Box: 23
MD9441A18
TSF


THIS SIDE UP
DH16-09 (GT-32)
220-229.5ft
Box: 24


DH16-09 (GT-32)
229.5-238.2ft
Box: 25
11/6/16 M09441A18
RCML NEAR WEST TSF


DH16-09 (GT-32)
238.2-246.8 ft
Box: 26
11/6/16 M09441A18
RCML NEAR WEST TSF


DH16-[illegible] (GT-32)
246.8-250 FL
Box: 27
11/6/16 MD9441A18
RCML NEAR WEST TSF

DH16-10 (GT-31)

DH16-10 (GT-31)
0.0 - 11.2 ft
Box: 1
11/8/16 MO9441A18
RCML NEAR WEST TSF

DH16-10 (GT-31)

11.2-20.2 ft

Box: 2

DH16-10 (GT-3)
20.2-29.5 ft
Box: 3
11/8/16 M09441A18
RCML NEAR WEST TSF

DH16-10 (GT-31)
29.5 - 39.0 ft
Box: 4
11/8/16 M09441A18
NEAR WEST TSF

DH16-10 (GT-31)
39.0-48.7ft
Box: 5
11/8/16 M09441A18
RCML NEAR WEST TSF

DH16-10 (GT-31)
487-590 ft
Box: 6
11/8/16 M09441A18
RCML NEAR WEST TSF

DH16-10 (GT-31)
59.0-68.0 ft
Box: 7
11/8/16 M09441A18
RCML NEAR WEST TSF

DH16-10 (GT-31)
620-773 m
Box: 8
11/8/16 MO9441A16

DH16-10 (GT-31)
77.3-87.1 m
Box: 9
11/9/16 MD9441A18
RCML NEAR WEST TSF


DH16-10 (GT-31)
Box: 10
11/9/16 M09441A18
RCML NEAR WEST TSF

DH16-10 (GT-31)
96.9-106.6ft
Box: 11
11/9/16 MO9441A18
RCML NEAR WEST


THIS SIDE UP
DH16-10 (GT-31)
106.6-116.0 ft
Box: 12
11/9/16 MØ9441A18


DH16-10 (GT-31)
116.0-124.9 m
Box: 13
11/9/16 M09441A18
RCML NEAR WEST TSF
119
124

DH16-10 (GT-31)
124.9-134.0 ft
3ox: 14
11/9/16 M0944118
RCML NEAR WEST TSF

DH16-10 (GT-31)
134.0-143.2 m
Box: 15
11/9/16 M09441A18
RCML NEAR WEST TSF

DH16-10 (GT-31)
1432-1520
3ox:16
11/10/16 M0944118
RCML NEAR WEST TSF


DH16-10 (GT-31)
152.0-161.5 ft
Box: 17
11/10/16 M09441A18
RCML NEAR WEST TSF
159
164

DH16-10 (GT-31)
161.5-170.0 m
Box: 18
11/10/16 MC
RCML NEAR WEST TSF


DH16-10 (GT-31)
170-179.0 ft
Box: 19
11/10/16 M09441A18
RCML NEAR WEST TSF
179
177
182

DH16-10 (GT-31)
179.0-188.5 ft
3ox: 20
11/10/10 MB9441.16
RCML NEAR WEST TSF


THIS SIDE UP
DH16-10 (GT-31)
188.5-198.0 ft
Box: 21
11/10/16 MØ9441A18
RCML NEAR WEST TSF


199
203.5
DH16-10 (GT-31)
198.0-206.9 ft
Box: 22
11/10/16 M09441A18
RCML NEAR WEST TSF


DH16-10 (31)
206.9-216.7 ft
Box: 23
11/10/16 M09441A18
RCML NEAR WEST TSF
208.5
219

DH16-10 (GT-31)
216.7-225.2ft
Box: 24
11/10/16 M09441A18
RCML NEAR WEST TSF


DH16-10 (GT-31)
225.7-234.5 ft
Box: 25
11/10/10 M09441A18
RCML NEAR WEST TSF
239
STANLEY 25'


DH16-10 (GT-31)
234.5-243.9 Pe
Box 26
11/10/16 MØ9441A18
234
244


244
245
246
247
248
HQ DIVIDER
DH16-10 (GT-31)
243.9-253.0 m
Box 27
11/10/16 MD9441A18
RCML NEAR WEST TSF

DH16-11 (GT-18)

DH16-1-(GT18)
6.0' - 22.5'
Box: 1
11/13/16 MØ9441A18
RCML NEAR WEST TSF


DH16-11-(GT18)
22.5-32.2
Box: 2
11/13/16
CML NEAR WEST TSF
Shur Saving
RECLOSABLE
STORAGE/FREEZER
15 PLASTIC BAGS
BOLSAS DE PLÁSTICO DE
GALLON SIZE
Cling Wrap
100
LONG-LASTING
FRESHNESS


DH16-11-(GT18)
32.2-41.3
Box: 3
11/13/16 MD9441A18
CML NEAR WEST TSF


DH16-11-(GT18)
41.3 - 50.9
Box: 4
11/13/16 M09441A18
CML NEAR WEST TSF
Cling Wrap
GLAD
Shur Saving
RECLOSABLE STORAGE/FREEZER
Tight Seal for LONG-LASTING FRESHNESS
WARNING-WEAR SAFETY GOGGLES


DH16-11-(GT13)
50.9-
Box: 5
11/13/16 M09441A10
CML NEAR WEST TSF
GLAD
Cling Wrap
Shurfine
Shurfine Saving
Tight Seal for LONG-LASTING FRESHNESS
RECLOSABLE STORAGE/FREEZER
Shoripto KING SIZE
59


DH10-11-(GT13)
54.0-6
Box: 6
11/13/16 M09441A18
CML NEAR WEST TSF
GLAD
Cling Wrap
Shur Saving
Sharpie
KING SIZE
LONG-LASTING FRESHNESS


DH16-...-(GT18)
67.6 - 77.2
Box: 7
11/14/16 M09441A18
CML NEAR WEST TSF
GLAD
Cling Wrap
100
Gallon Bags
Shur Saving
15
Tight Seal for LONG-LASTING FRESHNESS
Sharpie
Estwing


DH15-11-(GT18)
77.2-85.9
Box: 8
11/14/16 M09441A10
CML NEAR WEST TSF
GLAD
Cling Wrap
Gallon Bags
Tight Seal for LONG-LASTING FRESHNESS
Shur Saving


DH16-11-(GT18)
85.9 - 94.9
Box: 9
11/14/16 M09441A18
CML NEAR WEST TSF
GLAD
Cling Wrap
Gallon Bags
Shur Saving
Tight Seal for LONG-LASTING FRESHNESS
88.5
93.5
98.5


DH16-11-(GT18)
94.9 - 104.0
Box:10
11/14/16 M09441A10
RCML NEAR WEST TSF
98.5
108.5
Tight Seal for LONG-LASTING FRESHNESS
GLAD
Cling Wrap
100
Shur Saving
15


THIS SIDE UP
DRILL # BK30
BOX #
FROM:
TO:
LOCATION: NWTSF
GLAD
ClingWrap
100
FRESHNESS
Shur Saving
GallonBags
15

DH16-11-(GT18)
112.7 - 122.2
Box: 12
11/14/16 MD9441A10
RCML NEAR WEST TEE

DH16-11-(GTD)
122.2-131.0
Box: 13
11/14/16 M09441A18
RCML NEAR WEST TSF

DH16-11-(GT18)
131.0 - 139.8
Box: 14
11/14/16 MD9441A18
RCML NEAR WEST TSF


THIS SIDE UP
DH16-11-(GT18)
139.8 - 148.5
Box: 15
11/14/16 M09441A18
RCML NEAR WEST TSF
GLAD
Cling Wrap
100
Shur Saving
Gallon Bags
Dry Erase

DH16-11 -(GT18)
148.5 - 157.7
Box :16
11/14/16 M09441A18
RCML NEAR WEST TSF


GLAD ClingWrap
200
Tight Seal for LONG-LASTING FRESHNESS
12ft.
15
WARNING-WEAR SAFETY GOGGLES
Quarter


GLAD
Cling Wrap
200
Tight Seal for
LONG-LASTING
FRESHNESS
DH16-11-(
167.2 - 175.3
Box: 1.8
11/14/16. M09441A18
RCML NEAR WEST TSF


GLAD
Cling Wrap
200
15
184
DH16-11-(GT18)
175.3'-184.0'
Box: 19
11/14/16. M09441A18
RCML NEAR WEST TSF


DH16-11-(GT18)
1840-1930
Box: 20
11/15/16. M09441A18
RCML NEAR WEST TSF
HQ DIVIDER
GLAD
Cling Wrap
Shur Saving
RECLOSABLE STORAGE/FREEZER
TightSeal for LONG-LASTING FRESHNESS
12ft.
Estwing

DH16-11-(GT18)
193.0 - 201.7
Box: 21
11/15/16. M0941A18
RCML Near West TSF

DH16-11-(GT18)
201.7 - 210.2
Box: 22
11/15/16. MD9441A18
RCML NEAR WEST TSF


DH16-11 -(GT18)
210.2 - 219.0
Box: 23
11/15/16. MD9441A18
RCML NEAR WEST TSF
214
PEL-PLUG


DH16-11-(GT18)
219.0-227.4
Box: 24
11/15/16. MØ9441A18
RCML NEAR WEST TSF
Sharpie
KING SIZE
229


DH16-11 -(GT18)
2274 - 236.5
Box : 25
11/15/16. M09441A18
REML NEAR WEST TSF


DH16-11-(GT18)
236.5 - 244.9
Box: 26
11/15/16. M09441A18
RCML NEAR WEST TSF
PEL-PLUG

PEL-PLUG
Bentonite Pellets

DH16-12 (GT-19)


DH16-12-(GT 19)
4.0-
Box: 1
11/17/16 M09441A18
RCML NEAR WEST TSF
Rite in the Rain
ALL-WEATHER
FIELD BOOK
KING SIZE
PEL-PLUG
1/4" TR30


DH16-12-(GT 19)
26.5 - 38.5
Box: 2
11/17/16 M09441 A1B
RCML NEAR WEST TSF
PEL-PLUG
TR30


DH16 7-(GT 19)
38.5-41.6
Box: 3
11/17/16 M09441A18
RCML NEAR WEST TSF
GLAD
ClingWrap
PEL-PLUG
TR30


DH16-12-(GT 19)
57.0 - 66.1
Box: 5
11/17/16 M09441A18
RCML NEAR WEST TSF
GLAD
ClingWrap
Sharpie
KING SIZE
TightSeal for LONG-LASTING FRESHNESS
200


DH16-12-(GT 19)
66.1' - 74.8'
Box: 6
11/17/16 M09441A18
RCML NEAR WEST TSF
GLAD
Cling Wrap
200
PEL-PLUG


GLAD
ClingWrap
200
LONG-LASTING FRESHNESS
PEL-PLUG
1/4" TR30
DH16-12-(GT 19)
74.8--84.0
Box: 7
11/17/16 M09441A18


DH16-12-(GT 19)
84.0 - 93.3
Box: 8
11/17/16 M09441A18
RCML NEAR WEST TSF
GLAD
ClingWrap
200
TightSeal for LONG-LASTING FRESHNESS
12ft.


DH16-12-(GT 19)
93.0 - 102.7
Box: 9
11/18/16 M09441A18
RCML NEAR WEST TSF
PEL-PLUG
GLAD
Tear Up & Across
Wrap in Freshness
Cling Wrap
DryErase


DH16-12-(GT19)
102.7 - 111.0
Box: 10
11/18/16 M09441A18
RCML NEAR WEST TSF
GLAD
ClingWrap
Tight Seal for LONG-LASTING FRESHNESS
HUSKY


DH16-12-(GT19)
111.0 - 120.3
Box: 11
11/18/16 M09441A18
RCML NEAR WEST TSF


124
129
DH16-12-(GT19)
12 3-129.6
Box:12
11/18/16 M09441A18
PEL-PLUG


DH16-12-(GT19)
129.6 – 139.0
Box: 13
11/18/16 MØ94H1A18
RCML NEAR WEST TSF
139


DH16-12-(GT19)
139.0 - 146
Box: 14
11/18/16 M09441A18
RCML NEAR WEST TSF
HUSKY
Quartet

DH16-12-(GT19)
148.2 – 157.1
Box: 15
11/18/16 MD9411A18
REIML NEAR WEST TSF


159
164
DH16-12-(GT19)
157.1 - 166.0
Box: 16


DH16-
166.0-
Box: 17
174
769


DH16-12-(Gr 19)
174.6 - 184.0
Box: 18
11/19/16 M09441A18
RCML NEAR WEST TS3


WAX IMPRE
THIS SIDE UP
DH16-12-(GT19)
184.0-193.0
Box: 19
11/19/16 M09441A18
RCML NEAR WEST TS7

DH16-12-(GT19)
193.0 - 202.4
Box: 20
11/19/16 MOANALUA
RIML NEAR WEST TSF


Coeur Produ
WAX IMPREGNA
DH16-12-(GT19)
202.4-211.2
Box: 21
11/19/16 M09411A18
RCML NEAR WEST TSF

DH16-12-(GT19)
211.2-221.1
Box: 22
11/19/16 M09-HIA16
REML NEAR WEST TSF


Sharpie
12ft.
WARNING-WEAR
SAFETY GOGGLES
HQ EZ-BOX
WWW.COREBOX.COM
PELT-PLUS


DH16-12-(GT19)
230.7 - 239.4
Box: 24
11/19/16 M094H1A18
RCML NEAR WEST TS7


DH16-12-(GT19)
239.4 - 248.4
Box: 25
11/19/16 M09411A18
RCML NEAR WEST TS7


DH16-12-(GTK)
248.4-257.8
Box: 26
11/19/16 M09411A18
RCML NEAR WEST TS


DH16-12-(GT19)
257.8 - 267.3
Box: 27
11/19/16 M09411A18
RCML NEAR WEST TS7
12ft.
HUSKY
DryEreso


DH16-12-(GT19)
278.0-286.8
Box: 29
11/19/16 M04H1A18
RCML NEAR WEST TS7
Sharpie KING SIZE
HUSKY
Coeur Products
DRILL #
BOX #
FROM:
TO:
LOCATION:
293


DH16-13-(GT19)
286.8-293.0
Box: 30
11/19/16 M09441A18
RCIAL NEAR WEST TS7

DH16-13 (GT-17)


DH16-13-(GT-11)
2.5-19.3
Box:1
11/28/16
RCML NEAR WEST TSF


DH16-13-(GT-17)
19.3 - 31.8
Box:2
11/29/16
RCML NEAR WEST TSF


DRILL #
BOX #
FROM:
TO:
LOCATION:
GLAD
Cling Wrap
DH16-13-(GT-17)
31.8 - 39.0
Box: 2
11/29/16
RCMC NEAR WEST TSF


DRILL #
BOX #
FROM:
TO:
LOCATION: NWTSF
GLAD
ClingWrap
200
LONG LASTING FRESHNESS
DH16-13-(GT-17)
39.0 - 47.9
Box: 4
11/29/16
RCML NEAR WEST TSF


DRILL # BK30
BOX #
FROM:
TO:
GLAD
ClingWrap
200
DH16-13-(GT-17)
47.9 - 56.7
Box: 5
11/29/16 MØ9441A18
RCML NEAR WEST TSF


DRILL # BK30
BOX # 6
FROM: 56.7
DRILL # BK30
BOX #
CATION: NWTSF
GLAD
ClingWrap
200
Tight Seal for LONG-LASTING FRESHNESS
DH16-13-(GT-17)
56.7 - 65.9
Box: 6
11/29/16 MØ9441A18
RCML NEAR WEST TSF


DRILL # DK30
BOX #
FROM:
TO:
LOCATION: NWTSF
GLAD
ClingWrap
200
Tight Seal for LONG-LASTING FRESHNESS
D116-13-(GT-17)
65.9 -75.4
Box: 7
11/29/16 MØ9441A19
RCML NEAR WEST TSF

GLAD
ClingWrap
D1116-13-(GT-1)
75.4-84.8
Box: 8
11/29/16 PA:894411A1R
RCML NEAR WEST TSF

HQ EZ-BOX
GLAD
Cling Wrap
200
LONG-LASTING FRESHNESS
DRILL # BK30
DH16-13-(GT-17)
84.8 -94.0
Box: 9
11/29/16 PA$9441A18
RCML NEAR WEST TSF


HQ EZ-BOX
WWW.COREBOX
GLAD
ClingWrap
200
Tight Seal for LONG-LASTING FRESHNESS
D116-13-(GT-17)
94.0 -102.8
Box:10
11/29/16 MØ9441A18
RCML NEAR WEST TSF


GLAD
Cling Wrap
200
LONG-LASTING FRESHNESS
D1116-13-(GT-17)
102.8-113.0
Box: 11
11/29/16 M$9441A18
RCML NEAR WEST TSF


D116-13-(GT-17)
113.0 -122.0
Box #2
11/29/16
RCML NEAR WEST TSF
GLAD
ClingWrap
200

GLAD
ClingWrap
200
D116-13-(GT-17)
122.0-131.0
Box:13
11/29/16 PA@444'AIR
RCML NEAR WEST TSF


DH16-13-(GT-17)
131.0 - 141.6
Box: 14
11/29/16
HQ EZ-BOX
WWW.COREBOX.COM


D116-13-(GT-17)
141.8 -150.3
Box: 15
11/29/16
RCML NEAR WEST TSF


D116-13-(GT-17)
150.3 - 159.6
Box: 16
11/30/16
RCML NEAR WEST TSA


D1116-13-(GT-17)
159.6 -169.0
Box: 17
11/30/16 PM
REAR


DH16-13-(GT-17)
169.0 - 178.8
Box: 18
11/30/16


DI116-13-(GT-17)
178.8 -188.4
Box: 19
11/30/16
RCML NEAR WEST TSP
184
189


D1116-13-(GT-17)
188.4 - 197.9
Box: 20
11/30/16 MØ9441A18
RCML NEAR WEST TSA


DH16-13-(GT-17)
1979 - 2074
Box: 21
11/30/16


DH16-13-(GT-17)
207.4 - 216.3
Box: 22
11/30/16


DH16-13-(GT-17)
216.3 - 225.1
Box: 23
11/30/16


DH16-13-(GT-17)
2251 - 2340
Box: 24
11/30/16


234.0 - 243.4
Box: 26
RCML NEAR WEST TSA


BU16-13-(GT-17)
243.4- 249.0
Box:27
11/30/16 MØ9441A18
RCML NEAR WEST TSA

DH16-14 (GT-01)


DH16-14 (GT-1)
11/30/16
ϕ - 28.5 ft
NW TSF
Box 1
M0944A18


DH16-14 (GT-1)
28.5 - 39.7 ft
Box 2
11/30/16
NW TSF
M0944A18


DH16-14 (GT-1)
39.7 - 58.2 ft
Box: 3
11/30/16
NW TSF
M0944A18


DH16-14 (GT-1)
58.2 – 68.6 ft
Box 4
12/1/16
NW TSF
MQ944A18


DH16-14 (GT-1)
68.6 - 78.6
Box 5
12/1/16
NW TSF
MØ944A18


DH16-14 (GT-1)
12/1/16
78.6-90.2
NW TSF
Box 6
MQ44A18


955
DH16-14 (GT-1)
90.2-99.7
Box 7
12/1/16
NW TSF
M@944A18

DH16-14 (GT-1) 12/11/16
99.7-110.8 NW TSF
Box 8 MQ944A18

DH16-14 (GT-1) 12/1/16
110.8 - 119.4 NW TSF
Box 9 MQ941A18


GLAD
50
FAMILY SIZE
GLAD
GLAD
122
125
128
DH16-14 (GT-1)
119.4-128.4
Box 10
12/1/16
NW TSF
M@44A18


GLAD
GLAD
135
DH16-14 (GT-1)
128.4-137.4
Box 11
12/1/16
NW TSF
MQ94A18


DH16-14 (GT-1)
137.4--145.6
Box 12
12/1/16
NW TSF
MQ94A18


GLAD
50
STORAGE
DH16-M (GT-1)
145.6-155.0
Box 13
12/2/16
NW TSF
MQ941A18


GLAD
GLAD
159
162
165
DH16-M (GT-1)
155.0-165.0
Box 14
12/2/16
NW TSF
MØ94A18


DH16-14 (GT-1)
165.0-175.2
Box 15
12/2/16
NW TSF
M0944A18


DH16-14 (GT-1)
175.2-184.3
Box 16
12/2/16
NWI TSF
M0944A18


DH16-14 (GT-1)
184.3 - 192.6
Box 17
12/2/16
NW TSF
MQ14A18

DH16-14 (GT-1) 12/2/16
192.6-201.2 NW TSF
Box 18 M0144A18


DH16-M (GT-1)
12/2/16
201.2-210.0
NW TSF
Box 19
M0944A18


DH16-14 (GT-1)
210.0-220.9
Box 20
12/2/16
NWI TSF
M0144A18


DH16-14 (GT-1) 12/2/16
220.9-230.5 NW TSF
Box 21 M0144A18


DH16-14 (GT-1) 12/2/16
230.5-238.5 TD NW TSF
Box 22 M0144A18

DH16-15 (GT-16)


DH16-15-(GT16)
6.0'-18.7'
Box: 1
12/02/2016
RCML NEAR WEST TSF

DH16-15-(GT16)
18.7'-27.4'
Box: 2
12/02/2016 MWH1A18
RCML NEAR WEST TSF


DRILL #
BOX #
FROM:
TO:
LOCATION:
Coeur Products
WAX IMPREGNATED
HQ EZ-BOX
WWW.COREBOX.COM
Sharpie
DH16-15-(GT16)
27.9-37.4
Box:3
12/02/2016
RCML NEAR WEST TSF


BOX #
FROM:
TO:
LOCATION:
GLAD
Cling Wrap
DH16-15-(GT16)
37.4-45.4
Box: 4
12/03/2016
RCML NEAR WEST TSF

DRILL #
BOX #
FROM:
TO:
LOCATION:

GLAD Cling Wrap

DH16-15-(GT16)
45.4-54.0
Box:5
12/03/2016 MEM1A18
RCML NEAR WEST TSF


DH16-15-(GT16)
54.0-62.9
Box: 6
12/03/2016 ME1441A18
RCML NEAR WEST TSF
GLAD
ClingWrap
200
Sharpie
KING SIZE
59


DH16-15-(GT16)
62.9-71.7
Box:7
12/03/2016
GLAD
Cling Wrap
200


HQ EZ-BOX
WWW.COREE
DH16-15-(GT16)
71.7 - 5
Box: 8
12/03/2016
RCML NEAR WEST TSF
84


DH16-15-(GT16)
Box:9
RCML NEAR WEST TSF


DH16-15-(GT16)
90.3 - 99.0
Box: 10
12/03/2016
RCML NEAR WEST TSF


DH16-15-(GT16)
99.0 - 108.4
Box: 11
12/03/2016
RCML NEAR WEST TSF


DH16-15 - (@T16)
108.4 - 117.5
Box: 12
12/03/2016
RCML NEAR WEST TSF


DH16-15-(@T16)
117.5-126.5
Box: 13
12/03/2016
RCML NEAR WEST TSF



This is Box 14

Box 14


DH16-15-(GT16)
136.0-145.1
Box: 15
12/03/2016
RCML NEAR WEST TSF

DH16-15-(@T16)
145.1-154.6
Box#16
12/03/2016 MCMN1A18
RCML NEAR WEST TSF


DH16-15-(GT16)
154.6-163.4
Box: 17
12/03/2016 MC 1441A18
RCML NEAR WEST TSF

DH16-15-(GT16)
163.4-172.3
Box: 18
12/03/2016 MC MWA18
RCML NEAR WEST TSF


DH16-15-(GT16)
1723-181.6
Box: 19
12/03/2016 MC 1441A18
RCML NEAR WEST TSF
184

DH15-15-(GT16)
181.6-190.0
Box:20
12/04/2016


DH11-15-(CT16)
190.0-199.0
Box:21
12/04/2016
RCML NEAR WEST TSF


DH11-15-(CT16)
1990-207.8
Box:22
12/04/2016
RCML NEAR WEST TSF


DH16-15-(GT16)
207.8-217.8
Box: 23
12/04/2016
RCML NEAR WEST TSF


DH11-15-(CT16)
217.8-126.7
Box: 24
12/04/2014
RCML NEAR WEST TSF

226.7 - 235.9
Box 25


DH16-15-(GT16)
235.9-245.1
Box: 26


DH16-15-(GT16)
245.1-255.1
Box:27
12/05/2016 M0944IA18
RCML NEAR WEST TSF
259



Box 28



Box 29



Box 30


DH14-15-(CT16)
282.5-290.0
Box: 30
12/05/2016
RCML NEAR WEST TSF
Cling Wrap

Box 31

DH16-16 (GT-02)

DH16-16 (GT-2) 12/4/16
0 – 14.2 ft NW TSF
Box 1 MØ944A18


DH16-16 (GT-2) 12/4/16
14.2-23.7 NW TSF
Box 2 M#944A18


DH16-16 (GT-2) 12/4/16
23.7-32.7 ft NW TSF
Box 3 MΦ944A18

DH16-16 (GT-2) 12/4/16
37.7-50.0 NW TSF
Box #1 M0944A18


DH16-16 (GT-2) 12/4/16
50.0 - 65.9 NW TSF
Box 5 MΦ944A18


DH16-16 (GT-2) 12/5/16
65.9-74.0 NW TSF
Box 6 MΦ944A1E


DH16-16 (GT-2) 12/5/16
74.0-82.9 NW TSF
Box 7 MΦ944A1k


DH16-16 (GT-2) 12/5/16
82.9-92.0 NW TSF
Box 8 MΦ944A18


94
99
OH16-16 (GT-2) 12/5/16
92.0-101.1 NW TSF
Box 9 MΦ944A1½


101
107
DH16-16 (GT-2)
101.1-110.0
Box 10
12/5/16
NW TSF
MΦ944A1E


118.5
115.5
DH16-16 (GT-2) 12/5/16
110.0-119.0 NWTSF
Box 11 MΦ944A1R

DH16-16 (GT-2) 12/5/16
119.0-129.5 NWTS
Box 12 MΦ944A12


DH16-16 (GT-2) 12/5/16
129.5-140.9 NW TSF
Box 13 MΦ944A18
132
136
139
HQ DIVID
THIS SID
GLAD
Storage
STORAGE
WIDE SEAL
EXTRA


148
152
DH16-16 (GT-2)
140.9-152.0
BOX 14
12/6/16
NW TSF
M0944A18


DH16-16 (GT-2) 12/6/16
152-165.0 NW TSF
BOX 15 M#944A18


DH16-16 (GT-2) 12/6/16
165-177.2 ft NW TSF
BOX 16 M0944A18


HQ DIVIDER
THIS SIDE UP
DH16-16 (GT-2) 12/6/16
177.2-186.6- NW TSF
BOX 17 M0944A18


DH16-16 (GT-2) 12/6/16
186.6-195.2 NW TSF
BOX 18 M0944A18


HQ DIVIDER
THIS SIDE UP
DH16-16 (GT-2) 12/6/16
195.2-203.9 NW TSF
BOX 19 M0944A18


DH16-16 (GT-2)
12/6/16
203.9-212.9
NW TSF
BOX 20
M#944A18


DH16-16 (GT-2) 12/6/16
212.9-222.2 NW TSF
BOX 21 M4944A18


DH16-16 (GT-2) 12/6/16
222.2-231.3' NW TSF
BOX 22 M0944A18


DH16-16 (GT-2) 12/6/16
231.3-240.0 NW TSF
BOX 23 M0944A18


DH16-16 (GT-2) 12/6/16
240.0-248.8 NW TSF
BOX 24 M0944A18


DH16-16 (GT-2) 12/6/16
248.8-250 NW TSF
BOX 25 M0944A18

DH16-17 (GT-36)


DH16-17-(GT 36)
4.0-12.5'
Bonil
12/06/2016 MØ9441A18
RCML NEAR WEST TSF


PLUG
GLAD ClingWrap
GLAD ClingWrap
DH16-17 - (GT 36)
12.5 - 31.0
Box 2


DH16-17 - (GT-36)
31.0 - 40.0
Box 13
12/07/2016 M09441A1E
RCML NEAR WEST TSF


DH16-17-(GT936)
40.0-52.0
Box: 4
12/07/2016 MØ9441A1E
RCML NEAR WEST TSF


DH16-17-(GT36)
52.0-62.5
Box 5
12/07/2016 M0944141A1B
RCML NEAR WEST TSF

DH16-17 - (GT 36)
62.5 - 74.3
Box: 6
12/07/2016 M0944141A1B

GLAD
Cling Wrap
DH16-17 - (GT-36)
74.3 - 86.2
Box 7
12/07/2016 M@9441A1E


PLUG
DH16-17-(GT36)
86.2 -
Box 18
12/08/2016 MØ9441A18


DH16-17-(GT36)
96.5 -107.5
Sam 9
12/08/2016 MØ9441A18
RCML NEAR WEST TSF
GRAD
ClingWrap


EL-PLUG
DH16-17 - (GT36)
107.5 - 115.5
Box: 10
12/08/2016 M09441A18
RCML NEAR WEST TSF


DH16-17-(GT-36)
115.5-127.2
Box: 11
12/08/2016 M@9441A1E
RCML NEAR WEST TSF


PLUG
DH16-17-(GT36)
1272-136.0
Box:12
12/08/2016 MØ9441A18


DH16-17 - (GT36)
136.0 - 145.3
Box: 13
12/08/2016 MØ9441A18
RCML NEAR WEST TSF
GLAD
Cling
200
PLUG
1395
1405
D-5
R-45


PLUG
GLAD
200
DH16-17-(GT36)
145.3-158.5
Box:14
12/08/2016 MØ9441A18
RCML NEAR WEST TSF


PEL-PLUG
DH16-17 - (GT 36)
158.5-172.0
Sca:15
12/09/2016 MØ9441A18
RCML NEAR WEST TSF


PEL-PLUG
DH16-17-(GT-36)
172.0-183.0
Box: 16
12/09/2016 M@9441A18
RCML NEAR WEST TSF


PEL-PLUG
DH16-17-(GT-36)
183.0-192.0
Box: 17
12/09/2016 MØ9441A18
RCML NEAR WEST TSF


DH16-17-(GT 36)
192.0-199.0
Box: 18
12/09/2016 M09441A18

DH16-18 (GT-35)


GLAD
Storage
GALLON Zipper Bags
DH16-18 (GT-35) 12/8/16
ϕ-19.0 NW TSF
Box: 1 MØ944A18


GLAD
FAMILY SIZE
50
CAVE
DH16-18 (GT-35) 12/9/16
19.0 - 27.4 NW TSF
Box: 2 M¢944A18


GLAD
50
FAMILY SIZE
35
39
DH16-18 (GT-35) 12/9/16
27.4-39.2 NW TSF
Box: 3 M0944A18


GLAD
42
44
45
DH16-18 (GT-35) 12/9/16
39.2-50.0ft NW TSF
Box: 4 M0944A18


GLAD
FAMILY SIZE
50
52
57
58
59
DH16-18 (GT-35) 12/9/16
50.0-59.8 NW TSF
Box: 5 M0944A18



DH16-18 (GT-35) 12/9/16
59.8-68.6ft NW TSF
Box: 6 MØ944A18


DH16-18 (GT-35) 12/9/16
68.6-78.0 ft NW TSF
Box: 7 M0944A18


GLAD
FAMILY SIZE
50
80.5
83
87
DH16-18 (GT-35) 12/9/16
78.0-87.0 NW TSF
Box: 8 M0944A18


DH16-18 (GT-35) 12/9/16
87.0-95.3 ft NW TSF
Box: 9 MØ944A18


DH16-18 (GT-35) 12/10/16
95.3-105.2 NW TSF
Box: 10 MØ744A18


DH16-18 (GT-35) 12/10/16
105.2-119.5 NW TSF
Box: 11 M07414A18


DH16-18 (GT-35) 12/10/16
119.5 -128.0 NW TSF
Box: 12 M04444A18


DH16-18 (GT-35) 12/10/16
128.0-136.9 NW TSF
Box: 13 M07444A18


DH16-18 (GT-35)
12/10/16
136.9-145.6
NW TSF
Box: 14
MØ744A18
THIS SIDE UP
FAMILY SIZE
50
STORAGE
GLAD


WAX IMPREGNATED
DH16-18 (GT-35) 12/10/16
145.6 -155.0 NW TSF
BOX: 15 MΦ944A18


DH16-18 (GT-35)
12/10/16
155.0-163.7
NW TSF
Box: 16
MΦ944A18


DH16-18 (GT-35) 12/10/16
163.7-172.5 NW TSF
Box: 17 MΦ944A18


DH16-18 (GT-35) 12/10/16
172.5-181.1 NW TSF
Box: 18 MΦ944A18


DH16-18 (GT-35) 12/11/16
181.1 – 190 NW TSF
Box: 19 M0944A18


GLAD
DH16-18 (GT-35) 12/11/16
190.0-199.0 NW TSF
BOX: 20 MØ944A18


DH16-18 (GT-35)
199.0-209.2
BOX: 21
12/11/16
NW TSF
M#944A18


215
218
DH16-18 (GT-35)
12/11/16
209.2-218.0
NW TSF
BOX: 22
MØ944A18


DH16-18 (GT-35) 12/11/16
218.0 - 228.4 NW TSF
Box: 23 MØ944A18



Box 24


DH16-18 (GT-35) 12/11/16
238-249.5 (TD) NW TSF
BOX: 25 M0944A18

DH16-19 (GT-04)


GLAD
ClingWrap
Limited Edition
200
FIELD BOOK
DH16-19 - (GT-4)
2.5 - 12.0
12/11/2016
RCML NEAR WEST TSF

DH16-19 - (GT-4)
120 - 22.8
Box: 2
12/11/2016 M09441A18
RCML NEAR WEST TSF

DH16 - (GT-4)

22.8 - 33.9

Box 3

12/11/2016 MØ9441A18


GLAD
Clingwrap
200
DH16-19-(GT-4)
33.9-41.3
Box: 4
12/12/2016 MO9441A18
RCML NEAR WEST TSF


DH16-19-(GT-4)
41.3-52.0
Box: 5
12/12/2016 MØ9441A18
RCML NEAR WEST TSF
GLAD
200
57.5
54

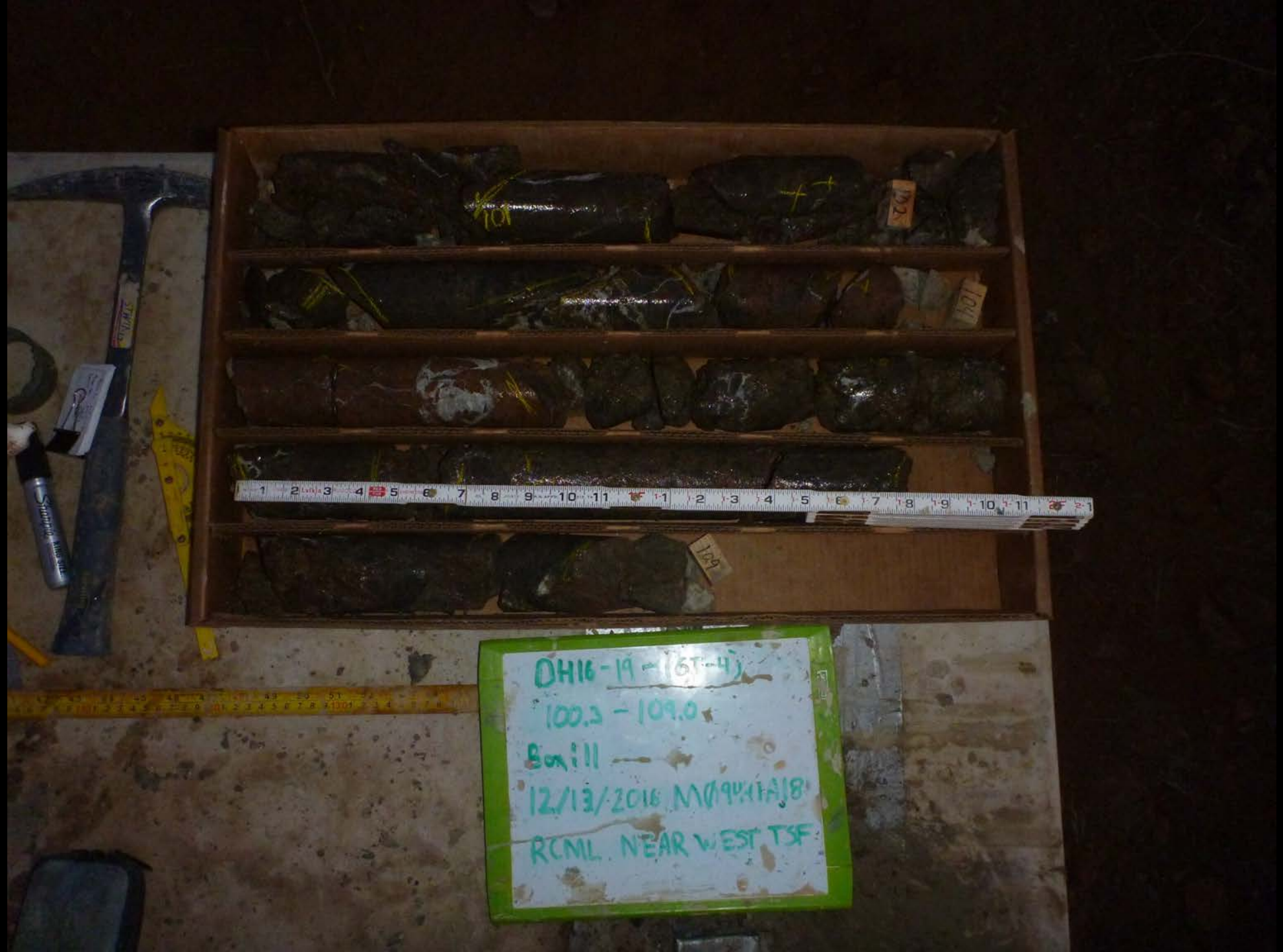

DH16-19-(GT-4)
52.0-63.0
Box:6
12/12/2016 MØ9441A18
RCML NEAR WEST TSF
57.5
58.5
59
62
63


DH16-19 - (GT-4)
63.0 - 72.5
Sm: 7
12/12/2016
RCML NEAR WEST TSF


DH16-19 - (GT-4)
Box: 8
12/12/2016
RCML NEAR WEST TSF
Sharpie
B2.5

GLAD
Cling Wrap
200
GLAD
Cling Wrap
200
Sharpie
DH16-19 (GT-4)
12/12/2016
RCML NEAR WEST TSF
93


DH16-19-(GT-4)
91.1 -100.3
Box:10
12/12/2016 MØ9411A18
RCML NEAR WEST TSF


DH16-19-(6T-4)
100.3 - 109.0
Box ill
12/13/2016 MØ9U41A18
RCML NEAR WEST TSF



109.0- 118.7
Box 12


DH16-19 - (GT-4)
118.7 - 127.8
Box: 13
12/13/2016 MØ9441A18
RCML NEAR WEST TSF


DH16-19 - (GT-4)
127.8 - 139.0
Box: 14
12/13/2016 MØ94-11A18
RCML NEAR WEST TSF
139


DH16-19
139.0
Box 15
12/13/2016


DH16-19 (GT-4)
147.9 - 157.1
Box 16
12/13/2016
148
149
150
151
152
153
154
155
156
157


DH16-19-(GT-4)
157.1-166.1
Box:17
12/13/2016
Shanpie KING SIZE



166.1 - 175.4
Box 18


DH16-19 - (GT-4)
179.4 - 184.5
Box 19
12/13/2016 MQ9411A18


DH16-19-(GT-4)
184.5-193.4
Box: 20
12/14/2016 M09411A18
RCML NEAR WEST TSF
GLAD
ClingWrap
200


DH16-19 - (GT-4)
193.4 - 201.7
Box 21
12/14/2016 MØ9411A18
RCML NEAR WEST TSF
GLAD
ClingWrap
Limited Edition
200


GLAD
Cling Wrap
DH16-19 - (GT-4)
Box 122
12/14/2016
RCML NEAR WEST TSF


DH16-19 - (GT-4)
210.4 - 219.0
Box: 23
12/14/2016 MØ9441A18
RCML NEAR WEST TSF
GLAD
ClingWrap
200

GLAD
Cling Wrap
200
GLAD
Cling Wrap
200
DH16-19 - (GT-4)
219.0 - 227.9
Box 24
12/14/2016 MCMAHON
RCML NEAR WEST TSF


DH16-19-(GT-4)
227.5-236.0
Box: 25
12/14/2016 MØ9411A18
RCML NEAR WEST TSF
GLAD
ClingWrap
200
Limited Edition


DH16-19 - (GT-4)
236.0 - 244.0
GLAD
ClingWrap
Limited Edition
200
242
243
244


GLAD
Cling Wrap
200
DH16-19 (GT-4)
244.0 - 249.0
5m: 27
12/14/2016 MM
RCML NEAR WEST TSF

DH16-20 (GT-03)


H16-20 (GT-03)
From: 0 - 23.5
Box: 1
12/13/16
NW TSF
M0944A18


H16-20 (GT-03)
From: 23.5-37.0
BOX: 3 2
12/13/16
NW TSF
M0944A18
BKGD
NWTSF


H16-2.0 (GT-03)
12/13/16
From 37-46.2
NW T5F
BOX: 3
M0944A18


H16-20 (GT-03) 12/13/16
From: 46.2-55.8 NW TSF
BOX: 4 M0944A18

WAX IMPREGNATED
WAX IMPREGNATED
DH16-20(GT-03)
From: 55.5 - 64.8
BOX: 5
12/14/16
NW TSF
M0944A18


DH16-20(GT-03) 12/14/16
FROM: 64.8-74.2 NW TSF
BOX: G M#944A18

DH16-20(GT-03) 12/14/16
FROM: 74.2-83.0 NW TSF
BOX: 7 M#944A18

DH16-20(GT-03) 12/14/16
FROM: 83.0-92.6 NW TSF
BOX: 8 M#944A18


DH16-20(GT-03) 12/14/16
FROM: 92.6-105.8 NW TSF
BOX: 9 M#944A18


DH16-20(GT-03) 12/14/16
FROM: 105.8-115.8 NW TSF
BOX: 10 M#944A18


DH16-20(GT-03) 12/14/16
FROM: 115.8 - 125.3 NW TSF
BOX: 11 M#944A18


125.5
126
127
129
131
DH16-20(GT-03)
FROM: 125.3-135.4
BOX: 12
12/14/16
NW TSF
M#944A18


DH16-20(GT-03) 12/14/16
FROM: 135.4-143.8 NW TSF
BOX: 13 M09-14A18


DH16-20(GT-03) 12/14/16
FROM: 143.8-153.0 NW TSF
BOX: 14
0944A18
146
151
156


DH16-20(GT-03) 12/15/16
FROM: 153-164.2 NW TSF
BOX: 15 M#944A18
154
155
162


DH16-20(GT-05)
12/15/16
FROM: 164.2-173.2
NW TSF
BOX: 16
M#944A18


177
182
DH16-20(GT-03)
FROM: 173.8-183
BOX: 17
12/15/16
NW TSF
N0944A18


Coeur Products
192
181
THIS SIDE UP
DH16-20(GT-03) 12/15/16
FROM: 183.0-192.1 NW TSF
BOX: 18 M@944A18


Coeur
DH16-20(GT-03) 12/15/16
FROM: 192.1-201.5. NW TSF
BOX: 19 M0944A18


202
207
2095
D-5
217
DH16-20(GT-03) 12/15/16
FROM: 201.5 - 212.8. NW TSF
BOX: 20 M#944A18
D-5
D-5


214.5
214.5
DH16-20(GT-03) 12/15/16
FROM: 212.8-222.0 NW TSF
BOX: 21. N0944A18


DH16-20(GT-03) 12/15/16
From: 222.0-231.8 NW TSF
Box: 22 M#944A18
230


DH16-20(GT-03) 12/15/16
FROM: 231.8 - 241.5 NW TSF
BOX: 23 M0944A18


242
246
247
250
DH16-20(GT-03) 12/16/16
FROM: 241.5-250.0 NW TSF
BOX: 24 M#9444A18

DH16-21 (GT-05)


S-1
6.0-7.5 ft
S-2
10-12.5 ft
S-3
16.0-17.5 ft
21.0 - 21.7 ft
3": 3-28-50/3"
5"/8"
DH16-21 (GT-05)
FROM: 0-22.9 ft
BOX: 1
12/16/16 MCQUILLAIS
RCML NEAR WEST


DH16-21 (GT-07)
12/16/10
NW TSF
S-3
16.0-17.5 ft
3": 5-8-14-21-23-25
14"/18"


JH16-21 (GT 05)
12/16/16
NW TSF
S-4
21.0 - 21.7ft
3": 3-28-50/2"
5"/8"


DH16-21 (GT-05)
FROM 22.9-37.0 ft
Box: 2
12/17/16 M@9441A18
ROM NEAR WEST


DH16-21 (GT-05)
FROM 37.0-58.0
Box: 3
12/17/16 M0944 1A18
RCML NEAR WEST


DH16-21 (GT-05)
FROM 5 -79.5
BOX: 4
12/18/16 MQ9441A18
RCHL NEAR WEST


DHIC-21 (GT-05)
FROM 79.5 - 88.9
Box: 5
12/8/16 MØ9441A18
RCML NEAR WEST


DH16-21 (GT-05)
FROM 88.9 - 99.2
BOX: G
12/18/16 M#9441A18
RCML WEAR WEST


DH16-21 (GT-05)
FROM 99.2 - 108.3
Box: 7
12 18/16
RQM WEAR WEST


DH16-21 (GT-05)
From: 108.3-117.0 ft
Box: 8
12/19/16 MØ9441A18
RCML NEAR WEST


DH16-21 (GT-05)
From: 117.0-128.6 ft
Box: 9
12/14/16 MØ9441A18
RCML NEAR WEST


DH16-21 (GT-05)
From: 128.6 - 137.5
Box 10
12/20/16 MQ9+4iA18
RCML NEAR WEST


DH16-21 (GT-05)
From: 137.5-146.5
Box 11
12/20/16
RCWL NEAR WEST


DH16-21 (GT-05)
From: 146.5 -155.3
Box 12
12/20/16 MØ9441A18
RCML NEAR WEST


DH16-21 (GT-05)
From: 155.3 - 164
Box 13
12/20/16 MQ+HiA18
RCM - NEAR WEST


DH16-21 (GT-05)
From: 164 - 173
Box 14
12/20/16 MØ44iA18
RC/WL NEAR WEST


THIS SIDE UP
DH16-21 (GT-05)
From: 173 182
Box 15
12/20/16 MØ94-41A18
RCML NEAR WEST


DH16-21 (GT-05)
From: 182 - 191
Box 16
12/20/16
RCWL NEAR WEST


DH16-21 (GT05)
From: 191 - 199.7'
Box 17
12/20/16 MQ44iA18
RCWL NEAR WEST


DH16-21 (GT-05)
From: 199.7 - 209
Box 18
12/20/16 MØ94HA18
RCML NEAR WEST


PH16-21 (GT-05)
From: 209 - 217.4'
Box 19
12/20/16
RCMI NEAR WEST


DH16-21 (GT-05)
From: 217.4 - 227
Box 20
12/20/16 MQ944iA18
RCWL NEAR WEST


PH16-21 (GT-05)
From. 227 - 236
Box 21
12/20/16 MOUNTAIN
RCML NEAR WEST


DH16-21 (GT-05)
From. 236 - 246.
Box 22
12/20/16 MØ9441A18
RCML NEAR WEST


DH16-21 (GT-05)
From 246-249 TD
Box 23
12/20/16
RCML NEAR WEST

DH16-22 (GT-40)


DH16-22 (ST-40)
12/19/16
From: 25.5-38.3
NW TSF
Box: 2
140944 A-B


41
46
49.5
52
DH11-22 (GT-40)
12/19/16
From: 38.3-52.1
NW TSF
Box: 3
N09441A:5


DHH-22 (ST-40)
From 52.1-62.5
Box: 4
12/9/16
NW TSE
NB9441A:5


65
69
72.5
DH16-22(GT-40) 12/19/16
From: 62.5-75.0ft NW TSF
Box: 5 M0944/AH8


DH16-22 (GT-40)
12/20/16
From: 75.0-84.0 ft
NW TS
Box: 5
MØ944/A1d


UH16-22(GT-40)
12/20/16
From: 840-92.3 ft
NW TSF
Box: 6
M0944/A1d


THIS SIDE UP
UH16-22(GT-4?)
12/20/15
From: 92.3-102.0
NW TSF
Box: 7



103
106
107
108
109
110
111
112
UH16-22(GT-40) 12/20/16
From 102.0-112.6 PS NW TSF
Box: 8
MØ944/AID


(1)H16-22(GT-40)
12/20/16
From 112.6-121.4
NW TSF
Box: 9
1994/AB


THIS SIDE UP
127
129.5
135
2F
3F
IH16-22(GT-40)
12/20/16
From 121.4-130.0
NW TST
Box: 10
IH 0944 AH


132.5
135
139
140
DH16-22 (GT-40)
12/20/16
From 130.0 - 140.0
NW TSF
Box: 11
M0944/A1d


THIS SIDE UP
145
146
147
148
149
DH16-22(GT-40) 12/20/16
From 140.0-149.3 NW TSF
Box 12 MD944/AHD


DH16-22(GT-40)
12/21/16
FROM 149.3-161.3
Box: 13
M0944/A18


DH16-22(GT-40)
12/2/16
FROM 161.3 - 170.3
BOX: 14
D944/A18


DH16-22(GT-40) 12/21/16
From 170.3-180.2ft NW 3F
Box: 15 ND944/A18


DH16-22 (GT-40)
From: 180.2-189.7
Box: 16
12/21/16
NW TSF
#3944/AB


DH16-22 (GT-40)
12/21/16
From: 189.7-202.4
NW T5F
Box: 17
#3944/A18


DH16-22 (GT-40)
12/21/18
From: 202.4 - 211.0
NW TSF
Box: 18
N 5944418


DH16-22 (GT-40)
12/21/16
From: 211.0 - 221.1
NW TSF
Box 19
N 5944418
D-2
R-1


222
225.5
229
DH16-22 (GT-40) 12/21/16
From: 221.1-230.0 NW TSF
Box 20 #0944/A18
232
D-3
R-3


232
235
236
237
239.5
DH16-22 (GT-40)
12/21/16
From: 230-239.5
NW TSF
Box 21
3944/A18


DH16-22(GT-40) 01/05/2017
FROM: 239.5-248.5
NW TSF
BOX: 22
MØ9441A18


Coeur Products
WAX IMPREGNATED
248
150
DH16-22(GT-40) 01/05/2017
FROM: 248.5-250.0
NW TSF
BOX: 23
M@9441A18

DH16-23 (GT-06-B)


DH17-23-(GT-6)
0.0' - 9.7
Box: 1
01/05/2017 M0944118
RCM NEAR WEST TSF


DH17-23-(GT-6)
9.7 - 19.0
Box: 2
01/05/2017 MA09441A18
RCM NEAR WEST TSF


DH17-23-(GT-6)
19.0 - 28.1
Box: 3
01/05/2017 M0944118
RCM NEAR WEST TSF


GLAD
ClingWrap
200
DH17-23-(GT-6)-B
20.0 -- 28.6
Box 13
01/06/2017 M0944181B
RCM NEAR WEST TSF

Box 4



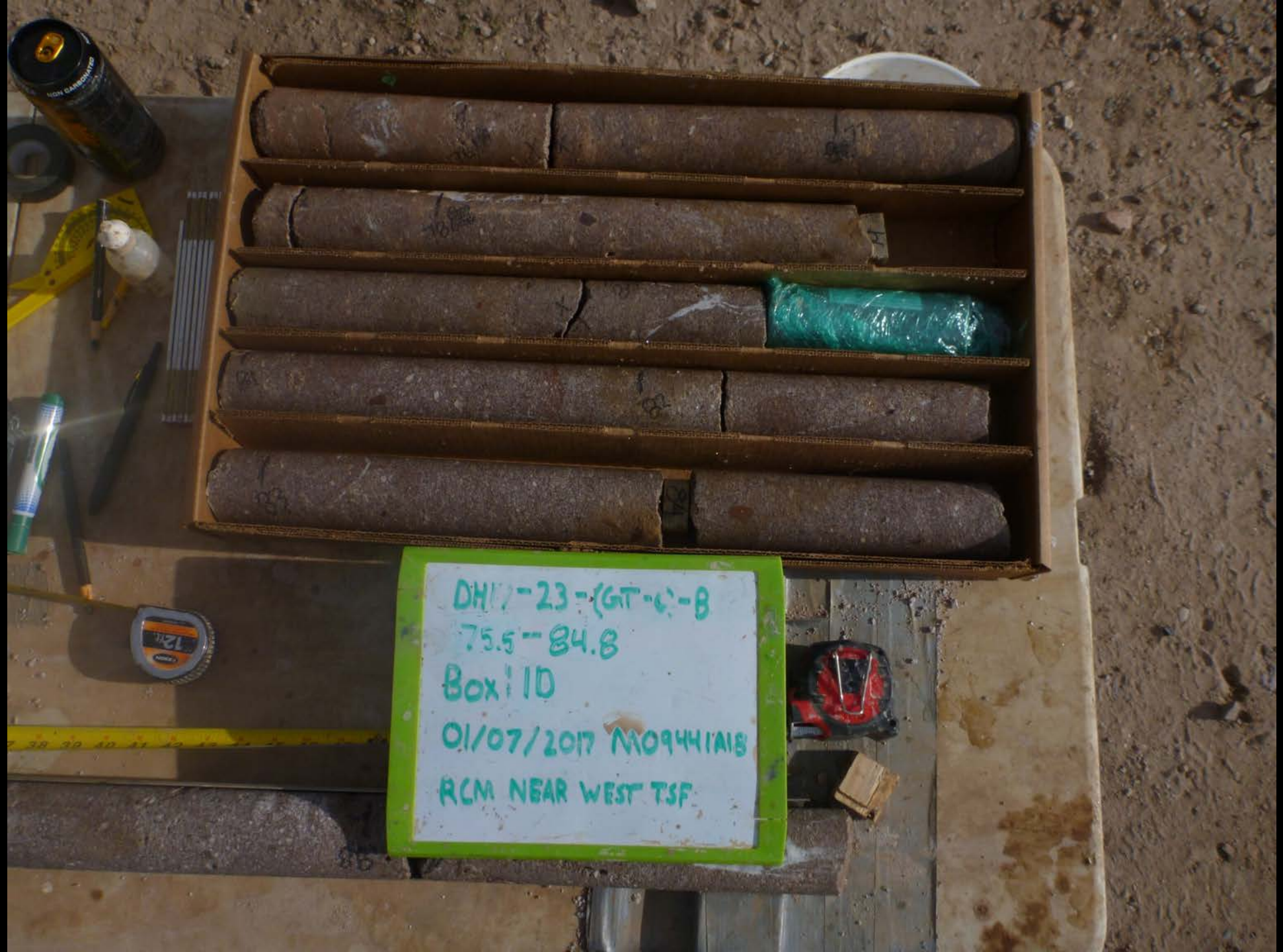
Box 5

DH17-23-(GT-6)-B
38.1 --46.8
Box:6
01/06/2017 MA09441A18
RCM NEAR WEST TSF

DH17-23-(GT-6)-B
46.8--57.0
Box:7
01/06/2017 M0944118

DH17-23-(GT-6)-B
57.6 -- 66.5
Box 18
01/06/2017 MA09441A18
RCM NEAR WEST TSF


DH17-23-(GT-6)-B
66.5 -- 73.5
Box:9
01/07/2017 M0944141A18
RCM NEAR WEST TSF


DH -23-(GT-C)-B
75.5-84.8
Box ID
01/07/2017 M09441A18
RCM NEAR WEST TSF

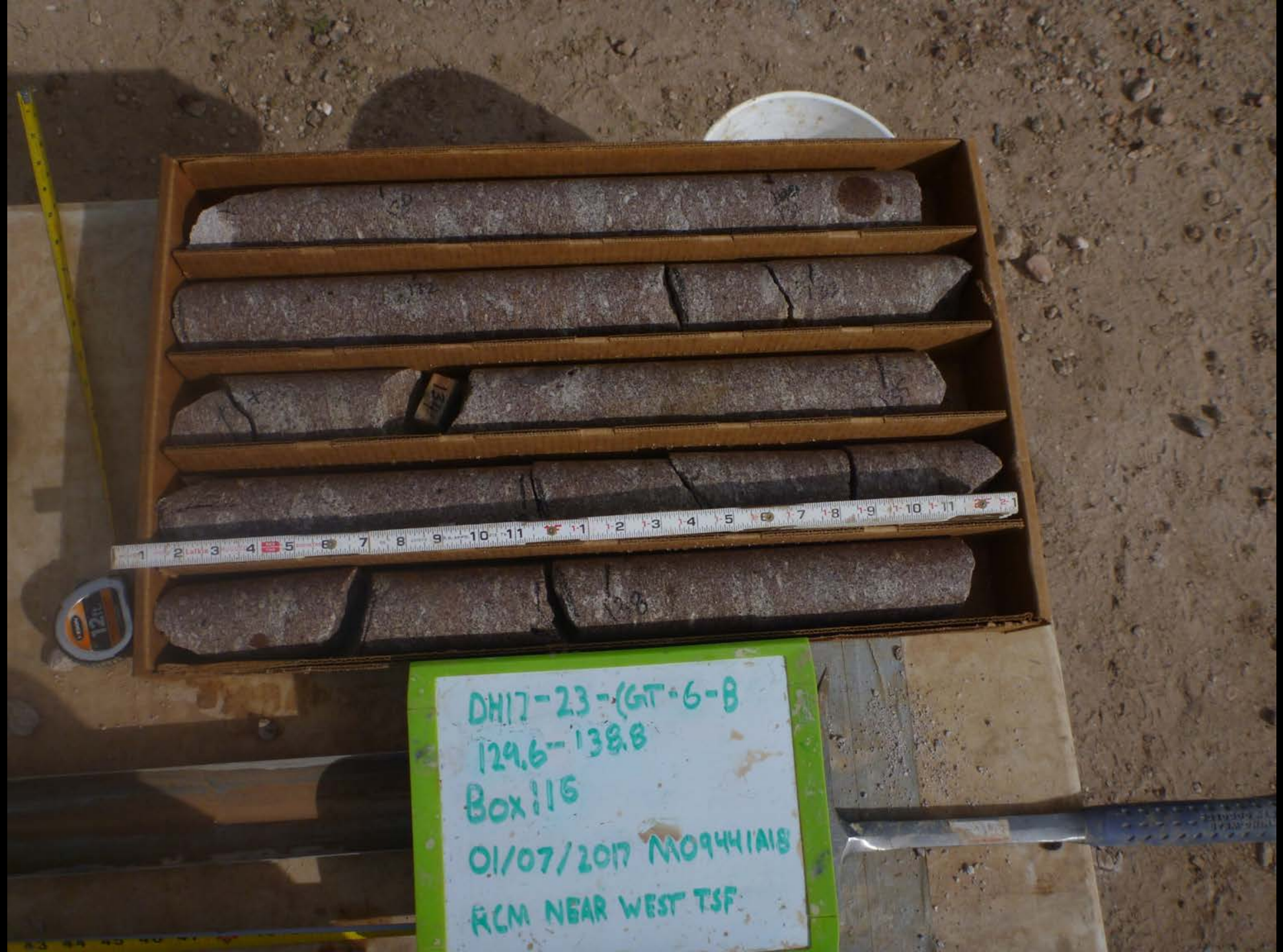

DH17-23-(GT-6-B
84.8--94.0
Box 111
01/07/2017 M09441A18
RCM NEAR WEST TSF


DH17-23-(GT-6-B
94.0--102.8
Box:12
01/07/2017 M09441A18


DH17-23-(GT-6-B
102.8--111.8
Box:13
01/07/2017 M09441A18


DH17-23-(GT-6-B
111.8 -- 120.0
Box #14
01/07/2017 M0944141A18
KCM NEAR WEST TSF


DH17-23-(GT-6-B
120.0-129.6
Box:15
01/07/2017 M09441A18
RCM NEAR WEST TSF


DH17-23-(GT-6-B
129.6--138.8
Box #16
01/07/2017 M09441A18
RCM NEAR WEST TSF

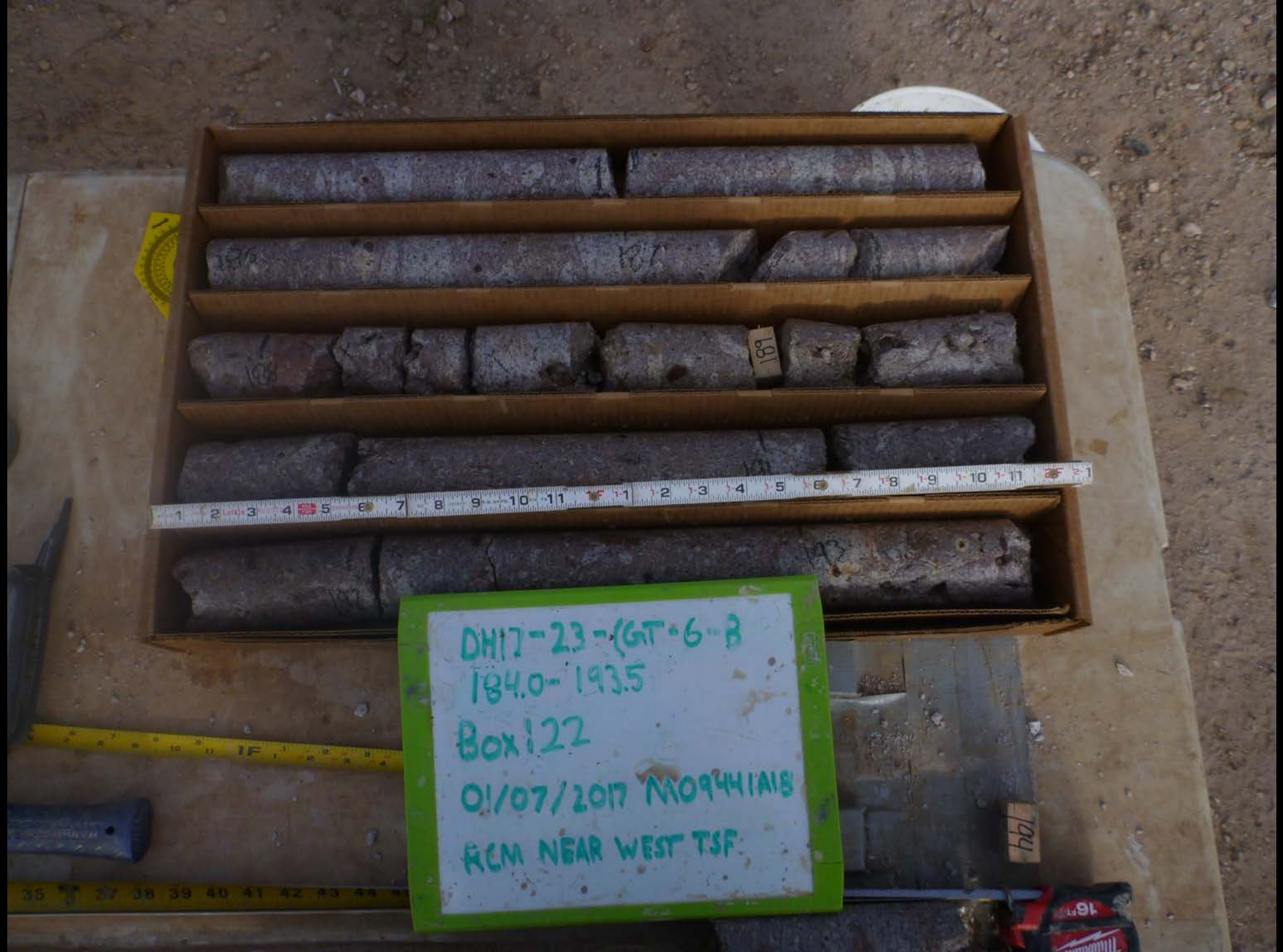

DH17-23-(GT-6-B
138.8 - 147.8
Box: 17
01/07/2017 NR09441A18
KCM NEAR WEST TSF


DH17-23-(GT-6-B
147.8-157.1
Box 118
01/07/2017 M09441A18
RCM NEAR WEST TSF


DH17-23-(GT-6-B
157.1-166.3
Box: 19
01/07/2017 M0944141A18
RCM NEAR WEST TSF

DH17-23-(GT-6-B
166.3-176.6
Box 120
01/07/2017 MA09441A18
RCM NEAR WEST TSF

DH17-23-(GT-6-B
175.8-184.0
Box: 21
01/07/2017 M0944118
RCM NEAR WEST TSF


DH17-23-(GT-6-B
184.0-193.5
Box 122
01/07/2017 M09441A18
RCM NEAR WEST TSF



Box 23



Box 24


DH17-23-(GT-6-B
212.3-221.7
Box 24
01/07/2017 M09441A18
ACM-NEAR WEST TSF

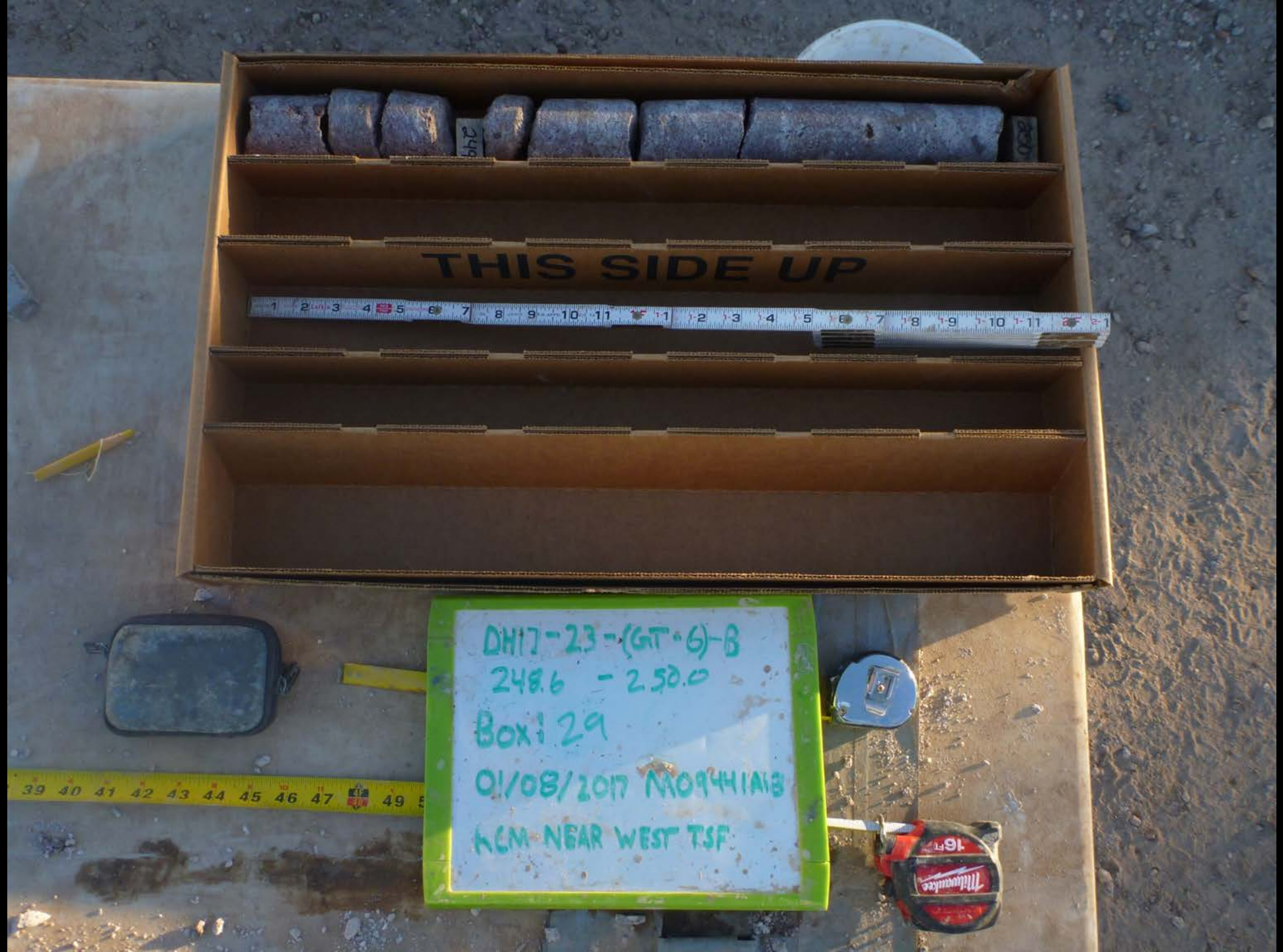
Box 25

Box 26


DH17-23-(GT-6)-B
221.7-230.9
Box 125
01/08/2017 M09441A13
KCM-NEAR WEST TSF


DH17-23-(GT-6)-B
230.9-234.5
Box: 27
01/08/2017 M0944A1B
ACM NEAR WEST TSF


DH17-23-(GT-6)-B
239.5 - 248.6
Box: 28
01/08/2017 M09441A18
KCM NEAR WEST TSF


THIS SIDE UP
DH17-23-(GT-6)-B
248.6 - 250.0
Box: 29
01/08/2017 M09441A18
KCM NEAR WEST TSF

DH16-24 (GT-40-2)

DH17-24 (GT-40-2) 1/7/17

From: 0-13.5 ft NWTSF

Box: 1 MØ9441A18

DH17-24 (GT-40-2) 1/7/17

From: 13.5-27.5 ft NWTSF

Box: 2 M09441A18


DH17-24 (GT-40-2) 1/8/17
From: 275-360 NW TSF
Box: 3
MD944418
355
GBC

DH17-24 (GT-40-2) 1/8/17

From: 36.0-44.9 NWTSF

Box: 4 MØ9441A18

DH17-24 (GT-40-2) 1/8/17

From: 449-533 NWTSF

Box: 5 M0944118


DH17-24 (GT-40-2)
1/8/17
From: 53.3-62.0
NW TSF
Box: 6
MØ9441A18

DH17-24 (GT-40-2)
From: 62.0 - 70.9
Box: 7

1/8/17
NWTSF
M09441A18

DH17-24 (GT-40-2) 1/8/17

From: 70.9-75.0 NWTSF

Box: 8 EOH MØ9441A18

DH17-25 (GT-37)

DH17-25-(GT-37)
3.0-14.0
Box#1
01/10/2017 M09441A18
RCML NEAR WEST TSF

DH17-25 (GT37)
14.0 - 28.0
Box: 2
01/11/2017 MØ9441A18
RCML NEAR WEST TSF

DH17-25-(GT37)
28.0- 42.5
Box 13
01/12/2017 M09441A1
RCML NEAR WEST TSF

DH17-25-(GT37)
42.5-51.9
Box:4
01/12/2017 M09441A1
RCML NEAR WEST TSF

DH17-25-(GT37)
51.9 - 62.9
Box 5
01/12/2017 M0944IA18
RCML NEAR WEST TSF


DH17-25-(GT37)
62.9 - 72.7
Box 6
01/12/2017 M0944IA18
RCML NEAR WEST TSF


DH17-25-(GT-37)
72.7-83.5
Box 17
01/12/2017 M0944IA18
RCML NEAR WEST TSF


DH17-25-(GT-37)
835 - 920
Box 18
01/12/2017 M0944IA18
RCML NEAR WEST TSF


DH17-25-(GT-37)
92.0-106.5
Box: 9
01/13/2017 M0944IA18
RCML NEAR WEST TSF
pepsi


DH17-25-(GT-37)
106.5 - 115.5
Box: 10
01/13/2017 M09441A18
RCML NEAR WEST TSF


DH17-25-(GT-37)
115.5 - 124.0
Boxi11
01/13/2017 M0944IA18
RCML NEAR WEST TSF


GLAD
ClingWrap
200
DH17-25-(GT37)
124.0- 134.0
Box: 12
01/13/2017 M09441A18
RCML NEAR WEST TSF


DH17-25-(GT37)
134.0-142.3
Box: 13
01/13/2017 M09441A18
RCML NEAR WEST TSF


DH17-25-(GT-37)
142.3-151.2,
Box:14
01/13/2017 MØ9441A18
BCML NEAR WEST TSF


GLAD
200
DH17-25-(GT-37)
151.2 - 162.0
Box: 15
01/13/2017 M0944IA18
RCML NEAR WEST TSF


DH17-25-(GT-37)
162.0-170.8
Box: 16
01/13/2017 M0944IA18
RCML NEAR WEST TSF


DH17-25-(GT-37)
170.8-178.0
Box:17
01/13/2017 M0944IA18
RCML NEAR WEST TSF
GLAD
Cling Wrap
200


DH17-25-(GT-37)
178.0- 186.7
Box:18
01/13/2017 M09441A18
RCML NEAR WEST TSF


DH17-25-(GT-37)
186.7 - 198.0
Box:19
01/14/2017 M9441A18
RCML NEAR WEST TSF


DH17-25-(GT-37)
198.0- 207.6
Box: 20
01/14/2017 MD9441A18
RCML NEAR WEST TSF


DH17-25-(GT37)
207.6 - 216.6
Box: 21
01/14/2017 NAD94: AIB
RCML NEAR WEST TSF


DH17-25-(GT-17)
216.6-226.5
Box: 22
01/14/2017
RCML: FAR WEST TSF


DH17-25-(GT 37)
226.5-240.8
Box: 23
01/17/2017
RCML, REAR WEST T35


DH17-25-(GT-27)
240.8-249.0
Box: 24
01/14/2017
QCML. EAR WEST TSF

DH17-26 (GT-13)


DH17-26 (GT-13)
0'-10.3'
BOX #1
M09441A18
01/11/2017
RCML NW TSF


DH17-26 (GT-13)
10.3 — 20.1
BOX # 2
M0944 1A 18


DH17-26 (GT-13)
20.1 — 29.9
BOX #3
M09441A18
JANUARY 11, 2017
RCMI NW TSF


DH17-26 (GT-13)
29.9 — 39.0
BOX #4
M09441A18
JANUARY 11, 2017


DH17-26 (GT-13)
390 — 501
BOX # 5
M09441A18
JANUARY 11, 2017


DH17-26 (GT-13)
50.1 - 59.4 ft.
BOX #6
M09441A18
JANUARY 11, 2017
RCML NW TSF AG.
HQ EZ-BOX
WWW.COREBOX.COM


DH17-26 (GT-13)
59.4-68.6'
BOX #7
MD9441A18


DH17-26(GT-13)
68.6-77.8
BOX #8
M09441A18
JANUARY 11, 2017
RCML NW TSF
A.G.


DH17-26(GT-13)
77.8-87.0ft.
BOX #9
M09441A18
JANUARY 11, 2017
RCML NW TSF
AG


DH17-26 (GT-13)
87.0-95.8
BOX #10
M09441A18
JANUARY 12, 2017
RCML NO. TSF
A.G.
WAX IMPREGNATED


DH17-26 (GT-13)
95.3-105.2
BOX #11
M09441A18
JANUARY 12, 2017
RCML NIVTSF, A.G.

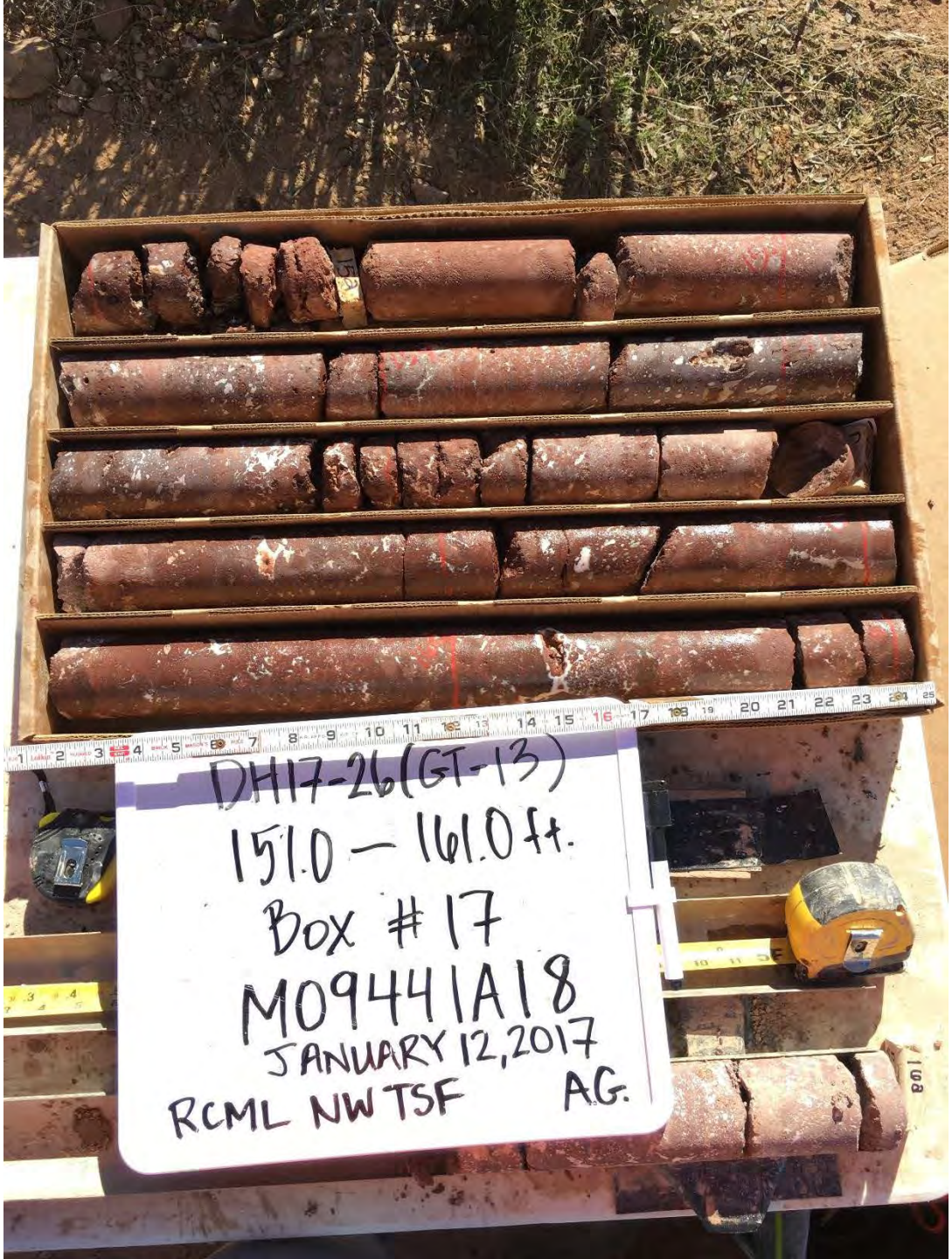

DH17-26 (GT-13)
105.2 - 114.7
BOX #12
MD9441A18
JANUARY 12, 2017
RCML/NWTGF, A.G.


DH17-26(GT-13)
114.7-123.1 ft.
BOX #13
M09441A18
JANUARY 12,2017
RCML NW TSF
A.G.


DH17-26(GT-13)
123.1- 132.4ft.
BOX #14
M09441A18
JANUARY 12,2017
RCML NW TSF
A.G.


DH17-26(GT-13)
132.4 - 141.7ft.
BOX #15
M09441A18
JANUARY 12,2017
RCML NW TSF
AG.


DH17-26(GT-13)
141.7 — 151.0ft.
Box # 16
M09441A18
JANUARY 12,2017
RCML NW TSF
AG.


DH17-26(GT-13)
151.0 – 161.0 ft.
Box # 17
M09441A18
JANUARY 12, 2017
RCML NW TSF
A.G.


DH17-26(GT-13)
161.0-169.8
Box #18
M09441A18
JANUARY 12,2017
RCML NW TSF AG.


DH17-26(GT-13)
169.8 - 178.4
Box #19
M09441A18
JANUARY 12,2017
RCML NW TSF
A.G.


DH17-26(GT-13)
178.4 – 187.3
Box # 20
M09441A18
JANUARY 12, 2017
RCML NW TSF
AG.


DH17-26(GT-13)
187.3-196.3 ft.
Box #21
M0144118
JANUARY 12,2017
RCML NW TSF AG.
HQ EZ-BOX
WWW.COREBOX.COM


DH17-26(GT-13),
196.3-204.9'
Box # 22
M09441A18
JANUARY 13,2017
RCML NW TSF A.G.
Coeur Products
HQ EZ-BOX
WWW.COREBOX.COM
Coeur Products

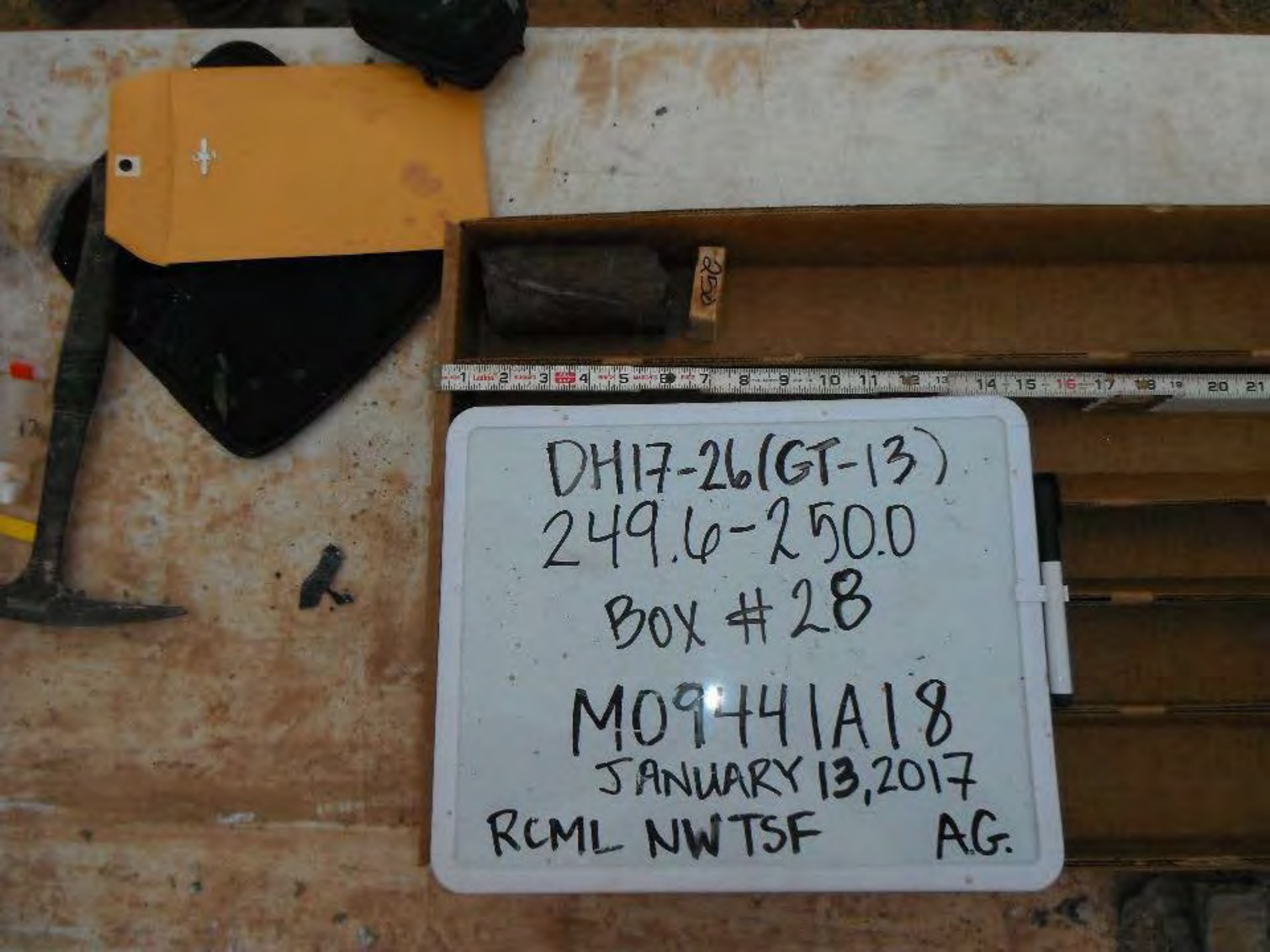

DH17-26(GT-13)
204.9-213.9'
Box # 23
M09441A18
JANUARY 13,2017
RCML NW TSF AG.
Coeur Products
EZ-BOX
WWW.COREBOX.COM


DH17-26(GT-13)
213.9 - 222.3 ft.
BOX #24
M09441A18
JANUARY 13, 2017
RCML NWTSF A.G.
Z-BOX
I.COREBOX.COM
STANLEY 25'


THIS SIDE UP
DH17-26(GT-13)
222.3-231.8ft.
Box #25
MO9441A18


DH17-26(GT-13)
231.8-240.8
BOX #26
M09441A18
JANUARY 13,2017
RCML NWTSF
A.G.


DH17-26(GT-13)
240.8-249.6
BOX #27
M09441A18
JANUARY 13, 2017
RCML NWTSF
AG.


DH17-26(GT-13)
249.6-250.0
BOX #28
M09441A18
JANUARY 13,2017
RCML NWTSF AG.

DH17-27 (GT-12)


DH17-26 (GT-13)
0'-10.3'
BOX #1
M09441A18
01/11/2017
RCML NW TSF


DH17-26 (GT-13)
10.3 — 20.1
BOX # 2
M0944 1A 18


DH17-26 (GT-13)
20.1 — 29.9
BOX #3
M09441A18
JANUARY 11, 2017
RCMI NW TSF


DH17-26 (GT-13)
29.9 — 39.0
BOX #4
M09441A18
JANUARY 11, 2017


DH17-26 (GT-13)
390 — 501
BOX # 5
M09441A18
JANUARY 11, 2017


DH17-26 (GT-13)
50.1 - 59.4 ft.
BOX #6
M09441A18
JANUARY 11, 2017
RCML NW TSF AG.
HQ EZ-BOX
WWW.COREBOX.COM


DH17-26 (GT-13)
59.4-68.6'
BOX #7
MD9441A18


DH17-26(GT-13)
68.6-77.8
BOX #8
M09441A18
JANUARY 11, 2017
RCML NW TSF
A.G.


DH17-26(GT-13)
77.8-87.0ft.
BOX #9
M09441A18
JANUARY 11, 2017
RCML NW TSF
AG


DH17-26 (GT-13)
87.0-95.8
BOX #10
M09441A18
JANUARY 12, 2017
RCML NO. TSF
AG
WAX IMPREGNATED


DH17-26 (GT-13)
95.3-105.2
BOX #11
M09441A18
JANUARY 12, 2017
RCML NIVTSF, A.G.

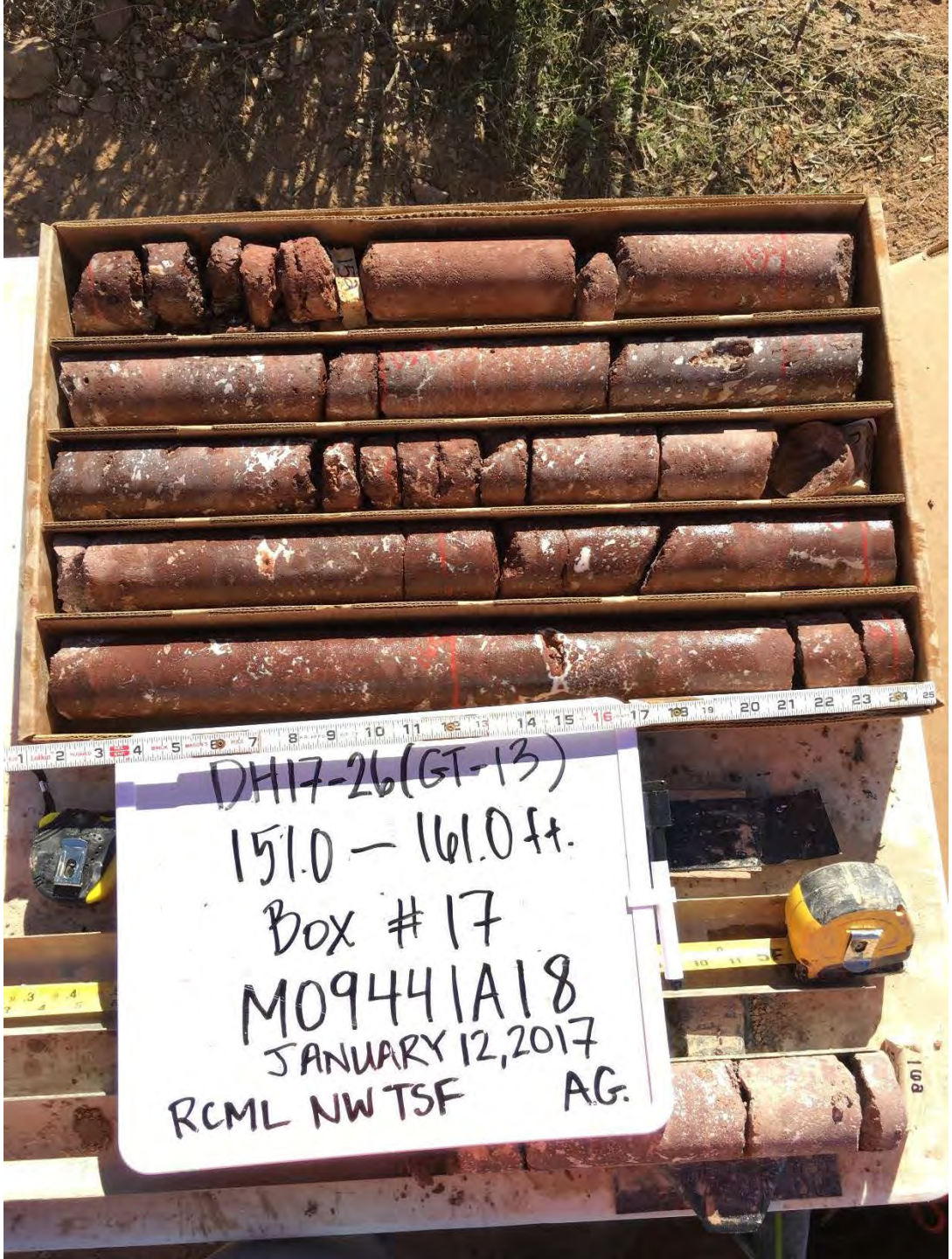

DH17-26 (GT-13)
105.2 - 114.7
BOX #12
MD9441A18
JANUARY 12, 2017
RCML/NWTGF, A.G.


DH17-26(GT-13)
114.7-123.1 ft.
BOX #13
M09441A18
JANUARY 12,2017
RCML NW TSF
A.G.


DH17-26(GT-13)
123.1- 132.4ft.
BOX #14
M09441A18
JANUARY 12,2017
RCML NW TSF
A.G.


DH17-26(GT-13)
132.4 - 141.7ft.
BOX #15
M09441A18
JANUARY 12,2017
RCML NW TSF
AG.


DH17-26(GT-13)
141.7 — 151.0ft.
Box # 16
M09441A18
JANUARY 12,2017
RCML NW TSF
AG.


DH17-26(GT-13)
151.0 – 161.0 ft.
Box # 17
M09441A18
JANUARY 12, 2017
RCML NW TSF
A.G.


DH17-26(GT-13)
161.0-169.8
Box #18
M09441A18
JANUARY 12,2017
RCML NW TSF AG.


DH17-26(GT-13)
169.8 - 178.4
Box #19
M09441A18
JANUARY 12,2017
RCML NW TSF
A.G.


DH17-26(GT-13)
178.4 – 187.3
Box # 20
M09441A18
JANUARY 12, 2017
RCML NW TSF
AG.


DH17-26(GT-13)
187.3-196.3 ft.
Box #21
M0144118
JANUARY 12,2017
RCML NW TSF AG.
HQ EZ-BOX
WWW.COREBOX.COM


DH17-26(GT-13),
196.3-204.9'
Box # 22
M09441A18
JANUARY 13,2017
RCML NW TSF A.G.
Coeur Products
HQ EZ-BOX
WWW.COREBOX.COM
Coeur Products

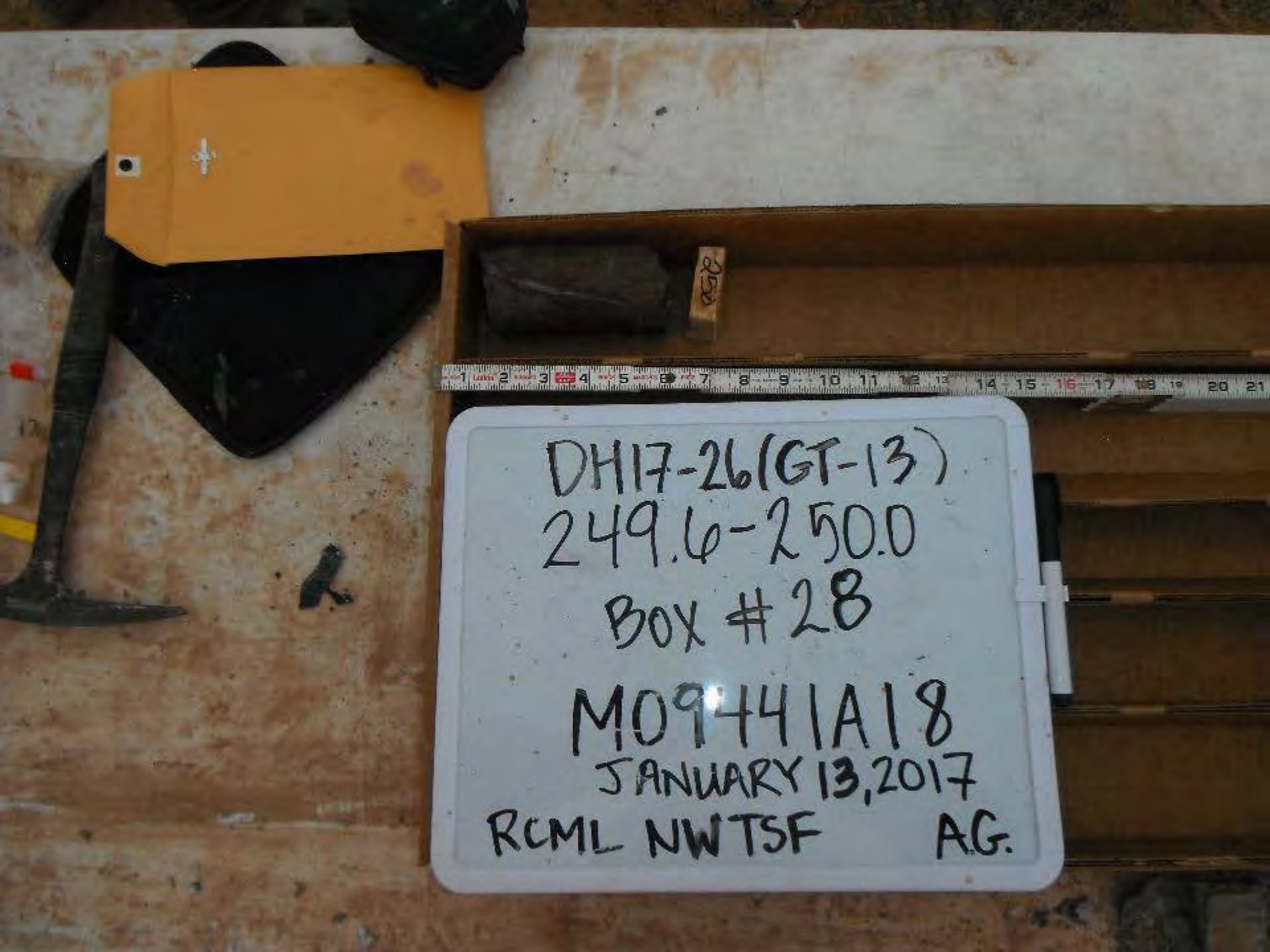

DH17-26(GT-13)
204.9-213.9'
Box # 23
M09441A18
JANUARY 13,2017
RCML NW TSF AG.
Coeur Products
EZ-BOX
WWW.COREBOX.COM


DH17-26(GT-13)
213.9 - 222.3 ft.
BOX #24
M09441A18
JANUARY 13, 2017
RCML NWTSF A.G.
Z-BOX
I.COREBOX.COM
STANLEY 25'


THIS SIDE UP
DH17-26(GT-13)
222.3-231.8ft.
Box #25
MO9441A18


DH17-26(GT-13)
231.8-240.8
BOX #26
M09441A18
JANUARY 13,2017
RCML NWTSF
A.G.


DH17-26(GT-13)
240.8-249.6
BOX #27
M09441A18
JANUARY 13, 2017
RCML NWTSF
AG.


DH17-26(GT-13)
249.6-250.0
BOX #28
M09441A18
JANUARY 13,2017
RCML NWTSF AG.

DH17-28 (GT-23)

DH17-28-(GT 23)
0.0 - 18.7
Box: 1
01/17/2017 M0944 1A1B
RCML NEAR WEST TSF

GLAD Cling Wrap


DH17-28-(GT 23)
18.7-29.0
Box 12
01/17/2017
RCML NEAR WEST TSF

DH17-28-(GT23)
29.0-37.6
Box 13
01/17/2017 M09111-18
RCML NEAR WEST TSF


DH17-28-(GT 23)
37.6 – 45.8
Box 14
01/17/2017 M0944141B
RCML NEAR WEST TSF


DH17-28-(GT 23)
45.8 – 54.0
Box 14
01/17/2017 M0944 1418
RCML NEAR WEST TSF

Box 5


GLAD
ClingWrap
200
DH17-28-(GT 23)
54.0- 62.8
Box 15
01/17/2017 M09441418
RCML NEAR WEST TSF

Box 6

GLAD
Cling Wrap
200
LONG-LASTING FRESHNESS
DH17-28-(GT 23)
62.8-71.8
Box 17
01/17/2017 M0944141B
RCML NEAR WEST TSF


GLAD
ClingWrap
200
DH17-28-(GT 23)
71.8 - 80.7
Box 18
01/17/2017 M09441418
RCML NEAR WEST TSF


GLAD Cling Wrap
DH17-28-(GT 23)
80.7 - 89.0
Box 19
01/17/2017 M0944141B
RCML NEAR WEST TSF


DH17-28-(GT 23)
89.0-97.8
Box 10
01/17/2017 M0944418
RCML NEAR WEST TSF


DH17-28-(GT 23)
97.8-107.2
Box 11
01/17/2017 M0944141B
RCML NEAR WEST TSF

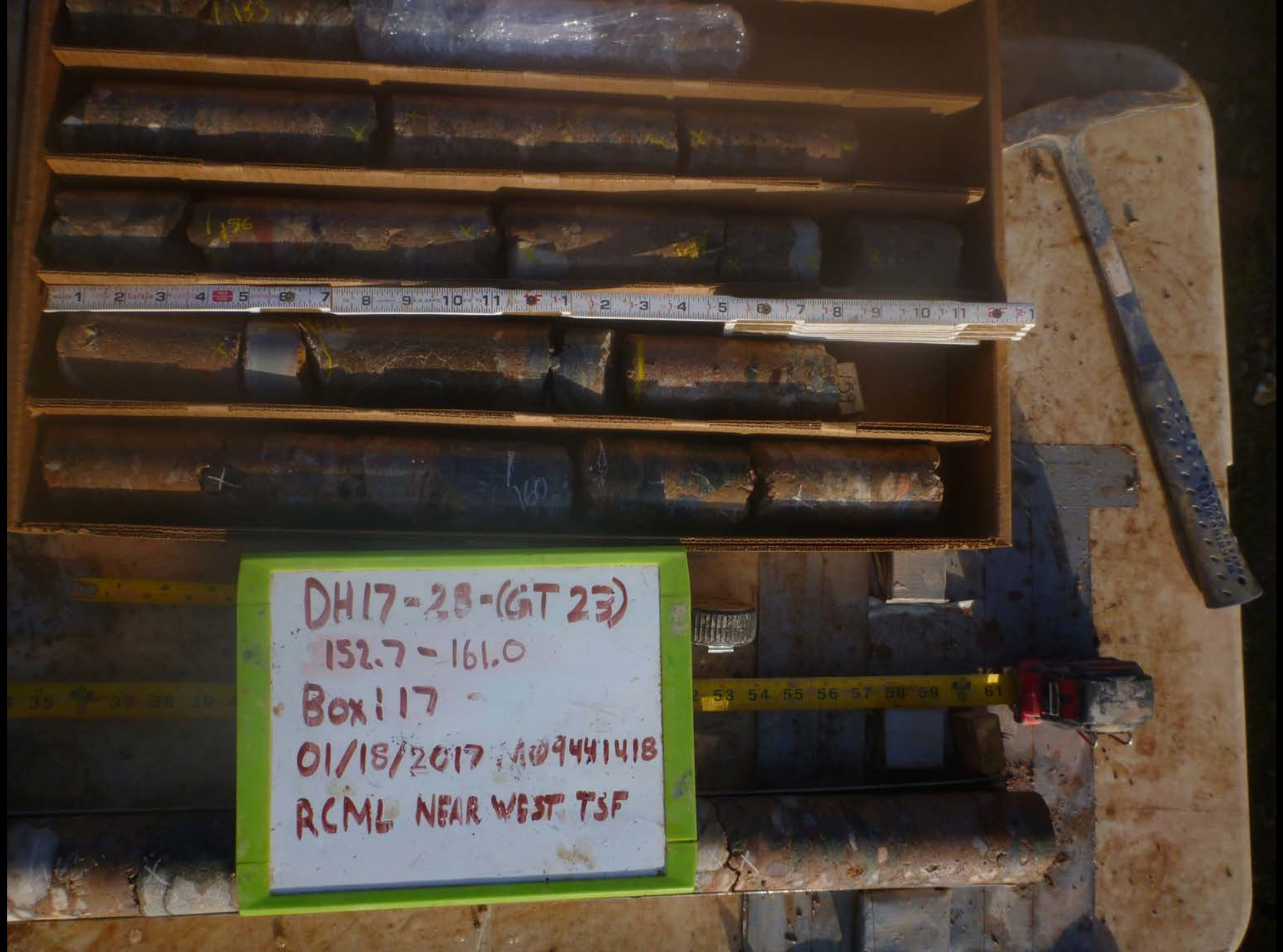

DH17-28-(GT23)
107.2 – 115.9
Box 112
01/18/2017 M09441418
RCML NEAR WEST TSF

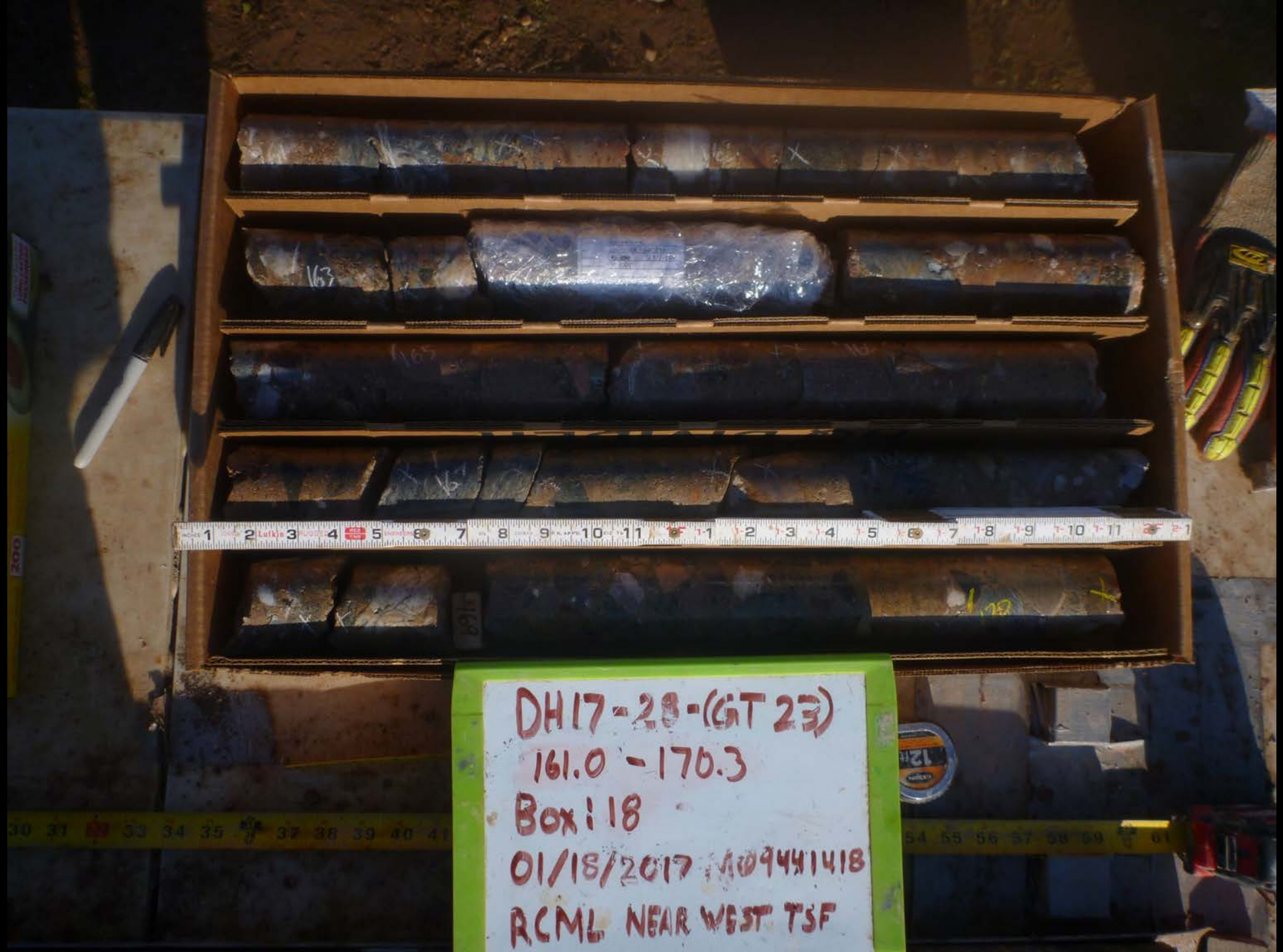

DH17-28-(GT23)
115.9 - 125.6
Box 13
01/18/2017 M0944418
RCML NEAR WEST TSF

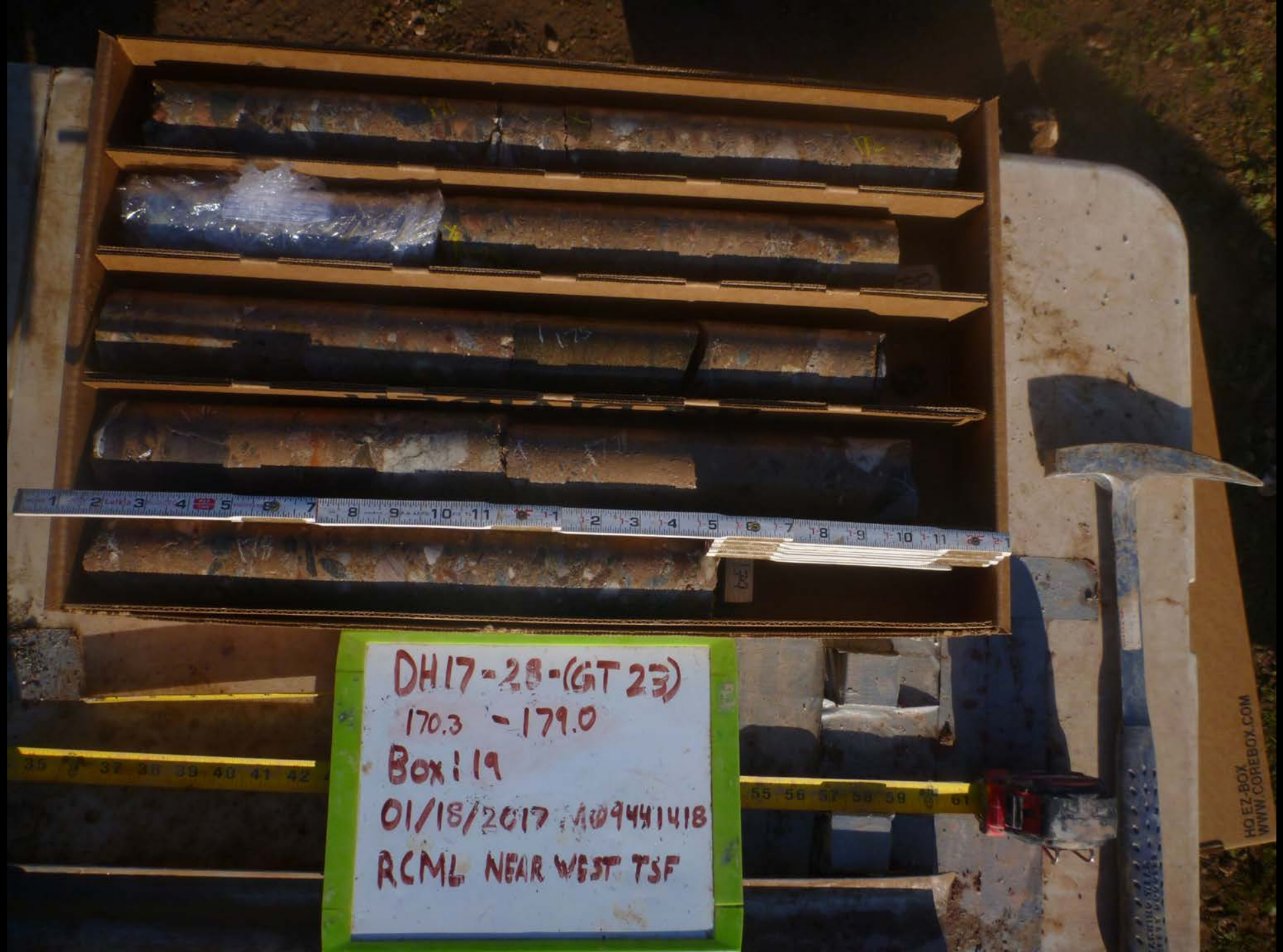

GLAD
ClingWrap
200
DH17-28-(GT23)
1250-1346
Box: 14
01/18/2017 M0944141418
RCML NEAR WEST TSF


GLAD
ClingWrap
200
DH17-28-(GT23)
134.0-143.3
Box 15
01/18/2017
RCML NEAR WEST TSF


DH17-28-(GT 23)
143.3 - 152.7
Box: 16
01/18/2017 M09441418
RCML NEAR WEST TSF


DH17-28-(GT23)
152.7-161.0
Box 117
01/18/2017 4094411418
RCML NEAR WEST TSF


DH17-28-(GT 23)
161.0 - 170.3
Box: 18
01/18/2017 M@9441418
RCML NEAR WEST TSF


DH17-28-(GT23)
170.3 - 179.0
Box: 19
01/18/2017
RCML NEAR WEST TSF
HQ EZ-BOX
WWW.COREBOX.COM


GLAD
Cling Wrap
200
DH17-28-(GT23)
179.0-187.5
Box: 20
01/18/2017 MD9441418
RCML NEAR WEST TSF


GLAD
ClingWrap
200
DH17-28-(GT23)
187.5 - 196.7
Box: 21
01/18/2017 4409441418
RCML NEAR WEST TSF


DH17-28-(GT 23)
196.7 - 206.1
Box 122
01/18/2017 M09441418
RCML NEAR WEST TSF

DH17-28-(GT 23)
206.1-215.4
Box 123


DH17-28-(GT 23)
215.4 - 224.4
Box: 24
01/18/2017

DH17-28-(GT 23)
224.4 - 233.0
Box 125
01/18/2017 AD9441418
RCML NEAR WEST TIE


GLAD
DH17-28-(GT 23)
233.0-242.0
Box: 26
01/18/2017 MO9441418

DH17-29 (GT-14-2)


DH17-28-GT-14-2
1/23/17
From 0 To 10
JS
DH


DH17-28-GT-14-2
1/23/17
From 10 To 19.4
Box 2 1420


Coeur Products
WAX IMPREGNATED
HQ EZ-BOX
WWW.COREBOX.COM
GT-14-2
From:19.4 To:29.8
Box 3 1/23/17


GT-14-2
From: 28.9
To: 39.4
Box 4
1/23/17


GT-14-2
394 - 485
Box 5


WAX IMPREGNATED
WAX IMPREGNATED
GT-14-2
48.5 57.8
Box 5

DH17-30 (GT-25)


EL-PLUG
Bentonite Pellets
TR30
OH17-30 (GT-25)
From: 0 - 16.6 ft
Box: 1
1/24/2017 M09441A18
RCML NW TSF


HQ DIVIDER
PEL-PLUG
Bentonite
1/4" TR30
OH17-30 (GT-2.5')
From: 16.6 - 25.4ft
Box: 2
1/24/2017
M0944IA18


OH17-30 (GT-2.5')
From: 25.4-34.7 ft
Box: 3
1/25/20
MD944A17
RCML NW TSF


OH17-30 (GT-25)
From: 34.7-43.6
Box: 4
1/25/2017 MD944A19


OH17-30 (GT-25)
From: 486-530
Box: 5
1/25/2017 M0944A19
RCML NW TSF

THIS SIDE UP

DH17-30 (GT-25)
From: 53.0-62.7
Box: 6
1/25/2017 MD944A19
RCML NW TSF


THIS SIDE UP
DH17.30 (GT-25)
From: 62.7-71.9
Box:
1/25/2017 M0944A18
PEL-PLUG
GLAD
Cling Wrap

OH17-30 (GT-25)
From: 71.9-80.9
Box: 8
1/25/2017 MD944A17


PEL-PLUG
Bentonite Pellets
1/4" TR30
THIS SIDE UP
DH17-30 (GT-2.5)
From: 80.9 - 90.3 ft
Box: 9
1/25/2017 M0944A19
RCML NW TSF


PEL-PLUG
Bentonite Pellets
1/4" TR30
OH17-30 (GT-25)
From: 90.3 - 99.
Box: 10
1/25/2017 MD944A17
RCML NW TSF


PEL-PLUG
Bentonite Pellets
1/4" TR30
104
OH17-30 (GT-2.5)
From: 99.0-108.2
Box: 11
1/25/2017 M0944A17
RCML NW TSF


THIS SIDE UP
DH17-30 (GT-25)
From: 108.2-117.2
Box: 12
1/25/2017 M0944A18
RCML NW TSF
PEL-PLU
Bentonite Pell
1/4" TR30
STORAGE
SIZE
50
GLAD


THIS SIDE UP
OH17-30 (GT-2.5)
From: 117.2-126.4
Box: 13
1/25/2017 MD944A17
RCML NW TSF


0417-30 (GT-2.5)
From 126.4-135.6
Box 14
1/26/2017 MD944A18
RCML NW TSF


HQ DIVIDER
D417-30 (GT-2.5)
From 135.6-144.7
Box 15
1/26/2017 M0944A19
RCML NW TSF


THIS SIDE UP
0417-30 (GT-2.5)
From 144.7-153.9
Box 16
1/26/2017 MD944A1P
RCML NW TSF


THIS SIDE UP
DH17-30 (GT-2.5)
From 153.9-163.1
Box 17
1/26/2017 M0944A19
RC/ML NW TSF


THIS SIDE UP
164
169
0417-30 (GT-25)
From 163.1-172.2
Box 12
1/26/2017 MD944A19
RCML NW TSF

DH417-30 (GT-2.5)
From 172.2-181.5
Box 19
1/26/2017 MDGHAIP

DH17-30 (GT-25)
From: 181.5 - 190.4
Box 20
1/26/2017 MD944A18
RCML NW TSF


0417-30 (GT-2.5)
From: 190.4-199.3
Box 21
1/26/2017


DH17-30 (GT-2.5)
From: 199.3-209.0
Box 22
1/26/2017 M0944A19
CML NW TSF

DH17-30 (GT-2.5)
From: 209.0-218.1
Box 23
TSF

DH17-30 (GT-25)
From: 218.1-227.4
Box 24
1/26/2017 MD944A18
NW TSF

THIS SIDE UP

D417-30 (GT-25)
From: 227.4-236.9'
Box 25


0417-30 (GT-25)
From 236.9-245.4
Box 26
1/26/2017 MD944A17
RCML NW TSF

DH17-31 (GT-34)


DRILL # DH17-31 (GT-34)
BOX # 1
FROM: 0
TO:
LOCATION: NNTSF
DH17-31 (GT-34)
From: 0 To: 18
1/25/17 Box # 1


DH17-31 (GT-34)
From: 18 To: 26.9
1/25/17 Box # 2


DH17-31 (GT-34)
From: 26.9 To: 38
1/25/17 Box # 3


DH17-31 (GT-34)
From: 38 To: 47
1/25/17 Box # 4

DH17-31 (GT-34)

From: 47 To: 56

1/25/17 Box # 5


WAX IMPREGNATED
DH17-31 (GT-34)
From: 56 To: 65.7
1/24/17 Box # 5


DH17-31 (GT-34)
From: 51 To: 74.5
1/2 - 17
Box #


DH17-31 (GT-34)
From: 74.5 To: 83.6
1/2 - 1/7
Box #


DH17-31 (GT-34
From: 826 To: 922
11/21/17 Box # 9


WAX IMPREGNATED
WWW.COREBOX.COM
DH17-31 (GT-34)
From: 922 To: 1014
11/2[illegible]/17
Box # 10


WAX IMPREGNATED
DH17-31 (GT-34)
From: 1014 To: 1112
11/21/17 Box # 11


WAX IMPREGNATED
DH17-31 (GT-34)
From: 111.2 To: 120.9
1/26/17 Box # 12

WAX IMPREGNATED
DH17-31 (GT-34
From: 120.9 To: 1295
1/26/17 Box # 13

MPREGNATED
DH17-31 (AT-34
From: 1295 To: 1382
1/25/17 Box # 14


DH17-31 (GT-34)
From: 137 To: 145
Box # 15


DH17-31 (GT-34
From: 148.5 To: 158.5
Box # 16

Coeur Products
HQ EZ-BOX
WWW.COREBOX.COM
WAX IMPREGNATED
DH17-31 (GT-34)
From: 158.5 To: 167
11/7/17
Box # 17

Box 18



DRILL # DH17-31 (GT-34)
BOX # 19
FROM: 175.5
TO:
LOCATION: NWTSF
DH17-31 (GT-34
From: 175.5 To: 184.5
11/7/17 Box # 19

WAX IMPREGNATED
DH17-31 (GT-34
From 184.5 To: 214
11/7/17 Box # 20

WAX IMPREGNATED
Coeur Prod
DH17-31 GT-34
From 194 To 233
Box # 21


WAX IMPREGNATED
HQ EZ-BOX
WWW.COREBOX.COM
DH17 31 (CT 34)
From 203 To 213
11/20/17 Box 22


From 213 To 222
1/28/17
BOX: 23


From 222 To 232
1/28/17 Box 24

Coeur Products
WAX IMPREGNATED
HQ.EZ-BOX
WWW.COREBOX.COM
DWT 31 (T 34)
From 232 To 241
11/28/11 Box 25


From 241 _ To 249 TD
Box 26

DH17-32 (GT-42)


DH17-32 (GT-42)
FROM: 0-33
BOX 1
1/29/2017 MOQUAH
RCML NW TSF


H17-32 (GT-42)
FROM: 33-45.3ft
Box 2
1/29/2017
RCML NW



46.5
48.5
D-2
R-1.5
50
52
54
55
DH17-32 (GT-42)
FROM: 45.3-55.9 ft
Box 3
1/29/2017 M0944A17
PCML NW


DH17-32 (GT-42)
From: 55.9-74.9
Box: 4
1/29/2017 MD
RCMC NW SE


DH17-32 (GT-42)
FROM: 749-889
BOX: 5
1/29/2017 MOQUIAID
RCMC NW TSE


DH17-32 (GT-42)
FROM: 88.9 - 97.4
BOX: 6
1/29/2017 MOQUHA ID
RCML NW TSE

DH17-32 (GT-42)


DH17-32 (GT-412)
From: 149.7 - 164.5
Box: 10
1/31/2017 Midway AK
RGML NW TSF


DH17-32 (GT-42)
FROM: 164-5-177.5
BOX: 11
1/31/2017 MINERALS
RC/ML NW TSF


DH17-32 (GT-42)
FROM: 177.5 - 189
BOX: 12
1/31/2017 MI944A18
RCML NW TSF
EL-PLUG
TR30


DH17-32 (GT-42)
FROM: 189-202.5
BOX: 13
1/31/2017 MP944A18
RCML NW TSF


DH17-32 (GT-42)
From: 2025 - 2175
Box: 14
1/31/2017
MW TSF


DH17-32 (GT-42)
FROM: 217.5 - 227.35'
BOX: 15
1/31/2017
REAR MT TSF


DH17-32(G7-42)
FROM: 227.75-237.5
Box: 16
2/1/2017
RCML NW TSF


DH17-32(G7-42)
FROM: 237.5 - 246.5
BOX: 17
2/1/2017
RCML NWTSF


DH17-32(GT-42)
From: 246.5-250
Box: 18
2/1/2017
RCWL NW TSF

DH17-33 (GT-29)

DH17-33 (GT-29)
From: 0
To: 13
Box: 1
11/30/17
Sharpie KING SIZE


WAX IMPREGNATED
DH17-33 (GT-29)
From: 13 To: 22
Box: 2 11/30/17


RCML
NWTSF
DH17-33 (GT-29)
From: 22 To: 31.5
Box: 3
11/30/17
HQ EZ-BOX
WWW.COREBOX.COM


DH17-33 (GT-29)
From: 31.5 To: 41
Box: 4
1/30/17
RCML
NWTSF
LOCATION: NWTSF
HQ EZ-BOX
WWW.COREBO


WAX IMPREGNATED
DH17-33 (GT-29)
From: 41 To: 55.2
Box: 5 11/30/17


Coeur Products
HQ EZ-BOX
WWW.COREBOX.COM
DH17-33 (61-2)
From: 55.2 To: 64.5
Box: 6
11/30/17


RCML
NWTSF
DH17-33 (GT-29)
From: 645 To: 673
Box: 7
11/30/17


DH17-33 (GT-29)
From: 73 To: 83.4
77
83
VAX IMPREGNATED


DH17-33 (GT-29)
From: 83.4 To: 94
Box: 9
1/31/17


WAX IMPREGNATED
HQ EZ-BOX
WWW.COREBOX.COM
DH17-33 (GT-29)
From: 94 To: 103.4
Box: 10 11/31/17


DH17-33 (GT-29)
From: 102.4 To: 112
Box: 11
11/31/17
HQ EZ-BOX
WWW.COREBO
LOCATION:
TO:


DH17-33 (GT-29)
From: 112 To: 122
Box: 12 11/31/17
HQ EZ-BOX
WWW.COREBOX.COM


DH17-33 (GT-29)
From: 122 To: 131.5
Box: 13 11/31/17


WAX IMPREGNATED
DH17-33 (GT-29)
From: 1315 To: 1405
Box: 14
1/31/17


DH17-33 GT-29
From 140.5 To 150
Box 15
2/11/17


DH17-336-T-29
From 150 T 159.5
Box 11
2/1/17
Dry Erase
TAPE MEASURE


DH17-33 (T-29
From 159.5 T. 170
Box 17
21/1/17
HQ EZ-BOX
WWW.COREBOX.COM
WAX IMPREGNATED


Coeur Products
DRILL #
BOX #
FROM:
TO:
LOCATION:
DH17-33 GT-29
From 170 To 178.5
Box 18
2/4/17


DH17-336-T-29
From 172.5 T. 188.4
Box 19
2/1/17

DH17-33 GT-29
From 184 T. 198
Box 20
2/1/17
Dry Erase


DRILL # DH17-33 (GT-29)
BOX # 21
FROM: 198
TO:
LOCATION: NWTSF
DH17-33 GT-29
From 198 T. 207.6
Box 21
2/1/17


WAX IMPREGNATED
EZ-BOX
W.COREBOX.COM
217
DH17-33 GT-29
From 2016 To 217
Box 22
2/1/17


IMPREGNATED
DH17-33 GT-29
From 217 To 226.6
Box 23
2/1/17


DRILL #DH17-33 (GT-29)
BOX # 24
FROM: 226.6
TO:
LOCATION: NWTSF
DH17-33 GT-29
From 226.5 To 236
Box 24
2/1/17


Coeur Products
HQ EZ-BOX
WWW.COREBOX.COM
DH17-33GT-29
From 236 To 245
Box 25
2/1/17


DH17-33 GT-29
From 245.5 To 250 TD
Box 26
2/1/17
Coeur
Products

DH17-34 (GT-27)


(GT-27)
From: 0-16.3
Box: 1
2/3/2017
RCML NWTSF
THIS SIDE UP


(GT-27)
From: 16.3-26.3
Box: 2
2/3/2017
RCML NWTSF


(GT-27)
From: 26.3-35.8
Box: 3
2/3/2017
RCML NWTSF
THIS SIDE UP
WAX IMPREGNATED


(GT-27)
From: 35.8-47.8
Box: 4
2/3/2017
RCML NWTSF


(G7-27)
From: 47.8-57.3
Box. 5
2/3/2017
RCML NWTSF


(GT-27)
From: 57.3-67
Box: 6
2/4/2017
RCML NWTSF


(G7-27)
From: 67-76.5
Box. 7
2/4/2017
RCML NWTSF


(GT-27)
From: 76.5-86
Box: 8
2/4/2017
RCML NWTSF
THIS SIDE UP


(G7-27)
From: 86 - 95.3
Box 9
2/4/2017


DH17-32 (GT-27)
From. 95.3-105.2
Box. 10
2/4/2017
NWTSF
102
104


DH17-32 (G7-27)
From 105.2-114.7
Box 11
2/9/2017 MWHAS
Recd NWTSF
DRILL #
BOX #


DH17-32 (GT-27)
Box 12
2/19/2017
REAL NWTSF


DH17-32 (G7-27)
Box 13
Coeur Products


133.5 TO 143.2 FT.
BOX 14


DH17-34 (GT-27)
From: 143.2-152.2 ft
Box: 15
2/5/17 M09441A18
RCML NW TSF


DH17-34 (GT-27)
From: 152.2-161.2
Box: 16
2/5/17 M09441A18
RCM NW TSF


DH17-34 (GT-27)
From: 161.2-170.4
Box: 17
2/5/17 MO9441418
RCM NW TSF
169
170
GLAD
Cling Wrap
31 BAGS
GALLON STORAGE BAGS


DH17-34 (GT-27)
From: 170.4-179.0
Box: 18
2/5/17 M09441A18
RCM NW TSF
GLAD
Cling Wrap


DH17-34 (GT-27)
From: 179.0-188.6
Box: 19
2/5/17 MO9441A18
RCM NW TSF
GLAD
Cling Wrap


DH17-34 (GT-27)
From: 188.6 - 197.8
Box: 20
2/5/17 M09441A18
RCM NW TSF

DH17-34 (GT-27)
From: 197.8-206.8
Box: 21
2/5/17 M09441A18
RCM NW TSF


DH17-34 (GT-27)
From: 206.8-215.0
Box: 22
2/5/17 M09441A18
RCM NW TSF
ACE


THIS SIDE UP
DH17-34 (GT-27)
From: 215.0 - 224.5
Box: 23
2/5/17 M09441A18
RCM NW TSF


DH17-34 (GT-27)
From: 224.5-233.6
Box: 24
2/5/17 M09441A18
RCM NW TSF


DH17-34 (GT-27)
From: 233.6-242.0
Box: 25
2/5/17 M09441A18
RM NW TSE


DRILL #
BOX #
FROM:
TO:
LOCATION:
DH17-34 (GT-27)
From: 242.0 - 250.0
Box: 26
2/5/17 M09441A18
RCML NW TSF

DH17-35 (GT-30)


DH17-35 GT-30
From: 0 To: 10
Box: 1 2/3/17
HQ EZ-BOX
WWW.COREBOX.COM


DH17-35 GT-30
From: 110 To: 122
Box: 2 2/3/17
HQ EZ-BOX
WWW.COREBOX.COM


HQ EZ-BOX
WWW.COREBOX.CO
DH17-35 GT-30
From: 22 To: 31.5
Box 3 2/3/17


DRILL #
BOX #
FROM:
TO:
LOCATION:
DH17-35 GT-30
From: 31.5 To: 40.4
Box 4 2/3/17


DRILL #DH17-35 (GT-30)
BOX #: 5
FROM: 40.4
TO:
LOCATION:
LH
Dry Erase
DH17-35 GT-30
From: 40.4 To: 50
Box 5 2/3/17


DH17-35 (GT-30)
From: 50 To: 59.1
Box: 6
2/4/17


DH17-35 (GT-30)
From: 59.1 To: 68.8
Box: 7
2/4/17


DH17-35 (GT-30)
From 68.8 To: 72.4
Box: 8
2/4/17


DH17-35 (GT-30)
From 774 To: 887
Box: 9
2/4/17
HQ EZ
WWW.


DH17-35 (GT-30)
From 87 To: 96
Box: 10
2/21/17


DH17-35 (GT-30)
From 96 To: 105.1
Box 11 2/4/17


DH17-35 ((GT-30)
From 105.1 To: 115
Box 12
2/4/17


DH17-35 (GT-30)
From 115 To: 126
Box 13 2/4/17
115
118
121
123
126
17-35 (GT-30)
NWTSF


DH17-35 (GT-30)
From 126 To: 136
Box 14 2/4/17


HQ EZ-BOX
WWW.COREBOX.COM
DH17-35 (GT-30)
From 131 To: 145
Box 15
2/4/17
Sharpie


DH17-35 (GT-30)
From 145 To: 154.8
Box 16
2/9/17


Coeur Products
HQ EZ-BOX
WWW.COREBOX.COM
DRILL
BOX #
FROM:
TO:
LOCATION
DH17-35 (GT-30)
From 154.8 To: 164
Box 17
2/4/17


DH17-35 (GT-30)
From 164 To: 174
Box 18
2/4/17


DH17-35 (GT-30)
From 174 To 183.7
Box 19 2/4/17


DH17-35 (GT-30)
From: 183.7 To: 193.4
Box: 20
2/5/17


DH-17-35 (GT-30)
From: 193.4 To: 202.8
Box: 21
2/5/17


DH. 17-35 (GT-30)
From: 202.8 To 211.7
Box: 22
2/5/17


DH. 17-35 (GT-30)
From: 211.7 To 221.2
Box: 23
2/5/17


DH: 17-35 (GT-30)
From: 221.2 To: 232
Box: 24 . 2/5/17

DH-17-35 (GT-30)
From 232 To 241.6
Box 25 2/5/17
Coeur Products


DH-17-35 (GT-30)
From 241.6 To 250 TD
Box. 26 2/5/17
Coeur Products
WAX IMPREGNATED
HQ EZ-BOX
WWW.COREBOX.COM

DH17-36 (GT-14-3)


OH17-36 (GT-14-3)
From: 0 - 11.3 ft
Box: 1
2/7/17 M0944118
RCML NW TSF


OH17-36 (GT-14-3)
From: 11.3 - 20.1
Box: 2
2/7/17 M09441A'8
RCML NW TSF


GLAD
ClingWrap
Limited Edition
200
OH17-36 (GT-14-3)
From: 20.1 - 29.0ft
Box: 3
2/7/17 M09441A18
RCML NW TSF

DH17-36 (GT-14-3)
From: 29.0 - 38.5 ft
Box: 4
2/7/17 M09441118
RCML NW TSF


OH17-36 (GT-14-3)
From: 38.5-47.7 ft
Box: 5
2/7/17 M09441A18
RCML NW TSF


GLAD
ClingWrap
GLAD
ClingWrap
DH17-36 (GT-14-3)
From: 47.7-56.7 M
Box: 5
2/7/17 M09441A18
RCML NW TSF
*Should be Box 6


THIS SIDE UP
DH17-36 (GT-14-3)
From: 56.7-66.0
Box: 7
2/7/17 M09441A18
RCML NW TSF


DH17-36 (GT-14-3)
From 66.0 - 75.3
Box: 8
2/7/17 M09441A18
RCML NW TSF

OH17-36 (GT-14-3)
From 75.3-84.6
Box: 9
2/7/17 M09441118
RCML NW TSF


OH17-36 (GT-14-3)
From 84.6 -94.0 ft
Box: 10
2/7/17 M09441A18
RCML NW TSF

DH17-36 (GT-14-3)
From 94.0 - 100.0
Box: 11
2/7/17 MN944118
RCML NW TSF

DH17-37 (GT-28)

DH17-37 GT-28

From: 0 To: 19.3

Box: 1 2/7/17

DH17-37 GT-28

From: 19.3 To: 28.0

Box: 2 2/7/17


THIS SIDE UP
DH17-37 GT-28
From: 28.0 To: 37.0
Box: 3
2/7/17

DH17-37 GT-28

From: 37.0 To: 46.1

Box: 4 2/7/17

DH17-37 GT-28

From: 46.1 To: 55.1

DH17-37 (GT-28)
FROM: 55.1 - 64.9 ft
BOX: 6
2/8/17 RCML NI TSF
MO9441418

DH17-37 (GT-28)
FROM: 64.9-73.9
BOX: 7
2/8/17 RCML NW TSF
M09441A18

DH17-37 (GT-28)
FROM: 73.9 - 82.2
BOX: 8
2/8/17 RCML NW TSF
MO9441418


DH17-37 (GT-28)
FROM: 82.2-92.0
BOX: 9
2/8/17 RCML NW TSF
MO9441A18

DH17-37 (GT: 28)
FROM: 92.0 - 101.5
BOX: 10
2/8/17 RCML NW TSF


111
116
DH17-27 (GT28)
From: 101.5-110.0
Box: 11
2/8/17 RC
RCML NW TSF
MO9441413
107
Cling Wrap
GLAD
100

DH17-327 (GT281)
2/8/17 RCML NW TSF
From: 100-110
Box: 12
2/8/17


DH17-37 (GT-28)
FROM: 119.0-128.8
BOX: 13
2/8/17 RCML NW TSF
MO9441A18
126
D R>2.5
D R>5.5
Getac

DH17-37 (GT-28)
From: 128.8 - 137.2
Box: 14
2/8/17 RCML NW TSF
MO9441A18

DH17-37 (GT-28)
FROM: 137.2-146.2
BOX: 15
2/8/17 RCML NW TSF
MD9441A18

DH17-37 (GT-28)
FROM: 146.2 - 155.2
BOX: 16
2/8/17 RCML NW TSF
MO9441A18

DH17-37 (GT28)
FROM: 155.2-165.0
BOX: 17
2/8/17 RCML NW TSF
MD9441A18

DH17-37 (GT28)
FROM: 165.0 - 174.3
BOX: 18
2/8/17 RCML NW TSF
MO9441418

DH17-37 (GT-28)
FROM: 174.3-183.1
BOX: 19
2/8/17 RCML NW TSF
MO9441A18

HQ DIVIDER

192

DH17-37 (GT-28)
FROM: 183.1 - 192.0
BOX: 20
2/8/17 RCML NW TSF
MO9441418

DH17-37 (GT-28)
FROM: 192.0 - 201.3 ft
Box: 21 2/9/2017
RCML NW TSF
MD9441A18

DH17-37 (GT-28)
FROM: 201.3 - 211.7 ft
BOX: 22 2/9/2017
RCML NW TSF
MD9441A18

DH17-37 (GT-28)
FROM: 210.7 - 220.0
BOX: 23 2/9/2017
RCML NW TSF
MD9441A18

DH17-37 (GT-28)
From: 220-229.3
Box: 24
RCMC NW
TSF
2/9/2017

DH17-37 (GT-28)
FROM: 229.3 - 238.3
BOX: 25 2/9/2017
RCML NW TSF
MD9441A18

DH17-37 (GT 28)
FROM: 238.3-247.8
BOX: 26 2/9/2017
RCML NW TSF
ME-441A18

DH17-37 (GT 28)
FROM: 247.8 - 250 EOH
BOX: 27 2/9/2017
RCML NW TSF
MØ9441A18

DH17-38 (GT-22)


DH17-38 (GT-22)
0.0 - 12.1 ft.
BOX #1
FEBRUARY 14, 2017
RCML NWTSFM0944IA18
LOGGED BY: A.G.


GLAD
DH17-38 (GT-22)
12.1 - 21.0 ft.
BOX #2
FEBRUARY 15, 2017
RCML NWTSF, MO9441A18
LOGGED BY: A. GARCIA

DH17-38 (GT-22)
21.0-29.9 ft.
BOX #3
FEBRUARY 15, 2017
RCML NWTSF, M09441A18

DH17-38 (GT-22)
29.9 - 39.0 ft.
BOX # 4
FEBRUARY 15, 2017
RCML NWTSF M09441A18


DH17-38 (GT-22)
39.0 - 48.0 ft.
BOX # 5
FEBRUARY 15, 2017
RCML NWTSF, M09441A18
LOGGED BY: A. GARCIA


DH17-38 (GT-22)
48.0-[illegible]3 ft.
BOX #6
FEBRUARY 15, 2017
RCML NWTSF, M09441A18
LOGGED BY: A. GARCIA


DH17-38 (GT-22)
57.3 - 66.5 ft.
BOX #7
FEBRUARY 15, 2017
RCML NWTSF; M09441A18
LOGGED BY: A. GARCIA


DH17-38 (GT-22)
665-675.9 ft.
BOX #8
FEBRUARY 15, 2017
RCML NWTSF; M09441A18
LOGGED BY: A. GARCIA


EZ-BOX
WWW.COREBOX.COM
DH17-38 (GT-22)
75.9 - 84.4 ft.
BOX #9
FEBRUARY 15, 2017
RCML NWTSF; M09441A18


DH17-38 (GT-22)
84.4-94.0 ft.
BOX # 10
FEBRUARY 15, 2017
RGML NWTSF, M09441A18
LOGGED BY: A. GARCIA


DH17-38 (GT-22)
94.0-103.3 ft.
BOX #11
FEBRUARY 15, 2017
Coeur Products


DH17-38 (GT-22)
103.3 – 112.2 ft.
Box #12
February 15, 2017
RGML NWTSF M09441A18


DH17-38 (GT-22)
112.2 - 121.3 ft.
BOX #13
FEBRUARY 15, 2017
RCMLNWTSF M09441A18
LOGGED BY: A GARCIA
Coeur Products


DH17-38(GT-22)
121.3 – 131.2 ft.
BOX #14
FEBRUARY 15, 2017
RCML NWTSF, M09441A18

DH17-38 (GT-22)
131.2 - 139.0 ft.
Box #15
February 15, 2017
RGML NWTSF M09441A18
Logged by: A. Garcia

RGML
NWTSF


DH17-38 (GT-22)
139.0-147.8ft.
Box #16
February 15, 2017


DH17-38 (GT-22)
147.8-157.0 ft.
Box #17
FEBRUARY 15, 2017


THIS SIDE UP
DH17-38 (GT-22)
157.0 - 165.8 ft.
BOX #18
FEBRUARY 16, 2017
RGM LNWTSF, M09441A18
LOGGED BY: A GARCIA


DH17-38 (GT-22)
165.8-175.2 ft.
BOX #19
FEBRUARY 16, 2017
RCMLNWTSF M09441A18
LOGGED BY: A GARCIA


DH17-38(GT-22)
175.2-184.6 ft.
BOX #20
FEBRUARY 16, 2017
RCNL NWTSF M09441A18
LOGGED BY: A GARCIA


RCML
NWTSF
DH17-38 (GT-22)
184.6-193.6 ft.
BOX #21
FEBRUARY 16, 2017
RCML NWTSF M09441A18
LOGGED BY: A GARCIA


RCML
NWTSF
DH17-38 (GT-22)
193.6-202.8 ft.
BOX #22
FEBRUARY 16, 2017
RCML NWTSF M09441A18


DH17-38 (GT-22)
202.8-211.5 ft.
BOX #23
FEBRUARY 16, 2017
RCMLNWTSF M09441A18
LOGGED BY: A GARCIA


DH17-38 (GT-22)
211.5-220.9 ft.
BOX #24
FEBRUARY 16, 2017
RCML NWTSF M09441A18
LOGGED BY: A GARCIA

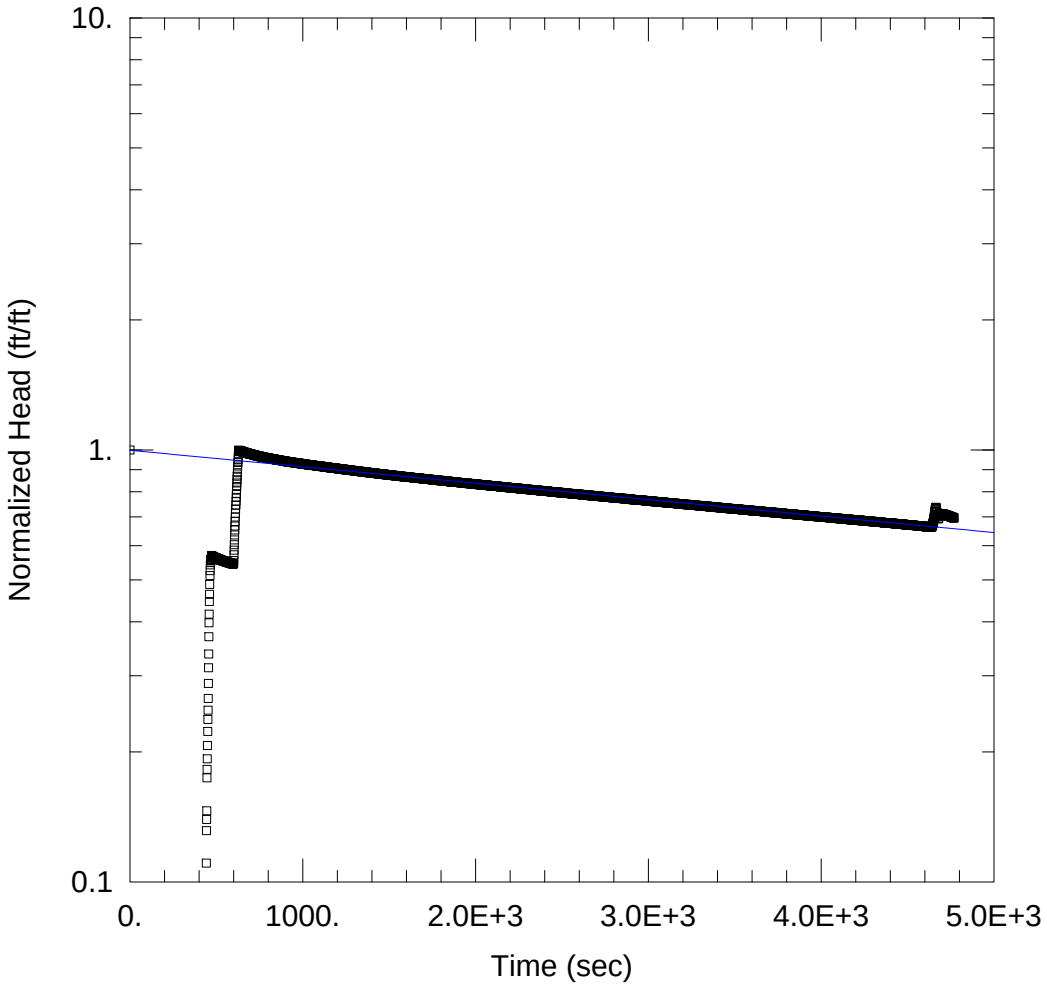

DH17-38 (GT-22)
220.9 - 230.0 ft.
BOX #25
FEBRUARY 16, 2017
RCML NWTSF, M
A GARCIA


RCML
NWTSF
DH17-38 (GT-22)
230-239.0 ft.
BOX #26
FEBRUARY 16, 2017
RCML NWTSF, M09441A18
LOGGED BY: A GARCIA


DH17-38 (GT-22)
239.0-248.3 ft.
BOX #27
FEBRUARY 16, 2017


DH17-38 (GT-22)
248.3-250.0 ft.
BOX #28
FEBRUARY 16, 2017
RCMLNWTSF, M09441A18
LOGGED BY: A GARCIA

APPENDIX B
HYDROGEOLOGICAL ANALYSES SOFTWARE OUTPUTS



TEST 1

Data Set: C:\...\DT-14_Test_1.aqt
Date: 09/30/16 Time: 19:01:49

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: DT-14
Test Date: 9/24/2016

AQUIFER DATA

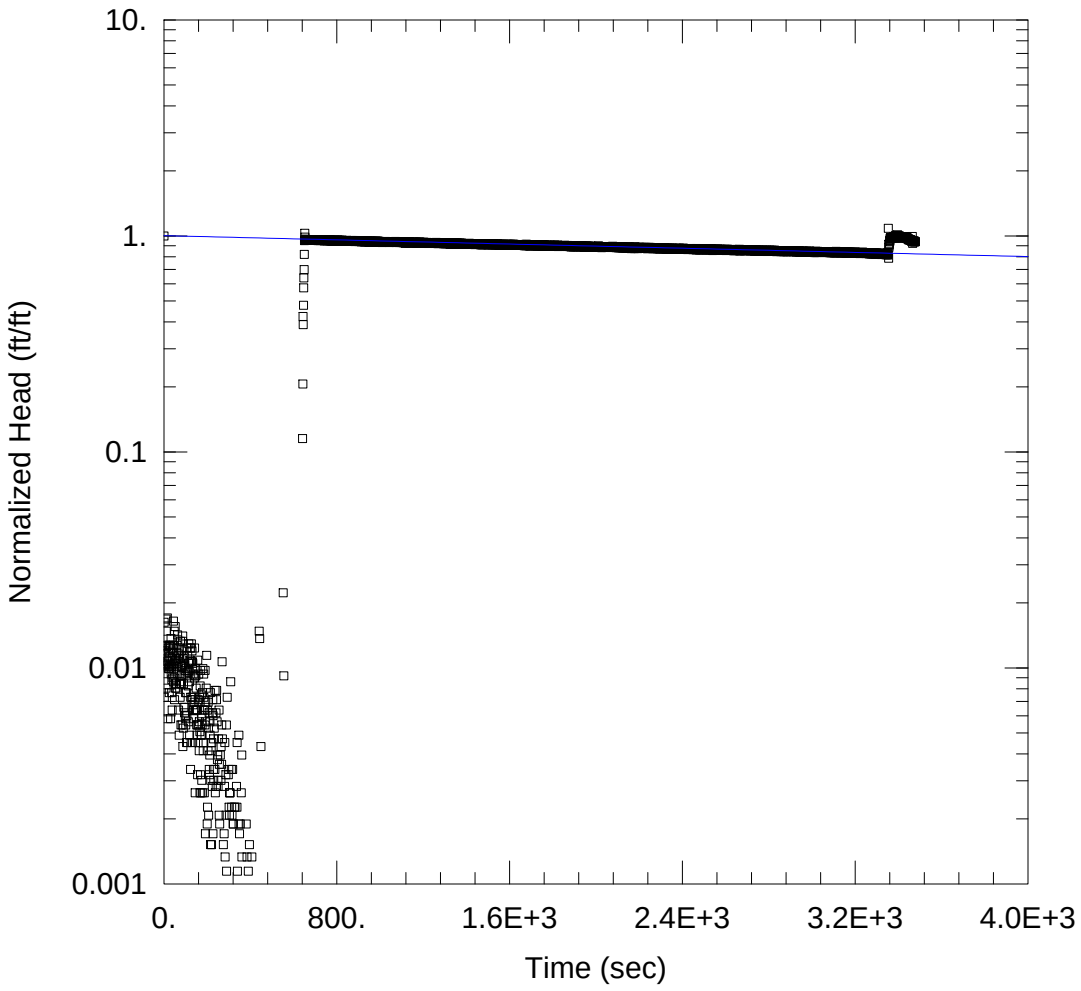
Saturated Thickness: 255. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (DT-14)

Initial Displacement: 36.8 ft
Total Well Penetration Depth: 258.6 ft
Casing Radius: 0.1579 ft
Static Water Column Height: 255. ft
Screen Length: 258.6 ft
Well Radius: 0.1579 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 8.341E-7 cm/sec
y0 = 36.72 ft



TEST 2

Data Set: C:\...\DT-14_Test_2.aqt
Date: 09/30/16 Time: 19:03:08

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: DT-14
Test Date: 9/24/2016

AQUIFER DATA

Saturated Thickness: 69.5 ft Anisotropy Ratio (Kz/Kr): 1.

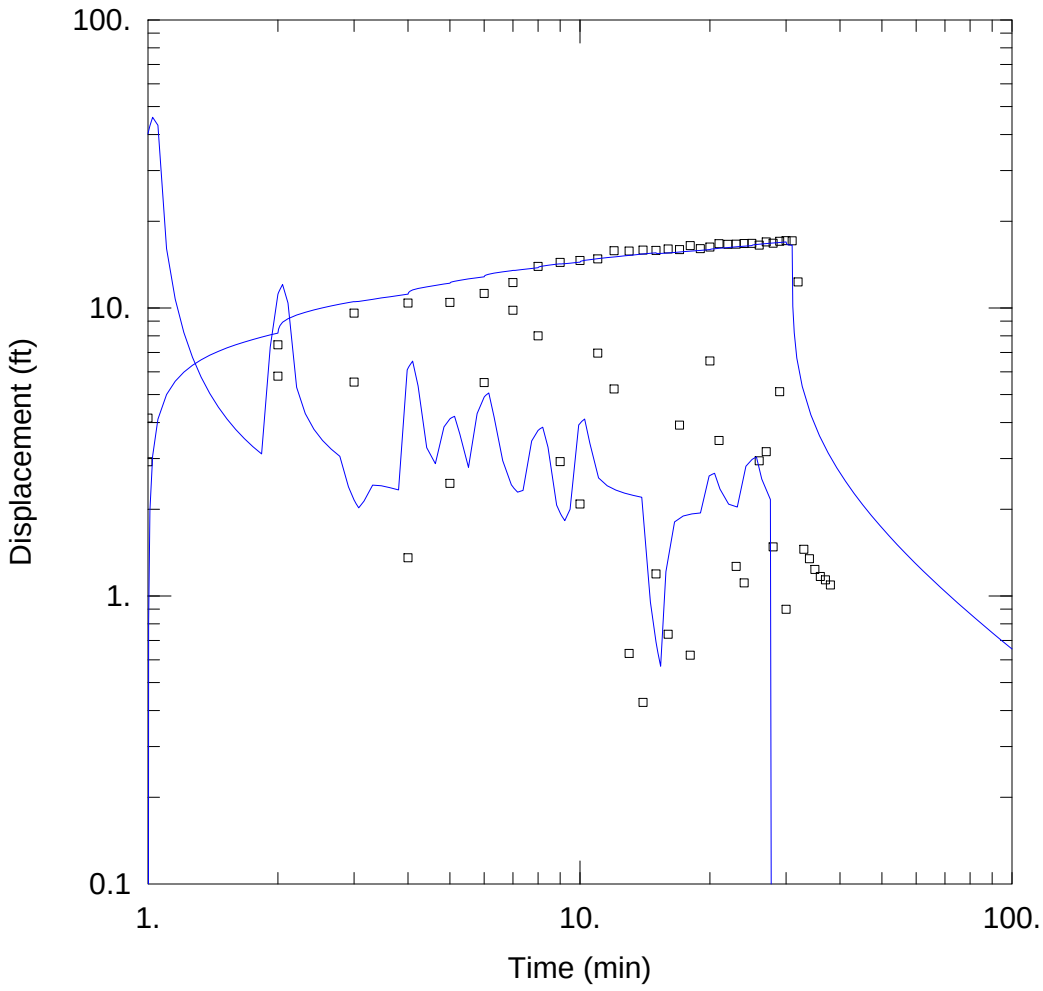
WELL DATA (DT-14)

Initial Displacement: 5.35 ft
Total Well Penetration Depth: 69.5 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 421.4 ft
Screen Length: 69.5 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 1.483E-6 cm/sec y0 = 5.364 ft



TEST 3

Data Set: C:\...\DT-14_Test_3_V.1.aqt
Date: 02/13/17 Time: 14:44:45

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: DT-14
Test Date: 9/24/2016

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
DT-14	0	0

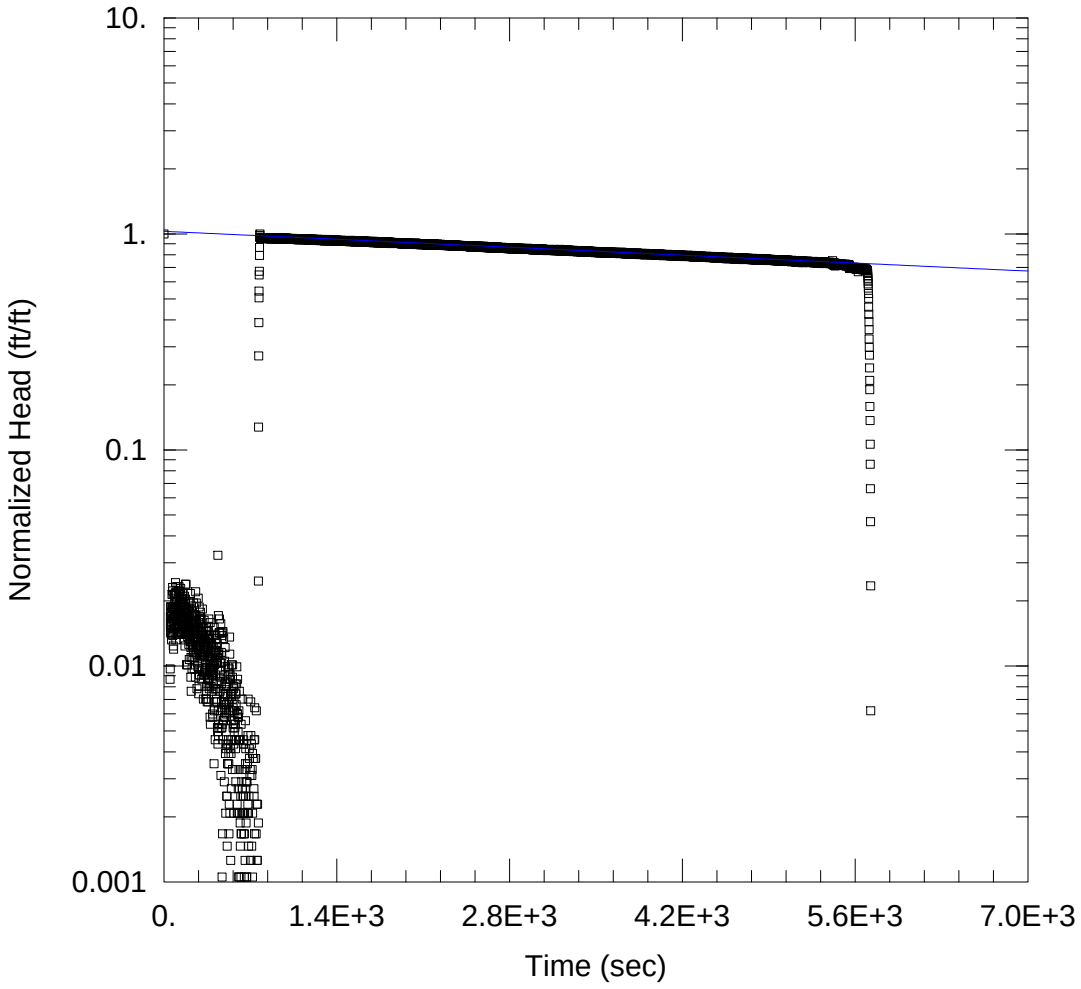
Observation Wells

Well Name	X (ft)	Y (ft)
▫ DT-14	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 2.853 cm^2/sec
S = 0.05563
Kz/Kr = 0.1
b = 16.5 ft



WELL TEST ANALYSIS

Data Set: C:\...\GT-8_Test1.aqt
Date: 10/09/16 Time: 12:08:39

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-8
Test Date: 9/29/2016

AQUIFER DATA

Saturated Thickness: 44. ft Anisotropy Ratio (Kz/Kr): 0.1

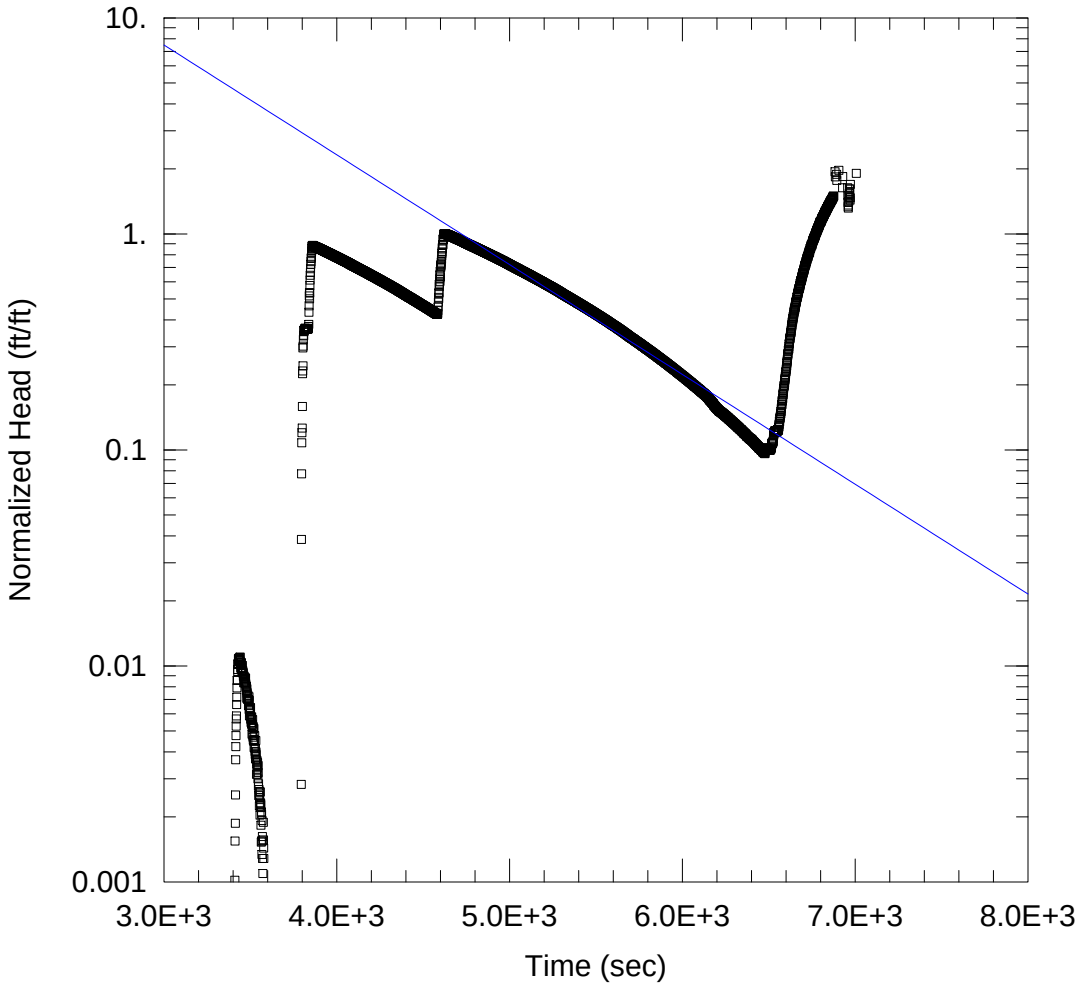
WELL DATA (GT-8)

Initial Displacement: 4.86 ft
Total Well Penetration Depth: 99. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 98.09 ft
Screen Length: 44. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 2.581E-6 cm/sec
y0 = 4.997 ft



TEST 2 SLUG

Data Set: C:\...\GT-8_Test2_Slug.aqt
Date: 10/10/16 Time: 13:56:49

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-8
Test Date: 10/1/2016

AQUIFER DATA

Saturated Thickness: 144.9 ft Anisotropy Ratio (Kz/Kr): 1.

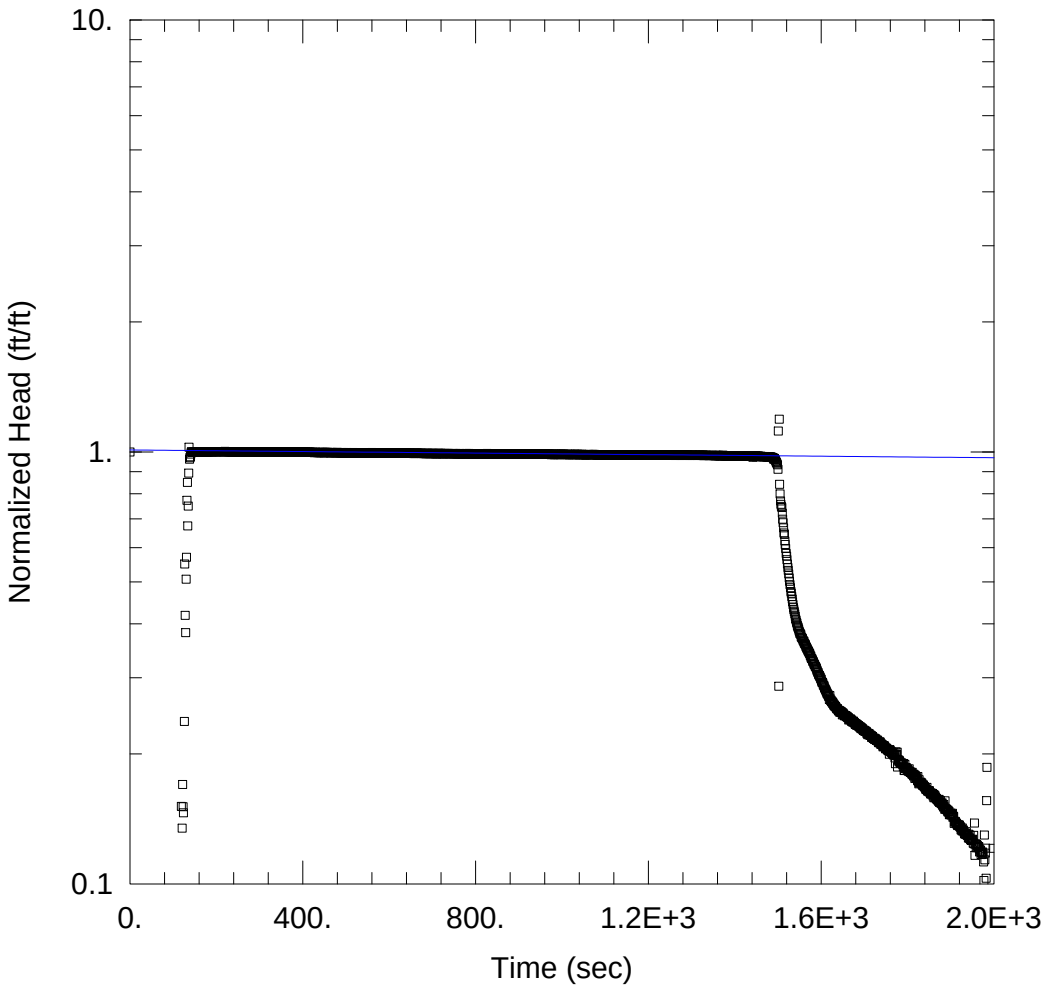
WELL DATA (GT-8)

Initial Displacement: 53. ft
Total Well Penetration Depth: 355.1 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 179.2 ft
Screen Length: 250. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 1.95E-5 cm/sec y0 = 1.33E+4 ft



TEST 3

Data Set: C:\...\GT-8_Test3.aqt
Date: 10/10/16 Time: 14:10:24

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-8
Test Date: 10/1/2016

AQUIFER DATA

Saturated Thickness: 23.55 ft Anisotropy Ratio (Kz/Kr): 1.

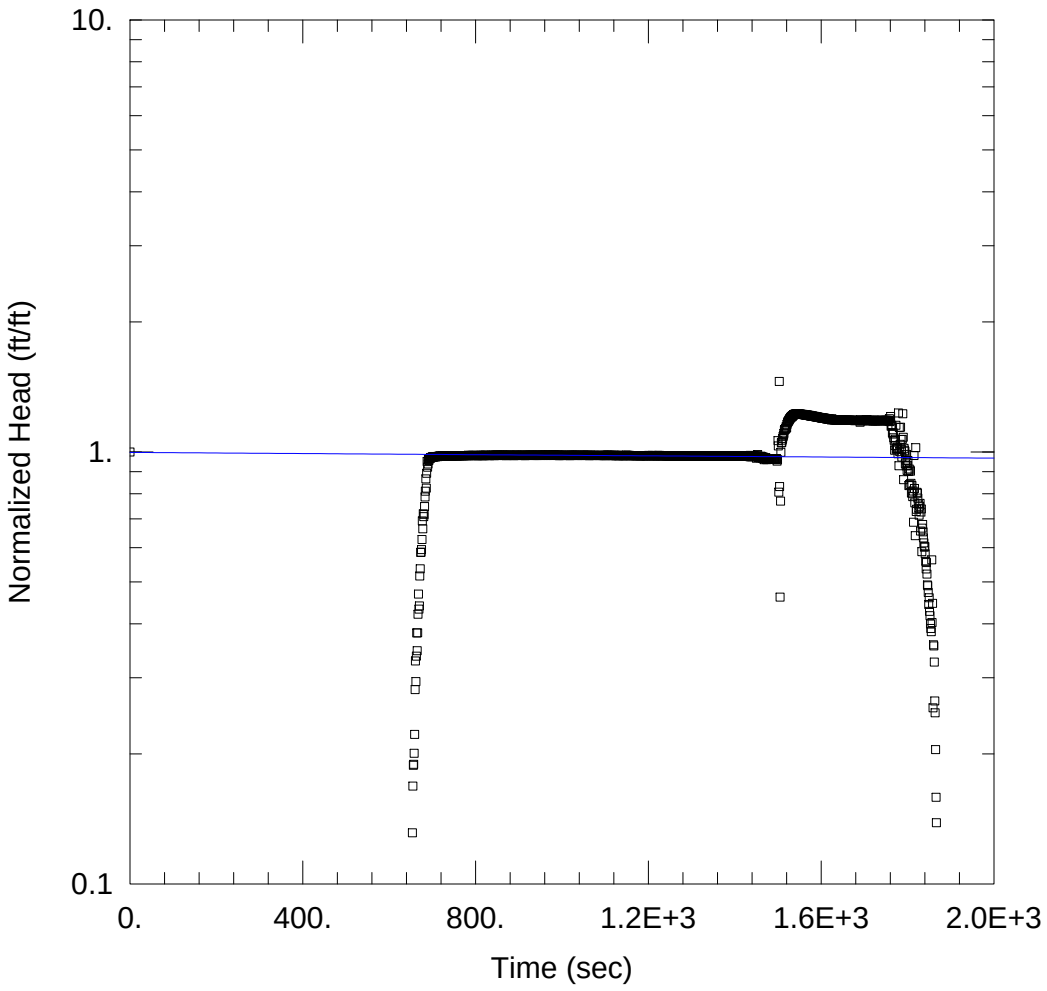
WELL DATA (GT-8)

Initial Displacement: 21. ft
Total Well Penetration Depth: 260. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 190.8 ft
Screen Length: 23.55 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 1.767E-6 cm/sec
y0 = 21.22 ft



TEST 4

Data Set: C:\...\GT-8_Test4.aqt
Date: 10/10/16 Time: 14:23:12

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-8
Test Date: 10/1/2016

AQUIFER DATA

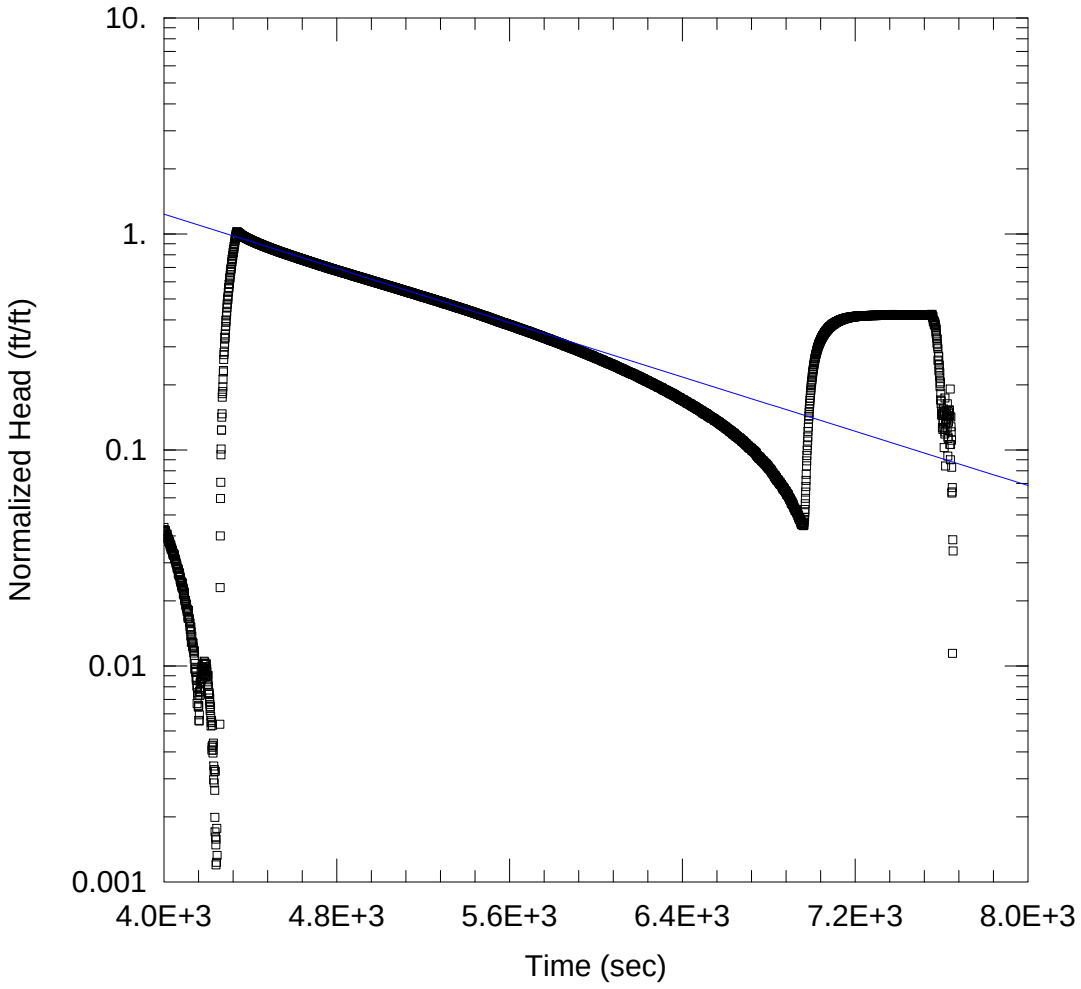
Saturated Thickness: 63.55 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (GT-04)

Initial Displacement: 23.5 ft
Total Well Penetration Depth: 260. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 205.5 ft
Screen Length: 63.55 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 5.209E-7 cm/sec
y0 = 23.44 ft



TEST 1

Data Set: C:\...\GT-7_Test1_Slug.aqt
Date: 10/10/16 Time: 15:11:32

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-7
Test Date: 10/4/2016

AQUIFER DATA

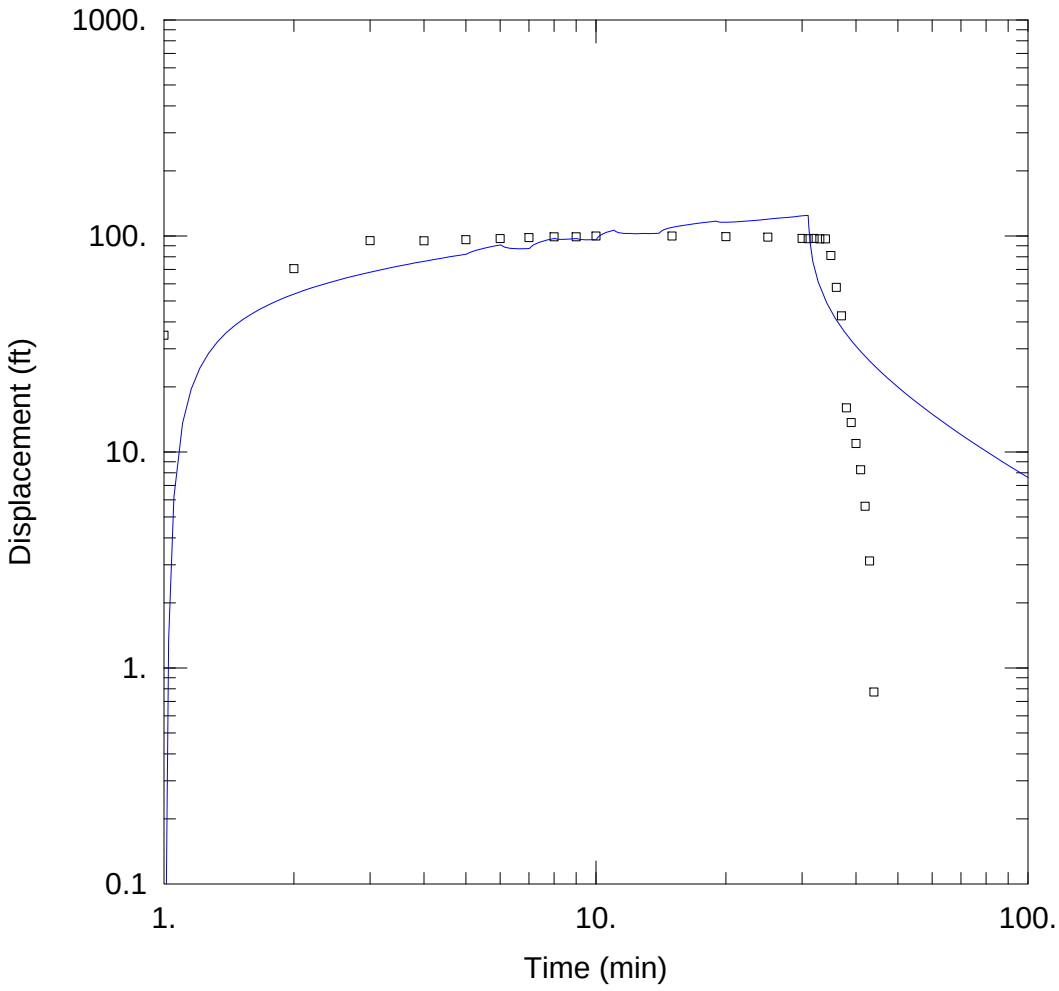
Saturated Thickness: 99.25 ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (GT-7)

Initial Displacement: 31.66 ft
Total Well Penetration Depth: 164. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 109.1 ft
Screen Length: 99.25 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 1.555E-5 cm/sec
y0 = 705.2 ft



TEST 1 CRI

Data Set: C:\...\GT-7_Test1_CRI.aqt
Date: 02/13/17 Time: 14:36:03

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-7
Test Date: 10/4/2016

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
GT-07	0	0

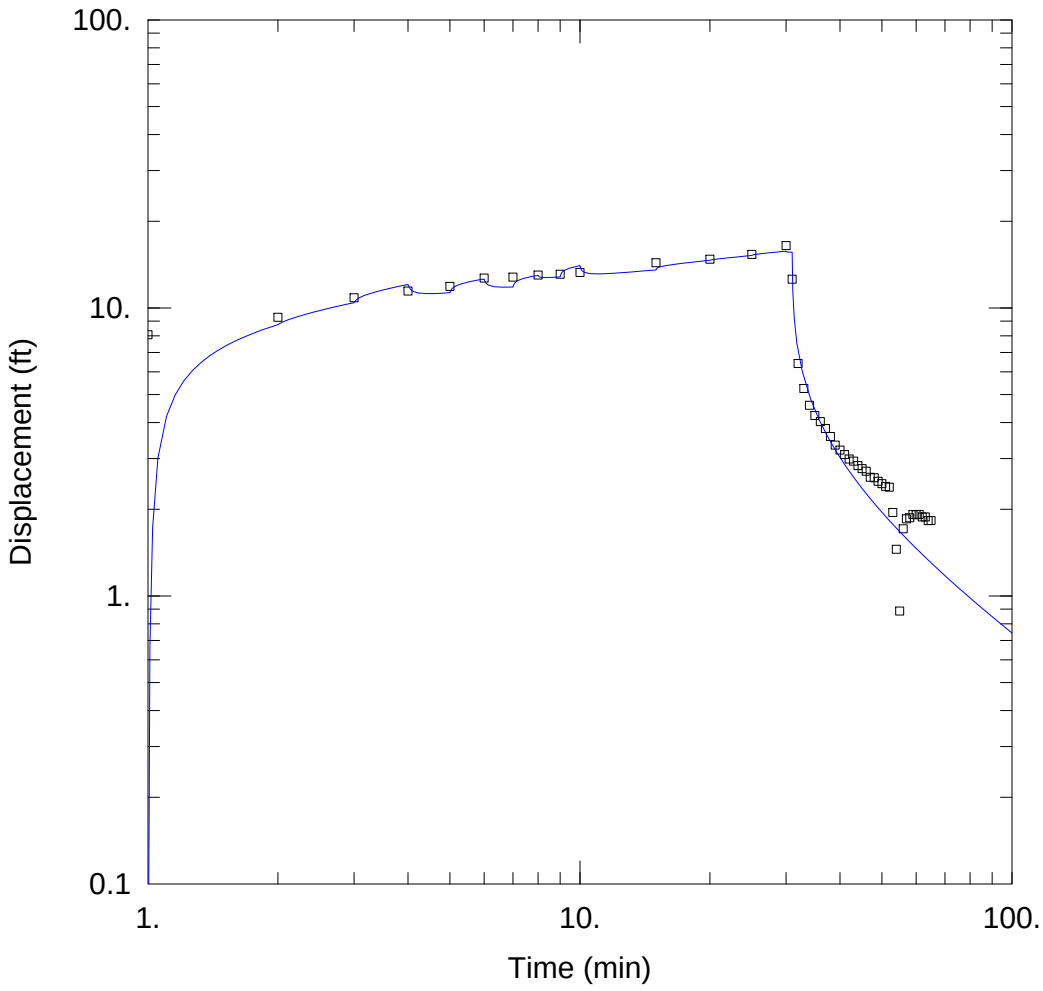
Observation Wells

Well Name	X (ft)	Y (ft)
GT-07	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.05109 cm^2/sec
S = 0.02436
Kz/Kr = 1.
b = 89. ft



TEST 2

Data Set: C:\...\GT-7_Test2.aqt
Date: 02/13/17 Time: 14:26:21

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-7
Test Date: 10/5/2016

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
GT-7	0	0

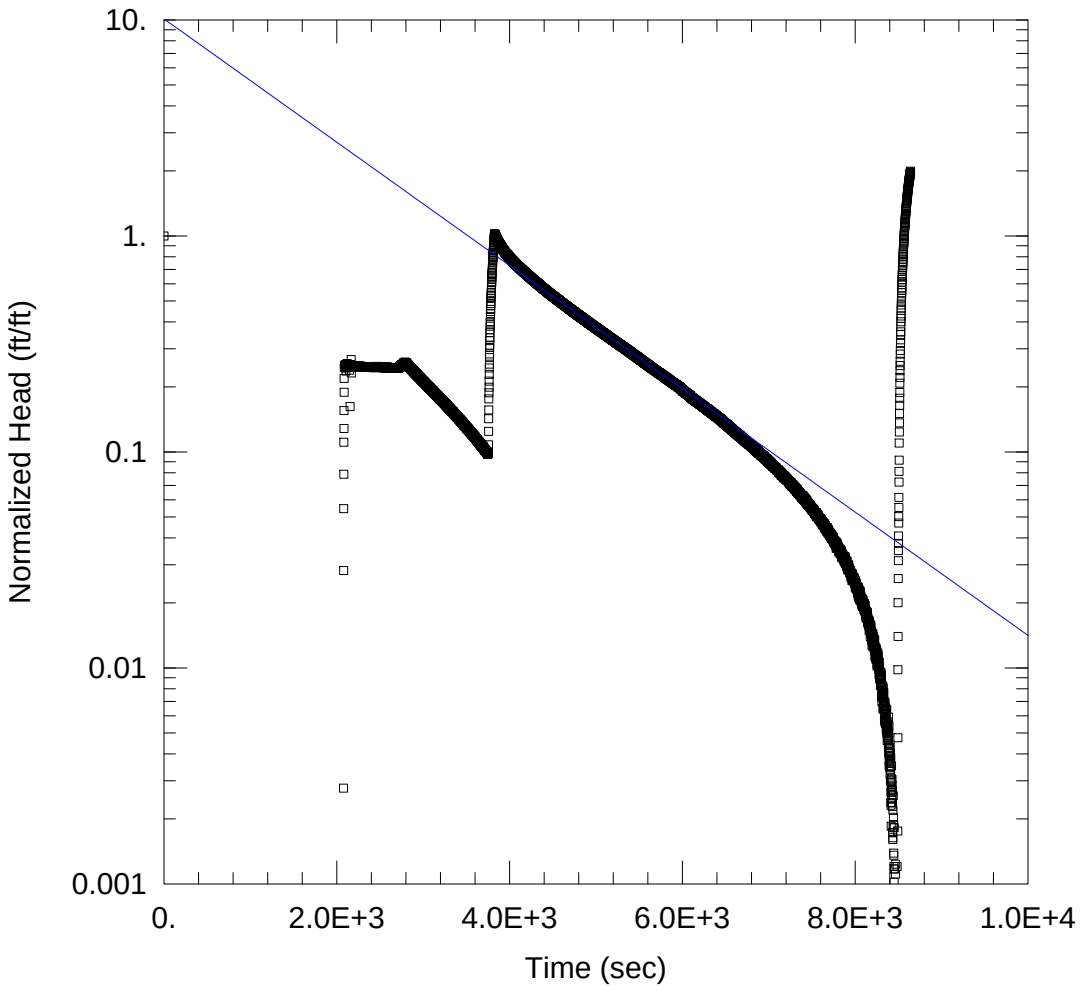
Observation Wells

Well Name	X (ft)	Y (ft)
GT-7	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 2.779 cm^2/sec
S = 0.2429
Kz/Kr = 0.1
b = 14.1 ft



TEST 3

Data Set: C:\...\GT-7_Test3.aqt
Date: 10/09/16 Time: 12:42:07

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-7
Test Date: 10/5/2016

AQUIFER DATA

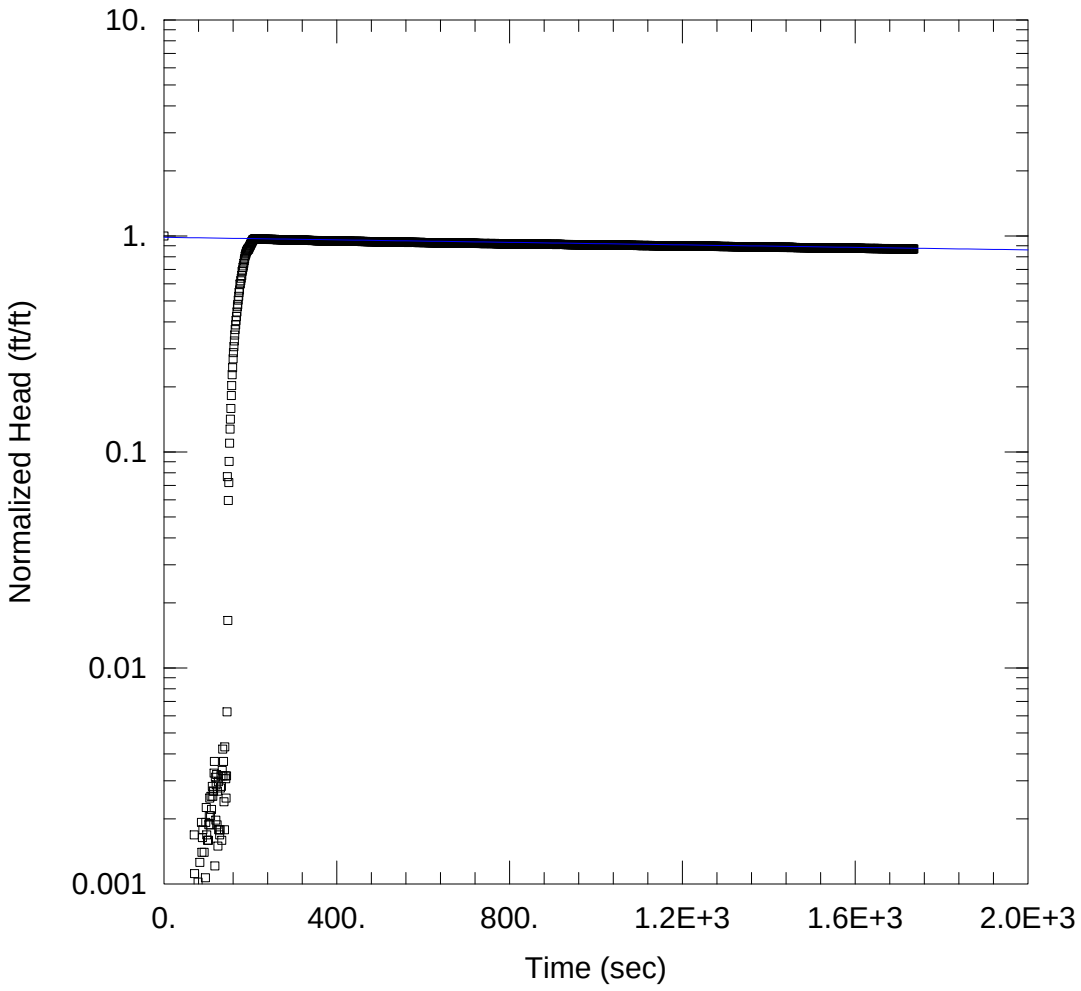
Saturated Thickness: 49. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (GT-7)

Initial Displacement: 32.42 ft
Total Well Penetration Depth: 164. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 108.7 ft
Screen Length: 49. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 2.706E-5 cm/sec
y0 = 327.7 ft



TEST 1

Data Set: C:\...\GT-41_Test_1.aqt
Date: 10/09/16 Time: 19:35:39

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-41
Test Date: 10/7/2016

AQUIFER DATA

Saturated Thickness: 35. ft Anisotropy Ratio (Kz/Kr): 1.

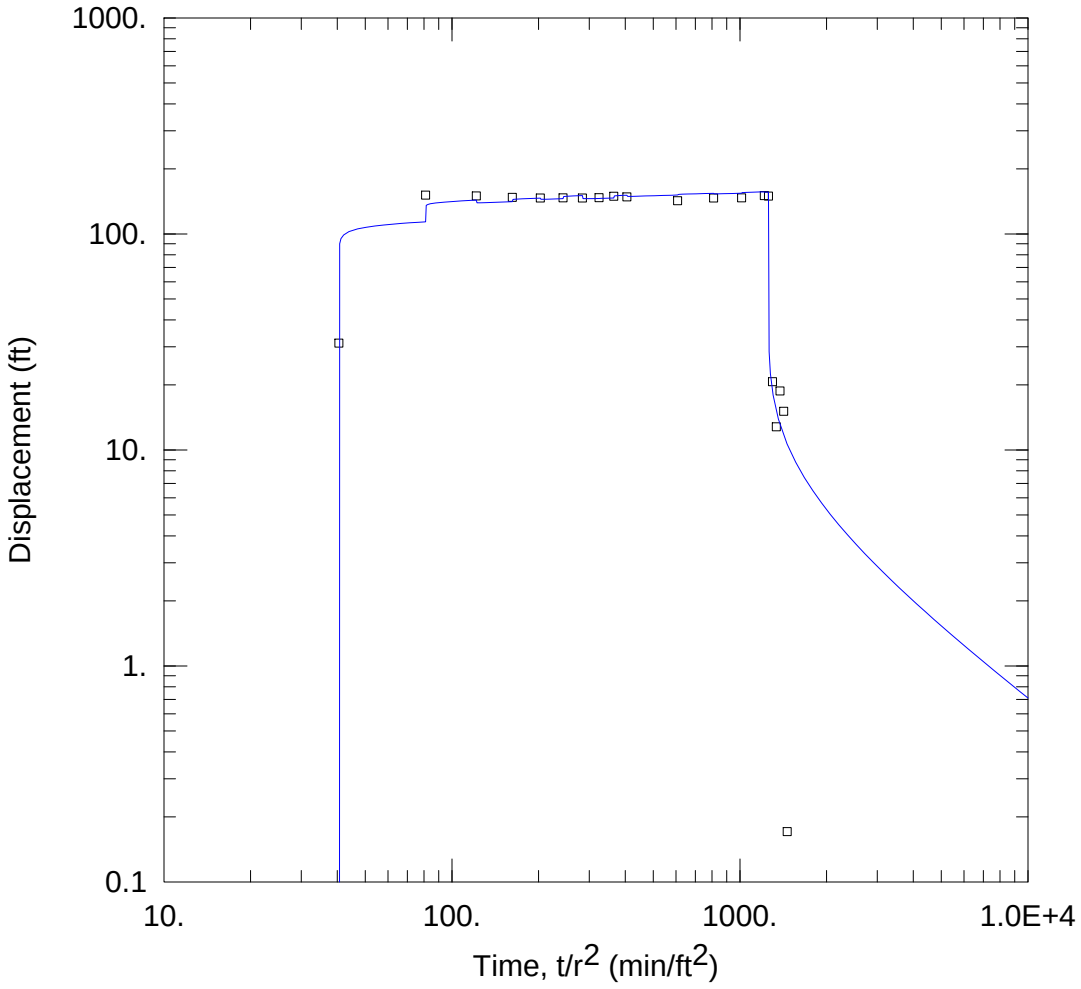
WELL DATA (GT-41)

Initial Displacement: 21. ft Static Water Column Height: 35. ft
Total Well Penetration Depth: 35. ft Screen Length: 35. ft
Casing Radius: 0.1571 ft Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 3.042E-6 cm/sec y0 = 20.69 ft



TEST 2

Data Set: C:\...\GT-41_Test_2.aqt
Date: 02/13/17 Time: 14:15:46

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-41
Test Date: 10/7/2016

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
GT-41	0	0

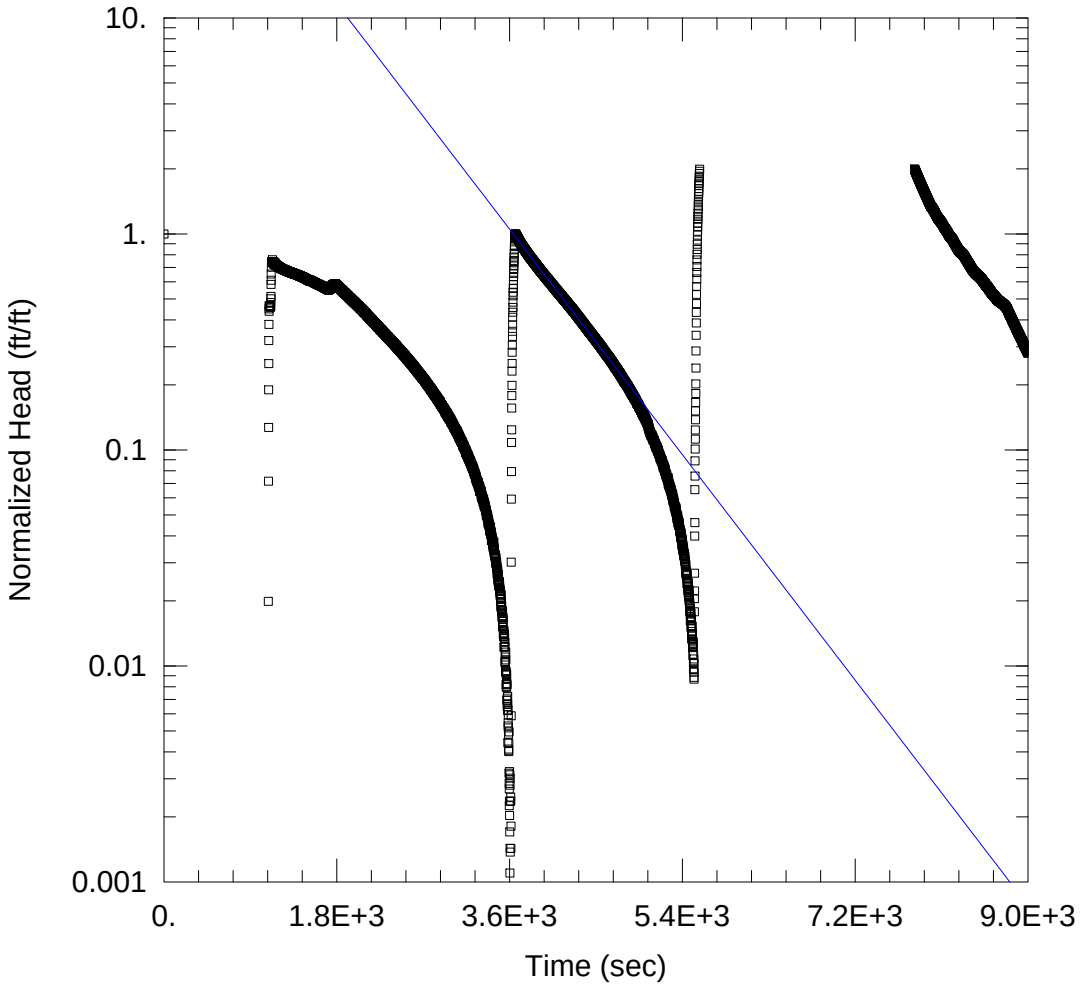
Observation Wells

Well Name	X (ft)	Y (ft)
▫ GT-41	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.7481 cm^2/sec
S = 1.0E-10
Kz/Kr = 1.013E+4
b = 50. ft



TEST 3 (SLUG)

Data Set: C:\...\GT-41_Test_3_Slug.aqt
Date: 10/10/16 Time: 10:08:44

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-41
Test Date: 10/8/2016

AQUIFER DATA

Saturated Thickness: 29.05 ft Anisotropy Ratio (Kz/Kr): 1.

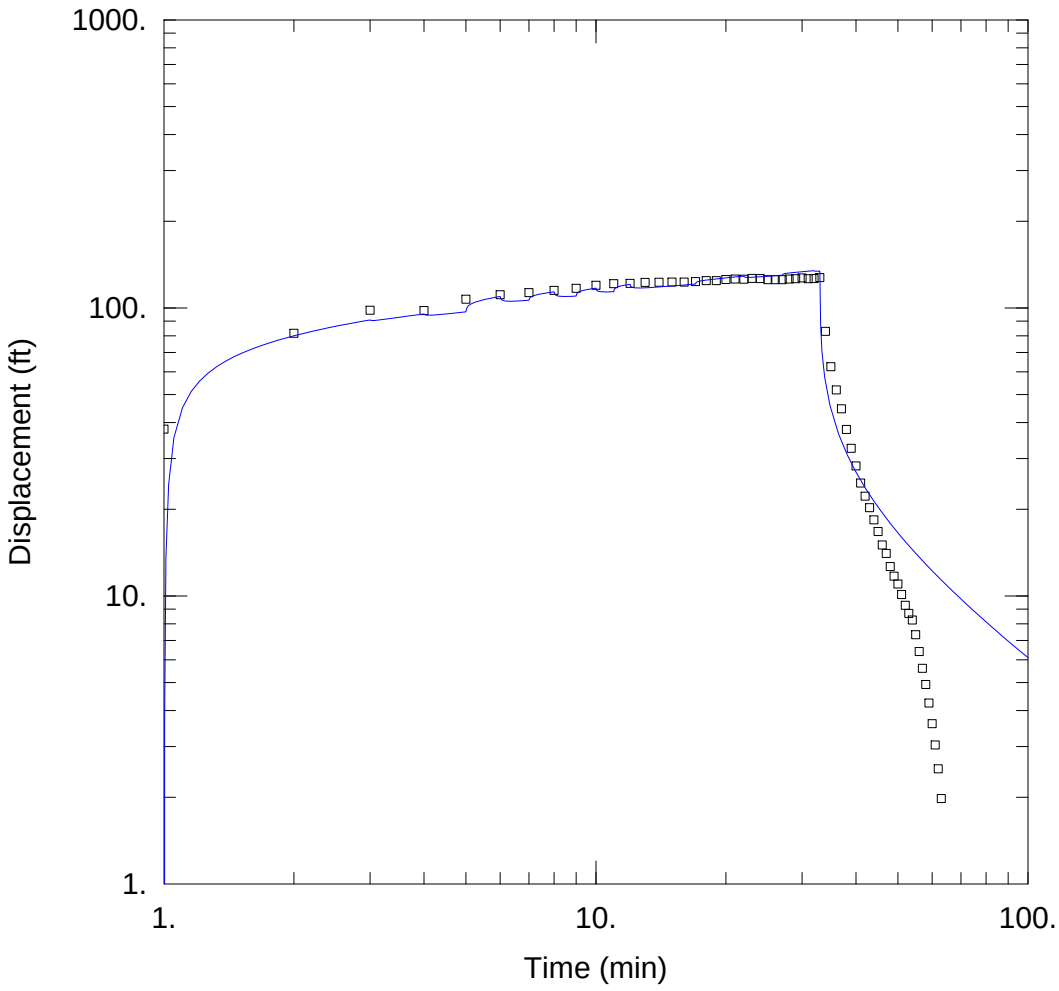
WELL DATA (GT-41I)

Initial Displacement: 18.2 ft Static Water Column Height: 55.25 ft
Total Well Penetration Depth: 108. ft Screen Length: 29.05 ft
Casing Radius: 0.1571 ft Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 8.475E-5 cm/sec y0 = 2343.6 ft



GT-41 CRI

Data Set: C:\...\GT-41_Test_3_CRI.aqt
Date: 02/13/17 Time: 14:06:10

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-34
Test Date: 10/8/2017

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

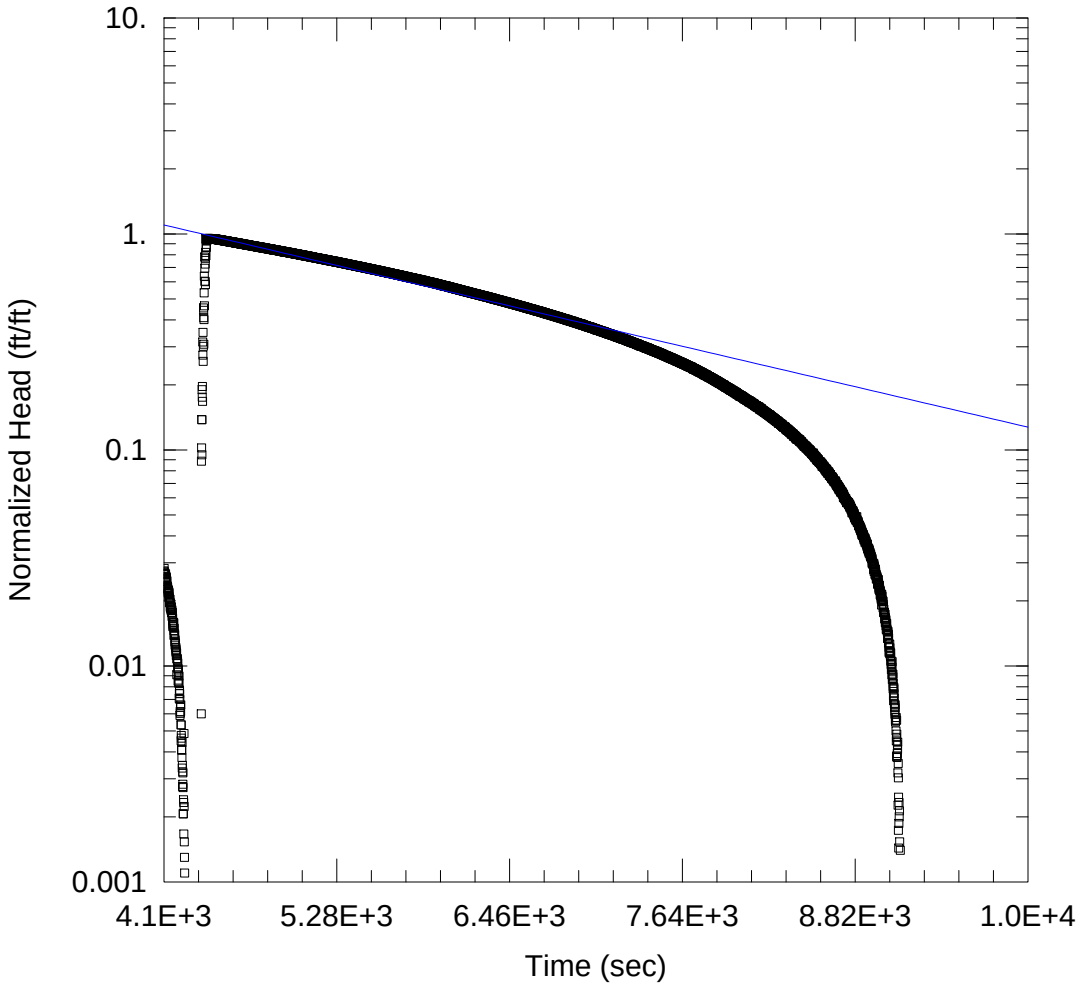
Observation Wells

Well Name	X (ft)	Y (ft)
▫ New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.1573 cm^2/sec
S = 0.005586
Kz/Kr = 1.
b = 29.05 ft



TEST 4

Data Set: C:\...\GT-41_Test_4.aqt
Date: 10/14/16 Time: 22:59:55

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-41
Test Date: 10/10/2016

AQUIFER DATA

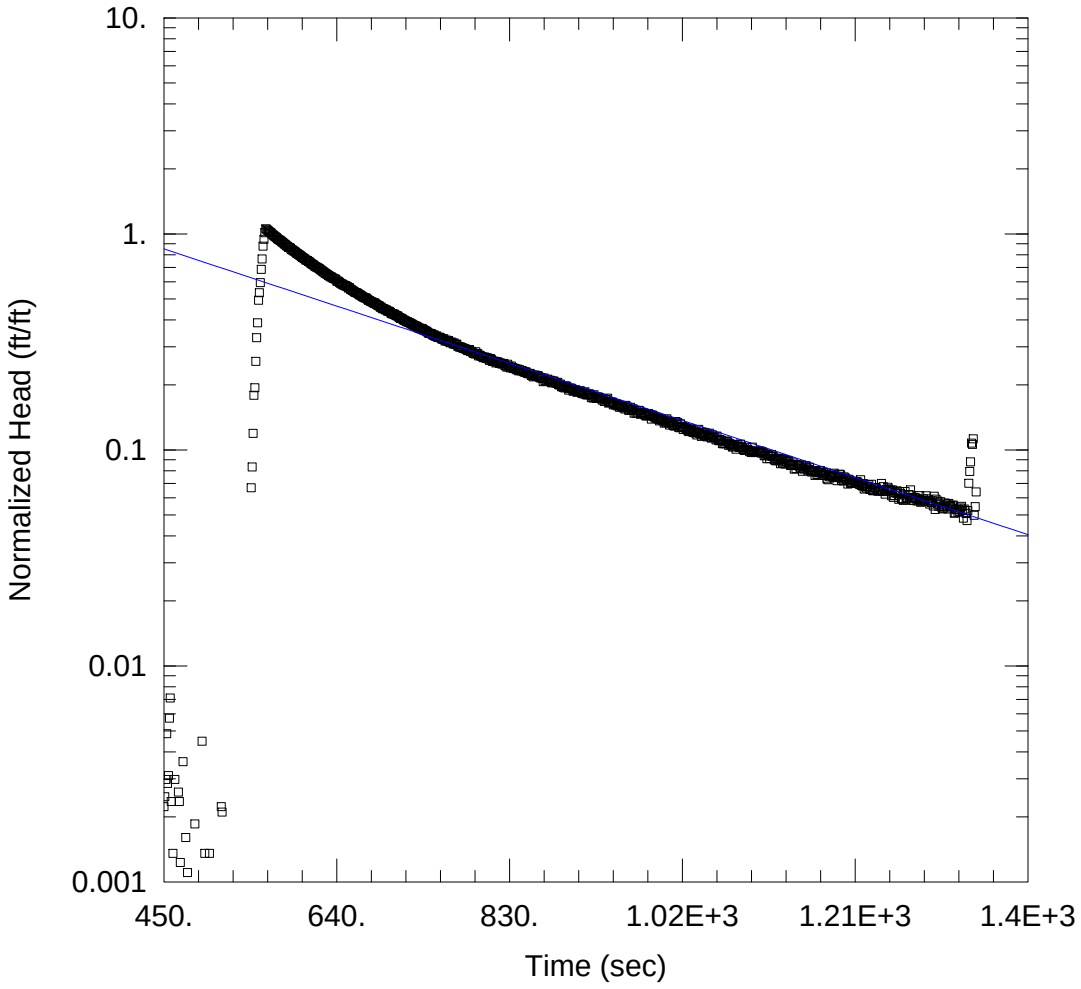
Saturated Thickness: 30.45 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (GT-41)

Initial Displacement: 30. ft
Total Well Penetration Depth: 164. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 164. ft
Screen Length: 30.45 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 2.335E-5 cm/sec
y0 = 147.5 ft



TEST 1

Data Set: C:\...\GT-39_Test 1.aqt
Date: 10/24/16 Time: 14:50:39

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-39
Test Date: 10/14/2016

AQUIFER DATA

Saturated Thickness: 14.05 ft Anisotropy Ratio (Kz/Kr): 1.

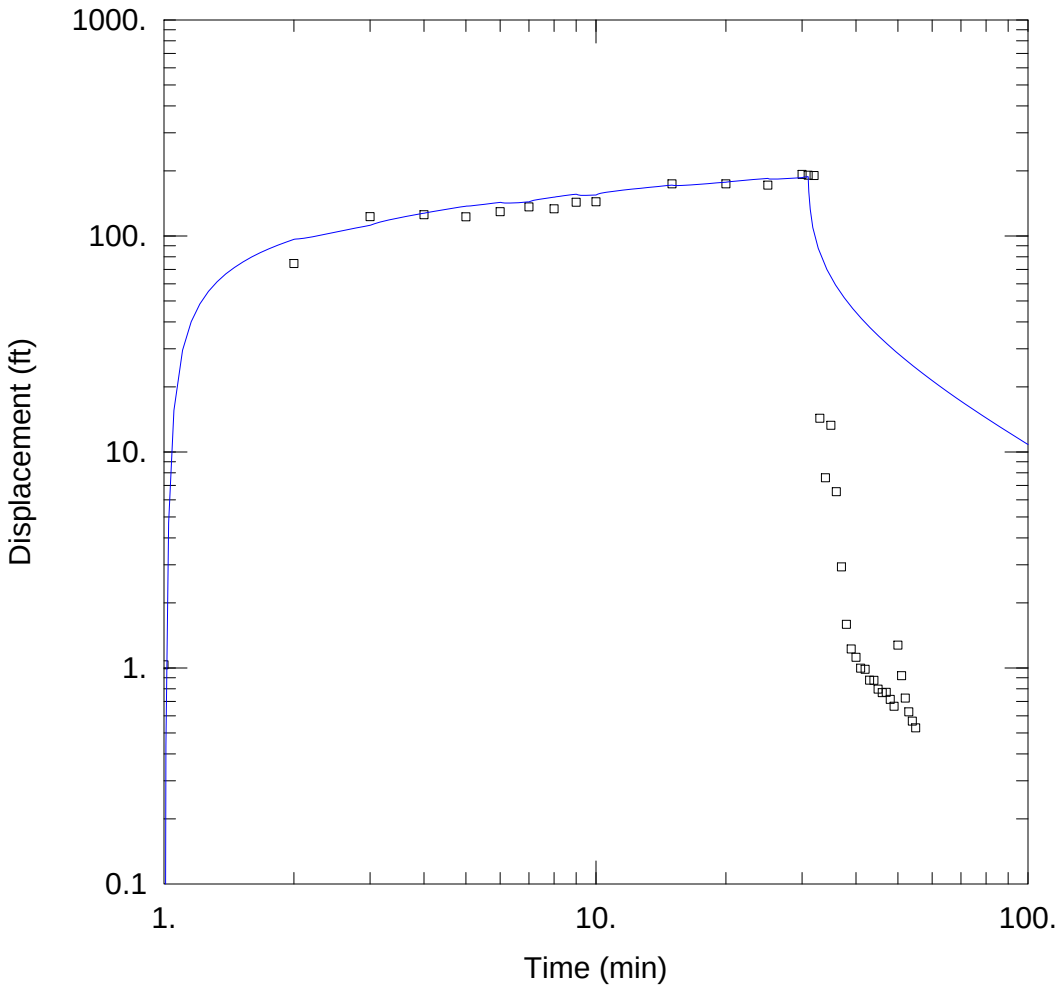
WELL DATA (GT-39)

Initial Displacement: 8. ft
Total Well Penetration Depth: 43. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 43. ft
Screen Length: 14.05 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0003566 cm/sec
y0 = 28.85 ft



TEST 2 CRI

Data Set: C:\...\GT-39_Test 2.aqt
Date: 02/13/17 Time: 13:49:37

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-39
Test Date: 10/15/2016

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
GT-39	0	0

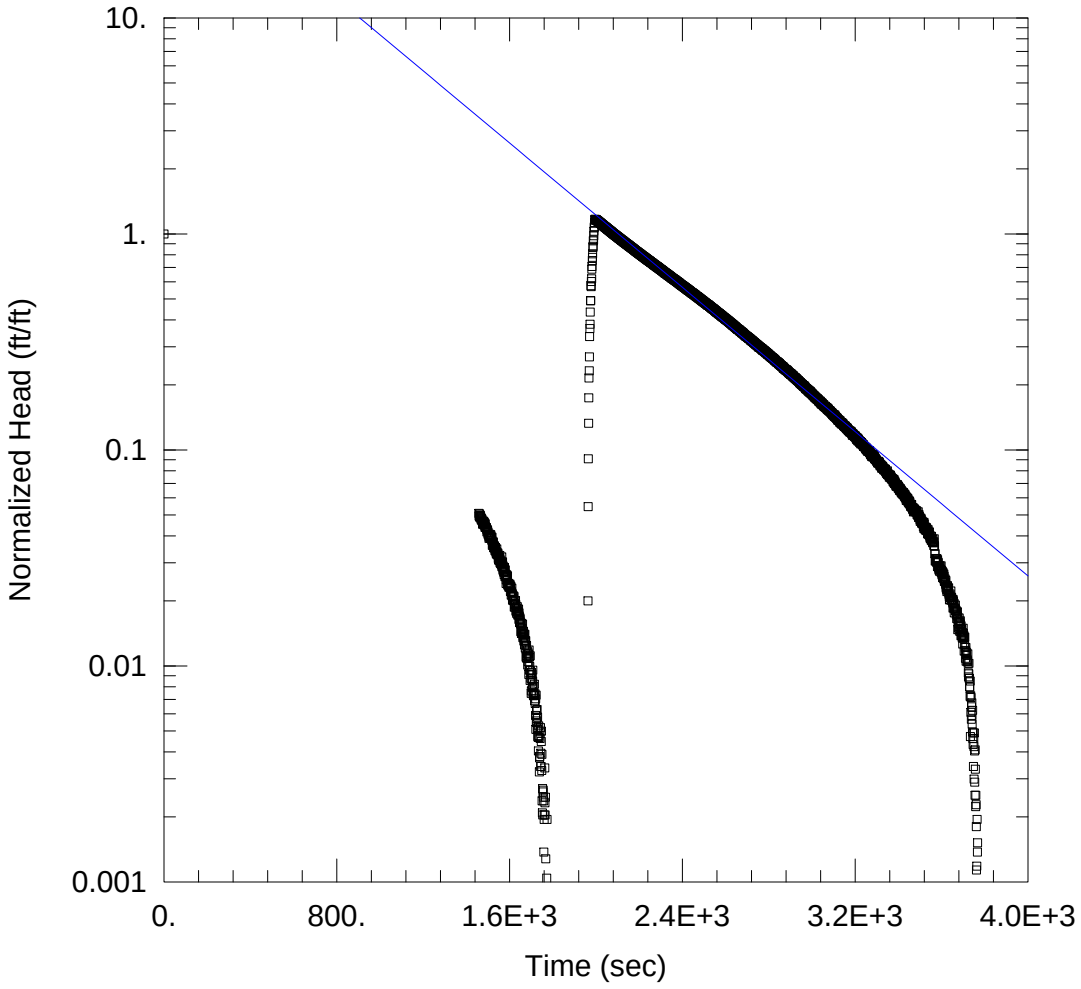
Observation Wells

Well Name	X (ft)	Y (ft)
GT-39	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.2361 cm^2/sec
S = 0.07934
Kz/Kr = 0.1
b = 77.9 ft



TEST 3 SLUG-IN

Data Set: C:\...\GT_39_Test 3_Slug.aqt
Date: 11/02/16 Time: 14:37:56

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-39
Test Date: 10/15/2016

AQUIFER DATA

Saturated Thickness: 79.7 ft Anisotropy Ratio (Kz/Kr): 1.

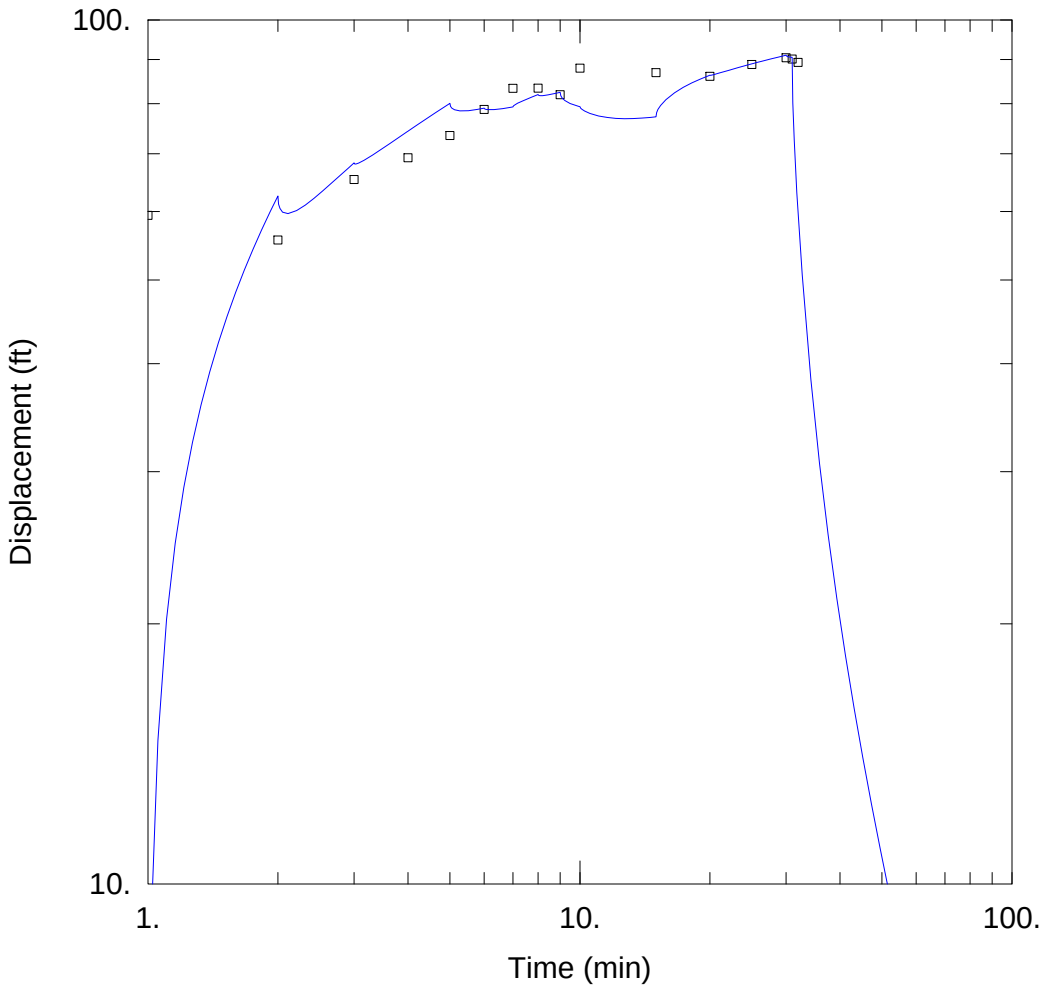
WELL DATA (GT-39)

Initial Displacement: 21. ft
Total Well Penetration Depth: 155. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 155. ft
Screen Length: 79.7 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 5.026E-5 cm/sec
y0 = 1200.5 ft



TEST 3 CRI

Data Set: C:\...\GT_39_Test 3_CRI.aqt
Date: 02/13/17 Time: 13:56:27

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-39
Test Date: 10/16/2016

AQUIFER DATA

Saturated Thickness: 79.7 ft Fracture Radius: 21.73 ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
GT-39	0	0

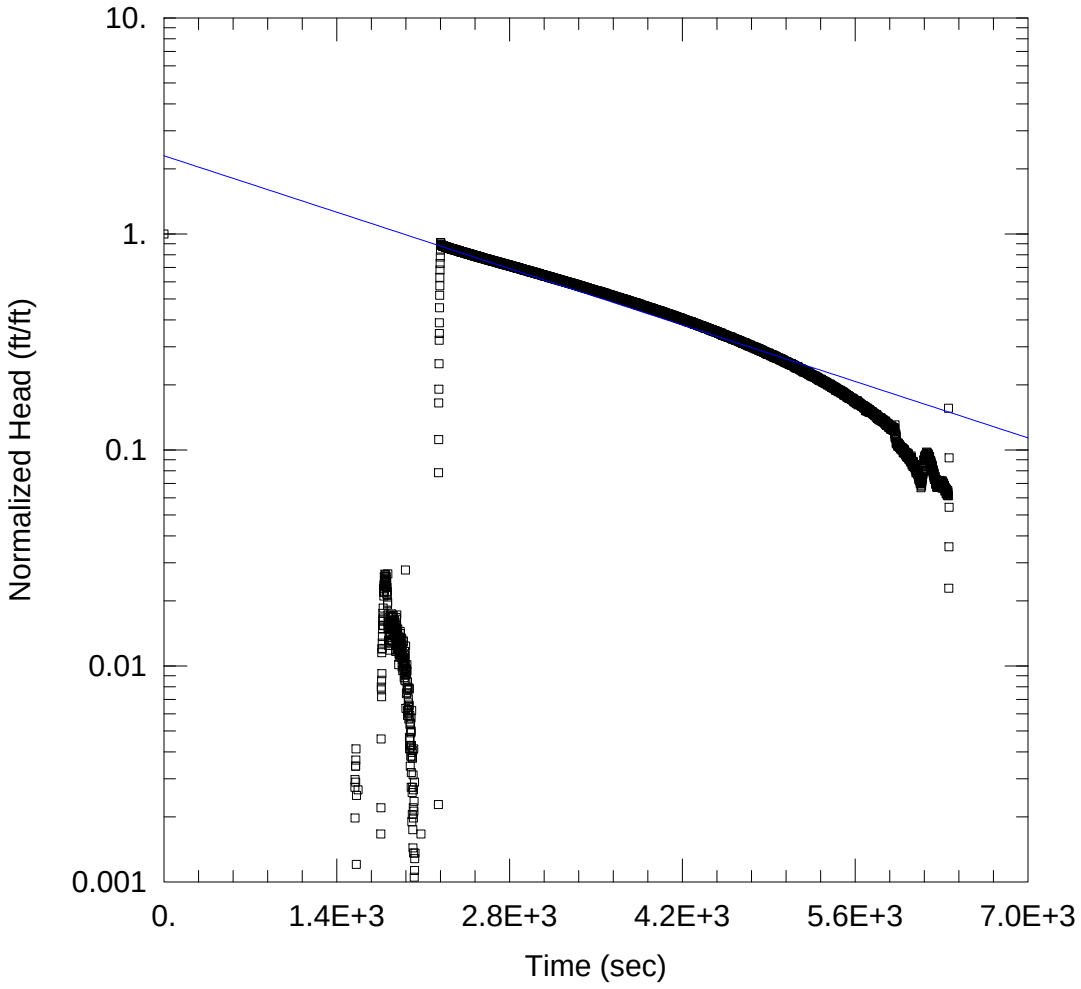
Observation Wells

Well Name	X (ft)	Y (ft)
GT-39	0	0

SOLUTION

Aquifer Model: Fractured
Solution Method: Gringarten (Horizontal)

Kr = 6.183E-5 cm/sec
Kz/Kr = 0.1
Ss = 4.187E-6 ft^{-1}
Rf = 21.73 ft



TEST 4

Data Set: C:\...\GT-39_Test 4.aqt
Date: 11/03/16 Time: 09:41:18

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-39
Test Date: 10/17/2016

AQUIFER DATA

Saturated Thickness: 65.65 ft Anisotropy Ratio (Kz/Kr): 1.

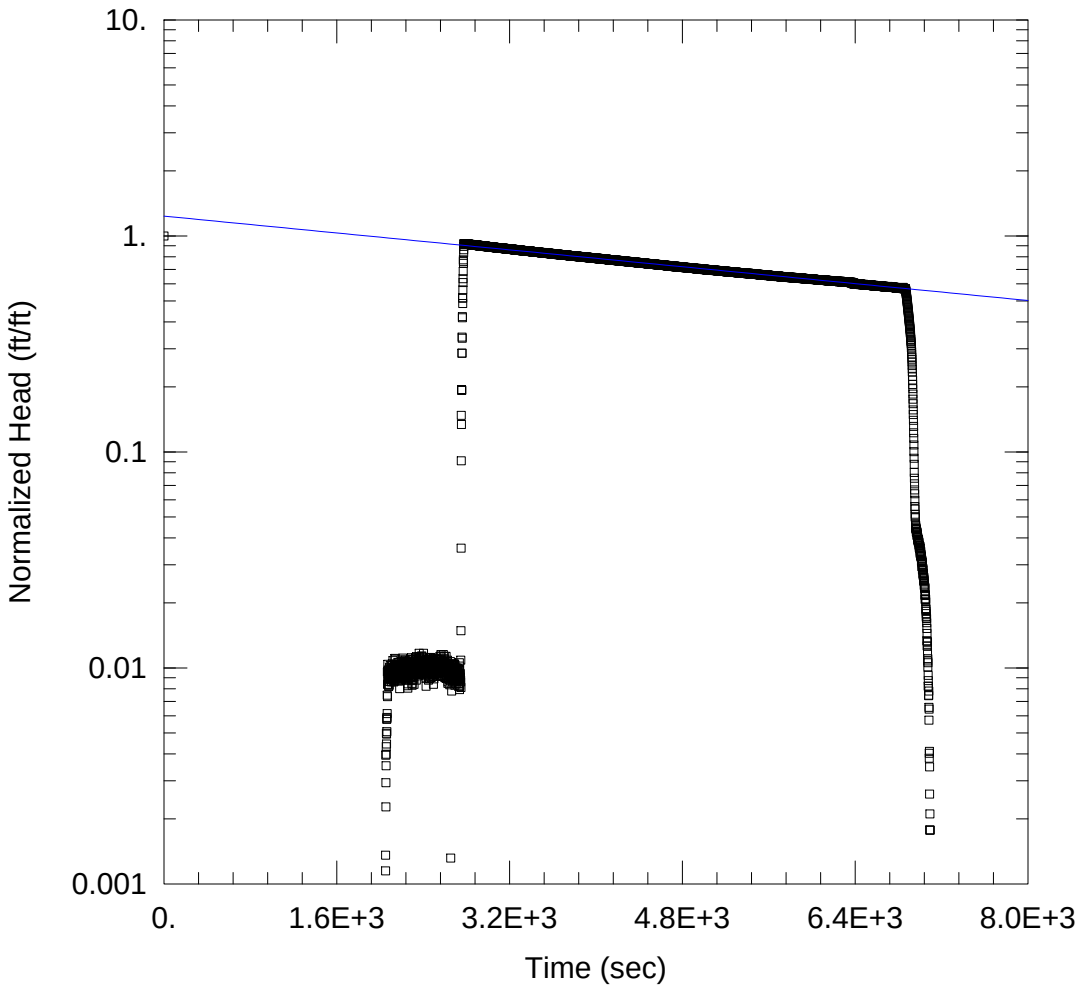
WELL DATA (GT-39)

Initial Displacement: 13. ft
Total Well Penetration Depth: 242.6 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 242.6 ft
Screen Length: 65.65 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 1.418E-5 cm/sec
y0 = 29.9 ft



TEST 5

Data Set: C:\...\GT-39_Test 5.aqt
Date: 11/03/16 Time: 09:56:11

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-39
Test Date: 10/17/2016

AQUIFER DATA

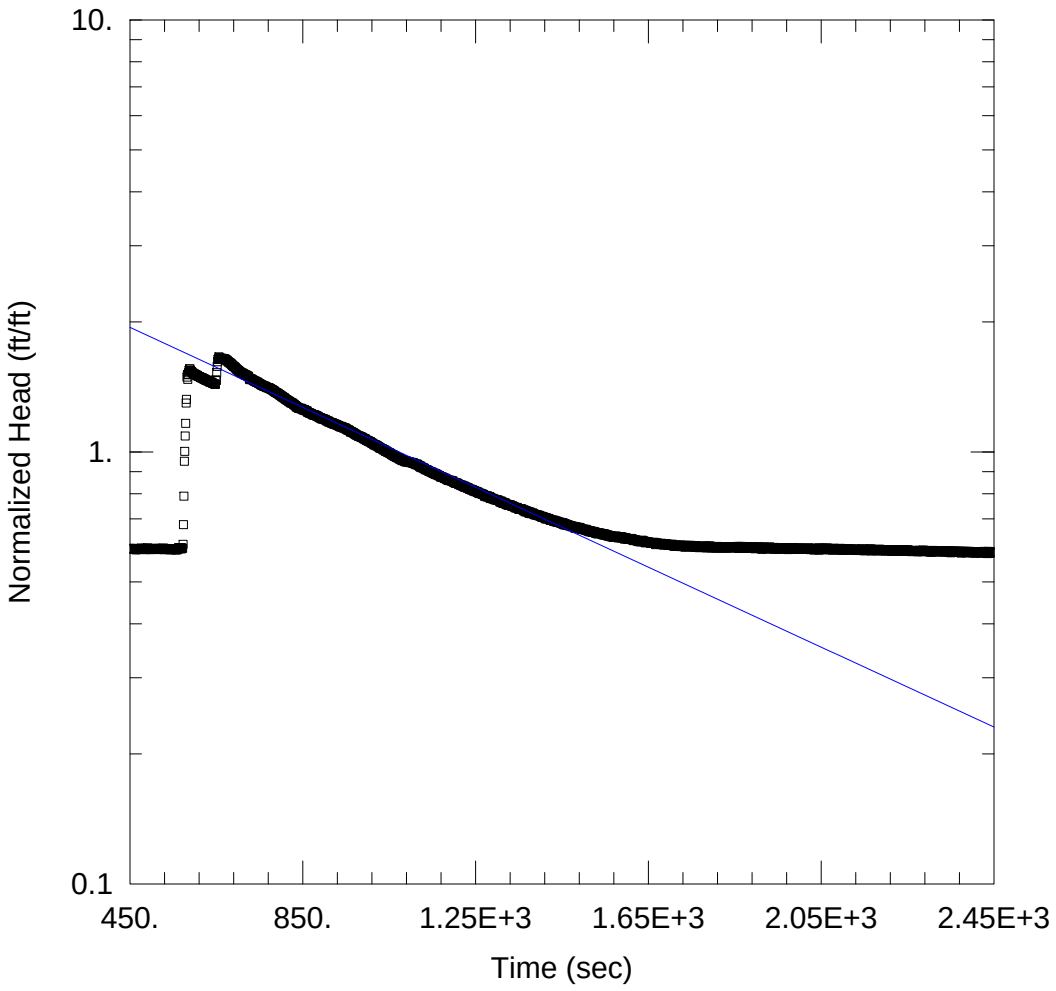
Saturated Thickness: 13.15 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (GT-39)

Initial Displacement: 24. ft
Total Well Penetration Depth: 41.75 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 41.75 ft
Screen Length: 13.15 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 1.327E-5 cm/sec
y0 = 29.65 ft



WELL TEST ANALYSIS

Data Set: C:\...\GT-21 Test 1.aqt
Date: 11/03/16 Time: 11:16:51

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-21
Test Date: 10/21/2016

AQUIFER DATA

Saturated Thickness: 29. ft Anisotropy Ratio (Kz/Kr): 1.

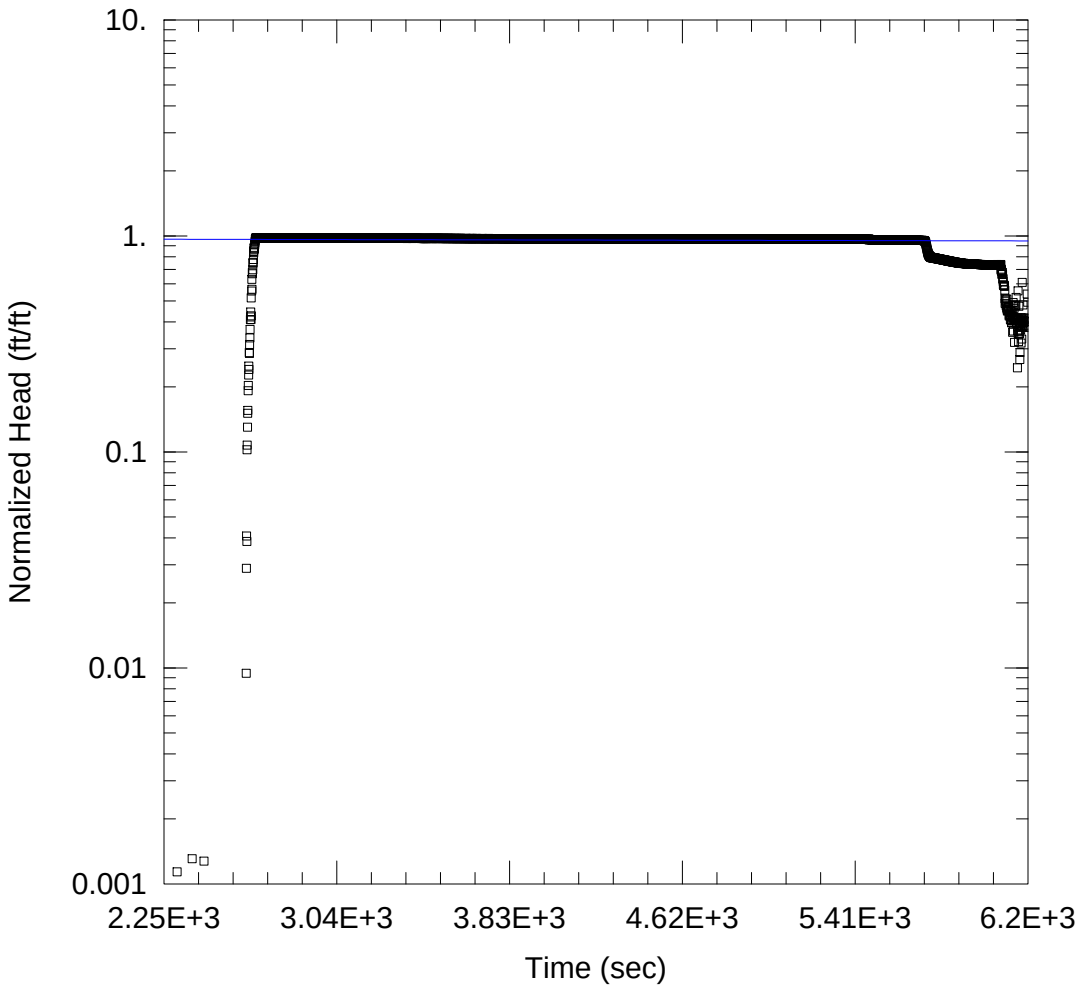
WELL DATA (GT-21)

Initial Displacement: 14. ft
Total Well Penetration Depth: 29. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 14.5 ft
Screen Length: 29. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 5.604E-5 cm/sec
y0 = 43.9 ft



TEST 2

Data Set: C:\...\GT-21 Test 2.aqt
Date: 11/03/16 Time: 11:29:35

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-21
Test Date: 10/21/2016

AQUIFER DATA

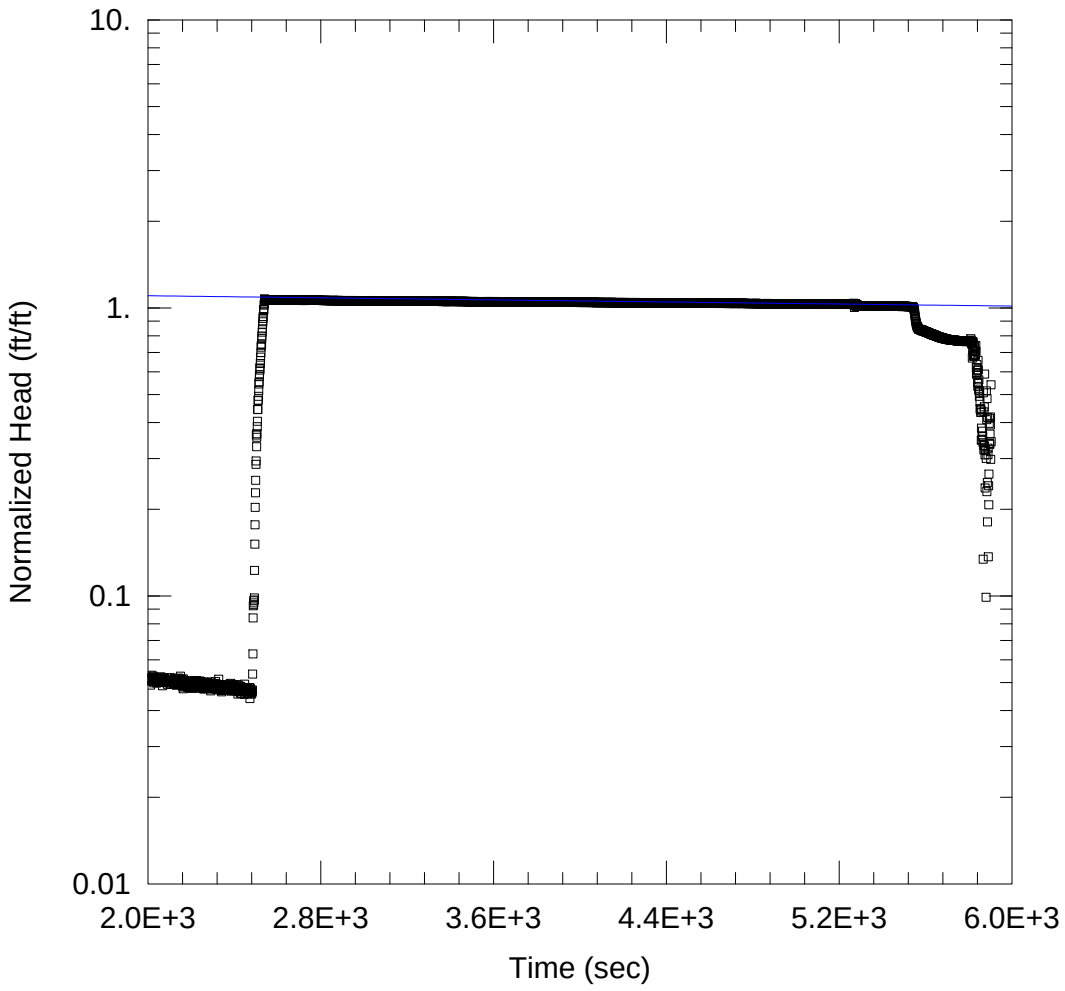
Saturated Thickness: 29.9 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (GT-21)

Initial Displacement: 29. ft
Total Well Penetration Depth: 38.6 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 38.6 ft
Screen Length: 29.9 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 2.4E-7 cm/sec
y0 = 28.27 ft



TEST 3

Data Set: C:\...\GT-21 Test 3.aqt
Date: 11/03/16 Time: 11:36:32

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-21
Test Date: 10/22/2016

AQUIFER DATA

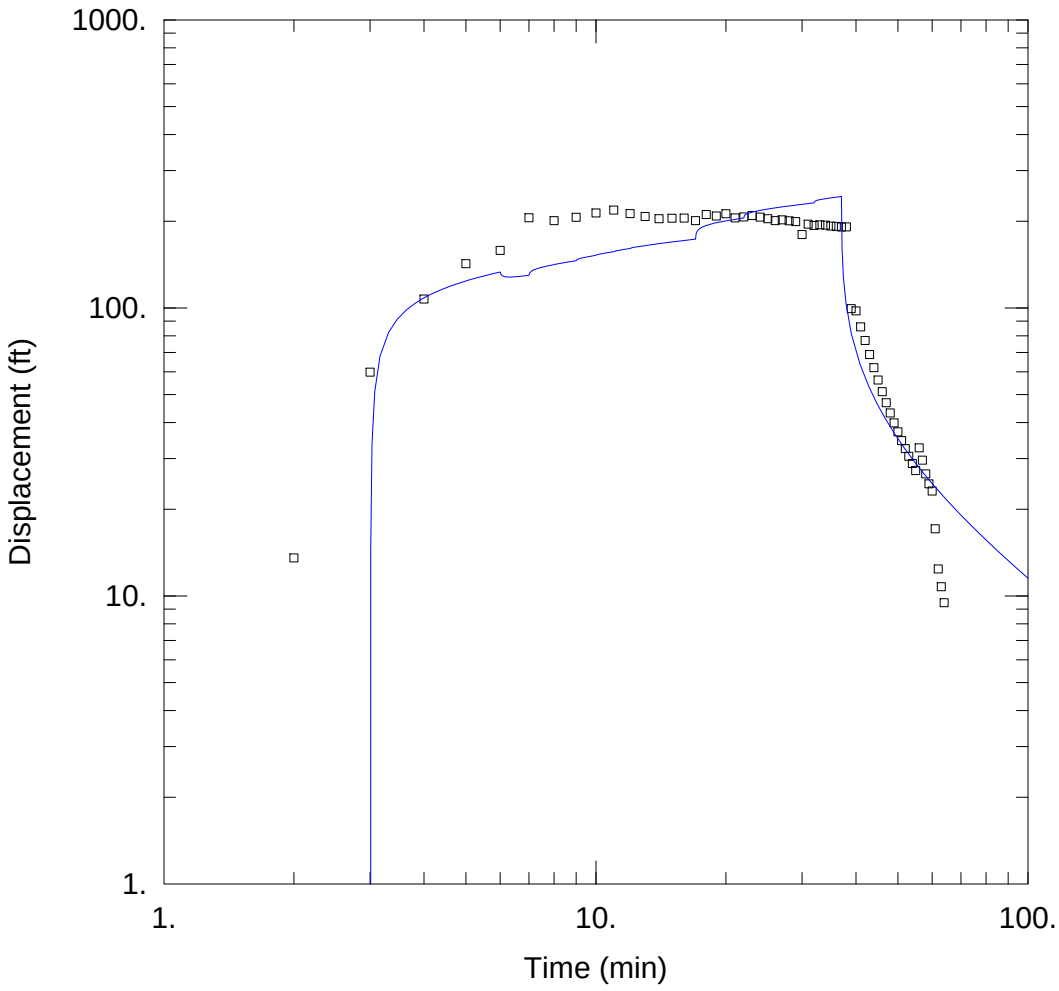
Saturated Thickness: 44.9 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (GT-21)

Initial Displacement: 20. ft
Total Well Penetration Depth: 90.1 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 90.1 ft
Screen Length: 44.9 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 8.535E-7 cm/sec
y0 = 22.97 ft



TEST 4 - CRI

Data Set: C:\...\GT-21 Test 4.aqt
Date: 02/13/17 Time: 14:19:53

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-21
Test Date: 10/22/2016

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
GT-21	0	0

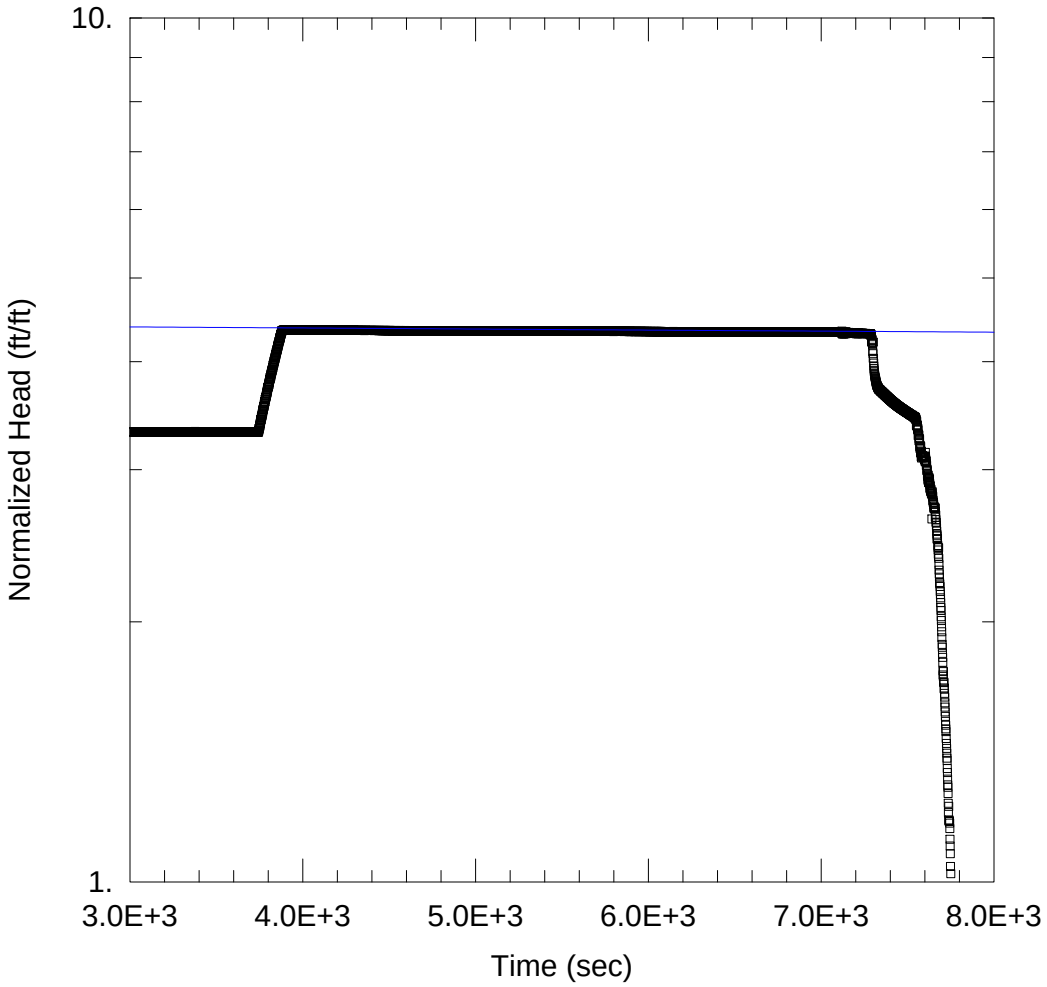
Observation Wells

Well Name	X (ft)	Y (ft)
GT-21	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.07996 cm^2/sec
S = 0.003953
Kz/Kr = 0.1
b = 24.9 ft



TEST 5

Data Set: C:\...\GT-21 Test 5.aqt
Date: 11/28/16 Time: 20:26:14

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-21
Test Date: 10/23/2016

AQUIFER DATA

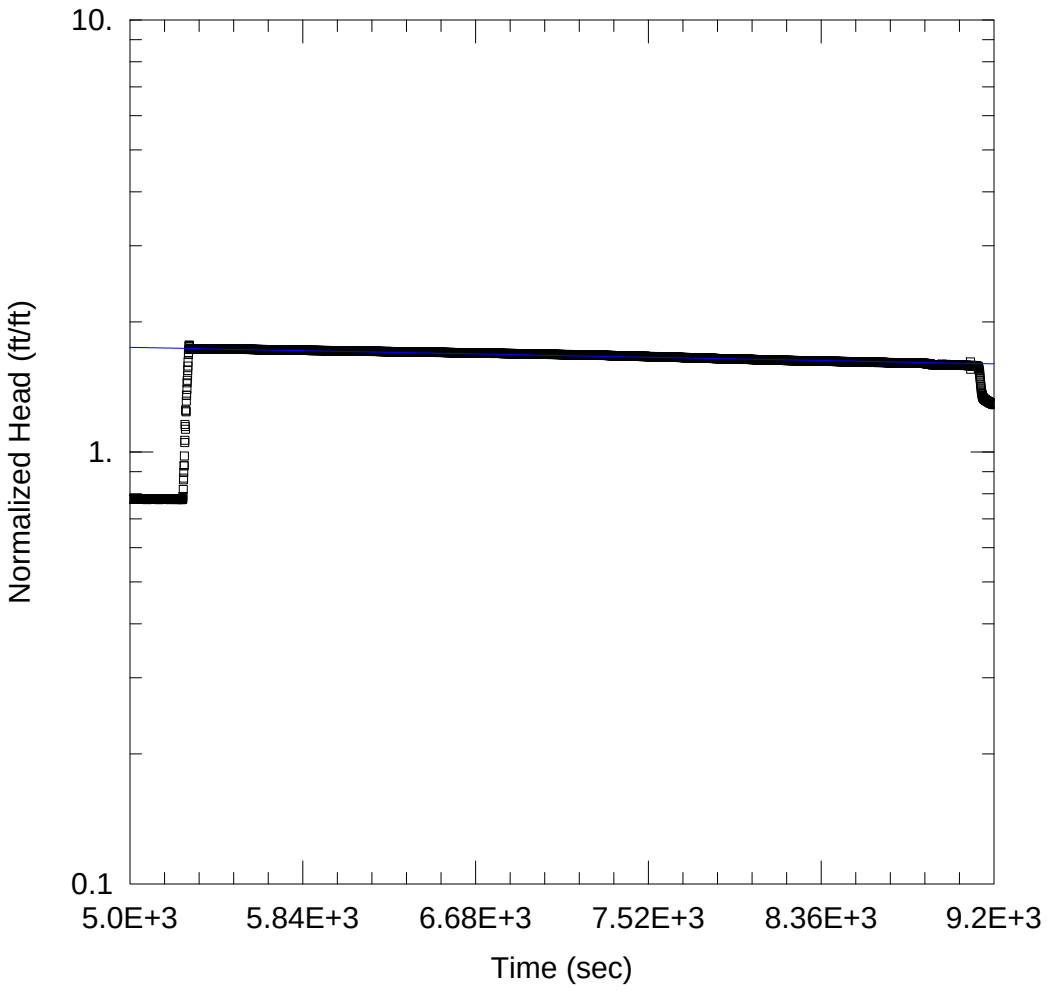
Saturated Thickness: 109.9 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (GT-21)

Initial Displacement: 30. ft
Total Well Penetration Depth: 135.6 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 135.6 ft
Screen Length: 109.9 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 5.385E-8 cm/sec
y0 = 132.8 ft



TEST 1

Data Set: C:\...\GT-20_Test 1.aqt
Date: 12/21/16 Time: 20:27:26

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-20
Test Date: 10/25/2016

AQUIFER DATA

Saturated Thickness: 24.9 ft Anisotropy Ratio (Kz/Kr): 1.

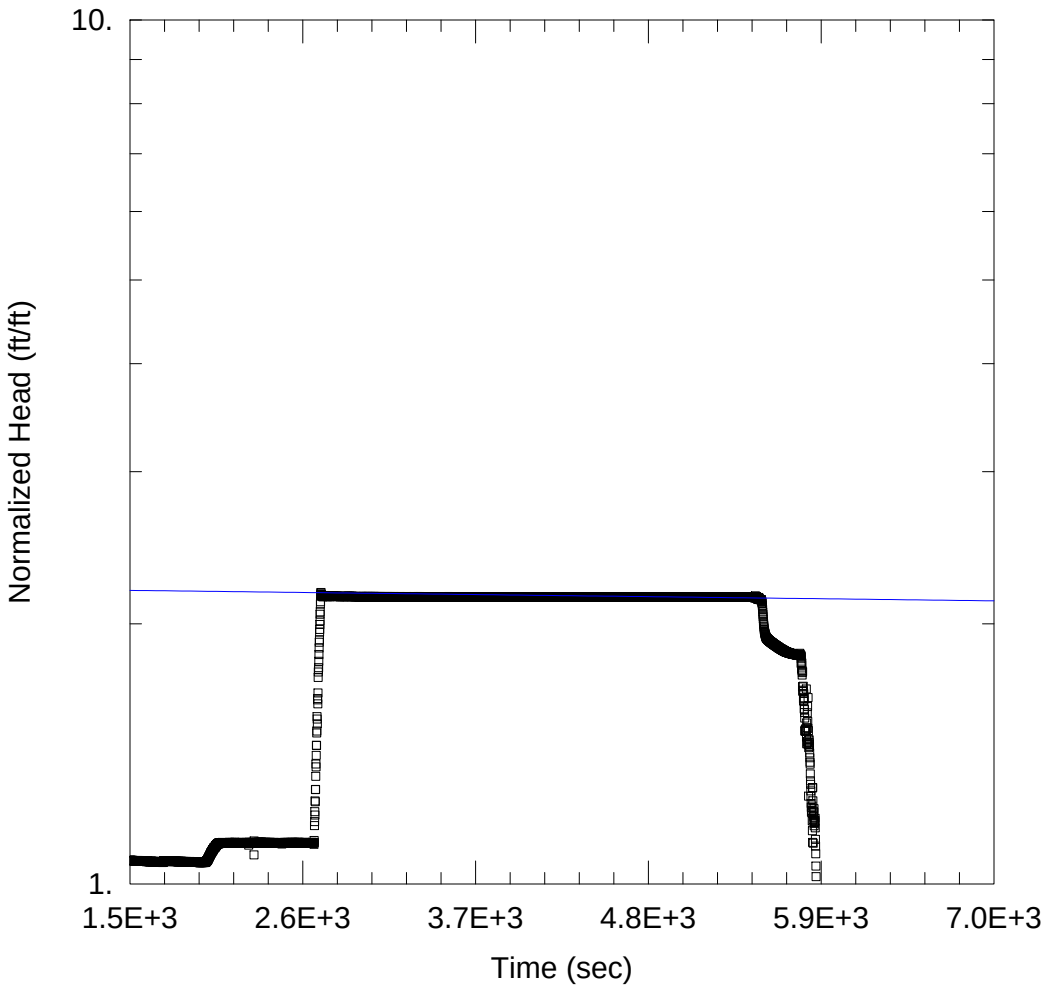
WELL DATA (New Well)

Initial Displacement: 20. ft
Total Well Penetration Depth: 36.1 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 36.1 ft
Screen Length: 24.9 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 1.312E-6 cm/sec y0 = 38.74 ft



TEST 2

Data Set: C:\...\GT-20_Test 2.aqt
Date: 12/21/16 Time: 20:39:44

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-20
Test Date: 10/26/2016

AQUIFER DATA

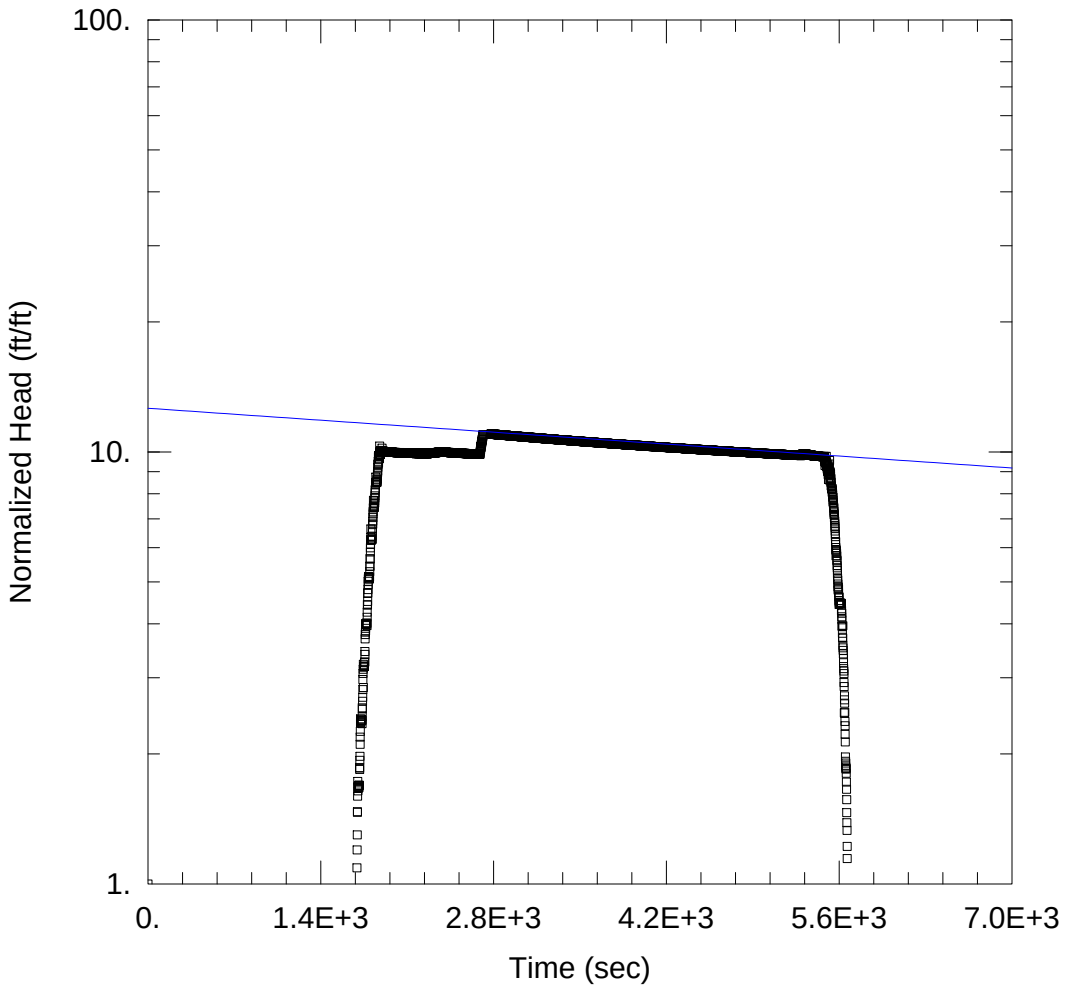
Saturated Thickness: 54.9 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 29. ft
Total Well Penetration Depth: 89.6 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 89.6 ft
Screen Length: 54.9 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 4.77E-8 cm/sec
y0 = 62.61 ft



TEST 3

Data Set: C:\...\GT-20_Test 3.aqt
Date: 12/21/16 Time: 20:48:26

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-20
Test Date: 10/26/2016

AQUIFER DATA

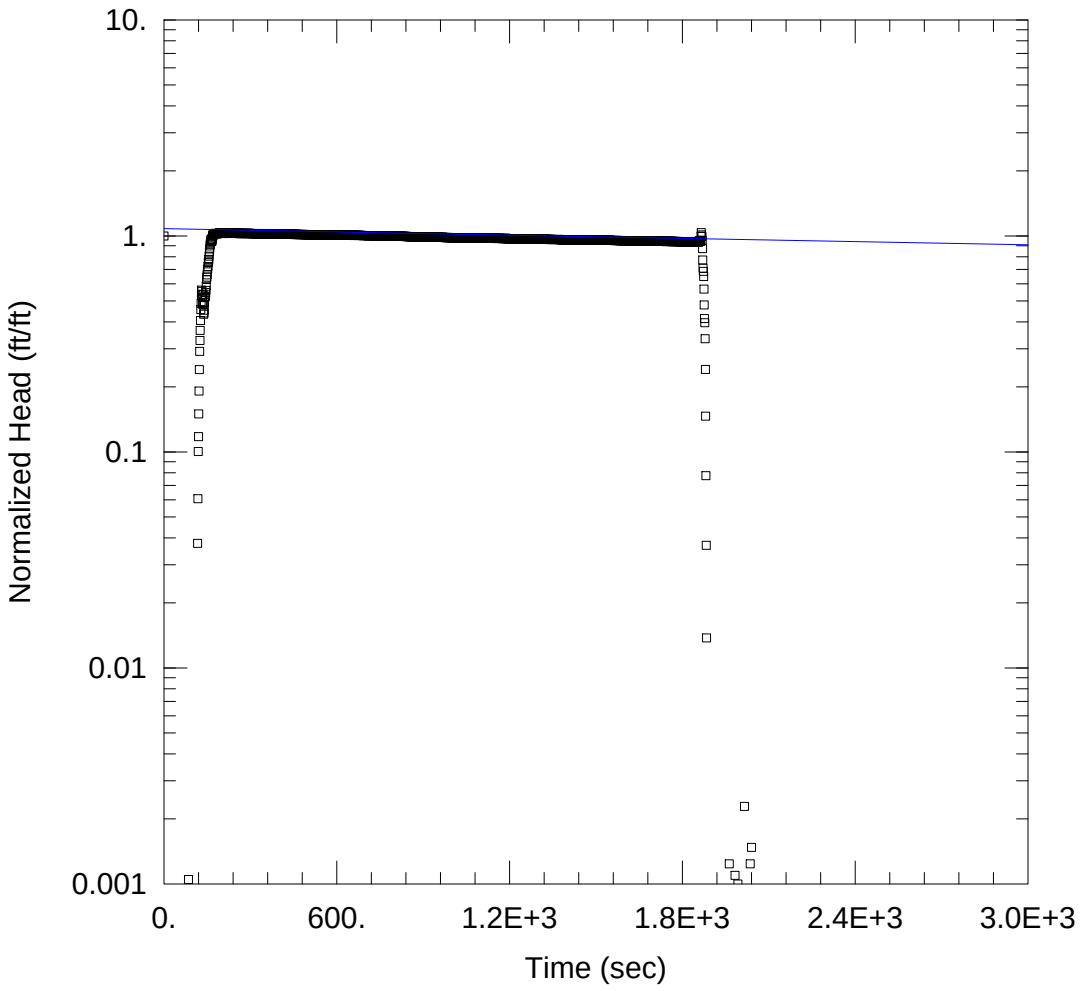
Saturated Thickness: 28.4 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 12. ft
Total Well Penetration Depth: 144.1 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 144.1 ft
Screen Length: 28.4 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 3.055E-6 cm/sec
y0 = 151.4 ft



WELL TEST ANALYSIS

Data Set: C:\...\GT-15 Test 1.aqt
Date: 11/03/16 Time: 10:40:30

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-15
Test Date: 10/29/2016

AQUIFER DATA

Saturated Thickness: 29. ft Anisotropy Ratio (Kz/Kr): 1.

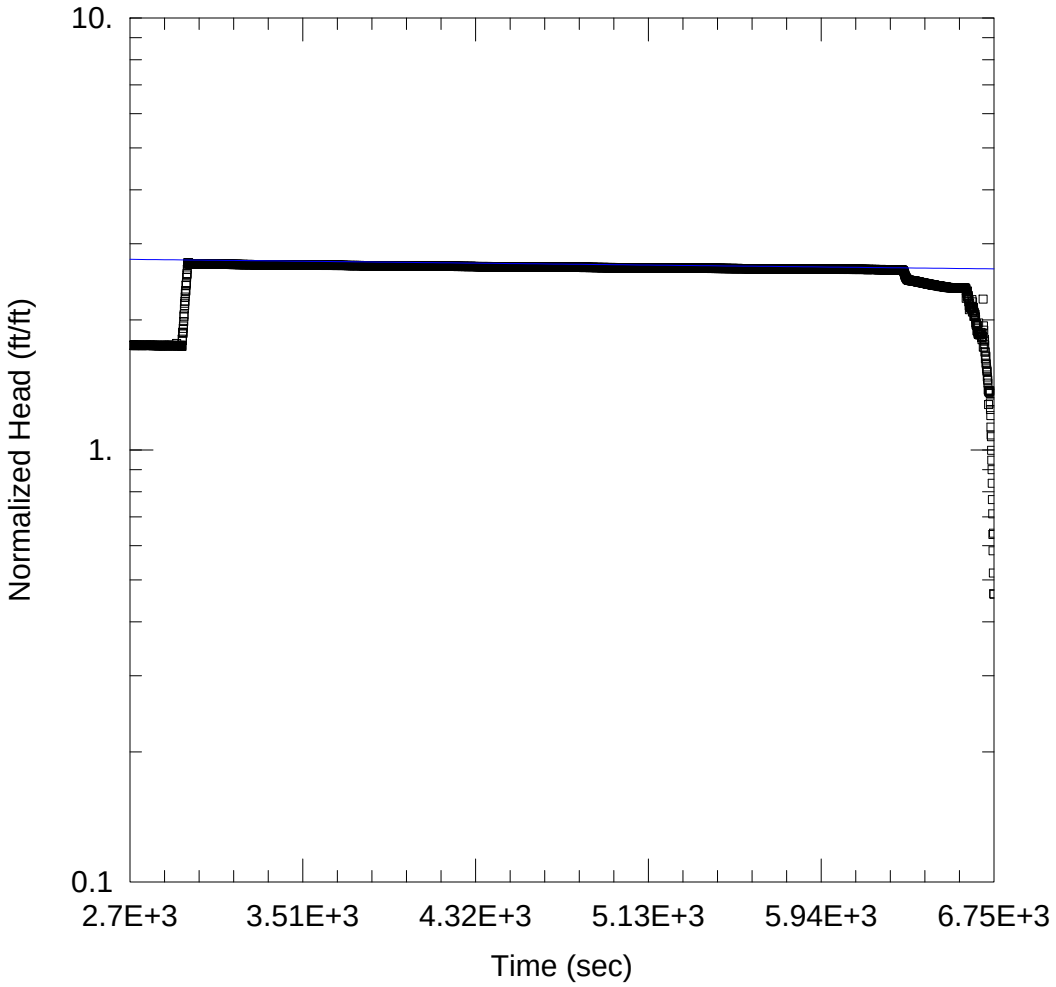
WELL DATA (GT-15)

Initial Displacement: 21. ft
Total Well Penetration Depth: 29. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 0. ft
Screen Length: 29. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 3.015E-6 cm/sec
y0 = 22.68 ft



TEST 2

Data Set: C:\...\GT-15 Test 2.aqt
Date: 11/03/16 Time: 10:48:48

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-15
Test Date: 10/30/2016

AQUIFER DATA

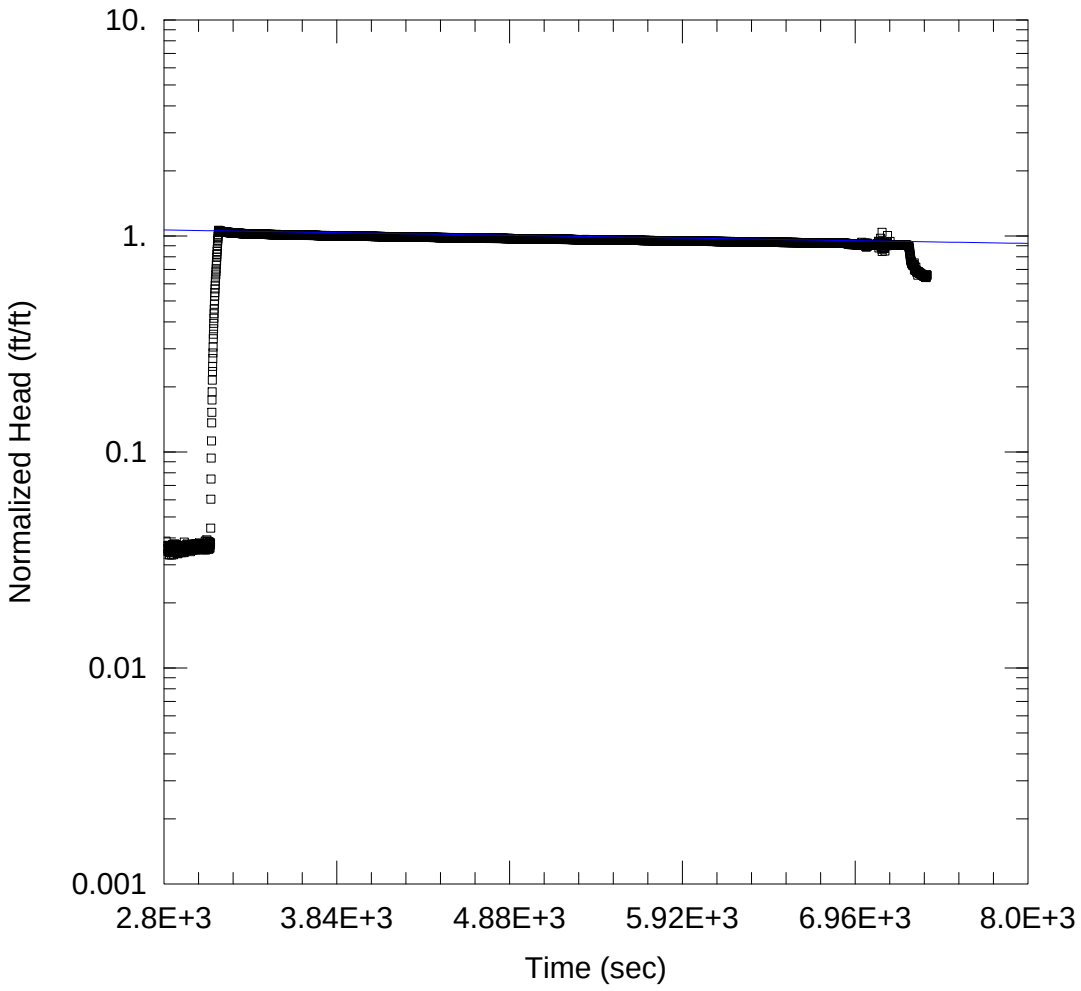
Saturated Thickness: 34.4 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (GT-15)

Initial Displacement: 16. ft
Total Well Penetration Depth: 43.1 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 43.1 ft
Screen Length: 34.4 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 5.994E-7 cm/sec
y0 = 45.71 ft



TEST 3

Data Set: C:\...\GT-15 Test 3.aqt
Date: 11/03/16 Time: 10:56:37

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-15
Test Date: 10/31/2016

AQUIFER DATA

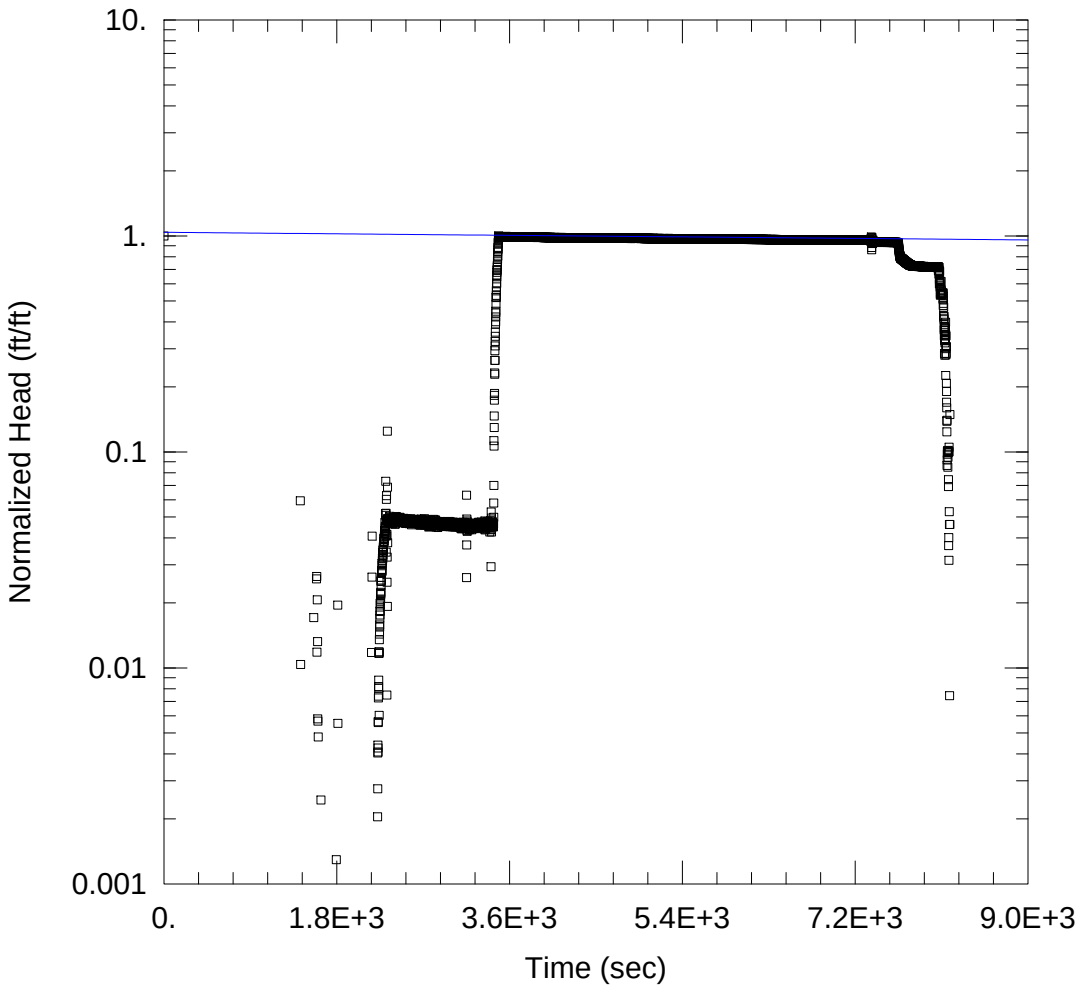
Saturated Thickness: 67.4 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (GT-15)

Initial Displacement: 18. ft
Total Well Penetration Depth: 126.9 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 126.9 ft
Screen Length: 67.4 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 8.179E-7 cm/sec
y0 = 20.72 ft



TEST 4

Data Set: C:\...\GT-15 Test 4.aqt
Date: 11/03/16 Time: 11:06:39

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-15
Test Date: 11/1/2016

AQUIFER DATA

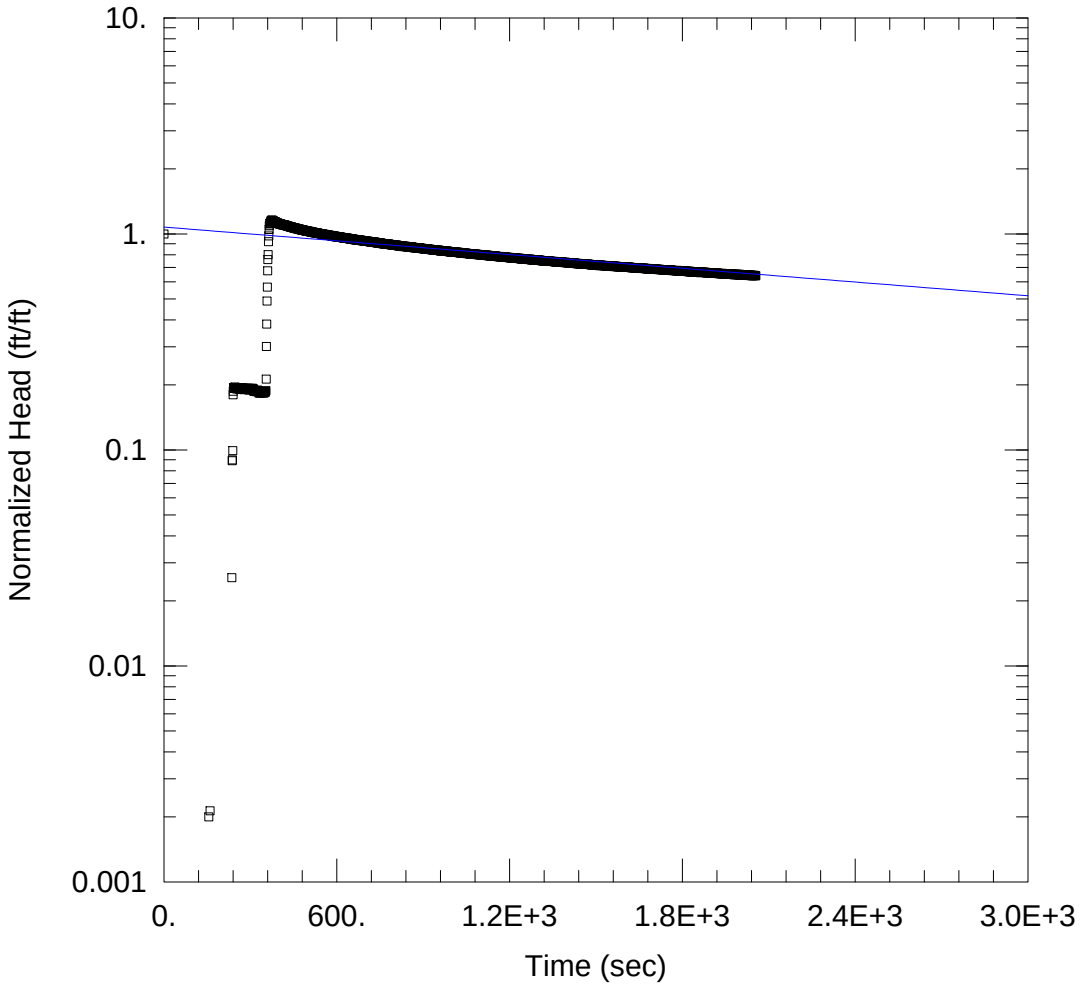
Saturated Thickness: 109.4 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (GT-15)

Initial Displacement: 22.6 ft
Total Well Penetration Depth: 224.1 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 224.1 ft
Screen Length: 109.4 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 1.846E-7 cm/sec
y0 = 23.49 ft



TEST 1

Data Set: C:\...\GT-32_Test 1.aqt
Date: 11/22/16 Time: 20:23:40

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-32
Test Date: 11/3/2016

AQUIFER DATA

Saturated Thickness: 15.05 ft Anisotropy Ratio (Kz/Kr): 1.

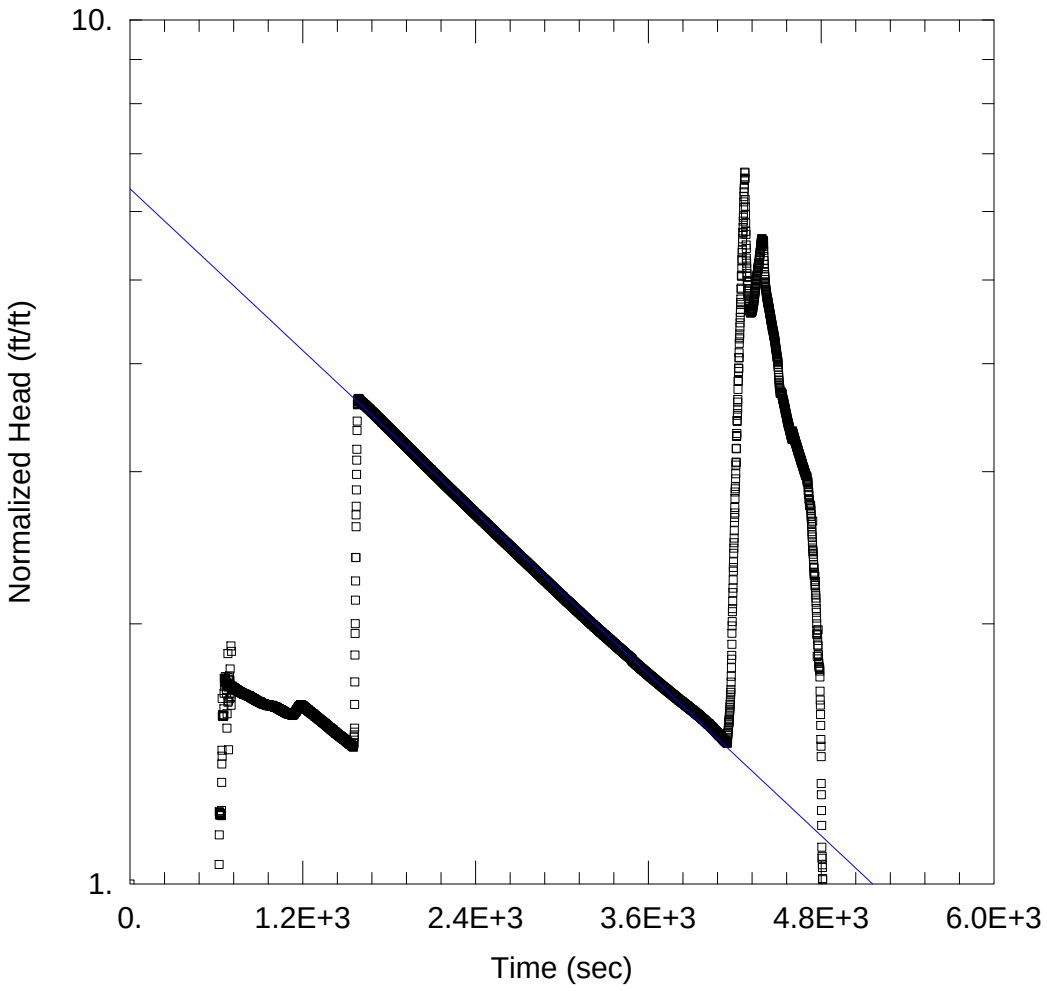
WELL DATA (GT-32)

Initial Displacement: 15. ft
Total Well Penetration Depth: 15.05 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 1. ft
Screen Length: 15.05 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 2.14E-5 cm/sec
y0 = 16.13 ft



TEST 3 - SLUG

Data Set: C:\...\GT-32_Test 3a.aqt
Date: 11/28/16 Time: 21:32:55

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-32
Test Date: 11/5/2016

AQUIFER DATA

Saturated Thickness: 15.2 ft Anisotropy Ratio (Kz/Kr): 1.

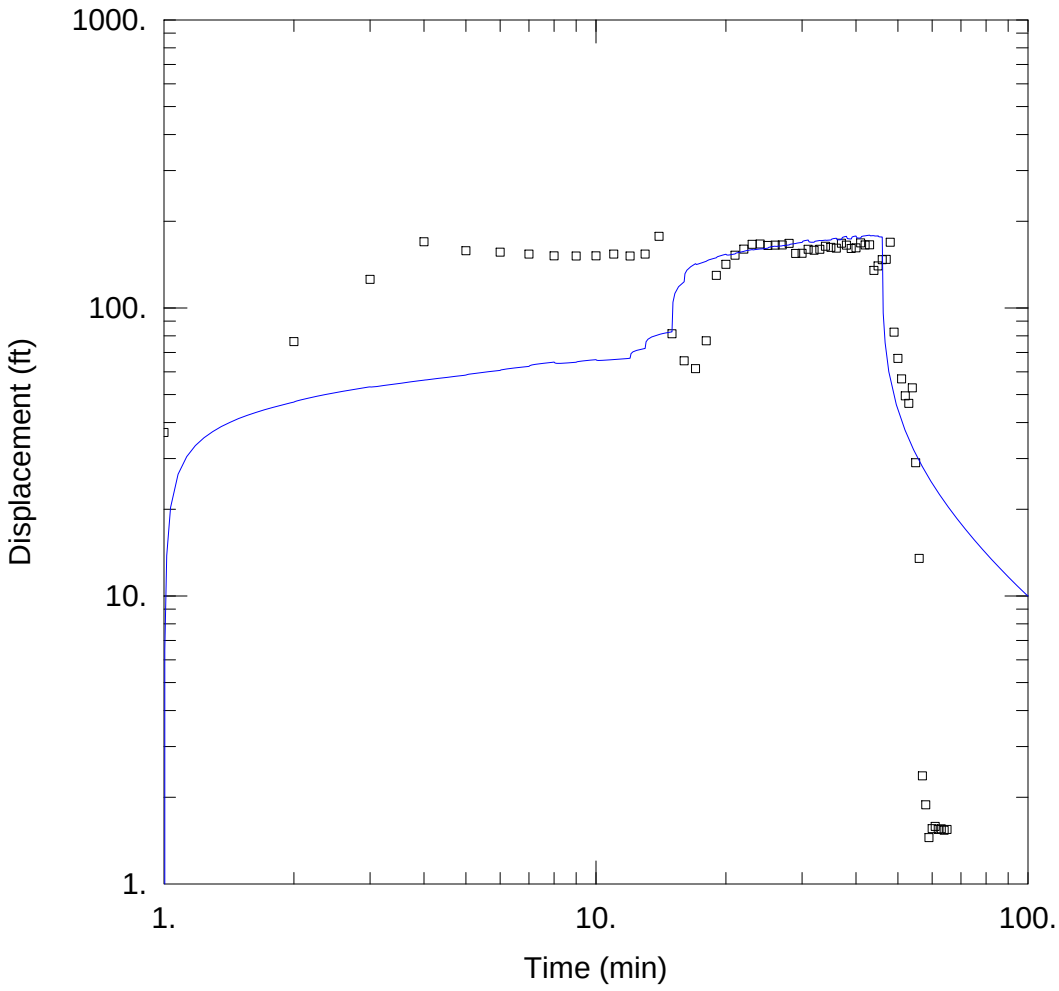
WELL DATA (New Well)

Initial Displacement: 20. ft
Total Well Penetration Depth: 43.9 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 43.9 ft
Screen Length: 15.2 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 3.719E-5 cm/sec
y0 = 127.5 ft



TEST 3 - CRI

Data Set: C:\...\GT-32_Test 3b.aqt
Date: 11/28/16 Time: 21:43:50

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-32
Test Date: 11/5/2016

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

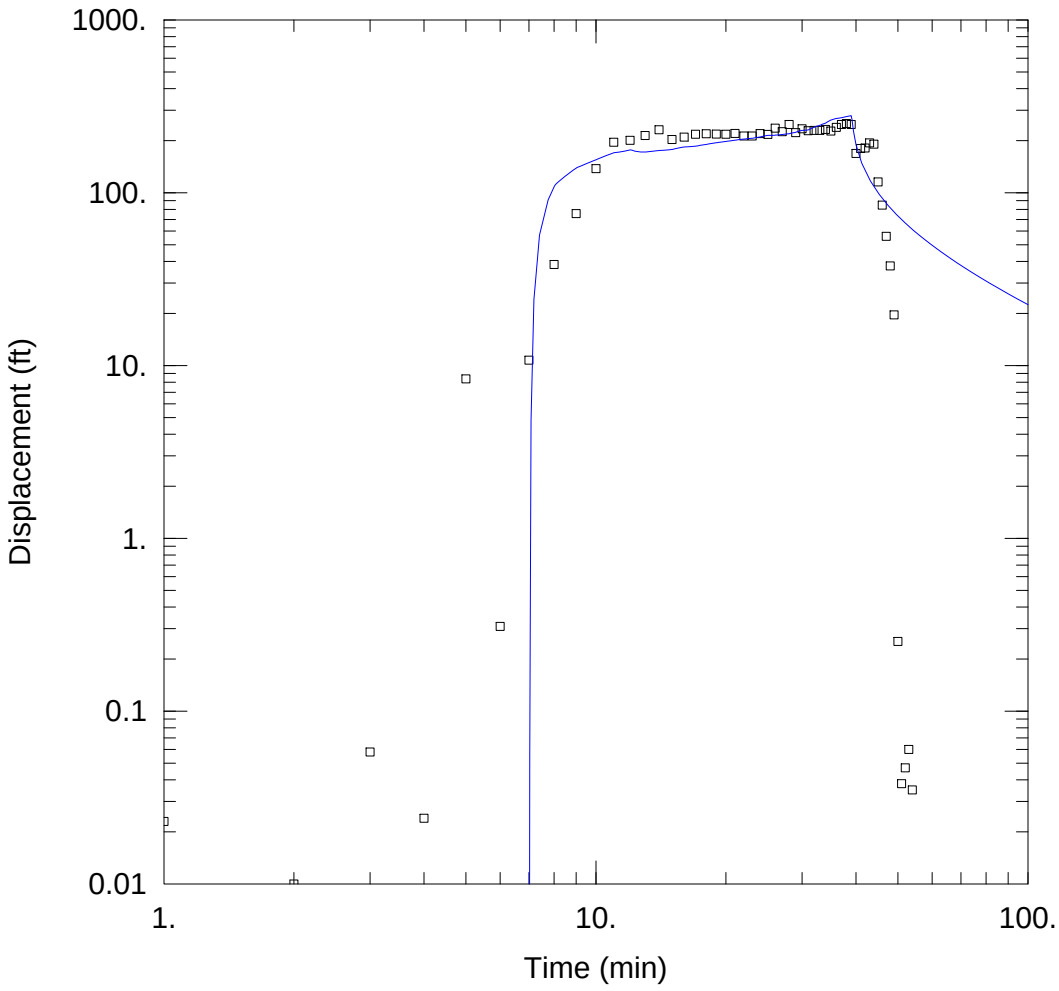
Observation Wells

Well Name	X (ft)	Y (ft)
▫ New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.2199 cm^2/sec
S = 0.004041
Kz/Kr = 0.1
b = 15.2 ft



TEST 4 - CRI

Data Set: C:\...\GT-32_Test 4.aqt
Date: 12/09/16 Time: 16:13:34

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-32
Test Date: 11/6/2016

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

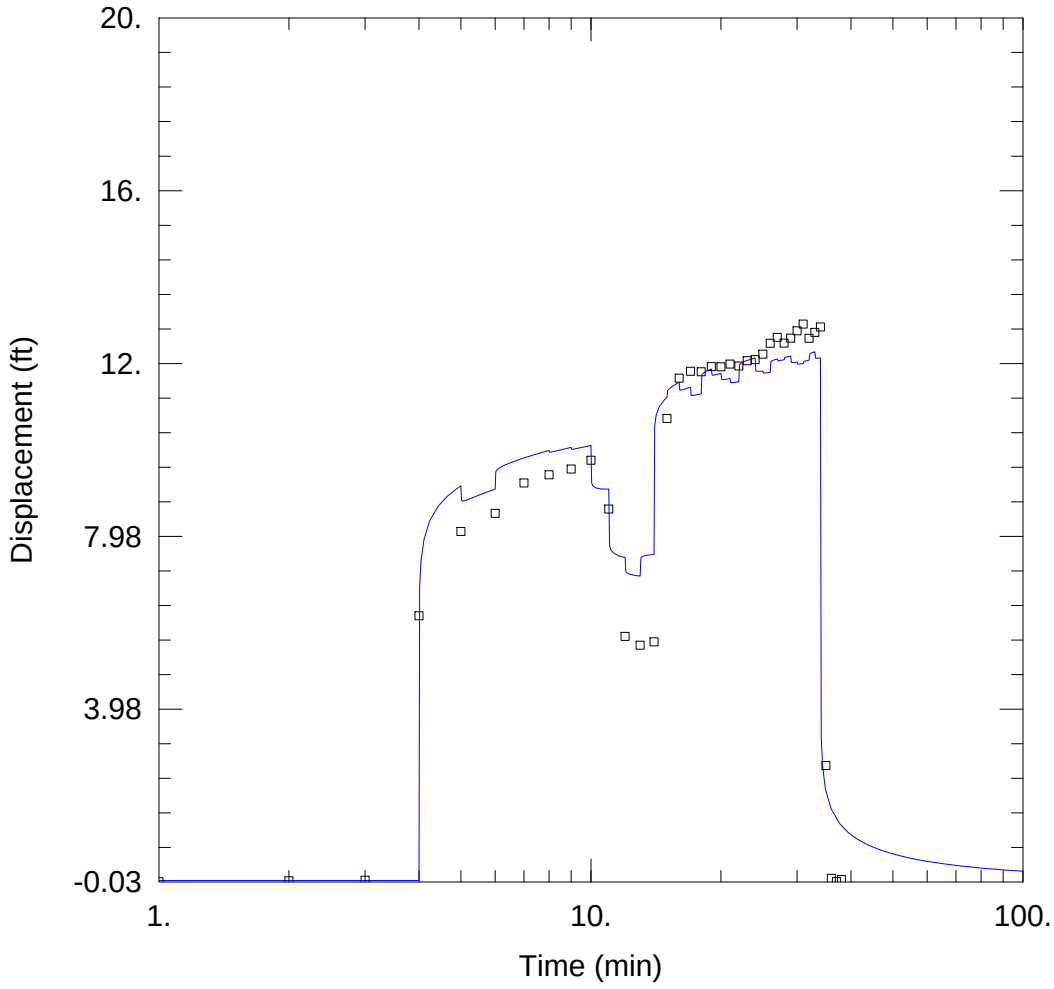
Observation Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.04761 cm^2/sec
S = 0.06982
Kz/Kr = 1.
b = 53.7 ft



TEST 5 - CRI

Data Set: C:\...\GT-32_Test 5.aqt
Date: 12/09/16 Time: 16:31:59

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-32
Test Date: 11/6/2016

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

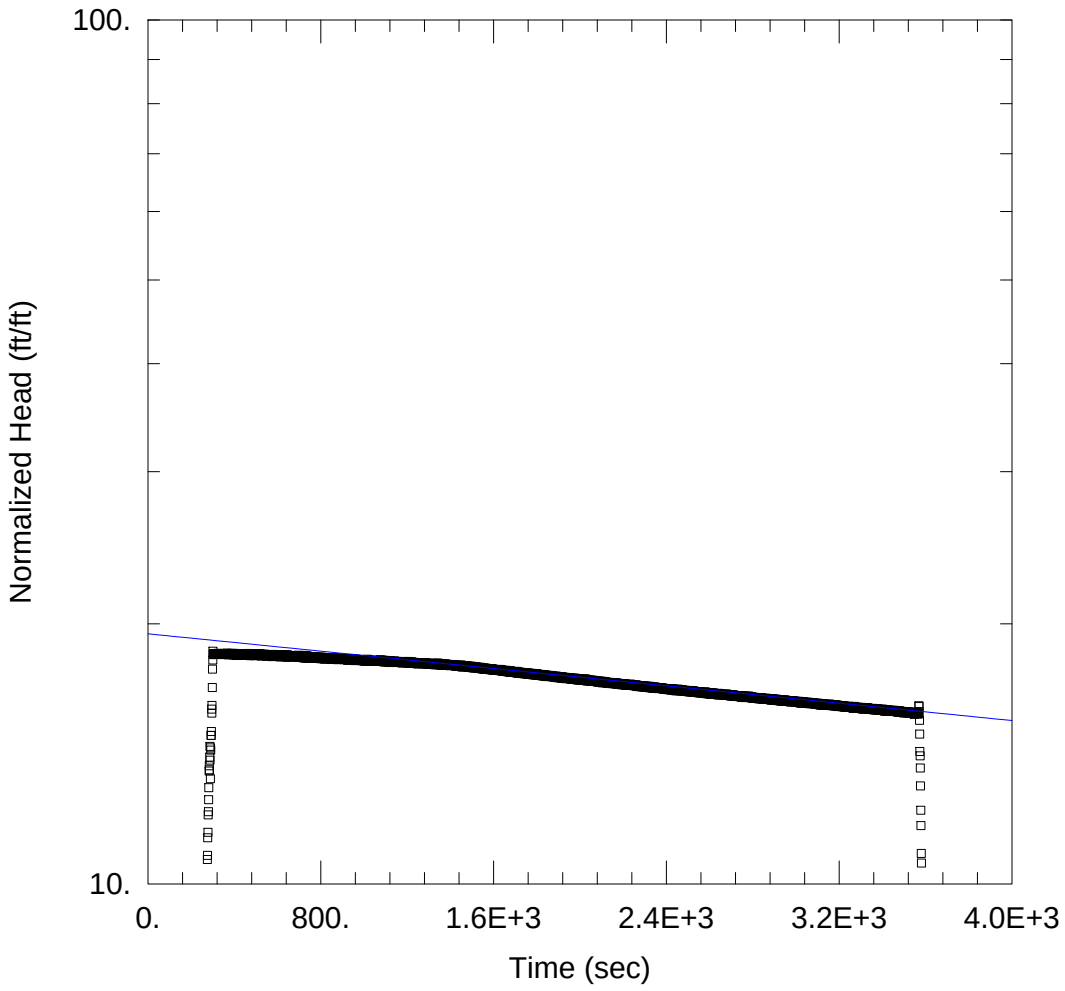
Observation Wells

Well Name	X (ft)	Y (ft)
▫ New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 4.705 cm^2/sec
S = 2.008E-6
Kz/Kr = 1.
b = 66.55 ft



TEST 1

Data Set: C:\...\GT-31_Test 1.aqt
Date: 11/20/16 Time: 21:11:23

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-31
Test Date: 11/8/2016

AQUIFER DATA

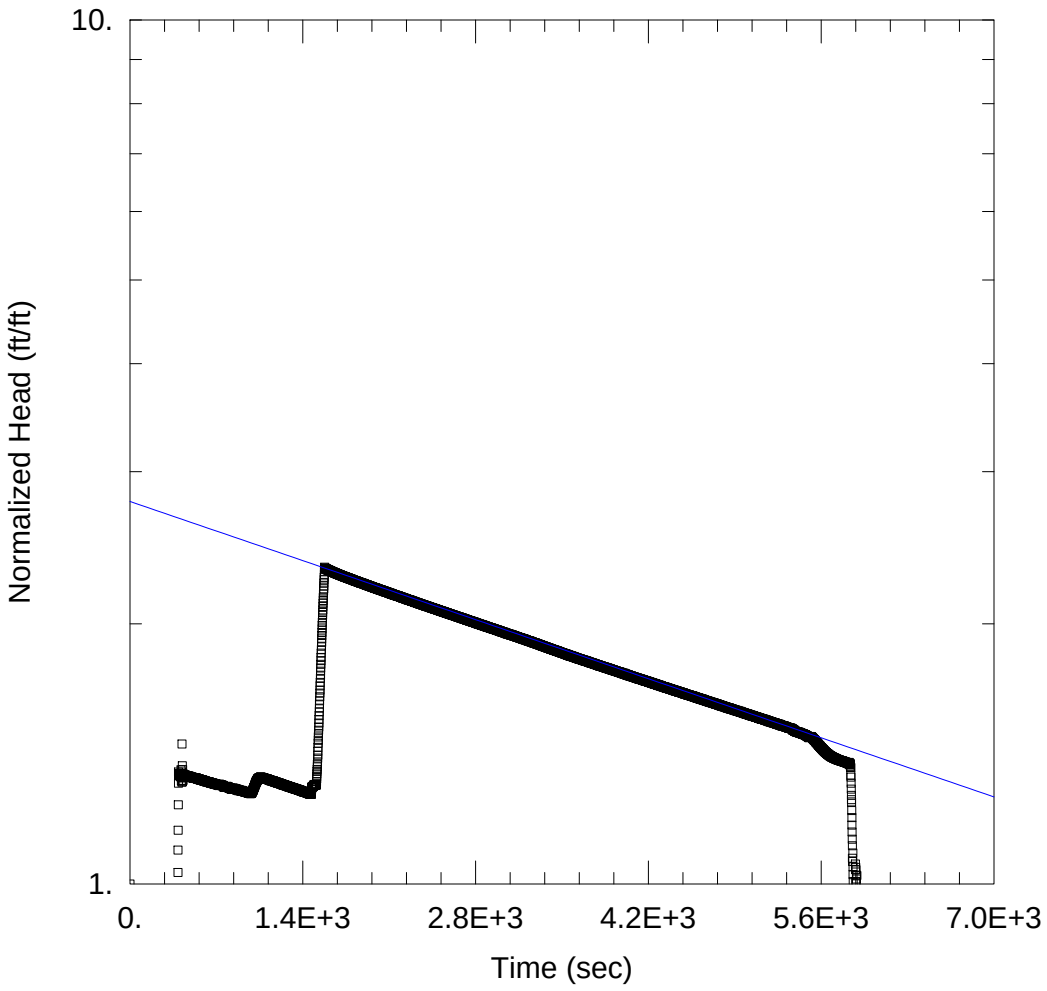
Saturated Thickness: 24. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (GT-31)

Initial Displacement: 1. ft
Total Well Penetration Depth: 24. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 24. ft
Screen Length: 24. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 3.525E-6 cm/sec
y0 = 19.48 ft



TEST 2

Data Set: C:\...\GT-31_Test 2.aqt
Date: 11/20/16 Time: 21:19:19

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-31
Test Date: 11/9/2016

AQUIFER DATA

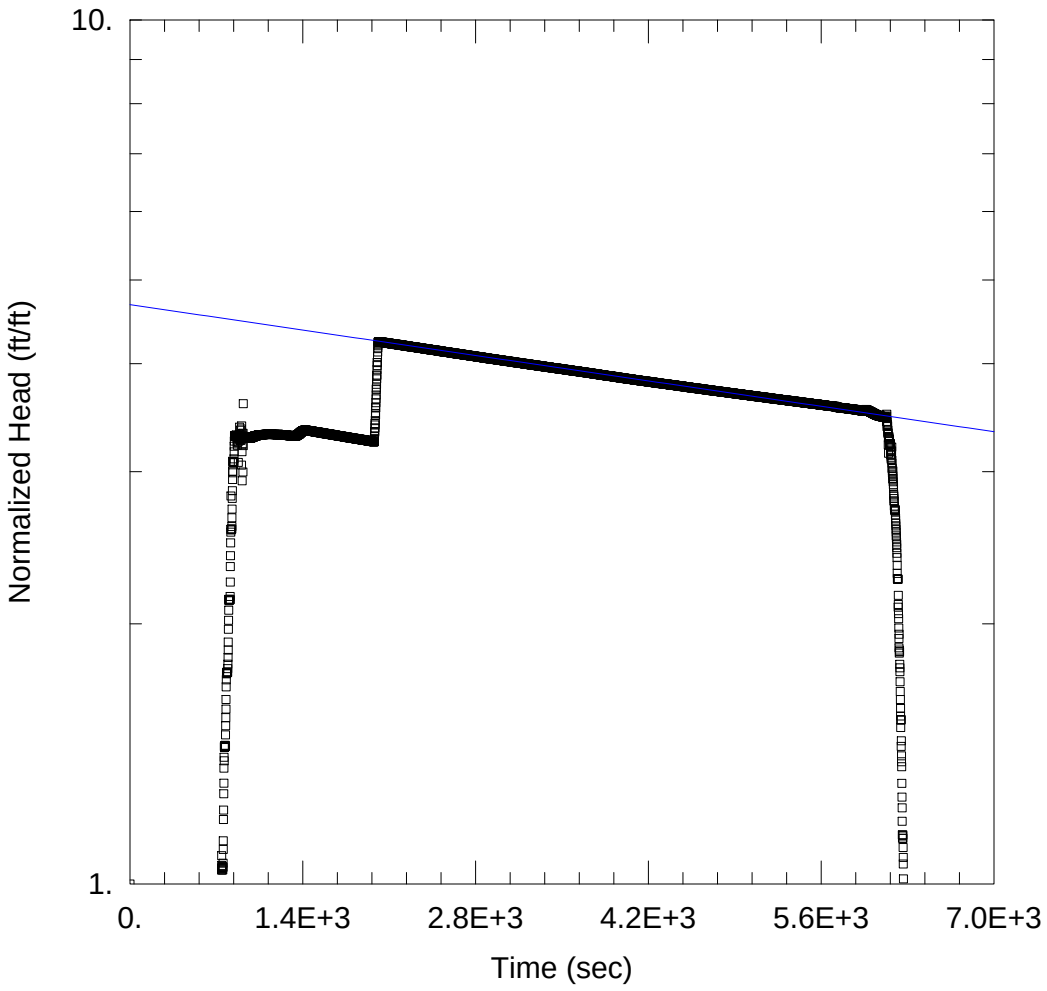
Saturated Thickness: 60.35 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (GT-31)

Initial Displacement: 23. ft
Total Well Penetration Depth: 86.45 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 86.45 ft
Screen Length: 60.35 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 3.515E-6 cm/sec
y0 = 63.73 ft



TEST 3

Data Set: C:\...\GT-31_Test 3.aqt
Date: 11/22/16 Time: 19:48:42

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-31
Test Date: 11/10/2016

AQUIFER DATA

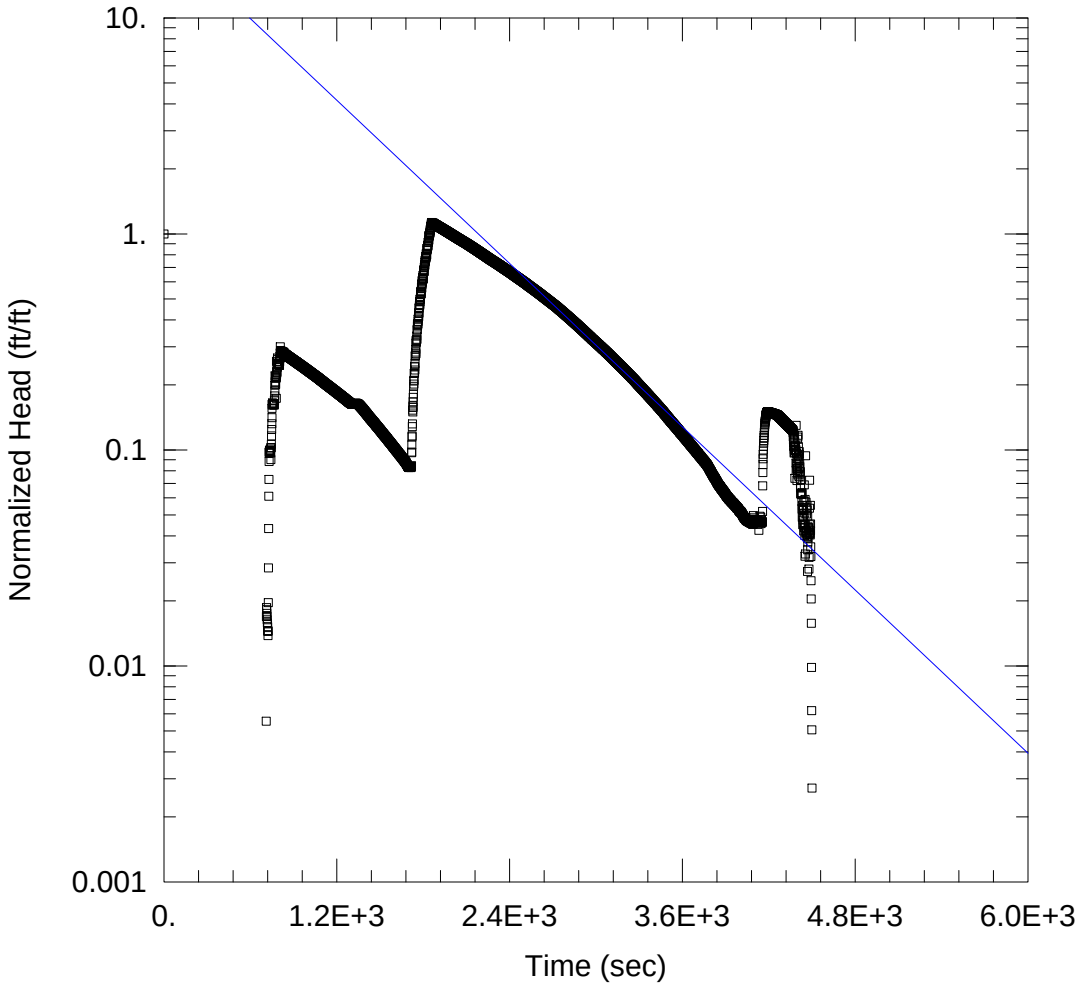
Saturated Thickness: 104.1 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (GT-31)

Initial Displacement: 25. ft
Total Well Penetration Depth: 179.7 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 179.7 ft
Screen Length: 104.1 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 1.007E-6 cm/sec
y0 = 117.1 ft



TEST 4 SLUG-IN

Data Set: C:\...\GT-31_Test 4.aqt
Date: 11/22/16 Time: 20:08:09

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-31
Test Date: 11/10/2016

AQUIFER DATA

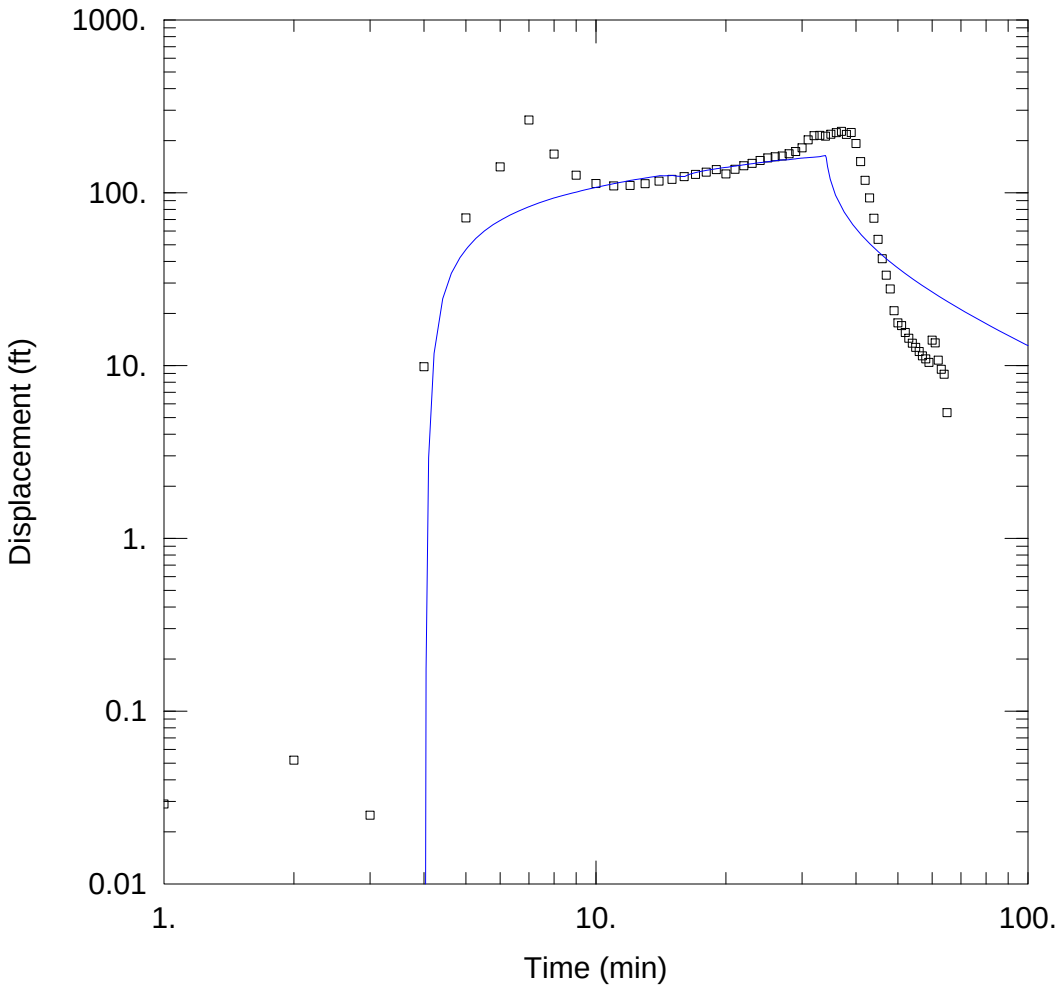
Saturated Thickness: 39.6 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (GT-31)

Initial Displacement: 160. ft
Total Well Penetration Depth: 73.2 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 73.2 ft
Screen Length: 39.6 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 6.549E-5 cm/sec
y0 = 3788.9 ft



TEST 4B - CRI

Data Set: C:\...\GT-31_Test 4b_2.aqt
Date: 02/13/17 Time: 13:41:11

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-31
Test Date: 11/11/2016

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
GT-31	0	0

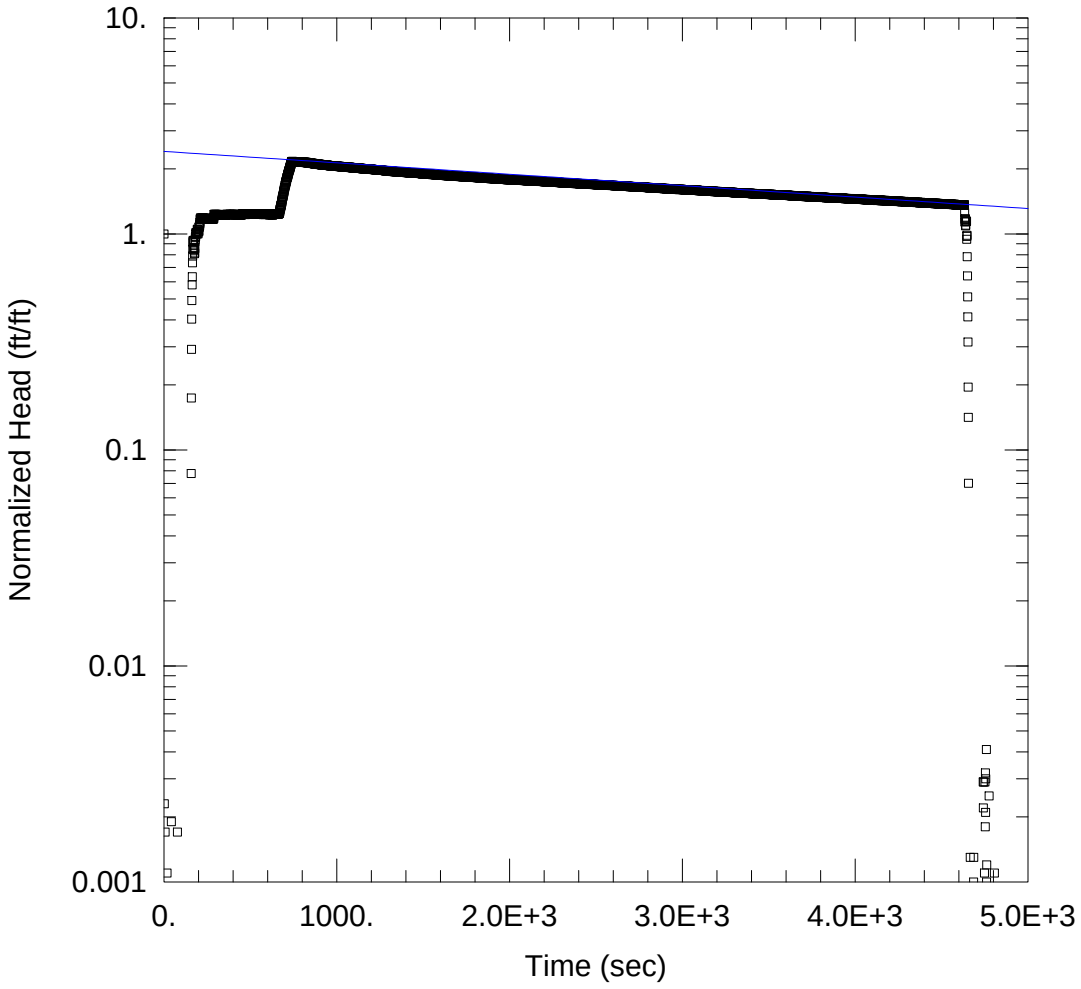
Observation Wells

Well Name	X (ft)	Y (ft)
▫ GT-31	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.09427 cm^2/sec
S = 0.1576
Kz/Kr = 0.1
b = 39.6 ft



TEST 1

Data Set: C:\...\GT-18_Test 1.aqt
Date: 12/21/16 Time: 21:08:39

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-18
Test Date: 11/13/2016

AQUIFER DATA

Saturated Thickness: 29. ft Anisotropy Ratio (Kz/Kr): 1.

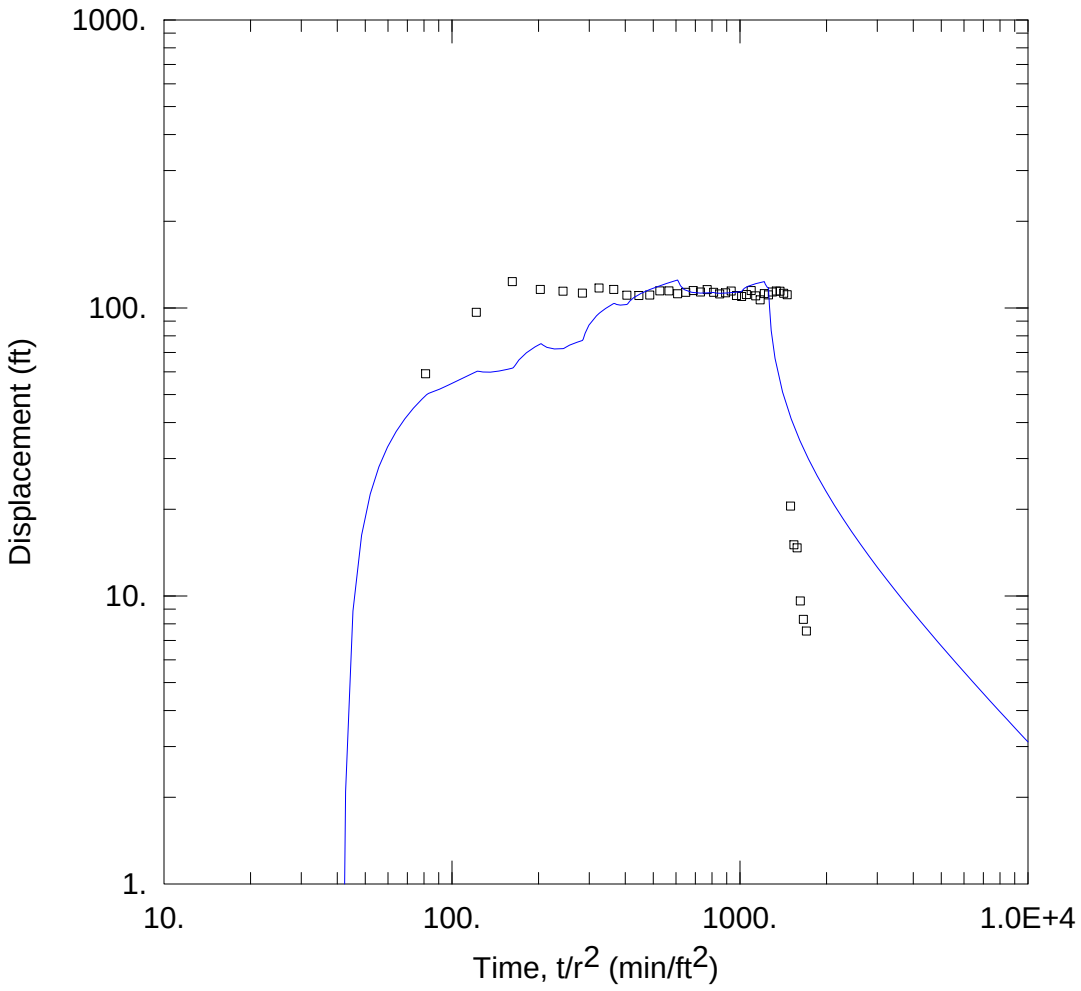
WELL DATA (New Well)

Initial Displacement: 10. ft
Total Well Penetration Depth: 29. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 14.5 ft
Screen Length: 29. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 6.405E-6 cm/sec
y0 = 24.1 ft



TEST 2

Data Set: C:\...\GT-18_Test 2.aqt
Date: 12/22/16 Time: 21:24:02

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-18
Test Date: 11/13/2016

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

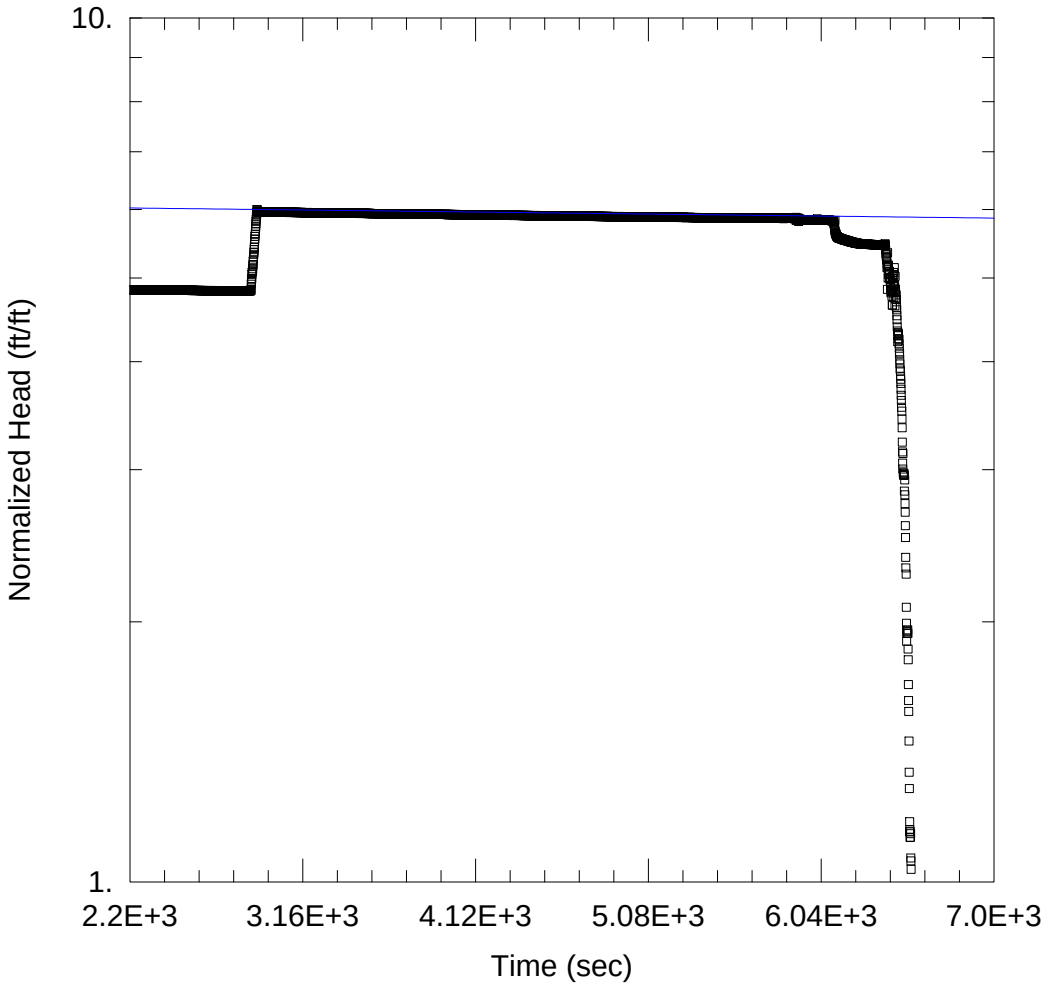
Observation Wells

Well Name	X (ft)	Y (ft)
▫ New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.005142 cm^2/sec
S = 0.004759
Kz/Kr = 0.1
b = 44.93 ft



TEST 3

Data Set: C:\...\GT-18_Test 3.aqt
Date: 12/21/16 Time: 21:21:16

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-18
Test Date: 11/14/2016

AQUIFER DATA

Saturated Thickness: 59.43 ft Anisotropy Ratio (Kz/Kr): 1.

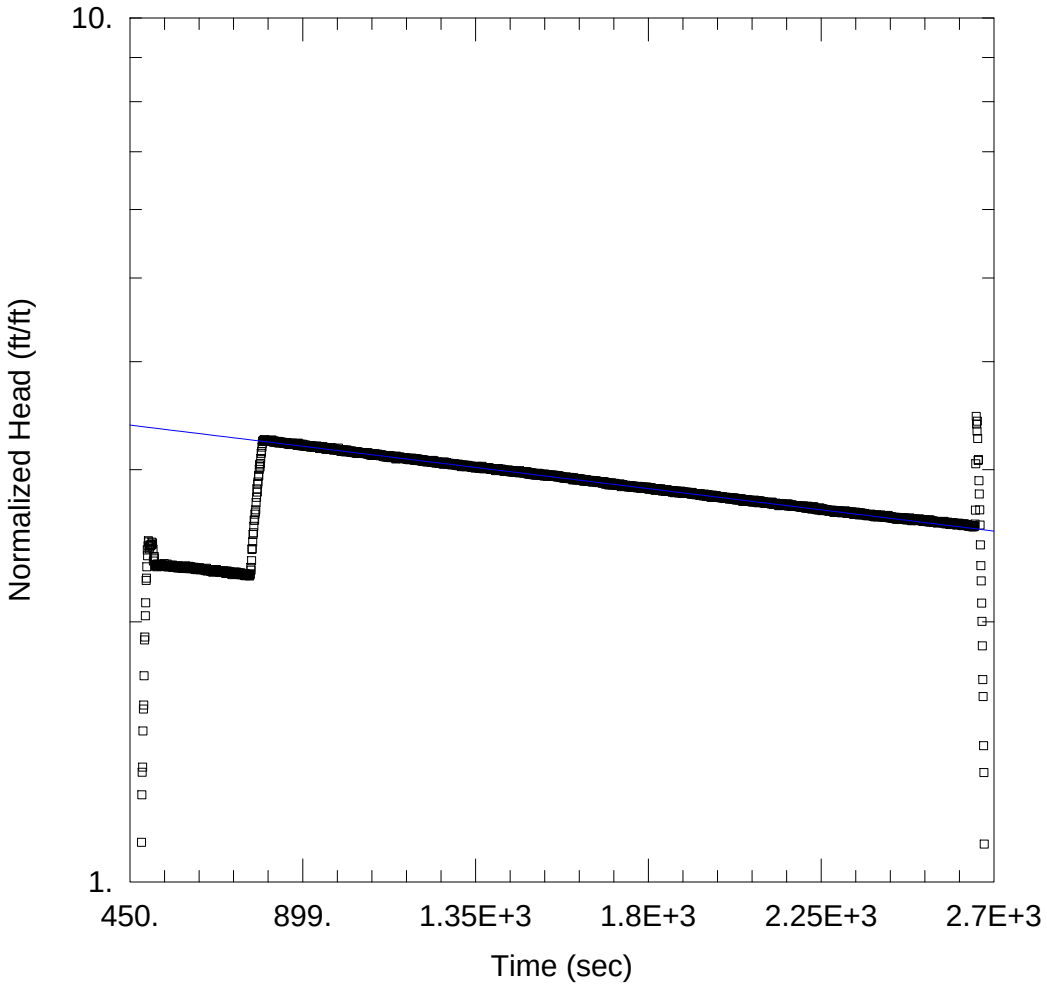
WELL DATA (New Well)

Initial Displacement: 14. ft
Total Well Penetration Depth: 122.2 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 122.2 ft
Screen Length: 59.43 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 1.864E-7 cm/sec y0 = 85.41 ft



TEST 1

Data Set: C:\...\GT-19_Test 1.aqt
Date: 11/20/16 Time: 20:30:40

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-19
Test Date: 11/17/2016

AQUIFER DATA

Saturated Thickness: 29. ft Anisotropy Ratio (Kz/Kr): 1.

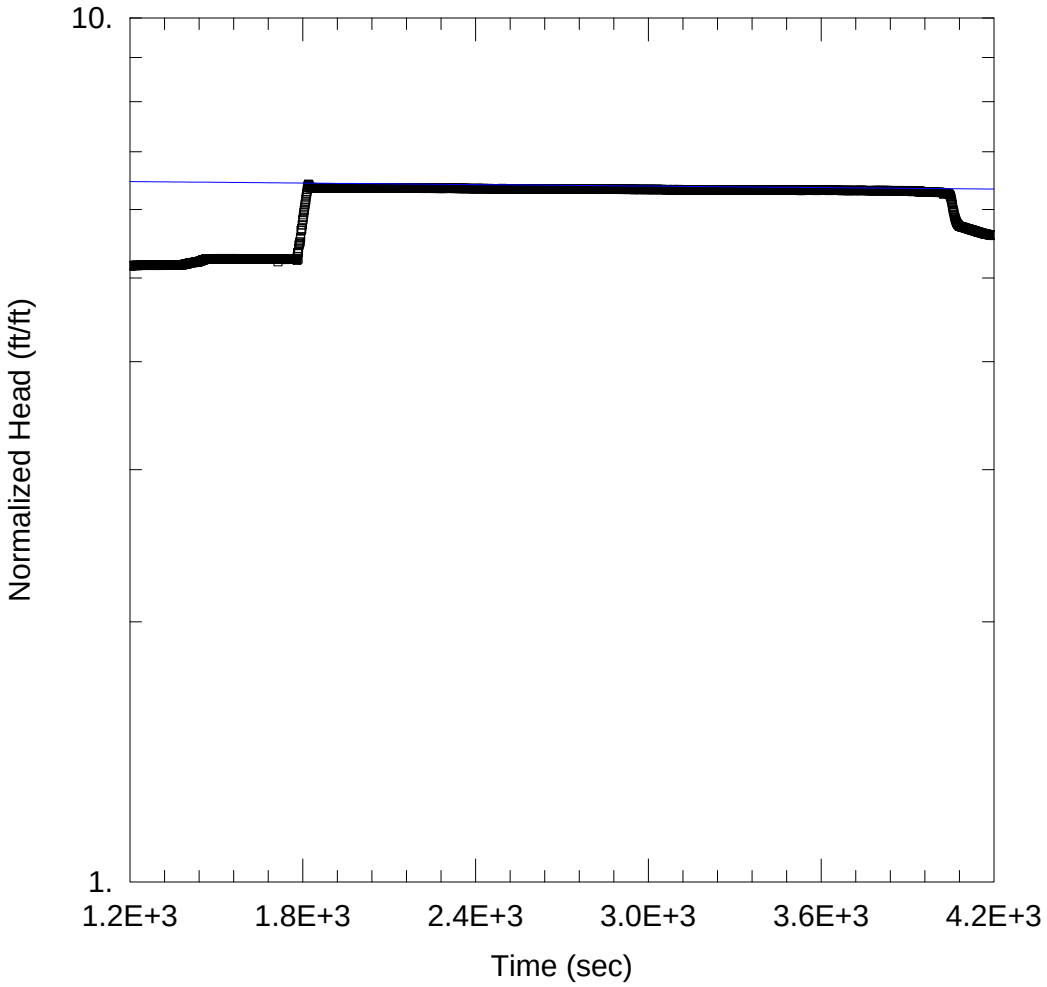
WELL DATA (GT-19)

Initial Displacement: 4. ft
Total Well Penetration Depth: 29. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 9. ft
Screen Length: 29. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 6.619E-6 cm/sec
y0 = 14.3 ft



TEST 2

Data Set: C:\...\GT-19_Test 2.aqt
Date: 11/20/16 Time: 20:29:02

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-19
Test Date: 11/17/2016

AQUIFER DATA

Saturated Thickness: 34.7 ft Anisotropy Ratio (Kz/Kr): 1.

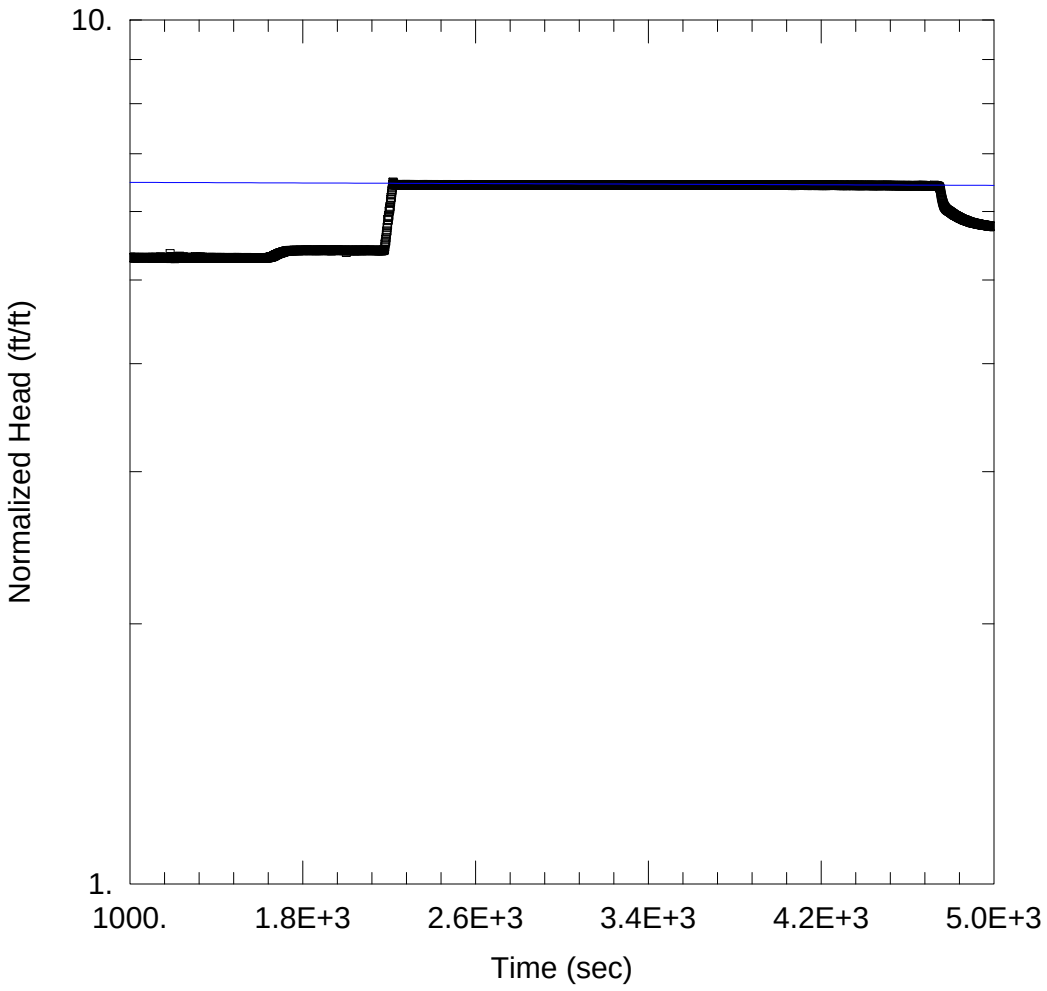
WELL DATA (New Well)

Initial Displacement: 8. ft
Total Well Penetration Depth: 64.4 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 34.7 ft
Screen Length: 34.7 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 3.359E-7 cm/sec
y0 = 52.14 ft



TEST 3

Data Set: C:\...\GT-19_Test 3.aqt
Date: 11/20/16 Time: 20:41:18

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-19
Test Date: 11/18/2016

AQUIFER DATA

Saturated Thickness: 44.7 ft Anisotropy Ratio (Kz/Kr): 1.

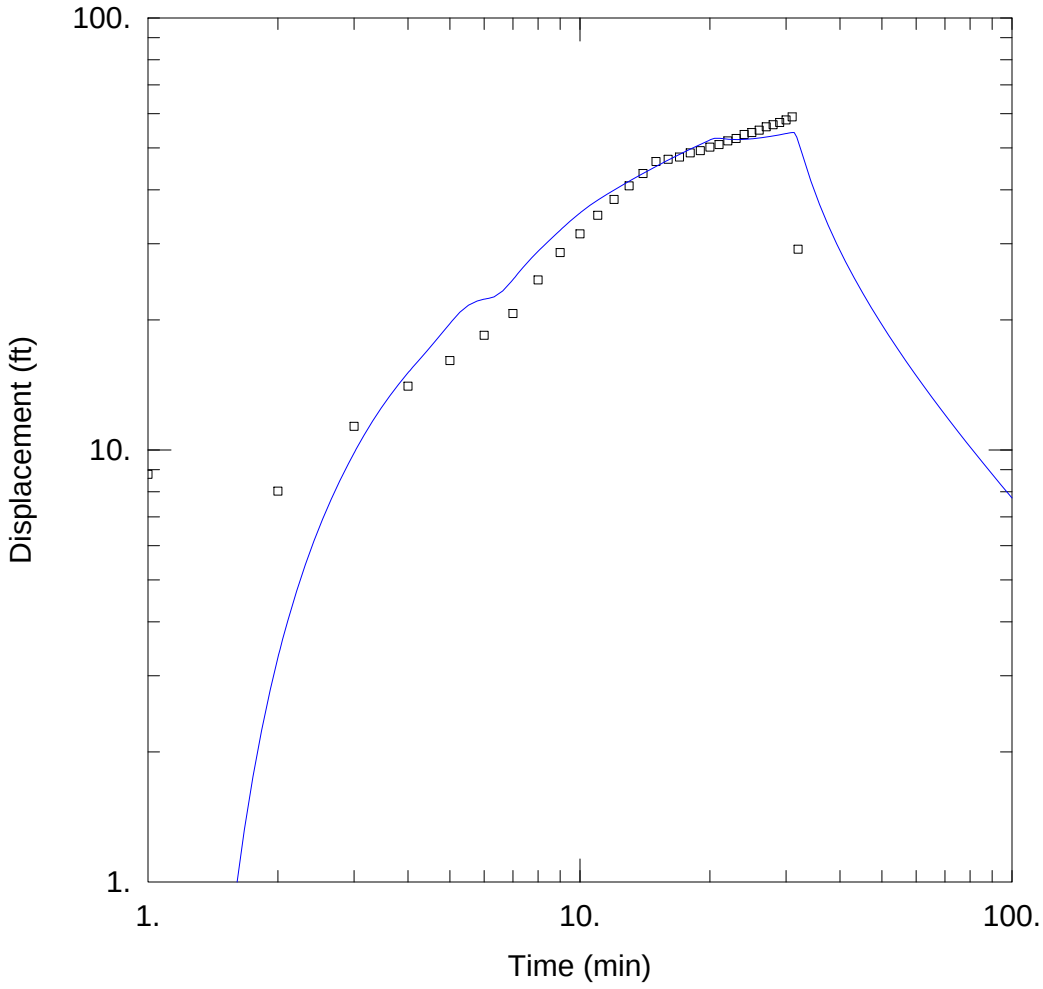
WELL DATA (GT-19)

Initial Displacement: 12. ft
Static Water Column Height: 69.7 ft
Total Well Penetration Depth: 44.7 ft
Screen Length: 44.7 ft
Casing Radius: 0.1571 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 7.504E-8 cm/sec
y0 = 77.99 ft



TEST 4 - CRI

Data Set: C:\...\GT-19_Test 4.aqt
Date: 02/13/17 Time: 13:46:29

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-19
Test Date: 11/18/2016

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
GT-19	0	0

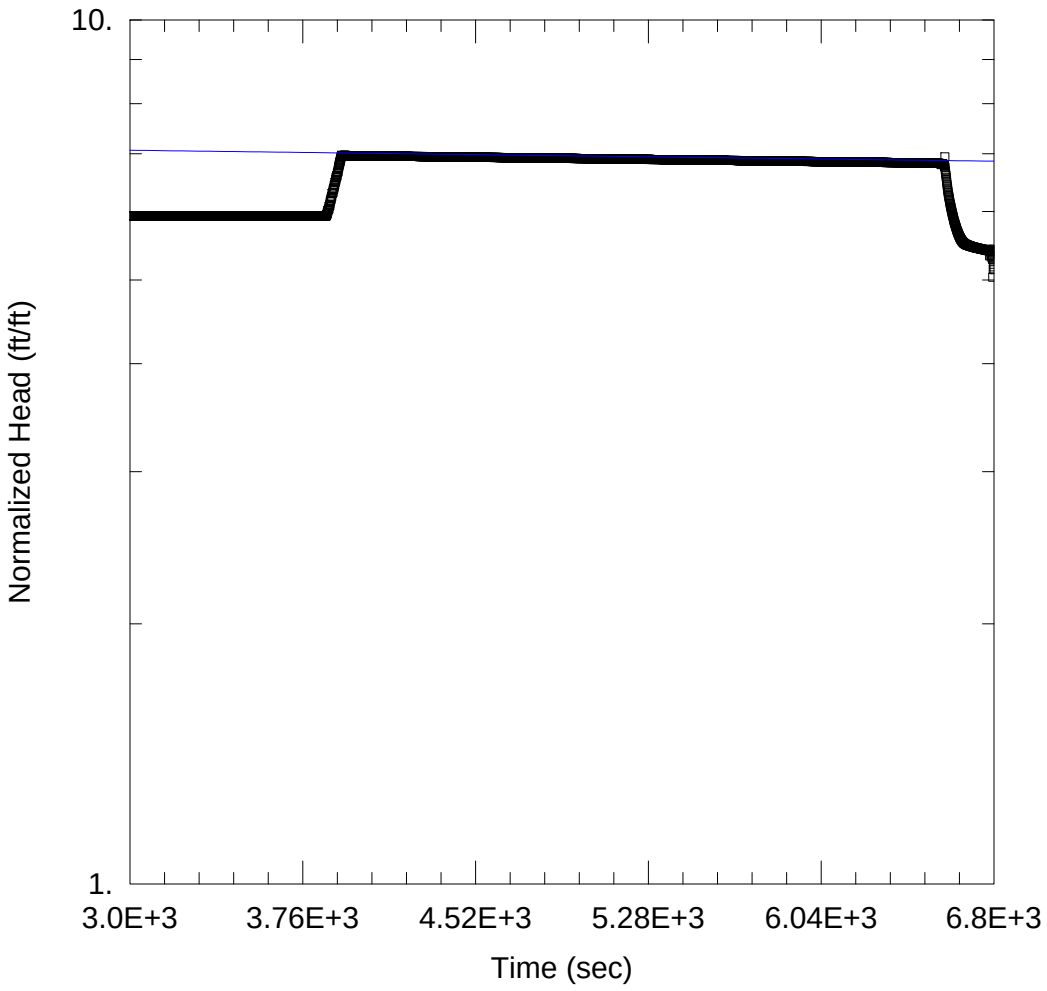
Observation Wells

Well Name	X (ft)	Y (ft)
▫ GT-19	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.04164 cm^2/sec
S = 0.5588
Kz/Kr = 0.1
b = 64.7 ft



TEST 5

Data Set: C:\...\GT-19_Test 5.aqt
Date: 11/20/16 Time: 21:03:15

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-19
Test Date: 11/19/2016

AQUIFER DATA

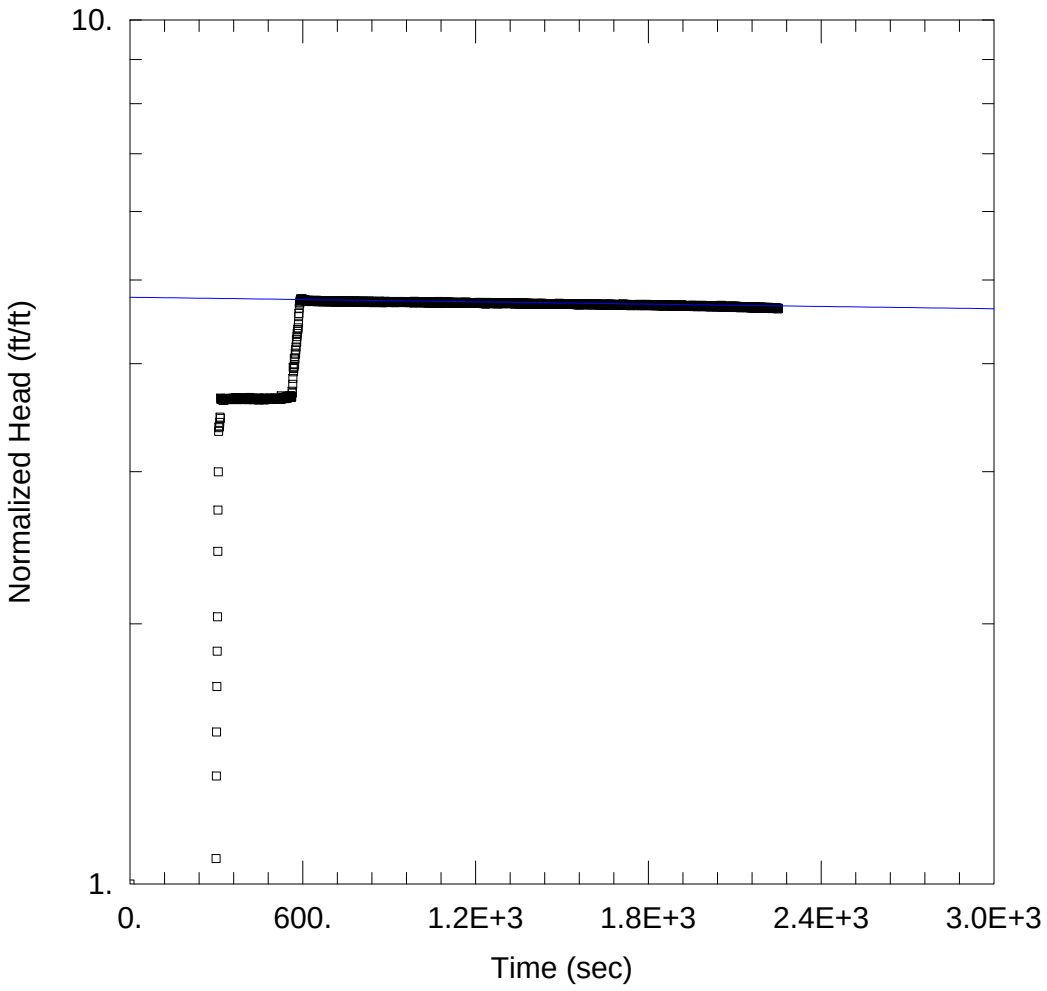
Saturated Thickness: 98.7 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (GT-19)

Initial Displacement: 29. ft
Total Well Penetration Depth: 279.4 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 189.7 ft
Screen Length: 89.7 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 1.934E-7 cm/sec
y0 = 209.7 ft



TEST 1

Data Set: C:\...\GT-17_Test 1.aqt
Date: 12/21/16 Time: 21:38:06

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-17
Test Date: 11/28/2016

AQUIFER DATA

Saturated Thickness: 28. ft Anisotropy Ratio (Kz/Kr): 1.

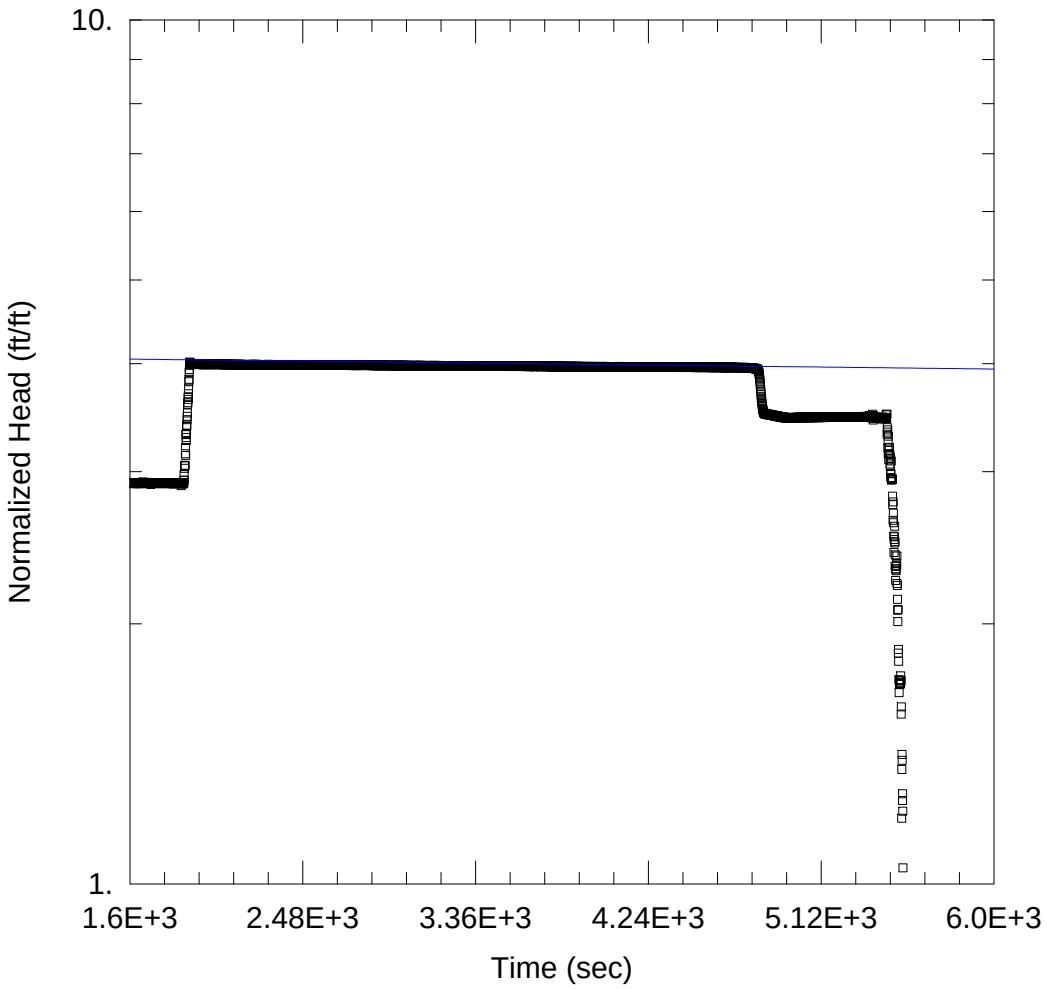
WELL DATA (New Well)

Initial Displacement: 4. ft
Total Well Penetration Depth: 28. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 14.5 ft
Screen Length: 28. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 5.518E-7 cm/sec
y0 = 19.1 ft



TEST 2

Data Set: C:\...\GT-17_Test 2.aqt
Date: 12/21/16 Time: 21:44:56

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-17
Test Date: 11/29/2016

AQUIFER DATA

Saturated Thickness: 14.1 ft Anisotropy Ratio (Kz/Kr): 1.

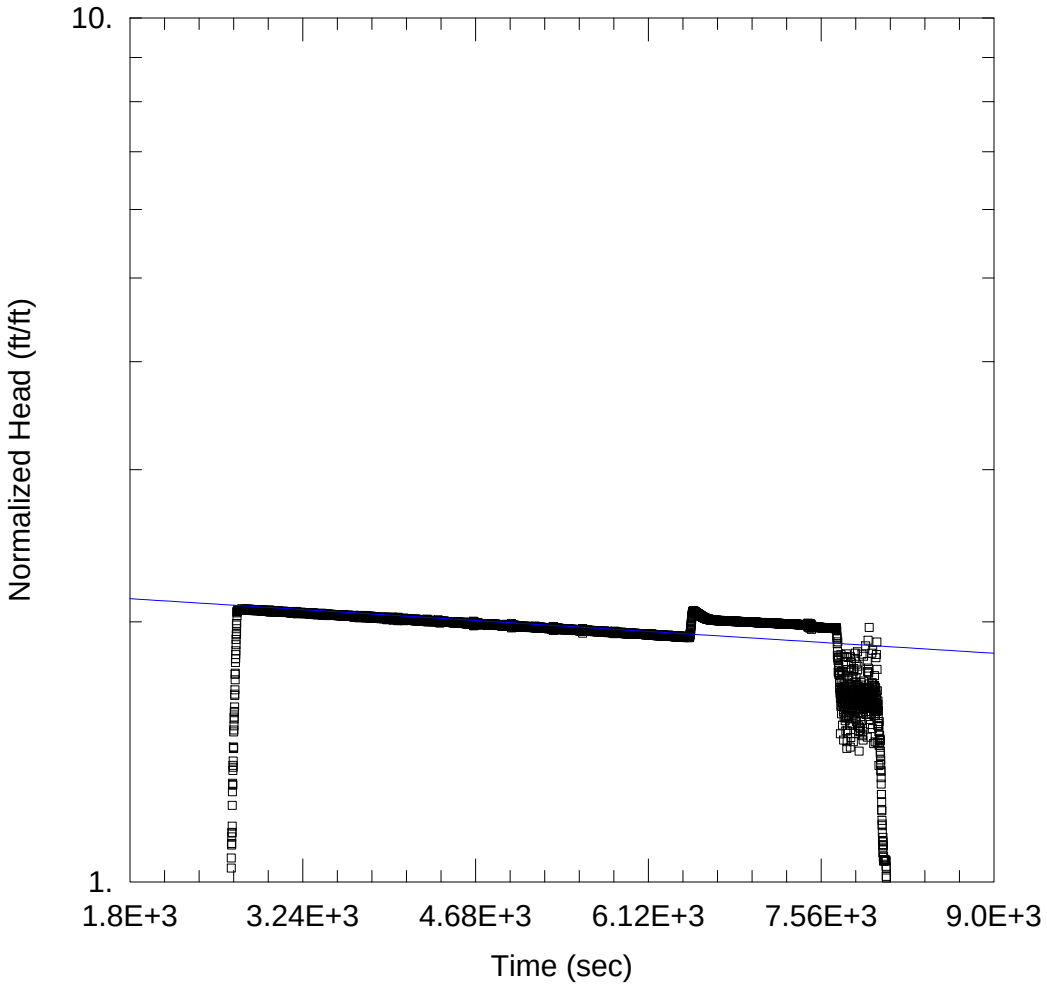
WELL DATA (New Well)

Initial Displacement: 10. ft
Total Well Penetration Depth: 51.2 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 51.2 ft
Screen Length: 14.1 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 6.838E-7 cm/sec
y0 = 40.89 ft



TEST 3

Data Set: C:\...\GT-17_Test 3.aqt
Date: 12/21/16 Time: 21:50:52

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-17
Test Date: 11/30/2016

AQUIFER DATA

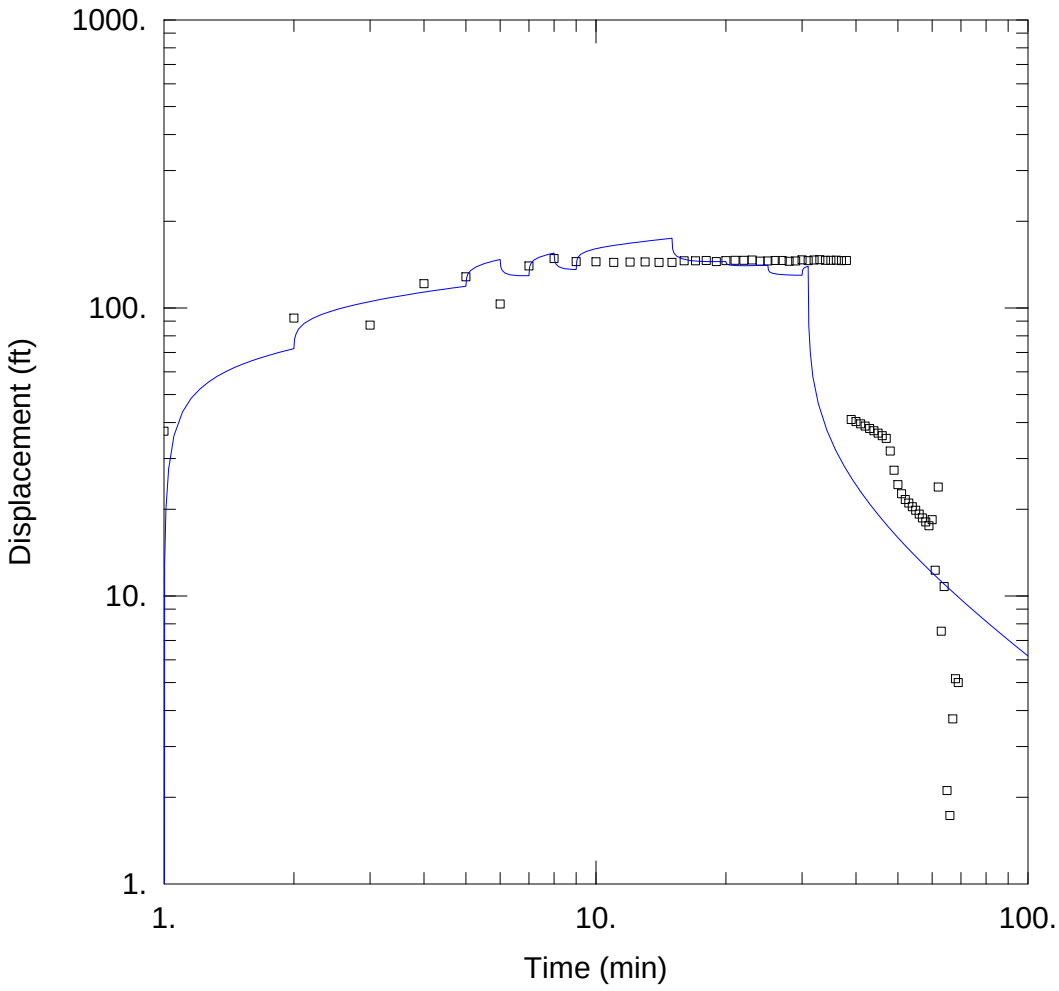
Saturated Thickness: 89.1 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 27. ft
Total Well Penetration Depth: 104.8 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 104.8 ft
Screen Length: 89.1 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 4.522E-7 cm/sec
y0 = 59.56 ft



TEST 4

Data Set: C:\...\GT-17_Test 4.aqt
Date: 02/13/17 Time: 13:33:20

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-17
Test Date: 11/30/2016

AQUIFER DATA

Saturated Thickness: 84.1 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

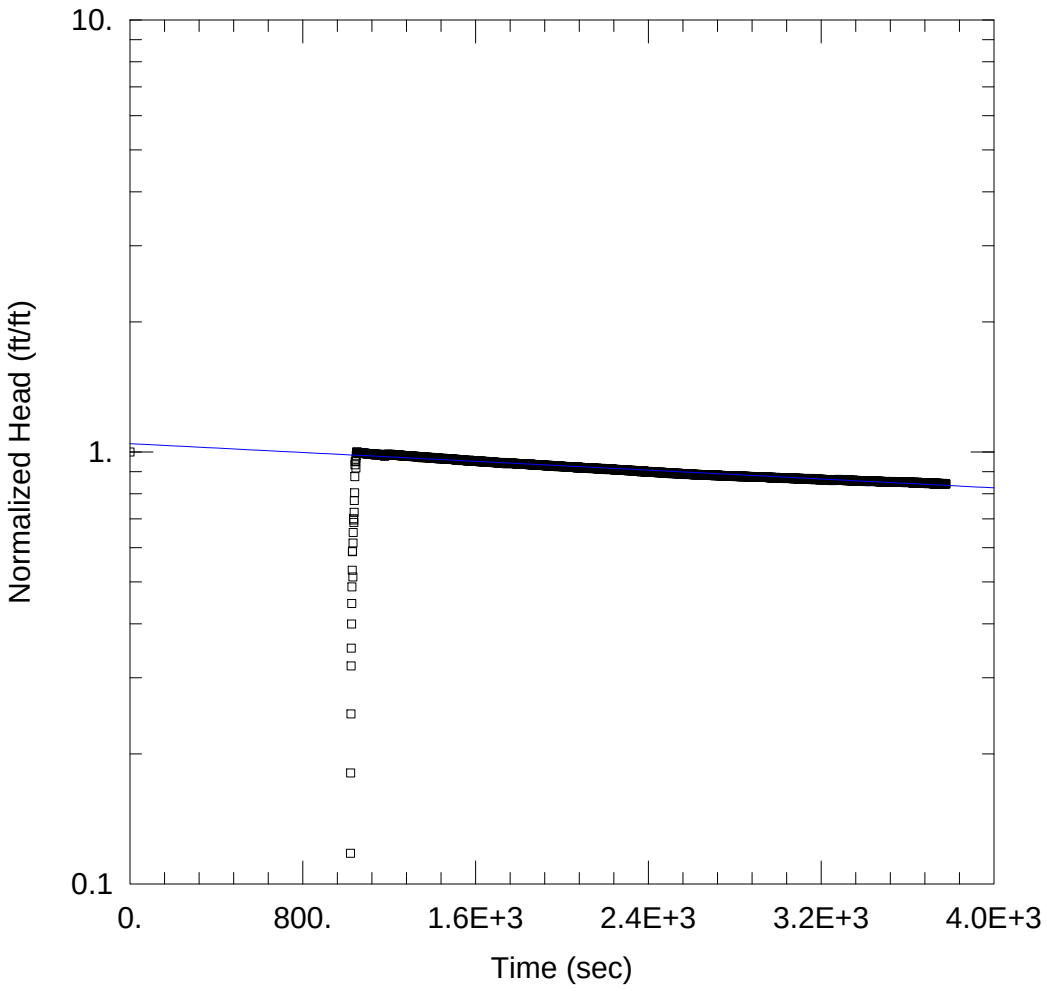
Observation Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

SOLUTION

Aquifer Model: Fractured Solution Method: Gringarten (Vertical)

Kx = 4.678E-6 cm/sec Ss = 1.331E-6 ft^{-1}
Ky/Kx = 0.1 Lf = 1. ft



TEST 1

Data Set: C:\...\GT-1_Test 1.aqt
Date: 12/22/16 Time: 21:32:10

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-1
Test Date: 11/30/2016

AQUIFER DATA

Saturated Thickness: 38. ft Anisotropy Ratio (Kz/Kr): 1.

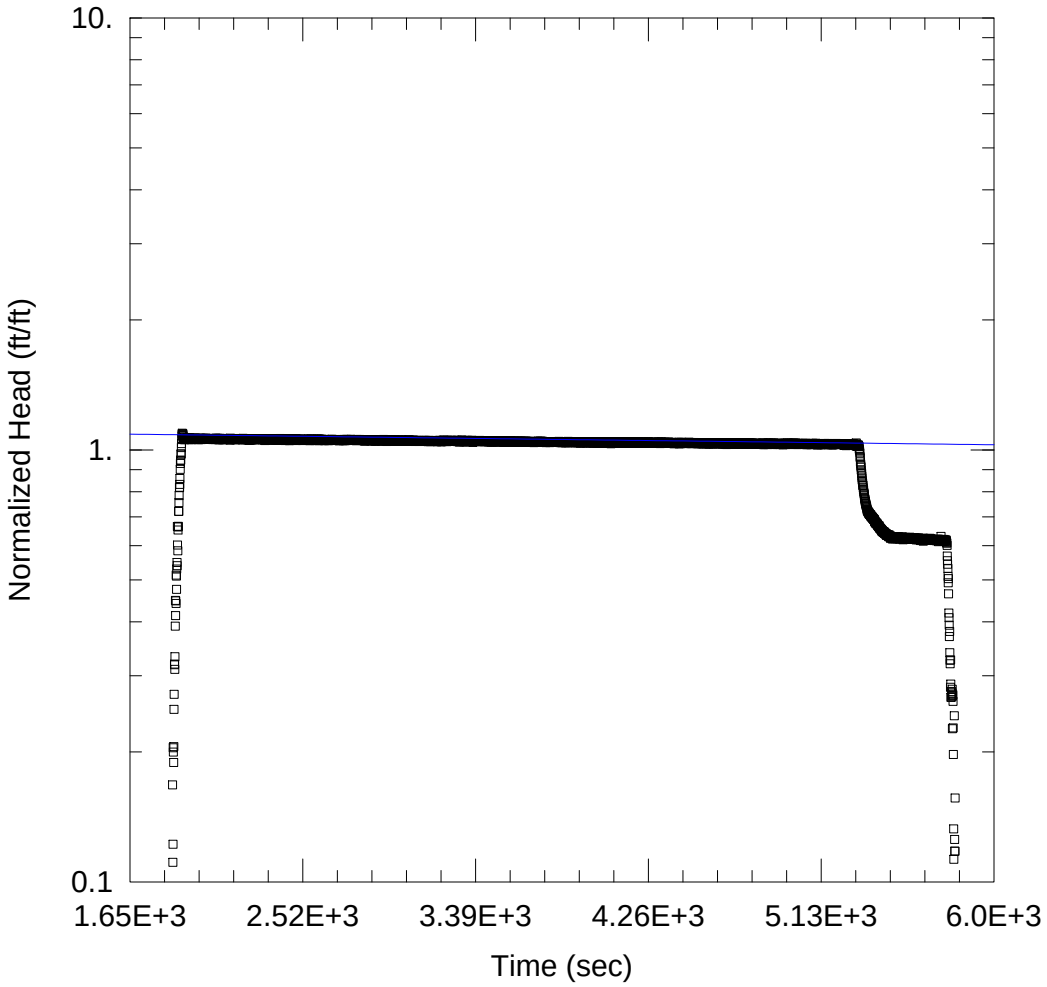
WELL DATA (New Well)

Initial Displacement: 8. ft Static Water Column Height: 4.1 ft
Total Well Penetration Depth: 38. ft Screen Length: 38. ft
Casing Radius: 0.1571 ft Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 2.509E-6 cm/sec y0 = 8.36 ft



TEST 2

Data Set: C:\...\GT-1_Test 2.aqt
Date: 12/22/16 Time: 21:38:38

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-1
Test Date: 12/1/2016

AQUIFER DATA

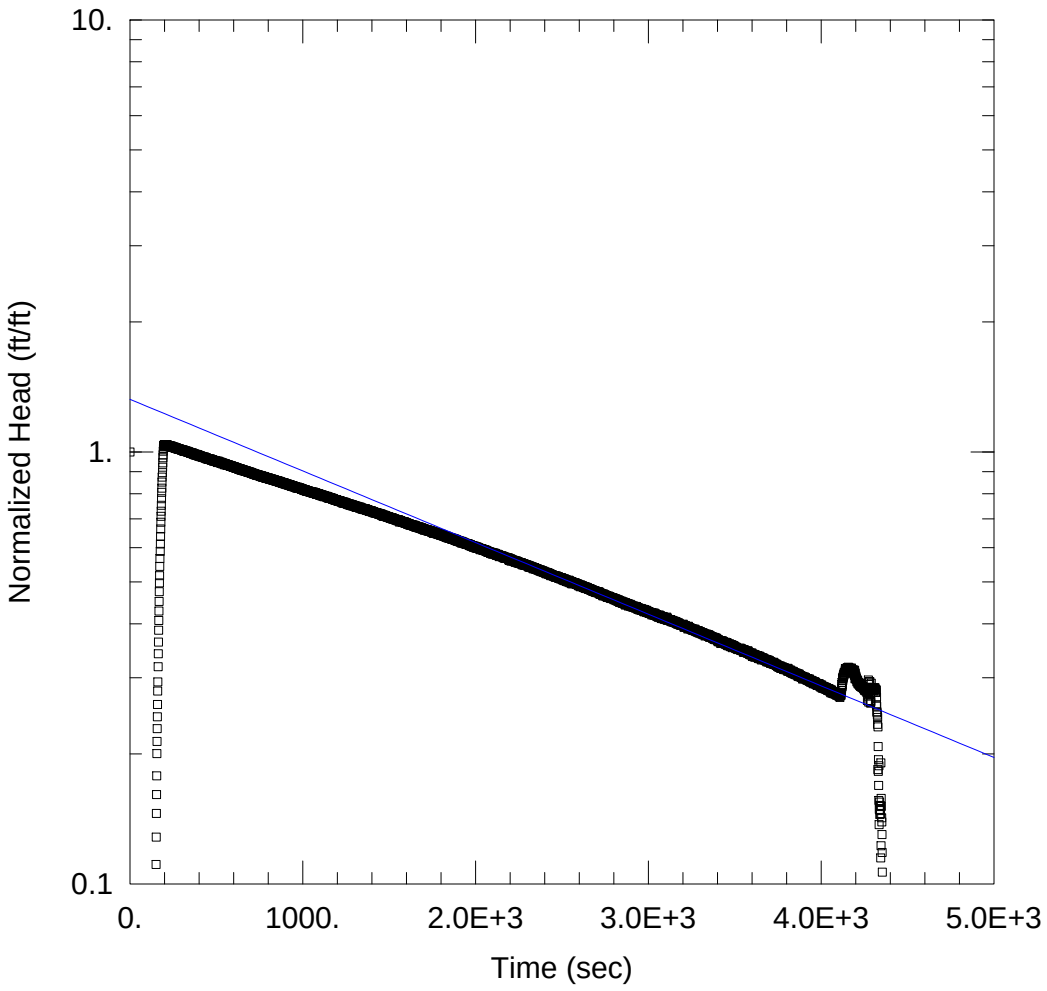
Saturated Thickness: 14.2 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 18. ft
Total Well Penetration Depth: 78.25 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 78.25 ft
Screen Length: 14.2 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 1.551E-6 cm/sec
y0 = 20. ft



TEST 3

Data Set: C:\...\GT-1_Test 3.aqt
Date: 12/22/16 Time: 21:45:02

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-1
Test Date: 12/2/2016

AQUIFER DATA

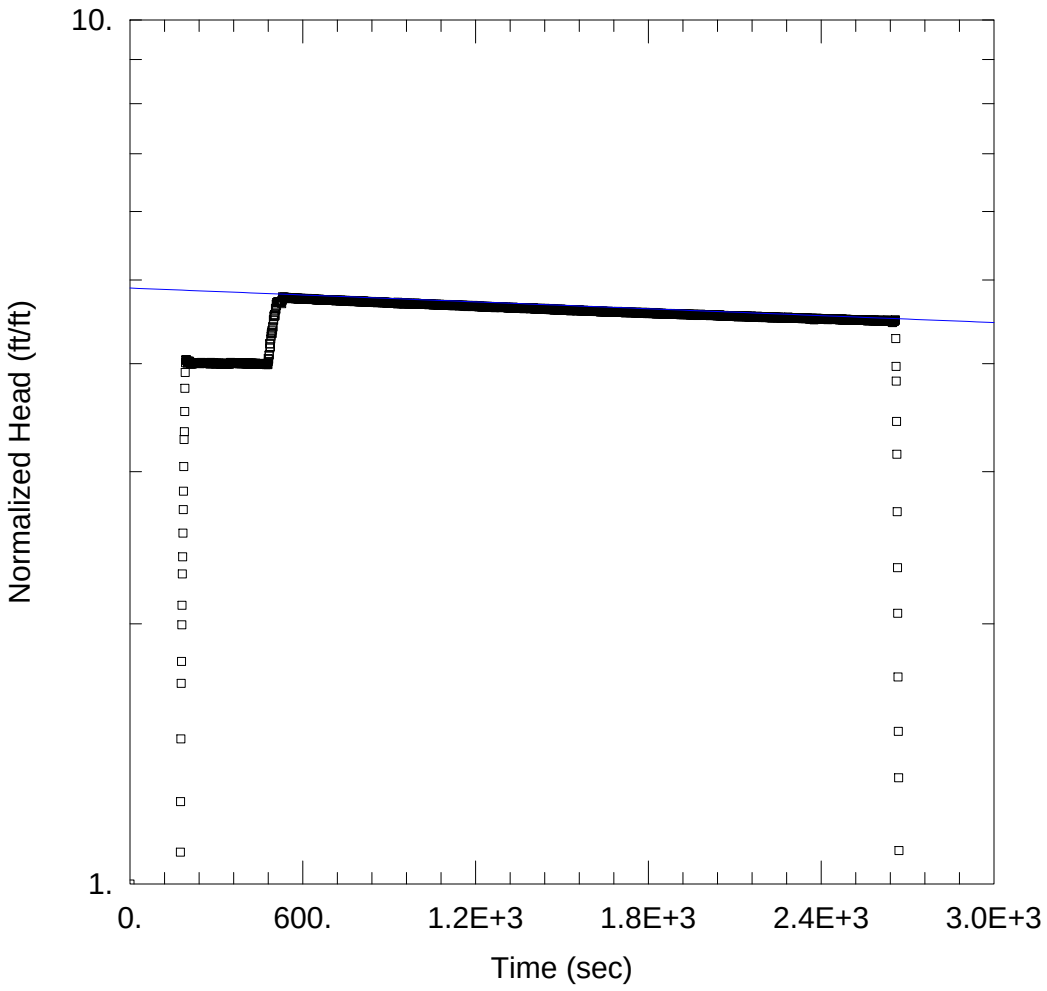
Saturated Thickness: 161.2 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 28. ft
Total Well Penetration Depth: 209.8 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 209.8 ft
Screen Length: 161.2 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 5.4E-6 cm/sec
y0 = 37.06 ft



TEST 1

Data Set: C:\...\GT-16_Test 1.aqt
Date: 12/22/16 Time: 19:38:52

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-16
Test Date: 12/2/2016

AQUIFER DATA

Saturated Thickness: 29. ft Anisotropy Ratio (Kz/Kr): 1.

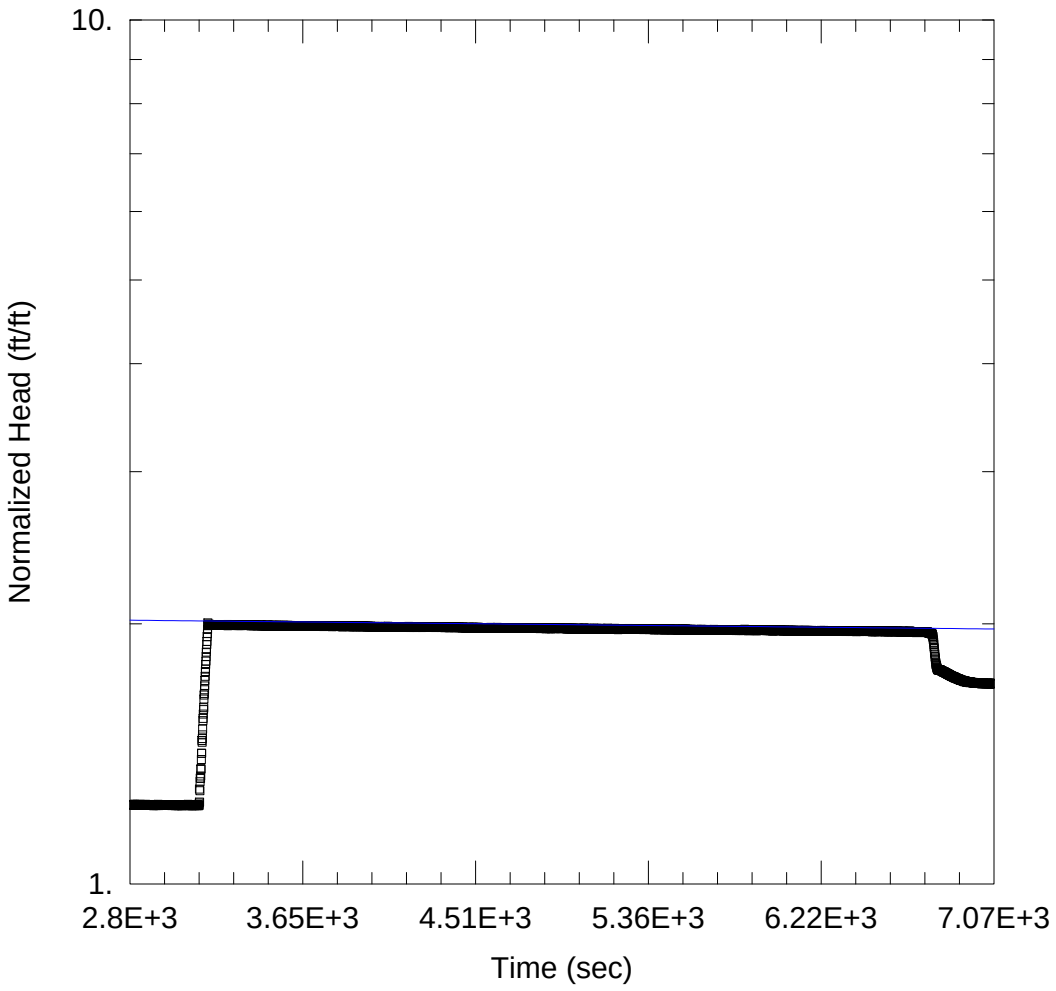
WELL DATA (New Well)

Initial Displacement: 5. ft
Total Well Penetration Depth: 29. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 14.5 ft
Screen Length: 29. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 1.611E-6 cm/sec
y0 = 24.47 ft



TEST 2

Data Set: C:\...\GT-16_Test 2.aqt
Date: 12/22/16 Time: 19:45:46

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-16
Test Date: 12/3/2016

AQUIFER DATA

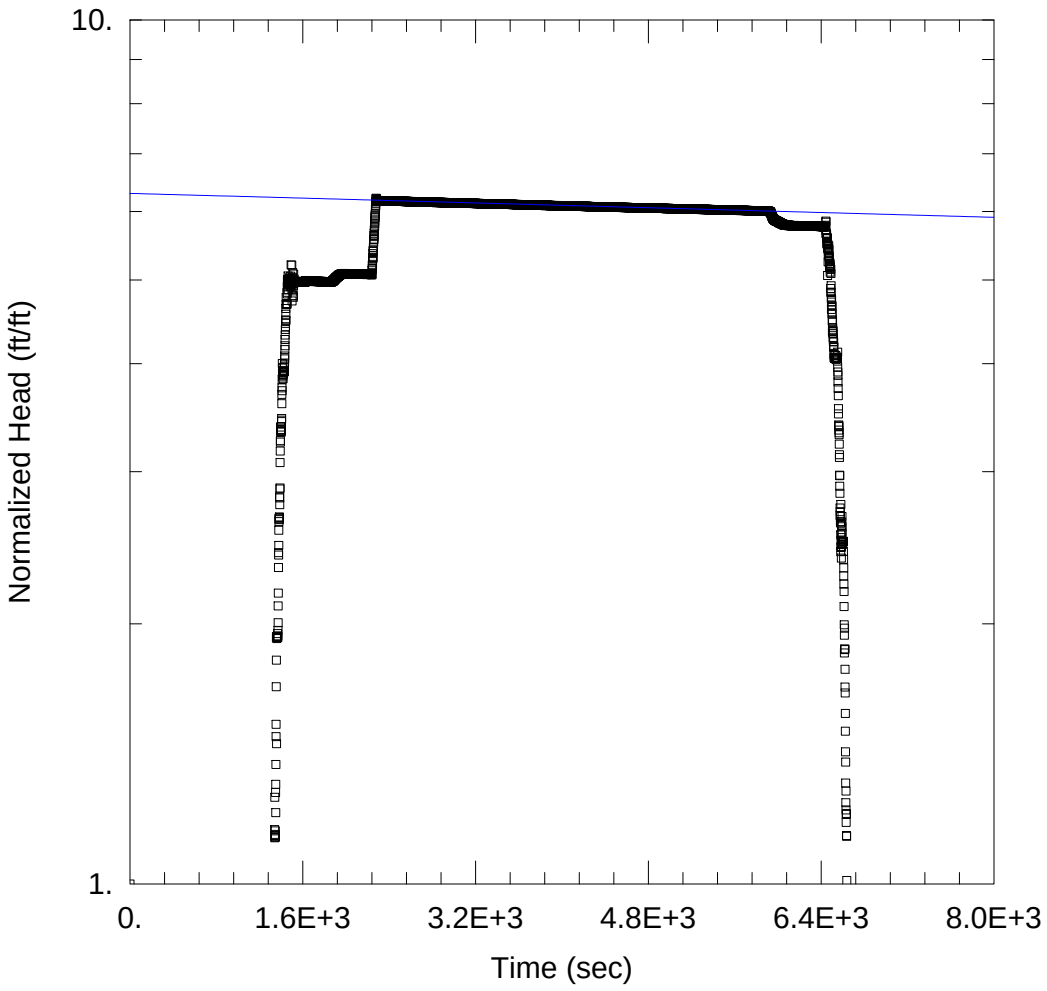
Saturated Thickness: 49.15 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 19. ft
Total Well Penetration Depth: 62.85 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 62.85 ft
Screen Length: 49.15 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 1.978E-7 cm/sec
y0 = 38.96 ft



TEST 3

Data Set: C:\...\GT-16_Test 3.aqt
Date: 12/22/16 Time: 19:50:43

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-16
Test Date: 12/3/2016

AQUIFER DATA

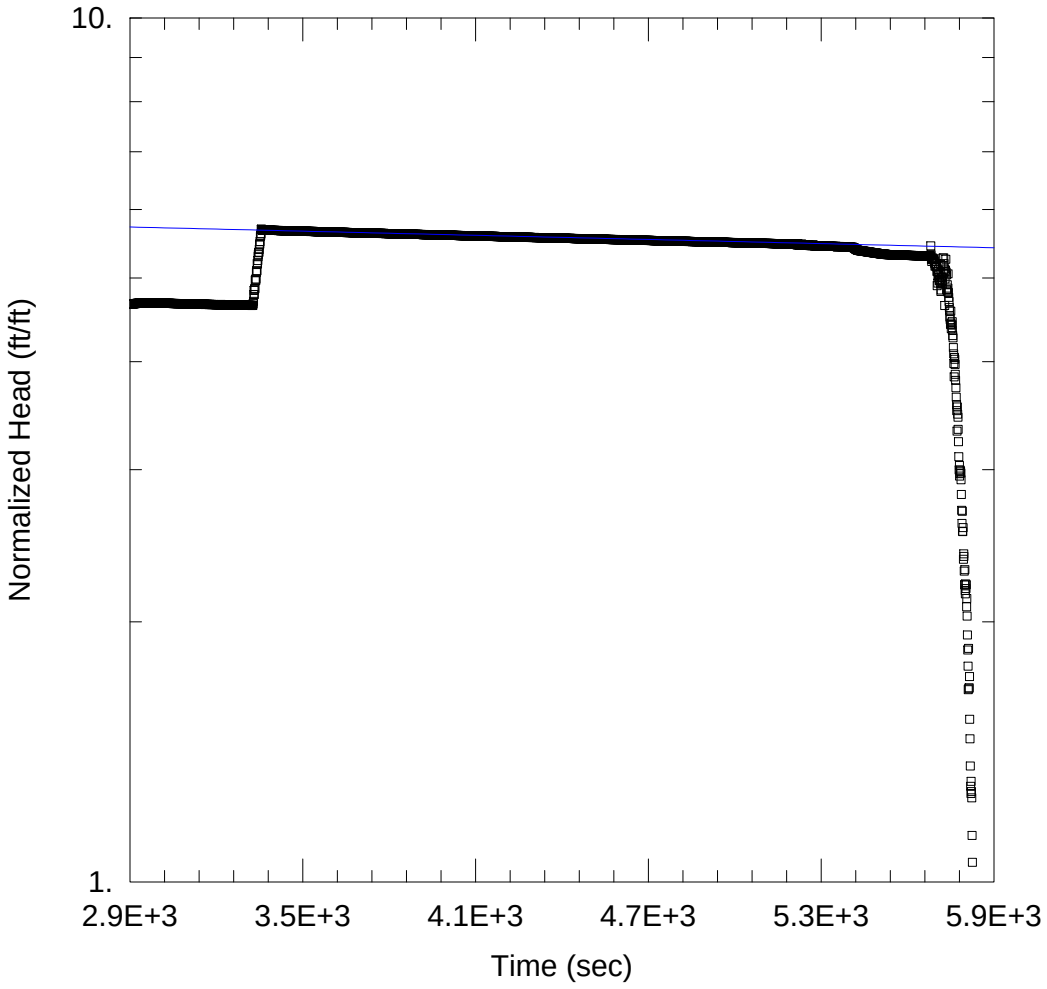
Saturated Thickness: 44.15 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 15. ft
Total Well Penetration Depth: 105.8 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 105.8 ft
Screen Length: 44.15 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 3.42E-7 cm/sec
y0 = 94.48 ft



TEST 4

Data Set: C:\...\GT-16_Test 4.aqt
Date: 12/22/16 Time: 19:57:38

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-16
Test Date: 12/4/2016

AQUIFER DATA

Saturated Thickness: 115.2 ft Anisotropy Ratio (Kz/Kr): 1.

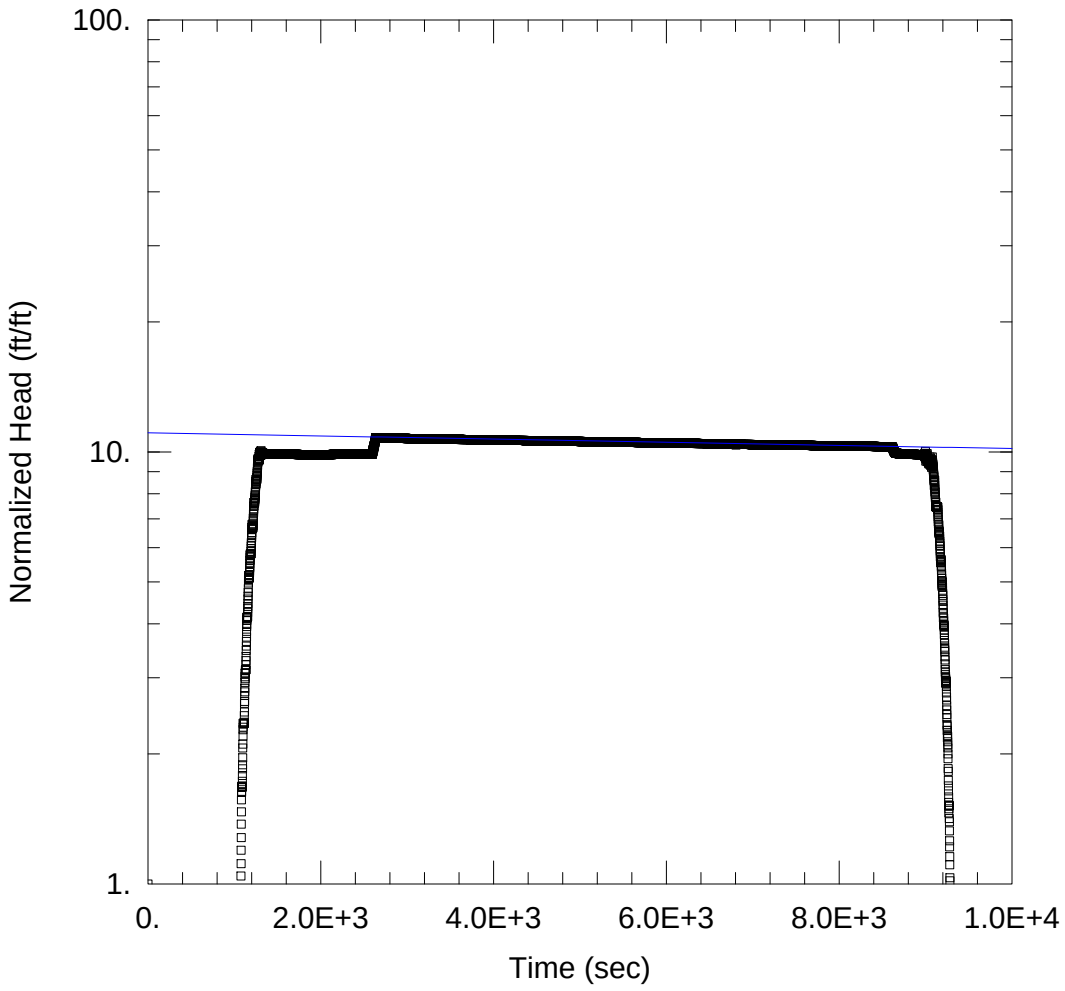
WELL DATA (New Well)

Initial Displacement: 25. ft
Total Well Penetration Depth: 228.9 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 228.8 ft
Screen Length: 115.2 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 3.602E-7 cm/sec
y0 = 151.1 ft



TEST 5

Data Set: C:\...\GT-16_Test 5.aqt
Date: 12/22/16 Time: 20:04:56

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-16
Test Date: 12/5/2016

AQUIFER DATA

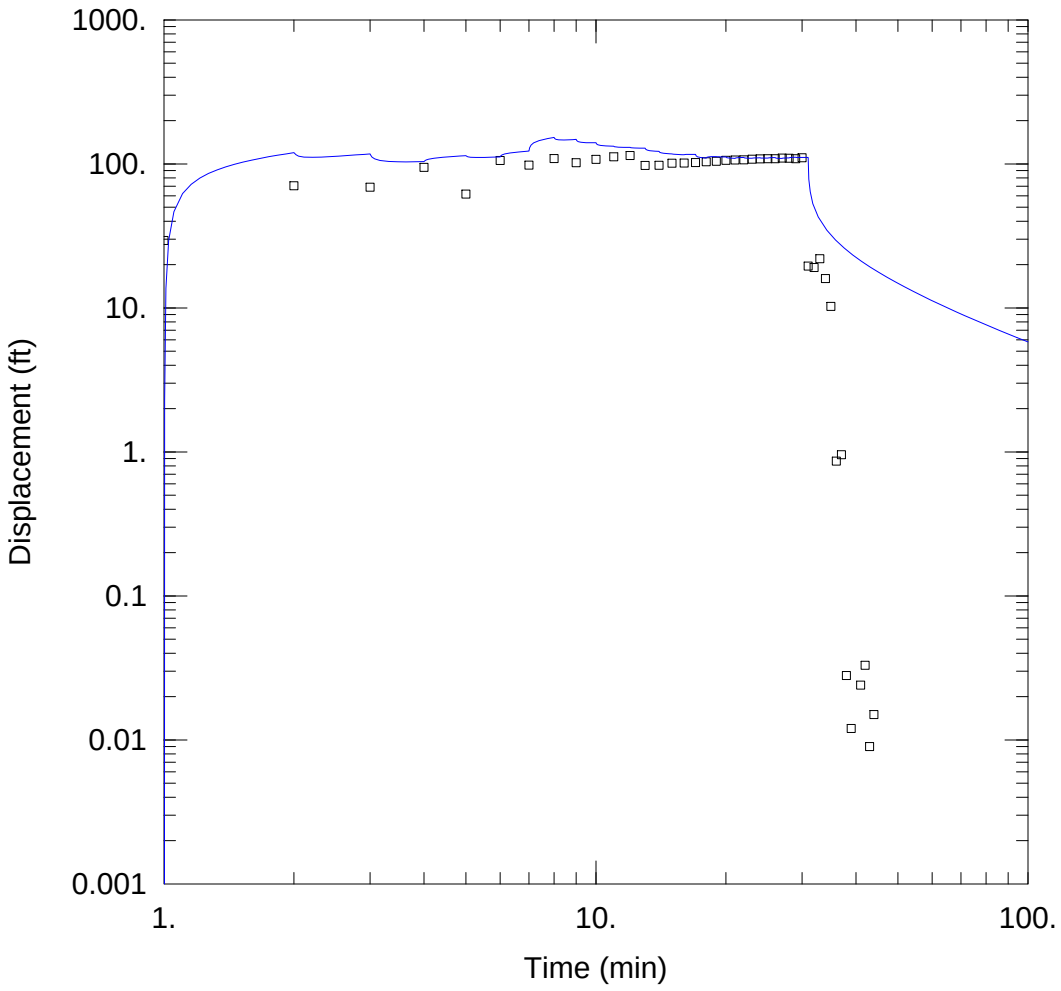
Saturated Thickness: 40.15 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 25. ft
Total Well Penetration Depth: 272.8 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 272.9 ft
Screen Length: 40.15 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 4.408E-7 cm/sec
y0 = 276.8 ft



TEST 1

Data Set: C:\...\GT-2_Test 1.aqt
Date: 02/13/17 Time: 13:23:41

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-2
Test Date: 12/5/2016

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

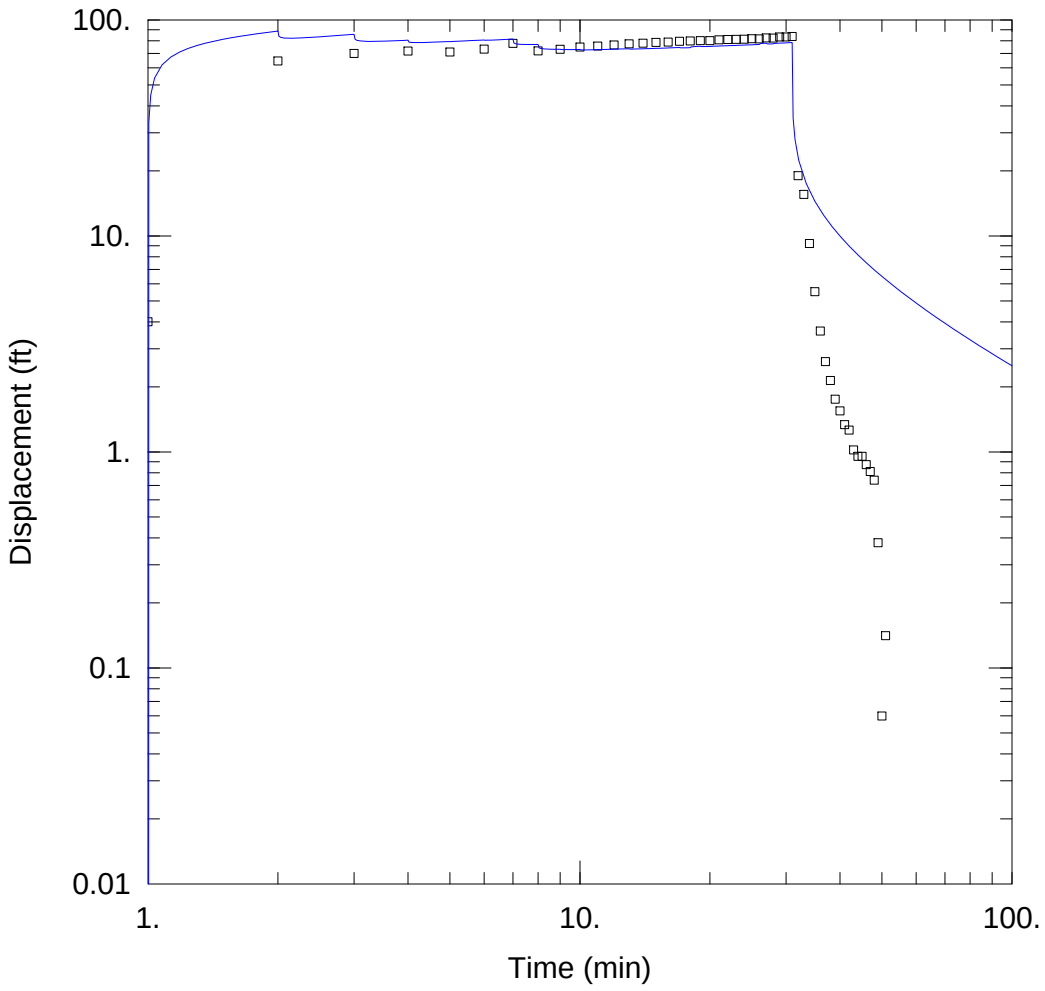
Observation Wells

Well Name	X (ft)	Y (ft)
▫ New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.08618 cm^2/sec
S = 0.005109
Kz/Kr = 0.1
b = 59.7 ft



TEST 2

Data Set: C:\...\GT-2_Test 2.aqt
Date: 12/22/16 Time: 20:40:31

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-2
Test Date: 12/5/2016

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

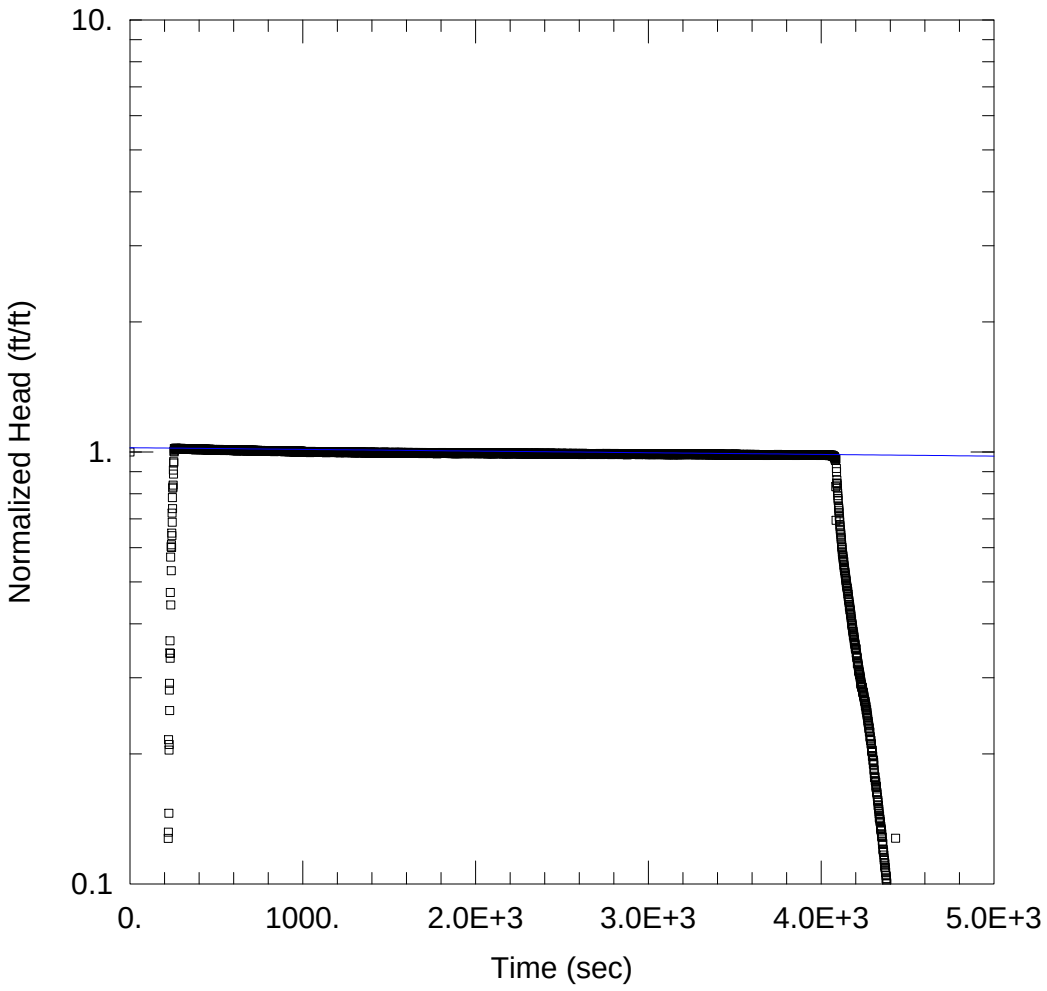
Observation Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.325 cm^2/sec
S = 0.0004042
Kz/Kr = 1.
b = 29.15 ft



TEST 3

Data Set: C:\...\GT-2_Test 3.aqt
Date: 12/22/16 Time: 20:50:56

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-2
Test Date: 12/6/2016

AQUIFER DATA

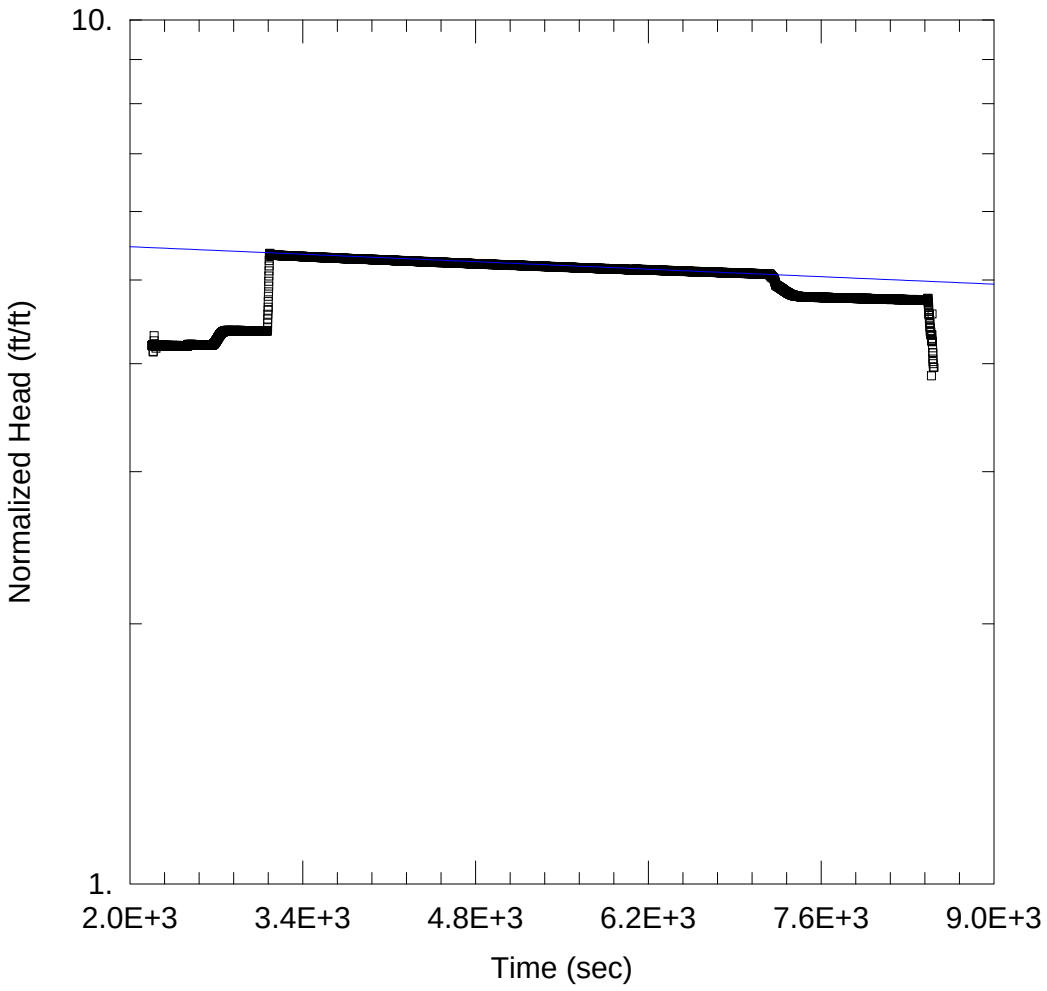
Saturated Thickness: 67.1 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 33. ft
Total Well Penetration Depth: 219.8 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 219.8 ft
Screen Length: 67.1 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 2.859E-7 cm/sec
y0 = 33.75 ft



TEST 1

Data Set: C:\...\GT-36_Test 1.aqt
Date: 01/10/17 Time: 14:59:29

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-36
Test Date: 12/7/2016

AQUIFER DATA

Saturated Thickness: 30.15 ft Anisotropy Ratio (Kz/Kr): 1.

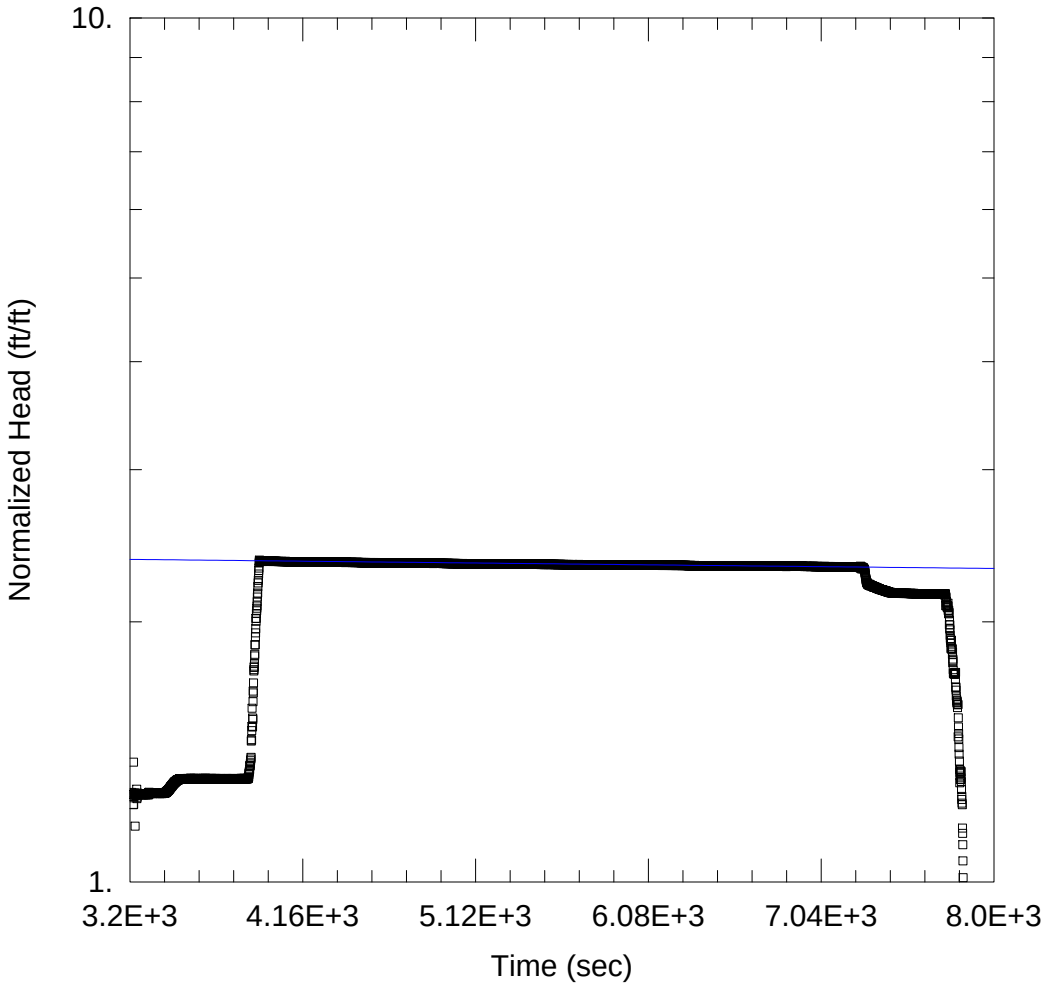
WELL DATA (New Well)

Initial Displacement: 9. ft
Total Well Penetration Depth: 55.5 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 55.5 ft
Screen Length: 30.15 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 7.994E-7 cm/sec
y0 = 50.6 ft



TEST 2

Data Set: C:\...\GT-36_Test 2.aqt
Date: 01/10/17 Time: 15:08:14

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-36
Test Date: 12/8/2016

AQUIFER DATA

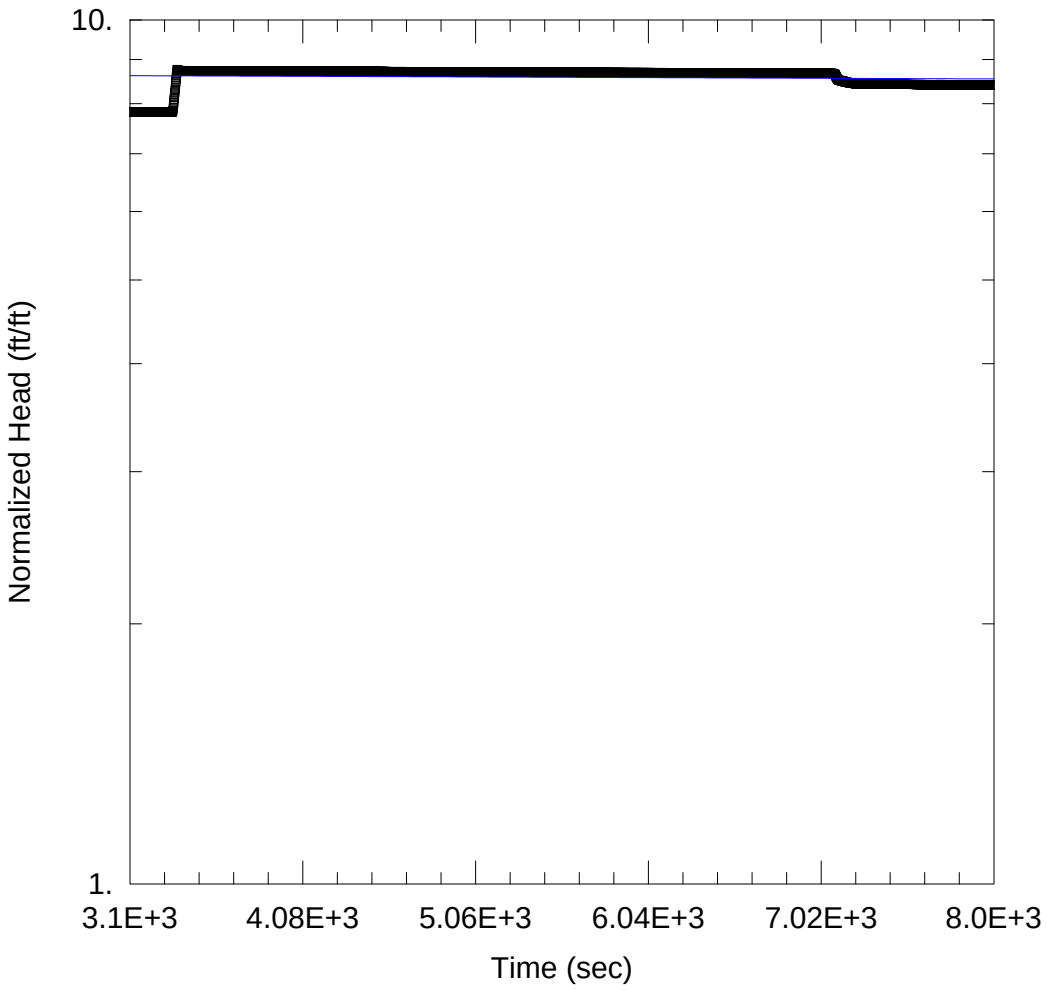
Saturated Thickness: 69.65 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (GT-36)

Initial Displacement: 30. ft
Total Well Penetration Depth: 131.4 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 131.3 ft
Screen Length: 69.65 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 1.463E-7 cm/sec
y0 = 72.02 ft



TEST 3

Data Set: C:\...\GT-36_Test 3.aqt
Date: 01/10/17 Time: 15:15:20

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-36
Test Date: 12/9/2016

AQUIFER DATA

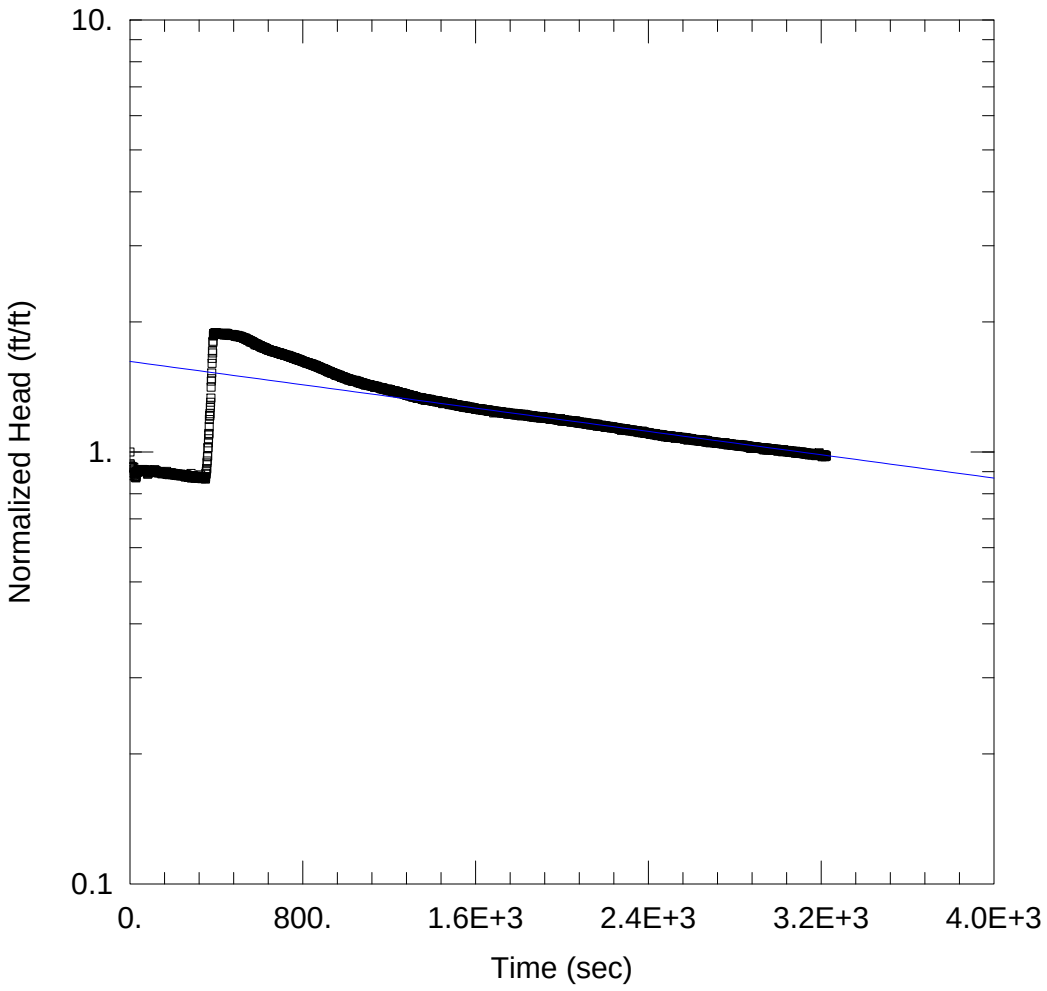
Saturated Thickness: 59.15 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (GT-36)

Initial Displacement: 17. ft
Total Well Penetration Depth: 187.8 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 187.8 ft
Screen Length: 59.15 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 6.269E-8 cm/sec
y0 = 147.3 ft



TEST 1

Data Set: C:\...\GT-35_Test 1.aqt
Date: 01/11/17 Time: 14:28:04

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-35
Test Date: 12/8/2016

AQUIFER DATA

Saturated Thickness: 21.6 ft Anisotropy Ratio (Kz/Kr): 1.

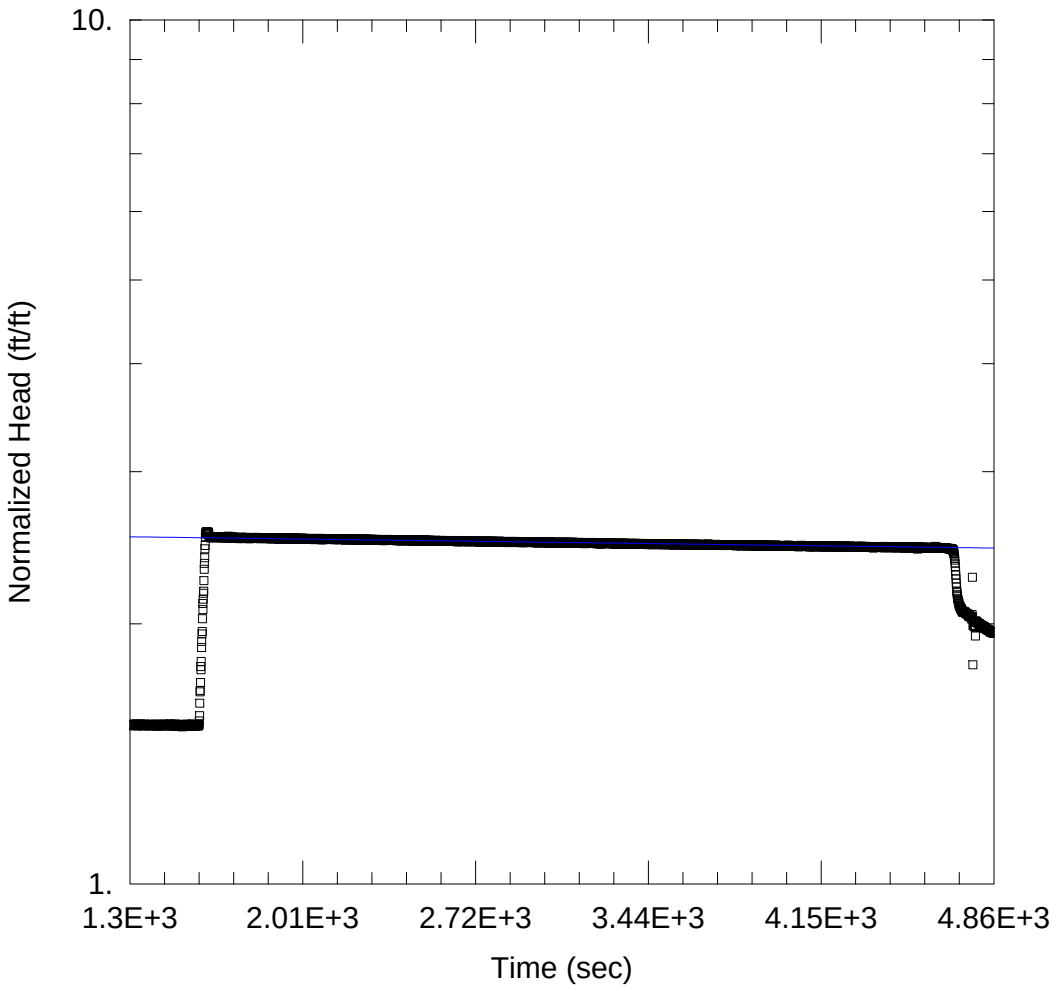
WELL DATA (New Well)

Initial Displacement: 2.8 ft
Total Well Penetration Depth: 24. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 21.6 ft
Screen Length: 24. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 1.048E-5 cm/sec
y0 = 4.535 ft



TEST 2

Data Set: C:\...\GT-35_Test 2.aqt
Date: 01/11/17 Time: 15:22:56

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-35
Test Date: 12/9/2016

AQUIFER DATA

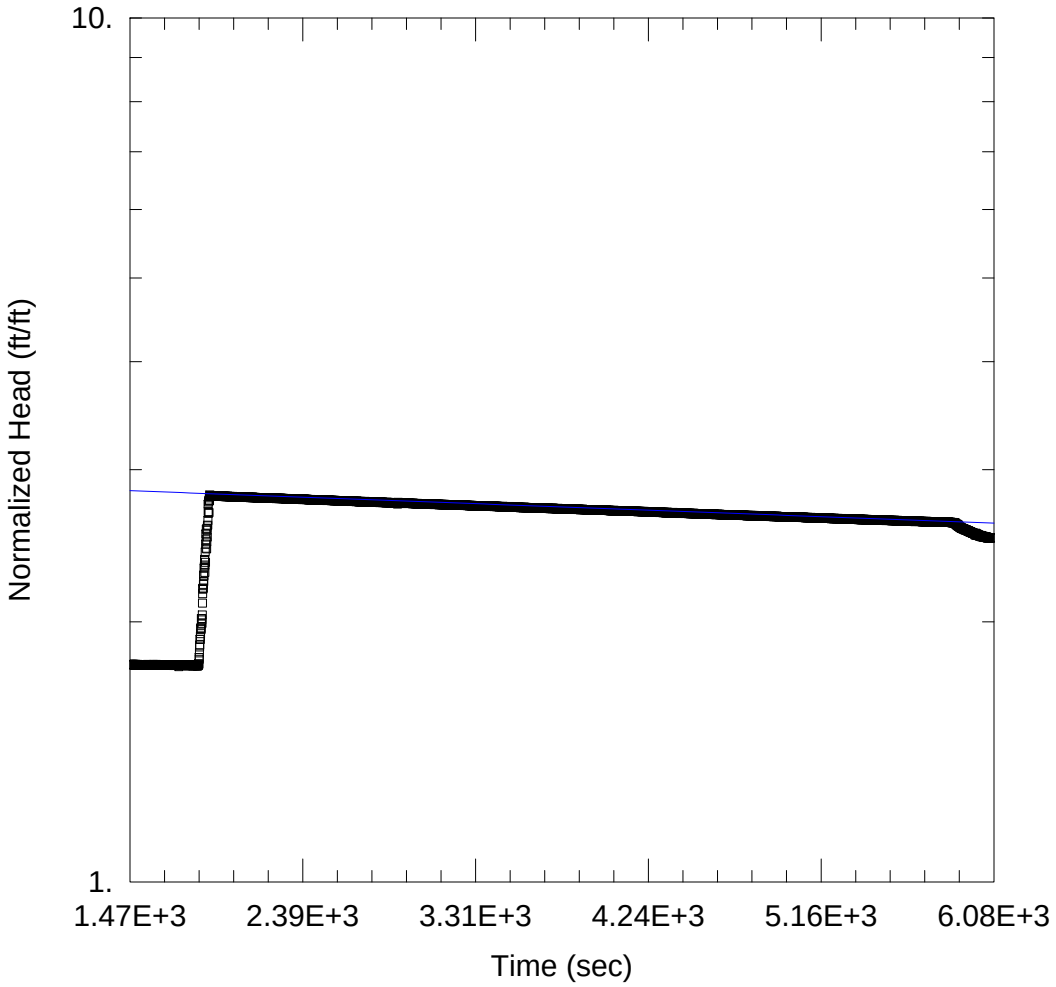
Saturated Thickness: 53.3 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 17.2 ft
Total Well Penetration Depth: 69.75 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 69.75 ft
Screen Length: 53.3 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 2.87E-7 cm/sec
y0 = 43.86 ft



TEST 3

Data Set: C:\...\GT-35_Test 3.aqt
Date: 01/11/17 Time: 15:28:08

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-35
Test Date: 12/10/2016

AQUIFER DATA

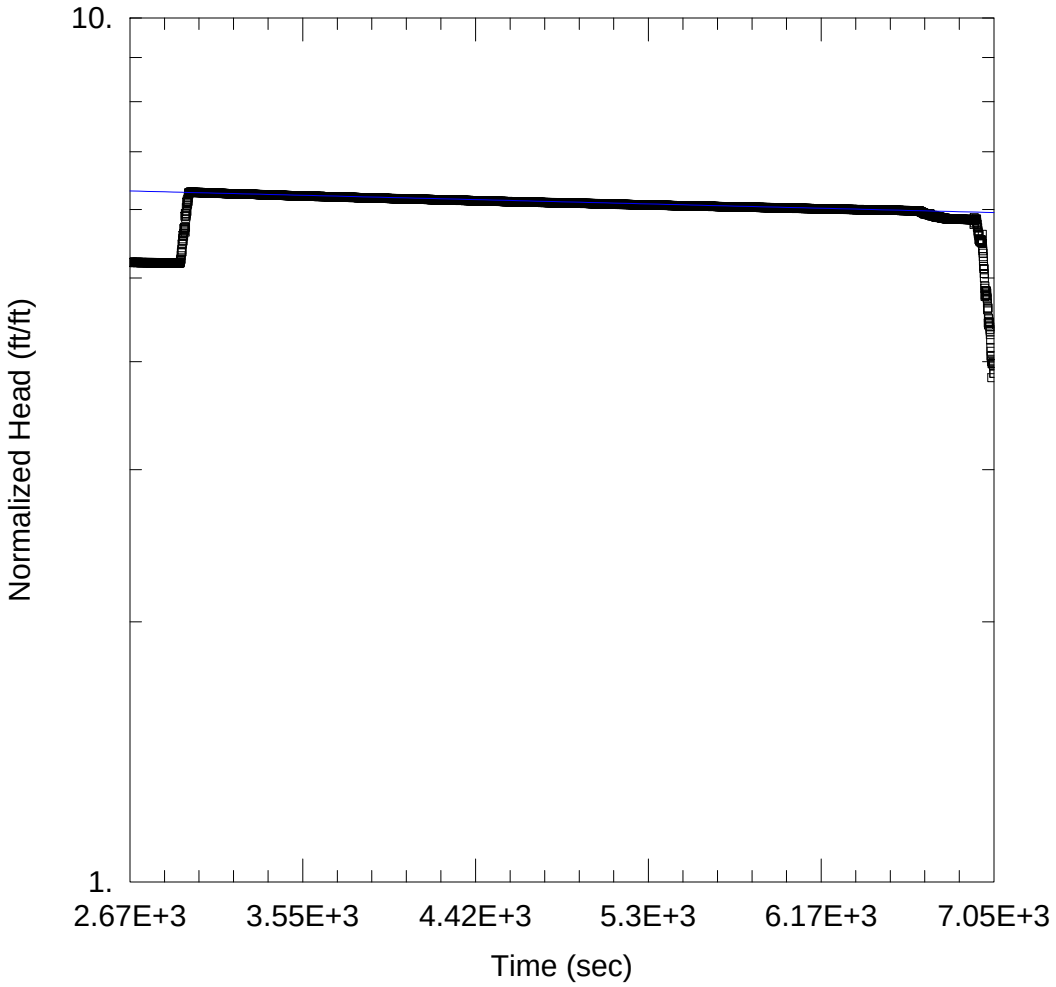
Saturated Thickness: 101.3 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 35. ft
Total Well Penetration Depth: 146.8 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 146.8 ft
Screen Length: 101.3 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 3.903E-7 cm/sec
y0 = 102.1 ft



TEST 4

Data Set: C:\...\GT-35_Test 4.aqt
Date: 01/11/17 Time: 15:33:09

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-35
Test Date: 12/11/2016

AQUIFER DATA

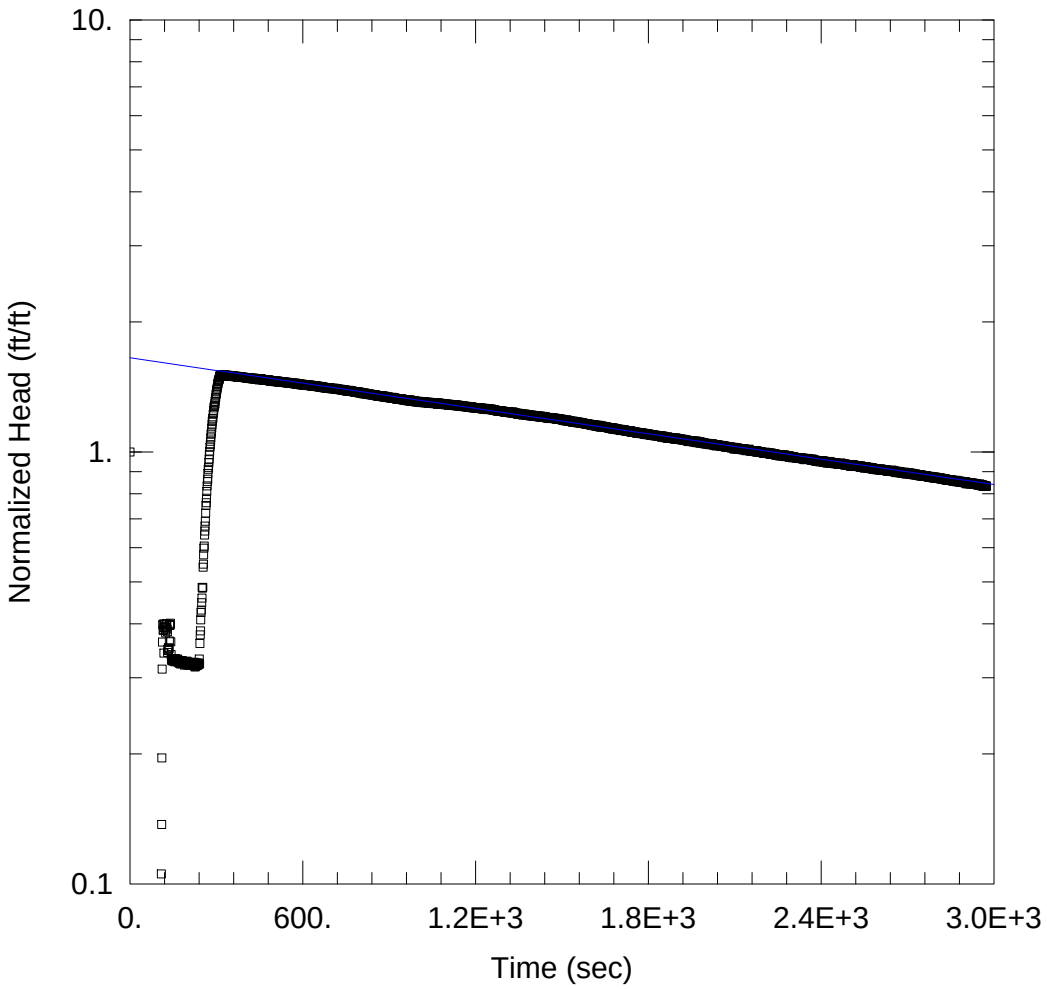
Saturated Thickness: 66.3 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 30. ft
Total Well Penetration Depth: 216.4 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 216.4 ft
Screen Length: 66.3 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 4.241E-7 cm/sec
y0 = 195.9 ft



TEST 1

Data Set: C:\...\GT-04_Test 1.aqt
Date: 01/11/17 Time: 16:22:16

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-04
Test Date: 12/11/2016

AQUIFER DATA

Saturated Thickness: 27. ft Anisotropy Ratio (Kz/Kr): 1.

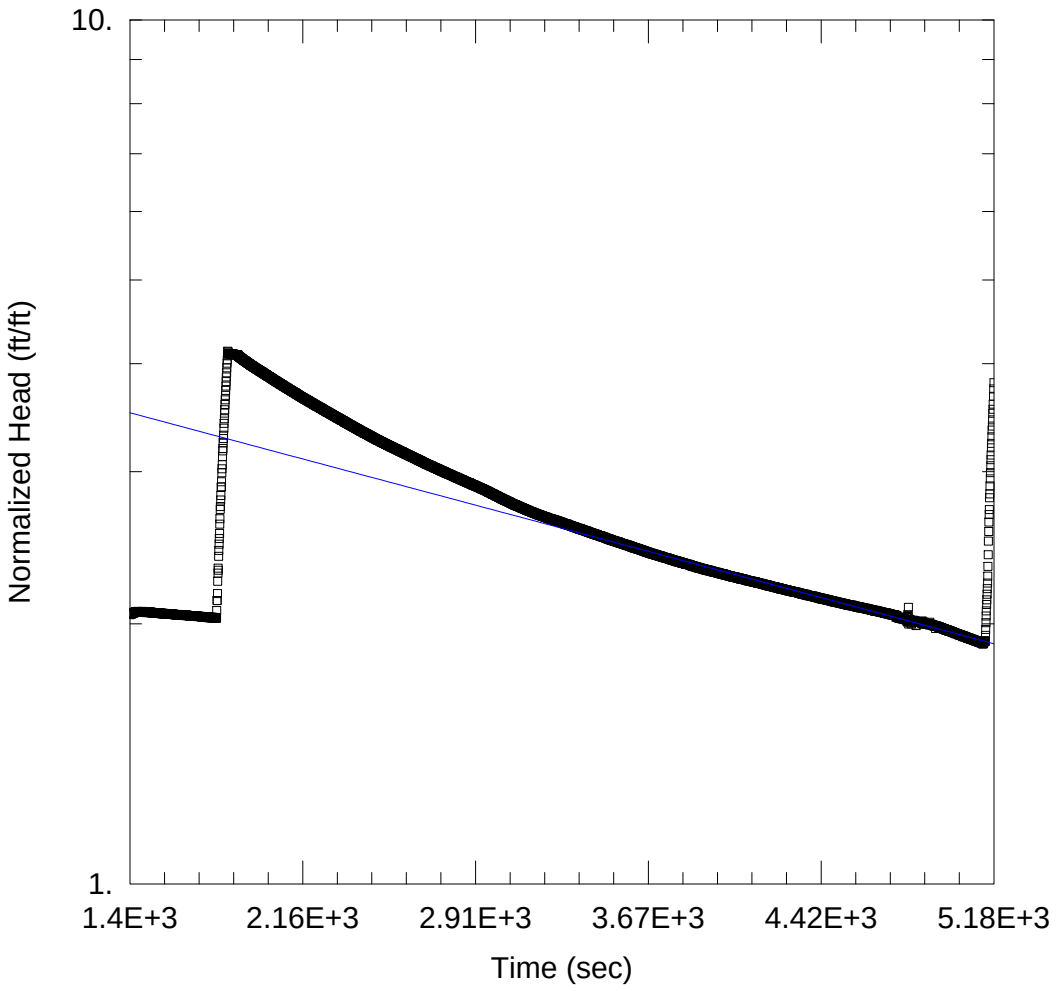
WELL DATA (New Well)

Initial Displacement: 9. ft
Total Well Penetration Depth: 39. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 27. ft
Screen Length: 39. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 1.328E-5 cm/sec
y0 = 14.86 ft



TEST 2 SLUG-IN

Data Set: C:\...\GT-04_Test 2_Slug.aqt
Date: 01/12/17 Time: 11:05:34

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-04
Test Date: 12/12/2016

AQUIFER DATA

Saturated Thickness: 17.65 ft Anisotropy Ratio (Kz/Kr): 1.

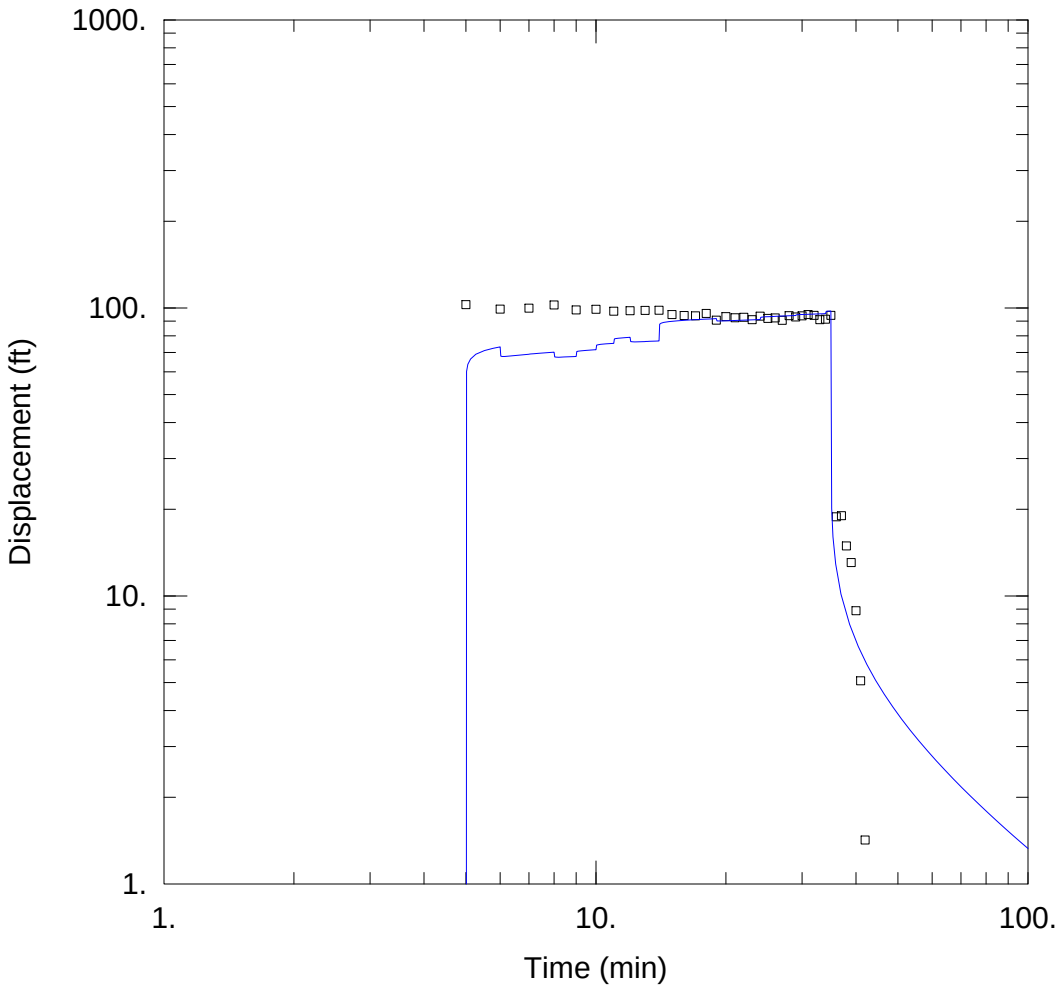
WELL DATA (New Well)

Initial Displacement: 14. ft
Total Well Penetration Depth: 36.35 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 36.35 ft
Screen Length: 17.65 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 1.423E-5 cm/sec
y0 = 61.73 ft



TEST 2

Data Set: C:\...\GT-04_Test 2_CRI.aqt
Date: 02/13/17 Time: 13:19:02

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-04
Test Date: 12/12/2016

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

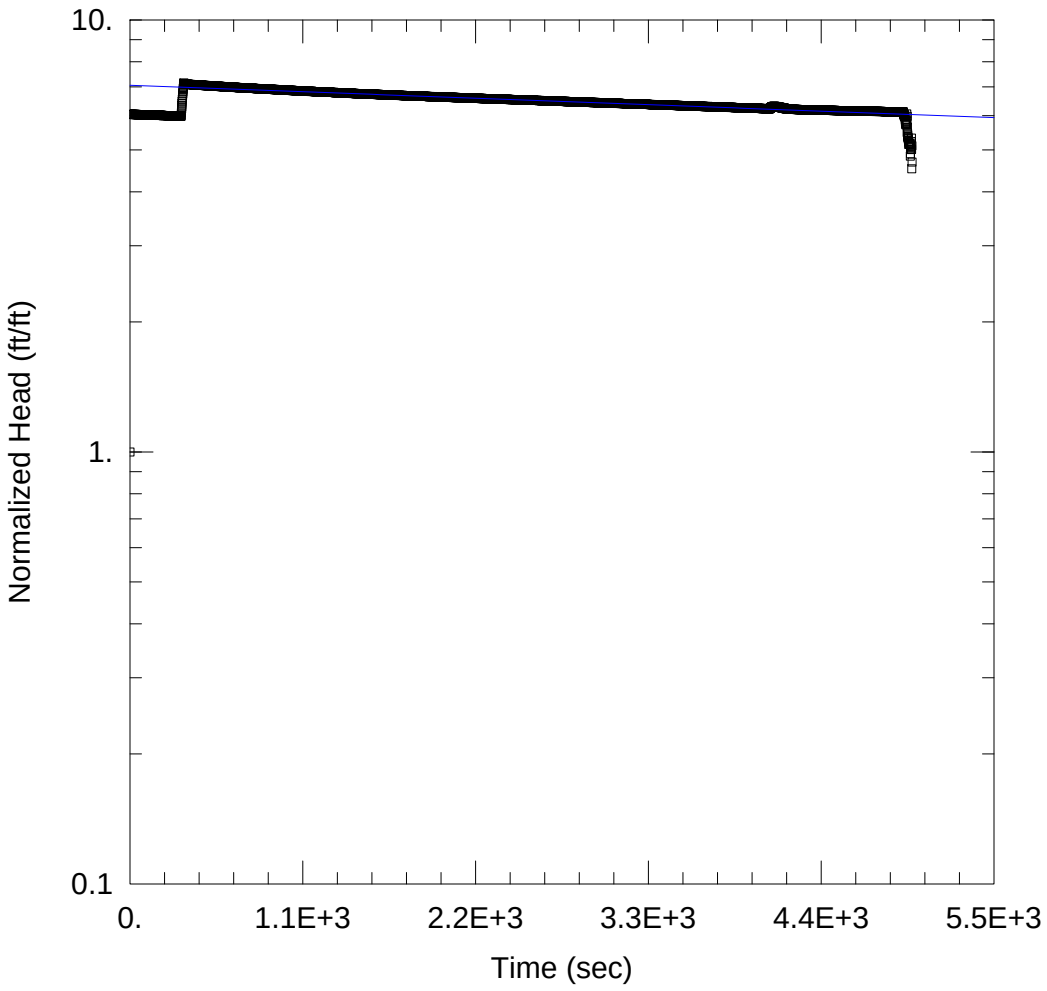
Observation Wells

Well Name	X (ft)	Y (ft)
▫ New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.1169 cm^2/sec
Kz/Kr = 1.
S = 1.066E-10
b = 17.65 ft



TEST 3

Data Set: C:\...\GT-04_Test 3.aqt
Date: 01/12/17 Time: 11:12:48

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-04
Test Date: 12/13/2016

AQUIFER DATA

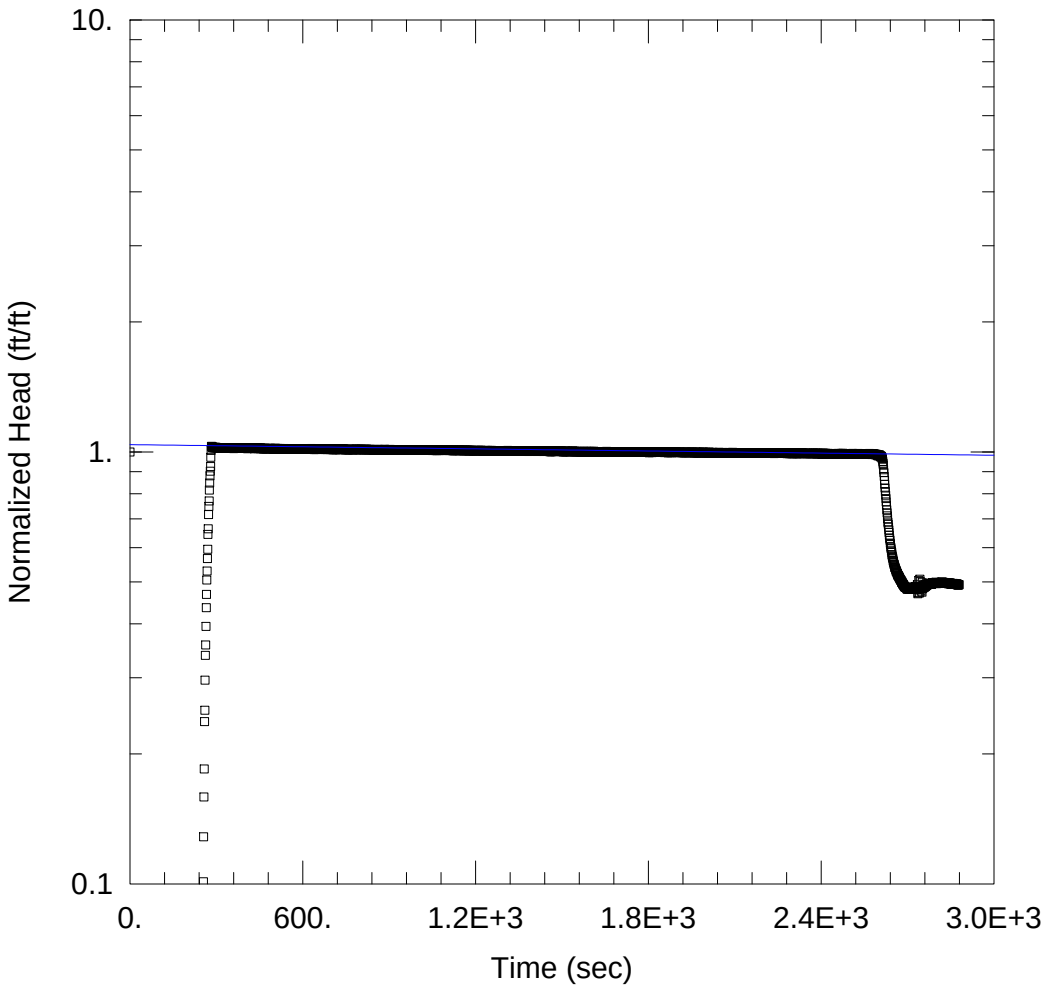
Saturated Thickness: 84.15 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 9. ft
Total Well Penetration Depth: 129.9 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 129.8 ft
Screen Length: 84.15 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 7.624E-7 cm/sec
y0 = 63.54 ft



TEST 4

Data Set: C:\...\GT-04_Test 4.aqt
Date: 02/28/17 Time: 11:56:31

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-04
Test Date: 12/13/2016

AQUIFER DATA

Saturated Thickness: 55. ft Anisotropy Ratio (Kz/Kr): 1.

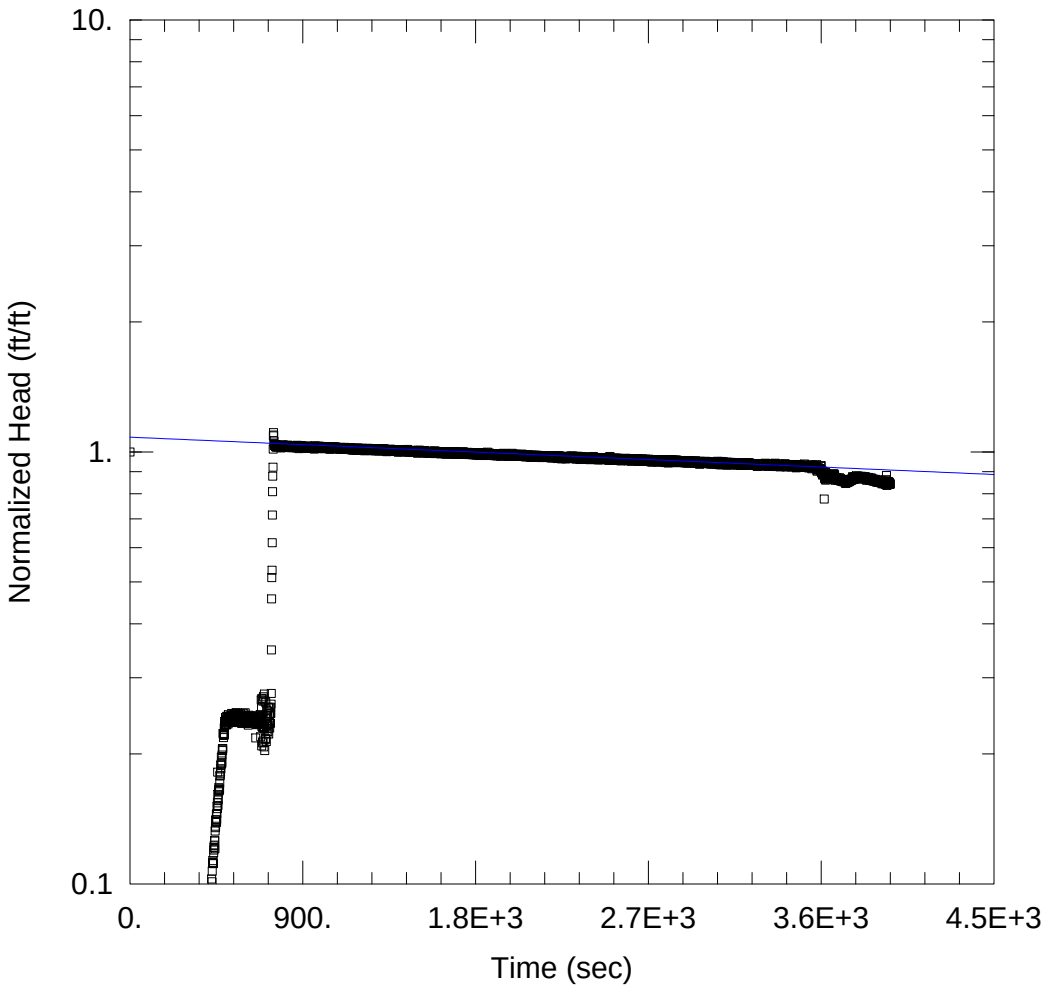
WELL DATA (New Well)

Initial Displacement: 15. ft
Total Well Penetration Depth: 175.8 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 175.8 ft
Screen Length: 55. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 7.027E-7 cm/sec
y0 = 15.59 ft



TEST 5

Data Set: C:\...\GT-04_Test 5.aqt
Date: 01/12/17 Time: 11:40:55

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1531436
Location: Near West TSF
Test Well: GT-04
Test Date: 12/14/2016

AQUIFER DATA

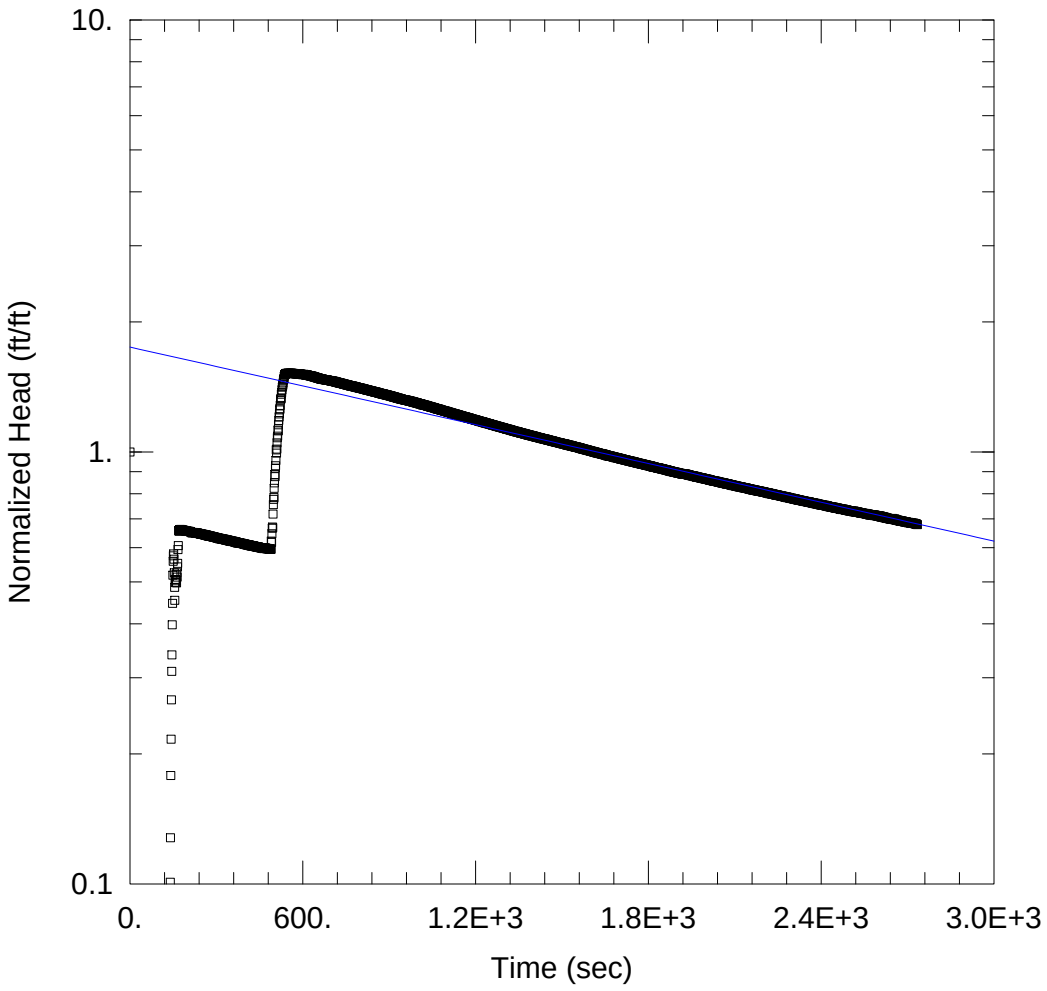
Saturated Thickness: 59.15 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 5. ft
Total Well Penetration Depth: 235.8 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 235.8 ft
Screen Length: 59.15 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 1.6E-6 cm/sec
y0 = 5.409 ft



TEST 1

Data Set: C:\...\GT-03_Test 1.aqt
Date: 01/26/17 Time: 15:03:21

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-03
Test Date: 12/13/2016

AQUIFER DATA

Saturated Thickness: 25. ft Anisotropy Ratio (Kz/Kr): 1.

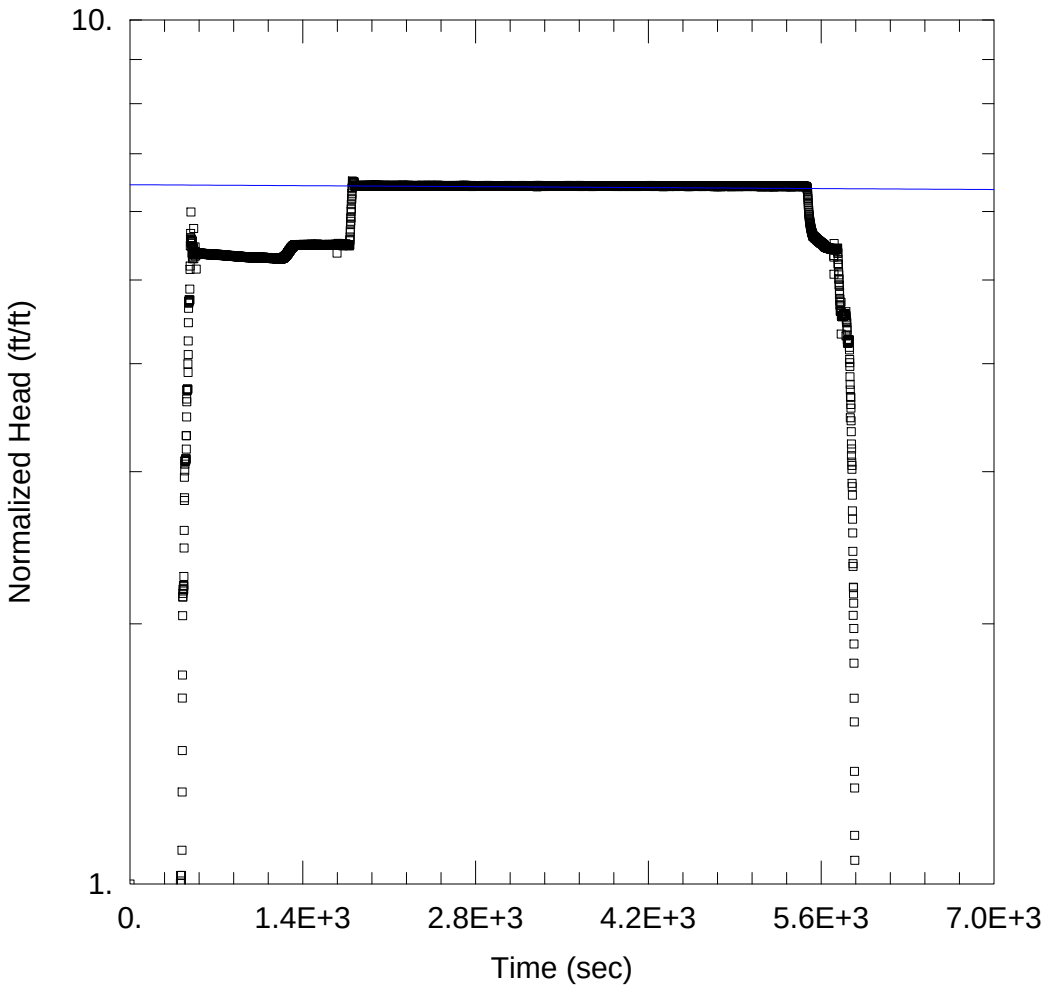
WELL DATA (New Well)

Initial Displacement: 13. ft Static Water Column Height: 15. ft
Total Well Penetration Depth: 25. ft Screen Length: 25. ft
Casing Radius: 0.1571 ft Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 2.037E-5 cm/sec y0 = 22.73 ft



TEST 2

Data Set: C:\...\GT-03_Test 2.aqt
Date: 01/26/17 Time: 15:09:26

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-03
Test Date: 12/13/2016

AQUIFER DATA

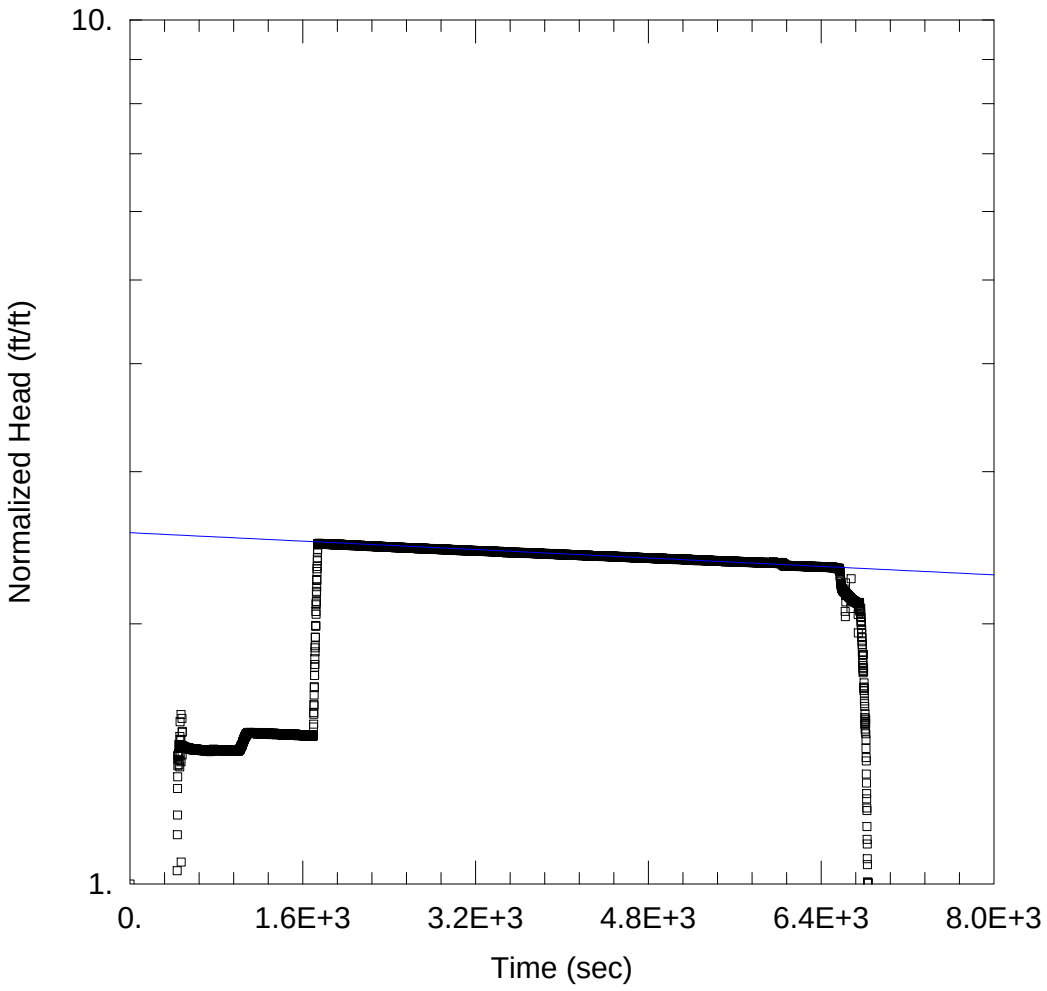
Saturated Thickness: 21.34 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 10. ft
Total Well Penetration Depth: 55.04 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 55.04 ft
Screen Length: 21.34 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 1.421E-7 cm/sec
y0 = 64.45 ft



TEST 3

Data Set: C:\...\GT-03_Test 3.aqt
Date: 01/26/17 Time: 15:13:00

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-03
Test Date: 12/14/2016

AQUIFER DATA

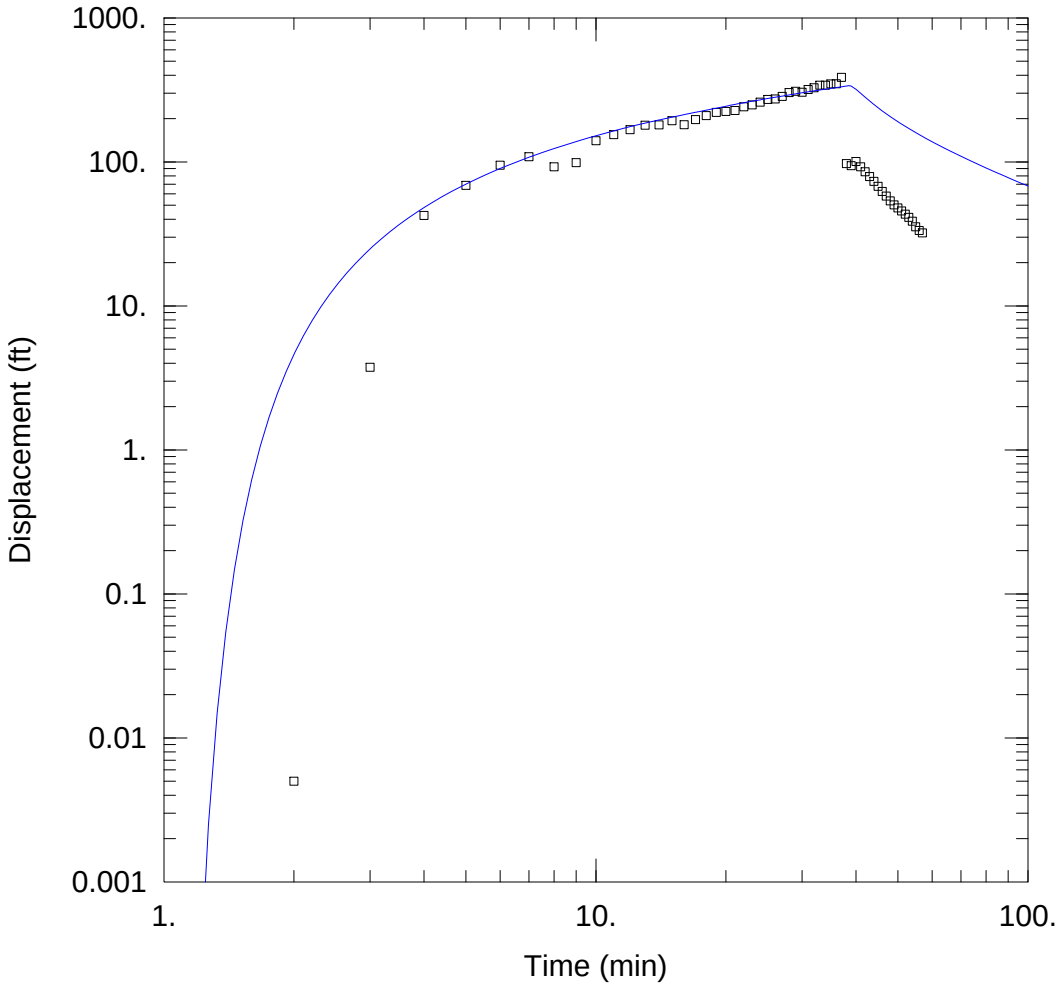
Saturated Thickness: 78.75 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 27. ft
Total Well Penetration Depth: 108.8 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 108.8 ft
Screen Length: 78.75 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 3.542E-7 cm/sec
y0 = 68.84 ft



TEST 4

Data Set: C:\...\GT-03_Test 4.aqt
Date: 02/13/17 Time: 13:12:30

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-03
Test Date: 12/15/2016

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

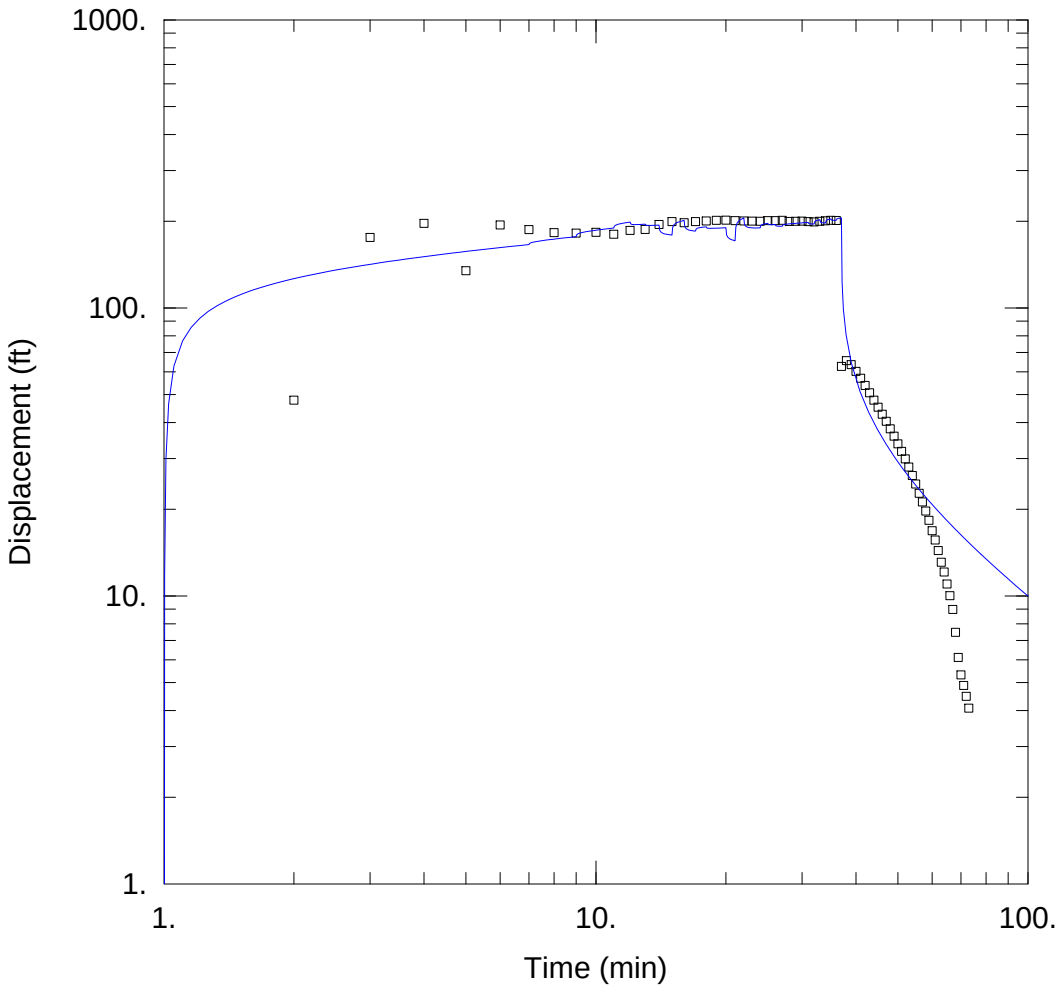
Observation Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.01744 cm^2/sec
S = 0.4275
Kz/Kr = 0.1
b = 22.65 ft



TEST 5

Data Set: C:\...\GT-03_Test 5.aqt
Date: 02/13/17 Time: 13:15:32

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-03
Test Date: 12/15/2016

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

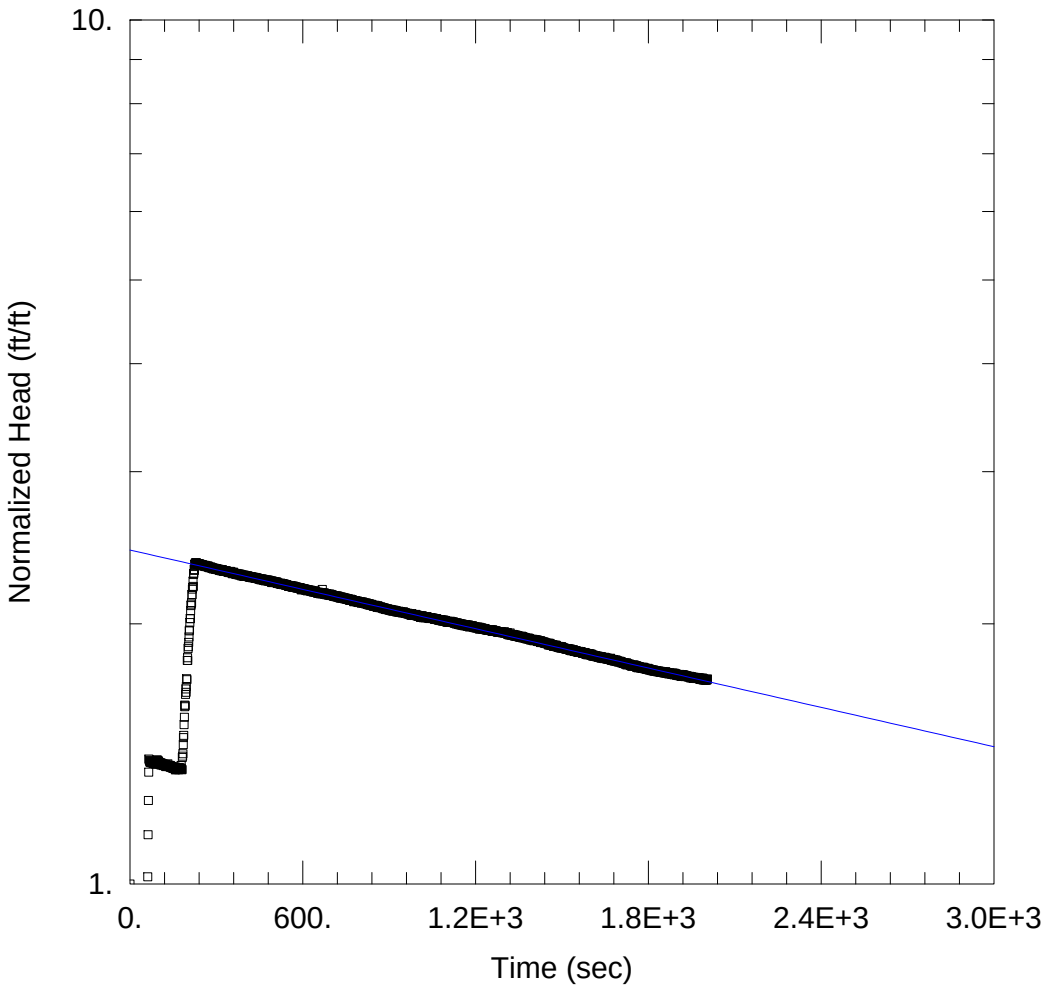
Observation Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.02888 cm^2/sec
S = 0.0005628
Kz/Kr = 0.1
b = 93.55 ft



TEST 1

Data Set: C:\...\GT-05_Test 1.aqt
Date: 01/30/17 Time: 13:59:34

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-05
Test Date: 12/16/2016

AQUIFER DATA

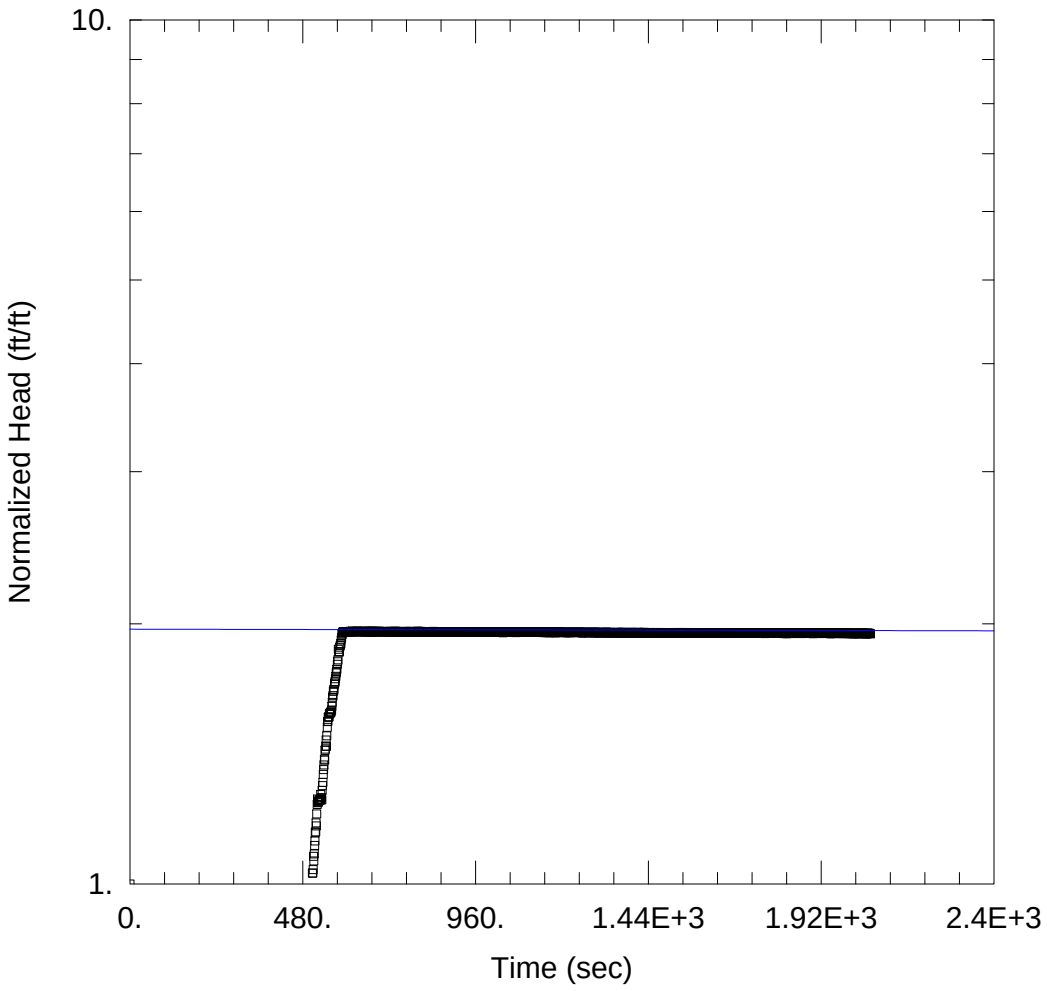
Saturated Thickness: 31.5 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 8. ft
Total Well Penetration Depth: 31.5 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 31.5 ft
Screen Length: 31.5 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 8.62E-6 cm/sec
y0 = 19.48 ft



TEST 2

Data Set: C:\...\GT-05_Test 2.aqt
Date: 01/30/17 Time: 14:09:39

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-05
Test Date: 12/18/2016

AQUIFER DATA

Saturated Thickness: 64.5 ft Anisotropy Ratio (Kz/Kr): 1.

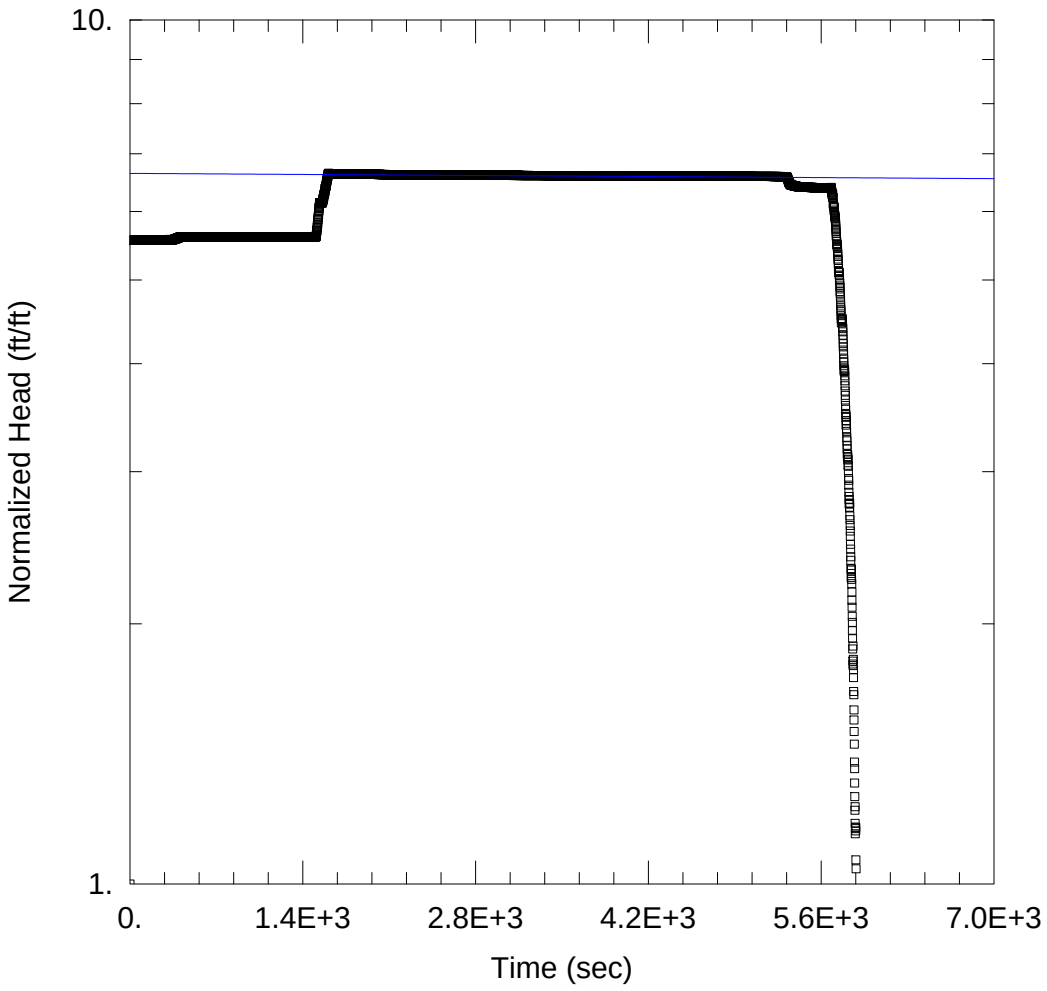
WELL DATA (New Well)

Initial Displacement: 19. ft
Total Well Penetration Depth: 64.5 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 64.5 ft
Screen Length: 64.5 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 5.103E-8 cm/sec
y0 = 37.46 ft



TEST 3

Data Set: C:\...\GT-05_Test 3.aqt
Date: 01/30/17 Time: 14:14:15

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-05
Test Date: 12/21/2016

AQUIFER DATA

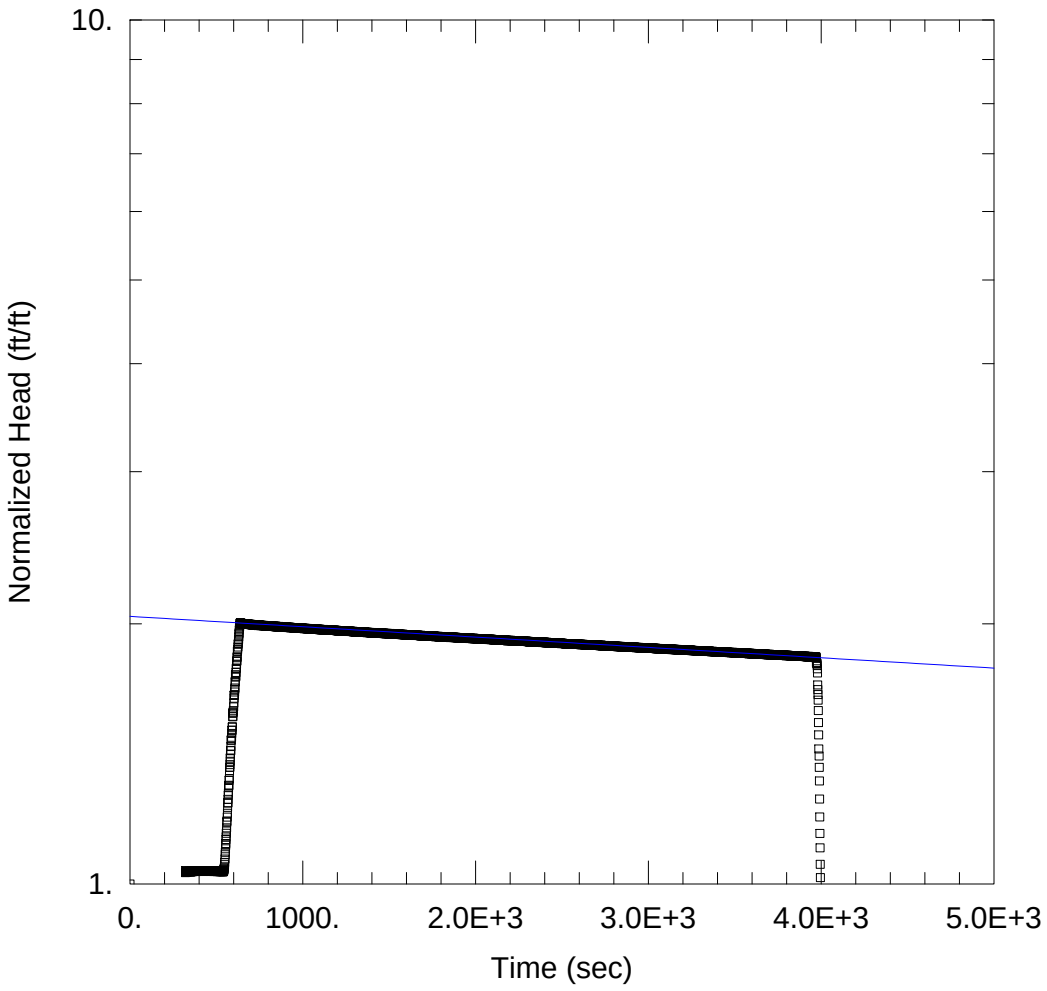
Saturated Thickness: 44.21 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 32. ft
Total Well Penetration Depth: 216.1 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 216.1 ft
Screen Length: 44.21 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 9.365E-8 cm/sec
y0 = 212.6 ft



TEST 5

Data Set: C:\...\GT-05_Test 5.aqt
Date: 01/30/17 Time: 14:21:43

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-05
Test Date: 12/21/2016

AQUIFER DATA

Saturated Thickness: 194. ft Anisotropy Ratio (Kz/Kr): 1.

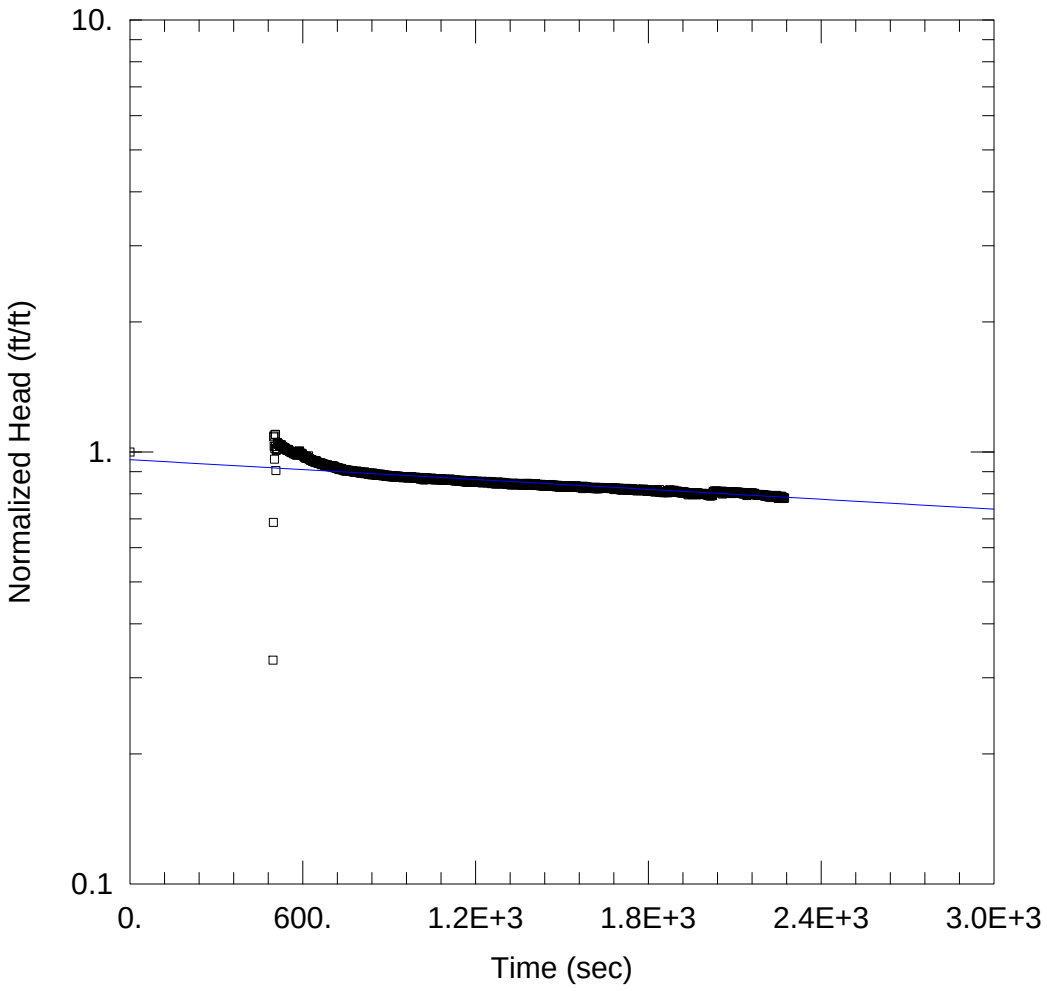
WELL DATA (New Well)

Initial Displacement: 30. ft
Total Well Penetration Depth: 194. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 194. ft
Screen Length: 194. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 3.243E-7 cm/sec
y0 = 61.2 ft



TEST 1

Data Set: C:\...\GT-40_Test 1.aqt
Date: 01/30/17 Time: 14:31:59

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-40
Test Date: 12/19/2016

AQUIFER DATA

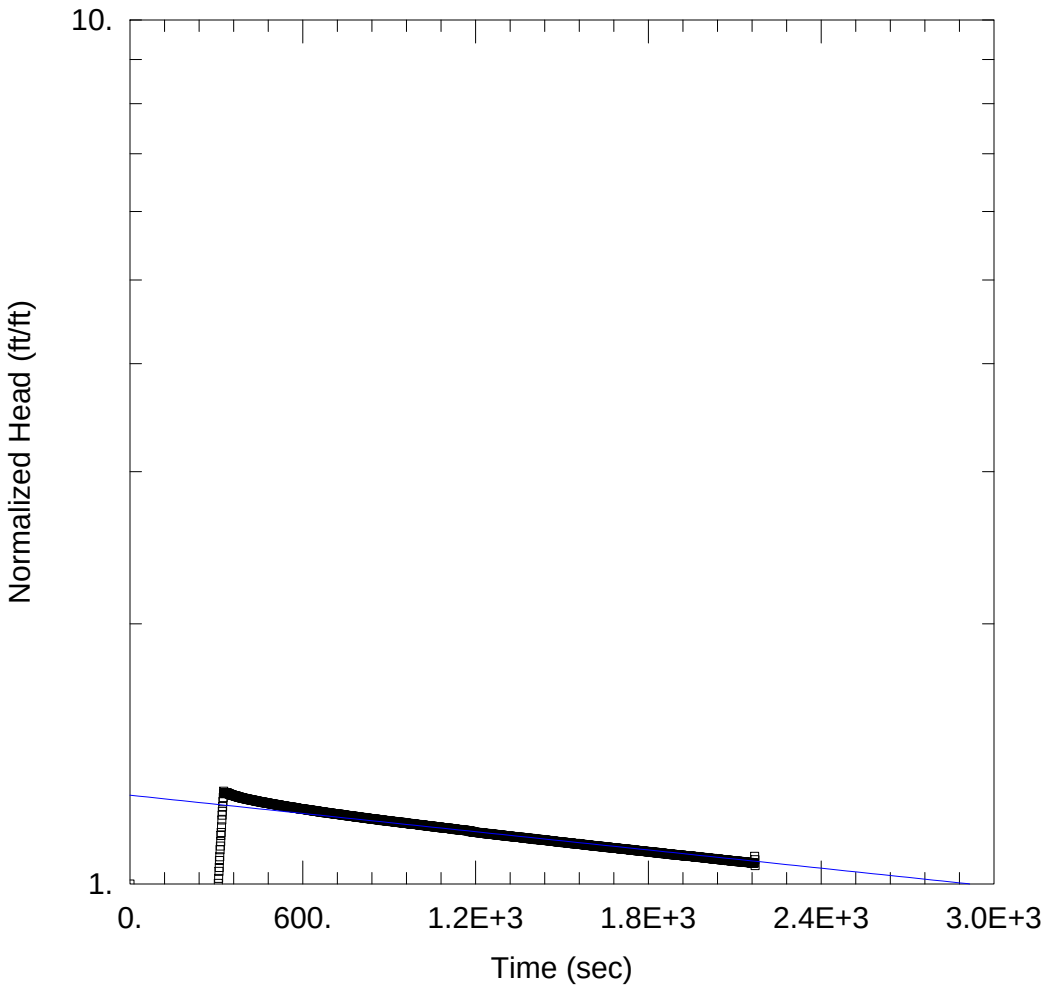
Saturated Thickness: 32. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 3.5 ft
Total Well Penetration Depth: 32. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 0. ft
Screen Length: 32. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 4.285E-6 cm/sec
y0 = 3.358 ft



TEST 2

Data Set: C:\...\GT-40_Test 2.aqt
Date: 01/30/17 Time: 14:36:22

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-40
Test Date: 12/20/2016

AQUIFER DATA

Saturated Thickness: 60. ft Anisotropy Ratio (Kz/Kr): 1.

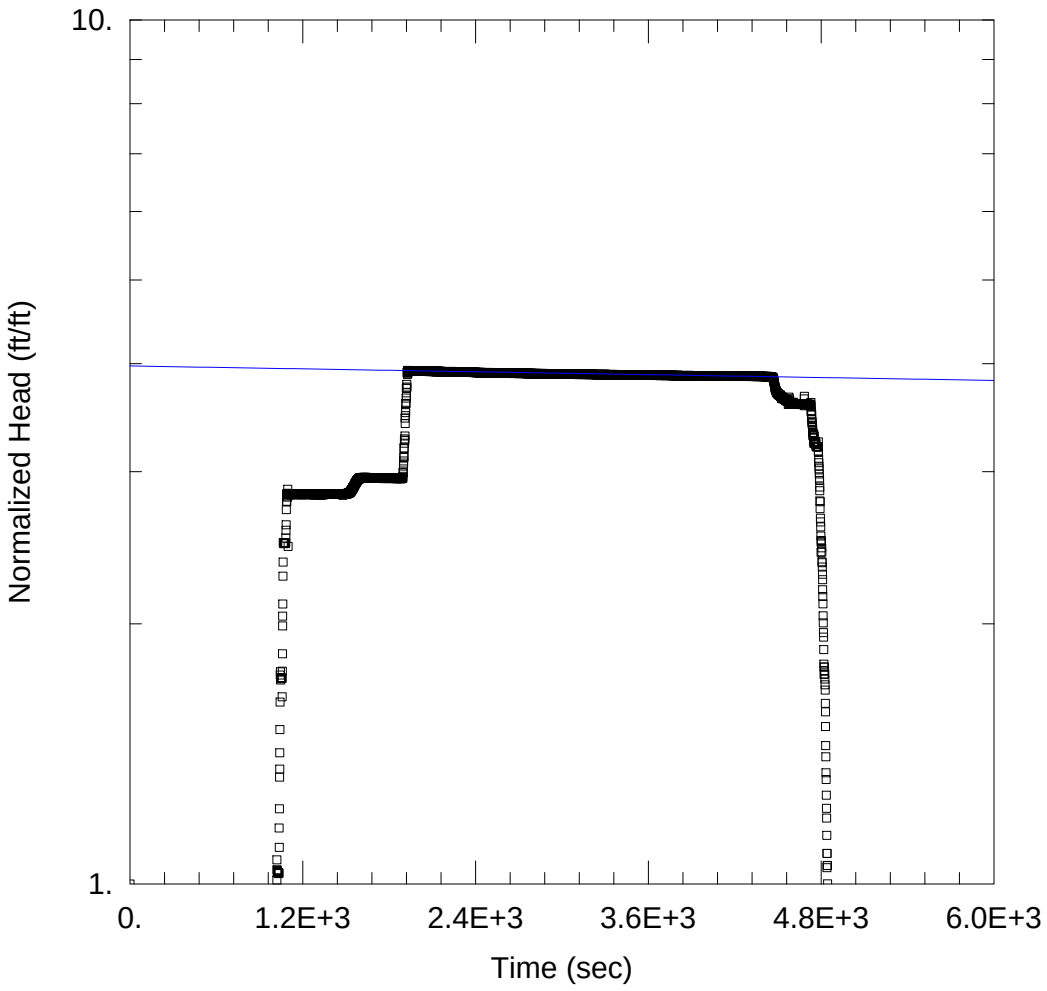
WELL DATA (New Well)

Initial Displacement: 25. ft
Total Well Penetration Depth: 60. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 60. ft
Screen Length: 60. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 2.419E-6 cm/sec
y0 = 31.67 ft



TEST 3

Data Set: C:\...\GT-40_Test 3.aqt
Date: 01/30/17 Time: 14:42:12

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-40
Test Date: 12/21/2016

AQUIFER DATA

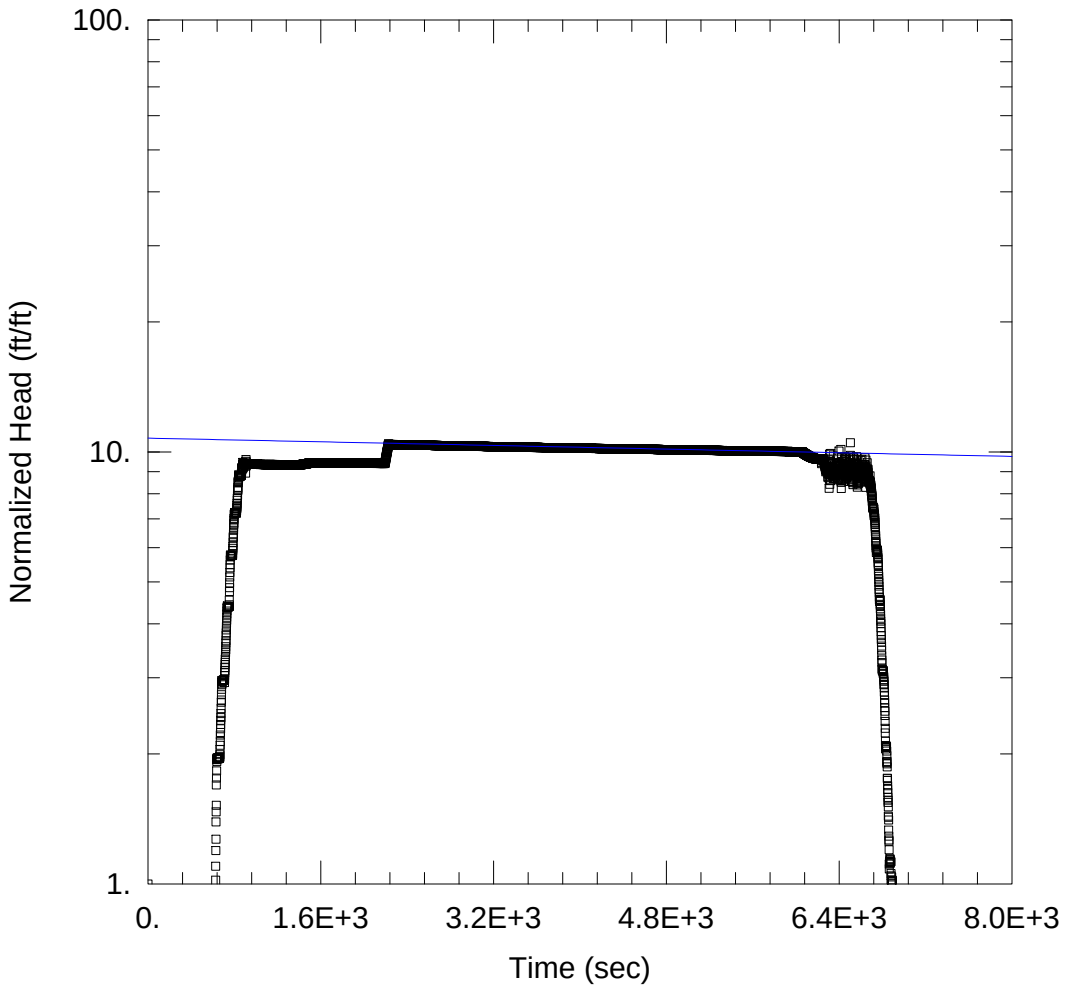
Saturated Thickness: 57.75 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 25. ft
Total Well Penetration Depth: 114.1 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 114.1 ft
Screen Length: 57.75 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 2.173E-7 cm/sec
y0 = 99.41 ft



TEST 4

Data Set: C:\...\GT-40_Test 4.aqt
Date: 01/30/17 Time: 14:53:13

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-40
Test Date: 1/5/2017

AQUIFER DATA

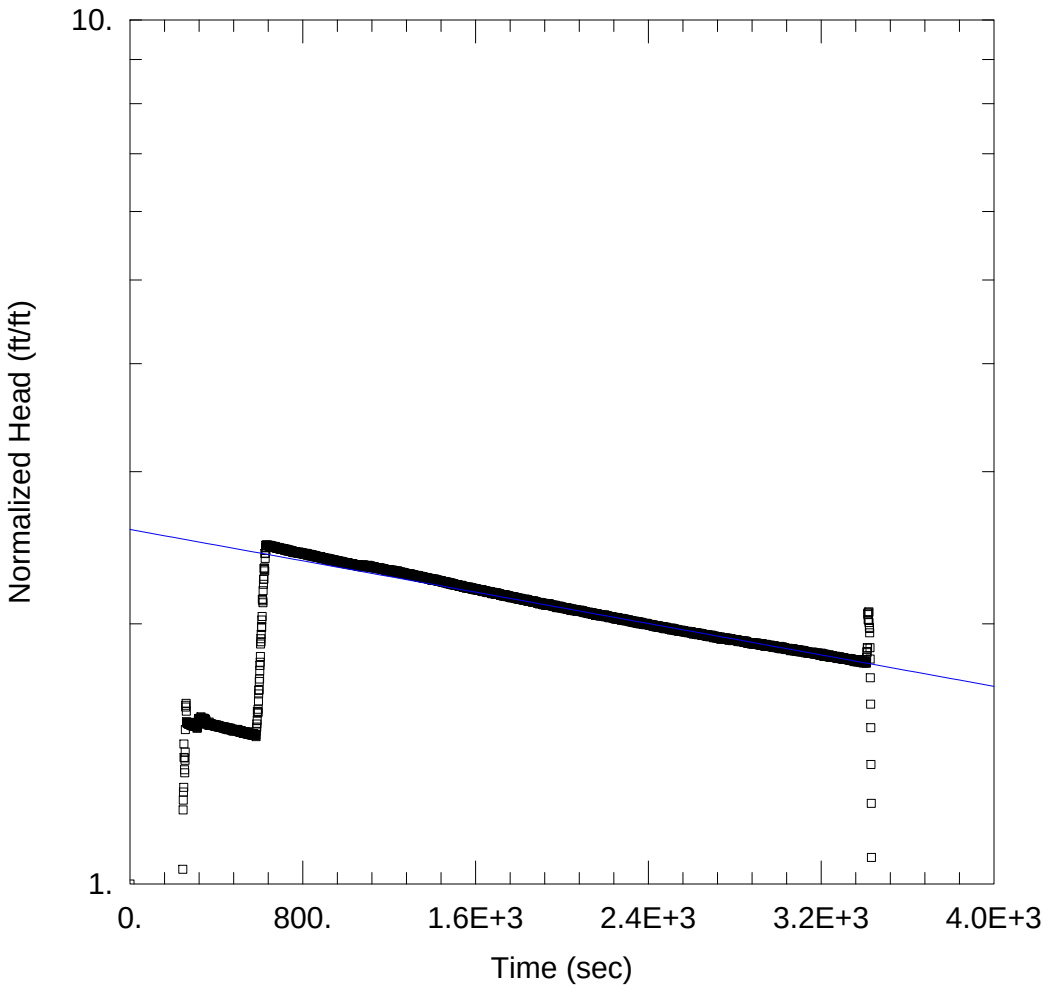
Saturated Thickness: 102.7 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 16. ft
Total Well Penetration Depth: 240.4 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 240.4 ft
Screen Length: 102.7 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 2.659E-7 cm/sec
y0 = 172.2 ft



TEST 1

Data Set: C:\...\GT-6_Test 1.aqt
Date: 01/30/17 Time: 15:18:08

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-6
Test Date: 1/6/2017

AQUIFER DATA

Saturated Thickness: 32. ft Anisotropy Ratio (Kz/Kr): 1.

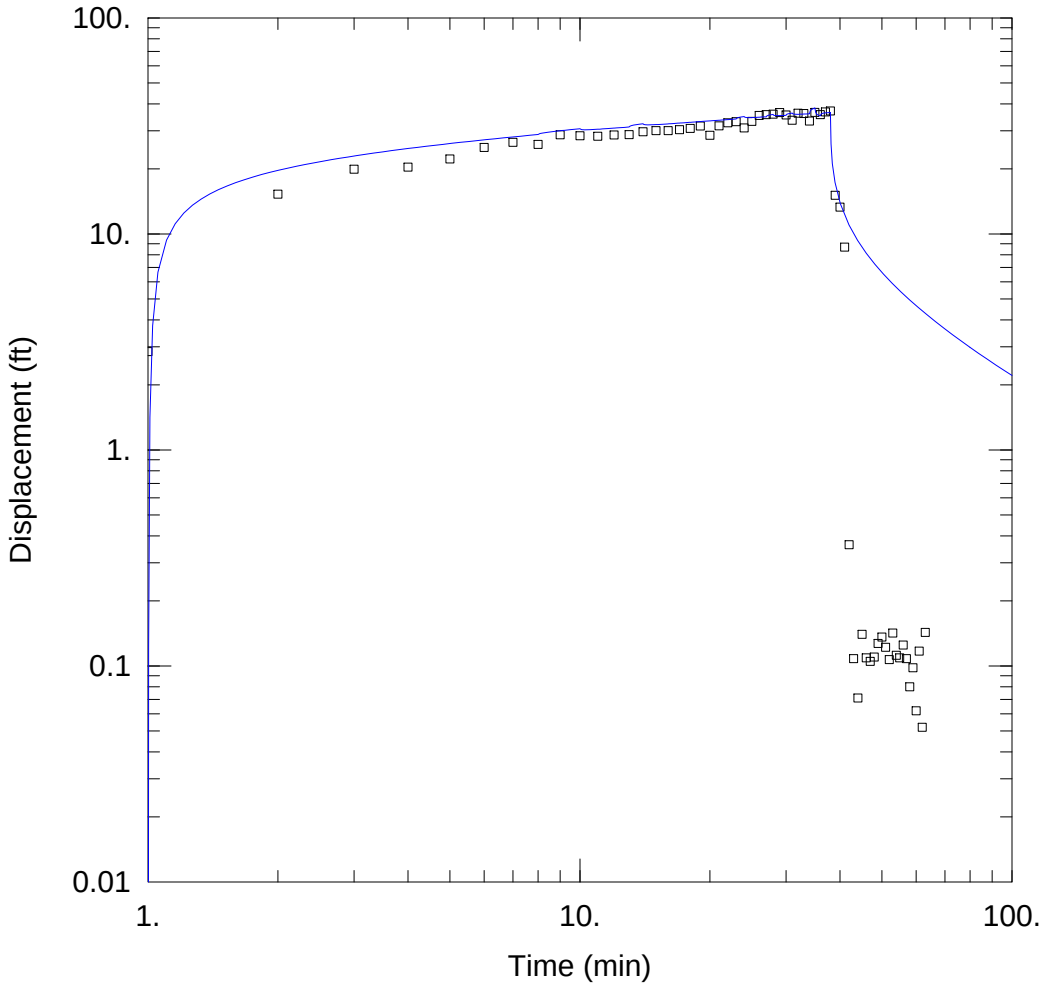
WELL DATA (New Well)

Initial Displacement: 7. ft Static Water Column Height: 22. ft
Total Well Penetration Depth: 32. ft Screen Length: 32. ft
Casing Radius: 0.1571 ft Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 5.092E-6 cm/sec y0 = 18. ft



TEST 2

Data Set: C:\...\GT-6_Test 2.aqt
Date: 01/30/17 Time: 15:35:44

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-6
Test Date: 1/6/2017

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

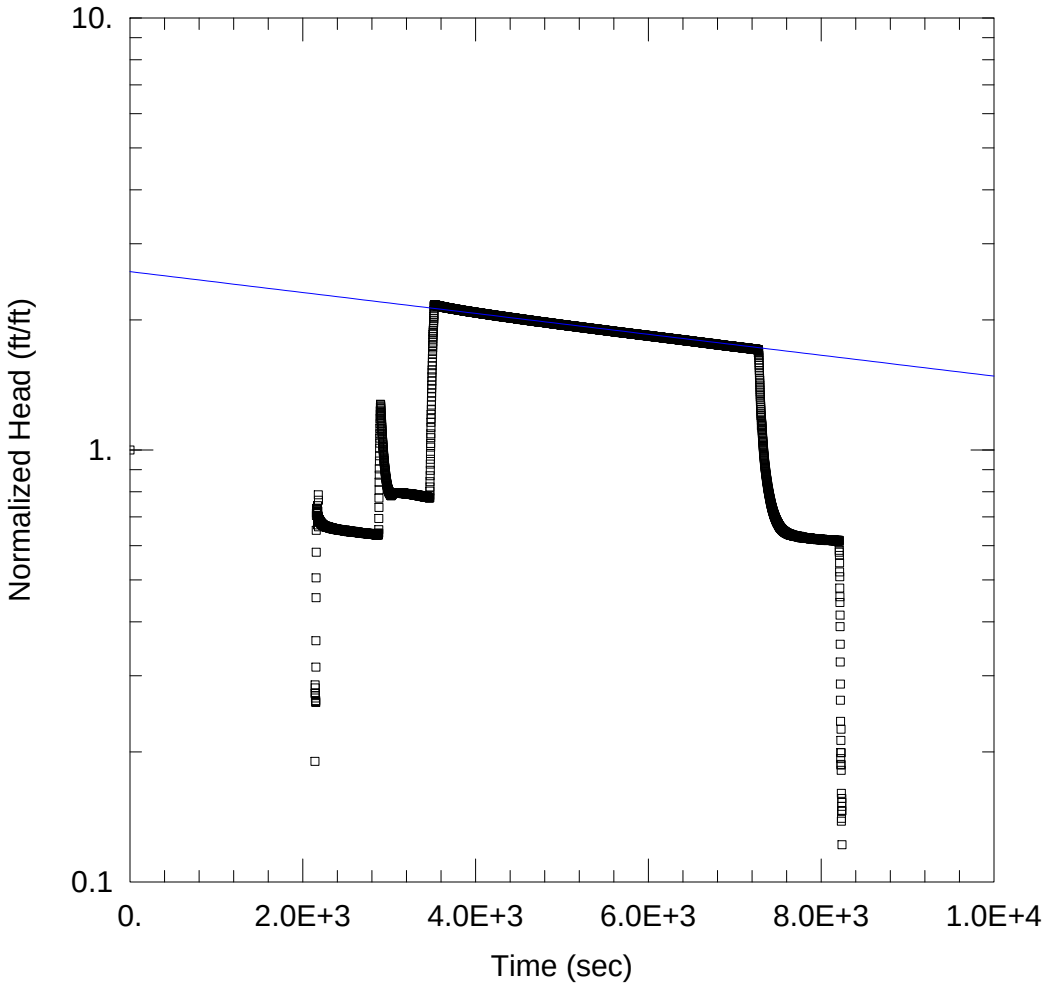
Observation Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.9488 cm^2/sec
S = 0.08737
Kz/Kr = 0.1
b = 34. ft



TEST 3

Data Set: C:\...\GT-6_Test 3.aqt
Date: 01/30/17 Time: 15:46:53

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-6
Test Date: 1/7/2017

AQUIFER DATA

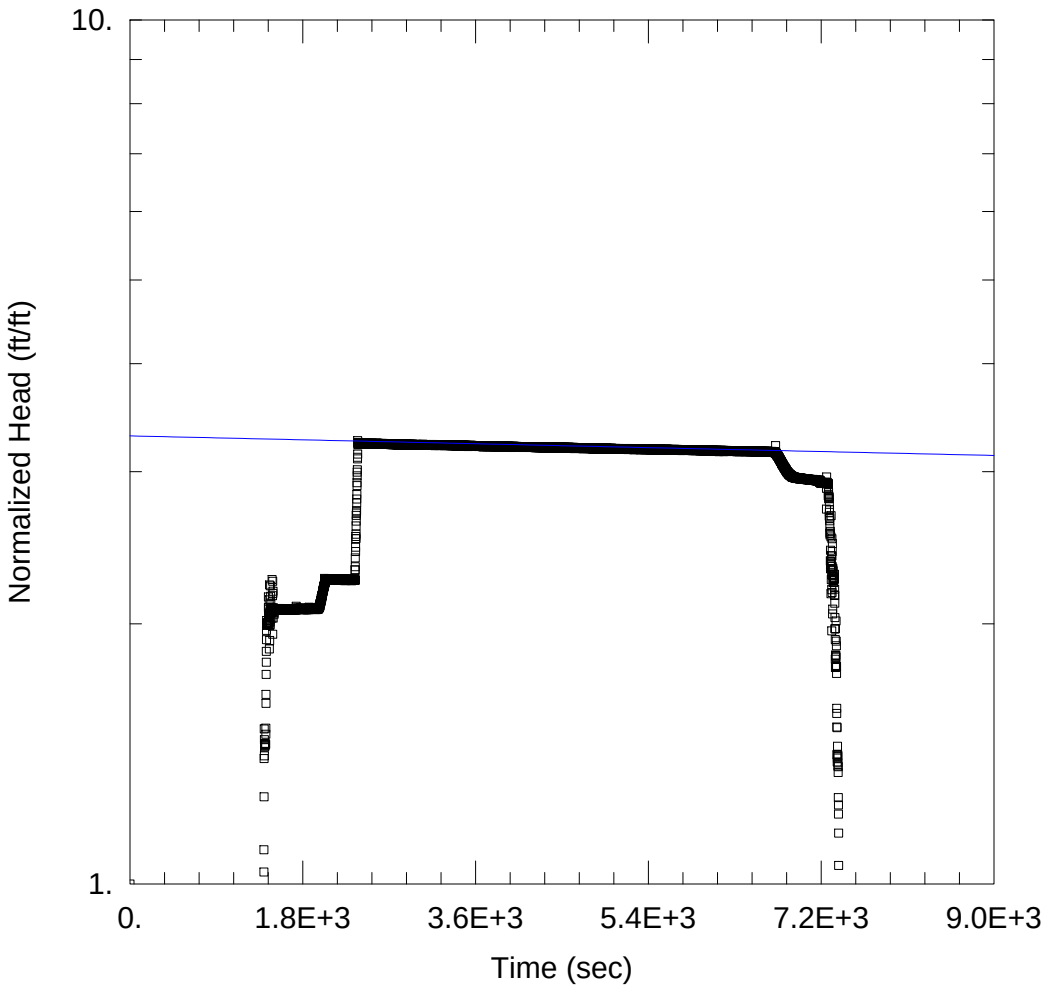
Saturated Thickness: 29.4 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 25. ft
Total Well Penetration Depth: 29.4 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 27.1 ft
Screen Length: 29.4 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 2.9E-6 cm/sec
y0 = 64.66 ft



TEST 1

Data Set: C:\...\GT-40-2_Test 1.aqt
Date: 01/30/17 Time: 15:06:14

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-40-2
Test Date: 1/8/2017

AQUIFER DATA

Saturated Thickness: 37.7 ft Anisotropy Ratio (Kz/Kr): 1.

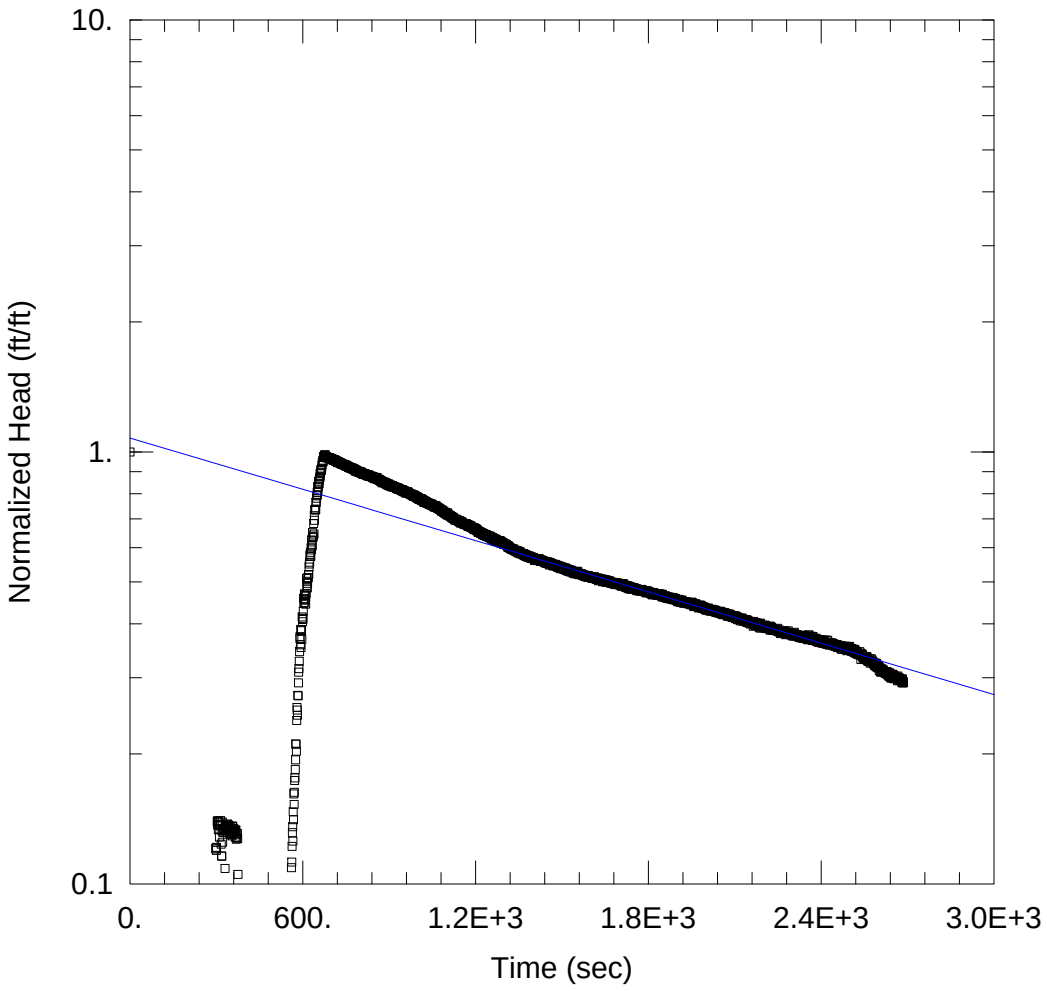
WELL DATA (New Well)

Initial Displacement: 17. ft
Total Well Penetration Depth: 65.4 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 65.4 ft
Screen Length: 37.7 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 2.694E-7 cm/sec
y0 = 56.1 ft



TEST 1

Data Set: C:\...\GT-37_Test 1.aqt
Date: 02/09/17 Time: 19:53:59

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-37
Test Date: 1/11/2017

AQUIFER DATA

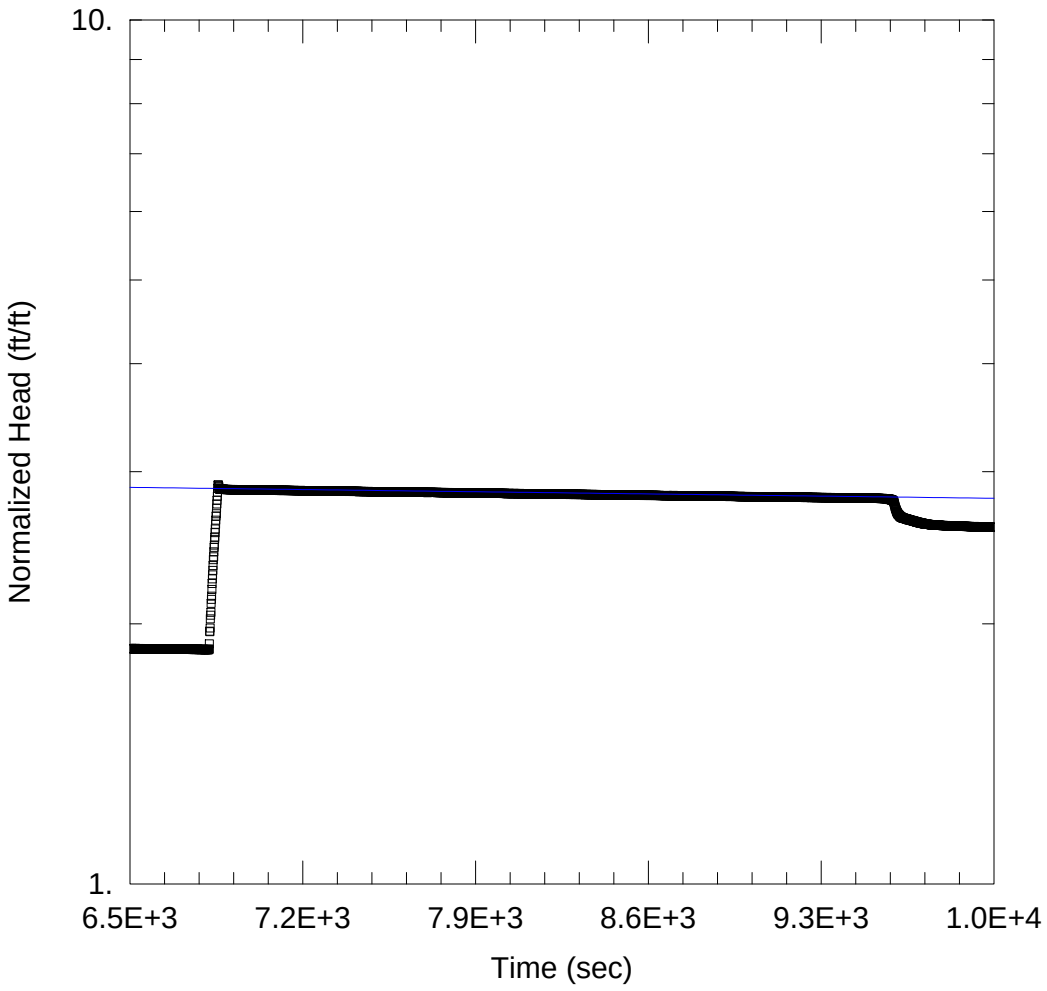
Saturated Thickness: 32. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 9. ft
Total Well Penetration Depth: 32. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 22. ft
Screen Length: 32. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 2.221E-5 cm/sec
y0 = 9.693 ft



TEST 2

Data Set: C:\...\GT-37_Test 2.aqt
Date: 02/28/17 Time: 12:00:05

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-37
Test Date: 1/13/2017

AQUIFER DATA

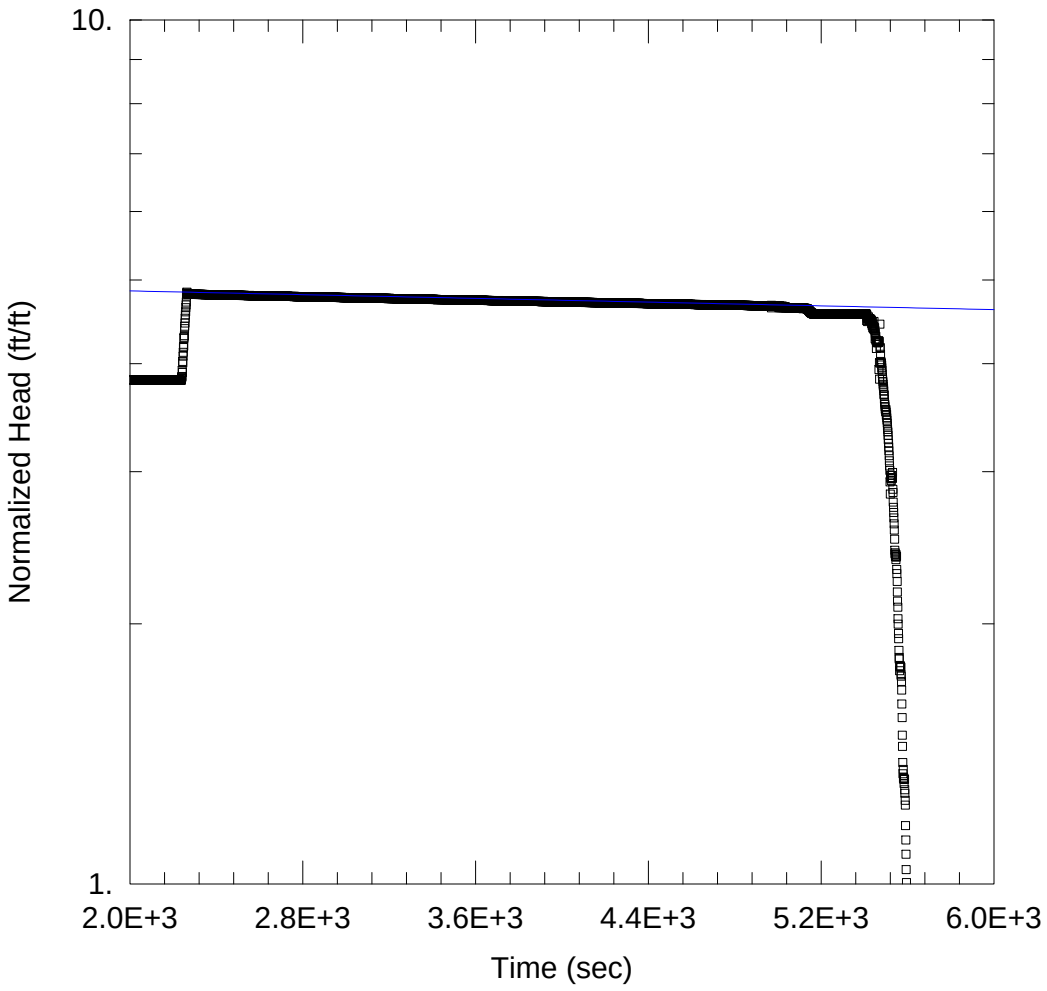
Saturated Thickness: 43. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 25. ft
Total Well Penetration Depth: 72. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 66. ft
Screen Length: 43. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 3.467E-7 cm/sec
y0 = 75.92 ft



TEST 3

Data Set: C:\...\GT-37_Test 3.aqt
Date: 02/28/17 Time: 12:02:27

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-37
Test Date: 1/14/2017

AQUIFER DATA

Saturated Thickness: 140. ft Anisotropy Ratio (Kz/Kr): 1.

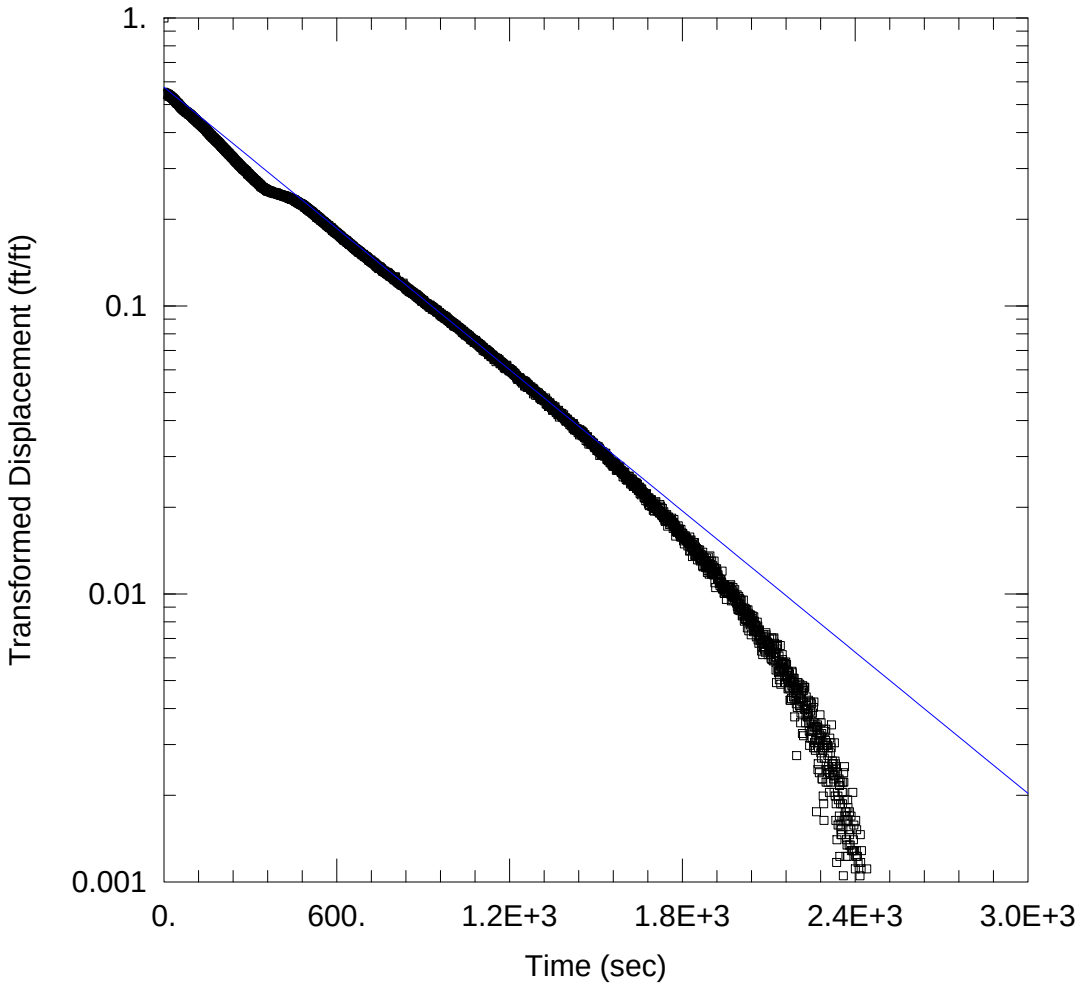
WELL DATA (New Well)

Initial Displacement: 25. ft Static Water Column Height: 227. ft
Total Well Penetration Depth: 227. ft Screen Length: 140. ft
Casing Radius: 0.1571 ft Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 2.028E-7 cm/sec y0 = 124.5 ft



TEST 1

Data Set: C:\...\GT-13_Test 1.aqt
Date: 02/10/17 Time: 11:30:47

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-13
Test Date: 1/11/2017

AQUIFER DATA

Saturated Thickness: 12. ft Anisotropy Ratio (Kz/Kr): 1.

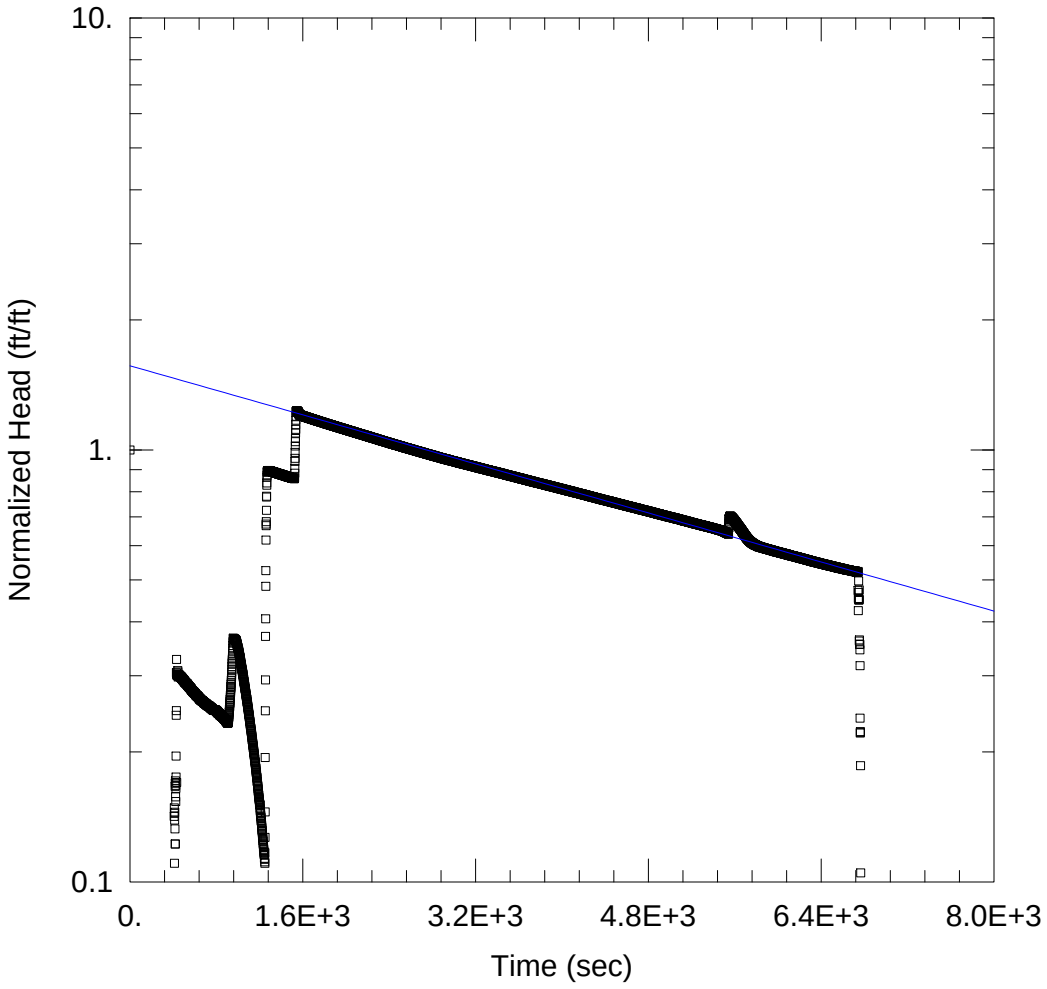
WELL DATA (New Well)

Initial Displacement: 10. ft
Total Well Penetration Depth: 12. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 2. ft
Screen Length: 12. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Dagan

K = 0.0002368 cm/sec y0 = 6.988 ft



TEST 2

Data Set: C:\...\GT-13_Test 2.aqt
Date: 02/10/17 Time: 11:34:38

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-13
Test Date: 1/11/2017

AQUIFER DATA

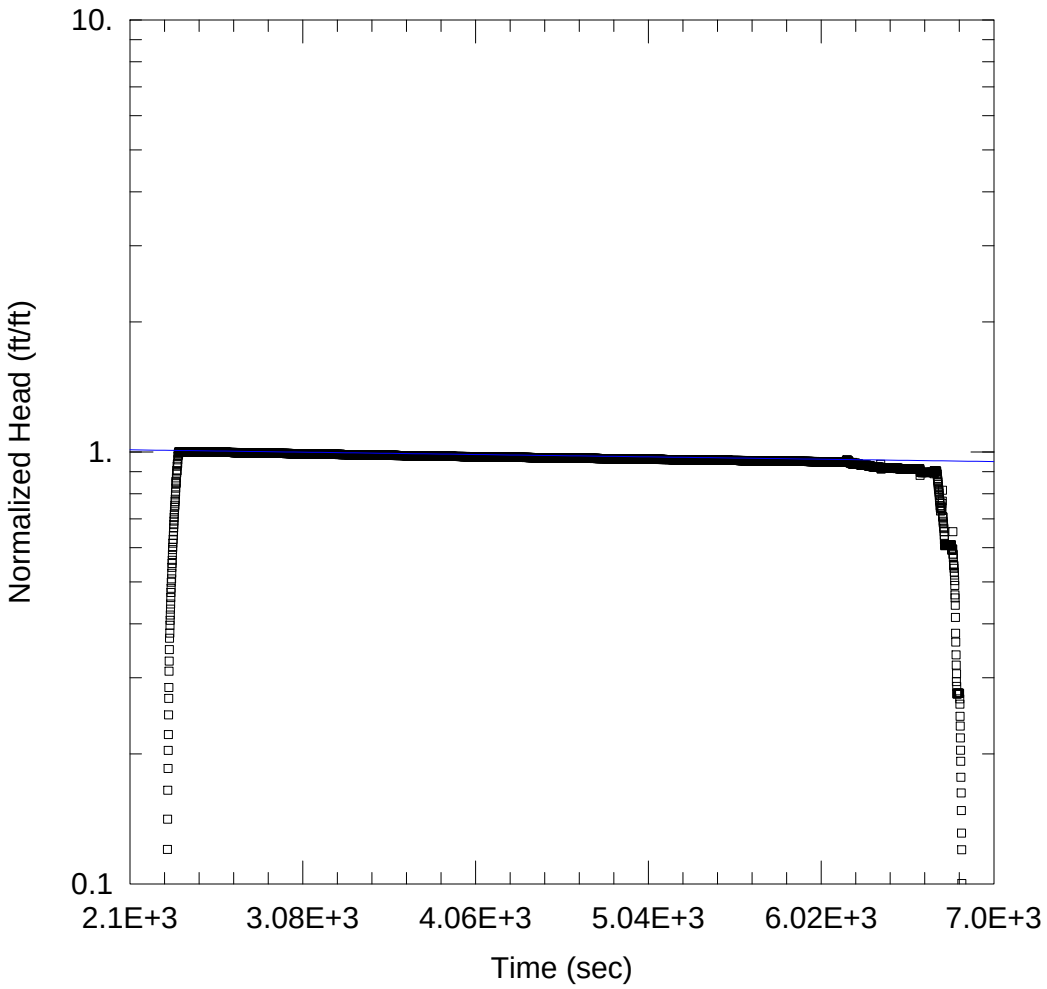
Saturated Thickness: 50.7 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 25. ft
Total Well Penetration Depth: 57. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 57. ft
Screen Length: 50.7 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 5.657E-6 cm/sec
y0 = 39.14 ft



TEST 3

Data Set: C:\...\GT-13_Test 3.aqt
Date: 02/09/17 Time: 20:56:46

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-13
Test Date: 1/12/2017

AQUIFER DATA

Saturated Thickness: 96.22 ft Anisotropy Ratio (Kz/Kr): 1.

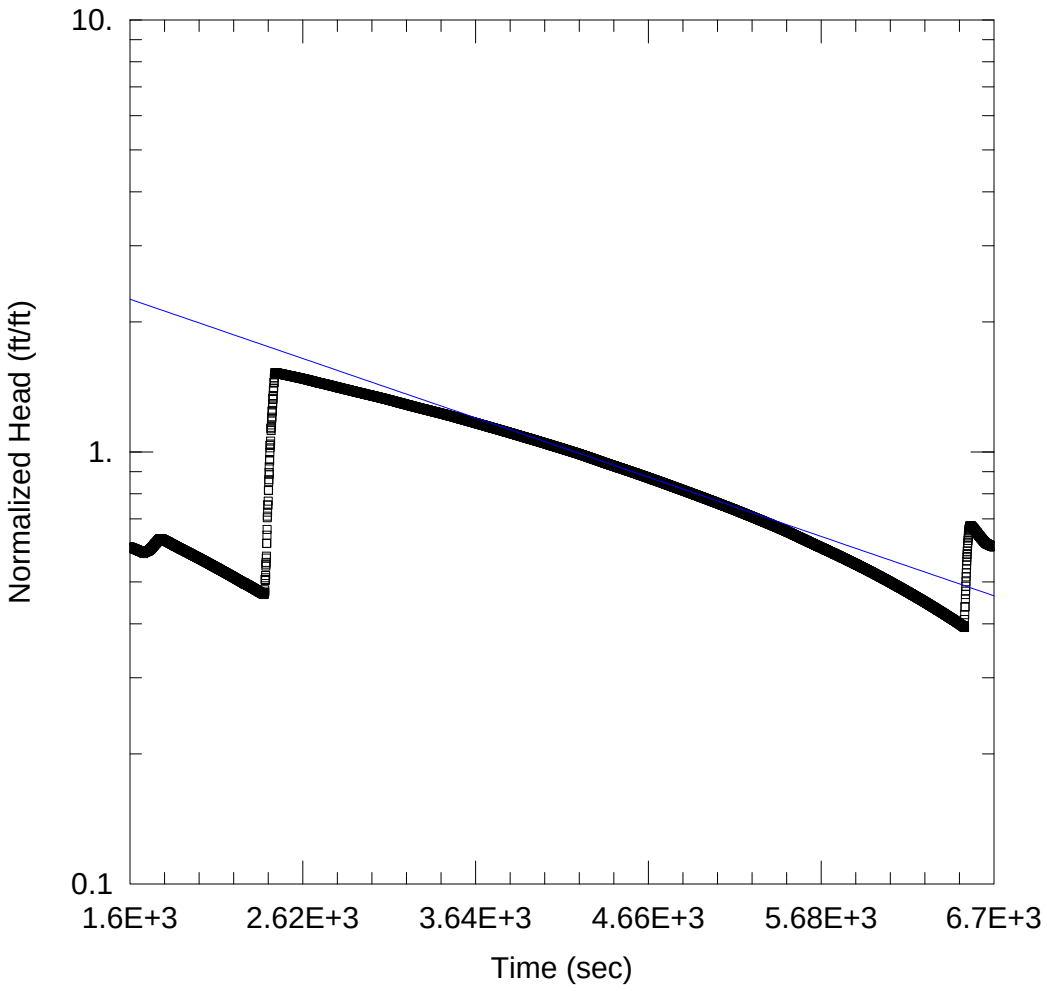
WELL DATA (New Well)

Initial Displacement: 55. ft
Total Well Penetration Depth: 108. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 108. ft
Screen Length: 96.22 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 2.673E-7 cm/sec
y0 = 57.13 ft



TEST 4

Data Set: C:\...\GT-13_Test 4.aqt
Date: 02/09/17 Time: 21:11:01

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-13
Test Date: 1/13/2017

AQUIFER DATA

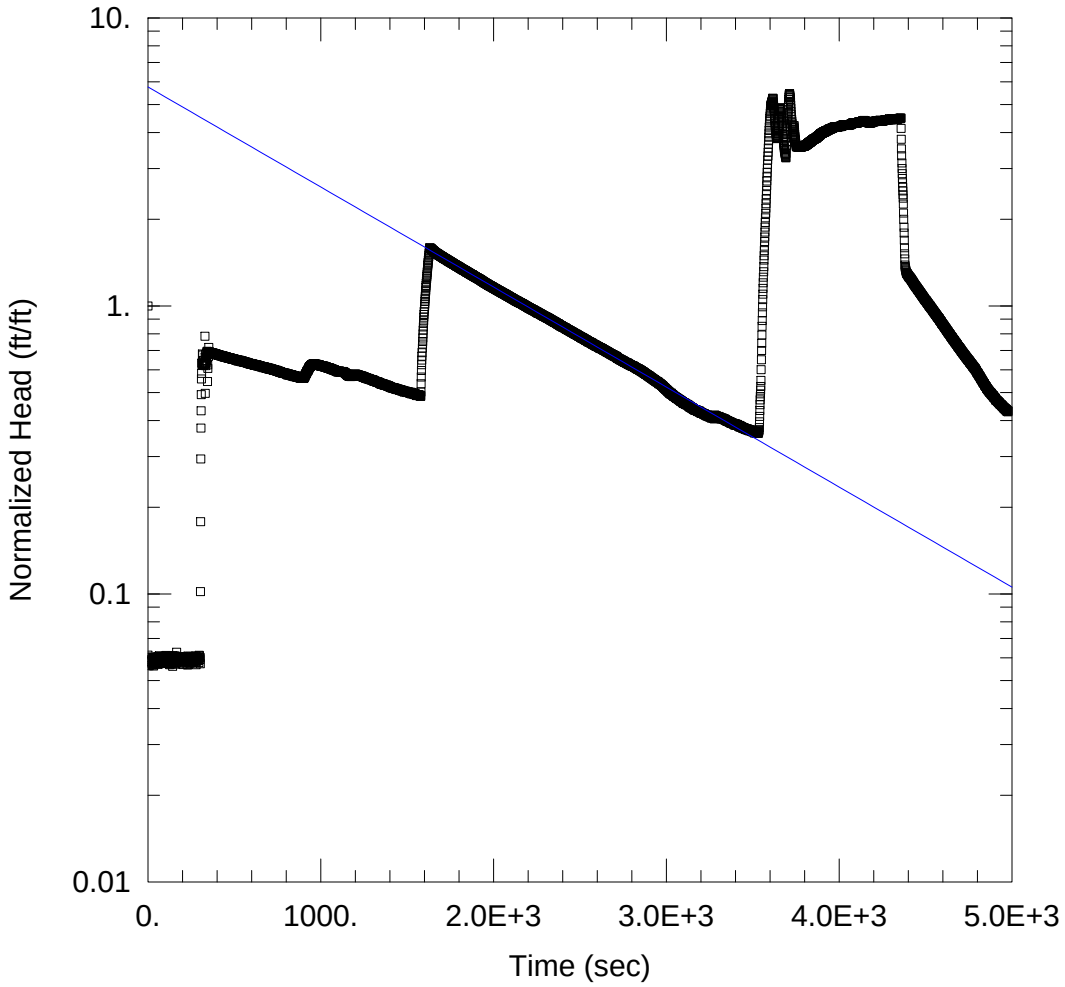
Saturated Thickness: 83.55 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 30. ft
Total Well Penetration Depth: 157.3 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 157.3 ft
Screen Length: 83.55 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 7.391E-6 cm/sec
y0 = 111.2 ft



TEST 1 SLUG

Data Set: C:\...\GT-12_Test 1_Slug.aqt
Date: 02/10/17 Time: 10:18:10

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-12
Test Date: 1/15/2017

AQUIFER DATA

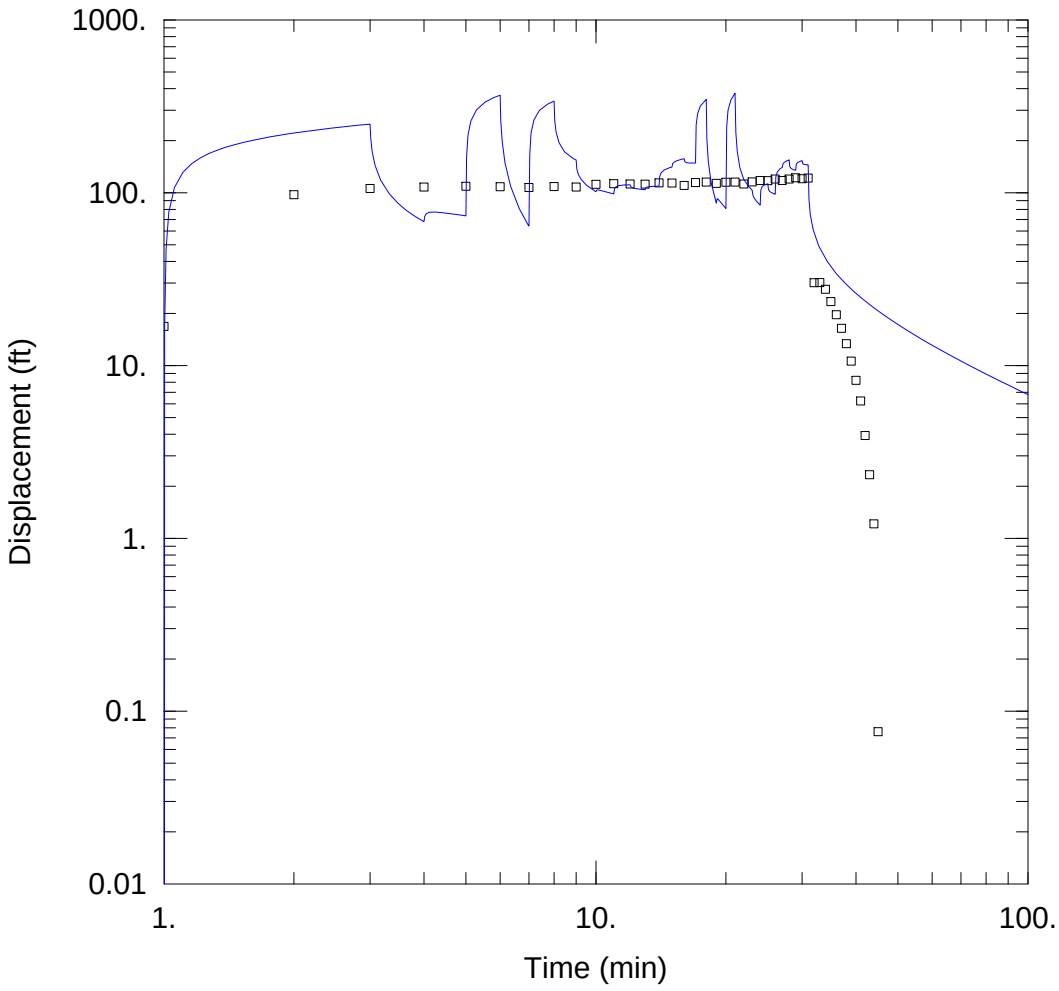
Saturated Thickness: 28.8 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 30. ft
Total Well Penetration Depth: 46.9 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 46.9 ft
Screen Length: 28.8 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 4.565E-5 cm/sec
y0 = 172.7 ft



TEST 1 CRI

Data Set: C:\...\GT-12_Test 1_CRI.aqt
Date: 02/10/17 Time: 10:49:35

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-12
Test Date: 1/15/2017

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

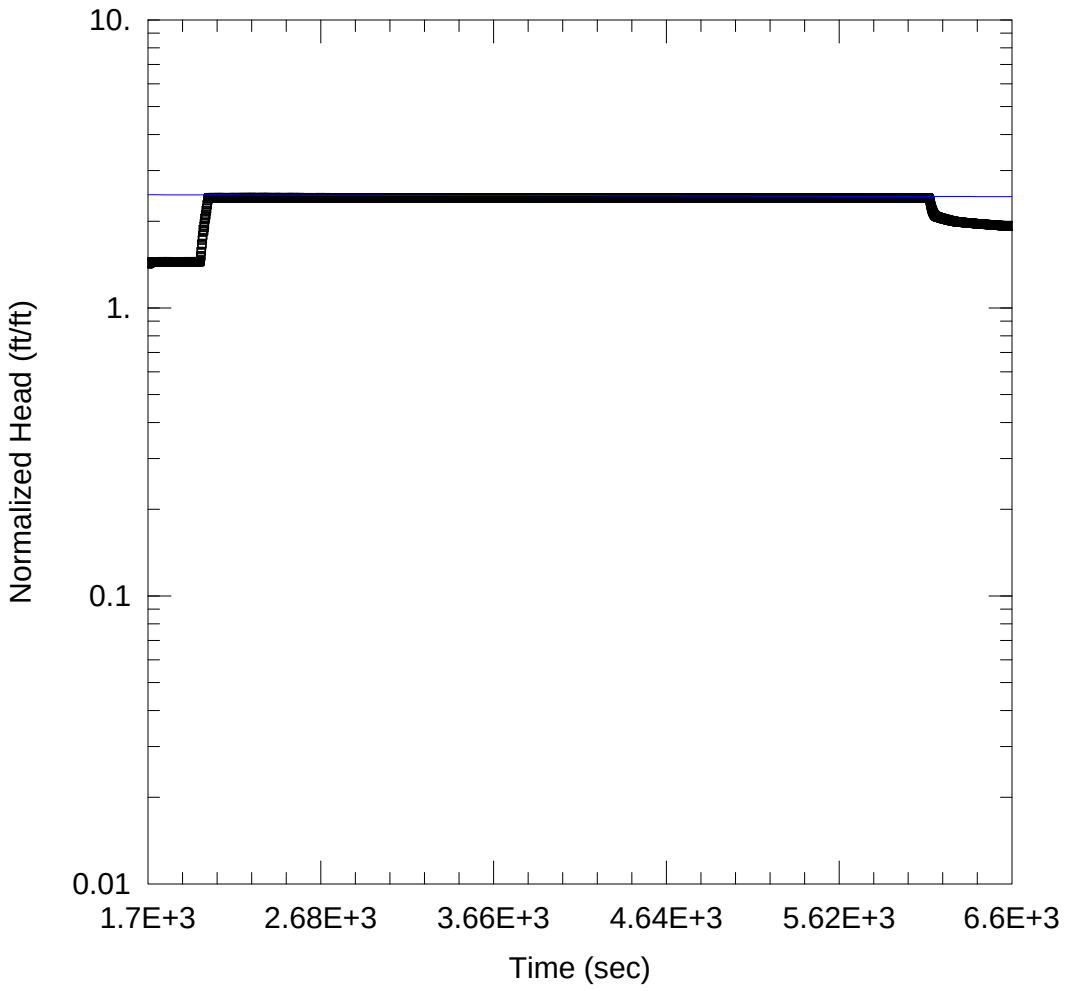
Observation Wells

Well Name	X (ft)	Y (ft)
▫ New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.04226 cm^2/sec
S = 0.001085
Kz/Kr = 0.1
b = 28.8 ft



TEST 2

Data Set: C:\...\GT-12_Test 2.aqt
Date: 02/28/17 Time: 12:10:37

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-12
Test Date: 1/16/2017

AQUIFER DATA

Saturated Thickness: 68.8 ft Anisotropy Ratio (Kz/Kr): 1.

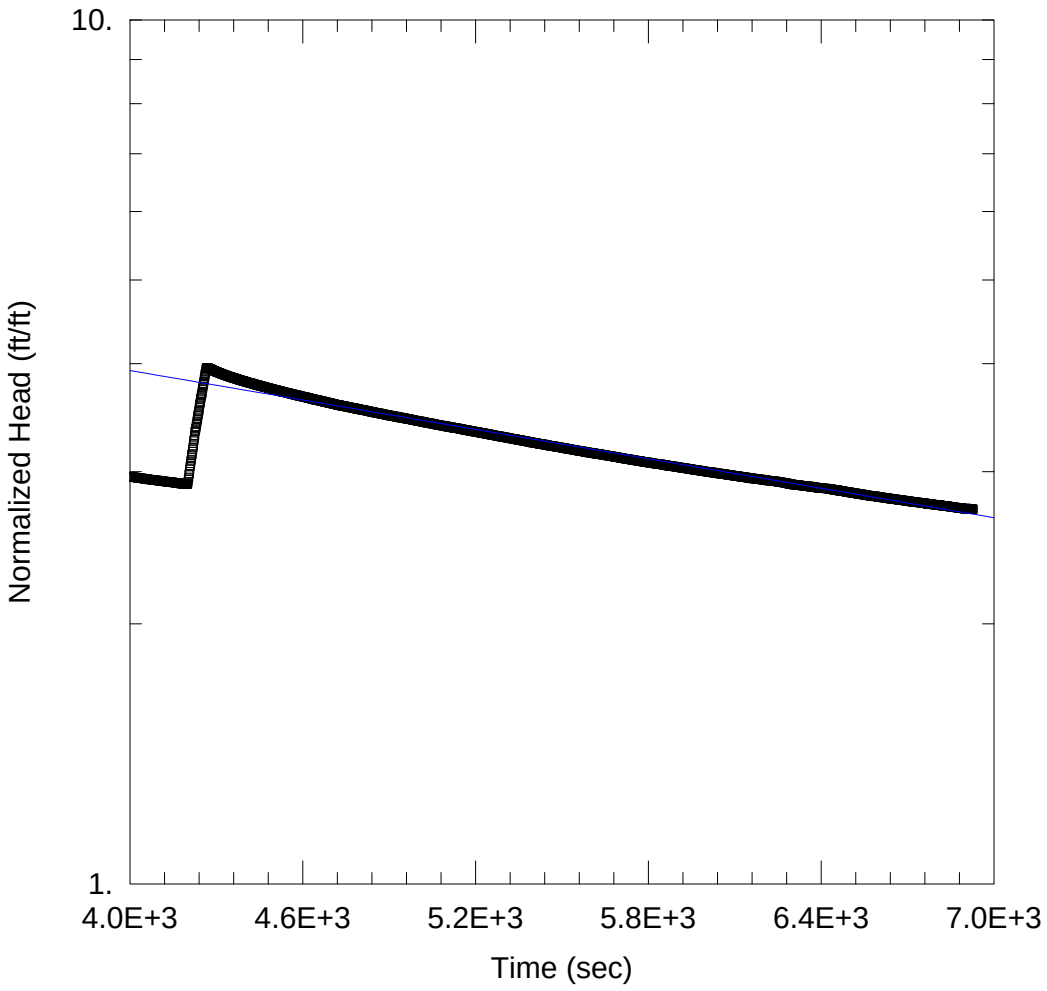
WELL DATA (New Well)

Initial Displacement: 32. ft
Total Well Penetration Depth: 112.8 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 112.8 ft
Screen Length: 68.8 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 8.821E-8 cm/sec
y0 = 79.49 ft



TEST 3 SLUG

Data Set: C:\...\GT-12_Test 3_Slug.aqt
Date: 02/10/17 Time: 10:35:22

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-12
Test Date: 1/17/2017

AQUIFER DATA

Saturated Thickness: 116.8 ft Anisotropy Ratio (Kz/Kr): 1.

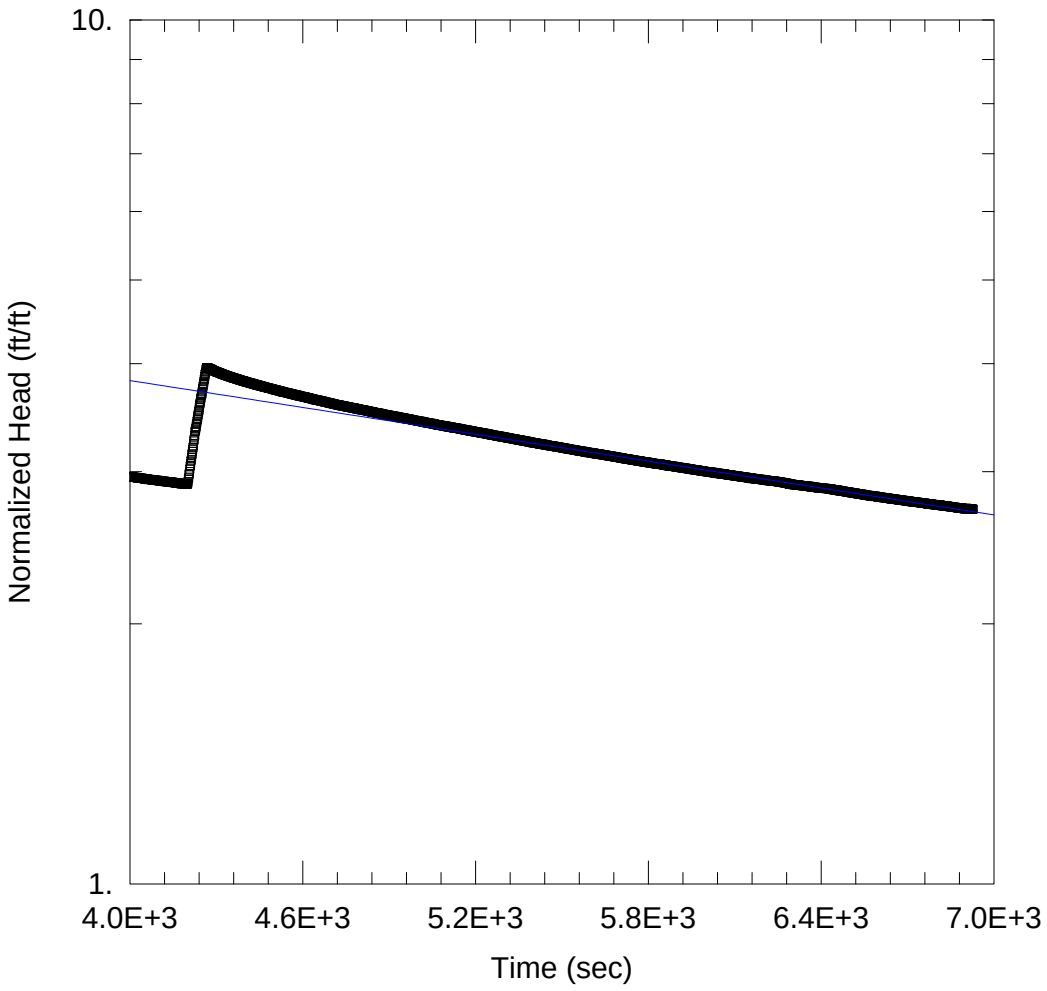
WELL DATA (New Well)

Initial Displacement: 32. ft
Total Well Penetration Depth: 210.8 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 210.8 ft
Screen Length: 116.8 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 2.496E-6 cm/sec y0 = 212. ft



TEST 3 SLUG

Data Set: C:\...\GT-12_Test 3_Slug_Short_Interval.aqt
Date: 02/28/17 Time: 12:28:01

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-12
Test Date: 1/17/2017

AQUIFER DATA

Saturated Thickness: 60. ft Anisotropy Ratio (Kz/Kr): 1.

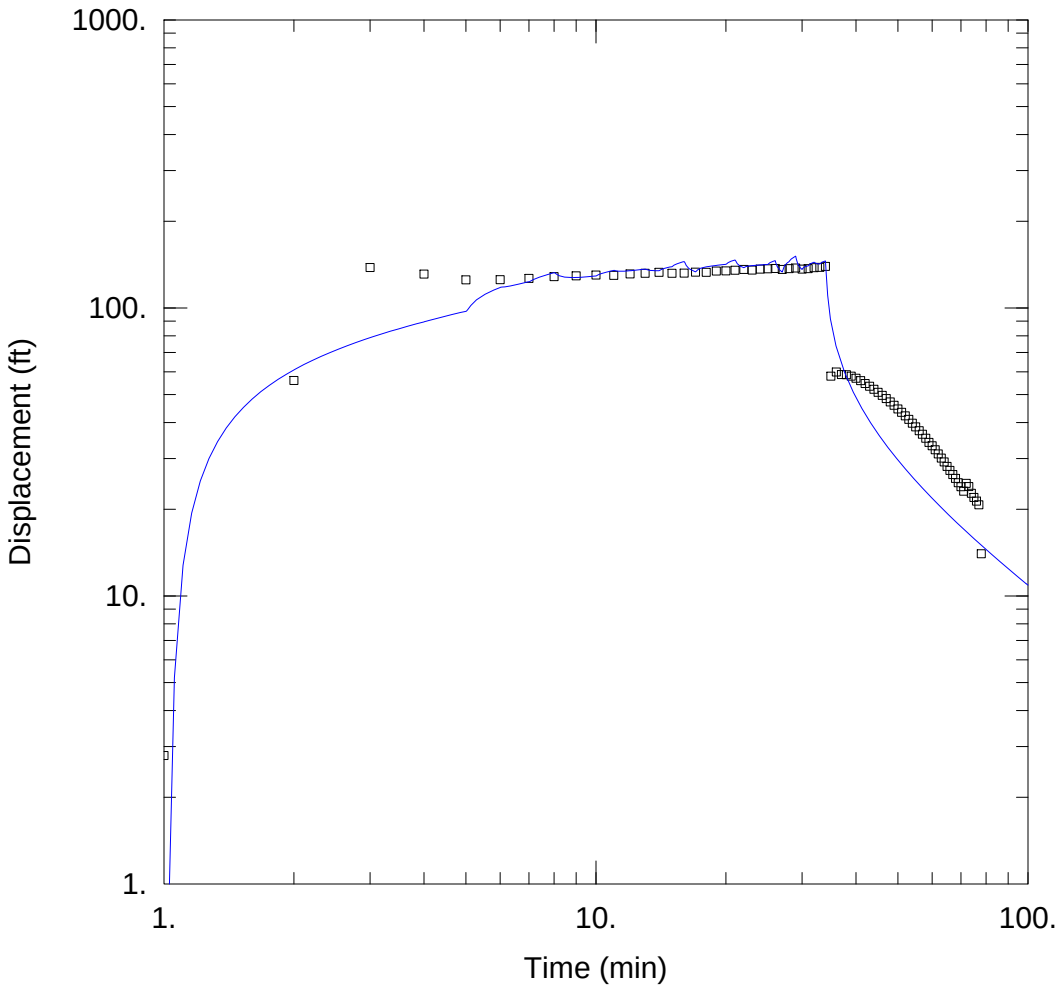
WELL DATA (New Well)

Initial Displacement: 32. ft Static Water Column Height: 210.8 ft
Total Well Penetration Depth: 210.8 ft Screen Length: 60. ft
Casing Radius: 0.1571 ft Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 4.206E-6 cm/sec y0 = 197.3 ft



TEST 3 CRI

Data Set: C:\...\GT-12_Test 3_CRI.aqt
Date: 02/10/17 Time: 10:47:03

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-12
Test Date: 1/17/2017

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

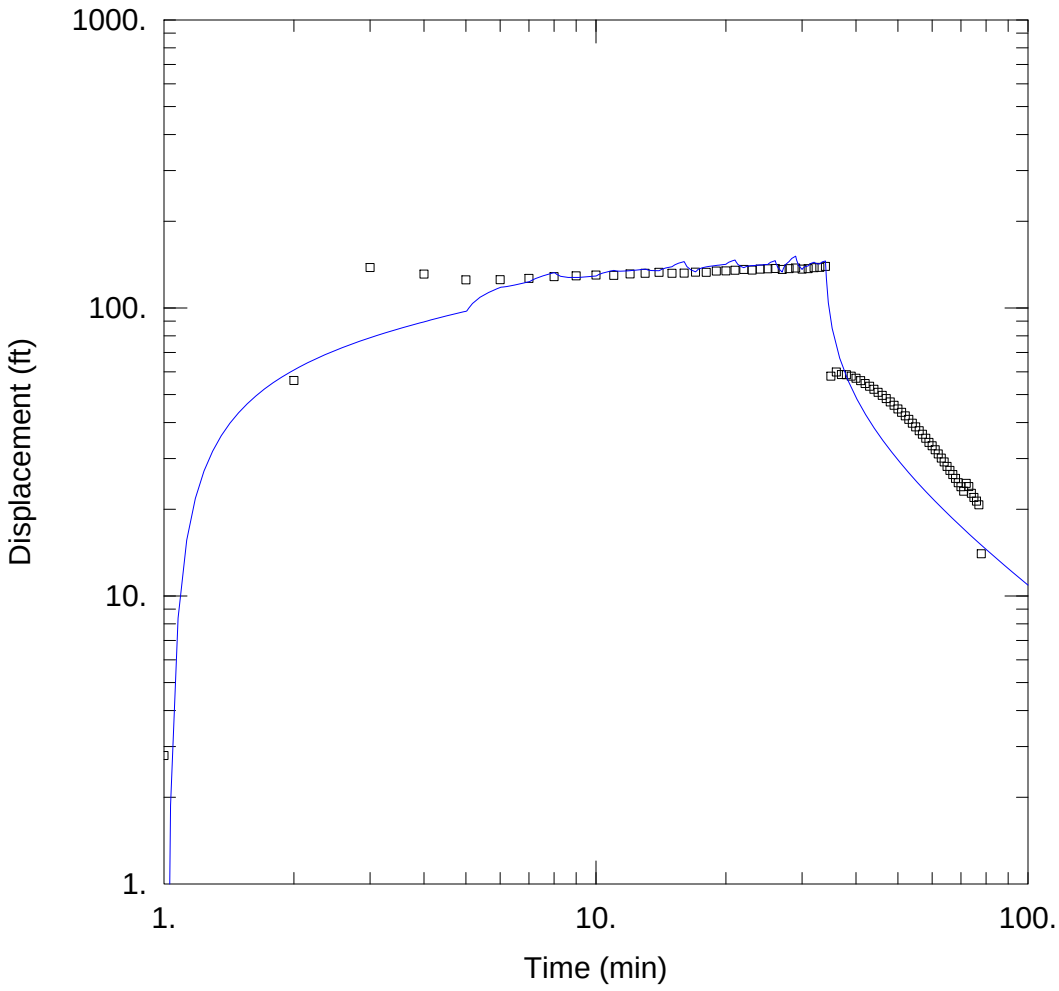
Observation Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.01034 cm^2/sec
S = 0.006751
Kz/Kr = 0.1
b = 116.8 ft



TEST 3 CRI

Data Set: C:\...\GT-12_Test 3_CRI_Short_Interval.aqt
Date: 02/28/17 Time: 12:24:08

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-12
Test Date: 1/17/2017

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

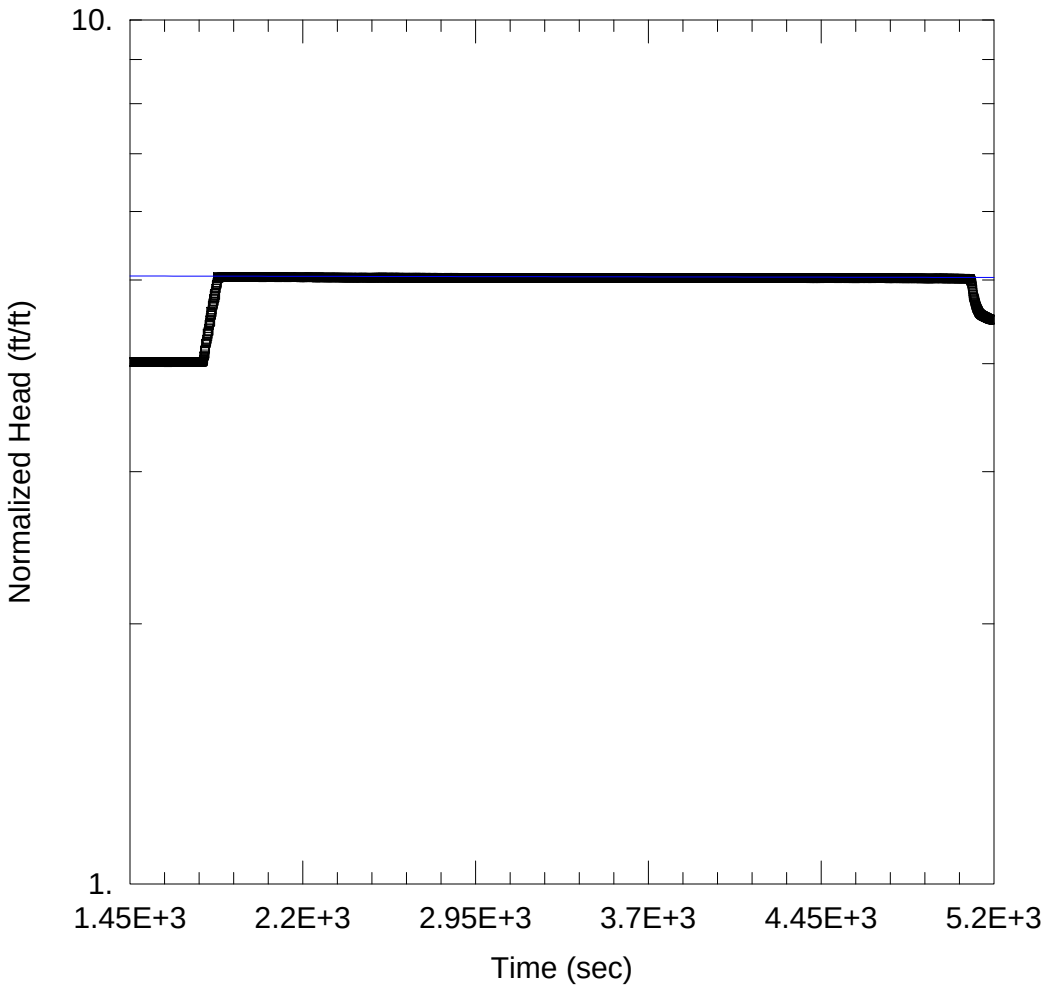
Observation Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.01034 cm^2/sec
S = 0.006751
Kz/Kr = 0.1
b = 60. ft



TEST 4

Data Set: C:\...\GT-12_Test 4.aqt
Date: 02/10/17 Time: 10:53:47

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-12
Test Date: 1/17/2017

AQUIFER DATA

Saturated Thickness: 56.8 ft Anisotropy Ratio (Kz/Kr): 1.

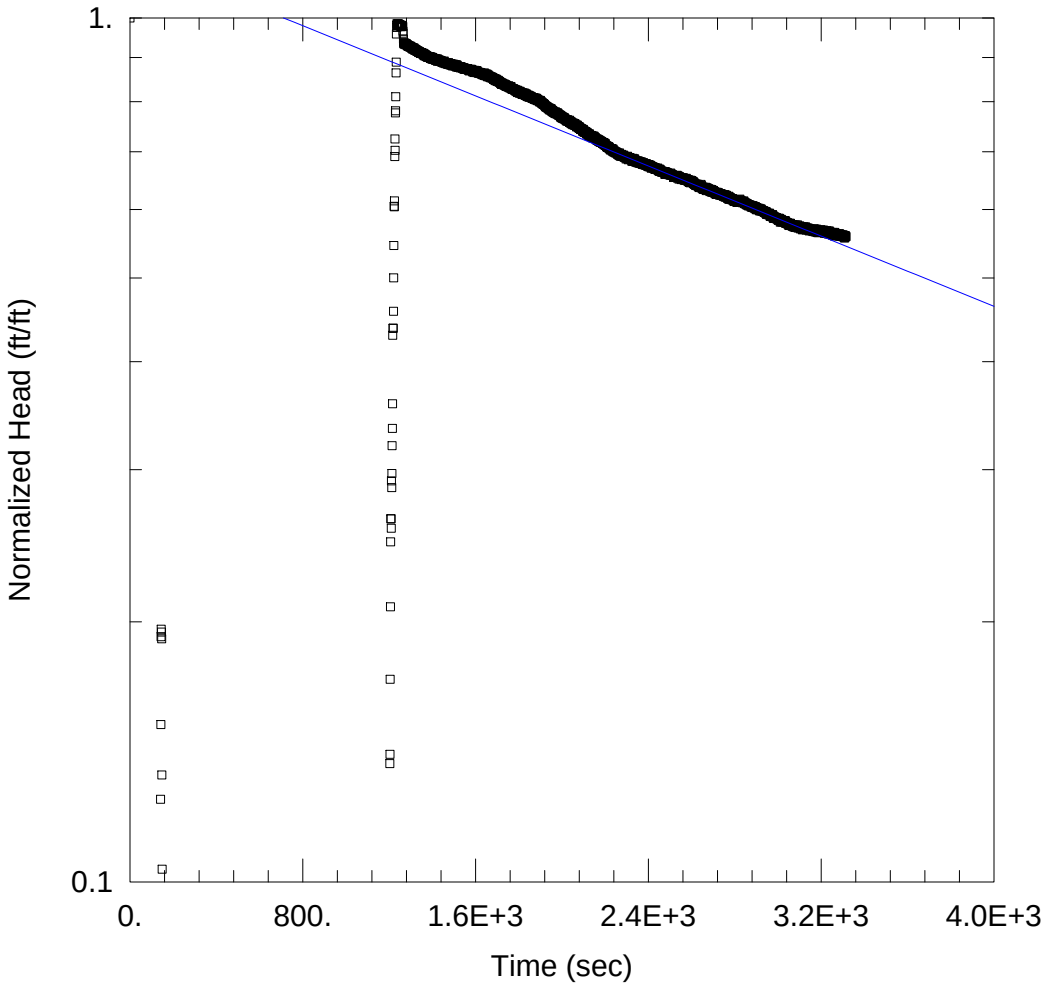
WELL DATA (New Well)

Initial Displacement: 38. ft
Total Well Penetration Depth: 210.2 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 210.2 ft
Screen Length: 56.8 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 3.837E-8 cm/sec
y0 = 192.3 ft



TEST 1

Data Set: C:\...\GT-23_Test 1.aqt
Date: 01/30/17 Time: 16:02:58

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-23
Test Date: 1/17/2017

AQUIFER DATA

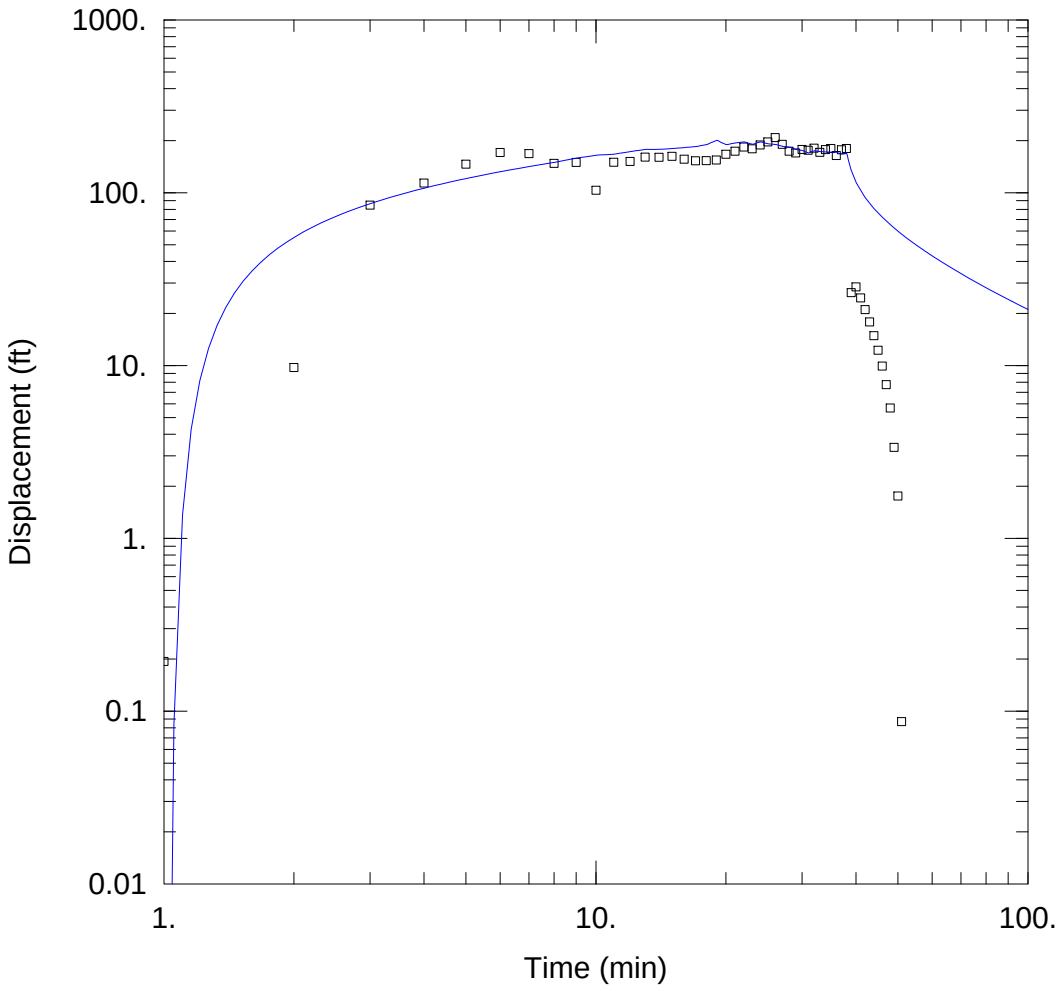
Saturated Thickness: 32. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 14. ft
Total Well Penetration Depth: 32. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 22. ft
Screen Length: 32. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 1.138E-5 cm/sec
y0 = 16.53 ft



TEST 2

Data Set: C:\...\GT-23_Test 2.aqt
Date: 01/30/17 Time: 16:15:37

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-23
Test Date: 1/17/2017

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

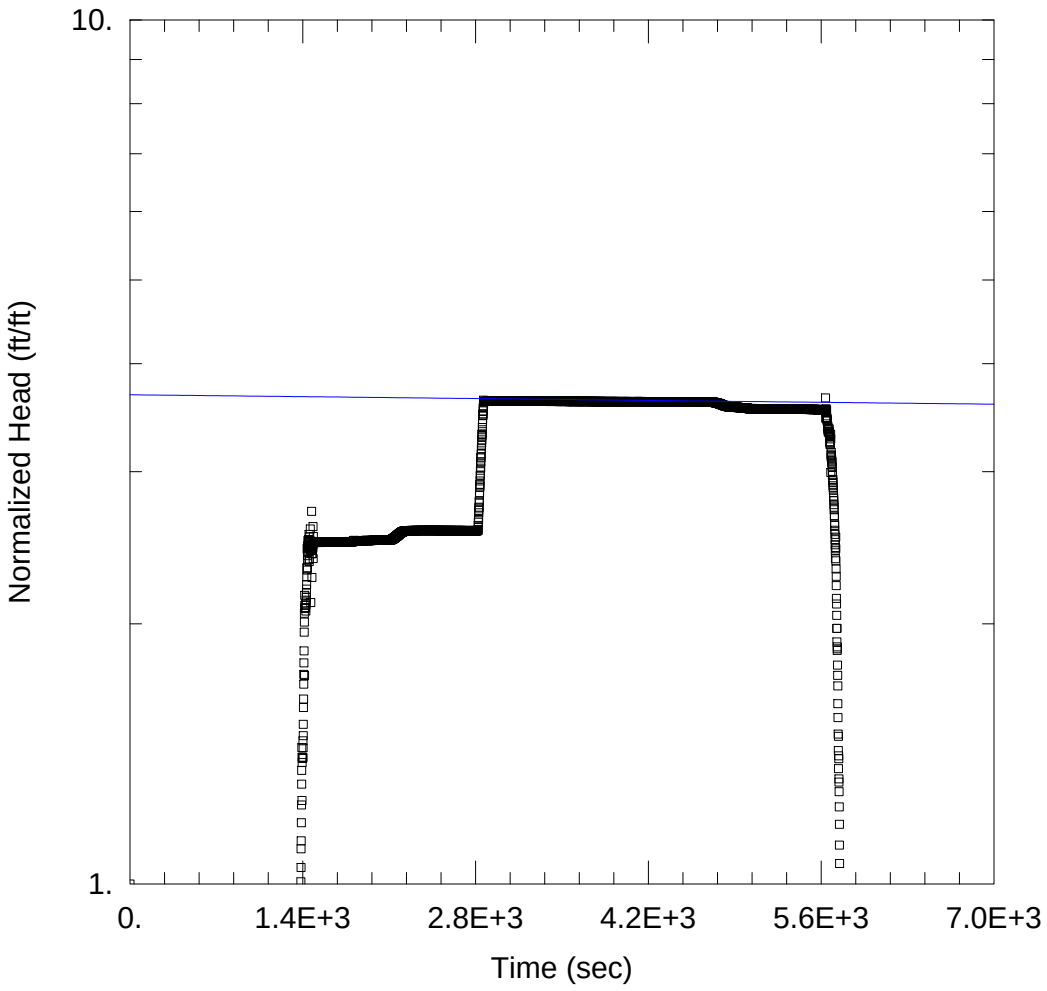
Observation Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.02119 cm^2/sec
S = 0.05774
Kz/Kr = 0.1
b = 74.4 ft



TEST 3

Data Set: C:\...\GT-23_Test 3.aqt
Date: 02/28/17 Time: 12:16:15

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-23
Test Date: 1/18/2017

AQUIFER DATA

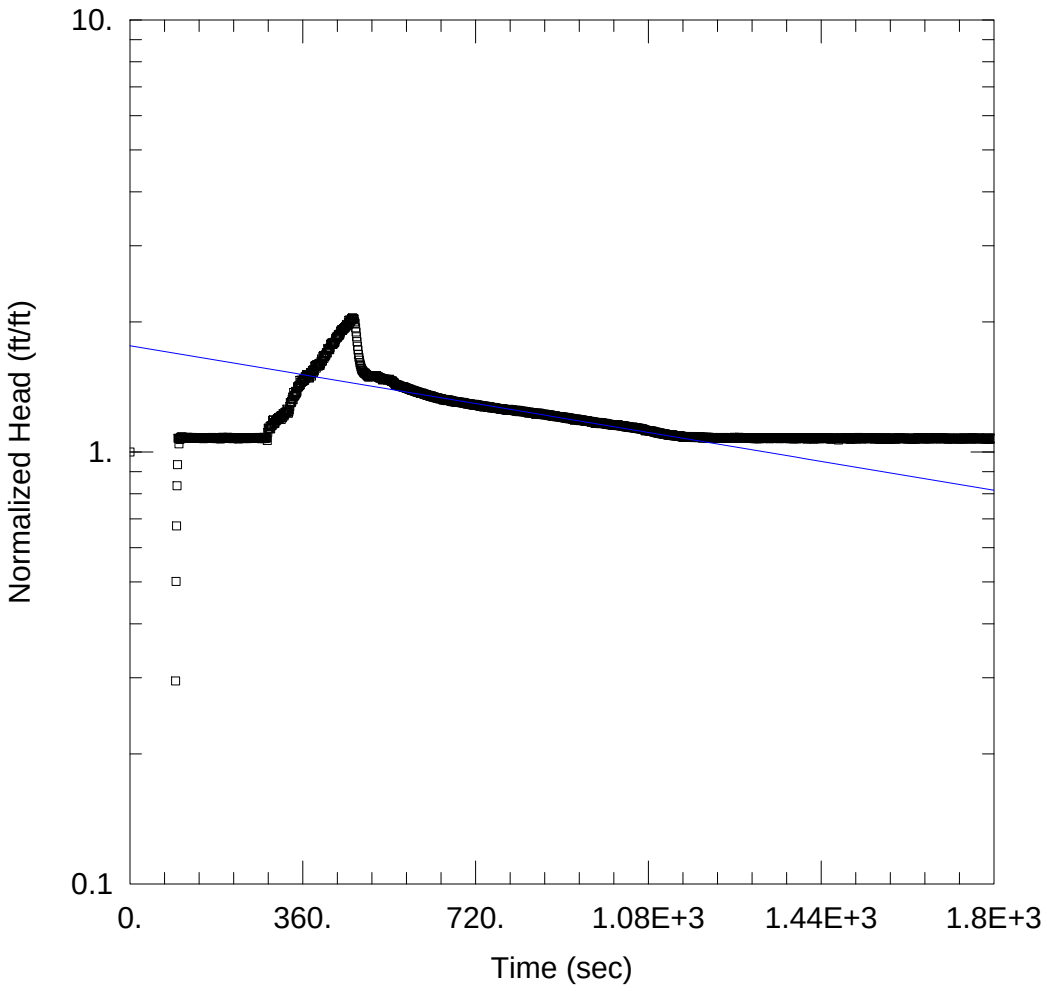
Saturated Thickness: 145.4 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 30. ft
Total Well Penetration Depth: 145.4 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 0. ft
Screen Length: 145.4 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 5.326E-8 cm/sec
y0 = 110.5 ft



TEST 1

Data Set: C:\...\GT-14-2_Test 1.aqt
Date: 01/30/17 Time: 16:33:57

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-14-2
Test Date: 1/23/2017

AQUIFER DATA

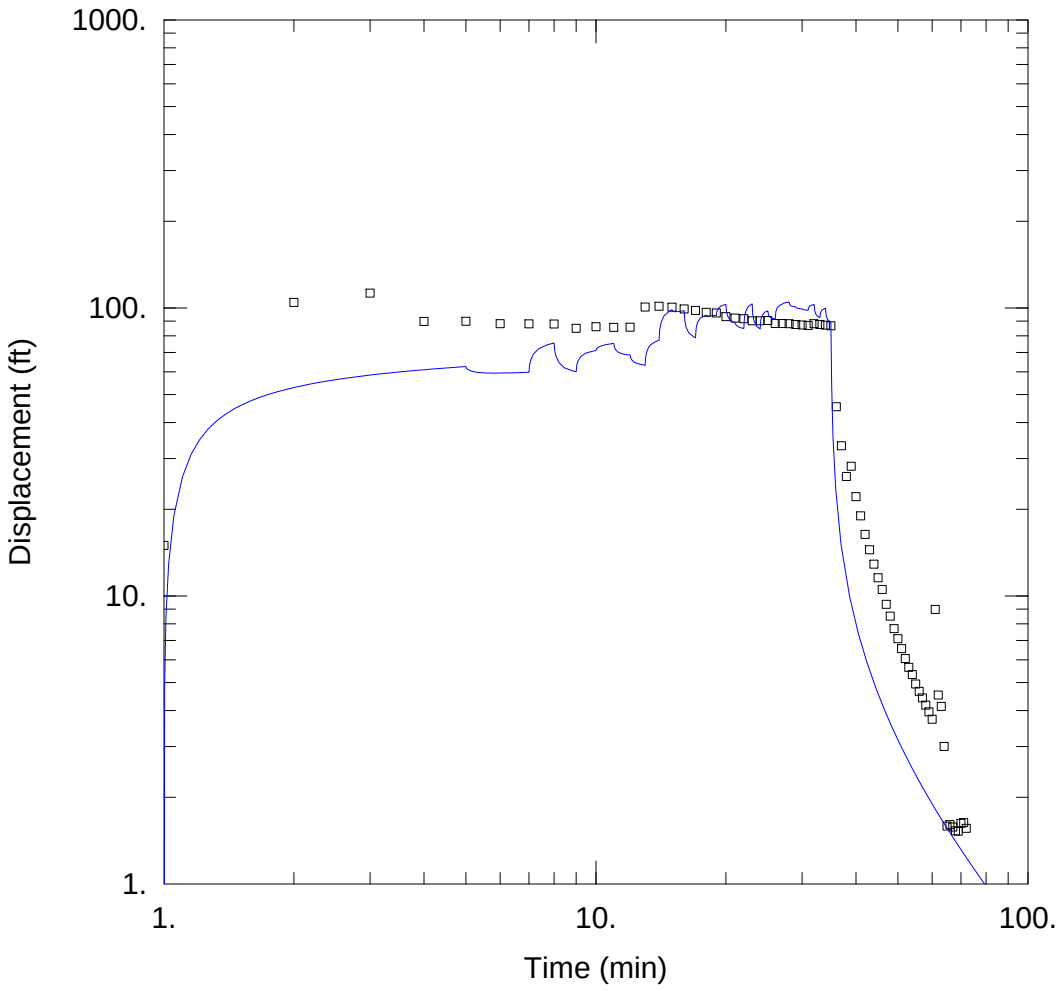
Saturated Thickness: 1. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 4. ft Static Water Column Height: 11. ft
Total Well Penetration Depth: 27. ft Screen Length: 27. ft
Casing Radius: 0.1571 ft Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev
K = 0.0008528 cm/sec y0 = 7.045 ft



TEST 2

Data Set: C:\...\GT-14-2_Test 2.aqt
Date: 02/13/17 Time: 16:08:20

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-14-2
Test Date: 1/24/2017

AQUIFER DATA

Saturated Thickness: 38.75 ft Fracture Radius: 1.005 ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

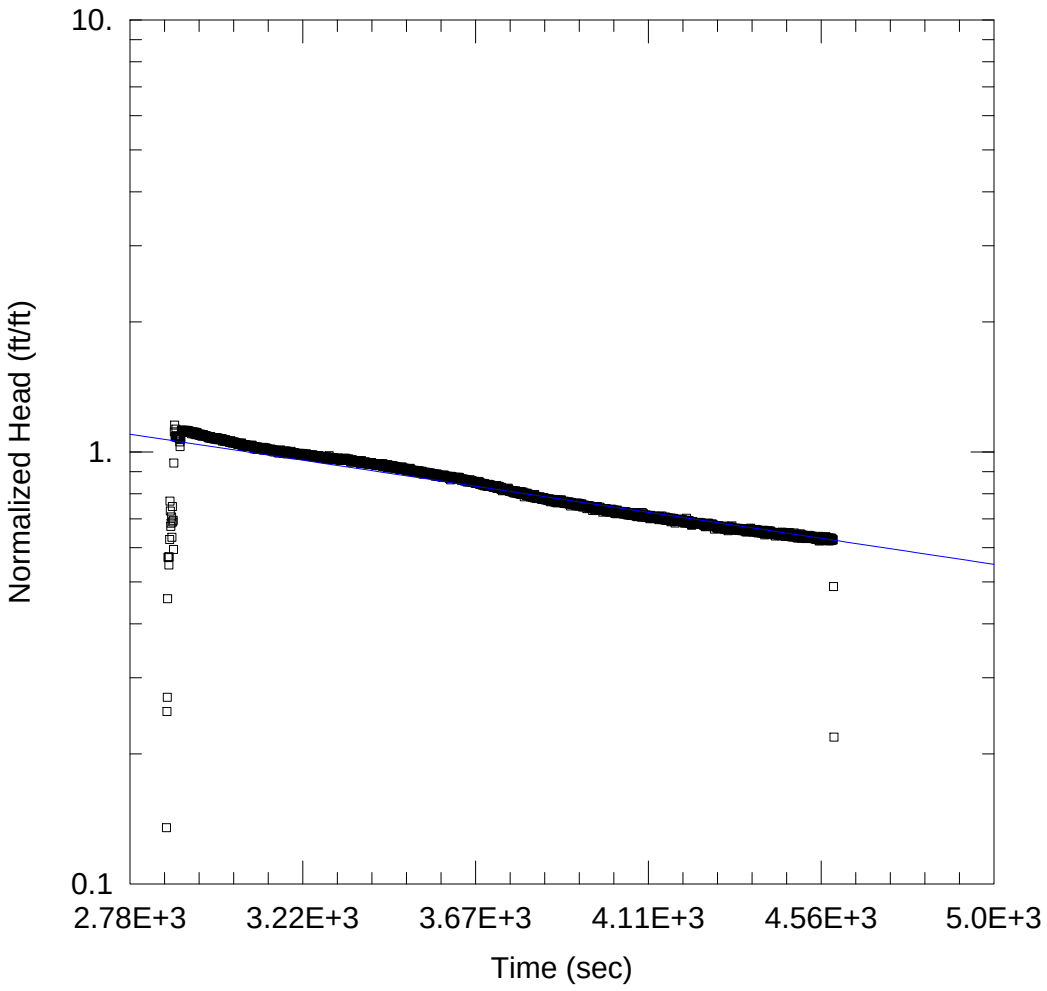
Observation Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

SOLUTION

Aquifer Model: Fractured Solution Method: Gringarten (Horizontal)

Kr = 0.009638 cm/sec Ss = 0.01911 ft^{-1}
Kz/Kr = 0.1 Rf = 1.005 ft



TEST 1

Data Set: C:\...\GT-25_Test 1.aqt
Date: 02/09/17 Time: 19:30:34

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-25
Test Date: 1/24/2017

AQUIFER DATA

Saturated Thickness: 32.5 ft Anisotropy Ratio (Kz/Kr): 1.

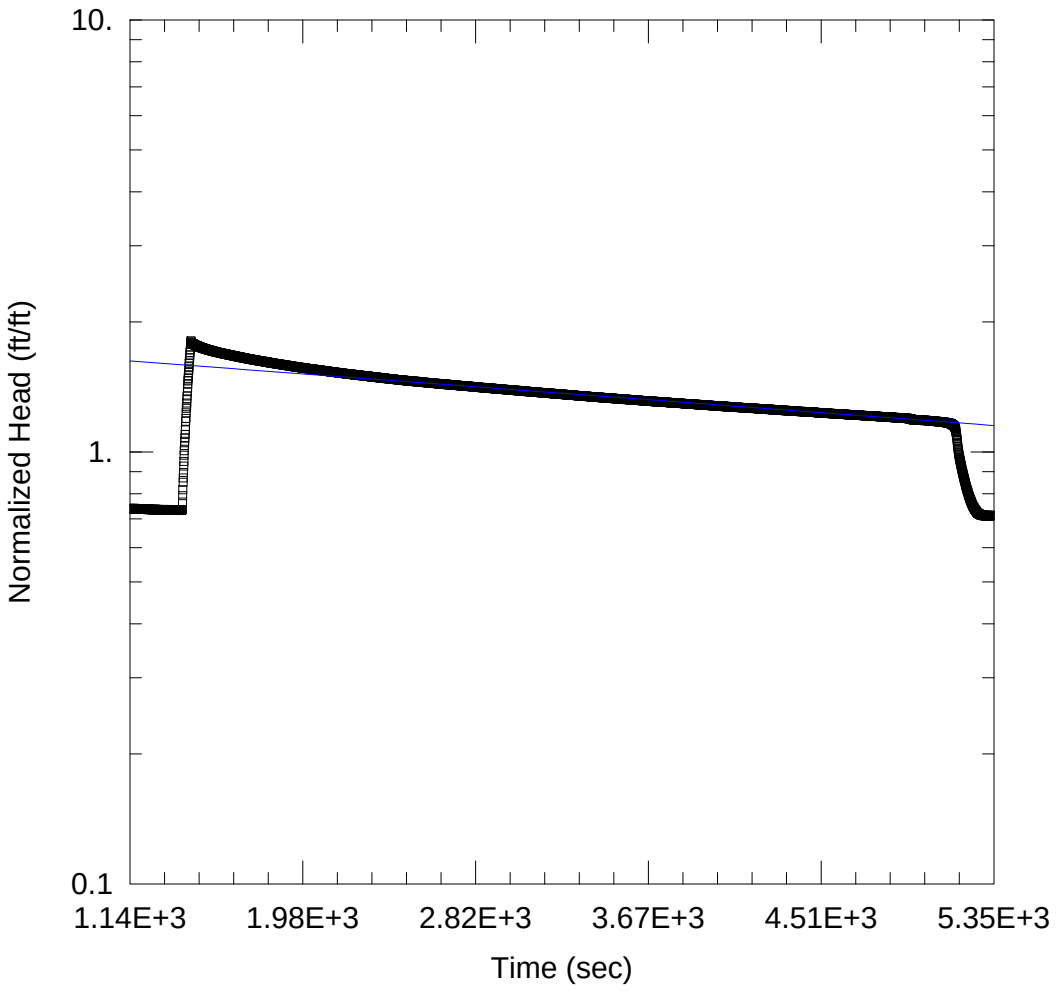
WELL DATA (New Well)

Initial Displacement: 5. ft
Total Well Penetration Depth: 32.5 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 31.6 ft
Screen Length: 32.5 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 1.504E-5 cm/sec
y0 = 13.09 ft



TEST 2

Data Set: C:\...\GT-25_Test 2.aqt
Date: 02/09/17 Time: 19:38:25

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-25
Test Date: 1/25/2017

AQUIFER DATA

Saturated Thickness: 60.55 ft Anisotropy Ratio (Kz/Kr): 1.

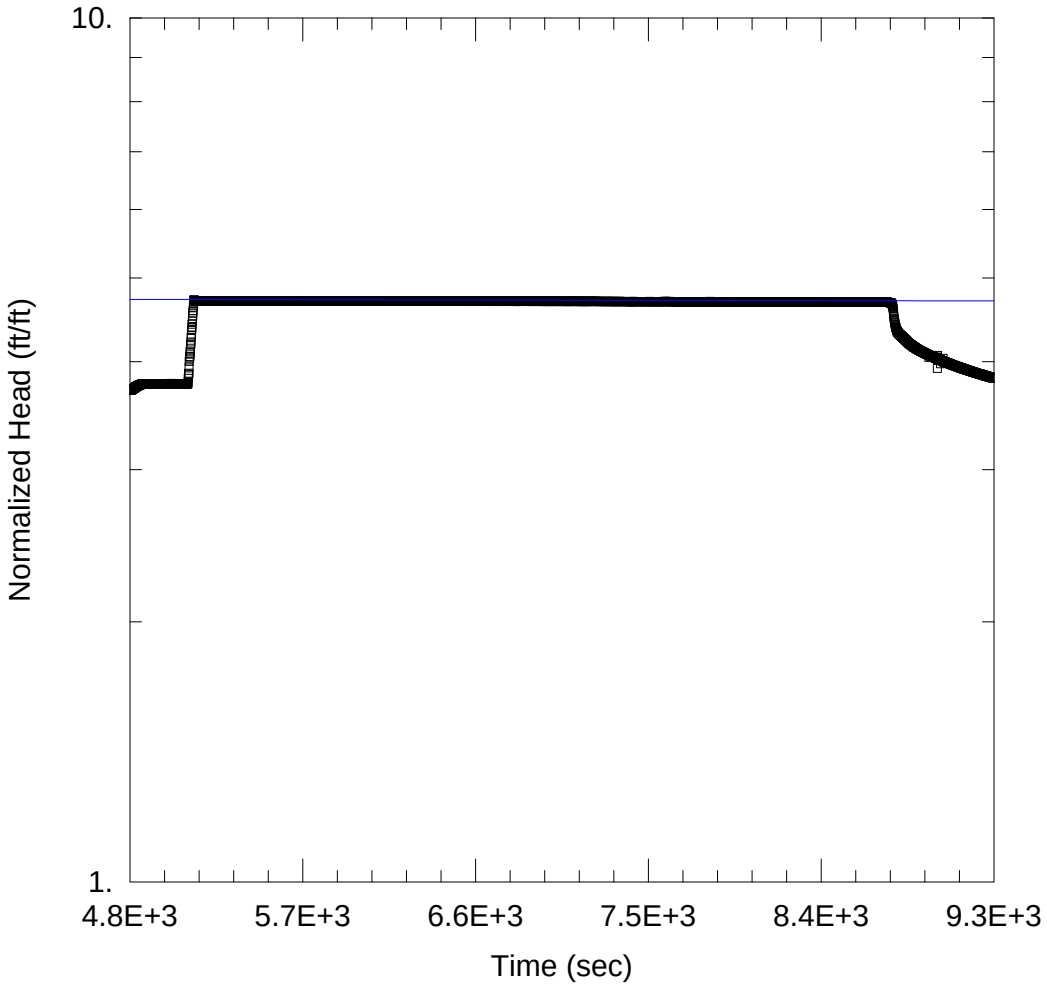
WELL DATA (New Well)

Initial Displacement: 25. ft
Total Well Penetration Depth: 73.35 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 73.35 ft
Screen Length: 60.55 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 2.489E-6 cm/sec
y0 = 44.56 ft



TEST 3

Data Set: C:\...\GT-25_Test 3.aqt
Date: 02/10/17 Time: 13:25:19

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-25
Test Date: 1/26/2017

AQUIFER DATA

Saturated Thickness: 155.6 ft Anisotropy Ratio (Kz/Kr): 1.

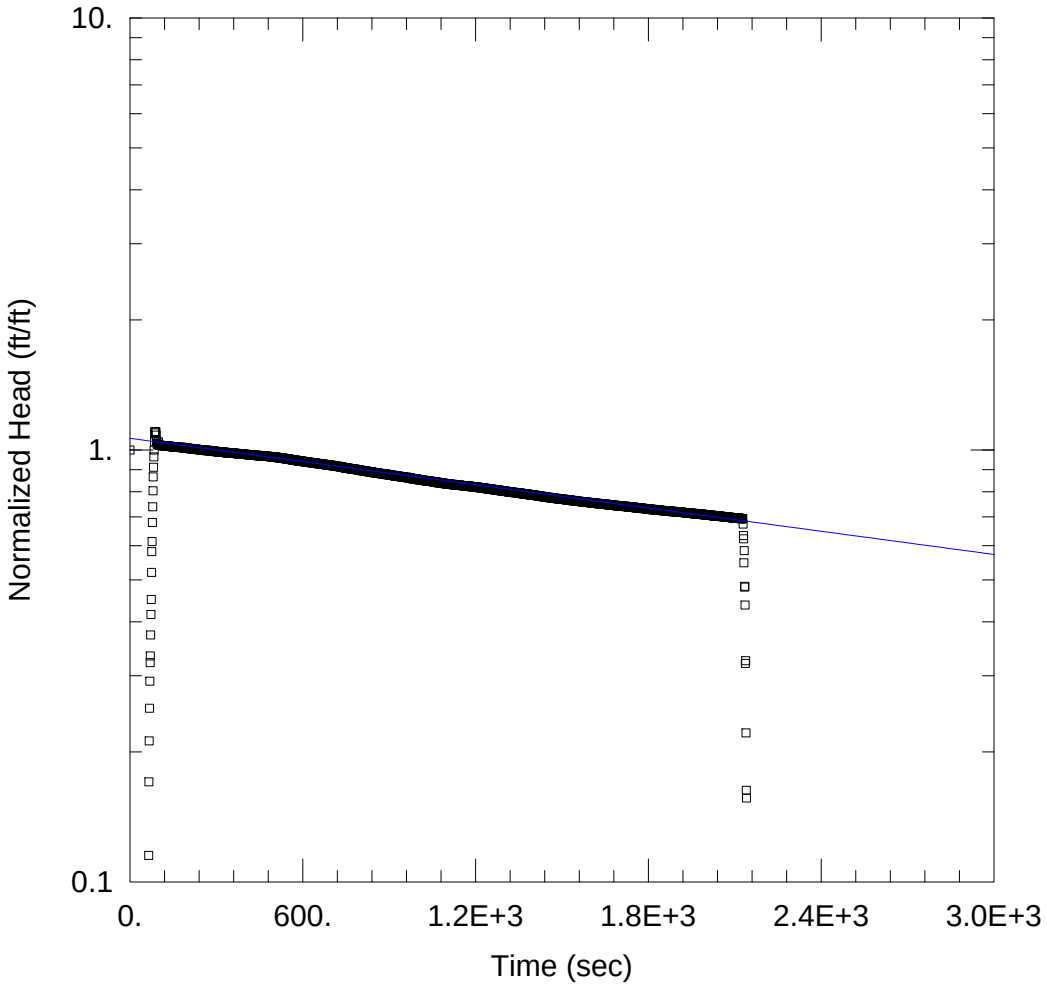
WELL DATA (New Well)

Initial Displacement: 22. ft
Total Well Penetration Depth: 234.2 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 234.2 ft
Screen Length: 155.6 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 1.395E-8 cm/sec
y0 = 104.4 ft



TEST 1

Data Set: C:\...\GT-34_Test 1.aqt
Date: 02/13/17 Time: 11:54:54

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-34
Test Date: 1/25/2017

AQUIFER DATA

Saturated Thickness: 30. ft Anisotropy Ratio (Kz/Kr): 1.

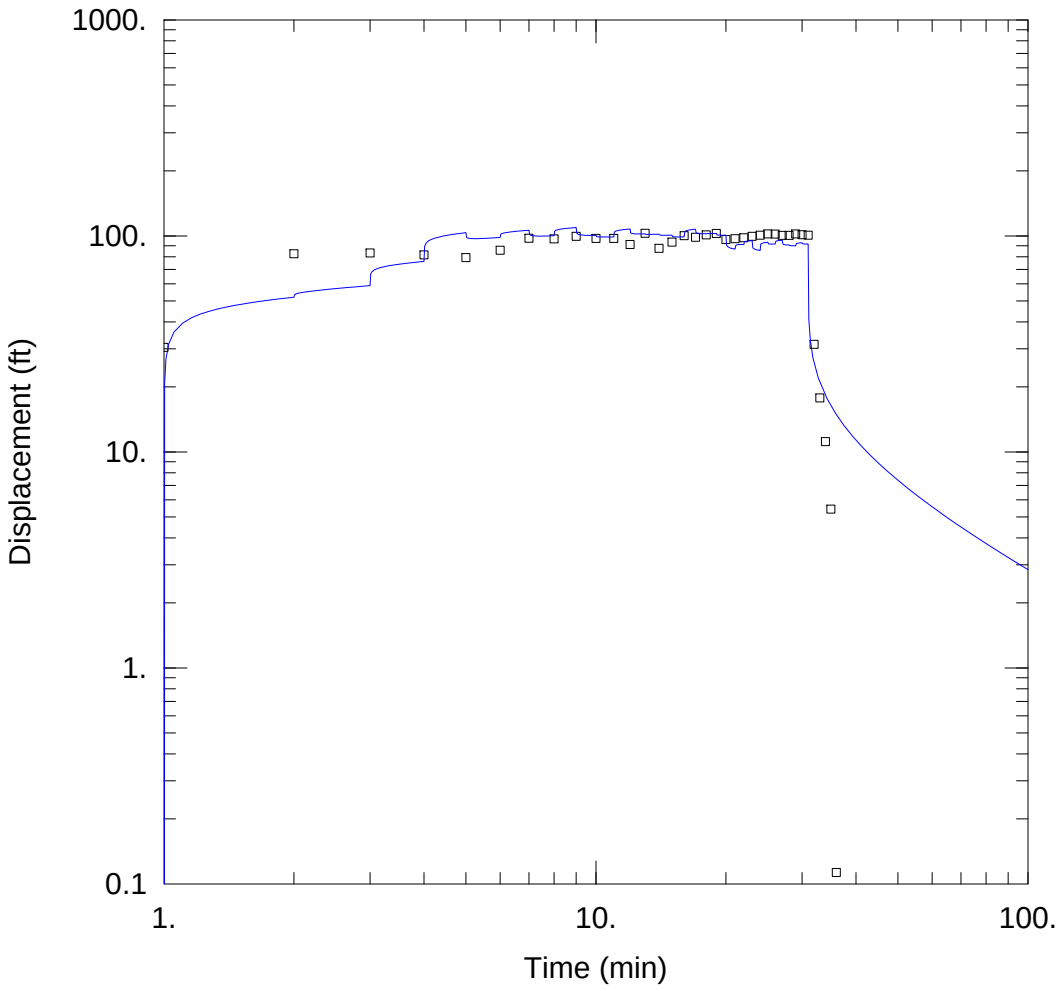
WELL DATA (New Well)

Initial Displacement: 16. ft
Total Well Penetration Depth: 30. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 12. ft
Screen Length: 30. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 1.057E-5 cm/sec
y0 = 17.02 ft



TEST 2

Data Set: C:\...\GT-34_Test 2.aqt
Date: 02/13/17 Time: 12:01:42

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-34
Test Date: 1/25/2017

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

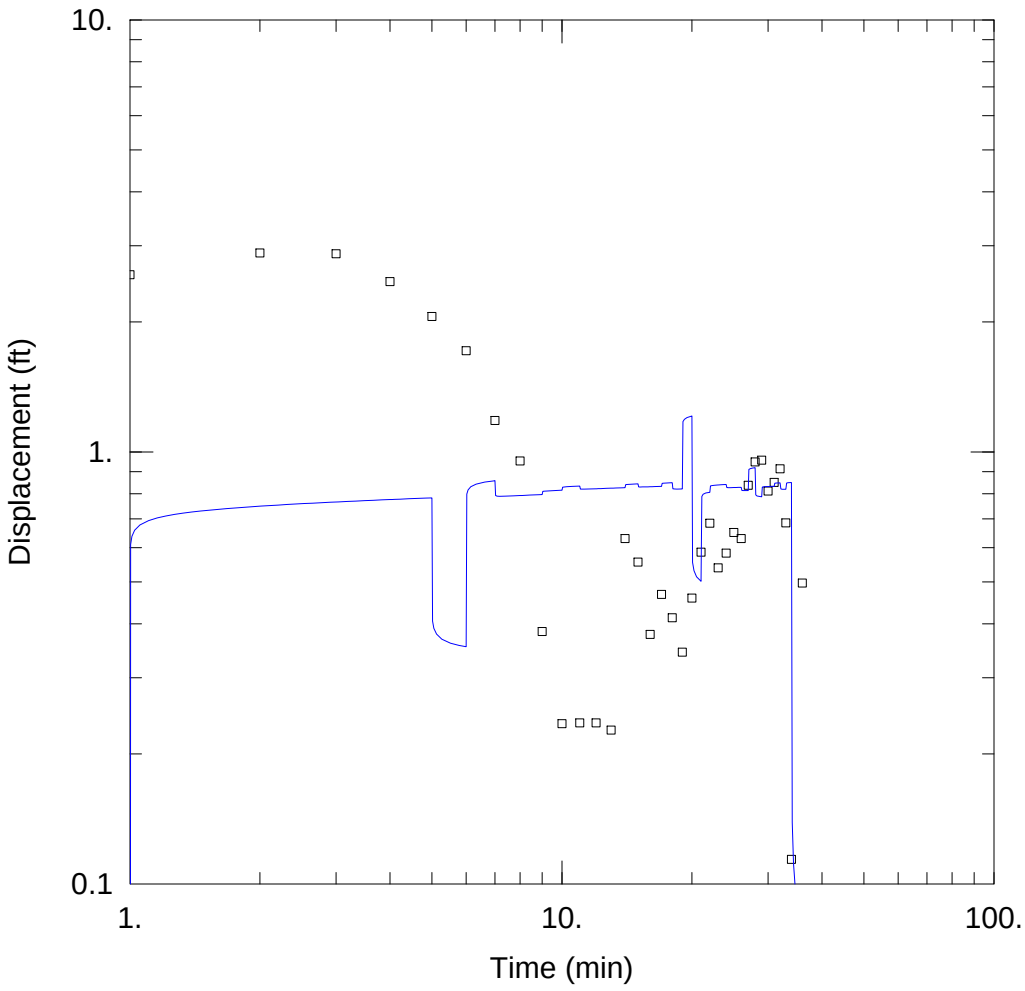
Observation Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.2073 cm^2/sec
S = 0.0001057
Kz/Kr = 1.
b = 44.15 ft



TEST 3

Data Set: C:\...\GT-34_Test 3.aqt
Date: 02/13/17 Time: 12:13:51

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-34
Test Date: 1/26/2017

AQUIFER DATA

Saturated Thickness: 48.25 ft Fracture Length: 1. ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

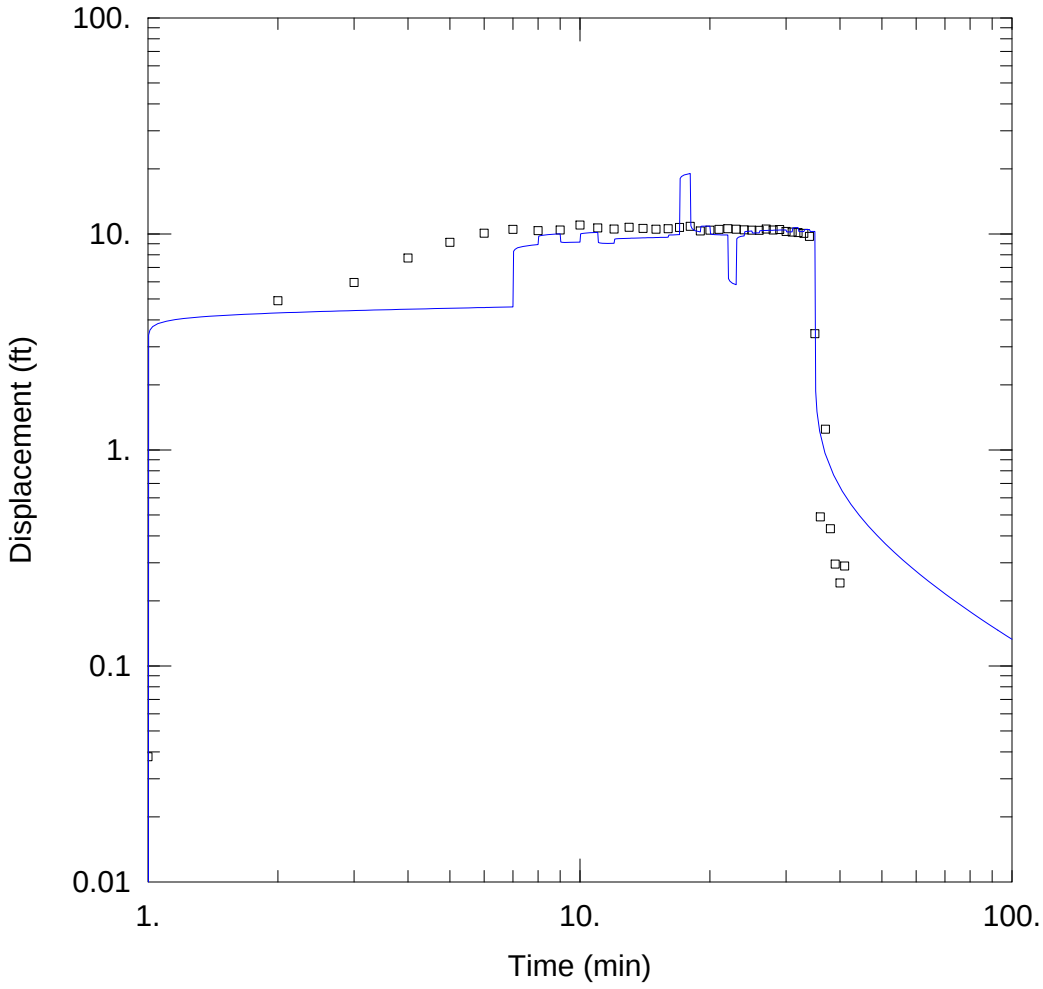
Observation Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

SOLUTION

Aquifer Model: Fractured Solution Method: Gringarten (Vertical)

Kx = 0.2863 cm/sec Ss = 2.073E-12 ft^{-1}
Ky/Kx = 0.1589 Lf = 1. ft



TEST 4

Data Set: C:\...\GT-34_Test 4.aqt
Date: 02/13/17 Time: 12:22:42

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-34
Test Date: 1/27/2017

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

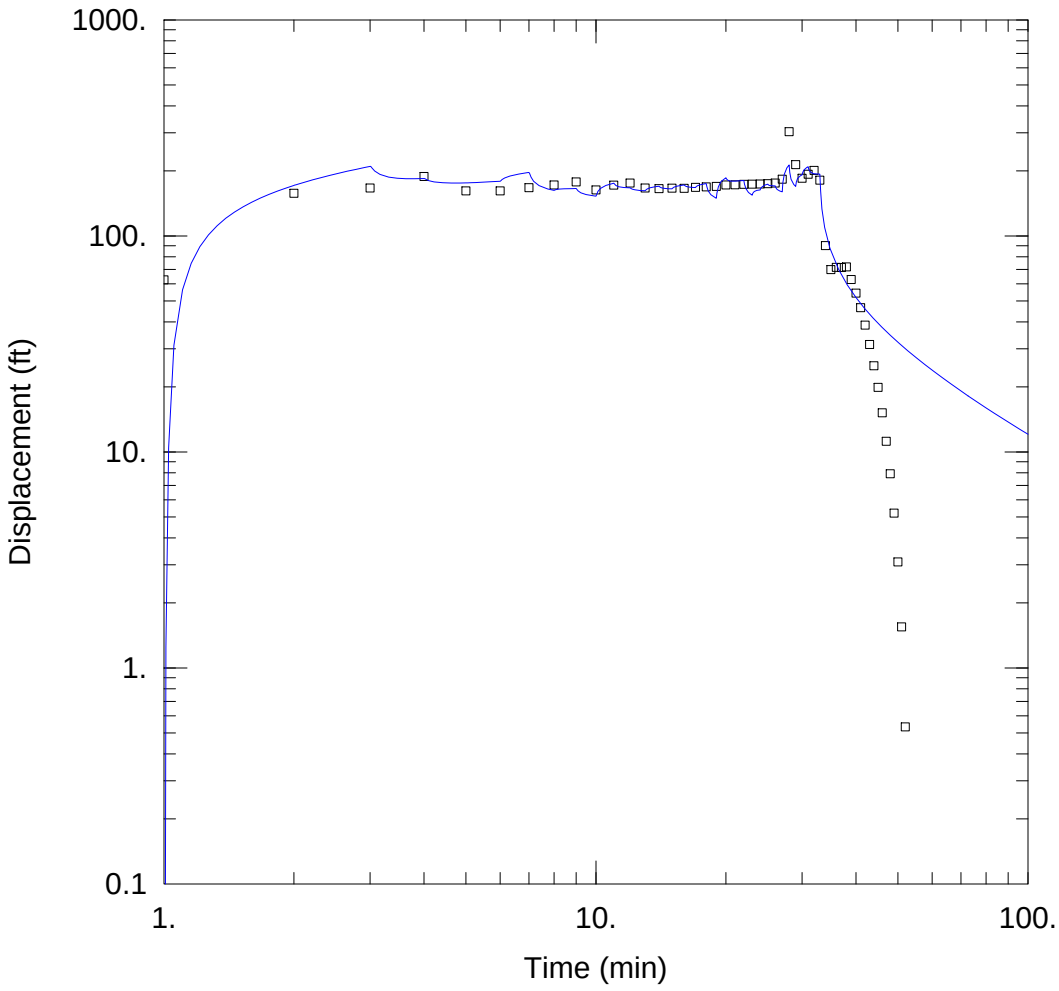
Observation Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 9.306 cm^2/sec
S = 1.0E-10
Kz/Kr = 1.
b = 49.55 ft



TEST 5

Data Set: C:\...\GT-34_Test 5.aqt
Date: 02/13/17 Time: 12:30:05

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-34
Test Date: 1/28/2017

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

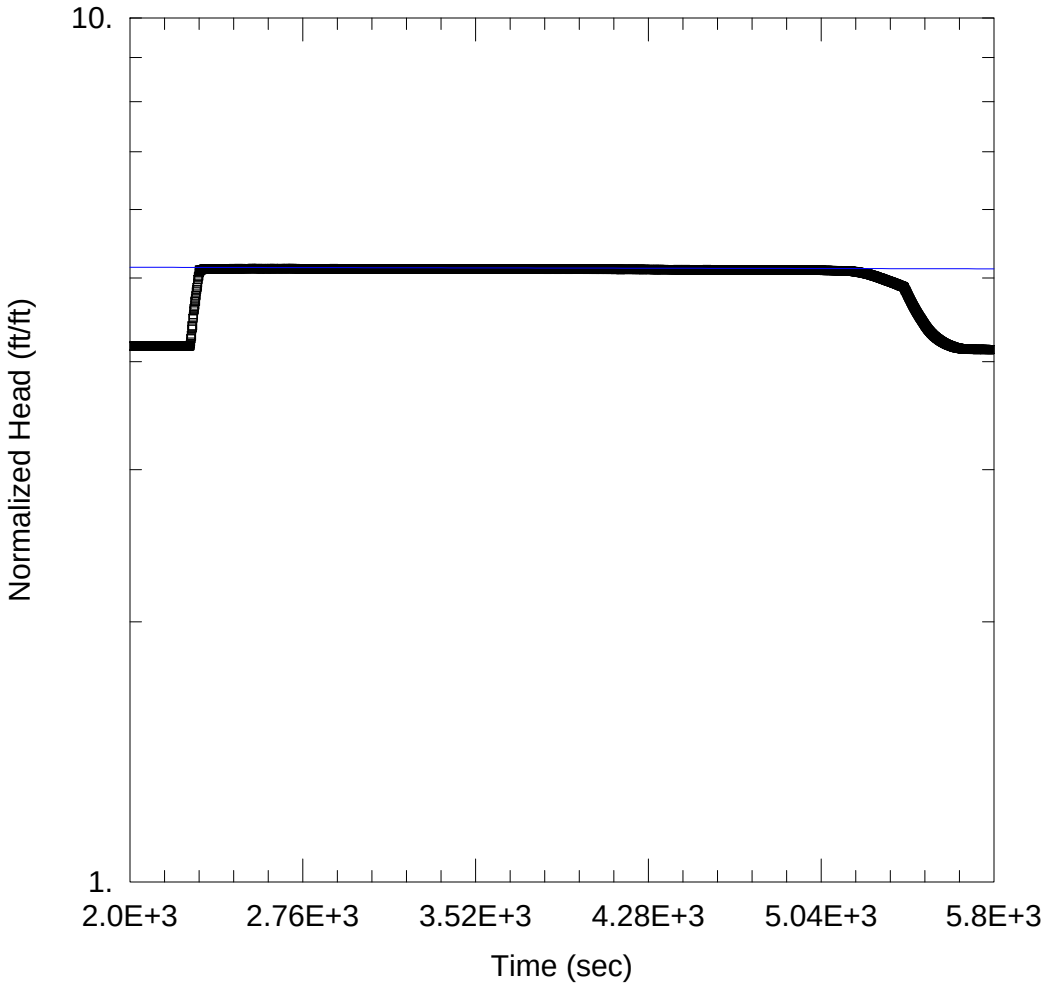
Observation Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.03647 cm^2/sec
S = 0.01059
Kz/Kr = 1.
b = 74.55 ft



TEST 6

Data Set: C:\...\GT-34_Test 6.aqt
Date: 02/13/17 Time: 12:35:29

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-34
Test Date: 1/28/2017

AQUIFER DATA

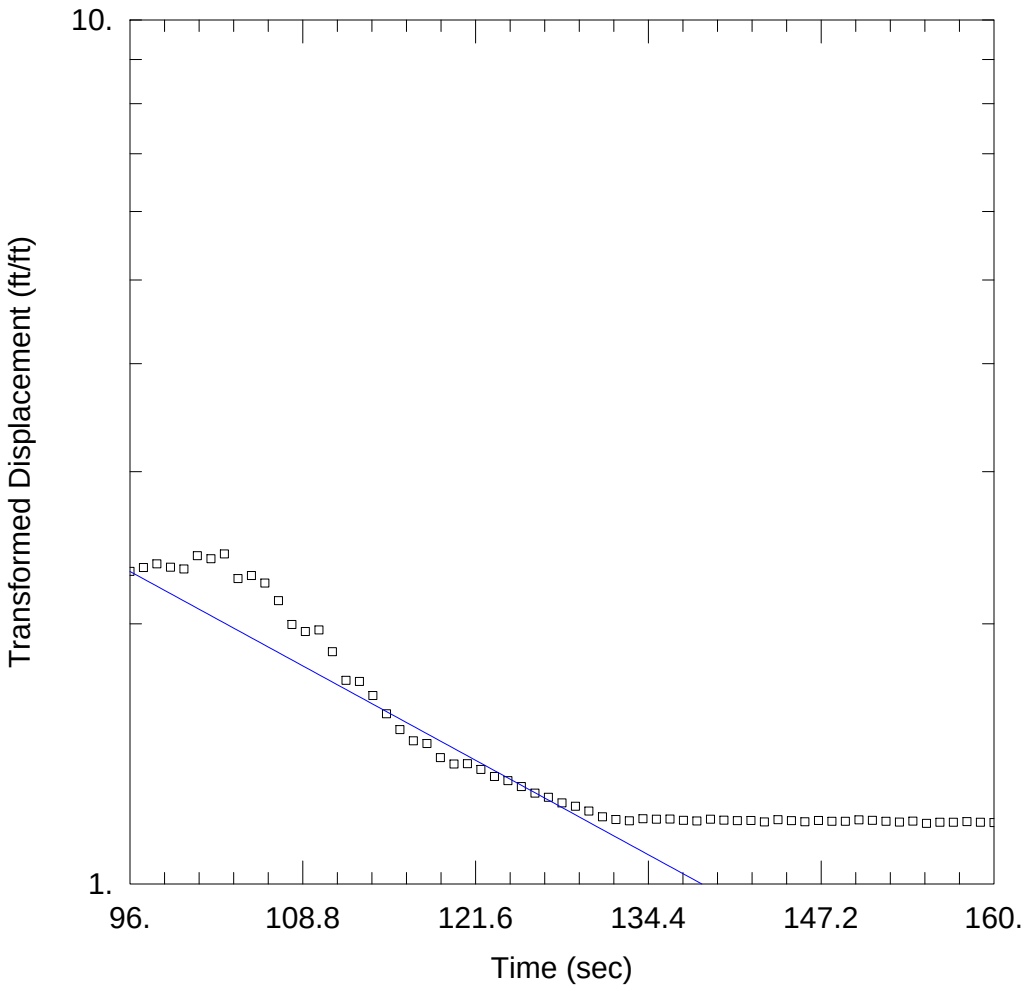
Saturated Thickness: 16.95 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 35. ft
Total Well Penetration Depth: 154.8 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 154.8 ft
Screen Length: 16.95 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 1.213E-7 cm/sec
y0 = 180.5 ft



TEST 1

Data Set: C:\...\GT-42_Test 1.aqt
Date: 02/10/17 Time: 16:02:19

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-42
Test Date: 1/28/2017

AQUIFER DATA

Saturated Thickness: 32.5 ft Anisotropy Ratio (Kz/Kr): 1.

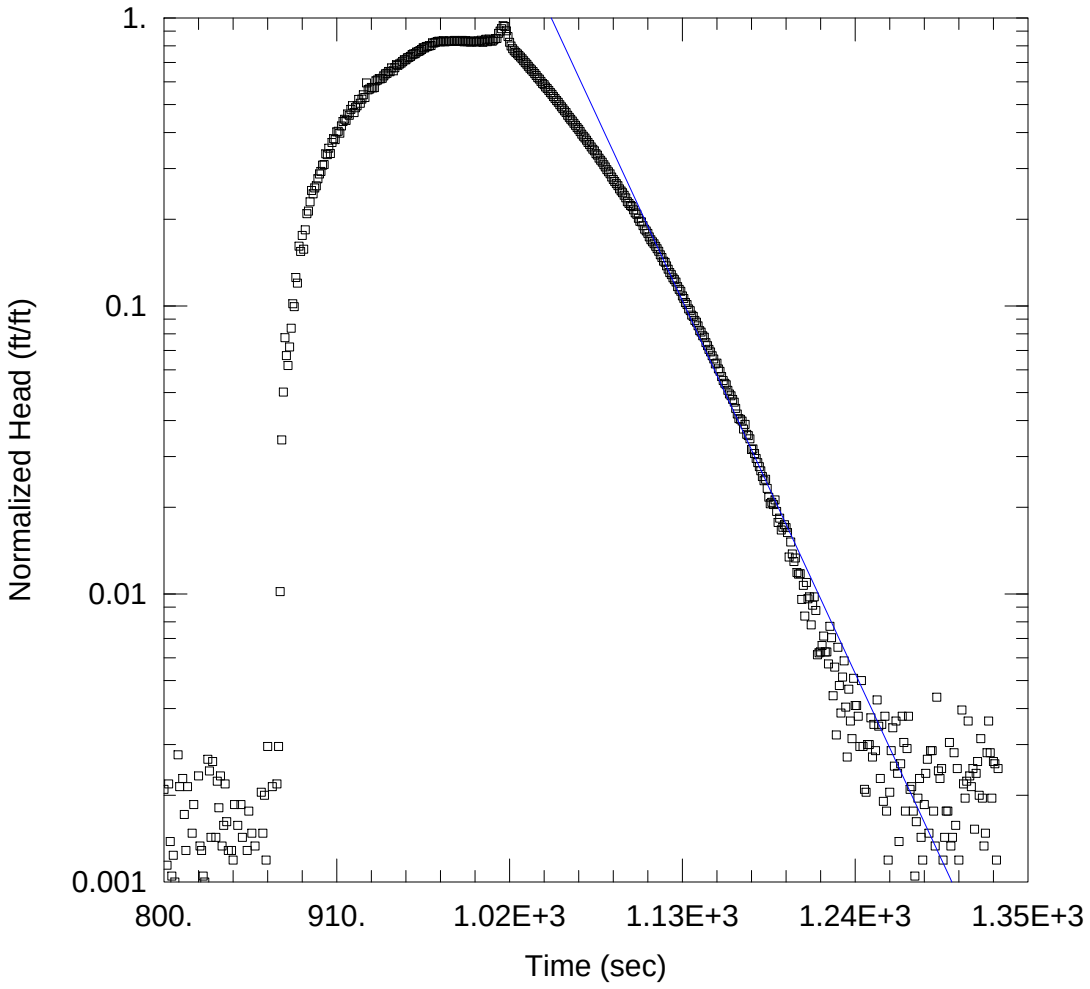
WELL DATA (New Well)

Initial Displacement: 8. ft
Total Well Penetration Depth: 32.5 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 16.1 ft
Screen Length: 32.5 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Dagan

K = 0.001101 cm/sec y0 = 44.23 ft



TEST 2

Data Set: C:\...\GT-42_Test 2.aqt
Date: 02/10/17 Time: 16:18:03

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-42
Test Date: 1/29/2017

AQUIFER DATA

Saturated Thickness: 23.25 ft Anisotropy Ratio (Kz/Kr): 1.

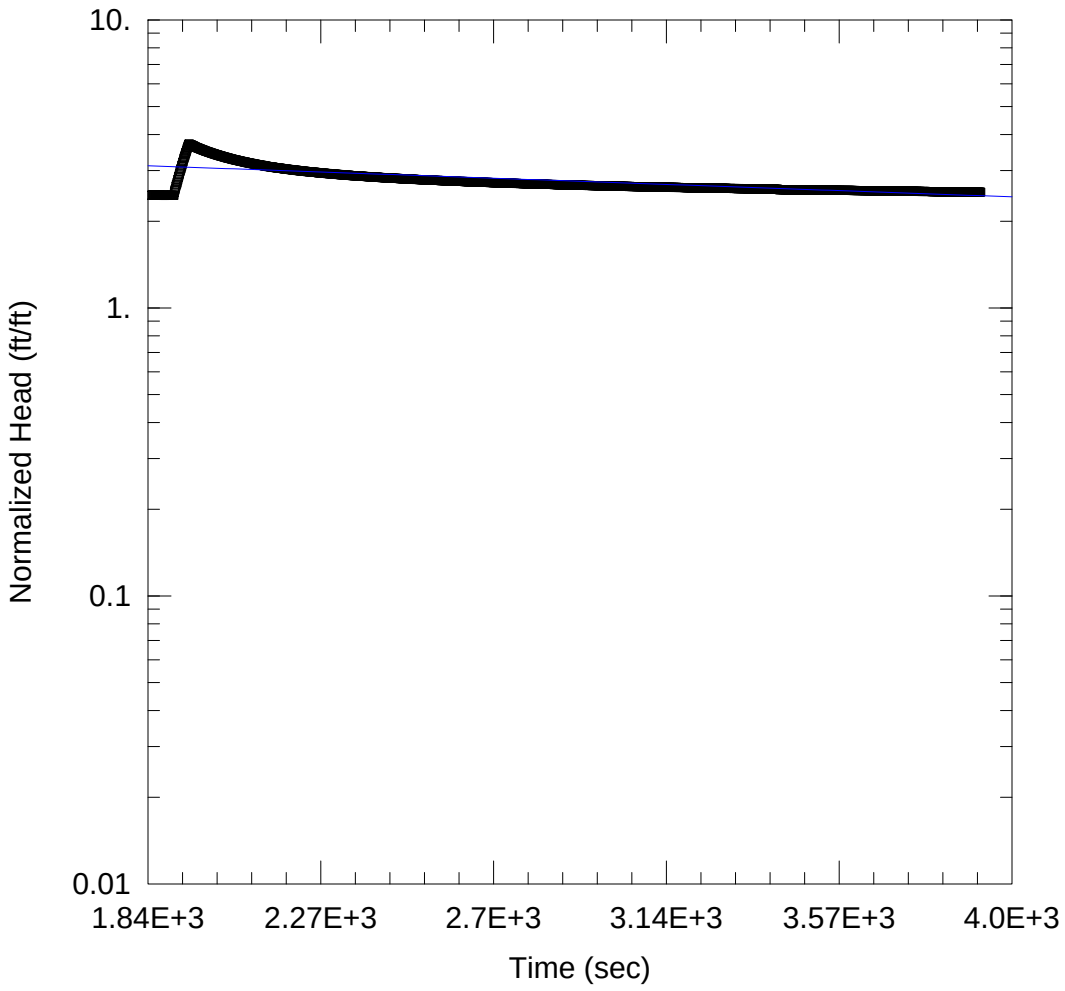
WELL DATA (New Well)

Initial Displacement: 21. ft
Total Well Penetration Depth: 41.6 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 41.6 ft
Screen Length: 23.25 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.002321 cm/sec
y0 = 4.295E+13 ft



TEST 3 SLUG

Data Set: C:\...\GT-42_Test 3_Slug.aqt
Date: 02/10/17 Time: 16:26:00

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-42
Test Date: 1/30/2017

AQUIFER DATA

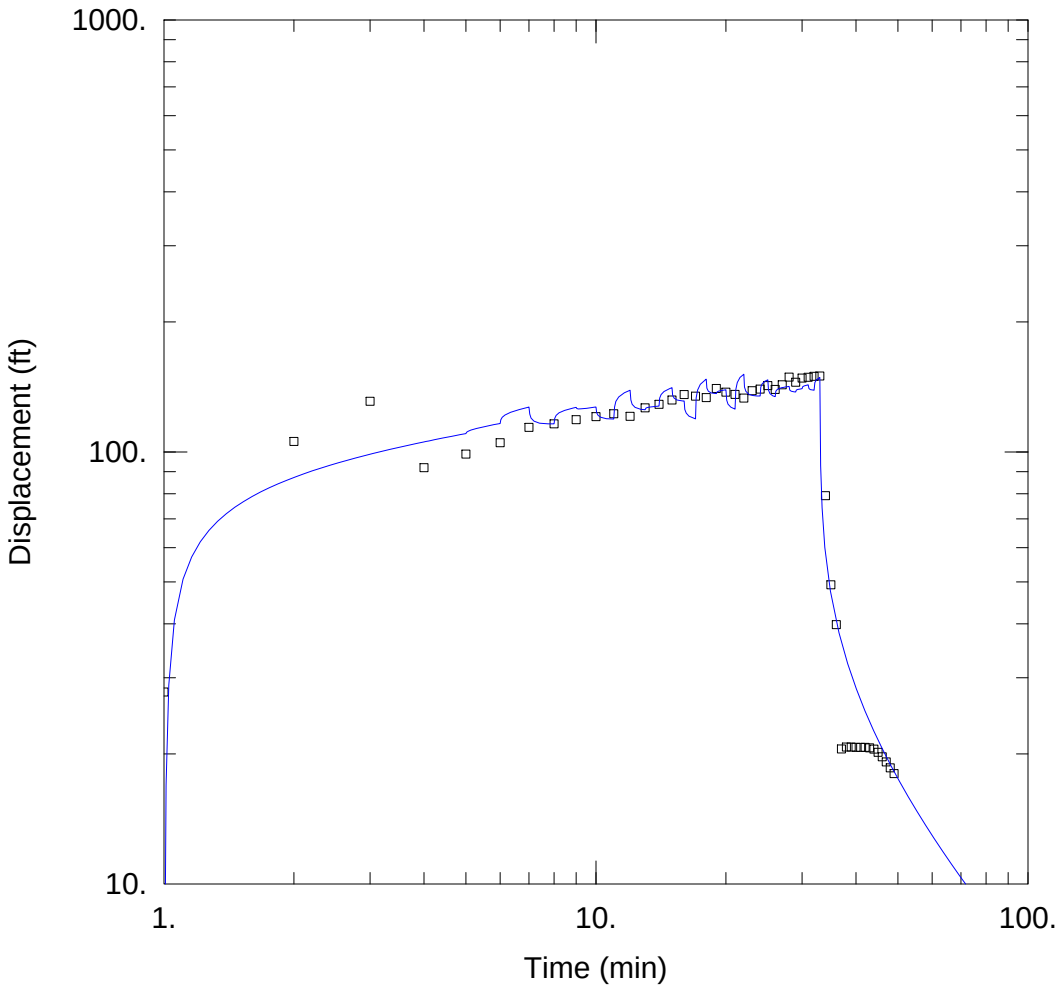
Saturated Thickness: 90.05 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 17. ft
Total Well Penetration Depth: 127.6 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 127.6 ft
Screen Length: 90.05 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 2.544E-6 cm/sec
y0 = 65.45 ft



TEST 3 CRI

Data Set: C:\...\GT-42_Test 3_CRI.aqt
Date: 02/10/17 Time: 16:34:38

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-42
Test Date: 1/30/2017

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

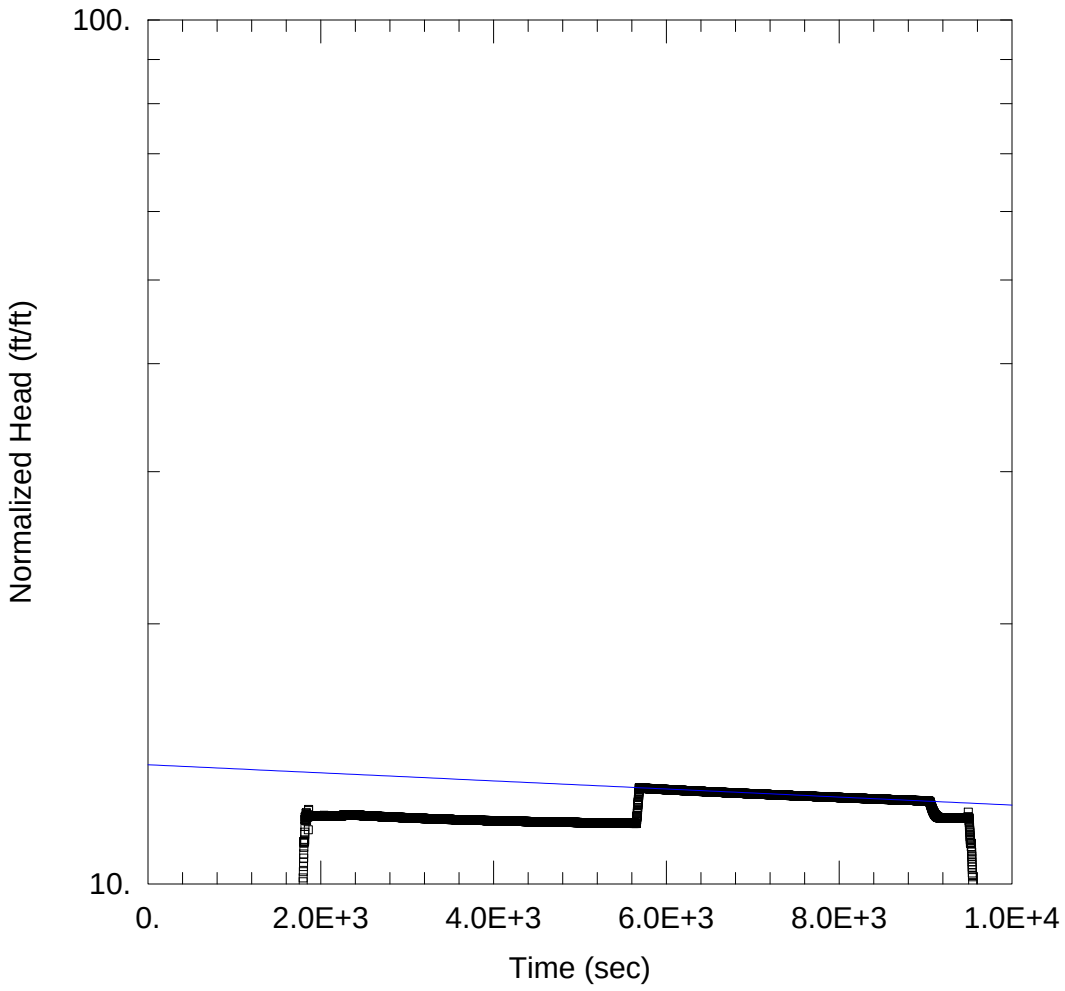
Observation Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.03575 cm^2/sec
S = 0.00109
Kz/Kr = 1.
b = 90.05 ft



TEST 4

Data Set: C:\...\GT-42_Test 4.aqt
Date: 02/17/17 Time: 10:16:17

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-42
Test Date: 1/31/2017

AQUIFER DATA

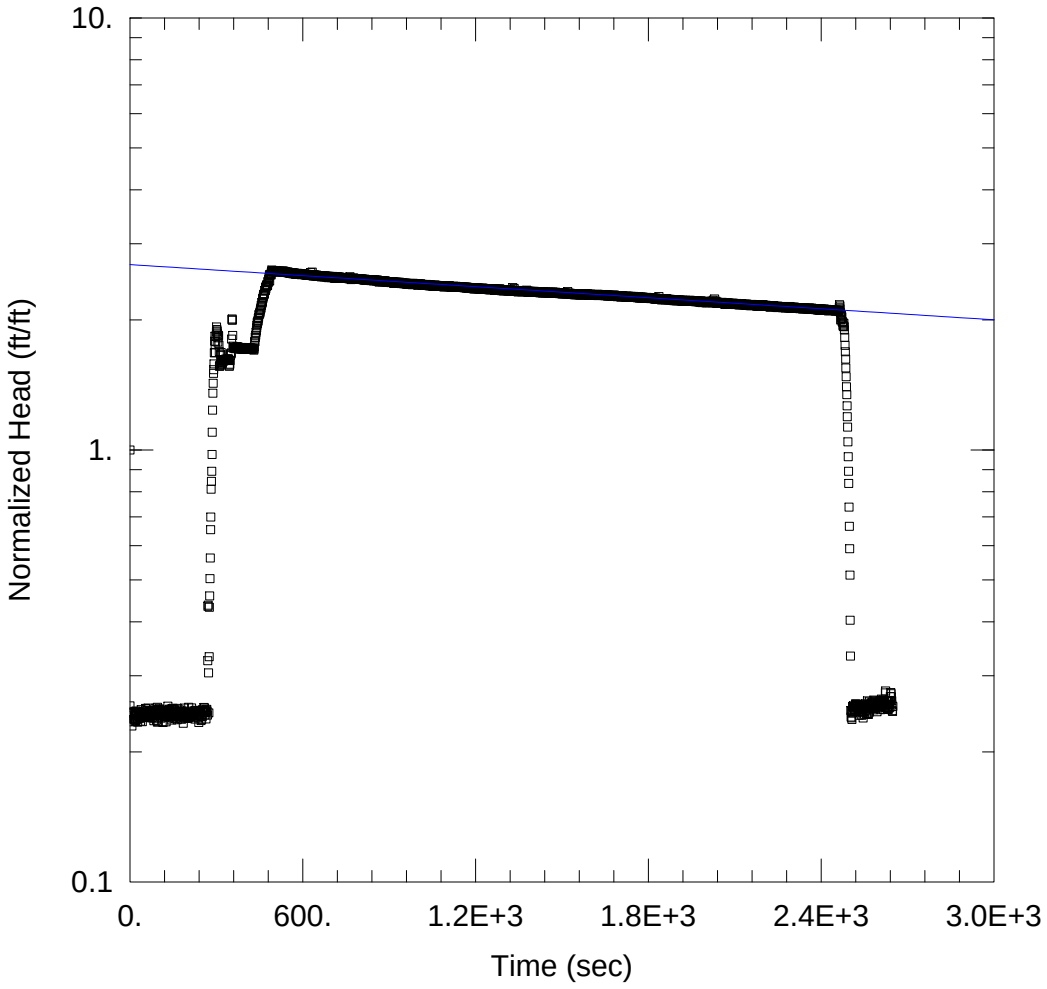
Saturated Thickness: 25.05 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 18. ft
Total Well Penetration Depth: 231.3 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 231.3 ft
Screen Length: 25.05 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 8.574E-7 cm/sec
y0 = 247.3 ft



TEST 1

Data Set: C:\...\GT-29_Test 1.aqt
Date: 02/13/17 Time: 11:05:58

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-29
Test Date: 1/30/2017

AQUIFER DATA

Saturated Thickness: 22. ft Anisotropy Ratio (Kz/Kr): 1.

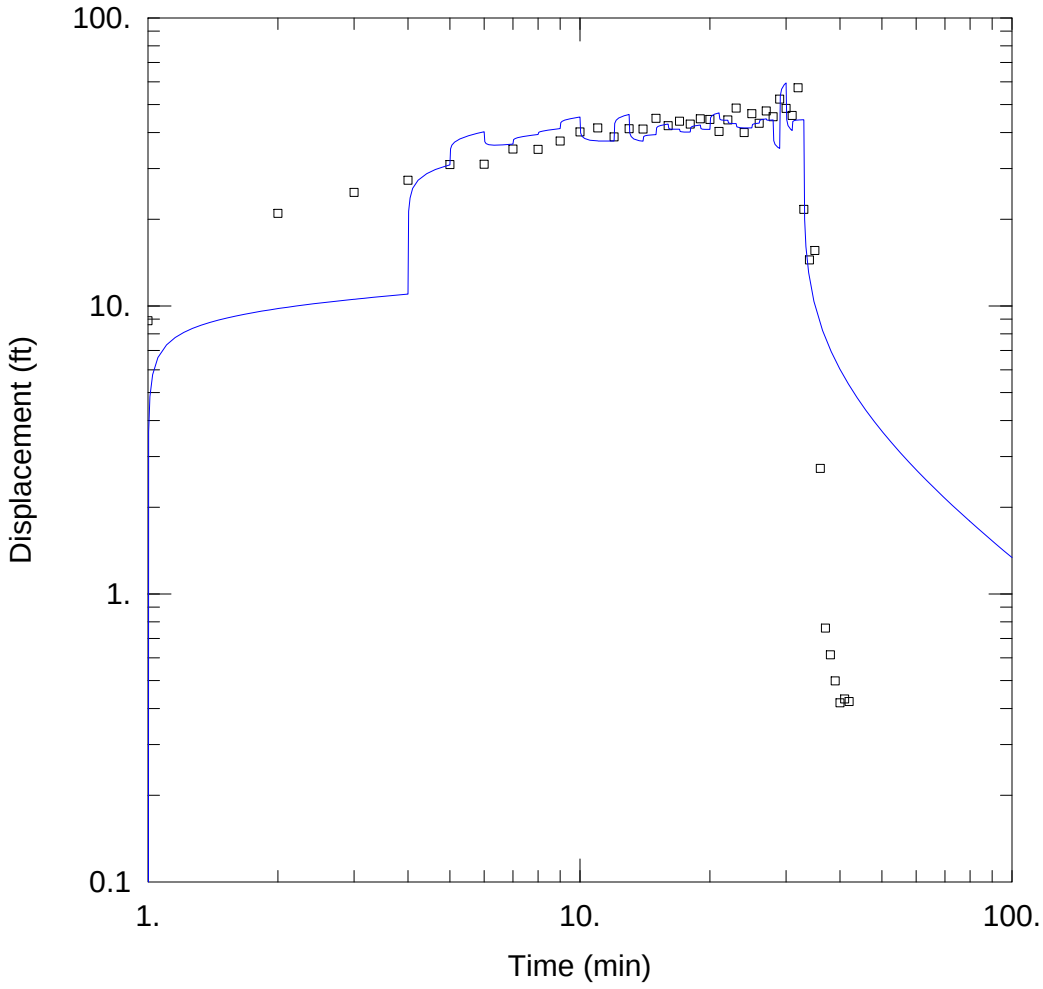
WELL DATA (New Well)

Initial Displacement: 8. ft
Total Well Penetration Depth: 22. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 15. ft
Screen Length: 22. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 6.407E-6 cm/sec
y0 = 21.48 ft



TEST 2

Data Set: C:\...\GT-29_Test 2.aqt
Date: 02/13/17 Time: 11:12:46

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-29
Test Date: 1/31/2017

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

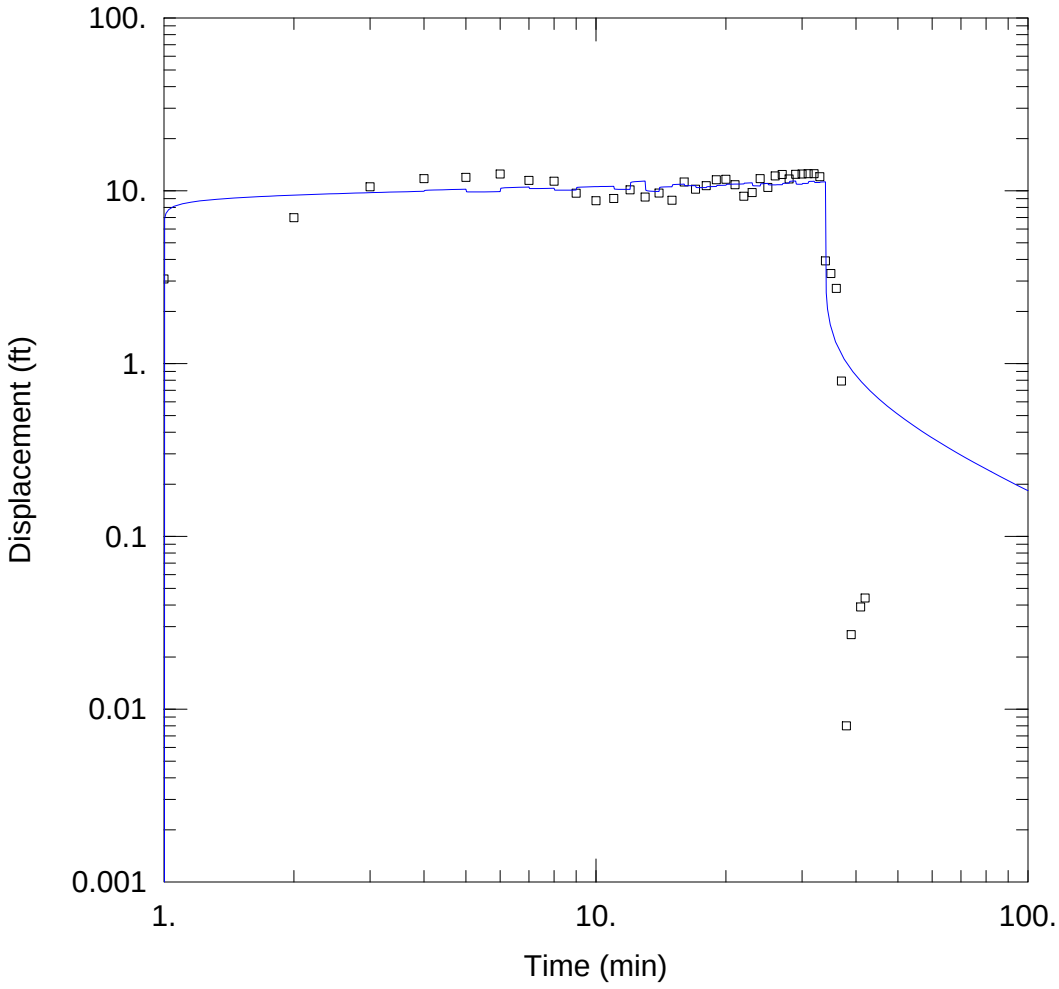
Observation Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.6791 cm^2/sec
S = 0.0005087
Kz/Kr = 1.
b = 29.85 ft



TEST 3

Data Set: C:\...\GT-29_Test 3.aqt
Date: 02/13/17 Time: 11:19:47

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-29
Test Date: 1/31/2017

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

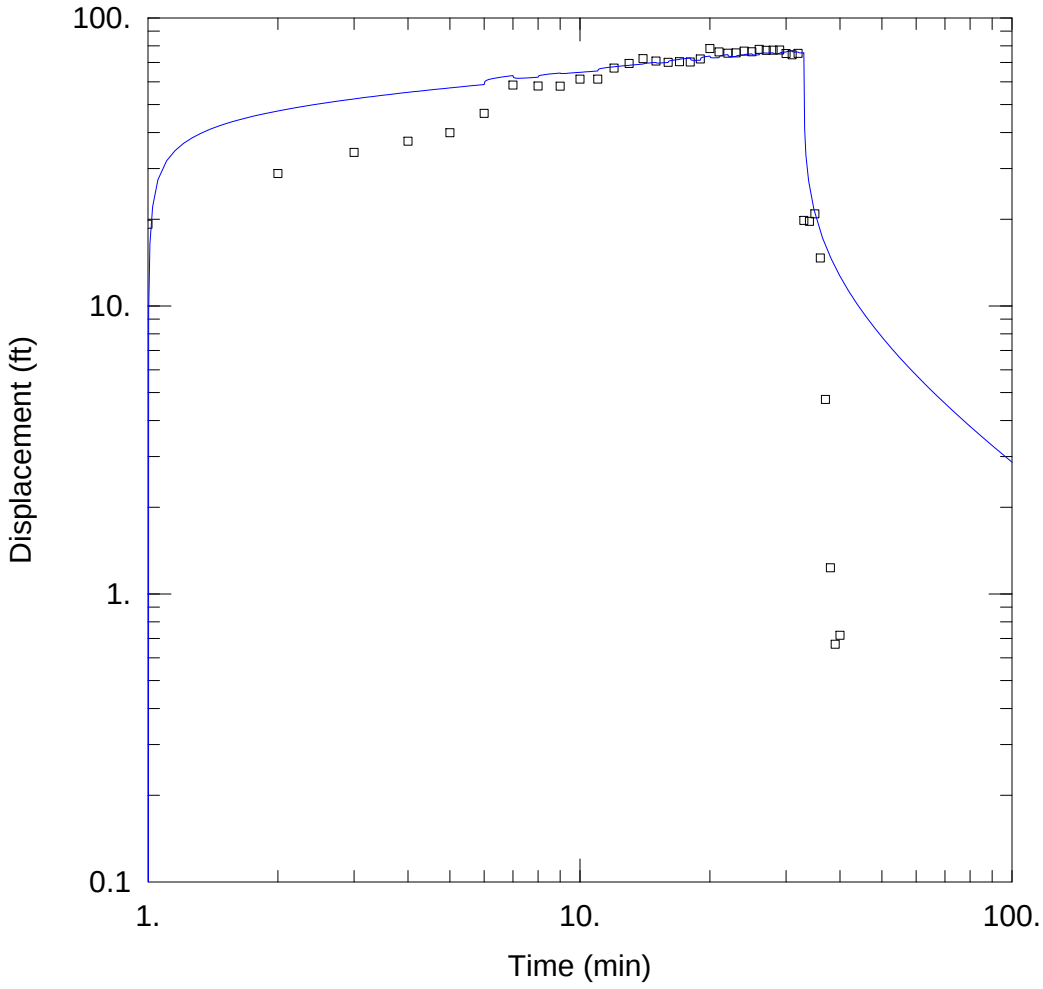
Observation Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 8.095 cm^2/sec
S = 3.929E-8
Kz/Kr = 1.
b = 69.05 ft



TEST 4B CRI

Data Set: C:\...\GT-29_Test 4b.aqt
Date: 02/13/17 Time: 11:41:01

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-29
Test Date: 2/1/2017

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

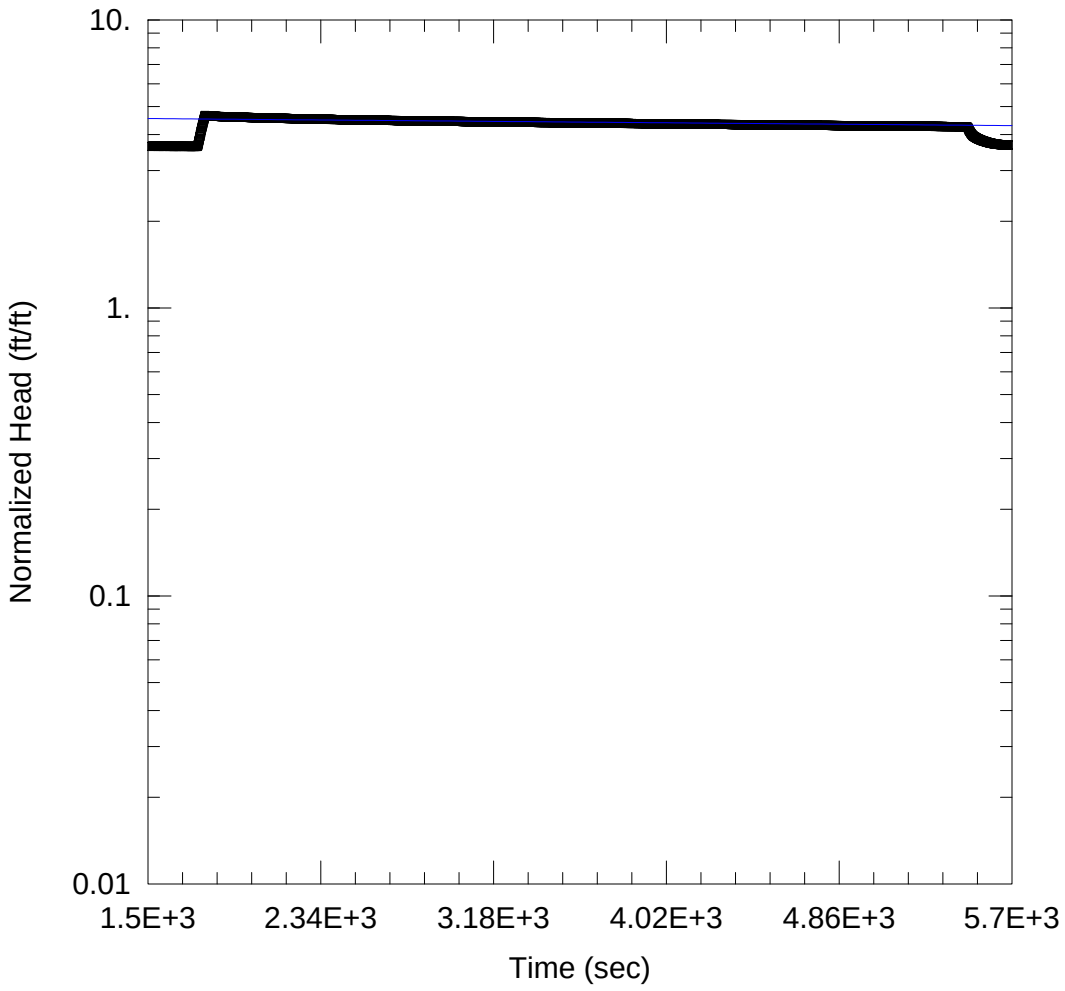
Observation Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.3677 cm^2/sec
Kz/Kr = 0.1
S = 0.002304
b = 69.05 ft



TEST 5

Data Set: C:\...\GT-29_Test 5.aqt
Date: 02/13/17 Time: 11:47:43

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-29
Test Date: 2/1/2017

AQUIFER DATA

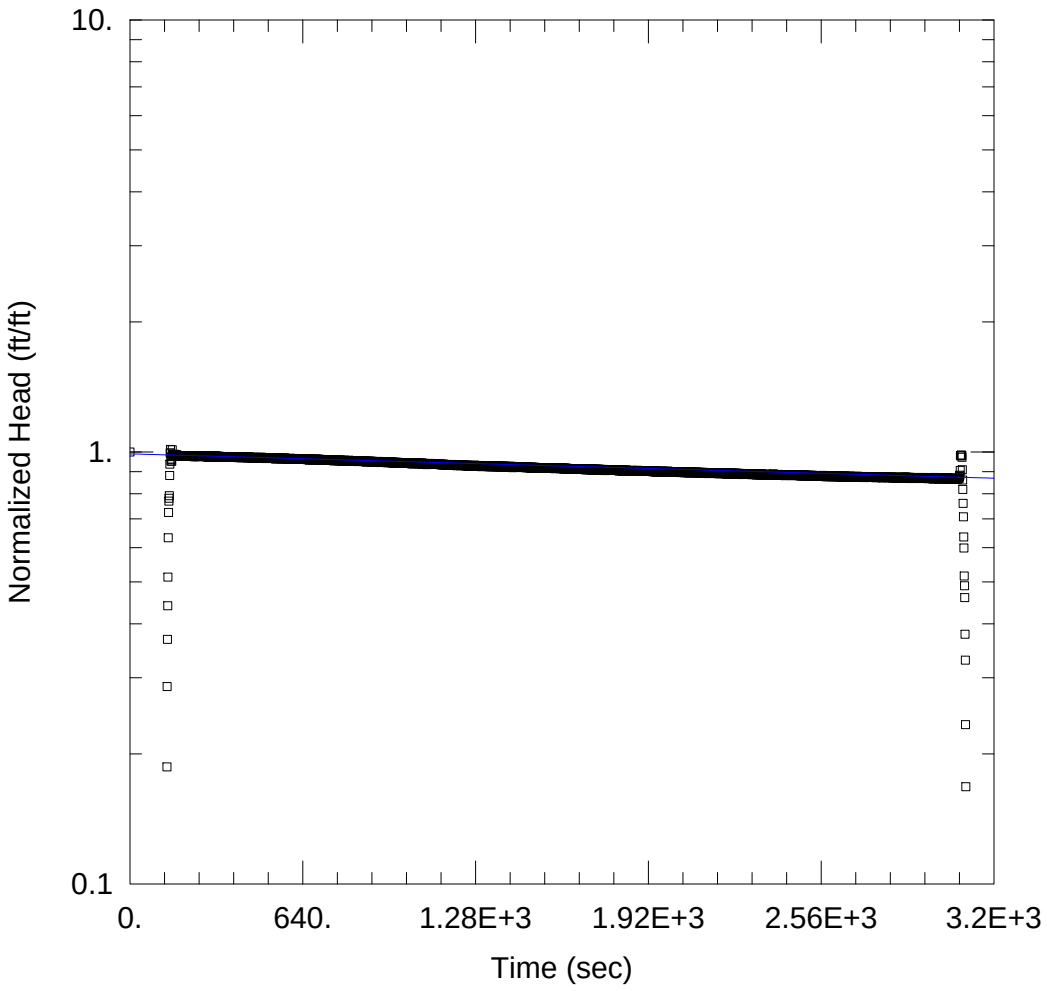
Saturated Thickness: 98.55 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 37. ft
Total Well Penetration Depth: 221.3 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 221.3 ft
Screen Length: 98.55 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 3.016E-7 cm/sec
y0 = 171.6 ft



TEST 1

Data Set: C:\...\GT-27_Test 1.aqt
Date: 02/13/17 Time: 10:18:30

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-27
Test Date: 2/3/2017

AQUIFER DATA

Saturated Thickness: 19. ft Anisotropy Ratio (Kz/Kr): 1.

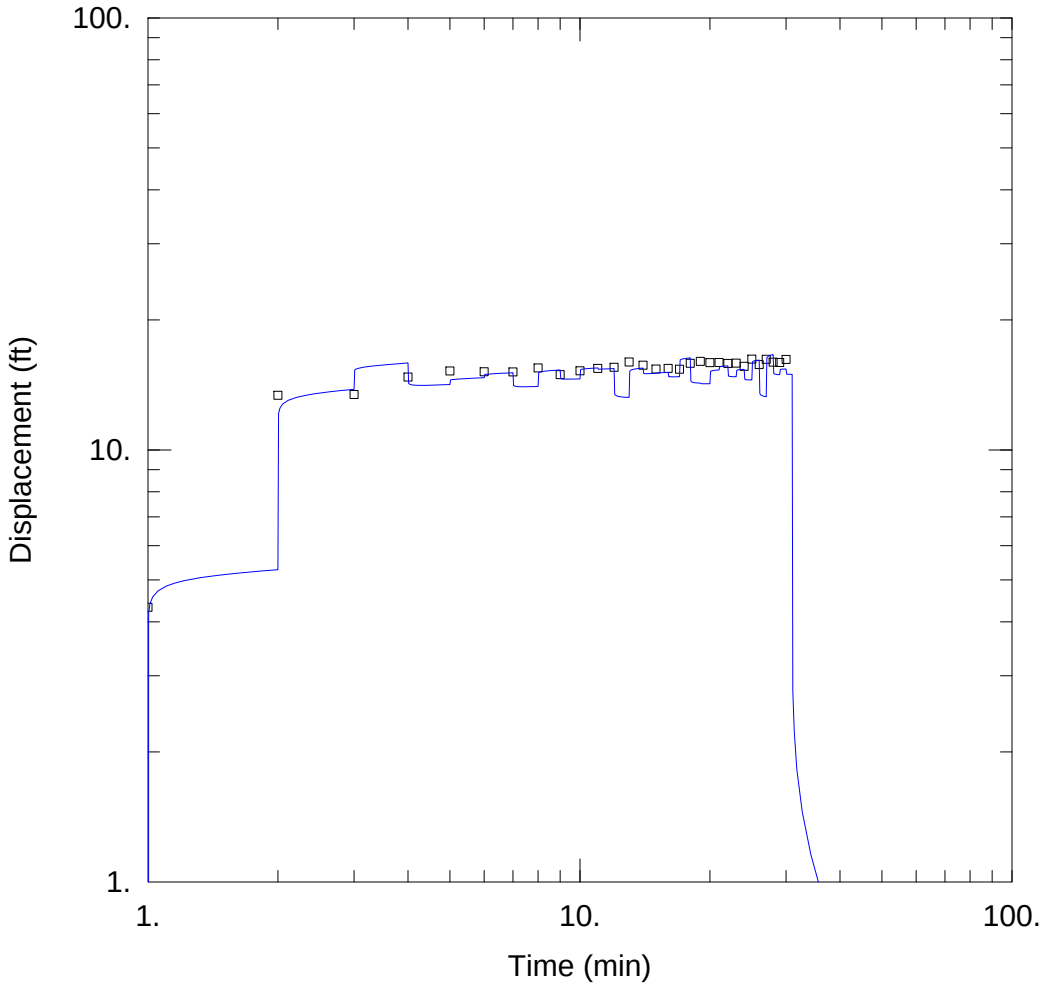
WELL DATA (New Well)

Initial Displacement: 14. ft
Total Well Penetration Depth: 19. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 0. ft
Screen Length: 19. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 2.968E-6 cm/sec
y0 = 13.86 ft



TEST 2

Data Set: C:\...\GT-27_Test 2.aqt
Date: 02/13/17 Time: 10:32:08

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-27
Test Date: 2/3/2017

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

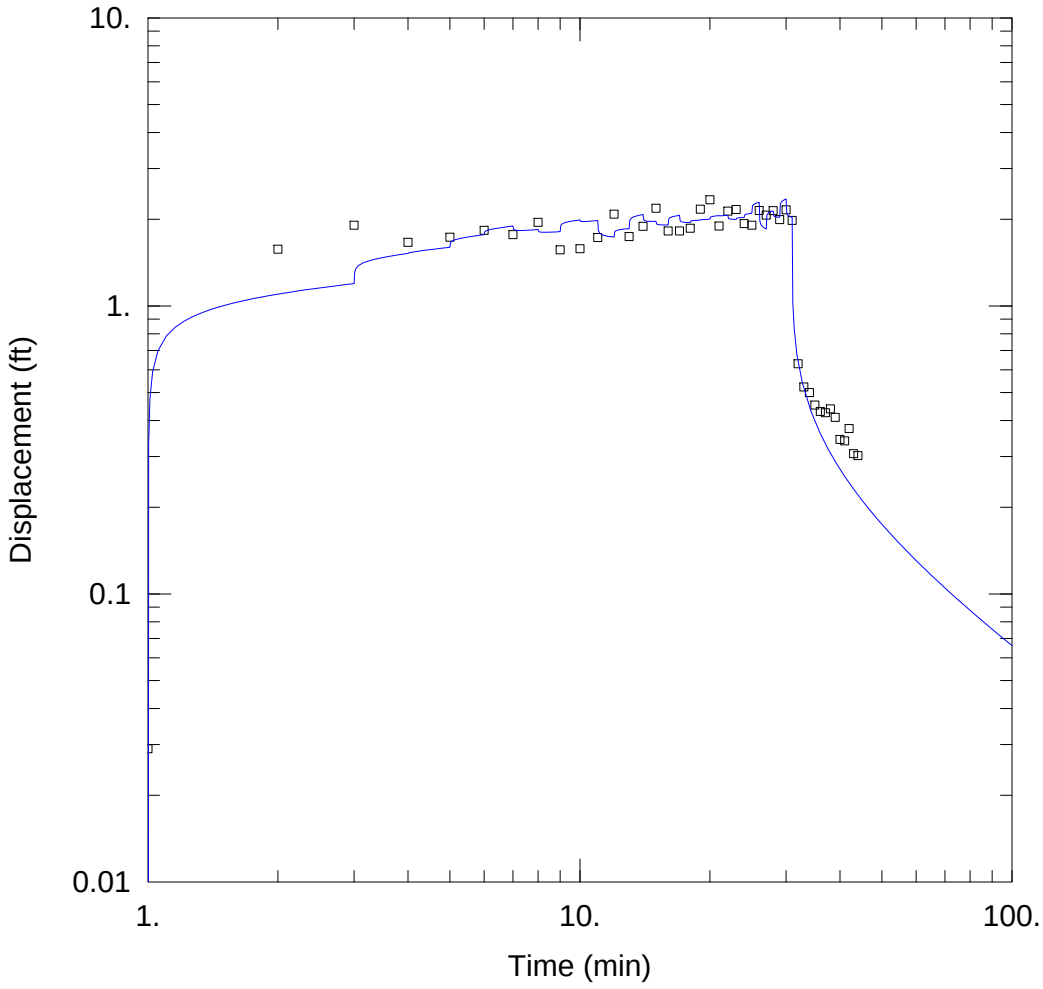
Observation Wells

Well Name	X (ft)	Y (ft)
▫ New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 10.77 cm^2/sec
Kz/Kr = 1.
S = 1.0E-10
b = 22.05 ft



TEST 3

Data Set: C:\...\GT-27_Test 3.aqt
Date: 02/13/17 Time: 10:41:08

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-27
Test Date: 2/4/2017

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

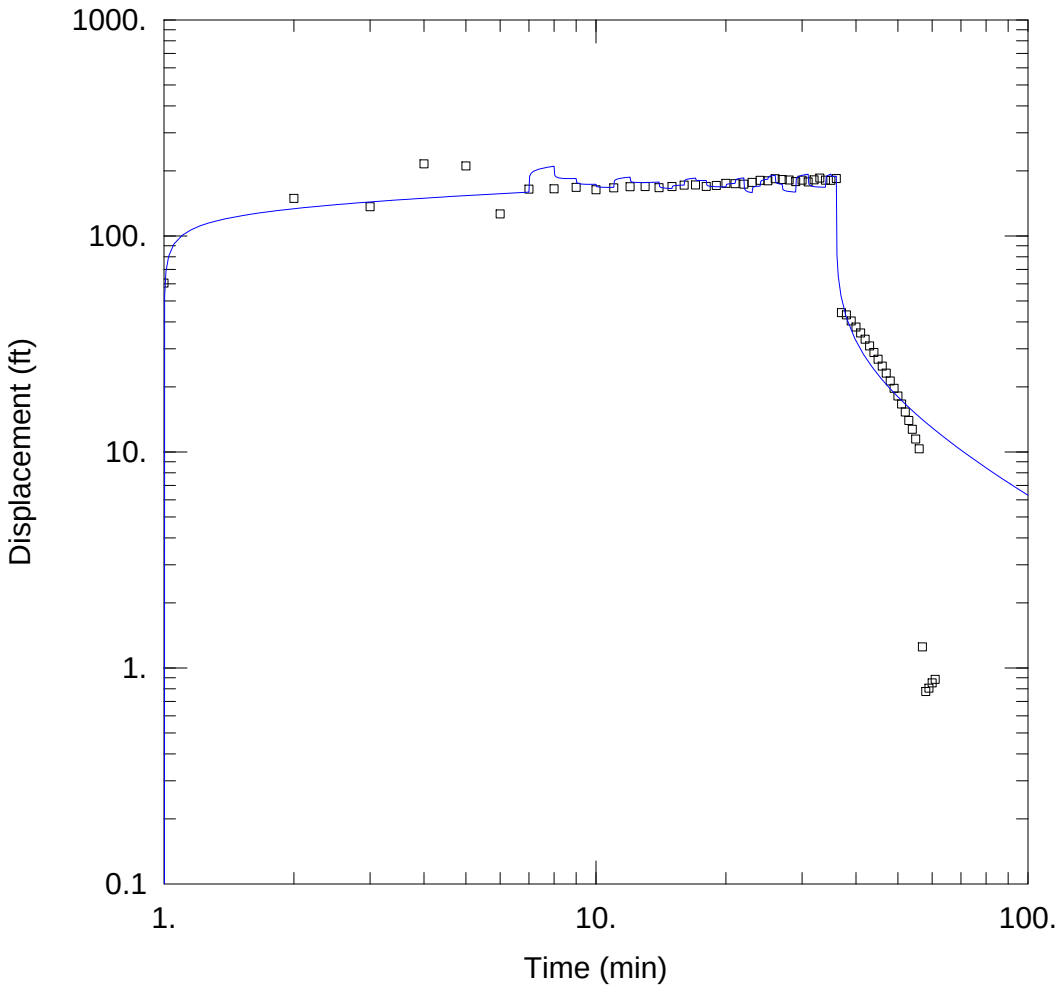
Observation Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 27.67 cm^2/sec
S = 0.05686
Kz/Kr = 1.
b = 59.05 ft



TEST 4

Data Set: C:\...\GT-27_Test 4.aqt
Date: 02/13/17 Time: 10:51:27

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-27
Test Date: 2/5/2017

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

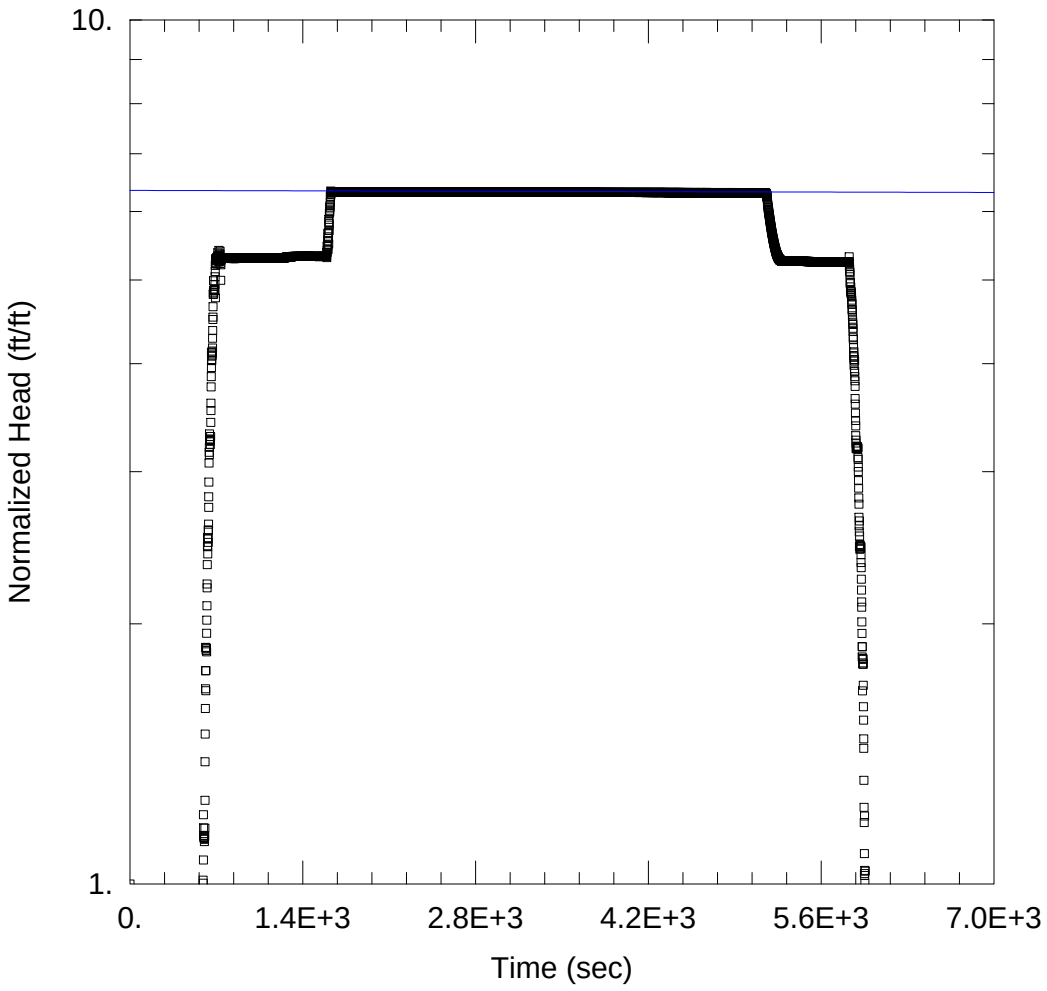
Observation Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.02428 cm^2/sec
S = 1.363E-5
Kz/Kr = 1.
b = 109.2 ft



TEST 5

Data Set: C:\...\GT-27_Test 5.aqt
Date: 02/13/17 Time: 10:55:46

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-27
Test Date: 2/5/2017

AQUIFER DATA

Saturated Thickness: 65.1 ft Anisotropy Ratio (Kz/Kr): 1.

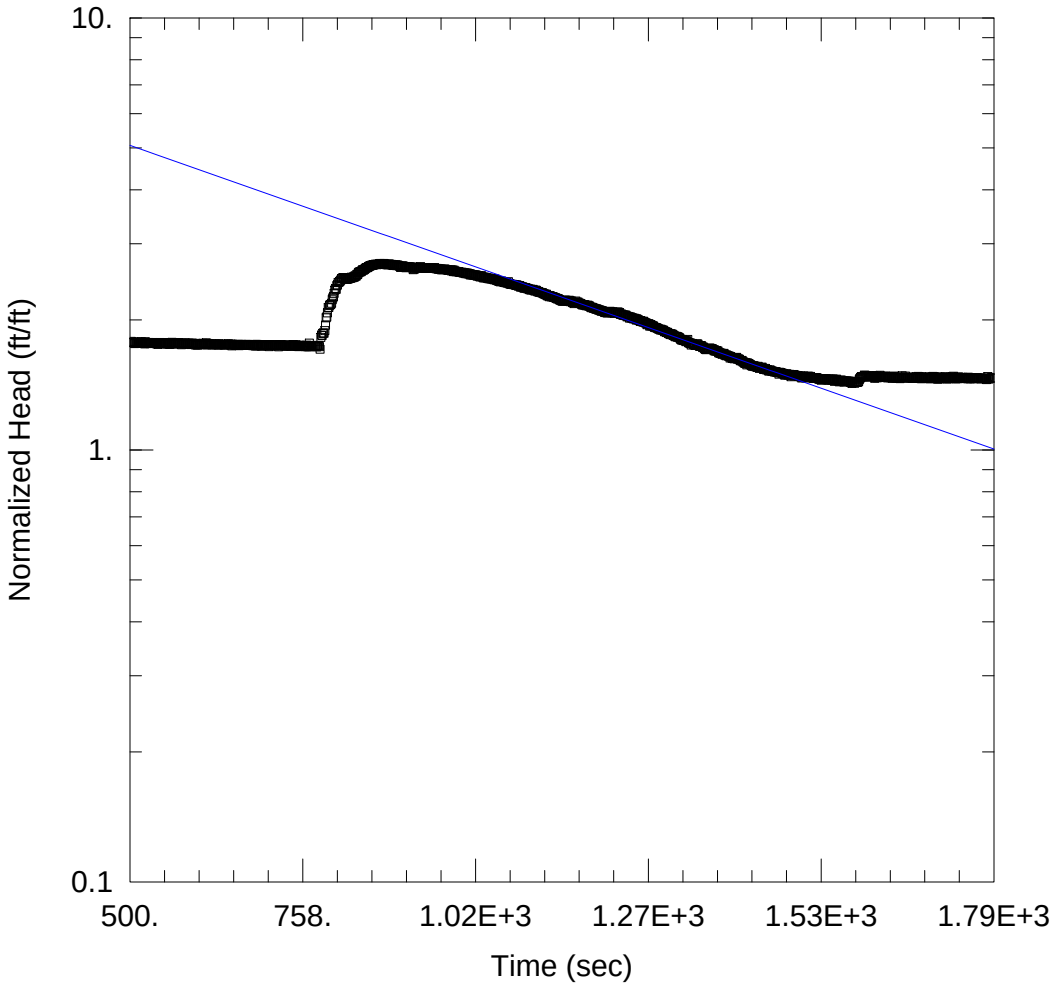
WELL DATA (New Well)

Initial Displacement: 28. ft
Total Well Penetration Depth: 204.5 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 204.5 ft
Screen Length: 65.1 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 2.528E-8 cm/sec
y0 = 177.8 ft



TEST 1

Data Set: C:\...\GT-30_Test 1.aqt
Date: 02/13/17 Time: 09:14:51

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-30
Test Date: 2/3/2017

AQUIFER DATA

Saturated Thickness: 22. ft Anisotropy Ratio (Kz/Kr): 1.

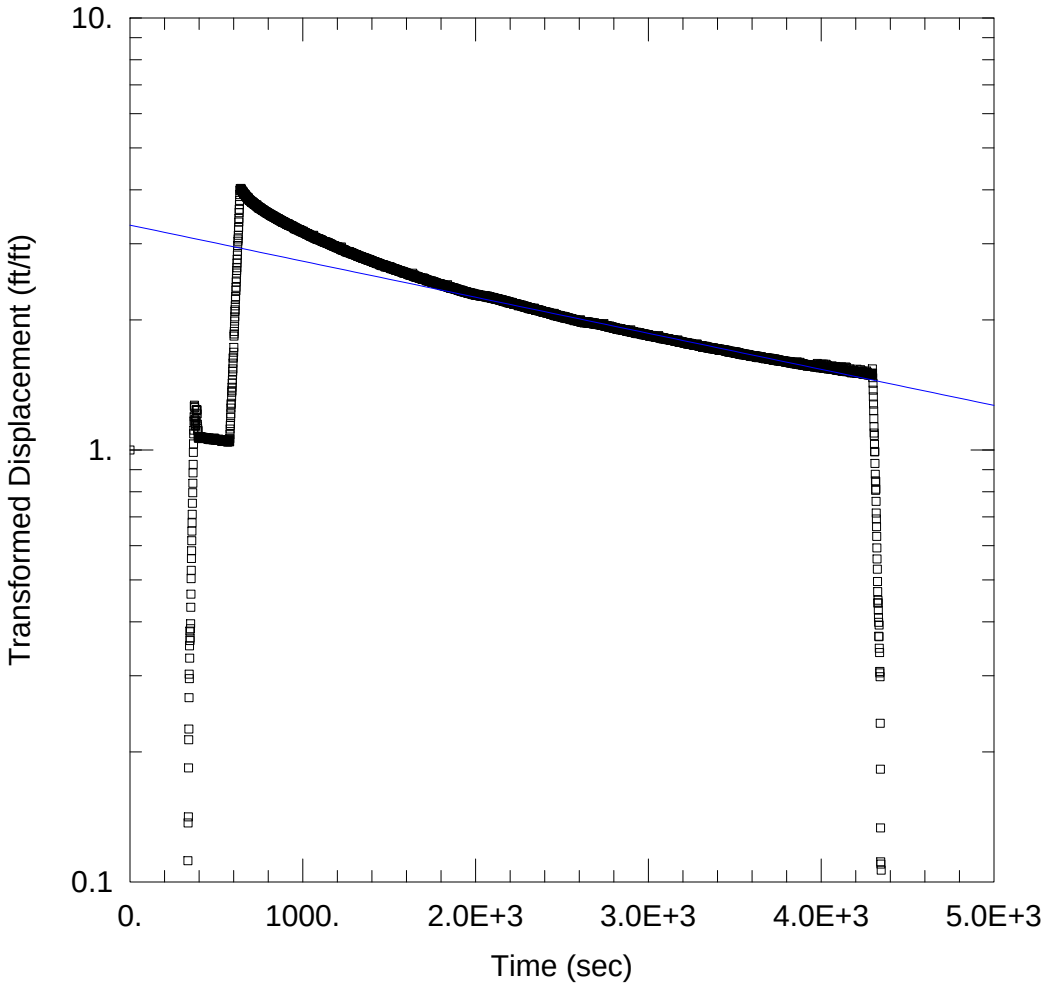
WELL DATA (New Well)

Initial Displacement: 7. ft Static Water Column Height: 15. ft
Total Well Penetration Depth: 22. ft Screen Length: 22. ft
Casing Radius: 0.1571 ft Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 8.192E-5 cm/sec y0 = 66.45 ft



TEST 2

Data Set: C:\...\GT-30_Test 2.aqt
Date: 02/28/17 Time: 12:19:37

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-30
Test Date: 2/3/2017

AQUIFER DATA

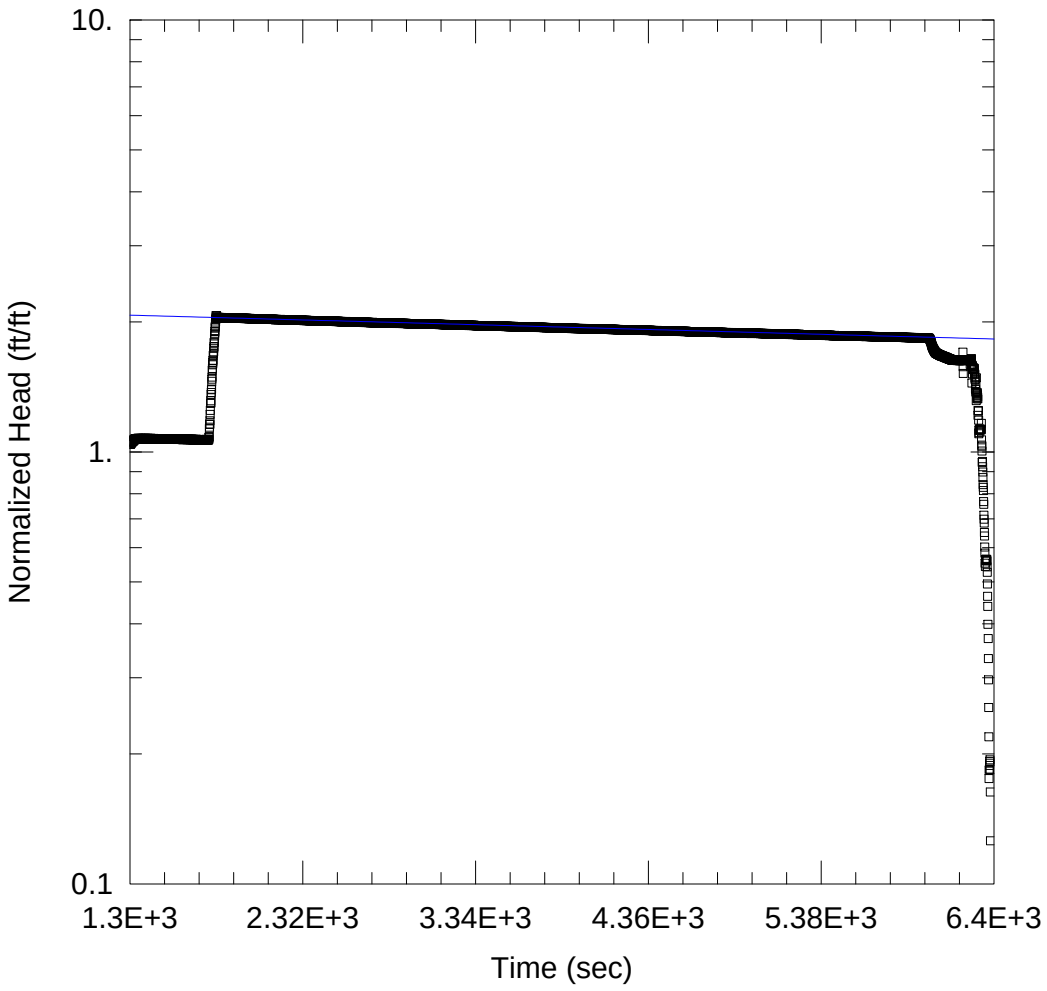
Saturated Thickness: 42. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 26. ft Static Water Column Height: 28. ft
Total Well Penetration Depth: 42. ft Screen Length: 42. ft
Casing Radius: 0.1571 ft Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Dagan
K = 8.792E-6 cm/sec y0 = 50.2 ft



TEST 3

Data Set: C:\...\GT-30_Test 3.aqt
Date: 02/13/17 Time: 09:24:18

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-30
Test Date: 2/4/2017

AQUIFER DATA

Saturated Thickness: 89.55 ft Anisotropy Ratio (Kz/Kr): 1.

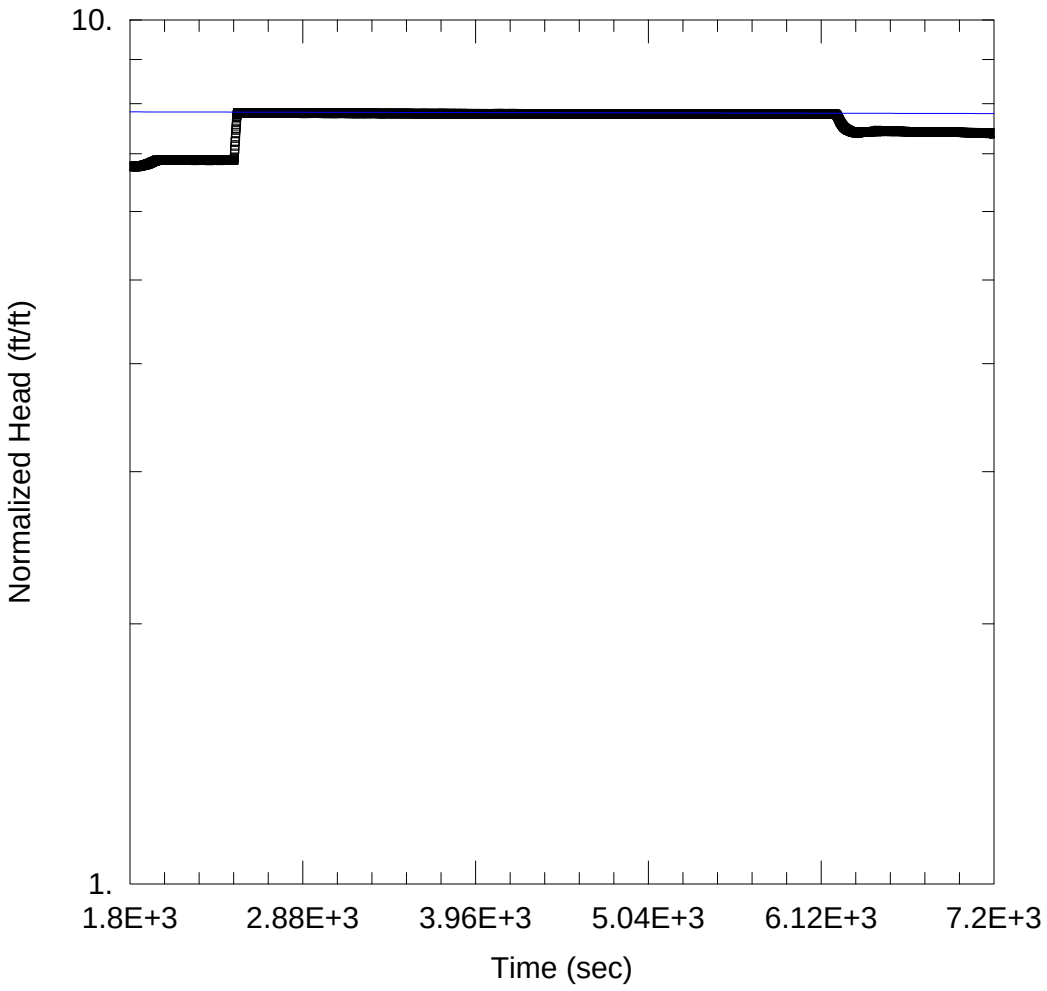
WELL DATA (New Well)

Initial Displacement: 35. ft Static Water Column Height: 89.55 ft
Total Well Penetration Depth: 89.55 ft Screen Length: 89.55 ft
Casing Radius: 0.1571 ft Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 5.439E-7 cm/sec y0 = 74.95 ft



TEST 4

Data Set: C:\...\GT-30_Test 4.aqt
Date: 02/13/17 Time: 09:31:08

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-30
Test Date: 2/6/2017

AQUIFER DATA

Saturated Thickness: 112.1 ft Anisotropy Ratio (Kz/Kr): 1.

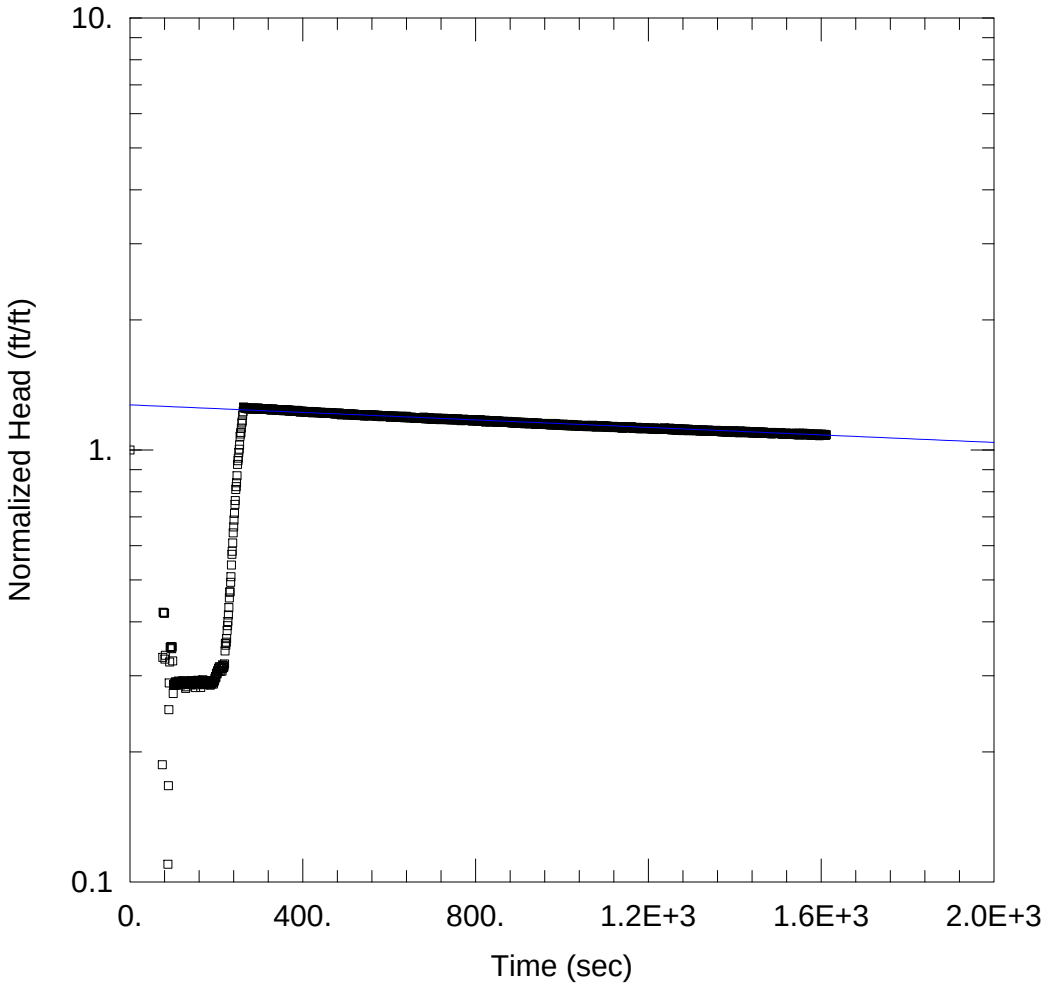
WELL DATA (New Well)

Initial Displacement: 20. ft
Total Well Penetration Depth: 215.7 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 215.7 ft
Screen Length: 112. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 1.639E-8 cm/sec
y0 = 156.8 ft



TEST 1

Data Set: C:\...\GT-14-3_Test 1.aqt
Date: 02/13/17 Time: 09:40:00

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-14-3
Test Date: 2/7/2017

AQUIFER DATA

Saturated Thickness: 10. ft Anisotropy Ratio (Kz/Kr): 1.

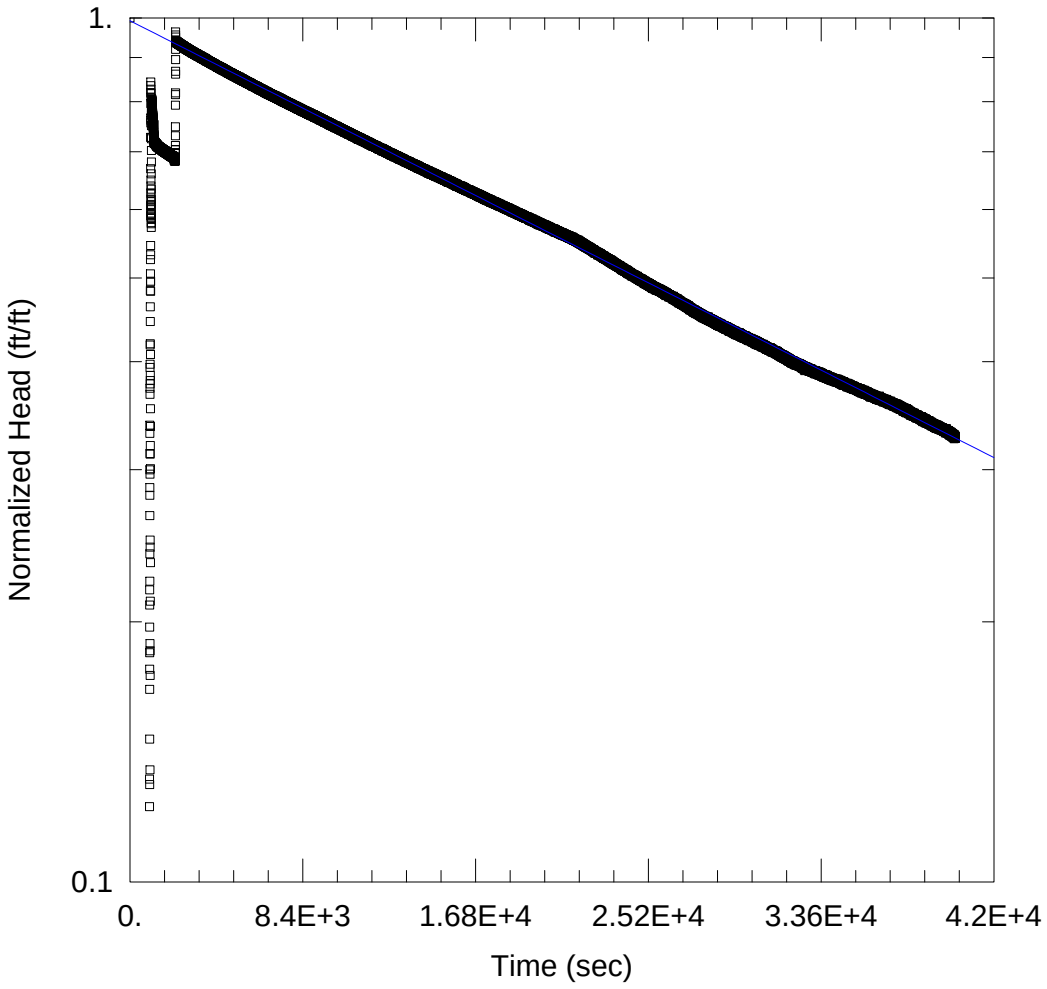
WELL DATA (New Well)

Initial Displacement: 7.5 ft Static Water Column Height: 2.5 ft
Total Well Penetration Depth: 10. ft Screen Length: 10. ft
Casing Radius: 0.1571 ft Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 1.2E-5 cm/sec y0 = 9.535 ft



TEST 2

Data Set: C:\...\GT-14-3_Test 2.aqt
Date: 02/13/17 Time: 09:45:47

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-14-3
Test Date: 2/7/2017

AQUIFER DATA

Saturated Thickness: 85.2 ft Anisotropy Ratio (Kz/Kr): 1.

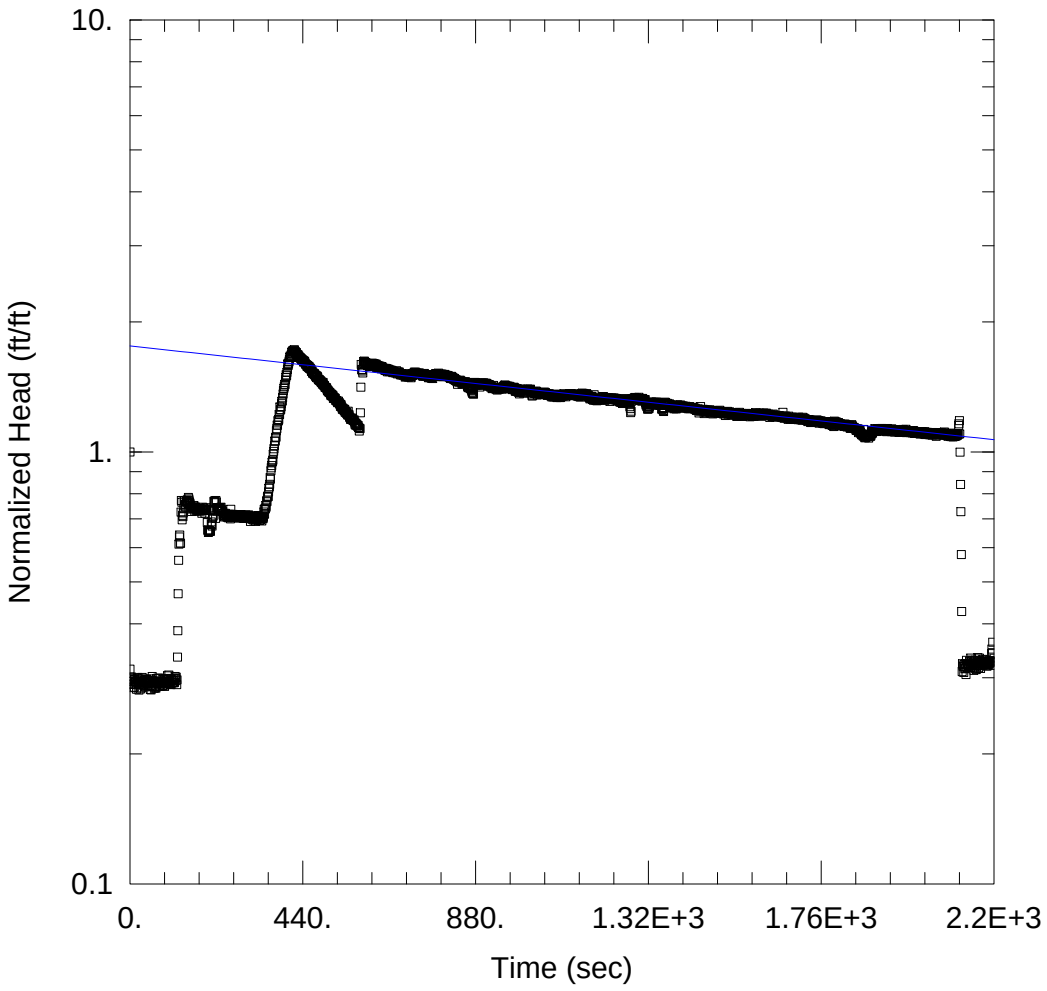
WELL DATA (New Well)

Initial Displacement: 25. ft
Total Well Penetration Depth: 85.2 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 81.65 ft
Screen Length: 85.2 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 6.28E-7 cm/sec
y0 = 24.81 ft



TEST 1

Data Set: C:\...\GT-28_Test 1.aqt
Date: 02/13/17 Time: 09:56:18

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-28
Test Date: 2/7/2017

AQUIFER DATA

Saturated Thickness: 27. ft Anisotropy Ratio (Kz/Kr): 1.

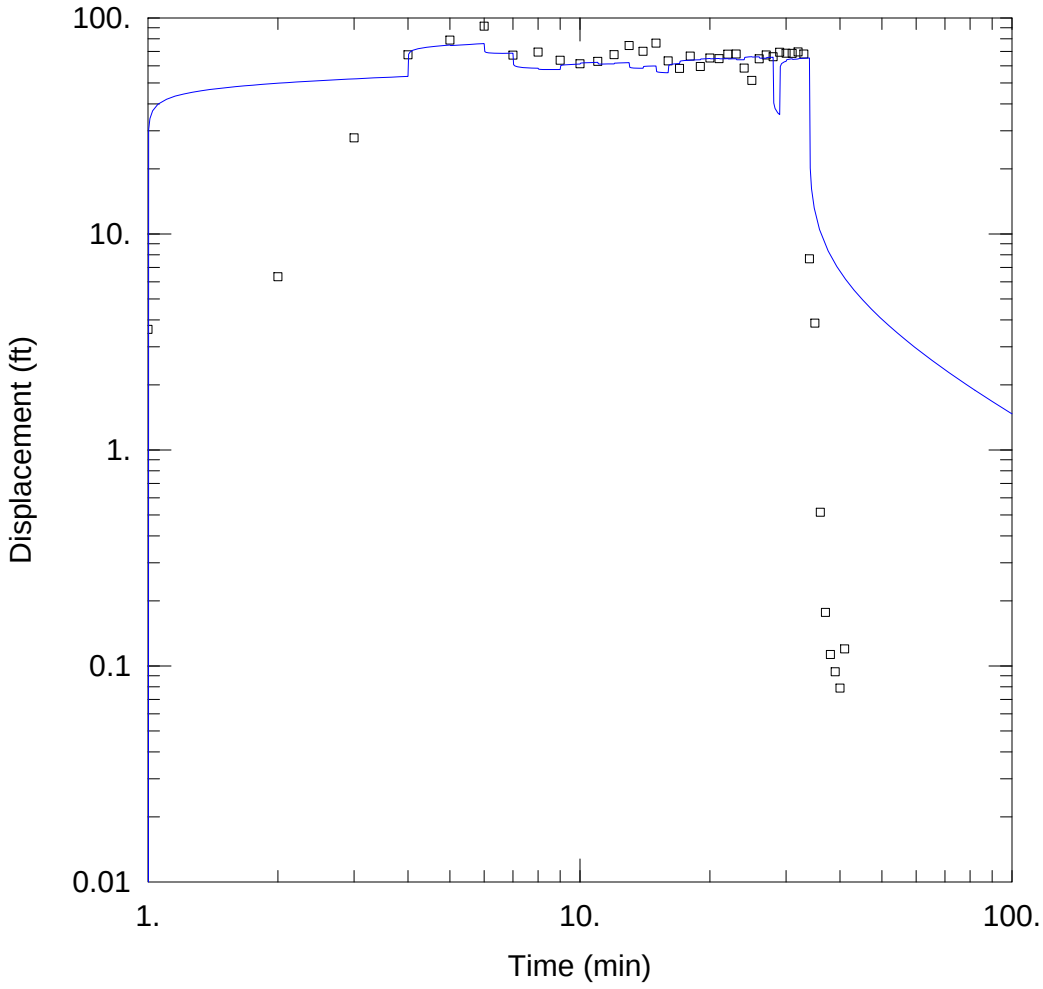
WELL DATA (New Well)

Initial Displacement: 6. ft
Total Well Penetration Depth: 27. ft
Casing Radius: 0.1571 ft
Static Water Column Height: 21. ft
Screen Length: 27. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 1.263E-5 cm/sec
y0 = 10.55 ft



TEST 2

Data Set: C:\...\GT-28_Test 2.aqt
Date: 02/13/17 Time: 10:08:04

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-28
Test Date: 2/8/2017

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

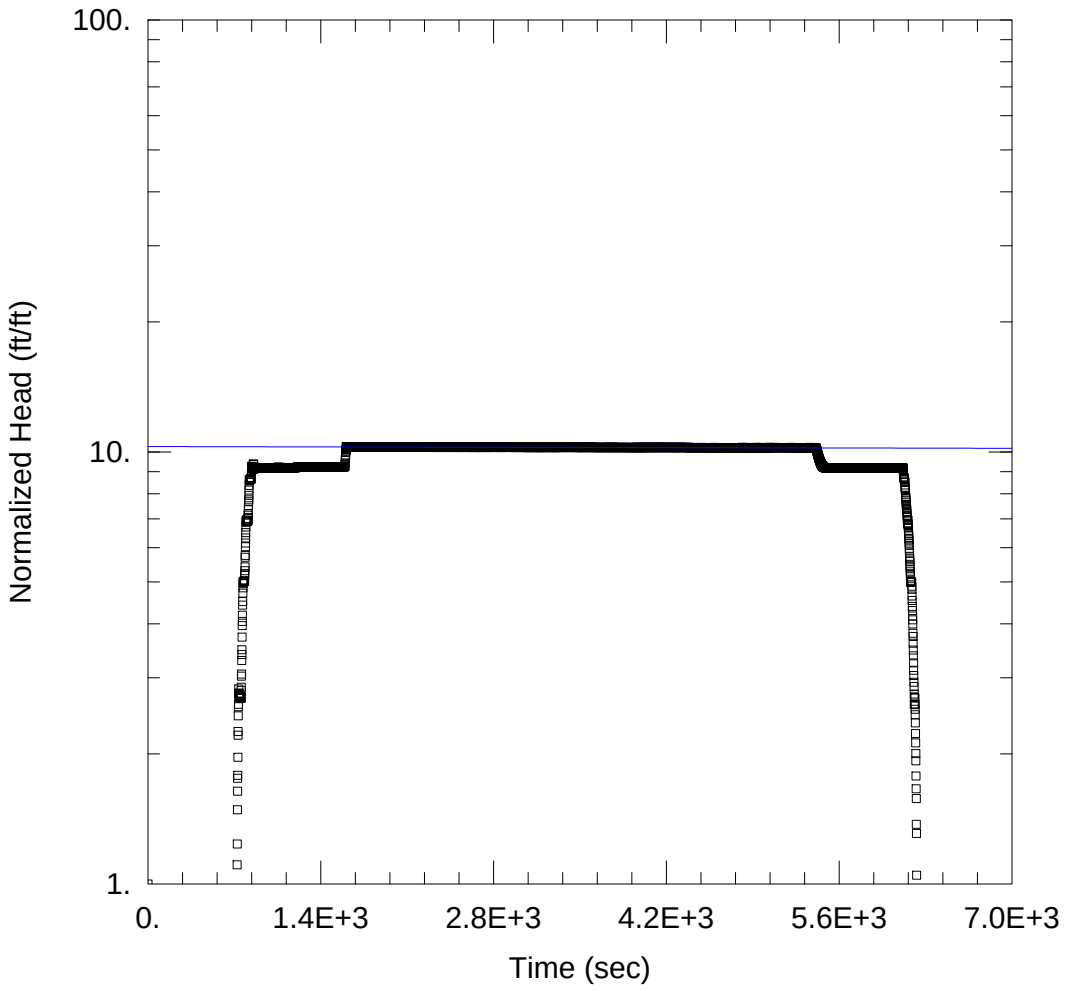
Observation Wells

Well Name	X (ft)	Y (ft)
New Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.8662 cm^2/sec
Kz/Kr = 0.1
S = 2.695E-6
b = 88.05 ft



TEST 3

Data Set: C:\...\GT-28_Test 3.aqt
Date: 02/17/17 Time: 10:22:51

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-28
Test Date: 2/9/2017

AQUIFER DATA

Saturated Thickness: 137.1 ft Anisotropy Ratio (Kz/Kr): 1.

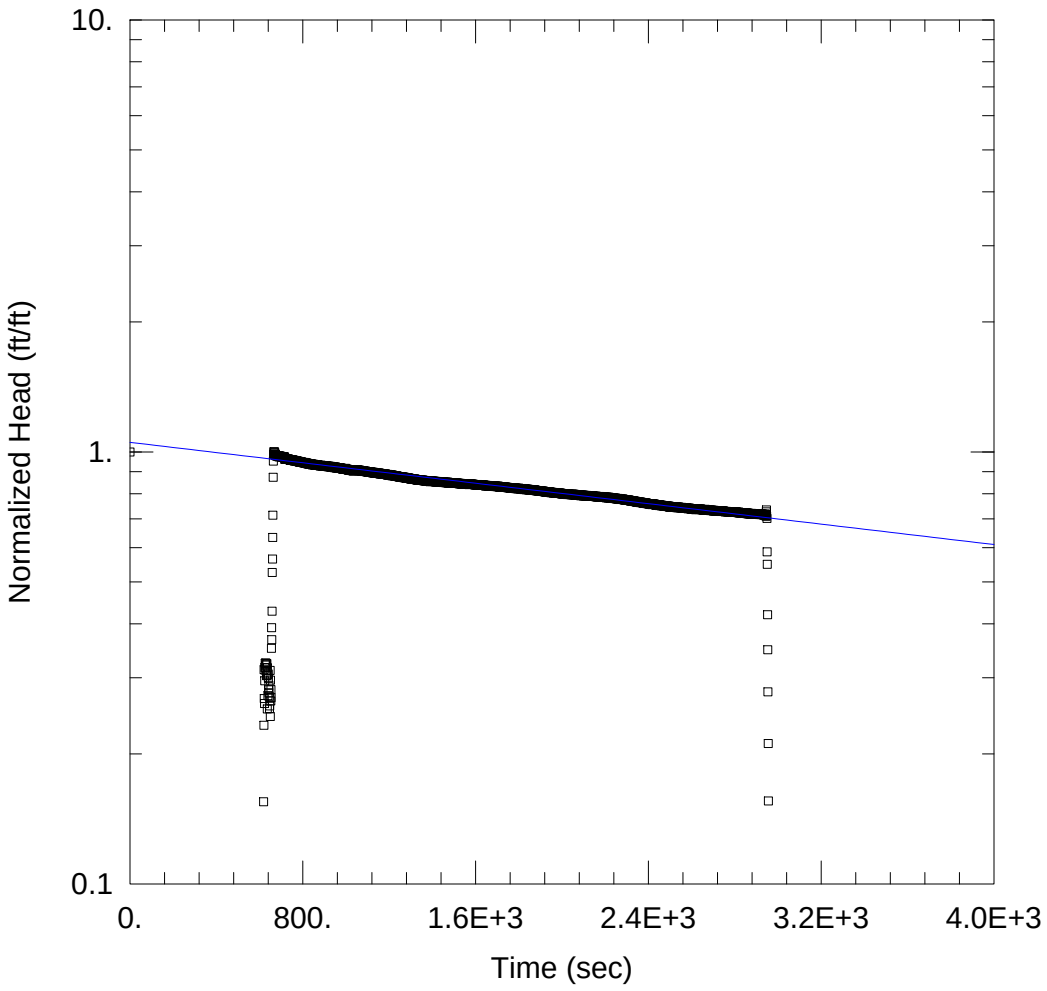
WELL DATA (New Well)

Initial Displacement: 12. ft
Total Well Penetration Depth: 240.8 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 240.8 ft
Screen Length: 137.1 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 2.239E-8 cm/sec
y0 = 123.5 ft



TEST 1

Data Set: C:\...\GT-22_Test 1.aqt
Date: 02/22/17 Time: 16:45:15

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-22
Test Date: 2/14/2017

AQUIFER DATA

Saturated Thickness: 16. ft Anisotropy Ratio (Kz/Kr): 1.

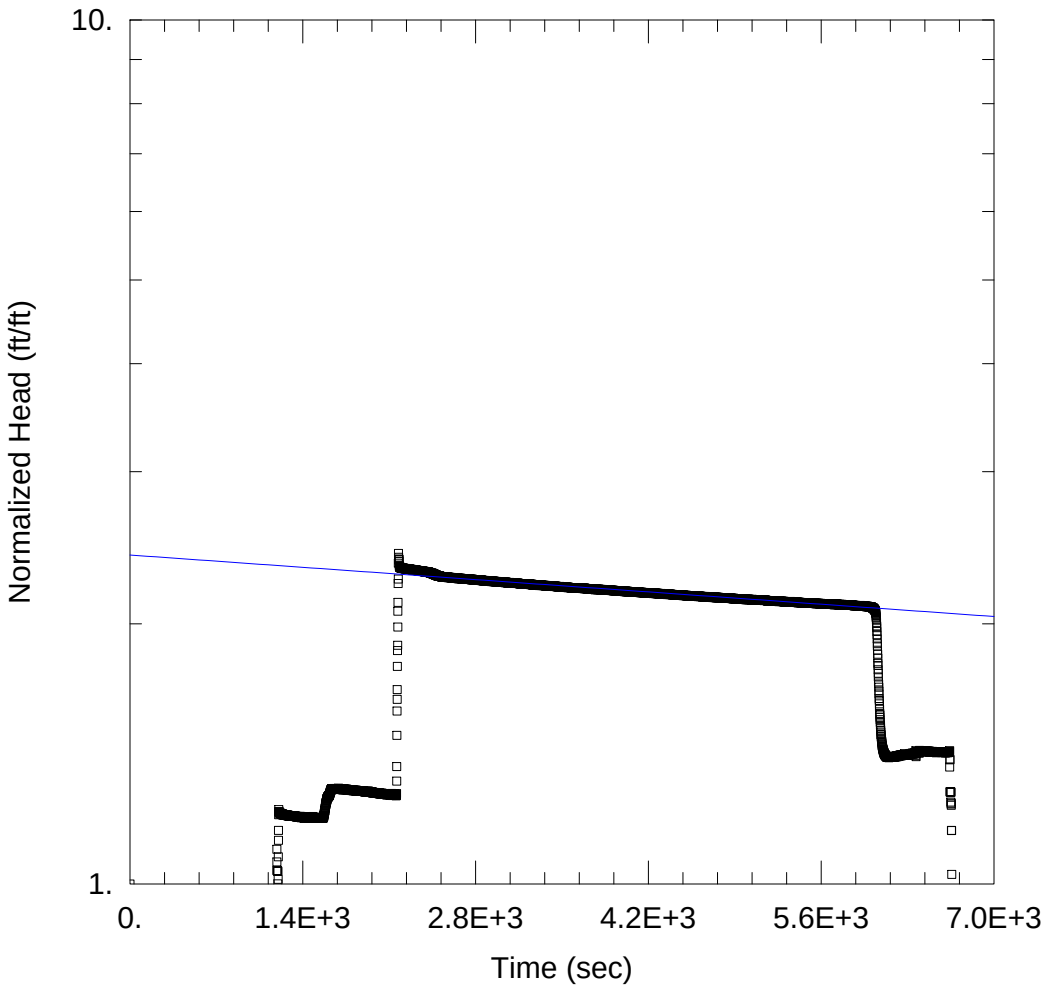
WELL DATA (New Well)

Initial Displacement: 9.5 ft Static Water Column Height: 15. ft
Total Well Penetration Depth: 16. ft Screen Length: 16. ft
Casing Radius: 0.1571 ft Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 1.139E-5 cm/sec y0 = 9.997 ft



TEST 2

Data Set: C:\...\GT-22_Test 2.aqt
Date: 02/22/17 Time: 16:54:08

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-22
Test Date: 2/15/2017

AQUIFER DATA

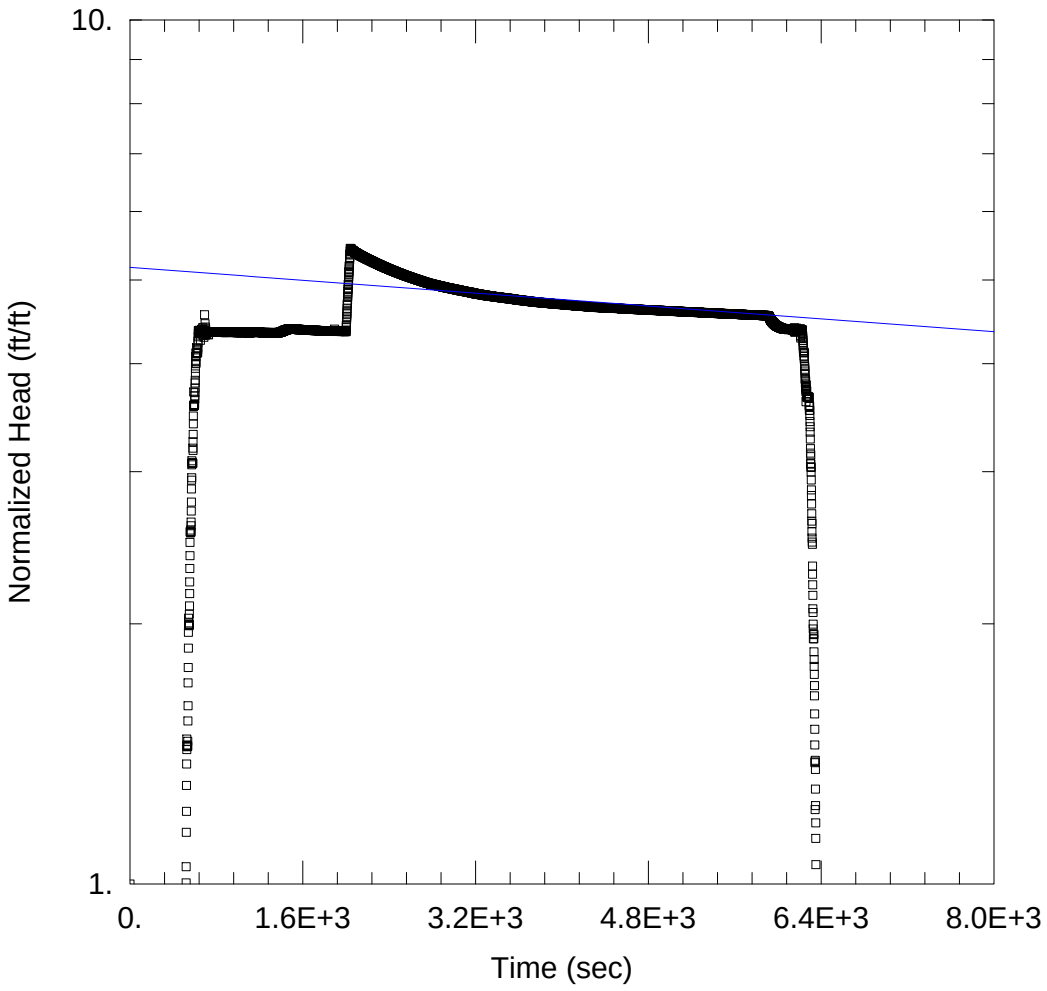
Saturated Thickness: 104.1 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 10. ft
Total Well Penetration Depth: 126.7 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 126.7 ft
Screen Length: 104.1 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 4.657E-7 cm/sec
y0 = 24.03 ft



TEST 3

Data Set: C:\...\GT-22_Test 3.aqt
Date: 02/24/17 Time: 09:20:16

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-22
Test Date: 2/16/2017

AQUIFER DATA

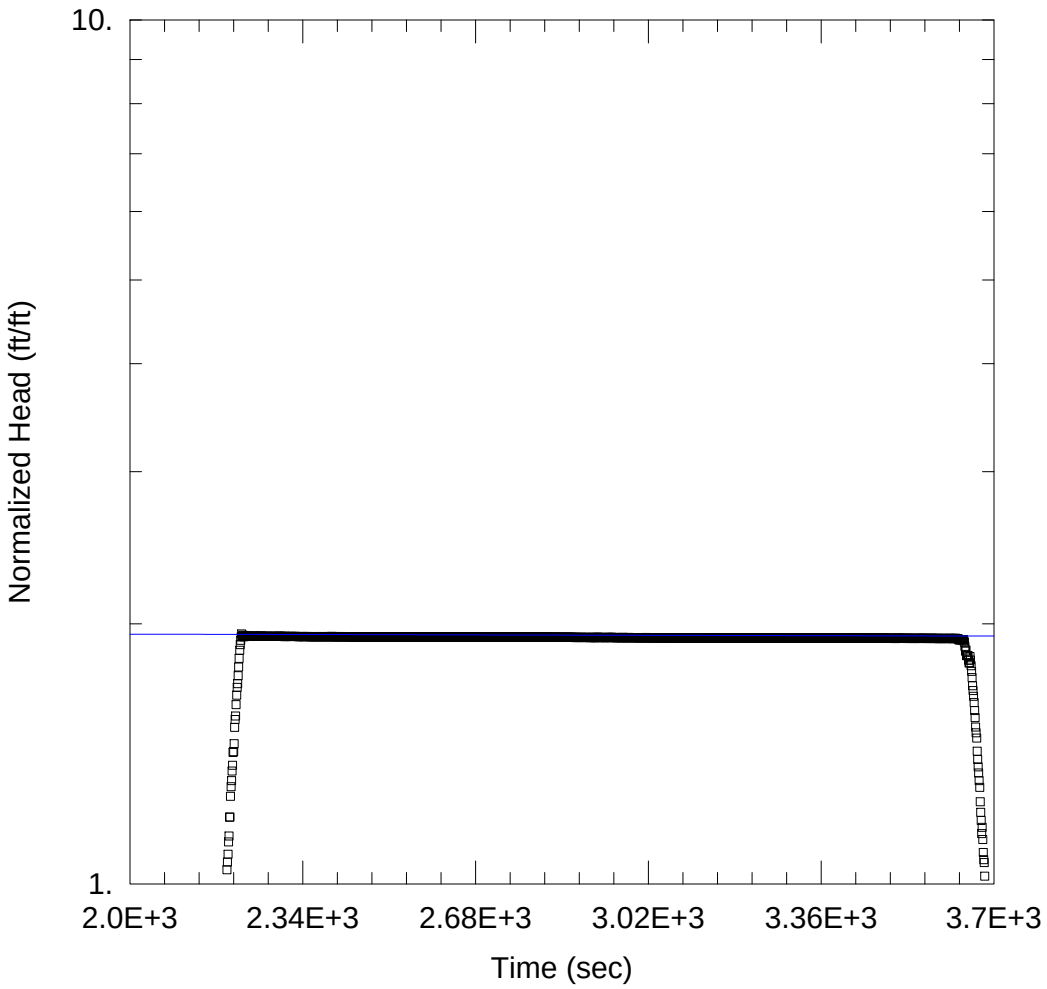
Saturated Thickness: 125.1 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 27. ft
Total Well Penetration Depth: 231.6 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 231.7 ft
Screen Length: 125. ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 4.753E-7 cm/sec
y0 = 139.6 ft



TEST 4

Data Set: C:\...\GT-22_Test 4.aqt
Date: 02/24/17 Time: 09:25:58

PROJECT INFORMATION

Company: Golder Associates Inc.
Client: RCML
Project: 1652193
Location: TSF 2
Test Well: GT-22
Test Date: 2/16/2017

AQUIFER DATA

Saturated Thickness: 65.05 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 21. ft
Total Well Penetration Depth: 236.1 ft
Casing Radius: 0.1571 ft
Static Water Column Height: 236.2 ft
Screen Length: 65.05 ft
Well Radius: 0.1571 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 9.854E-8 cm/sec
y0 = 41.1 ft

APPENDIX C
STANDPIPE PIEZOMETER DIAGRAMS

RECORD OF BOREHOLE DH16-01 (GT-14)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 21, 2016 15:26
DRILLING END: September 26, 2016 16:26
COORDINATES: N: 838,455 E: 923,219

SHEET: 1 of 8
GS ELEV.: 2406.7
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
0	HQ3	0.0		2406.7							
		1.5	Gila Sandstone (Tss): completely weathered surface materials.	2405.2				1	33		
		4.0	Gila Sandstone (Tss): brown, medium bedded, fine to coarse SANDSTONE, trace fine gravel, clasts of quartzite, tuff, basalt, moderate HCl reaction, small roots in discontinuities.	2402.7				2	84		
5		8.5	Moderately weathered, thinly bedded, brown, medium grained to very coarse grained, weak rock, CALCAREOUS SANDSTONE, As above.	2398.2				3	100		
10			As above, becomes more gravelly. Continues medium bedded SANDSTONE, fine to coarse silty sand, thin interbeds with fine to coarse gravel, and thin silty interbeds, clasts of quartzite, tuff, schist, basalt, very weak HCl reaction, brown.					4	100		
		13.5		2393.2							
15		18.0	As above, but slightly weathered with some lost core.	2388.7				5	100		
20		23.0	As above, moderately weathered, very weak to no HCl reaction.	2383.7				6	100		
25		28.0	Becomes Gila Conglomerate (Tcg): thickly bedded, matrix supported, slightly weathered polylithic CONGLOMERATE, coarse sand and some fine to coarse gravel, silty interbeds, clasts of tuff, quartzite, basalt, very weak to no HCl reaction, brown.	2378.7				7	100	26: Lost circulation.	
30		33.0	As above, becomes less gravelly.	2373.7				8	100	30: Drillers set casing to 30 ft-bgs, surface circulation returned.	
		34.0	As above.	2372.7				9	100		
35		39.0	Becomes SANDSTONE, thickly bedded, fine to coarse sand, trace fine to coarse gravel, clasts of tuff, quartzite, gneiss, weak to moderate HCl reaction, brown.	2367.7				10	100		
40		43.0	Becomes matrix supported, polylithic CONGLOMERATE, thickly bedded, fine to coarse gravel with fine to coarse sand matrix and silty interbeds, clasts of quartzite, tuff, basalt, diabase, schist, weak to moderate HCl reaction, brown.	2363.7				11	100		
45		48.0	As above, weak to no HCl reaction.	2358.7				12	100	44 - 303: Hydro test #1 SI	
50		53.0	As above.	2353.7				13	100		
55		58.0	Becomes SANDSTONE, thickly bedded, fine to coarse sand, trace fine to coarse gravel, clasts are tuff, quartzite, gneiss, weak to moderate HCl reaction, brown.	2348.7				14	100		
60			As above, silty interbeds, small fault.					15	100	59: Core tube slipped, core is stuck inside the	

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER:
DRILL RIG: BK-30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:40
P:\2015 PROJECTS\1531436 RCML NEAR WEST TSF GEOTECH\GINT\FINAL GINT PROJECTS\FINAL_OCTOBER 2017\NWTSF_FINAL_WELLS.GPJ

RECORD OF BOREHOLE DH16-01 (GT-14)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 21, 2016 15:26
DRILLING END: September 26, 2016 16:26
COORDINATES: N: 838,455 E: 923,219

SHEET: 2 of 8
GS ELEV.: 2406.7
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
60	HQ3	60.0	As above, silty interbeds, small fault. *(continued)*	2346.7				15	100	core barrel. Drillers trip out the core barrel to remove it.	
		63.0	As above.	2343.7				16	100		
65		68.0	As above, more silty interbeds.	2338.7				17	100		
70		73.0	As above. Some FeOx staining on discontinuities.	2333.7				18	100		
75		78.0	As above, fewer silty interbeds.	2328.7				19	100		
80		83.0	As above, few cobbles.	2323.7				20	100		
85		88.0	As above, some drilling damage to this run.	2318.7				21	100		
90		93.0	Becomes matrix supported, polylithic CONGLOMERATE, thickly bedded, fine to coarse gravel with fine to coarse sand matrix and silty interbeds, clasts of quartzite, tuff, basalt, diabase, schist, weak to moderate HCl reaction, brown.	2313.7				22	100		
95		98.0	Becomes SANDSTONE, thickly bedded, fine to coarse sand, trace fine to coarse gravel, clasts of tuff, quartzite, gneiss, weak to moderate HCl reaction, brown.	2308.7				23	100		
100		103.0	As above, quartzite cobble.	2303.7				24	100		
105		108.0	As above, tuff cobble.	2298.7				25	100		
110		113.0	Becomes matrix supported, polylithic CONGLOMERATE, thickly bedded, fine to coarse gravel with fine to coarse sand matrix and silty interbeds, clasts of quartzite, tuff, basalt, diabase, schist, weak to moderate HCl reaction, brown.	2293.7				26	100		
115		118.0	As above, few cobbles.	2288.7				27	100		
120			Log continued on next page								

DRILLING CO.: Boart Longyear
DRILLER:
DRILL RIG: BK-30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:40
P:\2015 PROJECTS\1531436 RCML NEAR WEST TSF GEOTECH\GINT\FINAL GINT PROJECTS\FINAL_OCTOBER 2017\NWTSF_FINAL_WELLS.GPJ

RECORD OF BOREHOLE DH16-01 (GT-14)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 21, 2016 15:26
DRILLING END: September 26, 2016 16:26
COORDINATES: N: 838,455 E: 923,219

SHEET: 3 of 8
GS ELEV.: 2406.7
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120	HQ3	120.0	As above, few cobbles. *(continued)*	2286.7				27	100		
		123.0	Becomes SANDSTONE, thickly bedded, fine to coarse sand, trace fine to coarse gravel, clasts of tuff, quartzite, gneiss, weak to moderate HCl reaction, brown.	2283.7				28	100		
125		128.0	Becomes fine to coarse sand, trace fine to coarse gravel.	2278.7				29	100		
130		133.0	Becomes matrix supported, polylithic CONGLOMERATE, thickly bedded, fine to coarse gravel with fine to coarse sand matrix and silty interbeds, clasts of quartzite, tuff, basalt, diabase, schist, weak to moderate HCl reaction, brown.	2273.7				30	100		
135		138.0	As above.	2268.7				31	100		
140		143.0	As above.	2263.7				32	100		
145		148.0	Becomes SANDSTONE, fine to coarse sand, trace fine to coarse gravel, clasts of tuff, quartzite, gneiss, weak to moderate HCl reaction, brown.	2258.7				33	101	148: Broken core at top of run from overdrilling.	
150		153.3	As above, gravel interbed at 154-155.5 ft-bgs.	2253.5				34	101		
155		158.0	As above, silty fine to coarse sand, trace fine to coarse gravel, silty interbeds.	2248.7				35	100		
160		163.0	As above.	2243.7				36	100		
165		168.0	As above.	2238.7				37	100		
170		173.0	As above, with few quartz and tuff cobbles, trace fine to coarse gravel, weak to no HCl reaction.	2233.7				38	100		
175		178.0	As above, gravelly.	2228.7				39	100		
180			Log continued on next page								

DRILLING CO.: Boart Longyear
DRILLER:
DRILL RIG: BK-30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:40
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RECORD OF BOREHOLE DH16-01 (GT-14)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 21, 2016 15:26
DRILLING END: September 26, 2016 16:26
COORDINATES: N: 838,455 E: 923,219

SHEET: 4 of 8
GS ELEV.: 2406.7
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
180	HQ3	180.0	As above, gravelly. *(continued)*	2226.7							
		183.0	As above.	2223.7				39	100		
185		188.0	As above.	2218.7				40	100		
190		193.0	As above.	2213.7				41	100		
195		198.0	As above.	2208.7				42	100		
200		203.0	As above.	2203.7			Cement Bentonite Grout	43	100		
205		208.0	As above, silty interbeds, clasts of quartzite, tuff, schist, and few basalt.	2198.7				44	96		
210		213.0	As above.	2193.7				45	96		
215		218.0	As above.	2188.7				46	100		
220		223.0	As above.	2183.7				47	100		
225		228.0	As above.	2178.7				48	100		
230		233.0	As above.	2173.7				49	100		
235		238.0	Becomes matrix supported, polylithic CONGLOMERATE, thickly bedded, fine to coarse gravel with fine to coarse sand matrix and silty interbeds, clasts of quartzite, tuff, basalt, diabase, schist, weak to moderate HCl reaction, brown.	2168.7				50	100		
240			As above, some coarse gravel.					51	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER:
DRILL RIG: BK-30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:40
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RECORD OF BOREHOLE DH16-01 (GT-14)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 21, 2016 15:26
DRILLING END: September 26, 2016 16:26
COORDINATES: N: 838,455 E: 923,219

SHEET: 5 of 8
GS ELEV.: 2406.7
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240	HQ3	240.0	As above, some coarse gravel. *(continued)*	2166.7				51	100		
		243.0	As above, silty fine to coarse sand.	2163.7				52	100		
245		248.0	As above, more coarse gravel and cobbles.	2158.7				53	100		
250		253.0	As above.	2153.7				54	100	254: Fracturing at 257 ft-bgs from overdrilling the run.	
255		258.0	As above.	2148.7				54	100		
260		263.0	Becomes SANDSTONE, poorly sorted, fine to coarse sand, silty matrix, trace fine gravel, trace coarse gravel, clasts of quartz, gneiss, schist, quartzite, very weak to no HCl reaciton, brown.	2143.7				55	100		
265		268.0	As above, few cobbles.	2138.7				56	100		
270		273.0	As above, gravel interbeds.	2133.7				57	100		
275		278.0	As above.	2128.7				58	100	278: Fractures in core from overdrilling run.	
280		283.0	As above.	2123.7				59	100		
285		288.0	As above, clasts of schist, quartzite, and tuff with trace other lithologies, very weak to no HCl reaction in matrix.	2118.7				60	100		
290		293.0	As above.	2113.7				61	100		
295		298.0	As above.	2108.7				62	100		
300			Log continued on next page								

DRILLING CO.: Boart Longyear
DRILLER:
DRILL RIG: BK-30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-01 (GT-14)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 21, 2016 15:26
DRILLING END: September 26, 2016 16:26
COORDINATES: N: 838,455 E: 923,219

SHEET: 6 of 8
GS ELEV.: 2406.7
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
300	HQ3	300.0	As above. *(continued)*	2106.7				62	100		
		303.0	Gila Conglomerate (Tcg): fine sand to coarse gravel, poorly sorted, clasts are predominantly tuff, quartzite, and breccia, little schist, trace other lithics, weak to no HCl reaction, brown.	2103.7				63	100		
305		308.0	Gila Conglomerate (Tss): silty fine to coarse sand, trace fine gravel, silty interbeds, clasts are predominantly schist, tuff, quartzite, trace limestone and other lithics, weak to no HCl reaction, brown.	2098.7				64	100		
310		313.0	As above	2093.7				65	100		
315		318.0	As above.	2088.7				66	100		
320		321.5	Gravel and cobbles of tuff and schist, matrix supported.	2085.2				67	100		
		323.0	Becomes matrix supported, polylithic CONGLOMERATE, fine to coarse gravel with fine to coarse sand matrix and silty interbeds, clasts of quartzite, tuff, basalt, diabase, schist, weak to moderate HCl reaction, brown.	2083.7				68	100		
325		328.0	As above.	2078.7				69	100		
330		333.0	As above, with fine to coarse gravel interbeds.	2073.7				70	100		
335		338.0	Becomes SANDSTONE medium to thickly bedded, interbedded silty fine sand, silt beds, and fine to coarse sand with trace fine gravel, weak to no HCl reaction, brown.	2068.7				71	100		
340		343.0	As above.	2063.7				72	100		
345		348.0	Volcaniclastic sandstone (Lithic Tuff), fine to coarse sand, brown, moderate HCl reaction.	2058.7				73	100	354 - 424: Hydro test #2 SI	
350		353.0	Becomes BASALT, dark brown, vesicles infilled with quartz and calcite.	2053.7				74	100		
355		358.0		2048.7				75	100		
360		359.0		2047.7							

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER:
DRILL RIG: BK-30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-01 (GT-14)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 21, 2016 15:26
DRILLING END: September 26, 2016 16:26
COORDINATES: N: 838,455 E: 923,219

SHEET: 7 of 8
GS ELEV.: 2406.7
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
360	HQ3	360.0	As above, with few voids and pockets of volcaniclastic sediments, dark brown to dark red brown. *(continued)*	2046.7				75	100		
		364.0	As above.	2042.7				76	100		
365		367.0	Becomes flow brecciated BASALT, altered and weak, argillized, minor calcite stockwork, red brown.	2039.7				77	100		
		369.0	As above with calcite stockwork.	2037.7							
370		374.0	As above.	2032.7				78	100		
		376.0	As above, vesicular with breccia veins.	2030.7				79	100		
375		379.0	Continues BASALT breccia, few voids, intermittent calcite stockwork, zeolites.	2027.7				80	100		
		384.0	As above.	2022.7				81	100		
380		389.0	As above, vesicular, calcite/quartz infilling and veining, few voids with zeolites.	2017.7				82	100		
		394.0	As above.	2012.7				83	100		
385		399.0	As above.	2007.7				84	100		
		404.0	Continues BASALT, dark brown, minor calcite stockwork and vesicles, few discontinuous voids.	2002.7			0-411.7: Cement Bentonite Grout	85	100		
390		409.0	As above.	1997.7				86	100		
		414.0	As above.	1992.7				86	100		
395		419.0	As above.	1987.7			411.7-424.8: Bentonite seal,				
		420	Log continued on next page								
400											
405											
410											
415											
420											

DRILLING CO.: Boart Longyear
DRILLER:
DRILL RIG: BK-30

LOGGED: Gwyn Smith
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RECORD OF BOREHOLE DH16-01 (GT-14)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 21, 2016 15:26
DRILLING END: September 26, 2016 16:26
COORDINATES: N: 838,455 E: 923,219

SHEET: 8 of 8
GS ELEV.: 2406.7
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
420	HQ3	420.0	As above. *(continued)*	1986.7			1/4" coated pellets	86	100		
		424.0	As above.	1982.7							
425		425.4	Becomes contact between SANDSTONE and BASALT, red brown, strong HCl reaction.	1981.3				87	100		
		427.0	Becomes volcaniclastic, orange brown SANDSTONE, poorly sorted, fine to coarse sand and fine gravel, CaCO3 cementation, clasts of weathered basalt and quartzite.	1979.7							
430		429.0	Becomes volcaniclastic CONGLOMERATE, altered, poorly sorted, fine gravel to cobbles, matrix (fine to coarse sand) supported, CaCO3 cementation, clasts are weathered basalt.	1977.7				88	100		
		434.0	As above.	1972.7							
435		436.0	Becomes Mescal Limestone (pCmls): pinkish gray brown, fine grained LIMESTONE, silicified.	1970.7				89	100	435 - 451: Hydro test #3 SI & CRI	
		438.0	As above, weakly calcareous sediments, zones of alteration and brecciation, little iron oxide staining.	1968.7			424.8-451: Filter Pack, 10/20 Silica Sand				
440							431-451: sch 40 2-inch PVC, 0.010" slot	90	100		
445		446.0	As above.	1960.7				91	100	445: Lost surface circulation.	
								92	100		
450		451.0	Bottom of borehole at 451.0 ft. Completed as well. Refer to diagram.	1955.7							
455											
460											
465											
470											
475											
480											

DRILLING CO.: Boart Longyear
DRILLER:
DRILL RIG: BK-30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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DH16-01 (GT-14)
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RECORD OF BOREHOLE DH16-02 (GT-8)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 28, 2016 07:15
DRILLING END: October 2, 2016 11:40
COORDINATES: N: 840,618 E: 919,190

SHEET: 1 of 5
GS ELEV.: 2391.1
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
0	HQ3	0.0	Surface residual soil, no recovery.	2391.1				1	0		
		4.5		2386.6							
5		5.0	Gila Sandstone (Tss): fine to coarse	2386.1				2	100		
		6.0	SANDSTONE, light brown, mainly schist, very weak to no HCL reaction	2385.1				3	100		
			As above.					4	50		
		9.0	As above, some gravel.	2382.1			0-17 ft: Cement Bentonite Grout				
10		10.5	No recovery	2380.6				5	80		
			Continues fine to coarse SANDSTONE with some fine gravel, matrix supported, clasts of schist, gneiss, quartzite, light brown.								
15		16.5		2374.6				6	90		
		19.0	Becomes Gila Conglomerate (Tcg): matrix supported, polylithic CONGLOMERATE, gravel to cobble clasts consisting of gneiss, quartzite, schist, tuff, matrix has moderate HCl reaction, light brown.	2372.1			17-21.8 ft: 1/4" Bentonite Pellets				
20			As above.					7	100		
		24.0		2367.1						24: Advanced surface casing to 15 ft-bgs (HW pipe).	
25		26.0	Washed-out coarse gravel with no matrix, clasts of quartzite, schist, tuff.	2365.1				8	50		
		27.5	As above.	2363.6				9	88		
		30.0	Becomes fine to coarse SANDSTONE with few clasts of gneiss, schist, quartz, weak to moderate HCl reaction, brown.	2361.1							
30			Becomes matrix supported, polylithic CONGLOMERATE, gravel to cobble sized clasts consisting of gneiss, quartzite, schist, tuff, matrix has moderate HCl reaction, light brown.				21.8-87 ft: 10/20 Silica Sand Filter Pack				
35								10	100		
		40.0		2351.1							
40		42.1	As above.	2349.0				11	100		
		45.0	As above.	2346.1							
45			As above.					12	96		
		50.0		2341.1							
50			As above.								
55							24.5-84.5 ft: 2" ID sch 40 PVC 0.010" slot	13	91	55 - 99: Hydro test #1 SI 56: Lost circulation.	
			55.9 to 59 ft-bgs: rock is friable, weak, highly weathered. Lost recovery at 56 ft-bgs.								
		59.0		2332.1						59: Core tube slipped, core is stuck inside the	
60			As above.					14	96		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK-30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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DH16-02 (GT-8)
1 of 5

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:40
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RECORD OF BOREHOLE DH16-02 (GT-8)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 28, 2016 07:15
DRILLING END: October 2, 2016 11:40
COORDINATES: N: 840,618 E: 919,190

SHEET: 2 of 5
GS ELEV.: 2391.1
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
60	HQ3	60.0	As above. *(continued)*	2331.1						core barrel. Drillers trip out the core barrel to remove it.	
								14	96		
65		69.0	As above.	2322.1							
70								15	91		
75		79.0	Vertical fault zone, upper wall is highly weathered, clayey gouge infill.	2312.1							
80		81.2	Becomes matrix supported, polylithic CONGLOMERATE, gravel to cobble sized clasts consisting of gneiss, quartzite, schist, tuff, matrix has moderate HCl reaction, light brown.	2309.9				16	95		
85		89.0	As above.	2302.1							
90								17	100		
95		99.0	As above.	2292.1			87-260 ft: 1/4" Bentonite Pellets				
100								18	100		
105		109.0	As above.	2282.1						105 - 250: Hydro test #2 SI & CRI	
110								19	100		
115		119.0	As above, few limestone clasts.	2272.1							
120			Log continued on next page					20	100		

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK-30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-02 (GT-8)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 28, 2016 07:15
DRILLING END: October 2, 2016 11:40
COORDINATES: N: 840,618 E: 919,190

SHEET: 3 of 5
GS ELEV.: 2391.1
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	SOIL PROFILE Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE INFO CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120	HQ3	120.0	As above, few limestone clasts. *(continued)*	2271.1				20	100		
125		129.0	As above.	2262.1				21	100		
130		139.0	As above, large quartzite cobble.	2252.1				22	100		
135		144.5	As above, some cobbles, very weak to no HCl reaction.	2246.6				23	100		
140		150.0	As above, with some schist clasts.	2241.1				24	100		
145		160.0	As above, with some basalt, rhyolite, chert clasts, weak HCl reaction.	2231.1				25	100		
150		170.0	As above, with some cobbles and clasts of basalt, quartzite, diabase, gneiss.	2221.1				26	100		
155		180.0		2211.1							
160											
165											
170											
175											
180											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK-30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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DH16-02 (GT-8)
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RECORD OF BOREHOLE DH16-02 (GT-8)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 28, 2016 07:15
DRILLING END: October 2, 2016 11:40
COORDINATES: N: 840,618 E: 919,190

SHEET: 4 of 5
GS ELEV.: 2391.1
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180	HQ3	180.0	As above.	2211.1				27	100		
185											
190		190.0	Continues matrix supported, polylithic CONGLOMERATE, gravel to cobble sized clasts consisting of gneiss, quartzite, schist, tuff, matrix has moderate HCl reaction, light brown.	2201.1				28	100	197 - 260: Hydro test #4 SI	
195											
200		200.0	As above, few calcite veins.	2191.1				29	99		
205											
210		210.0	As above, clasts of tuff, quartzite, chert, diabase.	2181.1				30	100		
215											
220		220.0	As above. Some diabase clasts.	2171.1				31	100		
225											
230		230.0	As above.	2161.1				32	100		
235											
240		240.0		2151.1						237 - 250: Hydro test #3 SI	

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK-30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-02 (GT-8)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: September 28, 2016 07:15
DRILLING END: October 2, 2016 11:40
COORDINATES: N: 840,618 E: 919,190

SHEET: 5 of 5
GS ELEV.: 2391.1
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0		2151.1							
	HQ3		As above.					33	100		
245		248.2		2142.9							
			Contact zone with Apache Leap Tuff (Talg), highly weathered, TUFF, clayey, friable and weak. Some iron oxide staining.								
250		251.5		2139.6				34	67		
			As above, small vesicles, few quartz phenocrysts.								
255		256.0		2135.1							
			As above.					35	100		
260		260.0		2131.1							
			Bottom of borehole at 260.0 ft. Completed as well. Refer to diagram.								
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK-30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-02 (GT-8)
5 of 5

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:40
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RECORD OF BOREHOLE DH16-03 (GT-7)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Up 252 from GT8

DRILLING START: October 2, 2016 14:45
DRILLING END: October 6, 2016 17:05
COORDINATES: N: 842,614 E: 918,055

SHEET: 1 of 3
GS ELEV.: 2487.7
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
0	HQ3	0.0	No recovery, surface soils.	2487.7							
		3.5		2484.2							
5			Gila Conglomerate (Tcg): matrix supported, polylithic CONGLOMERATE, fine to coarse gravel, fine to coarse sandy matrix, clasts of gneiss, quartz, schist, no HCl reaction.				0-7.8 ft: 3/8" Bentonite Chips	1	100		
		8.5		2479.2							
10			As above, with more fine to coarse sand.					2	100		
		13.5		2474.2							
15			As above.					3	100		
		18.5		2469.2							
20			As above, matrix is weathered and weak.				7.8-31.7 ft: 10/20 Silica Sand Filter pack 10-30 ft: 2" ID sch 40 PVC 0.010" slot	4	91		
		24.0		2463.7							
25		26.1	Becomes faulted and completely weathered, matrix partially washed out from drilling.	2461.6				5	100		
		30.0	Continues matrix supported, polylithic CONGLOMERATE, fine to coarse gravel, fine to coarse sandy matrix, clasts of gneiss, quartz, schist, no HCl reaction, slightly weathered.	2457.7				6	100		
			As above, few tuff clasts.					7	100		
		34.0		2453.7							
35			As above.				31.7-38.3 ft: 1/4" Bentonite Pellets	8	100		
		39.0		2448.7							
40			As above, predominantly coarse gravel, clast supported.					9	100		
		44.0		2443.7							
45			Gila Conglomerate (Tcg): fine to coarse gravel with fine to coarse sand, matrix supported, clasts of gneiss, schist, quartzite, diabase, no HCl reaction, brown.					10	100	45 - 59: Hydro test #2 SI & CRI	
		49.0		2438.7							
50			As above, with completely weathered zone, weak HCl reaction.				38.3-65.2 ft: 10/20 Silica Sand Filter Pack 40-60 ft: 2" ID sch 40 PVC 0.010" slot	11	100		
		54.0		2433.7							
55		55.0	Becomes completely weathered, fault zone, coarse gravel with partially washed out matrix.	2432.7				12	100		
		56.5	Continues fault zone, matrix washed out.	2431.2				13	80	55.5 - 58: Drillers lose surface circulation, zone taking a lot of water.	
		58.5	Continues fault zone, corestones of Gila Conglomerate in loose gravel.	2429.2				14	50		
60								15	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK-30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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DH16-03 (GT-7)

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:40
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RECORD OF BOREHOLE DH16-03 (GT-7)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Up 252 from GT8

DRILLING START: October 2, 2016 14:45
DRILLING END: October 6, 2016 17:05
COORDINATES: N: 842,614 E: 918,055

SHEET: 2 of 3
GS ELEV.: 2487.7
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
60	HQ3	60.0		2427.7							
		63.5	Becomes matrix supported, polylithic CONGLOMERATE, fine to coarse gravel, fine to coarse sandy matrix, clasts of gneiss, quartz, schist, no HCl reaction, slightly weathered. *(continued)*	2424.2				15	100		
65		68.5	As above, matrix to clast supported, few cobbles.	2419.2				16	100	64 - 164: Hydro test #1 SI & CRI	
70		73.5	As above, fine to coarse gravel and coarse sand, clast supported.	2414.2				17	96		
75		78.5	As above.	2409.2				18	100		
80		83.5	As above.	2404.2				19	100		
85		88.5	As above.	2399.2				20	100		
90		93.5	As above, weak HCl reaction.	2394.2				21	100		
95		98.5	Continues matrix supported, polylithic CONGLOMERATE, fine to coarse gravel, fine to coarse sandy matrix, clasts of gneiss, quartz, schist, no HCl reaction, slightly weathered.	2389.2				22	100		
100		103.5	Becomes fine to coarse SANDSTONE, trace gravel, tuff, quartz, chert, limestone, diabase, weak HCl reaction, brown.	2384.2				23	100		
105		109.0	Becomes matrix supported, polylithic CONGLOMERATE, fine to coarse gravel, fine to coarse sandy matrix, clasts of gneiss, quartz, schist, no HCl reaction, slightly weathered.	2378.7				24	100		
110		114.0	As above.	2373.7				25	100	114 - 164: Hydro test #3 SI	
115		119.0	As above, few limestone clasts.	2368.7			65.2-164 ft: 3/8" Bentonite Chips	26	100		
120			As above, few cobbles.					27	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK-30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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DH16-03 (GT-7)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:40
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RECORD OF BOREHOLE DH16-03 (GT-7)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Up 252 from GT8

DRILLING START: October 2, 2016 14:45
DRILLING END: October 6, 2016 17:05
COORDINATES: N: 842,614 E: 918,055

SHEET: 3 of 3
GS ELEV.: 2487.7
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120	HQ3	120.0	As above, few cobbles. *(continued)*	2367.7				27	100		
		124.0	As above, no cobbles.	2363.7				28	100		
125		126.0	As above, weak HCl reaction.	2361.7				29	100		
130		131.0	As above, few limestone clasts.	2356.7				30	100		
		136.0	Continues matrix supported, polylithic CONGLOMERATE, fine to coarse gravel, fine to coarse sandy matrix, clasts of gneiss, quartz, schist, no HCl reaction, slightly weathered.	2351.7				31	100		
135		139.0	As above.	2348.7				32	100		
140		144.0	As above.	2343.7				33	100		
		149.0	As above.	2338.7				34	100		
145		154.5	As above.	2333.2				35	96		
150		161.0	Becomes Apache Leap tuff (Talg), fine grained, TUFF, whitish gray, fresh.	2326.7				36	100		
155		164.0	Bottom of borehole at 164.0 ft. Completed as well. Refer to diagram.	2323.7							
160											
165											
170											
175											
180											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK-30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-03 (GT-7)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:40
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RECORD OF BOREHOLE DH16-04 (GT-41)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 6, 2016 14:10
DRILLING END: October 10, 2016 09:30
COORDINATES: N: 840,821 E: 916,971

SHEET: 1 of 4
GS ELEV.: 2429.4
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
0		0.0		2429.4							
		2.5	Completely weathered surface outcroppings of steeply dipping schist, iron oxide staining.	2426.9				1	20	0 - 35: Hydro test #1 FHT	
5		6.5	Pinal Schist (pCpi): interbedded SCHIST and METASILTSTONE, foliated, crenulated, weathered, jointed, iron oxide and manganese oxide staining, and faulting.	2422.9				2	100		
		10.5	As above.	2418.9				3	100		
10								4	100		
		13.5	Continues gray, METASILTSTONE partial iron oxide staining, faulted and crushed.	2415.9				5	100		
15		15.5	Becomes entirely crushed, breccia and sand, trace clay, minor iron oxide staining. Drillers note they are losing some circulation.	2413.9				6	100		
		19.0	Becomes gray METASANDSTONE, fine to medium grained, jointed with minor faulting, interbeds of METASILTSTONE are foliated and weak, trace iron oxide staining.	2410.4				7	100		
20		24.0	As above.	2405.4				8	100	23 - 50: Hydro test #2 SI & CRI	
25		29.0	As above, with faults, minor iron oxide staining across fault.	2400.4				9	100		
30	HQ3	31.5	Continues METASILTSTONE, foliated, crenulated, fine grained, gray, brecciated and crushed, trace chloritic alteration, manganese oxide dendrites.	2397.9				10	100		
		33.5	As above, quartz veins.	2395.9				11	100		
35		35.0	As above.	2394.4				12	100		
		37.0	As above, with more clayey gouge.	2392.4				13	100	35: Drillers set surface casing to 5 ft-bgs.	
40		40.5	As above.	2388.9				14	100		
		42.0	As above.	2387.4				15	100		
45		45.0	As above.	2384.4				16	50		
		47.0	As above.	2382.4				17	100		
		47.5	As above.	2381.9				18	100		
50		50.0	Becomes purple gray, METASANDSTONE, fine to medium grained, calcite veining, extensive iron oxide staining on all discontinuities, broken.	2379.4				19	100		
		53.0	Becomes fault gouge, sandy clay, some breccia.	2376.4				20	38		
55		55.0	Becomes METASANDSTONE brownish gray, fine to medium grained, foliated, boudined quartz veins, calcite veining, fractured, iron oxide staining on discontinuities.	2374.4				21	50		
		59.0	Fault gouge, sandy clay.	2370.4				21	75		
60			As above.								

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:40
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RECORD OF BOREHOLE DH16-04 (GT-41)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 6, 2016 14:10
DRILLING END: October 10, 2016 09:30
COORDINATES: N: 840,821 E: 916,971

SHEET: 2 of 4
GS ELEV.: 2429.4
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
60	HQ3	60.0		2369.4							
			As above. *(continued)*					21	75		
		62.0		2367.4							
			As above.					22	75		
		64.0		2365.4							
65			Becomes gray to brown gray, interbeds of SCHIST and METASANDSTONE, foliated along bedding, crenulated, boudined quartz, brecciated zones, few calcite veins.					23	100		
		68.0		2361.4							
			As above, brecciated.					24	100		
70		71.0		2358.4							
			As above.					25	75		
		73.0		2356.4							
			As above.					26	80		
75		75.5		2353.9							
		76.5	As above.	2352.9				27	100		
			As above, quartz vein.					28	100		
		78.3		2351.1							
			Becomes gray, interbedded METASILTSTONE and							79 - 108: Hydro test #3 SI & CRI	
80		80.0	METASANDSTONE, fine grained, boudined quartz veins, strong.	2349.4				29	100		
		82.0	As above, broken.	2347.4				30	50		
		84.0	Poor recovery, brownish gray breccia and sand, iron oxide staining on discotinuities.	2345.4							
85			Becomes pinkish gray, medium grained, SCHIST, foliated along bedding, iron oxide staining throughout and on discontinuities,					31	83		
		87.0	fractured, trace fine grained garnets.	2342.4						87: Driller notes he is losing ~ 40% fluid circulation, and increasing.	
		89.0	As above, but with zone of gougey crushed rock.	2340.4				32	60		
90			As above.					33	100		
		91.0		2338.4							
		92.0	As above.	2337.4				34	100		
			As above.					35	100		
		94.0		2335.4							
95			As above.					36	100		
		97.0		2332.4							
			Becomes gray brown, interbedded METASANDSTONE and METASILTSTONE, foliated along bedding,					37	100		
100		100.0	quartz boudins, fractured, iron oxide haloes around joints.	2329.4							
			Contact with intrusive, poor recovery.					38	67		
		103.5		2325.9				39	60		
			Becomes dark greenish gray, DIABASE, aphanitic, foliated, brecciated, extensive iron oxide staining on fracture surfaces.					40	50		
105		107.5		2321.9							
		108.0	As above, some calcite.	2321.4				41	100		
		109.5	Continues dark greenish gray, DIABASE,	2319.9				42	100		
110			aphanitic to very fine grained phaneritic, fabric slightly foliated, quartz veining, fractured with iron oxide (limonite and hematite) coating all fracture surfaces,					43	100		
		113.5	with partial healing by calcite veins.	2315.9							
			As above, trace calcite in fractures.								
115			As above, becomes less fractured.					44	100		
		118.5		2310.9							
			As above.					45	100		
120											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:41
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RECORD OF BOREHOLE DH16-04 (GT-41)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 6, 2016 14:10
DRILLING END: October 10, 2016 09:30
COORDINATES: N: 840,821 E: 916,971

SHEET: 3 of 4
GS ELEV.: 2429.4
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
120	HQ3	120.0	As above. *(continued)*	2309.4				45	100		
		122.0	Becomes extensively fractured, but completely healed with calcite.	2307.4				46	100		
125		124.0	Continues dark greenish gray, DIABASE, aphanitic, fabric slightly foliated, quartz veining, fractured with iron oxide coating all fracture surfaces, with zones of healing by calcite veins.	2305.4				47	100		
		127.5	As above but becomes completely brecciated, partially healed.	2301.9				48	100		
130		130.0	As above.	2299.4				49	100		
		134.0	As above, lightly fractured and jointed with iron oxide coating all fracture surfaces, completely healed with calcite veins.	2295.4				50	100		
135		137.8	As above.	2291.6							
		138.5	As above, less brecciated.	2290.9			0-148.2 ft: Cement Bentonite Grout	51	75		
		140.5	Contact with host rock, very poor recovery.	2288.9				52	33		
140		142.0	Becomes Pinal Schist (pCpi): METASILTSTONE, pinkish brown, fine grained, highly fractured, large quartz veins.	2287.4				53	100		
		144.0	As above.	2285.4				54	100		
		148.0	As above.	2281.4				55	100		
145		151.5	As above, highly fractured.	2277.9				56	91		
		154.0	As above, gougey fault zone.	2275.4				57	100		
		156.5	Becomes gray, METASANDSTONE, lightly foliated, trace calcite veining, fractured zones.	2272.9			148.2-164.4 ft: 1/4" Bentonite pellets	58	100		
150		159.0	As above.	2270.4				59	100		
		162.0	As above, crushed gougey rock with minor iron oxide staining.	2267.4				60	100		
		164.0	Continues gray, interbedded METASANDSTONE and METASILTSTONE, foliated, slightly crenulated, fractured zones.	2265.4				61	57		
155		165.0	Becomes fault zone.	2264.4				62	71		
		171.0	Continues pink gray, interbedded METASANDSTONE and METASILTSTONE, foliated, slightly crenulated, fractured zones.	2258.4				63	40		
		172.5	No recovery.	2256.9				64	100		
160		174.0	As above.	2255.4				65	20		
		176.5	As above.	2252.9				66	80		
		177.5	As above.	2251.9			164.4-195.2 ft: 10/20 Silica Sand Filter Pack	67	100	177.5 - 181: Driller notes zone is taking some water, poor recovery.	
165								68	57		
							169.6-189.6 ft: 2"				
170											
175											
180											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-04 (GT-41)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 6, 2016 14:10
DRILLING END: October 10, 2016 09:30
COORDINATES: N: 840,821 E: 916,971

SHEET: 4 of 4
GS ELEV.: 2429.4
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
180		180.0		2249.4							
	HQ3	181.0	As above. *(continued)*	2248.4			ID sch 40 PVC 0.010" slot	68	57		
			Very poor recovery, rubble only, iron oxide staining.					69	33		
		184.0		2245.4							
185			Becomes gray, fine grained, METASILTSTONE, foliated on bedding, some crenulations, some calcite and iron oxide along foliations.					70	75		
		188.0		2241.4							
			As above.					71	100	189 - 220: Hydro test #4 SI	
190		192.0		2237.4							
			As above.					72	100		
		194.0		2235.4							
195			As above.					73	100		
		198.5		2230.9							
			As above, but more fractured.					74	68		
200		201.0		2228.4							
			As above.					75	100		
		204.0		2225.4							
205		206.0	As above, brecciated, trace staining on discontinuities.	2223.4				76	100		
			Rock as above, but competent with gougey fault zone.				195.2-220 ft: 1/4" Bentonite Pellets	77	92		
		208.5		2220.9							
210			Continues pinkish gray, fine to medium grained, METASANDSTONE foliated, sheared, brecciated and partially healed,					78	100		
		211.5	some calcite stockwork, minor iron oxide staining.	2217.9							
			As above.					79	100		
		214.0		2215.4							
215			As above, increased quartz veining.					80	88		
		218.0		2211.4							
			As above.					81	100		
220		220.0		2209.4							
			Bottom of borehole at 220.0 ft. Completed as well. Refer to diagram.								
225											
230											
235											
240											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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DH16-04 (GT-41)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:41
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RECORD OF BOREHOLE DH16-05 (GT-39)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 13, 2016 10:30
DRILLING END: October 18, 2016 11:30
COORDINATES: N: 838,291 E: 916,378

SHEET: 1 of 5
GS ELEV.: 2247.0
TOC ELEV.: na
DATUM:

BORING METHOD: HQ3

Depth (ft)	Description	Elev
0.0	Alluvial material: washed gravels: schist, gneiss, quartzite, and quartz clasts.	2247.0
6.0	Completely weathered DIABASE, clayey gravel with sand, mottled red brown, clasts are dark green, mafic.	2241.0
9.0	Becomes Pinal Schist (pCpi): completely weathered psammitic SCHIST, yellow brown, clayey sand and gravel, some dark green intrusive clasts. SPT blows @ 9 (per 3"): 7-50/3"	2238.0
14.0	Washed gravel, clasts are pinkish brown. SPT blows @ 14 (per 3"): 13-50/1"	2233.0
17.0	As above.	2230.0
19.0	Becomes dark greenish gray, DIABASE, aphanitic intrusive, abundant FeOx on discontinuities.	2228.0
19.5	No recovery.	2227.5
20.5	Continues dark greenish gray, DIABASE, aphanitic intrusive, abundant FeOx on discontinuities, siltstone gravel as well.	2226.5
21.5	As above.	2225.5
24.5	As above, becomes weathered to clay.	2222.5
25.5	Becomes slightly foliated DIABASE, variably altered from very weak rock to soft clay.	2221.5
30.0	Becomes contact DIABASE with Pinal Schist, soft clayey, sandy gouge.	2217.0
34.5	Becomes Pinal Schist (pCpi): light pinkish brown, medium grained, psammitic SCHIST, light foliation, fractured and jointed.	2212.5
37.0	As above.	2210.0
39.0	As above.	2208.0
44.0	As above.	2203.0
48.5	As above.	2198.5
52.0	As above, becomes gray.	2195.0
53.5	As above.	2193.5
58.5	As above.	2188.5

Log continued on next page

WELL DIAGRAM

0-22.8 ft: 1/4" Bentonite Pellets

22.8-44.4 ft: 10/20 Silica sand Filter pack
24-44 ft: 2" ID sch 40 PVC 0.010" slot

44.4-72.7 ft: 1/4" Bentonite Pellets

CORE INFO

RUN NO.	CORE RECOVERY %
1	25
2	50
3	50
4	17
5	33
6	25
7	33
8	15
9	100
10	0
11	50
12	67
13	50
14	86
15	20
16	83
17	100
18	100
19	100
20	100
21	100
22	100
23	100

NOTES

20: Hole is caving and drillers can't get back to bottom. Cannot perform falling head test because of cave. Drillers to advance casing to 20.
21.5: Driller puts bag of holeplug down hole before start of drilling to help with hole washout.
22: Drillers add some polymer after setting casing to lift sand in hole.
29 - 44: Hydro test #1 FHT

49 - 62: Hydro test #5 SI

ADDITIONAL LAB TESTING

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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DH16-05 (GT-39)
1 of 5

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:41
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RECORD OF BOREHOLE DH16-05 (GT-39)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 13, 2016 10:30
DRILLING END: October 18, 2016 11:30
COORDINATES: N: 838,291 E: 916,378

SHEET: 2 of 5
GS ELEV.: 2247.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
60		60.0		2187.0							
			As above. *(continued)*					23	100		
		64.0		2183.0							
65			As above, abundant fine grained boudins.					24	100		
		69.0		2178.0						69 - 99: Hydro test #2 SI & CRI	
70			As above.					25	93		
		72.0		2175.0							
			Continues light brown gray, fine to medium grained, psammitic SCHIST, slightly foliated, healed hairline fractures, trace FeOx staining, faulted.					26	100		
75		75.0		2172.0							
			As above, fractured.					27	100		
		79.0		2168.0							
			As above.					28	100		
80		80.5		2166.5						80.5 - 82: Driller notes that zone is taking water.	
			Contact with intrusive, only washed-out gravel.					29	50		
		82.5		2164.5							
			Contact continues as above.				72.7-97.2 ft: 10/20 Silica sand Filter pack 74-94 ft: 2" ID sch 40 PVC 0.010" slot	30	67		
85		84.0		2163.0							
			Becomes dark green, DIABASE, aphanitic, fractured, extensive FeOx staining on discontinuities.					31	100		
		86.0		2161.0						86: Driller notes zone taking water.	
		87.0	As above, slightly phaneritic, slight foliation.	2160.0				32	100		
		89.0	As above, becomes brecciated.	2158.0				33	100		
90	HQ3		Continues dark green gray, DIABASE, aphanitic to very fine grained phaneritic, competent, closed calcite-quartz-epidote veining, calcite and FeOx coated discontinuities, healed fractures.					34	100		
		94.0		2153.0							
95			As above.					35	100		
		99.0		2148.0			97.2-250 ft: 1/4" Bentonite Pellets			99 - 189: Hydro test #3 SI & CRI	
100			As above, some open calcite veining.					36	100		
		104.0		2143.0							
105			As above.					37	100		
		106.5		2140.5							
			As above.					38	100		
		109.0		2138.0							
110			As above.					39	100		
		114.0		2133.0							
115			As above.					40	100		
		118.7		2128.3							
120								4241	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-05 (GT-39)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 13, 2016 10:30
DRILLING END: October 18, 2016 11:30
COORDINATES: N: 838,291 E: 916,378

SHEET: 3 of 5
GS ELEV.: 2247.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
120		120.0		2127.0							
		120.5	Faulted, contact zone between diabase and schist. *(continued)*	2126.5				43	50		
		123.0	As above.	2124.0				44	40		
		125.5	As above, large quartz vein.	2121.5				45	33		
125		127.5	Becomes Pinal Schist (pCpi): olive gray, fine to medium grained, foliated, SCHIST, small boudined quartz veins and large quartz veins, faults.	2119.5				46	100		
		129.0	As above with 6-in. thick quartz vein.	2118.0				47	80		
130		133.0	Becomes psammitic METASILTSTONE, slightly foliated, quartz and calcite veining, fractured, crushed and gougey.	2114.0				48	100		
		138.0	As above.	2109.0				49	63		
135		141.5	As above, brownish gray and pinkish gray, calcite crystals on fractures.	2105.5				50	100		
140		146.0	Continues interbedded METASILTSONE and METASANDSTONE, foliated and faulted along bedding, fractured with little calcite healing.	2101.0				51	100		
		149.0	As above.	2098.0				52	100		
145		151.0	As above, weak and fractured throughout.	2096.0				53	100		
		153.5	As above, becomes more schistose.	2093.5				54	100		
150	HQ3	156.5	As above.	2090.5				55	100	153.5 - 156.5: Driller notes losing some circulation.	
		163.0	Continues gray, medium grained METASANDSTONE, foliated along bedding, schistose, competent.	2084.0				56	100		
155		168.0	As above, crenulated.	2079.0				57	100	163 - 168: Driller notes almost full circulation.	
		172.0	As above, entirely fractured and crushed, some quartz veining.	2075.0				58	50	168 - 172: Driller notes zone taking a little water.	
160		174.5	As above.	2072.5				59	100		
		176.0	As above, quartz vein.	2071.0				60	100		
165		179.0	Becomes brecciated dark gray SCHIST, quartz veining.	2068.0				61	100		
								62	100		
170								63	100		
175											
180											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-05 (GT-39)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 13, 2016 10:30
DRILLING END: October 18, 2016 11:30
COORDINATES: N: 838,291 E: 916,378

SHEET: 4 of 5
GS ELEV.: 2247.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	SOIL PROFILE Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0		2067.0							
	HQ3	184.0	Continues dark gray and pinkish gray, fine grained METASILTSTONE, laminated, tightly folded, foliated, minor FeOx staining, quartz veins. *(continued)*	2063.0				63	100	184 - 250: Hydro test #4 SI	
185		189.0	Becomes pinkish gray to pink, SCHIST, sheared, quartz veins.	2058.0				64	100		
190		192.5	Becomes pinkish brown to gray, schistose METASANDSTONE, sheared and foliated along bedding.	2054.5				65	100		
		195.5	Becomes gray, SCHIST, brecciated with bands of sheared gouge.	2051.5				66	100		
195		198.0	As above.	2049.0				67	100		
200		203.0	As above.	2044.0				68	100		
		205.5	As above, but fractured and faulted throughout.	2041.5				69	80		
205		208.0	As above.	2039.0				70	60		
		210.5	As above.	2036.5				71	100		
210		214.0	Becomes gray, medium grained METASANDSTONE with zones of silicification, lightly foliated.	2033.0				72	80		
		217.0	As above.	2030.0				73	67		
215		219.0	As above.	2028.0				74	100		
		221.0	As above with zones of clayey gouge.	2026.0				75	100		
220		222.5	As above, fractured and crushed.	2024.5				76	100		
		224.0	As above.	2023.0				77	100		
225		226.5	As above, fractured and crushed.	2020.5				78	100		
		229.0	As above, clayey gougey crushed rock.	2018.0				79	80		
230		231.5	Becomes olive gray, SCHIST, foliated, faulted and crushed with clayey gouge.	2015.5				80	100		
		234.5	As above.	2012.5				81	100		
235		238.0	As above, fractured, less faulted.	2009.0				82	100		
			As above, gray to olive gray, fractured throughout.					83	100		
240			Log continued on next page								

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-05 (GT-39)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 13, 2016 10:30
DRILLING END: October 18, 2016 11:30
COORDINATES: N: 838,291 E: 916,378

SHEET: 5 of 5
GS ELEV.: 2247.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0		2007.0							
	HQ3	241.0		2006.0				83	100		
			As above.					84	100		
		243.0		2004.0							
245			As above.					85	100		
		247.0		2000.0							
			As above.					86	100		
		249.0		1998.0							
250		250.0	As above.	1997.0				87	100		
			Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram.								
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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DH16-05 (GT-39)
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RECORD OF BOREHOLE DH16-05 (GT-39) Soil

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 13, 2016 10:30
DRILLING END: October 18, 2016 11:30
COORDINATES: N: 838,291 E: 916,378

SHEET: 1 of 1
GS ELEV.: 2247.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0		2247.0							
			Washed out by drilling. Recover washed gravel, multi-lithic, schist, quartz, quartzite, gneiss. Alluvial material: poor recovery, washed gravels only. Mixed lithics: schist, gneiss, quartzite, quartz.					1	25		
5								2	50		
		6.0		2241.0				3	50		
			(GC), CLAYEY GRAVEL, fine to coarse, subrounded to subangular, medium to coarse subrounded to subangular sand, medium plasticity fines, gray-green mottled		GC			4	17		
		9.0		2238.0							
10			orange-brown, ALLUVIUM; non-cohesive, dense, w < PL, 2-11-14-14-17-16; dark green clasts, aphanitic. Completely weathered bedrock: clayey gravel with sand, mottled red brown, clasts are dark					5	33		
								6	25		
		14.0	green, mafic, aphanitic intrusive.	2233.0							
15		15.0	SPT blows @ 6 (per 3")': 2-11-14-14-17-16	2232.0	SC			7	33		
			Becomes completely weathered psammitic schist, yellow brown, clayey sand and gravel, some dark green intrusive clasts.								
		19.0		2228.0				8	15		
		19.5	SPT blows @ 9 (per 3"): 7-50/3"	2227.5				9	100		
20		20.5	(SC), CLAYEY SAND, medium to coarse,	2226.5				10	0		
		21.5	subangular to angular, medium plasticity fines, some fine subangular to angular gravel, yellow-brown mottled olive-brown; cohesive, w > PL, 13-50/1'', Poor recovery, returns are washed gravel, clasts are pinkish brown silicified metasiltstone.	2225.5				11	50		
25			SPT blows @ 14 (per 3"): 13-50/1"								
			As above.								
			Poor recovery, washed gravel, clasts are dark greenish gray, mafic, aphanitic intrusive, abundant FeOx on discontinuities.								
30			No recovery.								
			Poor recovery, clasts mixed intrusive and pinkish gray silicified siltstone.								
			Bottom of borehole at 21.5 ft. Completed as well. Refer to diagram.								
35											
40											
45											
50											
55											
60											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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DH16-05 (GT-39) Soil

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RECORD OF BOREHOLE DH16-06 (GT-21)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 21, 2016 07:55
DRILLING END: October 23, 2016 11:30
COORDINATES: N: 841,669 E: 924,865

SHEET: 1 of 5
GS ELEV.: 2561.6
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0		2561.6							
	HQ3		Surficial soils, no recovery.					1	13	0 - 29: Hydro test #1 FHT	
		4.0		2557.6							
5			Gila Conglomerate (Tcg): no matrix recovered, clasts of gneiss, schist, and quartz.					2	33		
		8.5		2553.1							
10			Gila Conglomerate (Tcg): slightly weathered, matrix dominant, brown CONGLOMERATE, gravel clasts consisting of schist, gneiss, quartz, diabase, weak HCl reaction.					3	90		
		13.5		2548.1							
15			As above.					4	88		
		18.5		2543.1							
20			As above, becomes clast dominant.					5	100		
		24.0		2537.6							
25			As above, moderate HCl reaction.					6	100		
		29.0		2532.6							
30			As above, matrix dominant.					7	100		
		34.0		2527.6						34 - 64: Hydro test #2 SI	
35			As above.					8	96		
		39.0		2522.6							
40			As above, some diabase clasts.					9	100		
		44.0		2517.6							
45			As above.				0-116.6ft: Cement bentonite grout	10	100		
		49.0		2512.6							
50			As above.					11	100		
		54.0		2507.6							
55			As above, strong HCl reaction.					12	100		
		59.0		2502.6							
60			As above.					13	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF BOREHOLE DH16-06 (GT-21)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 21, 2016 07:55
DRILLING END: October 23, 2016 11:30
COORDINATES: N: 841,669 E: 924,865

SHEET: 2 of 5
GS ELEV.: 2561.6
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
60		60.0		2501.6							
	HQ3		As above. *(continued)*					13	100		
		64.0		2497.6						64 - 109: Hydro test #3 SI	
65			Continues slightly weathered, matrix dominant, brown CONGLOMERATE, gravel clasts consisting of schist, gneiss, quartz, diabase, weak HCl reaction.					14	100		
		69.0		2492.6							
70			As above.					15	100		
		74.0		2487.6							
75			As above.					16	100		
		79.0		2482.6							
80			As above, clast dominant.					17	100		
		84.0		2477.6							
85			As above.					18	100		
		89.0		2472.6							
90			As above.					19	100		
		94.0		2467.6							
95			As above, becomes matrix dominant, no HCl reaction.					20	100		
		99.0		2462.6							
100			As above, no cobbles, some schist clasts.					21	100		
		104.0		2457.6							
105			As above.				0-116.6 ft: Cement bentonite grout	22	100		
		109.0		2452.6							
110			Continues slightly weathered, matrix dominant, brown CONGLOMERATE, gravel clasts consisting of schist, gneiss, quartz, diabase, weak HCl reaction.					23	100		
		114.0		2447.6						114 - 139: Hydro test #4 SI & CRI	
115			As above.					24	100		
		119.0		2442.6			116.6-121.8 ft:				
120			As above, some calcite veins.					25	100		
			Log continued on next page								

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:41
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RECORD OF BOREHOLE DH16-06 (GT-21)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 21, 2016 07:55
DRILLING END: October 23, 2016 11:30
COORDINATES: N: 841,669 E: 924,865

SHEET: 3 of 5
GS ELEV.: 2561.6
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120	HQ3	120.0	As above, some calcite veins. *(continued)*	2441.6			1/4" Bentonite Pellets	25	100		
		124.0	Gila Conglomerate (Tcg): matrix dominant, some gravel, schist, tuff, chert, gneiss, diabase, limestone, weak HCl reaction, brown.	2437.6				26	100	125: Started losing mud around 125 ft-bgs, where fault was observed.	
125		129.0	As above.	2432.6				27	100		
130		134.0	As above.	2427.6				28	100		
135		139.0	Continues slightly weathered, matrix dominant, brown CONGLOMERATE, gravel clasts consisting of schist, gneiss, quartz, diabase, weak HCl reaction.	2422.6				29	100	139 - 249: Hydro test #5 SI	
140		144.0	As above.	2417.6				30	100		
145		149.0	As above.	2412.6				31	100		
150		154.0	As above, some cobbles.	2407.6			121.8-197.2 ft: 10/20 Silica Sand Filter Pack 2" ID sch 40 PCV 0.010 slot	32	100		
155		159.0	As above.	2402.6				32	100		
160		164.0	As above.	2397.6				33	100		
165		169.0	As above, some cobbles.	2392.6				34	100		
170		174.0	Continues matrix dominant, brown CONGLOMERATE, gravel clasts consisting of schist, gneiss, quartz, diabase, weak HCl reaction.	2387.6				35	100		
175		179.0	As above.	2382.6				36	100		
180			Log continued on next page								

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:41
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RECORD OF BOREHOLE DH16-06 (GT-21)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 21, 2016 07:55
DRILLING END: October 23, 2016 11:30
COORDINATES: N: 841,669 E: 924,865

SHEET: 4 of 5
GS ELEV.: 2561.6
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180	HQ3	180.0	As above. *(continued)*	2381.6				36	100		
		184.0	As above.	2377.6				37	100		
185		189.0	As above.	2372.6				38	100		
190		194.0	As above.	2367.6				39	100		
195		199.0	As above.	2362.6				40	100		
200		204.0	As above.	2357.6			197.2-249 ft: 1/4" Bentonite Pellets	41	100		
205		209.0	As above.	2352.6				42	100		
210		214.0	Continues matrix dominant, brown CONGLOMERATE, gravel to cobble sized clasts consisting of schist, gneiss, quartz, diabase, weak HCl reaction.	2347.6				43	100		
215		219.0	As above.	2342.6				44	100		
220		224.0	As above, no cobbles.	2337.6				45	100		
225		229.0	As above, some gneiss clasts.	2332.6				46	100		
230		234.0	As above.	2327.6				47	100		
235		239.0	As above.	2322.6				48	100		
240			As above.								

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF BOREHOLE DH16-06 (GT-21)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 21, 2016 07:55
DRILLING END: October 23, 2016 11:30
COORDINATES: N: 841,669 E: 924,865

SHEET: 5 of 5
GS ELEV.: 2561.6
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0		2321.6							
	HQ3		As above. *(continued)*					48	100		
		244.0		2317.6							
245			As above.					49	100		
		249.0		2312.6							
250			Bottom of borehole at 249.0 ft. Completed as well. Refer to diagram.								
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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DH16-06 (GT-21)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:41
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RECORD OF BOREHOLE DH16-07 (GT-20)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 23, 2016 00:00
DRILLING END: October 27, 2016 00:00
COORDINATES: N: 843,640 E: 926,191

SHEET: 1 of 5
GS ELEV.: 2496.6
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0	Surficial soils, no recovery.	2496.6							
		3.5		2493.1							
5		6.0	Gila Conglomerate (Tcg): weathered, brown CONGLOMERATE, washed out from drilling.	2490.6				1	60		
		8.0	As above.	2488.6				2	50		
10		10.0	Gila Conglomerate (Tcg): matrix dominant, brown CONGLOMERATE, gravel clasts consisting of schist, gneiss, quartz, diabase, matrix is weak, no HCl reaction.	2486.6			0-17 ft: 1/4" Bentonite pellets	3	60		
		14.0	As above, matrix to clast dominant.	2482.6				4	95		
15		17.0	As above, completely weathered, matrix is weak and friable.	2479.6				5	67		
		19.0	As above.	2477.6				6	80		
20		24.0	As above.	2472.6				7	96		
25		29.0	As above.	2467.6				8	96	24 - 49: Hydro test #1 SI	
30	HQ3	34.0	As above, becomes slightly weathered.	2462.6				9	100		
35		39.0	Continues slightly weathered, matrix dominant, brown CONGLOMERATE, gravel clasts consisting of schist, gneiss, quartz, diabase, matrix is weak, no HCl reaction.	2457.6			17-53.1 ft: 10/20 Silica Sand Filter Pack	10	100		
40		44.0	As above, large cobbles with gravel.	2452.6			20-50 ft: 2" ID sch 40 PVC 0.010" slot	11	100		
45		49.0	As above.	2447.6				12	100		
50		54.0	As above, becomes clast dominant.	2442.6				13	100	49 - 104: Hydro test #2 SI	
55		59.0	Continues slightly weathered, matrix dominant, brown CONGLOMERATE, gravel clasts consisting of schist, gneiss, quartz, diabase, no HCl reaction.	2437.6				14	100		
60			As above.					15	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF BOREHOLE DH16-07 (GT-20)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 23, 2016 00:00
DRILLING END: October 27, 2016 00:00
COORDINATES: N: 843,640 E: 926,191

SHEET: 2 of 5
GS ELEV.: 2496.6
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
60	HQ3	60.0	As above. *(continued)*	2436.6				15	100		
		64.0	As above, becomes clast dominant.	2432.6				16	100		
65		69.0	As above.	2427.6				17	100		
70		74.0	As above.	2422.6				18	100		
75		79.0	As above.	2417.6				19	100		
80		84.0	As above.	2412.6				20	100		
85		89.0	Becomes fresh, clast dominant CONGLOMERATE, some gravel, schist, quartz, diabase, tuff, limestone, weak HCl reaction, brown.	2407.6				21	100		
90		94.0	As above.	2402.6				22	100		
95		99.0	As above.	2397.6				23	100		
100		104.0	As above.	2392.6				24	100		
105		109.0	As above.	2387.6				25	100		
110		114.0	As above.	2382.6				26	100		
115		119.0	As above.	2377.6				27	100		
120			Log continued on next page								

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-07 (GT-20)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 23, 2016 00:00
DRILLING END: October 27, 2016 00:00
COORDINATES: N: 843,640 E: 926,191

SHEET: 3 of 5
GS ELEV.: 2496.6
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120	HQ3	120.0		2376.6							
		122.7	Continues fresh, clast dominant CONGLOMERATE with gravel to fine to coarse sand, clasts of rhyolite, diabase, tuff, no HCl reaction, brown. *(continued)*	2373.9				27	100		
		124.0	Becomes perlitic, pale grayish brown RHYOLITE, aphanitic, some autobreccia, matrix is light brown, weak, fine grained.	2372.6						124 - 152.5: Hydro test #3 SI	
125			As above, perlite is fractured and vitreous.					28	100		
		129.0		2367.6							
130			As above.					29	100		
		134.0		2362.6							
135			Continues perlitic RHYOLITE moderately weathered, zones of very weak, friable, argillic rock, some flow banding.					30	100		
		139.0		2357.6							
140			As above.					31	100		
		142.5		2354.1							
			As above.					32	88		
145		147.5		2349.1							
			As above.					33	94		
150		152.5		2344.1			53.1-249 ft: 1/4" Bentonite Pellets				
			As above, becomes highly brecciated, matrix dominant, matrix is white, weak.					34	92		
155		157.2		2339.4							
		159.0	As above.	2337.6				35	53		
160			As above, zones of very weak matrix.					36	100		
		164.0		2332.6							
165			Becomes perlitic RHYOLITE breccia, perlite is highly vitreous, gray brown, in matrix.					37	100		
		169.0		2327.6							
170			As above.					38	100		
		174.0		2322.6							
175			Continues perlitic RHYOLITE breccia, perlite is highly vitreous, gray brown, in matrix.					39	100		
		179.0		2317.6							
180			As above.					40	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-07 (GT-20)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: October 23, 2016 00:00
DRILLING END: October 27, 2016 00:00
COORDINATES: N: 843,640 E: 926,191
SHEET: 4 of 5
GS ELEV.: 2496.6
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180	HQ3	180.0	As above. *(continued)*	2316.6				40	100		
		184.0	As above.	2312.6				41	100		
185		189.0	As above.	2307.6				42	100		
190		194.0	As above.	2302.6				43	100	194 - 249: Hydro test #4 SI & CRI	
		197.5	As above.	2299.1				44	100		
195		204.0	Becomes brown RHYOLITE breccia with white matrix, brittle and ductile deformation, matrix is very soft and soapy.	2292.6				45	100		
200		207.0	Becomes more matrix dominant with corestones, soft, white, soapy, talc.	2289.6				46	100	205.5 - 207: At 205.5 ft-bgs water presure got blocked, chewed up core from 205.5 to 207 ft-bgs.	
		209.0	As above vesicular, less white matrix.	2287.6				47	50		
205		214.0	As above.	2282.6				48	100		
		219.0	As above.	2277.6				49	100		
210		224.0	As above, white soapy matrix.	2272.6				50	100		
215		225.3	Becomes brown and white RHYOLITE breccia, fault zone rock with secondary alteration, weak.	2271.3				51	100		
		229.0	As above.	2267.6							
220		234.0	As above.	2262.6				52	100		
		239.0	As above.	2257.6				53	100		
225			As above.					54	100		
230											
235											
240											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30
LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-07 (GT-20)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 23, 2016 00:00
DRILLING END: October 27, 2016 00:00
COORDINATES: N: 843,640 E: 926,191

SHEET: 5 of 5
GS ELEV.: 2496.6
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0		2256.6							
	HQ3		As above. *(continued)*					54	100		
		244.0		2252.6							
245			As above.					55	100		
		249.0		2247.6							
250			Bottom of borehole at 249.0 ft. Completed as well. Refer to diagram.								
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-08 (GT-15)-A

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 29, 2016 11:08
DRILLING END: October 29, 2016 18:05
COORDINATES: N: 842,211 E: 922,848

SHEET: 1 of 1
GS ELEV.: 2441.6
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0	(SW-SM), SAND, well graded, trace fine angular gravel, trace low plasticity fines, brown, weathered, no odor, COLLUVIUM; Schist, gneiss, quartz gravel; moist, SPT @ 6ft: 29-50/1"	2441.6	SW-SM						
5		6.0	Gila Conglomerate (Tcg): slightly weathered, matrix dominant, brown CONGLOMERATE, gravel clasts consisting of schist, gneiss, quartz, diabase, matrix is weak, no HCl reaction.	2435.6				1	52		
10		8.5	As above.	2433.1				2	54		
15		13.5	As above.	2428.1				3	64		
20		18.0	As above.	2423.6				4	14		
25		23.0	As above.	2418.6				5	100		
30		24.0	As above.	2417.6				6	90		
35		29.0	As above.	2412.6				7	100		
40		34.0	Bottom of borehole at 34.0 ft. Completed as well. Refer to diagram.	2407.6							
45											
50											
55											
60											

CORE RECOVERY % scale: 20 40 60 80

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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DH16-08 (GT-15)-A
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RECORD OF BOREHOLE DH16-08 (GT-15)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: October 30, 2016 09:23
DRILLING END: November 1, 2016 08:25
COORDINATES: N: 842,211 E: 922,848

SHEET: 1 of 5
GS ELEV.: 2441.6
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0	Tricone	0.0	Drillhole GT-15-B is the continuation of GT-15-A.	2441.6			0-18ft: 1/4" Bentonite Pellets			0 - 30: Continuation of DH16-08 (GT-15)-A. Tri-cone down to 30 ft-bgs.	
30		30.0		2411.6			20-110.2 ft: 2" ID sch 40 PVC 0.010" slot				
34	HQ3	34.0	Gila Conglomerate (Tcg): slightly weathered, matrix dominant, CONGLOMERATE, gravel clasts consisting of schist, gneiss, quartz, diabase, matrix is weak, no HCl reaction, brown.	2407.6			18-111.2 ft: 10/20 Silica Sand Filter Pack	1	100	34 - 69: Hydro test #1 SI	
39		39.0	As above, core pitted.	2402.6				2	100		
44		44.0	As above. Highly weathered core with fractured/weak zone from 56 to 57.5. Slightly weathered 57.5-59 ft.	2397.6				3	100		
49		49.0	As above, becomes clast dominant, weak, fracture zone.	2392.6				4	90		
54		54.0	As above, matrix dominant, competent.	2387.6				5	100		
59		59.0	As above.	2382.6				6	100		
60								7	96		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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DH16-08 (GT-15)-B

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RECORD OF BOREHOLE DH16-08 (GT-15)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: October 30, 2016 09:23
DRILLING END: November 1, 2016 08:25
COORDINATES: N: 842,211 E: 922,848
SHEET: 2 of 5
GS ELEV.: 2441.6
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
60		60.0		2381.6							
	HQ3	64.0	Continues slightly weathered, matrix dominant, CONGLOMERATE, large gravel clasts, clasts consist of schist, gneiss, diabase, tuff, quartz, no HCl reaction, brown. *(continued)*	2377.6				7	96		
65		69.0	As above, some limestone clasts.	2372.6				8	100		
70		74.0	As above.	2367.6				9	100		
75		79.0	As above.	2362.6			20-110.2 ft: 2" ID sch 40 PVC 0.010" slot	10	100	74 - 139: Hydro test #2 SI	
80		84.0	As above, slightly weathered, pitted.	2357.6			18-111.2 ft: 10/20 Silica Sand Filter Pack	11	100		
85		89.0	As above.	2352.6				12	100		
90		94.0	As above.	2347.6				13	94		
95		99.0	As above.	2342.6				14	100		
100		104.0	Continues slightly weathered, matrix dominant, CONGLOMERATE, large gravel clasts, clasts consist of schist, gneiss, diabase, tuff, quartz, weak HCl reaction, brown.	2337.6				15	100		
105		109.0	As above, moderate HCl reaction.	2332.6				16	100		
110		114.0	As above, weak HCl reaction.	2327.6				17	100		
115		119.0	As above, lenses of fine grained sandstone, competent, no clasts.	2322.6				18	100		
120								19	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30
LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF BOREHOLE DH16-08 (GT-15)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: October 30, 2016 09:23
DRILLING END: November 1, 2016 08:25
COORDINATES: N: 842,211 E: 922,848
SHEET: 3 of 5
GS ELEV.: 2441.6
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120	HQ3	120.0	As above. 116.5-117 sand lens: fine grained sand no clasts, very competent *(continued)*	2321.6				19	100		
		124.0	As above.	2317.6				20	100		
125		129.0	As above, no HCl reaction.	2312.6				21	100		
		132.0	As above.	2309.6				22	100		
130		137.0	As above.	2304.6				23	100		
		139.0	Continues fresh, matrix dominant, CONGLOMERATE, gravel clasts of diabase, quartz, schist, limestone, gneiss, tuff, matrix is fine to coarse sand, no HCl reaction, brown.	2302.6				24	100	139 - 249: Hydro test #3 SI	
135		144.0	As above.	2297.6				25	100		
		149.0	As above.	2292.6				26	100		
140		154.0	As above.	2287.6				27	100		
		159.0	As above, weak HCl reaction.	2282.6				28	100		
145		164.0	As above, clast dominant, some oxidation.	2277.6				29	100		
		169.0	As above.	2272.6				30	100		
150		174.0	As above.	2267.6				31	100		
		179.0	As above.	2262.6				32	100		
155			Log continued on next page								
160											
165											
170											
175											
180											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30
LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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DH16-08 (GT-15)-B
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:41
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RECORD OF BOREHOLE DH16-08 (GT-15)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: October 30, 2016 09:23
DRILLING END: November 1, 2016 08:25
COORDINATES: N: 842,211 E: 922,848
SHEET: 4 of 5
GS ELEV.: 2441.6
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180	HQ3	180.0	As above. *(continued)*	2261.6			111.2-249 ft: 1/4" Bentonite Pellets	32	100		
		184.0	Continues fresh, matrix dominant, CONGLOMERATE, gravel clasts of diabase, quartz, schist, limestone, gneiss, tuff, no HCl reaction, brown.	2257.6				33	100		
185		189.0	As above.	2252.6				34	100		
190		194.0	As above.	2247.6				35	100		
195		199.0	As above, clast dominant.	2242.6				36	100		
200		204.0	As above.	2237.6				37	100		
205		209.0	As above.	2232.6				38	100		
210		214.0	Continues fresh, matrix dominant, CONGLOMERATE, gravel clasts of diabase, quartz, schist, limestone, gneiss, tuff, no HCl reaction, brown.	2227.6				39	100		
215		219.0	As above.	2222.6				40	100		
220		224.0	As above, clast dominant.	2217.6				41	100		
225		229.0	As above.	2212.6				42	100		
230		234.0	As above, matrix dominant.	2207.6				43	100		
235		239.0	As above.	2202.6				44	100		
240			Log continued on next page								

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30
LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-08 (GT-15)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: October 30, 2016 09:23
DRILLING END: November 1, 2016 08:25
COORDINATES: N: 842,211 E: 922,848
SHEET: 5 of 5
GS ELEV.: 2441.6
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0		2201.6							
	HQ3		As above. *(continued)*					44	100		
		244.0		2197.6							
245			As above.					45	100		
		249.0		2192.6							
250			Bottom of borehole at 249.0 ft. Completed as well. Refer to diagram.								
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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DH16-08 (GT-15)-B
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:41
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RECORD OF BOREHOLE DH16-09-(GT-32)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 2, 2016 16:58
DRILLING END: November 6, 2016 15:45
COORDINATES: N: 845,384 E: 927,715

SHEET: 1 of 5
GS ELEV.: 2619.7
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
0	HQ3	0.0	Dark gray, perlitic, RHYOLITE, glassy, flow-banded.	2619.7				1	83	0 - 24: Hydro test #1 FHT	
		4.0	As above, flow banding is alternating gray, pale pink, orange red, some crenulation, jointed, slightly weathered.	2615.7				2	100		
5		9.0	Continues perlitic RHYOLITE, flow-banded, aphanitic rhyolite, red brown, vesicles infilled with quartz, FeOx, and dark gray and white perlitic rock, webbed texture, glassy, crenulated.	2610.7				3	100		
10		13.5	As above.	2606.2				4	100		
15		18.5	As above, folded and crenulated.	2601.2				5	100		
20		24.0	As above.	2595.7				6	90	24: Set casing.	
25		29.0	As above.	2590.7				7	100		
30		34.0	As above.	2585.7				8	100		
35		39.0	As above.	2580.7				9	100		
40		44.0	As above, becomes more jointed along the flow banding.	2575.7			0-86.5 ft: Cement Bentonite Grout	10	100		
45		47.0	As above, jointed fractured.	2572.7				11	100		
50		52.0	As above.	2567.7				12	75	54 - 97: Hydro test #2 SI & CRI	
55		54.0	Becomes aphanitic white and brown RHYOLITE, flow banding, layered and boudined, few vesicles.	2565.7				13	100		
60		59.0	As above.	2560.7				14	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-09-(GT-32)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 2, 2016 16:58
DRILLING END: November 6, 2016 15:45
COORDINATES: N: 845,384 E: 927,715

SHEET: 2 of 5
GS ELEV.: 2619.7
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
60	HQ3	60.0	As above. *(continued)*	2559.7				14	100		
		64.0	As above.	2555.7				15	90		
65		69.0	As above, brittle and fractured throughout.	2550.7				16	58	69: Poor recovery, driller notes ~40% fluid return.	
70		73.0	Continues brown and gray flow-banded RHYOLITE, crenulated, oxidized phenocrysts, vesicular and pitted, returns to perlitic, glassy texture.	2546.7				17	90		
75		78.0	As above, fractured and sheared.	2541.7				18	100		
80		83.0	As above, weak and altered.	2536.7				19	100		
85		88.0	As above.	2531.7				20	100		
90		93.0	As above, fault zone.	2526.7				21	75	94 - 109: Hydro test #3 SI & CRI \ 95: Fault zone, lost circulation.	
95		97.0	Continues RHYOLITE, orange brown with light gray, flow banding, aphanitic, oxidized biotites, pitted.	2522.7				22	100	` 97: At 97 ft-bgs hole goes completely dry. Packer test fails.	
		99.0	As above.	2520.7				23	100	\ 99: Circulation returns, remains ~ 60%	
100		104.0	As above.	2515.7				24	100		
105		106.0	As above.	2513.7			86.5-123.9 ft: 1/4" Bentonite Pellets	25	100		
		109.0	As above, near vertical joint set, fresh and competent.	2510.7				26	100	114 - 168: Hydro test #4 SI & CRI	
110		116.0	As above.	2503.7				27	90		
115		119.0		2500.7							
120			Log continued on next page								

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-09-(GT-32)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 2, 2016 16:58
DRILLING END: November 6, 2016 15:45
COORDINATES: N: 845,384 E: 927,715

SHEET: 3 of 5
GS ELEV.: 2619.7
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
120	HQ3	120.0	Becomes predominantly orange brown, RHYOLITE gray boudins, flow laminations, gray rock is very weak and argillized. *(continued)*	2499.7				27	90		
		124.0	As above.	2495.7				28	100		
125		129.0	As above.	2490.7				29	100		
130		134.0	As above, sheared zones along foliation	2485.7				30	100		
135		139.0	As above, more crenulated, brown with gray.	2480.7				31	90		
140		144.0	As above.	2475.7				32	88		
145		148.0	As above.	2471.7			123.9-171.4 ft: 10/20 Silica Sand Filter Pack	33	100		
150		153.0	As above.	2466.7			130.3-170.3 ft: 2" ID sch 40 PVC 0.010" slot	34	100		
155		158.0	Continues RHYOLITE, moth eaten texture, flow-banded, folded brown and gray, weak.	2461.7				35	100	161: Lost circulation.	
160		163.0	As above.	2456.7				36	100		
165		168.0	As above.	2451.7				37	100		
170		173.0	As above, becomes more pinkish brown and gray, coarser, anhedral phenocrysts, trace FeOx.	2446.7				38	100		
175		176.5	As above.	2443.2				39	100		
180			Log continued on next page								

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-09-(GT-32)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: November 2, 2016 16:58
DRILLING END: November 6, 2016 15:45
COORDINATES: N: 845,384 E: 927,715
SHEET: 4 of 5
GS ELEV.: 2619.7
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
180		180.0		2439.7							
		181.5	As above. *(continued)*	2438.2				39	100		
		184.0	As above.	2435.7				40	100	183 - 250: Hydro test #5 SI & CRI	
185		189.0	Becomes RHYOLITE, moth eaten zone, flow-banded brown and gray, folded and crenulated, gray rock vesicular, weaker, and slightly porous.	2430.7				41	100		
190		193.0	As above.	2426.7				42	100		
195		198.0	As above.	2421.7				43	100		
200		203.0	As above.	2416.7				44	100		
205		208.0	As above, but gray rock more vesicular to pumaceous.	2411.7				45	100		
210	HQ3	213.0	As above, zones of weak, rubbly rock.	2406.7			171.4-250 ft: 1/4" Bentonite Pellets	46	100		
215		218.0	As above.	2401.7				47	90		
220		223.0	As above, fractured.	2396.7				48	100		
225		228.0	As above.	2391.7				49	100		
230		233.0	As above.	2386.7				50	100		
235		238.0	As above.	2381.7				51	100		
240			As above, more brittle deformation and fracturing.					52	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30
LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-09-(GT-32)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 2, 2016 16:58
DRILLING END: November 6, 2016 15:45
COORDINATES: N: 845,384 E: 927,715

SHEET: 5 of 5
GS ELEV.: 2619.7
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0		2379.7							
	HQ3		As above, more brittle deformation and fracturing. *(continued)*					52	100		
		243.0		2376.7							
245			As above.					53	100		
		248.0		2371.7							
			As above.					54	100		
250		250.0		2369.7							
			Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram.								
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-10 (GT-31)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 8, 2016 12:02
DRILLING END: November 11, 2016 17:30
COORDINATES: N: 845,877 E: 929,847

SHEET: 1 of 5
GS ELEV.: 2699.5
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
0		0.0		2699.5							
	HQ3	4.0	Perlitic, aphyric, gray RHYOLITE breccia with aphanitic rhyolite inclusions, shattered, highly vitreous, roots and iron staining.	2695.5				1	88	0 - 24: Hydro test # 1 FHT	
5		9.0	As above.	2690.5				2	70		
10		14.0	Continues perlitic aphyric RHYOLITE breccia, highly vitreous, shattered texture and brecia zones, abundant voids on veining, botryoidal opal in voids	2685.5				3	100		
15		19.0	As above, rock is extremely brittle, with weak zones and full of voids.	2680.5				4	100		
20		24.0	As above, abundant voids, more brown rhyolite veins/inclusions, still highly shattered texture.	2675.5				5	100		
25		29.0	Becomes matrix dominant RHYOLITE breccia, clasts of perlite and brown rhyolite, fewer voids, massive.	2670.5				6	100		
30		34.0	Becomes flow-banded, perlitic RHYOLITE, highly vitreous, some voids with botryoidal opal and chalcedony, some FeOx, some brown rhyolite inclusions, very brittle.	2665.5				7	100		
35		39.0	As above.	2660.5				8	100		
40		44.0	As above.	2655.5				9	100	43 - 109: Hydro test #2 SI	
45		48.0	As above.	2651.5				10	100		
50		50.0	As above	2649.5				11	100	48 - 50: Mislatch with core tube, drilling damage.	
		54.0	Continues flow-banded, perlitic RHYOLITE, highly vitreous, some voids with botryoidal opal and chalcedony, some FeOx, some brown rhyolite inclusions, very brittle.	2645.5				12	40		
								13	100		
55		59.0	As above.	2640.5				14	100		
60			As above.					15	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-10 (GT-31)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 8, 2016 12:02
DRILLING END: November 11, 2016 17:30
COORDINATES: N: 845,877 E: 929,847

SHEET: 2 of 5
GS ELEV.: 2699.5
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
60	HQ3	60.0	As above. *(continued)*	2639.5				15	100		
		64.0	As above.	2635.5				16	100		
65		69.0	As above.	2630.5				17	78		
70		73.5	Continues flow-banded, perlitic RHYOLITE, highly vitreous, some voids with botryoidal opal and chalcedony, some FeOx, some brown rhyolite inclusions, very brittle.	2626.0				18	100		
75		78.5	As above.	2621.0				19	100		
		80.5	As above.	2619.0			0-174.9 ft: Cement Bentonite Grout	20	100		
80		84.0	As above.	2615.5				21	100		
		89.0	As above.	2610.5				22	100		
85		94.0	As above.	2605.5				23	100		
		99.0	Continues flow-banded, perlitic RHYOLITE, highly vitreous, some voids with botryoidal opal and chalcedony, some FeOx, some brown rhyolite inclusions, very brittle.	2600.5				24	100		
90		104.0	As above.	2595.5				25	100	104 - 208.5: Hydro test #3 SI	
		111.3	As above, folded and crenulated.	2588.2				26	100		
95		114.0	As above.	2585.5				27	100		
		119.0		2580.5				28	100		
100			Log continued on next page					29	100		
105											
110											
115											
120											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-10 (GT-31)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 8, 2016 12:02
DRILLING END: November 11, 2016 17:30
COORDINATES: N: 845,877 E: 929,847

SHEET: 3 of 5
GS ELEV.: 2699.5
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120		120.0		2579.5							
	HQ3		Becomes silicified brown RHYOLITE with softer white laminations, vesicles. *(continued)*					29	100		
		124.0		2575.5							
125			As above.					30	100		
		128.0		2571.5							
			Becomes flow-banded, perlitic RHYOLITE, highly vitreous, some voids with botryoidal opal and chalcedony, some FeOx, some brown rhyolite inclusions, very brittle.					31	100		
130								32	100		
								33	100		
135		135.3		2564.2							
			As above.					34	100		
		139.0		2560.5							
140			As above.					35	100		
		144.0		2555.5							
145			As above.					36	100		
								37	100		
		149.0		2550.5							
150			As above.					38	100		
		154.0		2545.5							
155			As above, brecciated.					39	100		
		159.0		2540.5							
160			As above.					40	100		
165								41	100		
		167.3		2532.2							
			Becomes highly vesicular, weak.				0-174.9 ft: Cement Bentonite Grout				
		169.0		2530.5							
170			As above.					42	100		
		174.0		2525.5							
175			RHYOLITE breccia, abundant quartz, trace opal.					43	100		
		177.0		2522.5							
			As above, large voids.					44	100		
180											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:41
P:\2015 PROJECTS\1531436 RCML NEAR WEST TSF GEOTECH\GINT\FINAL GINT PROJECTS\FINAL_OCTOBER 2017\NWTSF_FINAL_WELLS.GPJ

RECORD OF BOREHOLE DH16-10 (GT-31)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 8, 2016 12:02
DRILLING END: November 11, 2016 17:30
COORDINATES: N: 845,877 E: 929,847

SHEET: 4 of 5
GS ELEV.: 2699.5
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0	As above, large voids. *(continued)*	2519.5				44	100		
		182.0	RHYOLITE breccia, brown "thundereggs" inclusion of chalcedony, in gray perlitic matrix.	2517.5				45	100		
185		186.0	Becomes RHYOLITE, brown, brecciated texture, completely silicified, vesicles infilled with chalcedony.	2513.5			174.9-200.1 ft: 1/4" Bentonite Pellets	46	100		
190		191.0	Becomes perlitic, dark gray RHYOLITE, highly vitreous, little brown rhyolite stockwork.	2508.5				47	100		
		194.0	As above.	2505.5				48	100		
195		199.0	As above.	2500.5				49	100		
200		203.5	As above.	2496.0				50	100		
		207.0	As above.	2492.5				52	100		
205		211.0	Continues gray perlitic RHYOLITE, highly vitreous, little brown inclusions are FeOx stained.	2488.5				53	100	214 - 254: Hydro test #4, 5 SI & CRI	
		212.9	Becomes brown RHYOLITE, brecciated texture, completely silicified, slightly vesicular, large pink inclusions.	2486.6							
210	HQ3	214.0	Becomes gray perlitic RHYOLITE, highly vitreous, little brown inclusions are FeOx stained.	2485.5							
		219.0	As above.	2480.5				54	100		
215		224.6	As above.	2474.9			200.1-254 ft: 10/20 Silica Sand Filter Pack	55	100		
		229.0	As above.	2470.5				56	100		
220		234.0	Continues RHYOLITE breccia, becomes matrix dominant, pinkish gray, slightly vitreous rhyolite clasts in dark pinkish-orange red matrix, angular clasts, sand to cobble sized, weak and massive.	2465.5				57	100		
		239.0		2460.5				58	100		
225											
230											
235											
240											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:41
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RECORD OF BOREHOLE DH16-10 (GT-31)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 8, 2016 12:02
DRILLING END: November 11, 2016 17:30
COORDINATES: N: 845,877 E: 929,847

SHEET: 5 of 5
GS ELEV.: 2699.5
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0		2459.5							
	HQ3		As above, breccia clasts, sand to gravel sized. *(continued)*				230-250 ft: 2" ID sch 40 PVC 0.010 slot	58	**100**		
		244.0		2455.5						244 - 249: Drillers note losing some water.	
245			As above.					59	**100**		
		249.0		2450.5							
250			As above.					60	**100**		
		254.0		2445.5							
255			Bottom of borehole at 254.0 ft. Completed as well. Refer to diagram.								
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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DH16-10 (GT-31)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:41
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RECORD OF BOREHOLE DH16-11 (GT-18)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 12, 2016 14:10
DRILLING END: November 16, 2016 08:45
COORDINATES: N: 850,299 E: 924,156

SHEET: 1 of 5
GS ELEV.: 2704.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0	HQ3	0.0	(SP-SM), SAND, poorly graded, some low plasticity fines, trace gravel, brown, weathered, friable, iron oxide staining; moist	2704.0	SP-SM					0 - 29: Hydro test #1 FHT	
5		7.5	Highly weathered DIABASE, phaneritic, medium grained, mm-scale plagioclase lathe phenocrysts, pervasive oxidation throughout groundmass, calcite veins. Rubble.	2696.5				1	31		
10		11.0	As above.	2693.0				2	43		
15		14.0	Continues highly weathered DIABASE, pervasisve oxidation, slightly fractured, two joint sets with calcite infilling.	2690.0				3	100		
20		17.5	As above.	2686.5			0-34 ft: Cement Bentonite Grout	4	80		
25		22.5	As above.	2681.5				5	100	24 - 69: Hydro test #2 SI & CRI	
30		24.0	As above.	2680.0				6	100		
35		29.0	As above.	2675.0				7	100		
40		34.0	As above.	2670.0				8	92		
45		39.0	Continues slighty weathered DIABASE, light iron oxide staining, phaneritic, medium grained, mm-scale plagioclase lathe phenocrysts, some calcite veins.	2665.0			34-47.5 ft: 1/4" Bentonite Pellets	9	100		
50		44.0	As above, less calcite.	2660.0				10	96		
55		49.0	As above.	2655.0				11	100		
60		54.0	As above, becomes fresh.	2650.0				12	100		
		59.0	As above, only one joint set.	2645.0				13	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:41
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RECORD OF BOREHOLE DH16-11 (GT-18)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: November 12, 2016 14:10
DRILLING END: November 16, 2016 08:45
COORDINATES: N: 850,299 E: 924,156
SHEET: 2 of 5
GS ELEV.: 2704.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
60	HQ3	60.0	As above, only one joint set. *(continued)*	2644.0				13	100		
		64.0	As above, two joint sets.	2640.0				14	100		
65		69.0	Continues slightly weathered DIABASE, phaneritic, medium grained, mm-scale plagioclase lathe phenocrysts, penetrative oxidation, some calcite veins.	2635.0			0-94.4 ft: 10/20 Silica Sand Filter Pack 50-90 ft: 2" ID sch 40 PVC 0.010" slot	15	96		
70		73.5	As above.	2630.5				16	100	74 - 133.5: Hydro test #3 SI	
75		78.5	As above.	2625.5				17	100		
		83.5	As above.	2620.5				18	100		
80		88.5	As above.	2615.5				19	100		
85		93.5	As above.	2610.5				20	100		
90		98.5	As above.	2605.5				21	100		
95		103.5	As above.	2600.5				22	100		
100		108.5	Continues slightly weathered DIABASE, phaneritic, medium grained, mm-scale plagioclase lathe phenocrysts, penetrative oxidation, some calcite veins.	2595.5			94.4-254 ft: 1/4" Bentonite Pellets	23	100		
105		113.5	As above.	2590.5				24	100		
110		118.5	As above.	2585.5				25	100		
115			Log continued on next page								
120											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30
LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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DH16-11 (GT-18)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:41
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RECORD OF BOREHOLE DH16-11 (GT-18)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 12, 2016 14:10
DRILLING END: November 16, 2016 08:45
COORDINATES: N: 850,299 E: 924,156

SHEET: 3 of 5
GS ELEV.: 2704.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120	HQ3	120.0	As above. *(continued)*	2584.0				25	100		
		123.5	As above.	2580.5				26	100		
125		128.5	As above.	2575.5				27	100		
130		133.5	As above.	2570.5				28	100		
135		138.5	As above.	2565.5				29	100		
140		143.5	As above.	2560.5				30	100		
145		148.5	As above.	2555.5				31	100		
150		153.5	Continues slightly weathered DIABASE, phaneritic, medium grained, mm-scale plagioclase lathe phenocrysts, penetrative oxidation, some calcite veins.	2550.5				32	100	154 - 254: Hydro test #4 SI	
155		158.5	As above.	2545.5				33	96		
160		163.5	As above.	2540.5				34	100		
165		166.5	As above.	2537.5				35	100		
170		171.5	As above.	2532.5				35	100		
		174.0	As above.	2530.0				36	100		
175		179.0	As above.	2525.0				37	100		
180			As above.								

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-11 (GT-18)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 12, 2016 14:10
DRILLING END: November 16, 2016 08:45
COORDINATES: N: 850,299 E: 924,156

SHEET: 4 of 5
GS ELEV.: 2704.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0		2524.0							
			As above. *(continued)*					37	100		
		184.0		2520.0							
185			As above.					38	100		
		189.0		2515.0							
190			As above.					39	100		
		194.0		2510.0							
195			As above.					40	100		
		199.0		2505.0							
200			As above, less calcite.					41	100		
		204.0		2500.0							
205			Continues slightly weathered DIABASE, phaneritic, medium grained, mm-scale plagioclase lathe phenocrysts, penetrative oxidation, some calcite veins.					42	100		
		209.0		2495.0							
210	HQ3		As above, no joints.					43	100		
		214.0		2490.0							
215			As above.					44	100		
		219.0		2485.0							
220			As above.					45	100		
		224.0		2480.0							
225			As above.					46	100		
		229.0		2475.0							
230			As above.					47	100		
		234.0		2470.0							
235			As above, interval of fault infilled with breccia, minor fault gouge and some iron oxide staining.					48	96		
		239.0		2465.0							
240			As above.					49	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:41
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RECORD OF BOREHOLE DH16-11 (GT-18)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 12, 2016 14:10
DRILLING END: November 16, 2016 08:45
COORDINATES: N: 850,299 E: 924,156

SHEET: 5 of 5
GS ELEV.: 2704.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0		2464.0							
	HQ3	244.0	As above. *(continued)*	2460.0				49	100		
245	HQ3	249.0	As above.	2455.0				50	100		
250	HQ3	254.0	As above.	2450.0				51	100		
255			Bottom of borehole at 254.0 ft. Completed as well. Refer to diagram.								
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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DH16-11 (GT-18)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:41
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RECORD OF BOREHOLE DH16-12 (GT-19)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 16, 2016 15:51
DRILLING END: November 19, 2016 17:00
COORDINATES: N: 847,002 E: 923,396

SHEET: 1 of 5
GS ELEV.: 2669.1
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0	Surficial soils.	2669.1						0 - 31: Hydro test #1 FHT	
		4.0	Gila Conglomerate (Tcg): only recovered gravel with few broken pieces of matrix, clasts consist of schist, tuff, and quartz.	2665.1							
5		6.0	Poor recovery, as above.	2663.1				1	50		
		9.0	(SM), SILTY SAND, fine to coarse, angular, medium plasticity fines, trace gravel, brown, weathered, lense; Ran SPT after 0 recovery core run fron 9' to 12', probably just a more weathered zone in the gila with less gravel. No recovery.	2660.1				2	43		
10		14.0	Gila Conglomerate (Tcg): highly weathered, matrix dominant, brown CONGLOMERATE, few gravel clasts consisting of schist, tuff, quartz, diabase, gneiss.	2655.1	SM				0		
		17.5	Poor recovery, as above.	2651.6				3	43		
15		20.0	Poor recovery, as above.	2649.1				4	40		
		21.5	Continues Gila Conglomerate (Tcg): highly weathered, clast dominant, brown	2647.6				5	87		
20		23.0	CONGLOMERATE, gravel clasts consisting of schist, tuff, quartz, diabase, gneiss.	2646.1				6	67		
		27.0	As above. Continues highly weathered, brown CONGLOMERATE, matrix dominant with gravel, few cobbles, and clasts consisting of schist, tuff, quartz, and gneiss, friable and weak matrix.	2642.1				7	85		
25		31.0	As above, becomes clast dominant.	2638.1				8	88		
		34.0	As above.	2635.1				9	73	34 - 69: Hydro test #2 SI	
30		39.0	As above, weak HCl reaction.	2630.1				10	86		
		44.0	As above, becomes matrix dominant.	2625.1				11	100		
35		49.0	As above, clasts of schist, quartz, and tuff.	2620.1				12	100		
		54.0	As above, no HCl reaction, slightly weathered but competent and unjointed.	2615.1				13	100		
40		59.0	As above.	2610.1				14	100		
								15	100		
45											
50											
55											
60											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:41
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RECORD OF BOREHOLE DH16-12 (GT-19)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 16, 2016 15:51
DRILLING END: November 19, 2016 17:00
COORDINATES: N: 847,002 E: 923,396

SHEET: 2 of 5
GS ELEV.: 2669.1
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
60		60.0		2609.1							
		64.0	Continues fresh, matrix dominant, brown CONGLOMERATE, gravel to cobble sized clasts consisting of schist, tuff, quartz, gneiss, chert, no HCl reaction, competent and unjointed. *(continued)*	2605.1				15	100		
65			As above, clasts of schist, tuff, quartz, gneiss, limestone, weak HCl reaction.					16	100		
		69.0		2600.1							
70			As above.				0-140.7 ft: Cement bentonite grout	17	100		
		74.0		2595.1						74 - 119: Hydro test #3 SI	
75			As above, clasts of tuff, quartz, gneiss, limestone.					18	100		
		79.0		2590.1							
80			As above.					19	100		
		84.0		2585.1							
85			As above.					20	100		
		89.0		2580.1							
90			As above, becomes very fine grained matrix, more friable, slightly weathered.					21	100		
		94.0		2575.1							
95			Continues CONGLOMERATE highly weathered, very weak, can indent matrix with thumb, matrix dominant with few brown gravel sized clasts consisting of schist, tuff, quartz, gneiss, limestone, granite, no HCl reaction.					22	94		
100		100.0		2569.1							
			As above, slightly weathered.					23	100		
		104.0		2565.1							
105			As above, fresh.					24	100		
		109.0		2560.1						109 - 174: Hydro test #4 SI & CRI	
110			As above, clasts of tuff, quartz, gneiss, limestone, diabase.					25	100		
		114.0		2555.1							
115			As above.					26	100		
		119.0		2550.1							
120			As above.					27	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF BOREHOLE DH16-12 (GT-19)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 16, 2016 15:51
DRILLING END: November 19, 2016 17:00
COORDINATES: N: 847,002 E: 923,396

SHEET: 3 of 5
GS ELEV.: 2669.1
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120		120.0		2549.1							
		124.0	As above. *(continued)*	2545.1				27	100	124: At 124.3 ft-bgs drill head dropped 4-6 in., started losing water.	
125		129.0	As above.	2540.1				28	90		
130		134.0	Continues fresh, matrix dominant CONGLOMERATE, gravel clasts consisting of tuff, quartz, gneiss, limestone, diabase, weak HCl reaction, competent and unjointed.	2535.1				29	100		
135		139.0	As above, competent.	2530.1				30	100		
140		144.0	As above.	2525.1				31	100		
145		149.0	As above.	2520.1			140.7-151.2 ft: 1/4" Coated Bentonite Pellets	32	100		
150		154.0	As above.	2515.1				33	100		
155		159.0	As above.	2510.1				34	100		
160		164.0	As above.	2505.1				35	100		
165		169.0	As above.	2500.1				35	100		
170		174.0	As above.	2495.1				35	100		
175		179.0	As above, becomes slightly weathered, slightly weaker matrix.	2490.1				36	100		
180								37	97		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:41
P:\2015 PROJECTS\1531436 RCML NEAR WEST TSF GEOTECH\GINT\FINAL GINT PROJECTS\FINAL_OCTOBER 2017\NWTSF_FINAL_WELLS.GPJ

RECORD OF BOREHOLE DH16-12 (GT-19)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 16, 2016 15:51
DRILLING END: November 19, 2016 17:00
COORDINATES: N: 847,002 E: 923,396

SHEET: 4 of 5
GS ELEV.: 2669.1
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0		2489.1							
		182.0	Continues fresh, matrix dominant CONGLOMERATE, gravel and few cobble sized clasts consisting of tuff, schist, quartz, gneiss, limestone, diabase, weak HCl reaction, competent and unjointed. *(continued)*	2487.1				37	97		
		184.0		2485.1				37	100		
185			As above.					38	100		
			As above.								
		189.0		2480.1							
190			As above.					39	100		
		193.0		2476.1							
			As above.					40	100	194 - 293: Hydro test #5 SI	
195		198.0		2471.1							
			As above, very fine grained and friable matrix.					41	100		
200		203.0		2466.1							
			As above.					42	100		
205		208.0		2461.1							
			Continues slightly weathered, matrix dominant CONGLOMERATE, gravel and few cobble sized clasts consisting of tuff, schist, quartz, gneiss, limestone, diabase, weak HCl reaction.				151.2-282 ft: 10/20 Silica Sand Filter Pack	43	100		
210		213.0		2456.1							
			As above.					44	96		
215		218.0		2451.1							
			As above.					45	100		
220		223.0		2446.1							
			As above.					46	100		
225		228.0		2441.1			182-272 ft: 2" ID sch 40 PVC 0.010" slot				
			As above.					47	100		
230		233.0		2436.1							
			As above.					48	100		
235		238.0		2431.1							
			As above.					49	100		
240											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:41
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RECORD OF BOREHOLE DH16-12 (GT-19)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 16, 2016 15:51
DRILLING END: November 19, 2016 17:00
COORDINATES: N: 847,002 E: 923,396

SHEET: 5 of 5
GS ELEV.: 2669.1
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0	As above. *(continued)*	2429.1				49	100		
		243.0	As above, clasts of tuff, schist, chert, quartz, limestone.	2426.1				50	100		
245		249.0	As above.	2420.1				51	96		
250		253.0	As above.	2416.1				52	100		
255		258.0	As above.	2411.1				53	100		
260		263.0	As above.	2406.1				54	100		
265		268.0	As above.	2401.1				55	96		
270		273.0	As above,	2396.1				58	70	273: Lost core, possibly due to mis-seated core tube.	
275		278.0	Continues slightly weathered, matrix dominant CONGLOMERATE, gravel and few cobble sized clasts consisting of tuff, schist, quartz, gneiss, limestone, diabase, weak HCl reaction.	2391.1				59	100		
280		283.0	As above.	2386.1				60	100		
		284.0	Gradational contact with Apache Leap Tuff (Talg), contact is closed.	2385.1			282-293 ft: 1/4" Coated Bentonite Pellets	61	100		
285		293.0	Bottom of borehole at 293.0 ft. Completed as well. Refer to diagram.	2376.1							
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-12 (GT-19)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:41
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RECORD OF BOREHOLE DH16-13 (GT-17)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 28, 2016 12:12
DRILLING END: November 28, 2016 12:12
COORDINATES: N: 849,357 E: 921,449

SHEET: 1 of 5
GS ELEV.: 2733.8
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0		2733.8						0 - 28: Hydro test #1 FHT	
		4.0	Gila Conglomerate (Tcg): clast dominant, brown CONGLOMERATE, some gravel and few cobbles, clasts consisting of schist, quartz, gneiss.	2729.8				1	38		
5			As above, becomes matrix dominant.					2	60		
		8.0		2725.8							
			As above, matrix washed out, poor recovery.					3	3		
10		12.0		2721.8							
		14.0	As above, matrix washed out, poor recovery.	2719.8				4	5		
15			As above, weak HCl reaction.					5	43		
		18.0		2715.8							
			Continues brown CONGLOMERATE, matrix dominant, gravel to cobble sized clasts consisting of schist, quartz, gneiss, tuff, no HCl reaction.					6	90		
20		23.0		2710.8							
			As above.					7	100		
25		28.0		2705.8							
			As above.					6	78	29 - 59: Hydro test #2 SI	
30		32.0		2701.8							
		34.0	As above.	2699.8				7	90		
35			As above.					8	100		
		39.5		2694.3				9	100		
40			As above.					10	100		
		44.0		2689.8							
45			As above.					11	100		
		49.0		2684.8							
50			As above.					12	100		
		54.0		2679.8							
55			As above, cobble-rich.					13	100		
		59.0		2674.8							
60			As above, no cobbles.					14	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:42
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RECORD OF BOREHOLE DH16-13 (GT-17)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: November 28, 2016 12:12
DRILLING END: November 28, 2016 12:12
COORDINATES: N: 849,357 E: 921,449
SHEET: 2 of 5
GS ELEV.: 2733.8
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
60		60.0	As above, no cobbles. *(continued)*	2673.8							
		64.0	As above.	2669.8				14	100	64 - 154: Hydro test #3 SI	
65		69.0	As above.	2664.8				15	100		
70		74.0	As above.	2659.8				16	100		
75		79.0	Continues brown, CONGLOMERATE, matrix dominant, some gravel, clasts consist of schist, quartz, gneiss, tuff, weak HCl reaction.	2654.8				17	100		
80		84.0	Becomes clast dominant.	2649.8			0-159.8 ft: Cement bentonite grout	18	100		
85		89.0	Continues brown, CONGLOMERATE, matrix dominant, some gravel, clasts consist of schist, quartz, gneiss, tuff, weak HCl reaction.	2644.8				19	100		
90		94.0	As above.	2639.8				20	100		
95		99.0	As above.	2634.8				21	100		
100		104.0	As above.	2629.8				22	100		
105		108.0	As above.	2625.8				23	100		
110		113.0	As above.	2620.8				24	100		
115		118.0	As above.	2615.8				25	100		
120			As above.					26	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30
LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-13 (GT-17)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 28, 2016 12:12
DRILLING END: November 28, 2016 12:12
COORDINATES: N: 849,357 E: 921,449

SHEET: 3 of 5
GS ELEV.: 2733.8
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120		120.0		2613.8							
		122.0	As above. *(continued)*	2611.8				26	100		
		127.0	As above.	2606.8				27	100		
		134.0	As above.	2599.8				28	100		
		139.0	Continues brown CONGLOMERATE, matrix dominant, some gravel, clasts consist of schist, quartz, gneiss, tuff, weak HCl reaction.	2594.8				29	100		
		144.0	Competent CONGLOMERATE consists primarily of underlying tuff material, gray matrix, clasts consist of tuff, quartz, feldspars, beginning of transition to tuff unit below.	2589.8				30	100		
		150.2	Continues gradational contact with Apache Leap tuff (Talg), contact is closed, possible rip-up chips.	2583.6				31	100		
		154.0	Becomes Apache Leap tuff (Talg): moderately to strongly welded TUFF, gray, with some small black phenocrysts, competent and unjointed.	2579.8				32	100		
		159.0	As above.	2574.8				33	100		
		164.0	As above, gray to white.	2569.8				34	100		
		169.0	As above.	2564.8			159.8-170.4 ft: 1/4" Coated Bentonite Pellets	35	100	164 - 249: Hydro test #4 SI & CRI	
		174.0	As above.	2559.8				36	100		
		179.0	As above.	2554.8				37	100		
			As above.					38	100		
180			As above.					39	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-13 (GT-17)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: November 28, 2016 12:12
DRILLING END: November 28, 2016 12:12
COORDINATES: N: 849,357 E: 921,449
SHEET: 4 of 5
GS ELEV.: 2733.8
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0		2553.8							
			As above. *(continued)*					39	100		
		184.0		2549.8							
185			Continues TUFF moderately to strongly welded, gray to white, with some small black phenocrysts, few lithic clasts, competent and unjointed.					40	100		
		189.0		2544.8							
190			As above.					41	100		
		194.0		2539.8							
195			As above.					42	100		
		199.0		2534.8							
200			As above.					43	100		
		204.0		2529.8							
205			As above, no lithic clasts.					44	100		
		209.0		2524.8							
210			Continues TUFF, moderately to strongly welded, gray to white, with some small black phenocrysts, competent. Subhorizontal jointing may be mechanical.				170.4-249 ft: 10/20 Silica Sand Filter Pack	45	100		
		214.0		2519.8							
215			As above.				179-249 ft: 2" ID sch 40 PVC 0.010" slot	46	100		
		219.0		2514.8							
220			As above.					47	100		
		224.0		2509.8							
225			As above.					48	100		
		229.0		2504.8							
230			As above.					49	100		
		234.0		2499.8							
235			As above.					50	100		
		239.0		2494.8							
240			As above.					51	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30
LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF BOREHOLE DH16-13 (GT-17)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 28, 2016 12:12
DRILLING END: November 28, 2016 12:12
COORDINATES: N: 849,357 E: 921,449

SHEET: 5 of 5
GS ELEV.: 2733.8
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0		2493.8							
			As above. *(continued)*					51	100		
		244.0		2489.8							
245			As above.					52	100		
		249.0		2484.8							
250			Bottom of borehole at 249.0 ft. Completed as well. Refer to diagram.								
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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DH16-13 (GT-17)
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RECORD OF BOREHOLE DH16-14-(GT-1)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 29, 2016 13:23
DRILLING END: November 29, 2016 13:23
COORDINATES: N: 845,266 E: 910,365

SHEET: 1 of 4
GS ELEV.: 2316.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0	HQ3	0.0	(GP), GRAVEL, fine to coarse, poorly graded, subangular to angular, some fine subangular to angular sand, trace non plastic fines, very dark gray-brown, weathered; schist gravel; very loose to loose, moist to wet, 6-50/2 (3 intervals) Surficial soils, no recovery.	2316.0	GP			1	0	0 - 38: Hydro test #1 FHT	
5		4.5	Pinal Schist (pCpi): dark green to gray, METASANDSTONE, fine-grained, foliated, brecciated with heavy oxidization.	2311.5				2	88		
10		8.0	As above, very poor recovery.	2308.0				3	25		
		11.0	As above.	2305.0							
		12.0	As above.	2304.0				4	30		
15		17.0	No recovery.	2299.0				5	0		
		18.0	No recovery.	2298.0				6	0		
20		22.0	Continues METASANDSTONE dark green to gray, fine-grained, rock fragments with quartz and quartz veining, foliated and brecciated, heavy oxidation, very poor recovery.	2294.0			0-49.2ft: Cement Bentonite Grout	7	33		
25		25.0	As above.	2291.0				8	43		
		28.5	As above.	2287.5				9	100		
30		32.0	As above.	2284.0				10	60		
		34.5	As above.	2281.5				11	71		
35		38.0	As above, many unopened/healed fractures between discontinuities.	2278.0				12	100	38: Set casing to 30 ft-bgs.	
40		41.0	As above, poor recovery.	2275.0				13	60		
		46.0	No recovery.	2270.0				14	0		
45		51.0	Continues METASANDSTONE, dark red to gray, fine-grained, heavy oxidation, many unopened/healed fractures between discontinuities, poor recovery.	2265.0				15	50		
50		56.0	As above.	2260.0			49.2-61.3ft: 1/4 Coated Bentonite Pellets	16	100		
		58.0	As above.	2258.0				17	100		
55											
60											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-14-(GT-1)
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RECORD OF BOREHOLE DH16-14-(GT-1)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: November 29, 2016 13:23
DRILLING END: November 29, 2016 13:23
COORDINATES: N: 845,266 E: 910,365
SHEET: 2 of 4
GS ELEV.: 2316.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
60	HQ3	60.0	As above. *(continued)*	2256.0				17	100		
		62.0	As above.	2254.0				18	75		
65		66.0	As above.	2250.0				19	88		
70		70.0	As above.	2246.0				20	100		
		72.0	As above.	2244.0				21	67		
75		76.5	As above.	2239.5				22	100	77.5 - 91.5: Hydro test #2 SI 77.6 - 238.5: Hydro test #3 SI	
80		80.6	As above.	2235.4							
		81.5	Becomes brecciated METASANDSTONE, dark gray green with some reddish brown, schist fragments with gouge and clay, some oxidation.	2234.5				23	80		
85		86.5	As above.	2229.5							
		87.5	No recovery.	2228.5				24	80		
90		91.5	As above.	2224.5				25	88		
95		95.5	As above.	2220.5			61.3-126.7ft: 10/20 Silica Sand Filter Pack 65-125ft: 2 ID sch 40 PVC 0.010 slot	26	100		
100		101.0	Continues METASANDSTONE, dark greenish gray, fine-grained, foliated, highly jointed, some oxidation.	2215.0							
		102.5	No recovery.	2213.5				27	50		
		104.0	Continues METASANDSTONE, dark greenish gray, fine-grained, foliated, highly jointed, some oxidation.	2212.0				28	100		
105		107.0	As above, discontinuous fractures.	2209.0							
		109.5	As above.	2206.5				29	100		
110		112.0	As above.	2204.0				30	80		
		115.0	Continues METASANDSTONE, dark greenish gray, fine-grained, foliated, highly jointed, some oxidation.	2201.0				31	83		
115		116.5	As above.	2199.5				32	100		
		118.5	As above, interval of breccia and washed out gouge.	2197.5				33	75		
120			As above.					34	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60
LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:42
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RECORD OF BOREHOLE DH16-14-(GT-1)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: November 29, 2016 13:23
DRILLING END: November 29, 2016 13:23
COORDINATES: N: 845,266 E: 910,365
SHEET: 3 of 4
GS ELEV.: 2316.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120	HQ3	120.0	As above. *(continued)*	2196.0				34	100		
		122.0	As above.	2194.0				35	100		
125		125.0	As above.	2191.0				36	100		
		128.0	Continues METASANDSTONE, dark greenish gray, foliated and highly fractured, some quartz veining with chloritic alteration.	2188.0				37	100		
130		132.0	As above.	2184.0				38	100		
135		135.0	As above.	2181.0				39	100		
140		140.0	As above.	2176.0				40	100		
		142.5	As above.	2173.5				41	100		
145		147.5	As above.	2168.5				42	89		
150		152.0	Continues METASANDSTONE, dark greenish gray, fine-grained, foliated and higly fractured with moderate oxidation.	2164.0				43	100		
155		155.5	As above, quartz veining, highly fractured.	2160.5				44	86		
		159.0	As above.	2157.0				45	100		
160		162.0	As above, very weathered, poor recovery.	2154.0				46	60		
165		164.5	As above.	2151.5				47	100		
		169.5	As above.	2146.5				48	100		
170		172.0	As above.	2144.0			126.7-217.7ft: 1/4 Coated Bentonite Pellets	49	70		
175		177.0		2139.0				50	100		
180			Log continued on next page								

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-14-(GT-1)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:42
P:\2015 PROJECTS\1531436 RCML NEAR WEST TSF GEOTECH\GINT\FINAL GINT PROJECTS\FINAL_OCTOBER 2017\NWTSF_FINAL_WELLS.GPJ

RECORD OF BOREHOLE DH16-14-(GT-1)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: November 29, 2016 13:23
DRILLING END: November 29, 2016 13:23
COORDINATES: N: 845,266 E: 910,365

SHEET: 4 of 4
GS ELEV.: 2316.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180	HQ3	180.0		2136.0							
		182.0	Continues METASANDSTONE, dark greenish gray, quartz veining, fine-grained, foliated, lightly to moderately fractured, moderate oxidation. *(continued)*	2134.0				50	100		
185		187.0	As above.	2129.0				51	100		
190		192.0	As above.	2124.0				52	100		
195		196.0	As above.	2120.0				53	100		
		199.5	As above.	2116.5				54	100		
200		202.0	As above.	2114.0				55	100		
205		207.0	As above.	2109.0				56	100		
210		212.0	As above.	2104.0				57	100		
215		217.0	As above.	2099.0				58	100		
220		222.0	Becomes METASANDSTONE, dark greenish gray, quartz veining, fine-grained, foliated, moderately fractured, moderate oxidation, fault gouge consists of rock fragments and clay, poor recovery.	2094.0				59	70		
		224.5	As above, no gouge.	2091.5				60	100		
225		228.5	Becomes METASANDSTONE, dark greenish gray, quartz veining, fine-grained, foliated, moderately fractured, moderate oxidation, fault gouge consists of rock fragments and clay, poor recovery.	2087.5			◄217.7-238.5ft: Hole Sluff	61	88		
230		232.0	As above, no gouge, oxidized	2084.0				62	86		
		234.5	As above.	2081.5				63	100		
235		238.5	As above.	2077.5				64	100		
240			Bottom of borehole at 238.5 ft. Completed as well. Refer to diagram.								

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

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DH16-14-(GT-1)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:42
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RECORD OF BOREHOLE DH16-15-(GT-16)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 2, 2016 11:52
DRILLING END: December 2, 2016 11:52
COORDINATES: N: 845,116 E: 920,176

SHEET: 1 of 5
GS ELEV.: 2667.7
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0		2667.7						0 - 29: Hydro test #1 FHT	
5		6.0		2661.7							
		9.0	Gila Conglomerate (Tcg): completely weathered, CONGLOMERATE, recovered only gravel and matrix fragments, clasts consist of schist, gneiss, quartz.	2658.7				1	37		
10		14.0	As above, recovered some intact matrix.	2653.7				2	40		
15		19.0	Continues CONGLOMERATE, matrix dominated, some gravel, clasts consist of diabase, gniess, schist, quartz, weak HCl reaction, matrix poorly cemented sand, very friable, moderately weathered,	2648.7				3	96		
20		24.0	As above.	2643.7				4	98		
25		29.0	As above.	2638.7				5	96	25 - 74: Hydro test #2 SI	
30		34.0	As above.	2633.7				6	96		
35		39.0	As above, weak HCl reaction.	2628.7				7	100		
40		44.0	As above.	2623.7				8	96		
45		49.0	Continues CONGLOMERATE, slightly weathered, matrix dominated, some gravel with cobbles, brown, clasts consist of schist, gneiss, diabase, quartz, few calcite veins, moderate HCl reaction.	2618.7				9	100		
50		54.0	As above.	2613.7				10	100		
55		59.0	As above.	2608.7				11	100		
60			As above.					12	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:42
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RECORD OF BOREHOLE DH16-15-(GT-16)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 2, 2016 11:52
DRILLING END: December 2, 2016 11:52
COORDINATES: N: 845,116 E: 920,176

SHEET: 2 of 5
GS ELEV.: 2667.7
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
60		60.0		2607.7							
			As above. *(continued)*					12	100		
		64.0		2603.7							
65			As above.					13	100		
		69.0		2598.7							
70			As above, moderate HCl reaction.					14	100		
		74.0		2593.7							
75			Continues CONGLOMERATE, fresh, matrix dominated, some gravel, brown, clasts consist of schist, gneiss, quartz, weak HCl reaction, competent.					15	100		
		79.0		2588.7							
80			As above.					16	100	80 - 124: Hydro test #3 SI	
		84.0		2583.7							
85			As above.					17	100		
		89.0		2578.7			0-175.4 ft: Cement Bentonite Grout				
90			As above.					18	100		
		94.0		2573.7							
95			As above.					19	100		
		99.0		2568.7							
100			As above.					20	100		
		104.0		2563.7							
105			As above.					21	100		
		109.0		2558.7							
110			As above.					22	100		
		114.0		2553.7							
115			As above.					23	100		
		119.0		2548.7							
120			As above.					24	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-15-(GT-16)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 2, 2016 11:52
DRILLING END: December 2, 2016 11:52
COORDINATES: N: 845,116 E: 920,176

SHEET: 3 of 5
GS ELEV.: 2667.7
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120		120.0	As above. *(continued)*	2547.7							
		124.0	As above.	2543.7				24	100		
125		129.0	As above.	2538.7				25	100		
130		134.0	As above.	2533.7				26	100		
135		139.0	As above.	2528.7				27	100	135 - 250: Hydro test #4 SI	
140		144.0	As above, weak friable matrix.	2523.7				28	100		
145		149.0	As above, weak matrix.	2518.7				29	100		
150		154.0	Continues CONGLOMERATE, slightly to moderately weathered, clast dominated, gravel with few cobbles, matrix is fine grained, poorly cemented clasts consist of schist, gneiss, quartz, tuff, weak HCl reaction.	2513.7				39	100		
155		159.0	As above.	2508.7				40	100		
160		164.0	As above.	2503.7				41	100		
165		169.0	As above.	2498.7				42	100		
170		174.0	As above, moderate HCl reaction.	2493.7				43	100		
175		179.0	As above, few mechanical breaks on ends.	2488.7				44	100		
180			As above.					45	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:42
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RECORD OF BOREHOLE DH16-15-(GT-16)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 2, 2016 11:52
DRILLING END: December 2, 2016 11:52
COORDINATES: N: 845,116 E: 920,176

SHEET: 4 of 5
GS ELEV.: 2667.7
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0		2487.7							
			As above. *(continued)*								
		184.0		2483.7			175.4-190 ft: 1/4" Coated Bentonite Pellets	45	100		
185			Continues CONGLOMERATE fresh, matrix dominated some gravel, brown, clasts consist of schist, gneiss, quartz, tuff, diabase, weak HCl reaction.					46	100		
		189.0		2478.7							
190			As above.					47	100		
		194.0		2473.7							
195			As above.					48	100		
		199.0		2468.7							
200			As above.				190-290 ft: 10/20 Sillica Sand Filter Pack	49	100		
		204.0		2463.7							
205			As above.					50	100		
		209.0		2458.7							
210			As above.					51	60		
		214.0		2453.7							
215		215.0	As above.	2452.7				52	100		
			As above.					53	100		
220		220.0		2447.7							
			As above.					53	100		
		224.0		2443.7							
225			Becomes CONGLOMERATE, fresh, clast dominated, some gravel, brown, clasts consist of schist, gneiss, quartz, tuff, diabase, weak HCl reaction, competent.					54	100		
		229.0		2438.7							
230			Becomes CONGLOMERATE fresh, matrix dominated, some gravel and few cobbles, brown, clasts consist of schist, gneiss, quartz, tuff, diabase, moderate HCl reaction, competent.					55	100		
		234.0		2433.7							
235			As above.					56	100		
		239.0		2428.7							
240			As above.					57	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:42
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RECORD OF BOREHOLE DH16-15-(GT-16)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 2, 2016 11:52
DRILLING END: December 2, 2016 11:52
COORDINATES: N: 845,116 E: 920,176

SHEET: 5 of 5
GS ELEV.: 2667.7
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0	As above. *(continued)*	2427.7				57	100		
		244.0	As above.	2423.7				58	50		
245		249.0		2418.7							
250		250.0	As above.	2417.7			◄ 190-290 ft: 10/20 Sillica Sand Filter Pack	59	100	250 - 290: Hydro test #5 SI	
			As above.					60	100		
		254.0		2413.7							
255			As above.					61	100		
		259.0		2408.7							
260			As above.				◄ 230-290 ft: 2" ID sch 40 PVC 0.010" slot	62	100		
		264.0		2403.7							
265			As above.					63	100		
270								64	100		
		272.5		2395.2							
275			Becomes CONGLOMERATE, fresh, clast dominated, some gravel, brown, clasts consist of schist, gneiss, quartz, tuff, diabase, weak HCl reaction, competent.					65	100		
		277.5		2390.2							
280			Becomes CONGLOMERATE fresh, matrix dominated, some gravel and few cobbles, brown, clasts consist of schist, gneiss, quartz, tuff, diabase, moderate HCl reaction, competent.					66	100		
		282.5		2385.2							
285			As above.					67	100		
		287.5		2380.2							
290		290.0	As above.	2377.7				68	100		
			Bottom of borehole at 290.0 ft. Completed as well. Refer to diagram.								
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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DH16-15-(GT-16)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:42
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RECORD OF BOREHOLE DH16-16 (GT-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 6, 2016 14:45
DRILLING END: December 6, 2016 14:45
COORDINATES: N: 845,081 E: 912,658

SHEET: 1 of 5
GS ELEV.: 2284.5
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0		2284.5							
	HQ3	2.0	Washed gravel, alluvium, pieces of sandstone and quartz	2282.5				1	25	0 - 17: Hydro test #1 FHT	
		4.5	Unconsolidated alluvium rubble. sandstone, tuff, quartz, schist rubble	2280.0				2	60		
5		5.0		2279.5							
		7.0	Surficial alluvium, clasts of tuff and quartz	2277.5				3	80	5 - 185: Drillers noticed some circulation loss throughout zone.	
		11.5	Pinal Schist (pCpi): dark green to gray, METASANDSTONE, fine-grained, foliated and brecciated, light oxidation.	2273.0				4	89		
10		12.0	As above, rubble.	2272.5				5	100		
			As above.				0-25ft: 1/4 Coated Bentonite Pellets	6	100		
15		17.0		2267.5						17 - 77: Hydro test #2 SI & CRI	
		19.5	As above.	2265.0				7	100		
20		22.0	As above.	2262.5				8	100		
		25.0	As above.	2259.5				9	67		
25		28.0	As above.	2256.5				10	83		
		29.5	As above.	2255.0				11	100		
30		31.5	As above.	2253.0				12	100		
		34.5	Continues dark green to gray, METASANDSTONE, fault zone with rubble and plastic clay, foliated, fractured, light oxidation.	2250.0				13	83		
35		36.5	As above, oxidized.	2248.0				14	100		
		38.0	As above.	2246.5				15	100		
		40.5	As above.	2244.0				16	40		
40		45.0	As above.	2239.5				17	44		
45		50.0	As above.	2234.5				18	40		
50		53.5	As above.	2231.0				19	71		
		55.0	As above.	2229.5				20	67		
55			Continues dark green to gray, METASANDSTONE with quartz veining, fine grained, fault zone continues, fractured and foliated, infill washed out.					21	20		
60		60.0		2224.5							

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-16 (GT-2)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:42
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RECORD OF BOREHOLE DH16-16 (GT-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: December 6, 2016 14:45
DRILLING END: December 6, 2016 14:45
COORDINATES: N: 845,081 E: 912,658
SHEET: 2 of 5
GS ELEV.: 2284.5
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
60	HQ3	60.0		2224.5							
		61.0	As above.	2223.5				22	100		
		63.0	As above.	2221.5				23	100		
65		66.5	As above.	2218.0				24	57		
		68.0	As above.	2216.5				25	100		
		69.5	Continues METASANDSTONE, dark green to gray, fine-grained, foliated, some oxidation, highly fractured.	2215.0				26	100		
70		72.0	As above.	2212.5				27	100		
		77.0	As above.	2207.5			25-122.8ft: 10/20 Silica Sand Filter Pack 30-120ft: 2 ID sch 40 PVC 0.010 slot	28	100		
75											
		82.0	As above.	2202.5				29	100		
80		87.0	As above.	2197.5				30	90		
		89.5	As above.	2195.0				31	100		
85		91.0	As above.	2193.5				32	100		
		94.0	As above.	2190.5				33	100		
90		99.0	As above.	2185.5				34	100		
		102.0	Continues METASANDSTONE, dark green to gray, fine-grained, foliated, jointed, little to no oxidation.	2182.5				35	100		
95		107.0	As above.	2177.5				36	100		
		111.0	As above.	2173.5				37	100		
100		115.5	As above.	2169.0				38	100	113 - 142: Hydro test #3 SI & CRI	
		118.5	As above foliated, highly fractured.	2166.0				39	67		
105			As above, quartz veins.					40	80		
110			Log continued on next page								
115											
120											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60
LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

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DH16-16 (GT-2)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:42
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RECORD OF BOREHOLE DH16-16 (GT-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 6, 2016 14:45
DRILLING END: December 6, 2016 14:45
COORDINATES: N: 845,081 E: 912,658

SHEET: 3 of 5
GS ELEV.: 2284.5
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120	HQ3	120.0	As above, quartz veins. *(continued)*	2164.5				40	80		
		121.0	As above, quartz veins.	2163.5				41	75		
125		125.0		2159.5							
		126.0	As above.	2158.5				42	100		
			As above.					43	100		
130		129.5		2155.0							
			As above.					44	100		
		132.0		2152.5			122.8-250ft: 1/4 Coated Bentonite Pellets				
			Continues METASANDSTONE, dark green to gray, fine-grained, foliated, highly fractured, lost and broken core, possibly fault zone with infill washed out.					45	50		
135		136.0		2148.5							
			As above, highly fractured.					46	100		
		139.0		2145.5							
140			As above.					47	100		
		142.0		2142.5							
		143.0	As above, quartz veins.	2141.5				48	100		
			As above, some oxidation.					49	100		
145		148.0		2136.5							
			As above.					50	50		
150		152.0		2132.5							
		154.0	As above.	2130.5				51	100		
			As above.					52	100		
155		157.0		2127.5							
		158.5	As above.	2126.0				53	40		
160			Continues METASANDSTONE, dark green to gray, fine-grained, foliated, fractured, gouge, little to no oxidation.								
		162.0		2122.5							
		163.8	As above.	2120.7				54	100		
165		165.0	As above, becomes fault breccia and gouge, crushed rock in clay matrix.	2119.5							
			As above.					55	63		
		169.0		2115.5							
170		172.0	Becomes METASANDSTONE, dark green to gray, fine-grained, foliated, little to no oxidation, crushed zones.	2112.5				56	100		
			As above.					57	78		
175		176.5		2108.0							
			As above.					58	100		
180											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:42
P:\2015 PROJECTS\1531436 RCML NEAR WEST TSF GEOTECH\GINT\FINAL GINT PROJECTS\FINAL_OCTOBER 2017\NWTSF_FINAL_WELLS.GPJ

RECORD OF BOREHOLE DH16-16 (GT-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 6, 2016 14:45
DRILLING END: December 6, 2016 14:45
COORDINATES: N: 845,081 E: 912,658

SHEET: 4 of 5
GS ELEV.: 2284.5
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
180	HQ3	180.0	As above. *(continued)*	2104.5				58	100		
		181.0	Becomes contact with DIABASE, highly oxidized, dark green to gray with dark red, drillers note improvement with fluid circulation.	2103.5				59	100	183 - 250: Hydro test #4 SI	
185		185.0	Becomes DIABASE (Yd): dark brownish red, highly oxidized, fine to medium grained, jointed.	2099.5				60	100		
190		190.0	As above.	2094.5				61	100		
195		195.0	As above.	2089.5			122.8-250ft: 1/4 Coated Bentonite Pellets	62	100		
		196.0	As above.	2088.5				63	100		
200		201.0	As above.	2083.5				64	100		
205		206.0	As above.	2078.5				65	100		
210		211.0	As above.	2073.5				66	100		
215		216.0	As above.	2068.5				67	100		
220		221.0	Continues DIABASE, dark brownish red, highly oxidized, fine to medium grained, jointed, competent.	2063.5				68	100		
225		226.0	As above.	2058.5				69	100		
230		231.0	As above.	2053.5				70	100		
235		236.0	As above.	2048.5				71	100		
		239.0	Becomes some calcite veining.	2045.5				72	100		
240			Log continued on next page								

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:42
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RECORD OF BOREHOLE DH16-16 (GT-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 6, 2016 14:45
DRILLING END: December 6, 2016 14:45
COORDINATES: N: 845,081 E: 912,658

SHEET: 5 of 5
GS ELEV.: 2284.5
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	SOIL PROFILE Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE INFO CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0		2044.5							
	HQ3	242.0	Continues DIABASE, dark brownish red, highly oxidized, fine to medium grained, jointed. *(continued)*	2042.5				72	100		
245		247.0	As above.	2037.5				73	100		
250		250.0	As above.	2034.5				74	100		
			Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram.								
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

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DH16-16 (GT-2)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:42
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RECORD OF BOREHOLE DH16-17-(GT36)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 6, 2016 13:50
DRILLING END: December 6, 2016 13:50
COORDINATES: N: 851,184 E: 924,180

SHEET: 1 of 4
GS ELEV.: 2671.9
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0		2671.9							
		4.0	Pinal Schist (pCpi): grayish orange, SCHIST, foliated, completely weathered, very highly fractured and argillized, some iron staining.	2667.9						0 - 38: Hydro test #1 FHT	
5		6.0	As above, clayey.	2665.9				1	75		
		9.0	As above.	2662.9				2	100		
10		12.5	As above, rubbly.	2659.4				3	77		
		14.0	As above.	2657.9				4	100		
15		19.0	As above, rubble.	2652.9				5	34		
20		24.0	As above, rubble.	2647.9			0-44.6ft: 1/4" Coated Bentonite Pellets	6	20		
25		26.0	Continues SCHIST, fault zone, reddish gray, highly weathered, foliated, some oxidation, gougey zones, few calcite veins.	2645.9				7	65		
		28.0	As above, rubble.	2643.9				8	25		
		29.0	As above.	2642.9				9	30		
30		31.0	As above.	2640.9				10	75		
		32.5	As above.	2639.4				11	100		
35		36.5	As above.	2635.4				12	95		
		38.0	As above.	2633.9				13	67		
40		40.0	Continues SCHIST, green to greenish gray, foliated, rubbly with corestones, calcified, weak HCl reaction, large quartz vein, poor recovery.	2631.9				14	50	39 - 70: Hydro test #2 SI	
		42.0	As above.	2629.9				15	75		
		44.0	As above.	2627.9				16	85		
45		45.5	As above.	2626.4				17	87		
		48.0	As above.	2623.9				18	92		
50		52.0	As above.	2619.9				19	33		
		54.0	As above, rubble.	2617.9				20	25		
55		57.0	As above.	2614.9				21	77		
		59.0	Continues SCHIST green to greenish gray, foliated, moderate iron staining, weak HCl reaction, rubble throughout.	2612.9				22	100		
60								23	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-17-(GT36)
1 of 4

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RECORD OF BOREHOLE DH16-17-(GT36)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 6, 2016 13:50
DRILLING END: December 6, 2016 13:50
COORDINATES: N: 851,184 E: 924,180

SHEET: 2 of 4
GS ELEV.: 2671.9
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
60		60.0		2611.9							
		60.5	As above. *(continued)*	2611.4							
		62.5	As above.	2609.4				24	90		
		64.0	As above.	2607.9				25	100		
65		66.5	As above.	2605.4				26	60		
		70.0	As above.	2601.9				27	63		
70		73.5	Continues SCHIST, green to greenish gray, foliated and fractured throughout, some oxidation, some calcite/quartz veins, moderate HCl reaction, rubbly and broken, poor recovery.	2598.4			44.6-100ft: 10/20 Silica Sand Filter Pack	28	57	70 - 139.5: Hydro test #3 SI	
75		76.0	As above.	2595.9				29	100		
		78.0	As above.	2593.9				30	30		
		80.0	As above.	2591.9				31	90		
80		81.0	As above, some broken core.	2590.9				32	100		
		84.0	As above, rubble zones.	2587.9				33	67		
85		88.0	As above.	2583.9				34	90		
		90.0	As above.	2581.9				35	80		
90		91.5	As above.	2580.4				36	100		
		94.0	As above.	2577.9				37	88		
95		96.5	As above.	2575.4				38	92		
		99.0	Continues SCHIST, greenish gray to brown, foliated and brecciated texture, moderately fractured, veining, calcified, some iron staining, moderate HCl reaction.	2572.9				39	80		
100		102.0	As above.	2569.9			50-150ft: 2" ID sch 40 PVC 0.010" slot	40	87		
		104.0	As above.	2567.9				41	60		
105		106.0	As above.	2565.9				42	65		
		107.5	As above.	2564.4				43	87		
		109.5	As above, folded.	2562.4				44	75		
110		111.0	As above.	2560.9				45	87		
		113.5	As above.	2558.4				46	100		
115		115.5	As above.	2556.4				47	85		
		117.5	As above.	2554.4				48	100		
120			As above.					49	73		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF BOREHOLE DH16-17-(GT36)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 6, 2016 13:50
DRILLING END: December 6, 2016 13:50
COORDINATES: N: 851,184 E: 924,180

SHEET: 3 of 4
GS ELEV.: 2671.9
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
120		120.0		2551.9							
		121.5	As above. *(continued)*	2550.4				49	73		
		124.0	Continues SCHIST, dark green to greenish gray, foliation is subvertical and curving, fractured, light oxidation, weak HCl reaction.	2547.9				50	52		
125		127.5	As above.	2544.4			100-152.7ft: 10/20 Silica Sand Filter Pack	51	91		
		130.5	As above, brecciated and crushed.	2541.4				52	90		
130		132.0	As above.	2539.9				53	100		
		133.0	As above, broken core.	2538.9				54	50		
		136.0	As above, brecciated.	2535.9				55	87		
135		139.5	As above, moderately fractured.	2532.4				56	91		
		140.5	As above, highly fractured.	2531.4				57	100	140 - 199: Hydro test #4 SI	
140		143.5	As above, moderately fractured.	2528.4				58	77		
		148.5	As above, no iron staining.	2523.4				59	90		
145		151.3	As above.	2520.6				60	100		
		153.5	FAULT ZONE, crushed rock with clayey gouge, moderate iron staining, extremely weak.	2518.4							
150		158.5	As above.	2513.4				61	24		
		160.5	As above, becomes greenish gray.	2511.4				62	100		
155		164.0	Becomes faulted SCHIST, dark gray to greenish gray, foliated, crushed, and brecciated, weak HCl reaction.	2507.9				63	57		
		167.5	As above.	2504.4				64	86		
160		172.0	As above.	2499.9				65	67		
		174.0	Becomes SCHIST, corestones with breccia and crushed rock, foliated, brecciated texture, weak HCl reaction, quartz veining.	2497.9				66	100		
165		177.5	As above.	2494.4			152.7-199ft: 1/4" Coated Bentonite Pellets	67	66		
			As above.					68	83		
170											
175											
180											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-17-(GT36)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 6, 2016 13:50
DRILLING END: December 6, 2016 13:50
COORDINATES: N: 851,184 E: 924,180

SHEET: 4 of 4
GS ELEV.: 2671.9
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	SOIL PROFILE Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE INFO CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0		2491.9							
			As above. *(continued)*					68	83		
		181.5		2490.4							
		183.0	Continues SCHIST, dark gray to greenish gray, foliated, crushed and brecciated throughout, gouge zones, weak HCl reaction, few large pieces of quartz.	2488.9				69	100		
		184.5		2487.4							
185			As above, massive quartz vein.					70	92		
			As above, crenulated, small zones of breccia.								
		188.0		2483.9							
			As above.					71	78		
190											
		192.0		2479.9							
			As above.					72	100		
		194.0		2477.9							
195			As above.					73	100		
		199.0		2472.9							
200			Bottom of borehole at 199.0 ft. Completed as well. Refer to diagram.								
205											
210											
215											
220											
225											
230											
235											
240											

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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DH16-17-(GT36)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:42
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RECORD OF BOREHOLE DH16-18 (GT-35)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 8, 2016 09:14
DRILLING END: December 11, 2016 14:26
COORDINATES: N: 842,319 E: 909,644

SHEET: 1 of 5
GS ELEV.: 2222.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0		2222.0							
			(SW), SAND, well graded, fine to coarse; quartz, schist gravel; unconsolidated alluvium, washed gravel,		SW			1	20	0 - 24: Hydro test #1 FHT	
5		5.0		2217.0							
			(SW-SC), SAND, well graded, fine to coarse subrounded to subangular gravel, some medium plasticity fines, dark brown-red, weathered; loose, moist		SW-SC			2	70		
		7.5		2214.5				3	20		
10			(SW-SC), SAND, well graded, some medium plasticity fines, trace fine rounded to subrounded gravel, dark brown, weathered; compact, moist,		SW-SC		0-21.0ft - 3/8" Bentonite chips				
		12.2	5-11-16-41-50/2" (3" spacing)	2209.8				4	67		
		13.5	(SW-SC), SAND, well graded, fine to coarse subrounded to subangular gravel, some plasticity fines; washed gravel.	2208.5	SW-SC						
15		15.5	estimated from S-2	2206.5				5	80		
			Pinal Schist (pCpi): dark greenish grey, METASANDSTONE, foliated, highly weathered, some oxidation.								
			As above.								
20		20.5		2201.5							
		22.0	As above.	2200.0			21-22ft: 1/4" Coated Bentonite Pellets	6	100		
		24.0	As above.	2198.0				7	50		
25		27.0	As above.	2195.0				8	83		
			As above.					9	88	27 - 80.5: Hydro test #2 SI	
30		31.0		2191.0							
			As above.					10	75		
35		35.0		2187.0							
			As above.					11	33		
		38.0		2184.0							
40			As above.					12	100		
		42.0		2180.0							
			As above.					13	100		
45		47.0		2175.0							
			As above.					14	72		
50		52.0		2170.0							
		54.0	As above.	2168.0			22-88ft: 10/20 Silica Sand Filter Pack	15	50		
55			As above.				25-85ft: 2" ID sch 40 PVC 0.010" slot	16	100		
		57.0		2165.0							
		58.0	Pinal Schist (pCpi): quartz vein with some oxidation.	2164.0				17	100		
60								18	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

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DH16-18 (GT-35)
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RECORD OF BOREHOLE DH16-18 (GT-35)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: December 8, 2016 09:14
DRILLING END: December 11, 2016 14:26
COORDINATES: N: 842,319 E: 909,644
SHEET: 2 of 5
GS ELEV.: 2222.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
60		60.0		2162.0							
		62.0	Pinal Schist (pCpi): dark greenish grey, METASANDSTONE, with quartz, foliated, some oxidation. *(continued)*	2160.0				18	100		
		64.5	As above.	2157.5				19	100		
65		66.3	As above.	2155.7				20	100		
		68.0	As above, becomes brecciated.	2154.0				20	100		
70		72.0	Pinal Schist (pCpi): dark greenish grey, METASANDSTONE, foliated, minor oxidation.	2150.0				21	100		
		75.5	As above.	2146.5				22	100		
75		80.5	As above, some oxidation.	2141.5				23	100		
80		83.0	As above.	2139.0				24	100		
		87.0	As above.	2135.0			85-88ft: 10/20 Silica Sand Filter Pack	25	100	83 - 184.5: Hydro test #3 SI	
85		89.0	As above.	2133.0				26	100		
90		91.5	As above, high angle joints sub-parallel to core axis.	2130.5				27	100		
		94.5	Pinal Schist (pCpi): dark greenish grey, METASANDSTONE, fine grained, highly foliated, some oxidation.	2127.5			88-249.5ft: 1/4" Coated Bentonite Pellets	28	100		
95		98.0	As above.	2124.0				29	86		
100		101.5	As above.	2120.5				30	100		
		106.5	As above.	2115.5				31	100		
105		111.5	As above.	2110.5				32	30		
110		113.5	As above.	2108.5				33	50		
		117.0	As above, becomes less foliated.	2105.0				34	100		
115		119.5	As above.	2102.5				35	100		
120			Log continued on next page								

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60
LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF BOREHOLE DH16-18 (GT-35)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: December 8, 2016 09:14
DRILLING END: December 11, 2016 14:26
COORDINATES: N: 842,319 E: 909,644
SHEET: 3 of 5
GS ELEV.: 2222.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120		120.0	As above. *(continued)*	2102.0				36	100 100		
		122.0	As above.	2100.0				37	100		
125		124.0	As above.	2098.0				38	100		
		126.0	As above.	2096.0				39	100		
130		130.0	As above.	2092.0				40	100		
		133.0	As above, becomes faulted.	2089.0				41	100		
135		135.5	Pinal Schist (pCpi): dark greenish grey, METASANDSTONE, fine grained, foliated, some oxidation.	2086.5				42	100		
140		140.0	As above.	2082.0				43	100		
		143.5	As above.	2078.5				44	80		
145		148.5	As above.	2073.5				45	100		
		151.5	As above.	2070.5				46	86		
150		155.0	As above.	2067.0				47	100		
		160.0	As above.	2062.0				48	100		
155		163.0	As above.	2059.0				49	100		
		166.5	As above.	2055.5				50	100		
160		170.5	As above.	2051.5				51	100		
		175.5	As above, slight weathering.	2046.5			88-249.5ft: 1/4" Coated Bentonite Pellets	52	100		
165		179.5		2042.5							
170			Log continued on next page								
175											
180											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60
LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:42
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RECORD OF BOREHOLE DH16-18 (GT-35)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 8, 2016 09:14
DRILLING END: December 11, 2016 14:26
COORDINATES: N: 842,319 E: 909,644

SHEET: 4 of 5
GS ELEV.: 2222.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0		2042.0							
			As above. *(continued)*					53	100 / 100	183 - 249.5: Hydro test #4 SI	
185		184.5		2037.5							
			As above.					54	100		
		189.0		2033.0							
190			As above.					55	100		
		192.0		2030.0							
			As above.					56	100		
195		197.0		2025.0							
			As above, some oxidation.					57	78		
200		201.5		2020.5							
			As above, no oxidation.					58	100		
		204.5		2017.5							
205			As above, some oxidation.					59	100		
		208.0		2014.0							
			As above.					60	77		
210		211.5		2010.5							
			As above.					61	100		
		214.0		2008.0							
215			As above.					62	100		
		218.0		2004.0							
		218.7	As above.	2003.3							
220			Fault gouge.					63	67		
		221.0		2001.0							
		222.5	Pinal Schist (pCpi): dark greenish grey with dark red, METASANDSTONE, fine grained, with some quartz, foliated, highly oxidatized.	1999.5				64	100		
225			As above, becomes slightly brecciated.					65	100		
		227.0		1995.0							
			Pinal Schist (pCpi): dark greenish grey, METASANDSTONE, fine grained, foliated, oxidized.					66	100		
230		230.5		1991.5							
			As above.					67	100		
		233.0		1989.0							
235			As above.					68	100		
		235.0		1987.0							
			Fault gouge, intervals of competent rock within zone of clayey gouge.					69	100		
		237.5		1984.5							
240			As above.					70	78		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-18 (GT-35)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 8, 2016 09:14
DRILLING END: December 11, 2016 14:26
COORDINATES: N: 842,319 E: 909,644

SHEET: 5 of 5
GS ELEV.: 2222.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0		1982.0							
			As above. *(continued)*					70	78		
		242.0		1980.0							
			Pinal Schist (pCpi): dark greenish grey with dark red, METASANDSTONE, fine grained, foliated, intervals of gouge, highly					71	83		
245		245.0	fractured, oxidatized.	1977.0							
			As above, becomes highly oxidized.					72	100		
		247.0		1975.0							
			As above, highly foliated and broken.					73	80		
250		249.5		1972.5							
			Refusal at 12.2 ft. Bottom of borehole at 249.5 ft. Completed as well. Refer to diagram.								
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Erik Novak
CHECKED: G Smith
REVIEWED: R Post

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DH16-18 (GT-35)
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RECORD OF BOREHOLE DH16-19-(GT-4)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 11, 2016 12:43
DRILLING END: December 15, 2015 12:15
COORDINATES: N: 846,101 E: 916,859

SHEET: 1 of 5
GS ELEV.: 2443.4
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0	BASALT (TB): dark green to black, aphanitic groundmass with epidote filled amygdules, olivine phenocrysts, oxidation on discontinuity surfaces.	2443.4						0 - 39: Hydro test #1 FHT	
5		5.0	As above, calcite veins, moderatly fractured, strong HCl reaction.	2438.4				1	100		
		9.0	As above.	2434.4				2	95	9 - 10.5: Drill blocked, resulted in broken core.	
10		10.5	BASALT (TB): dark green to green, phaneritic ground mass with pyroxene phenocrysts, discontinuities surfaces are oxidized, weak HCl reaction.	2432.9				3	67		
		12.0	As above, mostly rubble highly fractured	2431.4				4	80		
		14.0	As above, groundmass becomes aphanitic, highly fractured, minor breccia with calcite inifill.	2429.4				5	65		
15		17.5	As above, highly oxidized.	2425.9				6	86		
		20.0	As above, moderately fractured and brecciated.	2423.4				7	88		
20		24.0	As above.	2419.4				8	95		
		29.0	As above.	2414.4			0-125.3ft: Cement Bentonite Grout	9	78		
25		34.0	As above.	2409.4				10	80		
		39.0	As above, breccia	2404.4				11	94		
30		42.3	Mescal Limestone (pCmls): LIMESTONE, light gray to pink, very fine grained, light iron staining, few healed fractures infilled with calcite.	2401.1				12	98	40 - 57.5: Hydro test #2 SI & CRI	
		44.0	As above	2399.4				13	100		
35		49.0	As above	2394.4							
		49.7	DIABASE (pCdiab): dark gray to black, fine grained, moderatly fractured, few calcite veins, layer of clay and breccia at contact 1" thick. Drillers notice some circulation loss at limestone-diabase contact at 49 ft-bgs.	2393.7				14	100	49: Drillers noted some circulation loss at limestone-diabase contact.	
40		51.0	As above, becciated.	2392.4				15	100		
		54.0	As above, brecciated.	2389.4				16	94	55 - 139: Hydro test #3 SI	
45		57.5	As above, broken core.	2385.9				17	60	57.5 - 58.5: Drill blocked, broken core. 58.5 - 63: Misslatch-replacing landing	
		58.5	As above.	2384.9							
50			Log continued on next page								
55											
60											

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-19-(GT-4)
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RECORD OF BOREHOLE DH16-19-(GT-4)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: December 11, 2016 12:43
DRILLING END: December 15, 2015 12:15
COORDINATES: N: 846,101 E: 916,859
SHEET: 2 of 5
GS ELEV.: 2443.4
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
60		60.0	As above. *(continued)*	2383.4				17	60	shoulder and springs.	
		63.0		2380.4				18	80		
		64.0	DIABASE (pCdiab): dark gray to black, fine grained, highly fractured, few calcite veins, brecciated texture, some fractures infilled with calcite, moderate oxidation around fractures.	2379.4				19	100		
65		66.0		2377.4				20	100		
		67.5	As above.	2375.9				21	100		
			As above.								
70			As above.					22	96		
		72.5		2370.9							
			As above, healed fractures with calcite.					23	94		
75		77.5		2365.9			0-125.3ft: Cement Bentonite Grout				
			As above.					24	100		
80		82.5		2360.9							
		83.0	As above.	2360.4				25	60		
			As above.					26	100		
85		88.0		2355.4							
			As above.					27	90		
90		93.0		2350.4							
			DIABASE (pCdiab): red to brownish black, coarse grained, calcite veining, fractured with breccia zones, partially oxidized, oxidation on discontinuities.					28	100		
95		98.0		2345.4							
			As above, less fractured					29	100		
100		102.0		2341.4							
		104.0	DIABASE (pCdiab): pinkish brown to dark brown, coarse to pegmatitic, minor calcite stockwork, abundant oxidation.	2339.4				30	100		
105			As above, pegmatitic vein, breccia and rubble.					31	96		
		109.0		2334.4							
110		111.0	DIABASE (pCdiab): red to brownish black, medium grained, few calcite veins, highly fractured, minor oxidation, brecciated.	2332.4				32	100		
			As above, becomes coarser grained.					33	90		
		114.0		2329.4			0-125.3ft: Cement Bentonite Grout				
115			As above, no oxidation.					34	100		
		119.0		2324.4							
120								35	96		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30
LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-19-(GT-4)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 11, 2016 12:43
DRILLING END: December 15, 2015 12:15
COORDINATES: N: 846,101 E: 916,859

SHEET: 3 of 5
GS ELEV.: 2443.4
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120		120.0	As above, dark grey to black, slight oxidiation. *(continued)*	2323.4							
		124.0	As above.	2319.4				35	96		
125		129.0	As above.	2314.4				36	100		
130		134.0	As above.	2309.4			125.3-140.0ft: 1/4" Coated Bentonite Pellets	37	100		
135		139.0	As above, very broken.	2304.4				38	56	134 - 139: Drill misslatch, broken.	
140		144.0	DIABASE (pCdiab): dark gray to black, coarse grained, few calcite veins, no oxidation.	2299.4				39	100	139 - 189: Hydro test #4 SI	
145		149.0	As above, moderately fractured.	2294.4				40	100		
150		154.0	As above.	2289.4				41	100		
155		159.0	As above, minor oxidation on discontinuties.	2284.4				42	100		
160		164.0	As above.	2279.4				43	100		
165		169.0	As above.	2274.4			149.0-249.0ft: 2" ID sch 40 PVC 0.010" slot	44	100		
170		174.0	As above, becomes brecciated with quartz and calcite infill.	2269.4				45	100		
175		179.0	DIABASE (pCdiab): dark gray to black, medium grained, few calcite veins, slight iron staining in joints, few joints, brecciated texture.	2264.4				46	100		
180			As above.					47	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-19-(GT-4)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 11, 2016 12:43
DRILLING END: December 15, 2015 12:15
COORDINATES: N: 846,101 E: 916,859

SHEET: 4 of 5
GS ELEV.: 2443.4
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0		2263.4							
			As above. *(continued)*					47	100		
		184.0		2259.4							
185			As above, becomes coarse grained.					48	100		
		189.0		2254.4							
190			As above, becomes red brown to black, medium grained.					49	96	190 - 249: Hydro test #5 SI	
		194.0		2249.4							
195			As above.				140.0-249.0ft: 10/20Silica Sand Filter Pack	50	100		
		199.0		2244.4							
200			As above.					51	100		
		204.0		2239.4							
205			As above.					52	100		
		209.0		2234.4							
210			As above, becomes coarse with calcite filled voids.					53	100		
		214.0		2229.4							
215			As above.				149.0-249.0ft: 2" ID sch 40 PVC 0.010" slot	54	100		
		219.0		2224.4							
220			As above					55	100		
		224.0		2219.4							
225			As above.					56	100		
		229.0		2214.4							
230			As above.					57	100		
		234.0		2209.4							
235			As above, 2 joint sets.					58	100		
		239.0		2204.4							
240			As above					59	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-19-(GT-4)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 11, 2016 12:43
DRILLING END: December 15, 2015 12:15
COORDINATES: N: 846,101 E: 916,859

SHEET: 5 of 5
GS ELEV.: 2443.4
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0		2203.4							
			As above *(continued)*					59	100		
		244.0		2199.4							
245			As above					60	100		
		249.0		2194.4							
250			Bottom of borehole at 249.0 ft. Completed as well. Refer to diagram.								
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH16-19-(GT-4)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:42
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RECORD OF BOREHOLE DH16-20 (GT-03)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 13, 2016 07:40
DRILLING END: December 17, 2016 11:00
COORDINATES: N: 844,754 E: 915,215

SHEET: 1 of 5
GS ELEV.: 2369.5
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0	(CH), CLAY, medium plasticity, coarse subangular gravel, fine to coarse subangular to angular sand, red-brown, stratified, moderate HCL reaction; diabase gravel; wet	2369.5	CH					0 - 23.5: Hydro test #1 FHT	
5		5.0	(SP-SC), SAND, fine to medium, poorly graded, angular, some non plastic fines, trace gravel, dark red-brown, weathered, iron oxide staining, moderate HCL reaction; moist, diabase regolith, SPT (3" int): 9-38-50/2"	2364.5	SP-SC						
		8.5	DIABASE (pCdiab): red brown, completely to moderately weathered, friable and weak, weathered to sand, oxidized.	2361.0				2	93		
10		10.0	As above.	2359.5				3	60		
15		15.0	As above, rubble.	2354.5				4	60		
20		20.0	DIABASE (pCdiab): red-brown, completely to highly weathered, brecciated, oxidized, calcite veins present.	2349.5				5	86		
		23.5	As above.	2346.0			0-45.0ft: 3/8" Bentonite Chips	6	100		
25		25.0	As above.	2344.5				7	10	25 - 28: Rock in bit causes mis-latch, poor recovery.	
		28.0	As above, mislatch, recovered rubble, oxidized with thin calcite veining.	2341.5				8	50		
30		30.0	DIABASE (pCdiab): red brown, completely to highly weathered, strong oxidation, brecciated, moderate reaction to HCl, calcite cementation, rubble.	2339.5				9	85		
		32.0	As above.	2337.5				10	90		
35		37.0	As above.	2332.5				11	100	36 - 57: Hydro test #2 SI	
40		40.0	As above, becomes faulted, brecciated and crushed with sandy gouge, highly oxidized.	2329.5				12	100		
		41.0	FAULT: contact with limestone is brecciated with gouge zones, mixed diabase and limestone clasts.	2328.5				13	100		
45		43.0	As above.	2326.5				14	100		
		47.3	Mescal Limestone (pCmls): pink LIMESTONE calcite veining, strong rock, faulted zones.	2322.2							
		48.0	As above.	2321.5				15	100		
50		52.0	As above, fault gouge 56.5-57ft.	2317.5			45.0-60.1ft: 1/4" Coated Bentonite Pellets	16	100	52 - 131: Hydro test #3 SI	
55		57.0	As above, moderately weathered sections of gouge.	2312.5				17	100		
60			Log continued on next page								

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-20 (GT-03)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 13, 2016 07:40
DRILLING END: December 17, 2016 11:00
COORDINATES: N: 844,754 E: 915,215

SHEET: 2 of 5
GS ELEV.: 2369.5
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
60		60.0		2309.5							
		62.0	As above, moderately weathered sections of gouge. *(continued)*	2307.5				17	100		
65		65.5	Becomes GOUGE, light pink sandy clay with gravel sized clasts.	2304.0				18	100		
		67.0	Mescal Limestone (pCmls)): dark pink LIMESTONE moderately weathered, very strong to strong.	2302.5				19	100		
70		71.0	As above, fractures coated with gouge.	2298.5							
		72.0	As above, becomes highly weathered, brecciated.	2297.5				20	100		
		73.8	As above, gouge.	2295.7							
75		77.0	Mescalero Limestone (pCmls): light gray LIMESTONE, highly weathered, oxidized.	2292.5				21	100		
80		82.0	As above, highly weathered.	2287.5				22	100		
		87.0	Mescalero Limestone (pCmls): pink LIMESTONE, highly weathered, oxidized.	2282.5				23	100		
85		92.0	As above, highly fractured, chlorite infill.	2277.5			60.1-120.0ft: 10/20 Silica Sand Filter Pack 65.1-115.1ft: 2" ID sch 40 PVC 0.010" slot	24	50		
90		97.0	Becomes light pink, and dark gray LIMESTONE, foliated and folded, sheared, altered, and boudined.	2272.5				25	100		
		99.0	As above, fault zone, breccia, crushed rock and sand and little clay, some oxidation and silicification.	2270.5				26	100		
95		101.0	As above, transitions out of fault zone.	2268.5				27	100		
		103.0	Becomes brown LIMESTONE, highly weathered, highly fractured, oxidized.	2266.5				28	75		
100		107.0	As above.	2262.5				29	80		
		110.5	Becomes pink LIMESTONE, black stratified chert inclusions, cemented gouge at bottom 1 ft of run.	2259.0				30	100		
105		112.3	Continues cemented GOUGE, highly weathered.	2257.2							
		115.5	Becomes pink LIMESTONE, moderately weathered, highly fractured.	2254.0				31	100		
110			Becomes orange gray to dark gray LIMESTONE, foliated and boudined, broken with rubbly zones, highy oxidized.								
115											
120											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:42
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RECORD OF BOREHOLE DH16-20 (GT-03)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 13, 2016 07:40
DRILLING END: December 17, 2016 11:00
COORDINATES: N: 844,754 E: 915,215

SHEET: 3 of 5
GS ELEV.: 2369.5
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
120		120.0		2249.5							
		120.5	As above, brecciated.	2249.0				33	100		
125		125.5		2244.0							
			As above, highly oxidized with MnOx dendrites.					34	100		
130		131.0		2238.5							
		133.5	Becomes light pink LIMESTONE, moderately weathered, highly fractured, partially brecciated.	2236.0				35	100	131 - 225: Hydro test #5 SI & CRI	
135		136.0	Dripping Springs Quartzite (pCds): gray pink QUARTZITE, fine grained, many fractures near contact, moderately weathered, moderate HCl reaction.	2233.5			120.0-250ft: 1/4" Coated Bentonite Pellets				
			As above, liesegang banding present.					36	100		
140		141.0		2228.5							
			As above					37	100		
145		146.0		2223.5							
		149.0	Becomes pinkish orange BRECCIA, weak calcite matrix, clasts are quartzite with liesegang banding.	2220.5				38	100		
150		153.3	Dripping Springs Quartzite (pCds): grayish black to brown QUARTZITE medium grained to silty, bedded, fractured thoughout, minor calcite stockwork.	2216.2				39	100		
155		156.0	Becomes pinkish orange, BRECCIA, weak calcite matrix, quartzite clast have liesegang banding.	2213.5							
		159.5	Becomes FAULT, matrix is extremely weak, friable, gougey, and clayey, no HCl reaction.	2210.0				40	86		
160		162.0	As above, slightly more competent.	2207.5				41	64		
			Becomes orange-brown QUARTZITE, moderately weathered, zones of cemented breccia and beds of fine material.					42	100		
165		167.0		2202.5							
			As above.					43	88		
170		172.0		2197.5							
			As above.					44	100		
175		177.0		2192.5							
			As above.					45	100		
180											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:42
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RECORD OF BOREHOLE DH16-20 (GT-03)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: December 13, 2016 07:40
DRILLING END: December 17, 2016 11:00
COORDINATES: N: 844,754 E: 915,215
SHEET: 4 of 5
GS ELEV.: 2369.5
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0		2189.5							
			As above. *(continued)*					45	100		
		182.0		2187.5							
			As above, intervals of cemented breccia throughout.					46	100		
185		187.0		2182.5							
			Becomes BRECCIA, red oxide matrix, clasts are gravel sized and oxidized.					47	100		
190		192.0		2177.5							
			As above with intervals of unbrecciated fine material.					48	100		
195		197.0		2172.5							
			Becomes orange brown QUARTZITE, moderately weathered.					49	100		
200		202.0		2167.5			120.0-250ft: 1/4" Coated Bentonite Pellets				
			As above.					50	94		
205		207.0		2162.5							
		208.0	Becomes BRECCIA.	2161.5				51	80		
		209.5	As above, completely weathered, no HCl reaction.	2160.0							
210			As above.					52	100		
		212.0		2157.5							
			As above.					53	100		
		214.5		2155.0							
215			As above, more competent.					54	100		
		219.5		2150.0							
220			As above, brecciated quartzite, intervals of gouge.					55	100		
		224.5		2145.0							
225			As above.					56	100	227 - 250: Hydro test #4 SI & CRI	
		230.0		2139.5							
230			As above.					57	100		
		233.0		2136.5							
		235.0	Becomes highly fractured dark red and orange QUARTZITE bedded, highly oxidized.	2134.5							
235			As above. Drillers noticed circulation loss at 237 ft-bgs.					58	87	237: Circulation lost at 237 ft-bgs.	
		238.0		2131.5							
		239.5	As above, becomes less fractured.	2130.0				59	87		
240											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60
LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:42
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RECORD OF BOREHOLE DH16-20 (GT-03)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: December 13, 2016 07:40
DRILLING END: December 17, 2016 11:00
COORDINATES: N: 844,754 E: 915,215
SHEET: 5 of 5
GS ELEV.: 2369.5
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0		2129.5							
			As above. *(continued)*					60	100 100		
		242.0		2127.5							
			As above.					61	63		
		244.0		2125.5							
245			Becomes BRECCIA, strong, well cemented, quartzite clasts are altered and oxidized.								
		246.0		2123.5							
		247.0	As above.	2122.5				62	100		
			Becomes less brecciated.					63	100		
250		250.0		2119.5							
			Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram.								
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

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DH16-20 (GT-03)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:42
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RECORD OF BOREHOLE DH16-21-(GT-05)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: December 16, 2016 11:31
DRILLING END: December 16, 2016 11:31
COORDINATES: N: 845,595 E: 917,417
SHEET: 1 of 5
GS ELEV.: 2406.9
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0		2406.9							
		4.0	(CL), SILTY CLAY, medium plasticity, fine to coarse subrounded to subangular sand, trace fine to coarse subrounded to subangular gravel, brown-red, COLLUVIUM; Quartzite gravel; cohesive,	2402.9	CL			1	88	0 - 31.5: Hydro test #1 FHT	
5		6.0	stiff, w ~ PL, Bolsa quartzite colluvium, patches of mod HCl reaction	2400.9				2	25		
		11.0	Poor recovery, washed gravel, mixed quartzites and diabase.	2395.9	SP-SC			3	20		
10			(SP-SC), SAND, medium, poorly graded, subangular to angular, some low plasticity fines, trace fine angular gravel, dark pink-brown, RESIDUUM; Diabase gravel; non-cohesive, dry to moist, Residual weathered diabase, 3" int blows: 3-6-5-11-16-22. Recovery from split spoon only, no core.		SP-SM			4	40		
15		15.0	(SP-SM), SAND, medium, poorly graded, subangular to angular, trace low plasticity fines, trace gravel, brown-black,	2391.9							
		16.0		2390.9							
		18.5	RESIDUUM; non-cohesive, wet, 3" blows: 1-1-1-1-2-12; residual weathered diabase, moisture content from drill fluid, recovery from split spoon only.	2388.4	SP-SM			5	80		
20		21.0	Continues DIABASE, residual soil to completely weathered, poorly graded sand, becomes little gravel, trace calcite.	2385.9				6	100		
		24.0	(SP-SM), SAND, medium, poorly graded, subangular to angular, trace non plastic fines, trace gravel, dark brown, weak cementation, strong HCL reaction, RESIDUUM; non-cohesive, dry to moist, Weakly cemented completely weathered diabase, little FeOx staining, weathered calcite veining. 3" blows: 5-8-14-21-23-25	2382.9			0-53.7ft: Cement Bentonite Grout	7	96		
25		29.0	DIABASE: brown, completely weathered to sandy gravel with trace silt, weakly to moderately cemented, strong HCl reaction,	2377.9							
30		31.5	weathered calcite veins, some FeOx staining.	2375.4				8	80		
		33.0		2373.9				9	0	31.5: Set surface casing to 25 ft-bgs. 33: Drilling difficulties, hole cave and recovery problems.	
		34.0	Becomes dark gray brown, DIABASE, moderately weathered, medium to coarse	2372.9				10	50		
35		35.0	grained, irregular calcite veining, FeOx staining, fractured, no HCl reaction in rock	2371.9				11	100		
		36.5	body, just veins.	2370.4				12	0	36.5 - 40: Drilling dfifficulties, hole washing out and producing lots of sand but no core. Drillers stop to advance surface casing. 40 - 45: Drillers advance hole with rock bit in attempt to find solid rock to set casing on. Driller notes harder material from 42 to 44 ft-bgs, but soft drilling again from 44 to 45 ft-bgs. 45 - 64: Hydro test #2 FHT	
			As above.								
			As above, becomes highly weathered and fractured.					13	29		
40		40.0	No recovery.	2366.9							
			Becomes brownish black DIABASE aphanitic, slight foliation, calcite and quartz veining, FeOx staining, returns are washed gravel only.					14	0		
			As above.								
45		45.0	No recovery.	2361.9							
		48.0	Mafic intrusive: dark greenish black DIABASE, aphanitic, slight foliation, calcite and quartz veining, FeOx staining, returns are washed gravel only.	2358.9				15	0		
			No recovery.								
50		50.5	Continues no core recovery.	2356.4				16	40		
			Continues washed gravel and redrill.								
		52.5	Mafic intrusive: dark greenish gray	2354.4				17	67		
		54.0	DIABASE, aphanitic, slight lustrous sheen, FeOx staining on discontinuities, broken	2352.9				18	100		
55		54.5	core and redrill.	2352.4				19	100		
			As above, becomes coarser grained.					20	100		
		56.5	Fractured and brecciated.	2350.4				21	100	55 - 249: Hydro test #4 FHT 55.1 - 69: Borehole walls are covered in bentonite.	
			As above.					22	100		
		58.0	As above, rubbly breccia zones.	2348.9							
		59.5	As above, fractured and highly jointed, subvertical joint set, FeOx coatings on	2347.4			53.7-65.3ft: 1/4"	23	100		
60			Log continued on next page								

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH16-21-(GT-05)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: December 16, 2016 11:31
DRILLING END: December 16, 2016 11:31
COORDINATES: N: 845,595 E: 917,417
SHEET: 2 of 5
GS ELEV.: 2406.9
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
60		60.0		2346.9			Coated Bentonite Pellets				
			discontinuities.					24	60		
		62.0	As above.	2344.9					60		
			As above. *(continued)*					25	35		
		64.0	As above.	2342.9							
65			No recovery.					26	0		
		67.0		2339.9							
		67.5	No recovery, slow advancement.	2339.4				27	0		
		68.5	No recovery.	2338.4				28	0		
		69.0		2337.9				29	0		
70		70.0	Mafic intrusive: dark greenish gray DIABASE, aphanitic, some oxidation in	2336.9				30	0		
		71.0	rock body, foliated, some alteration, FeOx staining on discontinuities, only washed	2335.9				31	100		
		73.0	gravel redrill recovered.	2333.9				32	75		
			As above.					33	0		
75		75.0	As above with fragments of weakly cemented sandy breccia matrix and calcite veining.	2331.9				34	10		
			As above with trace strong cemented breccia matrix.					35	33		
		79.5	Mafic intrusive: dark greenish gray, DIABASE, aphanitic, some oxidation in	2327.4							
80		81.0	rock body, foliated, FeOx coatings, only redrill recovered (gravel), thought to be	2325.9				36	67		
			similar to above with weak breccia matrix lost in drilling process.					37	100		
		84.0	As above, with few chunks of matrix recovered - matrix is soft, silty clay, purple	2322.9							
85		85.5	brown. Clasts continue mafic intrusive as above, gravel and corestones.	2321.4				38	100		
			Mafic intrusive: dark green and red, DIABASE, aphanitic, altered, epidote amygdules and oxidation. Brecciated with corestones.					39	100		
90		90.5	Becomes red, white, and black, BRECCIA, diabase and limestone clasts, well	2316.4							
			cemented and massive matrix, strong HCl reaction.					40	100		
			Continues BRECCIA, well cemented and massive, clast-supported, diabase clasts.								
95		95.0	Becomes Mescal Limestone (pCmls): pink,	2311.9			65.3-124.1ft: 10/20 Silica Sand Filter Pack 70-120ft: 2" ID sch 40 PVC 0.010" slot	41	100		
		97.0	gray, yellow, and white LIMESTONE BRECCIA, variably cemented with calcite	2309.9							
			and stiff clay, gougey fault zones, few mafic intrusive clasts incorporated.					42	93		
100		100.0	Continues light gray to pinkish gray LIMESTONE, with oxidized red zones,	2306.9							
			weak, healed breccia texture, weak altered/fault zones. Brecciated at contact with diabase below.					43	95		
		104.0	Becomes DIABASE (pCdiab) dark gray with little red mottling, coarse-grained	2302.9							
105			(sub-ophitic), fractured and highly jointed, FeOx coatings, trace calcite coatings.								
		106.5	As above, with healed breccia and open brecciated zones.	2300.4				44	100		
		109.0	As above.	2297.9							
110			Becomes BRECCIA, matrix supported, dark gray diabase clasts in very weak, red, highly oxidized matrix, some calcification, zone of extremely weak rock.					45	96		
		114.0	Becomes DIABASE (pCdiab): very dark gray, coarse to very coarse grained, calcite	2292.9							
115			veins, little oxidation, some zones of open and irregular fractures.								
		116.0	Becomes reddish black with greenish	2290.9				46	100		
			black, DIABASE, chloritic and hematitic alteration, quartz/calcite veining, FeOx haloes around faults, healed (calcite and								
		119.0	weak rock) fractures, brecciated	2287.9							
120			throughout.					47	70	119 - 124: Lost core from core tube	

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30
LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH16-21-(GT-05)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 16, 2016 11:31
DRILLING END: December 16, 2016 11:31
COORDINATES: N: 845,595 E: 917,417

SHEET: 3 of 5
GS ELEV.: 2406.9
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120		120.0		2286.9							
		124.0	Becomes reddish black DIABASE BRECCIA, clast supported, very weak matrix, clasts are coarsely crystaline/porphyritic with hematitic alteration, calcite veining, weak HCl reaction, jointed.	2282.9				47	70	mislatch.	
125			Becomes dark reddish brown BRECCIA matrix supported, matrix is extremely weak, subvertical faulting.					48	88		
		129.0	As above. *(continued)* Continues DIABASE BRECCIA, matrix	2277.9							
130			variably extremely weak to weak, oxidized throughout, jointed and sheared, some drilling damage to extremely weak rock.					49	100		
		134.0	Becomes reddish black DIABASE (pCdiab), coarse grained, healed fracture texture throughout, weak, oxidation throughout, weak HCl reaction.	2272.9							
135		135.5	As above.	2271.4				50	98		
		137.5	Becomes DIABASE BRECCIA, subrounded diabase clasts in fine matrix	2269.4							
		139.0	grades into zone of intense calcite viening and fracturing with less matrix.	2267.9							
140			Becomes reddish gray, DIABASE (pCdiab), aphanitic, abundant calcite veining.					51	96		
		144.0	Becomes DIABASE BRECCIA, matrix dominated, subround to subangular diabase clasts up to 1.5", friable matrix, minor calcite vieing.	2262.9							
145		149.0	As above, intervals where veining and fractures dominate to zones of matrix dominant breccia, subround diabase clasts.	2257.9				52	100		
150		154.0	Becomes reddish gray DIABASE (pCdiab), fine grained, phaneritic diabase intense calcite veining and fracturing.	2252.9				53	100		
155		159.0	Becomes DIABASE BRECCIA, poorly cemented clay rich matrix, diabase clasts subrounded, calcite veins.	2247.9				54	100		
160		164.0	As above.	2242.9				55	100		
165		169.0	Becomes reddish gray DIABASE (pCdiab), fine grained, phaneritic diabase euhedral phenocrysts, moderate clay and oxidation alteration.	2237.9				56	100		
170		174.0	As above, minor interval of pegmatite, coarse lathes of plagioclse.	2232.9				57	100		
175		179.0	As above, fine to medium grained, moderate clay and iron oxide alteration present.	2227.9				58	100		
180								59	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH16-21-(GT-05)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 16, 2016 11:31
DRILLING END: December 16, 2016 11:31
COORDINATES: N: 845,595 E: 917,417

SHEET: 4 of 5
GS ELEV.: 2406.9
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0		2226.9							
			As above, minor zone of pegmatitic diabase. *(continued)*					59	100		
		184.0		2222.9							
185		185.0	Becomes DIABASE BRECCIA, subround clasts, matrix supported, weakly cemented, clasts to 1.5".	2221.9				60	100		
			Becomes reddish gray DIABASE (pCdiab) with minor zone of pegmatite, moderate clay and oxide alteration present.				124.1-249ft: 1/4" Coated Bentonite Pellets				
		189.0		2217.9							
190			As above, intervals of stockwork calcite veining and interval of coarser grained diabase.					61	100		
		194.0		2212.9							
195			As above, becomes fine grained, fractured, calcite veins.					62	100		
		199.0		2207.9							
200			As above					63	100		
		202.0		2204.9							
		204.0	Becomes DIABASE BRECCIA, clast supported subangular to subround, matrix is clay-rich and has hematite present.	2202.9							
205			Beomes reddish gray DIABASE (pCdiab), fine to medium grained, moderate clay and oxide alteration present.					64	96	205 - 249: Hydro test #3 SI	
		209.0		2197.9							
210			As above, minor interval of breccia around calcite vein.					65	100		
		212.0		2194.9							
		214.0	As above, becomes medium grained, plagioclase lathes.	2192.9				66	95		
215			As above.					67	100		
		217.0		2189.9							
			As above.					68	100		
220		222.0		2184.9							
		224.0	As above, abundant iron oxide alteration.	2182.9				69	90		
225			As above.					70	98		
		229.0		2177.9							
230			Continues red gray DIABASE (pCdiab), medium to fine grained, competent, phaneritic, euhedral.					71	100		
		232.0		2174.9							
		234.0	As above.	2172.9				72	85		
235			As above.					73	95		
		238.0		2168.9							
			As above.					74	50	238 - 240: Mislatch core out of order and jumbled.	
240		240.0		2166.9							

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-21-(GT-05)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 16, 2016 11:31
DRILLING END: December 16, 2016 11:31
COORDINATES: N: 845,595 E: 917,417

SHEET: 5 of 5
GS ELEV.: 2406.9
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
240		240.0		2166.9							
		241.0	As above.	2165.9				75	88	\ 240 - 242: Redrill from mislatch.	
			Continues dark gray DIABABSE (pCdiab), fine to medium grained, iron oxide and clay alteration.								
		244.0		2162.9							
245			As above, clay and iron oxide alteration selveges around calcite veins.					76	98		
		249.0		2157.9							
250			Bottom of borehole at 249.0 ft. Completed as well. Refer to diagram.								
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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DH16-21-(GT-05)
5 of 5

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RECORD OF BOREHOLE DH16-22 (GT-40)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 18, 2016 16:14
DRILLING END: December 18, 2016 16:14
COORDINATES: N: 841,495 E: 912,378

SHEET: 1 of 5
GS ELEV.: 2303.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0		2303.0							
			(GW), GRAVEL, fine to coarse, well graded, subangular, trace sand; oxidized schist and quartz gravel; washed in sampler, surface material has sand and		GW			1	33	0 - 32: Hydro test #1 FHT	
		3.0		2300.0							
		4.0	fines.	2299.0				2	50		
5			Transitions to fractured, weathered schist in sample.					3	8		
			Pinal Schist (pCpi): grey, micaceous fine grained SCHIST, thick pink quartz veining								
		8.0	to 0.5 inches, highly fractured and weathered, red-brown oxidation throughout.	2295.0							
10			As above.					4	50		
		12.0		2291.0							
			As above, foliated.					5	71		
15		15.5		2287.5							
			As above.					6	56		
20		20.0		2283.0							
		22.0	As above, predominately quartz veins with oxidation.	2281.0				7	50		
			Becomes gray METASANDSTONE, fine to medium grained crushed/brecciated throughout, FeOx staining on discontinuities.					8	60		
25		27.0		2276.0							
		29.0	Becomes predominantly large quartz vein, FeOx staining, fractured and rubbly.	2274.0				9	100		
30			Pinal Schist (pCpi): grey to red, fine to medium grained, healed fracture texture, and gougey fault, oxidation selveges					10	90	30 - 90: Hydro test #2 FHT	
		32.0	around fault zones, very weak HCl	2271.0						32: Drillers advance surface casing to 25 ft-bgs.	
		33.0	reaction.	2270.0				11	50		
			As above: some re-drill, breccia with gouge matrix.					12	100		
35			Pinal Schist (pCpi): grey to red, fine to medium grained, healed fracture texture, and gougey fault, oxidation haloes around								
		38.0	fault zones, very weak HCl reaction.	2265.0							
			As above.					13	100		
40		41.0		2262.0							
			Pinal Schist (pCpi): gray, METASANDSTONE, fine to medium grained, crushed/brecciated throughout, some quartz, FeOx staining on discontinuities.					14	50		
45		46.0		2257.0							
			As above.				0-92.1ft: Cement Bentonite Grout	15	57		
50		49.5		2253.5							
			As above.					16	80		
		52.0		2251.0							
			As above.					17	100		
55		55.0		2248.0							
		56.5	As above.	2246.5				18	100		
			As above.					19	100		
60		59.5		2243.5							

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-22 (GT-40)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: December 18, 2016 16:14
DRILLING END: December 18, 2016 16:14
COORDINATES: N: 841,495 E: 912,378
SHEET: 2 of 5
GS ELEV.: 2303.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
60		60.0		2243.0							
		61.5	As above. *(continued)*	2241.5				20	100 100		
		62.5	As above.	2240.5				21	100		
65		65.0	Pinal Schist (pCpi): pinkish gray, METASANDSTONE, fine to medium grained, highly jointed and foliated, some crushed rock, FeOx selveges and on discontinuity surfaces.	2238.0				22	100		
			Becomes foliated, crenulated.					23	70		
70		70.0		2233.0				24	100		
		71.0	As above.	2232.0				25	100		
		72.5	As above.	2230.5				26	50		
75		76.5	As above.	2226.5				27	100		
		80.5	As above..	2222.5				28	93		
80		83.5	As above	2219.5				29	100		
85		88.0	Pinal Schist (pCpi): pinkish gray, SCHIST, fine to medium grained foliated, quartz and calcite veining, fractured or crushed throughout, weak HCl reaction, FeOx staining.	2215.0				30	100		
		90.0	As above, becomes more fractured and oxidized.	2213.0				31	100		
90		91.0	As above.	2212.0				32	100	92 - 150: Hydro test #3 SI	
		95.5	As above.	2207.5				33	100		
95		98.0	As above.	2205.0				34	100		
		100.0	As above, becomes more fractured.	2203.0				35	100	100 - 103: Split was dropped, core broken.	
100		103.0	Pinal Schist (pCpi): greenish gray, SCHIST, medium grained, foliated, crushed and gouged, no HCl reaction, FeOx staining and coatings.	2200.0			◄92.1-109.1ft: 1/4" Coated Bentonite Pellets	36	85		
		107.0	Becomes pinkish gray, METASANDSTONE, medium grained, foliated, crushed zones, FeOx coatings, weak HCl reaction.	2196.0				37	100		
105		109.8	Becomes, pink and gray, METASILTSTONE, foliation follows bedding planes, faulted, very weak HCl reaction.	2193.2				38	100		
		112.0	Becomes, gray METASANDSTONE, medium grained, foliated, comptent, no HCl reaction.	2191.0				39	100		
110		115.5	As above.	2187.5				40	83		
		118.0	Pinal Schist (pCpi): dark gray to reddish gray, METASANDSTONE/METASILTSTONE, fine to medium grained, foliated, fractured, sheared, FeOx coatings and staining	2185.0							
115											
120											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60
LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-22 (GT-40)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 18, 2016 16:14
DRILLING END: December 18, 2016 16:14
COORDINATES: N: 841,495 E: 912,378

SHEET: 3 of 5
GS ELEV.: 2303.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120		120.0	haloes.	2183.0							
		122.0	As above, zones of gouge. *(continued)*	2181.0				40	83		
			As above, highly foliated and crenulated.					41	100		
125		127.0		2176.0						127 - 129: Driller notes slight loss of drill fluid in zone.	
			Becomes fault zone, gouge and rubble.					42	100		
		129.5		2173.5							
130			Pinal Schist (pCpi), brownish gray, SCHIST, foliated, fractured, quartz vein with gouge, Feox staining.					43	100		
		132.5		2170.5							
			As above.					44	100		
135		135.0		2168.0							
			As above.					45	100		
		139.0		2164.0							
140		140.0	As above, highly jointed, broken core.	2163.0				46	80		
			Becomes gray to brownish gray, METASILTSTONE, fine to medium grained foliated and jointed, slightly silicified, little FeOx coatings.					47	100		
145		145.0		2158.0							
			As above.					48	100	147 - 250: Hydro test #4 SI	
150		150.0		2153.0							
			As above, folded.					49	93		
		153.0		2150.0							
155			As above, large quartz vein and poor recovery, gouge zones bracketing vein washed out in drilling, strong HCl reaction.					50	37		
		156.5		2146.5							
		158.5	As above, schistose, foliated, broken and brecciated, FeOx coatings on all discontinuities, no HCl reaction.	2144.5				51	100		
160			Becomes FAULT GOUGE.					52	100		
		162.5		2140.5							
			As above with sand and rubble.				109.1-215.9ft: 10/20 Silica Sand Filter Pack	53	100		
165							115-215ft: 2" ID sch 40 PVC 0.010" slot	54	100		
		168.3		2134.7				55	90		
		170.0	Becomes Pinal Schist (pCpi): pinkish gray, SCHIST, foliated and fractured, FeOx and clay coatings.	2133.0							
170		172.0	As above.	2131.0				56	100		
		174.0	As above, becomes more crushed and gougey.	2129.0				57	100		
175		175.0	Recover only rubble/redrill.	2128.0				58	50		
		177.3	Pinal Schist (pCpi): grayish red, SCHIST, fault, gouge with crushed rock, FeOx staining throughout.	2125.7				59	100		
180											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-22 (GT-40)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: December 18, 2016 16:14
DRILLING END: December 18, 2016 16:14
COORDINATES: N: 841,495 E: 912,378

SHEET: 4 of 5
GS ELEV.: 2303.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0		2123.0							
			Pinal Schist (pCpi): gray to reddish gray, METASANDSTONE, fine to medium grained, bedded, lightly foliated, fractured-both healed and open, quartz veining, moderate HCl reaction, FeOx staining and coating. *(continued)*					60	100		
185		185.0		2118.0							
			As above.					61	100		
190		190.0		2113.0							
			As above.					62	96		
195		195.0		2108.0							
			As above, poor recovery, gouge.					63	50		
200		200.0		2103.0							
		202.0	Becomes FAULT GOUGE, light greenish gray, soft clay with crushed rock fragments.	2101.0				64	100		
			Continues FAULT.					65	100		
205		204.7		2098.3							
		207.0	Becomes Pinal Schist (pCpi): pinkish gray, SCHIST, sheared rock fabric and closed brecciated texture, clay and FeOx.	2096.0				66	100		
			As above with gouge and rubble.								
210		211.0		2092.0							
			As above.					67	100		
		214.0		2089.0							
215			As above.					68	100		
		218.5		2084.5							
		220.0	Continues Pinal Schist (pCpi): light greenish gray, SCHIST, highly foliated, crenulated and sheared, clay coatings and infill.	2083.0				69	100		
220		222.0		2081.0				70	65		
			As above.								
			Becomes FAULT.				215.9-229.5ft: 1/4" Coated Bentonite Pellets	71	86		
225		225.5		2077.5							
			As above, mostly gouge, sandy clay with gravel.					72	100		
		229.0		2074.0							
230			As above.					73	100		
		232.0		2071.0							
			As above.					74	100		
235		235.0		2068.0							
			As above.					75	100		
		239.5		2063.5							
240								76			

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH16-22 (GT-40)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: December 18, 2016 16:14
DRILLING END: December 18, 2016 16:14
COORDINATES: N: 841,495 E: 912,378
SHEET: 5 of 5
GS ELEV.: 2303.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	SOIL PROFILE Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE INFO CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0		2063.0							
		240.5	Continues Pinal Schist (pCpi): light greenish gray, SCHIST, highly foliated, crenulated, brecciated and sheared, FeOx and clay coatings and infill. *(continued)*	2062.5			229.5-250ft Hole Sluff		100		
		243.0		2060.0				77	100		
			As above.					78	100		
245		245.0	As above, faulted, weak HCl reaction.	2058.0							
			As above.					79	100		
		247.0		2056.0							
		248.5	As above, broken core, fracture surfaces have full FeOx.	2054.5				80	67		
		249.0	As above.	2054.0				81	100		
250		250.0	As above, highly fractured, FeOx staining on clean surfaces.	2053.0				82	100		
			Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram.								
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Cara Shonsey
CHECKED: G Smith
REVIEWED: R Post

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DH16-22 (GT-40)
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RECORD OF BOREHOLE DH17-23-(GT-6)-A

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 5, 2017 00:00
DRILLING END: January 5, 2017 00:00
COORDINATES: N: 843,658 E: 916,937

SHEET: 1 of 1
GS ELEV.: 2419.8
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
0		0.0		2419.8							
		4.0	Apache Leap tuff (Talg): light gray to whitish pink, ash flow TUFF, biotite and feldspar phenocrysts, highly weathered.	2415.8				1	100		
5		6.0	As above.	2413.8				2	100		
		11.0	As above, less weathered.	2408.8				3	100		
10		14.0	As above, horizontal discontinuities along bedding.	2405.8				4	100		
15		19.0	As above, becomes more competent, highly welded.	2400.8				5	100		
20		24.0	As above.	2395.8				6	100		
25		29.0	As above	2390.8				7	100	29: Hole Lost at 29 ft-bgs.	
30			Bottom of borehole at 29.0 ft. Lost hole at 29'								
35											
40											
45											
50											
55											
60											

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK 30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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DH17-23-(GT-6)-A
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RECORD OF BOREHOLE DH17-23-(GT-6)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: January 6, 2017 11:03
DRILLING END: January 6, 2017 11:03
COORDINATES: N: 843,658 E: 916,937
SHEET: 1 of 5
GS ELEV.: 2419.8
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0		2419.8						0 - 32: Hydro test #1 FHT	
20		24.0	Apache Leap tuff (Talg): light gray, ash flow TUFF, feldspar and biotite phenocrysts, highly welded, few calcite veins, few lithic fragments.	2395.8			0-21.3ft: Cement Bentonite Grout	1	100	20: Same pad as DH17-23-(GT-6)-A. Reamed down to 20 ft-bgs, began coring.	
								2	100		
25		29.0	As above.	2390.8			21.3-35.1ft: 1/4" Coated Bentonite Pellets	3	100		
30		34.0	As above.	2385.8				4	98	30 - 90: Hydro test #2 FHT	
35		39.0	As above.	2380.8				5	100		
40		44.0	As above.	2375.8				6	100		
45		49.0	As above, becomes friable.	2370.8				7	94		
50		54.0	As above, moderately fractured.	2365.8				8	100	49 - 54: Circulation lost on this run. There are two small fracture zones around 52 ft-bgs.	
55		59.0	As above.	2360.8				9	100		
60								10	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK 30
LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH17-23-(GT-6)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: January 6, 2017 11:03
DRILLING END: January 6, 2017 11:03
COORDINATES: N: 843,658 E: 916,937
SHEET: 2 of 5
GS ELEV.: 2419.8
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
60		60.0		2359.8							
			As above, becomes massive and competent. *(continued)*					10	100		
		64.0		2355.8							
65			As above, becomes reddish brown.					11	100		
		69.0		2350.8							
70			As above, minor fractured zone. 2" lens of fine grained sandstone at 69.8 ft-bgs.					12	100		
		74.0		2345.8							
75			As above.					13	100		
		79.0		2340.8							
80			As above, continues massive and competent.					14	100		
		84.0		2335.8							
85			As above.					15	100		
		89.0		2330.8							
90			As above.				35.1-143.2ft: 10/20 Silica Sand Filter Pack 40-140ft: 2" ID sch 40 PVC 0.010" slot	16	100	92 - 150: Hydro test #3 SI	
		94.0		2325.8							
95			As above, few lithic clasts some with an iron staining halo around them.					17	100		
		99.0		2320.8							
100			As above.					18	100		
		104.0		2315.8							
105			Apache Leap tuff (Talg): light gray, ash flow TUFF, feldspar and biotite phenocrysts, highly welded, few calcite veins, auto-breccia texture, few lithic clasts with iron staining					19	100		
		109.0		2310.8							
110			As above.					20	100		
		114.0		2305.8							
115			Apache Leap tuff (Talg): light gray to reddish brown, ash flow TUFF, feldspar and biotite phenocrysts, highly welded, few calcite veins.					21	100		
		119.0		2300.8							
120								22	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK 30
LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH17-23-(GT-6)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: January 6, 2017 11:03
DRILLING END: January 6, 2017 11:03
COORDINATES: N: 843,658 E: 916,937
SHEET: 3 of 5
GS ELEV.: 2419.8
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120		120.0	As above, intervals of auto-breccia texture present. *(continued)*	2299.8							
		124.0	As above.	2295.8				22	100		
125		129.0	As above.	2290.8				23	100		
130		134.0	As above.	2285.8				24	100		
135		139.0	As above.	2280.8				25	100		
140		144.0	As above.	2275.8				26	100		
145		149.0	As above.	2270.8				27	100	147 - 250: Hydro test #4 SI	
150		154.0	As above.	2265.8				28	100		
155		159.0	As above.	2260.8				29	90		
160		164.0	As above.	2255.8				30	100		
165		169.0	As above.	2250.8				31	100		
170		174.0	As above, few large 1" calcite crystals.	2245.8				32	100		
175		179.0	Apache Leap tuff (Talg): light gray to reddish brown, ash flow TUFF, feldspar and biotite phenocrysts, highly welded, auto-breccia texture.	2240.8				33	100		
180			As above.					34	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK 30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH17-23-(GT-6)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: January 6, 2017 11:03
DRILLING END: January 6, 2017 11:03
COORDINATES: N: 843,658 E: 916,937
SHEET: 4 of 5
GS ELEV.: 2419.8
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0		2239.8							
			As above. *(continued)*					34	100		
		184.0		2235.8							
185			As above.					35	100		
		189.0		2230.8							
190			As above, few lithic clasts some with iron staining.					36	100		
		194.0		2225.8							
195			As above, some open voids not inter-conected.				143.2-250ft: 1/4" Coated Bentonite Pellets	37	100		
		199.0		2220.8							
200			Apache Leap tuff (Talg): light gray to reddish brown, ash flow TUFF, feldspar and biotite phenocrysts, highly welded, auto-breccia texture, most lithic clasts have iron staining.					38	100		
		204.0		2215.8							
205			As above.					39	100		
		209.0		2210.8							
210			As above.					40	100		
		214.0		2205.8							
215			As above, some open voids, though not inter-conected.					41	100		
		219.0		2200.8							
220			As above.					42	100		
		224.0		2195.8							
225			As above, massive.					43	100		
		229.0		2190.8							
230			As above, many horizontal fractures along bedding planes.					44	100		
		234.0		2185.8							
235			As above, fewer fractures.					45	100		
		239.0		2180.8							
240			As above, few lithic clasts.					46	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK 30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH17-23-(GT-6)-B

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: January 6, 2017 11:03
DRILLING END: January 6, 2017 11:03
COORDINATES: N: 843,658 E: 916,937
SHEET: 5 of 5
GS ELEV.: 2419.8
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0		2179.8							
			As above, few lithic clasts. *(continued)*					46	100		
		244.0		2175.8							
245			As above.					47	100		
		249.0		2170.8							
250		250.0	As above.	2169.8				48	100		
			Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram. Start coring at 19'								
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK 30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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DH17-23-(GT-6)-B
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH17-24(GT-40-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: January 7, 2017 14:33
DRILLING END: January 7, 2017 14:33
COORDINATES: N: 841,495 E: 912,378
SHEET: 1 of 2
GS ELEV.: 2303.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0		2303.0							
			Recovery is washed quartz gravel from surficial soils.					1	13	0: Twinned hole with GT-40. Drilling optimized for hole quality and speed, not recovery. See hole DH16-22 (GT-40) for record of twinned hole.	
		4.0		2299.0							
5			Pinal Schist (pCpi): brownish gray, SCHIST, fine to medium grained, highly foliated, quartz veining, FeOx on					2	83		
		7.0	discontinuities, clayey infill.	2296.0			0-13ft: 3/8" Bentonite Chips				
			As above.					3	100		
		9.5		2293.5							
10			As above.					4	100		
		12.0		2291.0							
			As above.					5	100		
		14.0		2289.0							
15			As above.					6	100		
		16.0		2287.0							
		17.0	As above.	2286.0				7	50		
			As above.					8	67		
		18.5		2284.5							
			No recovery.				13-25.2ft: 1/4" Coated Bentonite Pellets	9	0		
20		20.0		2283.0							
			Continues SCHIST, greenish gray, highly foliated and fractured, fine to medium					10	100		
		22.0	grained, full FeOx coatings.	2281.0							
		23.5	As above, large quartz vein.	2279.5				11	100		
			As above.					12	33		
25		25.0		2278.0							
			Becomes brecciated SCHIST, quartz veins, FeOx on discontinuity surfaces.					13	29		
		28.5		2274.5							
			Becomes brownish gray SCHIST, highly foliated and faulted, gougey and very weak,					14	100		
30		30.5	FeOx staining.	2272.5							
		32.0	As above.	2271.0				15	100		
			Becomes brownish gray, METASANDSTONE, fine to medium grained, jointed and lightly foliated, full					16	100		
		35.5	FeOx coatings, weak HCl reaction.	2267.5							
35			As above.					17	100		
		37.0		2266.0						37 - 75: Hydro test #1 FHT	
			As above, less jointed.					18	100		
		42.0		2261.0							
40			As above.					19	100		
		45.0		2258.0							
		47.0	As above, becomes very highly jointed, broken and faulted.	2256.0			25.2-67ft: 10/20 Silica Sand Filter Pack	20	100		
			As above, calcite infill in fracture.				27-67ft: 2" ID sch 40 PVC 0.010" slot	21	100		
45		50.5		2252.5							
			Becomes greenish gray with red SCHIST, fine grained, schistose, highly foliated,					22	100		
		54.5	crenulations, minor FeOx coatings, no HCl reaction.	2248.5							
50			As above.					23	100		
		57.0		2246.0							
			As above.					24	100		
55											
60											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60
LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF BOREHOLE DH17-24(GT-40-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 7, 2017 14:33
DRILLING END: January 7, 2017 14:33
COORDINATES: N: 841,495 E: 912,378

SHEET: 2 of 2
GS ELEV.: 2303.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
60		60.0		2243.0							
		61.0	As above. *(continued)*	2242.0				24	100		
			As above.					25	89		
65		65.5		2237.5							
			As above.					26	100		
		69.0		2234.0							
70			As above.					27	100		
		72.0		2231.0			67-75ft Hole Cave				
			As above.					28	100		
75		75.0		2228.0							
			Bottom of borehole at 75.0 ft. Completed as well. Refer to diagram.								
80											
85											
90											
95											
100											
105											
110											
115											
120											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH17-25 (GT-37)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 9, 2017 14:24
DRILLING END: January 9, 2017 14:24
COORDINATES: N: 843,072 E: 914,519

SHEET: 1 of 5
GS ELEV.: 2350.4
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0	Colluvium with sub-angular gravel and cobbles of shale.	2350.4						0 - 31: Hydro test #1 FHT	
		3.0	Pioneer Formation (pCp): dark gray SHALE, fine-grained, thinly bedded, highly weathered, highly fractured, complete	2347.4							
5		6.0	FeOx staining on all surfaces, rubble.	2344.4				1	40		
		7.5	As above, interbeds of light siltstone.	2342.9				2	100		
		8.5	As above.	2341.9				3	100		
10			As above, becomes less fractured, fine-grained siltstone interbeds, FeOx staining on fracture surfaces.					4	57		
		12.0		2338.4							
		14.0	As above.	2336.4			0-25.2ft: 1/4" Coated Bentonite Pellets	5	100		
15		17.0	No recovery.	2333.4				6	0		
		20.0	As above.	2330.4				7	17		
20		21.0	As above.	2329.4				8	100		
		24.0	As above.	2326.4				9 10 11	100		
25		25.0	Continues dark reddish brown SHALE,	2325.4				12	100		
		26.0	completly weathered, very fine to fine-grained, moderate FeOx staining, highly fractured, siltstone interbeds, rubble.	2324.4				13	90		
		28.0	As above.	2322.4				14	100		
		29.0	As above.	2321.4				15	70		
30		30.5	As above.	2319.9				16	100		
		34.0	As above.	2316.4				17	43		
35		37.5	As above.	2312.9				18	40		
		39.0	As above.	2311.4				19	33		
40		41.0	Continues dark reddish brown SHALE, completly weathered, very fine to fine-grained, moderate FeOx staining, highly fractured, siltstone interbeds, rubble.	2309.4				20	70		
		43.0	As above.	2307.4				21	100		
		44.0	As above, rubble.	2306.4				22	50		
45		44.5	As above.	2305.9				23	60		
		48.0	As above, brecciated with rubble zones, intervals of brown clay.	2302.4				24	86		
50		51.0	As above.	2299.4				25	90		
		54.0	As above.	2296.4				26	100		
55		57.0	As above.	2293.4				27	100		
		59.0	As above, rubble.	2291.4				28	50		
60								29	100	59 - 102: Hydro test #2 SI	

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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DH17-25 (GT-37)
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RECORD OF BOREHOLE DH17-25 (GT-37)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: January 9, 2017 14:24
DRILLING END: January 9, 2017 14:24
COORDINATES: N: 843,072 E: 914,519
SHEET: 2 of 5
GS ELEV.: 2350.4
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
60		60.0		2290.4							
		62.0	Continues dark reddish brown to tan SHALE, moderately weathered, very fine to fine-grained, light FeOx staining, highly fractured, siltstone interbeds, few calcite veins, rubble zones. *(continued)*	2288.4				29	100		
		64.0		2286.4				30	60		
65			As above.					31	60		
		66.0	As above.	2284.4			25.2-107ft: 10/20 Silica Sand Filter Pack	32	100		
		67.5	As above.	2282.9				33	60		
70		70.0	As above.	2280.4			35-105ft: 2" ID sch 40 PVC 0.010" slot	34	100		
		71.5	As above.	2278.9				35	100		
		74.0	As above.	2276.4				36	100		
75		75.5	As above.	2274.9				37	80		
		78.0	As above.	2272.4				38	80		
		79.5	As above.	2270.9				39	80		
80		82.0	As above.	2268.4				40	100		
		84.0	As above.	2266.4				42	100		
85		88.0	As above.	2262.4				43	65		
		90.0	As above.	2260.4				44	100		
90		91.0	As above.	2259.4				45	70		
		92.0	As above.	2258.4				46	100		
		94.0	Continues reddish brown SHALE, moderately weathered, very fine to fine-grained, light FeOx staining, highly fractured, siltstone interbeds, few calcite veins, rubble zones.	2256.4				47	100		
95		97.0	As above.	2253.4				48	20		
		102.0	As above.	2248.4				49	65		
100		104.0	As above.	2246.4				50	92		
		106.5	As above.	2243.9				51	93	109 - 249: Hydro test #3 SI	
105		110.5	As above.	2239.9				52	94		
		114.0	As above.	2236.4				53	97		
110		117.5	As above.	2232.9				54	91		
			As above.								
115											
120											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30
LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF BOREHOLE DH17-25 (GT-37)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: January 9, 2017 14:24
DRILLING END: January 9, 2017 14:24
COORDINATES: N: 843,072 E: 914,519
SHEET: 3 of 5
GS ELEV.: 2350.4
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120		120.0	As above. *(continued)*	2230.4				54	91		
		122.0	As above.	2228.4				55	90		
125		124.0	As above.	2226.4				56	100		
		127.0	As above.	2223.4				57	82		
130		132.0	As above.	2218.4				58	90		
		134.0	Continues dark reddish brown to tan SHALE, slightly weathered, very fine to fine-grained, light FeOx staining, slightly fractured, siltstone interbeds, few calcite veins, some rubble.	2216.4				59	100		
135		138.5	As above.	2211.9				60	100		
		143.5	As above, rubble zone.	2206.9				61	94		
140		147.0	As above.	2203.4				62	100		
		152.0	As above.	2198.4				63	100		
145		154.0	As above.	2196.4				64	80		
		158.5	As above, rubble.	2191.9				65	51		
150		160.0	As above.	2190.4				66	100		
		162.0	As above.	2188.4				67	90		
155		164.0	As above.	2186.4				68	100		
		166.0	As above.	2184.4				69	83		
160		169.0	As above.	2181.4				70	100		
		172.5	As above.	2177.9				71	100		
165		174.0	As above.	2176.4				72	100		
		178.0	As above.	2172.4			107-249ft: 1/4" Coated Bentonite				
170											
175											
180											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH17-25 (GT-37)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
P:\2015 PROJECTS\1531436 RCML NEAR WEST TSF GEOTECH\GINT\FINAL GINT PROJECTS\FINAL_OCTOBER 2017\NWTSF_FINAL_WELLS.GPJ

RECORD OF BOREHOLE DH17-25 (GT-37)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 9, 2017 14:24
DRILLING END: January 9, 2017 14:24
COORDINATES: N: 843,072 E: 914,519

SHEET: 4 of 5
GS ELEV.: 2350.4
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0		2170.4			Pellets				
		181.0	As above. *(continued)*	2169.4				72	100		
			As above, becomes brecciated.					73	87		
		184.0		2166.4							
185			As above, rubble.						100		
		189.0		2161.4							
190			As above.					75	75		
		193.0		2157.4							
		194.5	Continues dark reddish brown SHALE, moderately weathered, very fine to fine-grained, highly fractured, siltstone interbeds, few calcite veins, rubble.	2155.9				76	87		
195			As above.					77	66		
		198.0		2152.4							
			As above.					78	65		
200		200.0		2150.4							
			As above.					79	100		
		204.0		2146.4							
205			As above.					80	100		
		209.0		2141.4							
210			As above.					81	100		
		213.0		2137.4							
			As above.					82	90		
215		215.0		2135.4							
			As above.					83	73		
		218.0		2132.4							
220			As above, becomes brecciated.					84	100		
		223.0		2127.4							
			As above.					85	71		
225		226.5		2123.9							
			As above.					86	88		
230		230.5		2119.9							
			As above, rubble.					87	20		
		234.0		2116.4							
235			As above.					88	46		
		239.0		2111.4							
240			As above.					89	97		
			Log continued on next page								

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH17-25 (GT-37)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: January 9, 2017 14:24
DRILLING END: January 9, 2017 14:24
COORDINATES: N: 843,072 E: 914,519
SHEET: 5 of 5
GS ELEV.: 2350.4
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0		2110.4							
			As above. *(continued)*					89	97		
		242.0		2108.4							
			As above.					90	100		
		244.0		2106.4							
245			As above.								
		249.0		2101.4							
250			Bottom of borehole at 249.0 ft. Completed as well. Refer to diagram.								
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH17-25 (GT-37)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH17-26 (GT-13)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 10, 2017 17:00
DRILLING END: January 10, 2017 17:00
COORDINATES: N: 834,203 E: 924,372

SHEET: 1 of 5
GS ELEV.: 2383.8
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
0		0.0		2383.8							
		2.0	(CL), CLAY, low plasticity, some fine to coarse subrounded to subangular gravel, dark red and dark brown, laminated; wet	2381.8	CL					0 - 12: Hydro test #1 FHT	
5		5.0	Gila Sandstone (Tss): medium to coarse-grained SANDSTONE with stiff clay lenses, thinly bedded, reddish to dark brown.	2378.8				1	100		
		6.5	As above.	2377.3				2	100		
10		10.0	Becomes variably matrix supported CONGLOMERATE with subrounded-subangular clasts and thinly laminated SANDSTONE.	2373.8							
		10.7	Becomes reddish-brown Gila CONGLOMERATE, matrix supported, mostly gravel clasts.	2373.1				3	100		
		12.0		2371.8							
15			Becomes thinly laminated, fine-grained, reddish brown SANDSTONE with alternating light and dark laminations.					4	89		
		16.5	Becomes variably thinly bedded siltstone, coarse-grained sandstone, and matrix supported conglomerate.	2367.3						16 - 67: Hydro test #2 SI	
20			As above.					5	100		
		21.5		2362.3							
25			As above.					6	91		
		27.0		2356.8							
30			Continues interbedded CONGLOMERATE and thinly laminated medium- to coarse-grained SANDSTONE.					7	100		
		32.0		2351.8							
35			As above.					8	100		
		37.0		2346.8							
40			As above, intervals of clay layers.					8	72		
		42.0		2341.8							
45			As above.					9	93		
		46.0		2337.8							
50			Becomes medium- to coarse-grained SANDSTONE, light brown-reddish brown, with interbedded clay lenses.					10	100		
		51.0		2332.8							
		52.0	As above.	2331.8				11	100		
55			As above, with interbeds of matrix supported conglomerate.					12	100		
		57.0		2326.8							
60								13	94		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH17-26 (GT-13)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 10, 2017 17:00
DRILLING END: January 10, 2017 17:00
COORDINATES: N: 834,203 E: 924,372

SHEET: 2 of 5
GS ELEV.: 2383.8
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
60		60.0		2323.8							
		62.0	Continues interbedded thinly laminated, reddish-tan SANDSTONE and matrix supported CONGLOMERATE, predominantly gravel sized clasts, weak HCl reaction. *(continued)*	2321.8				13	94		
65			As above.					14	100	66 - 162: Hydro test #3 SI	
		67.0		2316.8							
			As above.					15	100		
70		72.0		2311.8							
			As above.					16	100		
75		77.0		2306.8							
			As above.					17	100		
80		82.0		2301.8			0-164ft: Cement Bentonite Grout				
			As above.					18	100		
85		87.0		2296.8							
			As above.					19	100		
90		91.0		2292.8							
			As above.					20	100		
95		96.0		2287.8							
			As above.					21	100		
100		101.0		2282.8							
			As above.					22	100		
105		106.0		2277.8							
			As above.					23	100		
110		111.0		2272.8							
			As above.					24	100		
115		116.0		2267.8							
			As above.					25	100		
120											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH17-26 (GT-13)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 10, 2017 17:00
DRILLING END: January 10, 2017 17:00
COORDINATES: N: 834,203 E: 924,372

SHEET: 3 of 5
GS ELEV.: 2383.8
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120		120.0		2263.8							
		121.0	As above. *(continued)*	2262.8				25	100		
		122.0	As above.	2261.8				26	100		
125			As above.					27	100		
		127.0		2256.8							
130			As above.					28	100		
		132.0		2251.8							
135			As above.					29	100		
		137.0		2246.8							
140			Becomes volcaniclastic SANDSTONE, highly oxidized, reddish-brown to light brown, ash-rich, weak HCl reaction.					30	100		
		142.0		2241.8							
145			As above.					31	100		
		147.0		2236.8							
			Becomes reddish-brown to black BASALT, calcite filled amygdales, auto-breccia, pervasive oxidation.					32	100		
150								33	100		
		152.0		2231.8							
155			As above.					34	100		
		157.0		2226.8							
160			As above.					35	100		
		162.0		2221.8						162 - 250: Hydro test #4 SI	
165			As above, FeOx staining decreases.					36	100		
		165.4		2218.4							
		166.1	Continues heavily oxidized,	2217.7							
		167.0	auto-brecciated BASALT with calcite amygdales.	2216.8							
		169.0	As above.	2214.8							
170			As above.					37	100		
			Becomes aphanitic dark gray BASALT, abundant thick calcite veins.				◄164-177.8ft: 1/4 Coated Bentonite Pellets				
175								38	100		
		177.0		2206.8							
			As above.					39	100		
180											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH17-26 (GT-13)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 10, 2017 17:00
DRILLING END: January 10, 2017 17:00
COORDINATES: N: 834,203 E: 924,372

SHEET: 4 of 5
GS ELEV.: 2383.8
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0	As above. *(continued)*	2203.8							
		182.0	As above.	2201.8				39	100		
185		187.0	As above.	2196.8				40	100		
190		192.0	As above.	2191.8				41	100		
195		197.0	As above.	2186.8				42	100		
200		202.0	As above.	2181.8				43	100		
205		207.0	As above.	2176.8				44	100		
210		212.0	As above.	2171.8				45	100		
215		217.0	As above.	2166.8			177.8-250ft: 10/20 Silica Sand Filter Pack	46	100		
220		220.0	As above.	2163.8			190-250ft: 2 ID sch 40 PVC 0.010 slot	47	100		
		222.0	As above.	2161.8				48	100		
225		227.0	As above.	2156.8				49	100		
230		232.0	As above.	2151.8				50	100		
235		237.0	As above.	2146.8				51	100		
240			As above.					52	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH17-26 (GT-13)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 10, 2017 17:00
DRILLING END: January 10, 2017 17:00
COORDINATES: N: 834,203 E: 924,372

SHEET: 5 of 5
GS ELEV.: 2383.8
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0	As above. *(continued)*	2143.8							
		242.0	As above.	2141.8				52	100		
245		247.0	As above.	2136.8				53	100		
250		250.0	Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram.	2133.8				54	100		
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

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DH17-26 (GT-13)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH17-27 (GT-12)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 14, 2017 13:05
DRILLING END: January 14, 2017 13:05
COORDINATES: N: 832,977 E: 923,488

SHEET: 1 of 5
GS ELEV.: 2333.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0		2333.0							
	HQ3		Dark brown gravelly clay, fragmented basalt with tuff, quartz, and other volcanic fragments.					1	20		
5		5.0		2328.0							
		6.0	Rubble zone with basalt, tuff, quartz, and other volcanic fragments.	2327.0				2	100		
		6.4		2326.6				3	100		
		8.0	Fragmented pinkish-gray strongly welded tuff and some basalt.	2325.0			0-15ft: Cement Bentonite Grout				
		9.0	Light- to dark-gray aphanitic BASALT with small phenocrysts (1 to 0.5-mm) of hornblende, biotite, garnet, and olivine, pervasive FeOx staining.	2324.0				4	30		
10		11.5	As above, rubble.	2321.5				5	100		
		13.5	As above, at ~11 ft-bgs, yellowish-white staining begins to appear on fracture surfaces, no HCL reaction.	2319.5				6	100		
15		15.5	Continues light to dark gray aphanitic BASALT with small phenocrysts (1-mm) of hornblende, olivine, garnet, and biotite, fractures have less FeOx staining and are partially to fully-coated with talc.	2317.5				7	100		
		17.5	As above, abundant MnOx and talc on discontinuities, becomes more factured.	2315.5				8	100		
20		20.5	As above.	2312.5			15-25ft: 1/4 Coated Bentonite Pellets	9	100		
		22.0	As above.	2311.0				10	100		
		22.5	As above.	2310.5				11	100		
			As above, broken.					12	100		
25			As above.								
		26.5	Continues aphanitic BASALT, dark gray with FeOx staining, small phenocrysts (<0.5-mm) of hornblende, garnet, FeOx staining and some chlorite coatings on fracture surfaces.	2306.5				13	100		
		27.5	As above.	2305.5				14	100		
30			As above, increase in FeOx staining.								
		32.0		2301.0							
			As above, rubble.					15	100	33 - 62: Hydro test #1 SI & CRI	
35		36.5		2296.5							
		37.0	As above.	2296.0				16	100		
		39.0	As above, joints have thick (>5-mm) infill, white, soft, no HCL reaction, possibly chlorite or talc.	2294.0			25-112ft: 10/20 Silica Sand Filter Pack	17	100		
40		41.5	As above.	2291.5				18	100		
		43.0	As above.	2290.0				19	100		
		44.0	As above, rubble.	2289.0				20	100		
45		45.5	As above.	2287.5			30-110ft: 2 ID sch 40 PVC 0.010 slot	21	100		
		47.5	As above, rubble and gouge.	2285.5				22	100		
50		52.0	Continues aphanitic BASALT, dark gray, weak FeOx staining, small phenocrysts (<~0.5-mm) of hornblende, garnet, and biotite, some FeOx stained fractures, some fractures completely coated with chlorite/talc.	2281.0				23	100		
			As above, calcite on fracture surfaces and open veins.					24	100		
55		57.0		2276.0							
			As above, increased calcite veining.					25	100		
60											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH17-27 (GT-12)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 14, 2017 13:05
DRILLING END: January 14, 2017 13:05
COORDINATES: N: 832,977 E: 923,488

SHEET: 2 of 5
GS ELEV.: 2333.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
60	HQ3	60.0	As above, increased calcite veining. *(continued)*	2273.0				25	100		
		62.0	As above.	2271.0				26	100	63 - 132: Hydro test #2 SI	
65		66.5	As above.	2266.5				27	100		
70		71.5	As above.	2261.5				28	100		
75		76.5	As above.	2256.5				29	100		
80		82.0	As above.	2251.0			25-112ft: 10/20 Silica Sand Filter Pack	30	100		
85		87.0	As above.	2246.0			30-110ft: 2 ID sch 40 PVC 0.010 slot	31	100		
90		92.0	As above.	2241.0				32	100		
		94.5	As above.	2238.5				33	100		
95		99.5	As above.	2233.5				34	100		
100		102.0	As above.	2231.0				35	100		
		103.0	As above, mostly rubble.	2230.0				36	100		
105		108.0	Continues aphanitic BASALT, dark gray to black, weak FeOx staining, small phenocrysts (<~1.0-mm) of hornblende, garnet, and biotite, some FeOx/MnOx stained fractures, some fractures completely coated with chlorite/talc.	2225.0				37	100		
110		112.0	As above.	2221.0				38	100		
115		117.0	As above.	2216.0				39	100		
120			As above.								

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH17-27 (GT-12)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 14, 2017 13:05
DRILLING END: January 14, 2017 13:05
COORDINATES: N: 832,977 E: 923,488

SHEET: 3 of 5
GS ELEV.: 2333.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120	HQ3	120.0	As above. *(continued)*	2213.0			112-250ft: 1/4 Coated Bentonite Pellets	39	100	132 - 192: Some circulation loss was noticed from 132 to 192 ft-bgs. 133 - 250: Hydro test #3 SI & CRI	
		122.0	As above.	2211.0				40	100		
125		127.0	As above.	2206.0				41	100		
130		132.0	Becomes highly oxidized amygdaloidal BASALT, calcite amygdales and veins, completely oxidized phenocrysts, open veins have yellow-colored staining, bright rust to purple-blackish color.	2201.0				42	100		
135		136.5	As above.	2196.5				43	100		
140		141.5	As above, decreasing FeOx staining.	2191.5				44	100		
145		146.5	As above, increase in FeOx staining.	2186.5				45	100		
150		151.5	As above.	2181.5				46	100		
155		156.5	As above, fractured surfaces completely covered in calcite and zeolite crystals.	2176.5				47	100		
160		162.0	As above.	2171.0				48	100		
165		167.0	As above.	2166.0				49	100		
170		172.0	As above.	2161.0				50	100		
175		177.0	As above.	2156.0				51	100		
180			Log continued on next page								

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH17-27 (GT-12)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 14, 2017 13:05
DRILLING END: January 14, 2017 13:05
COORDINATES: N: 832,977 E: 923,488

SHEET: 4 of 5
GS ELEV.: 2333.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180	HQ3	180.0	As above. *(continued)*	2153.0							
		182.0	As above.	2151.0				51	100		
185		185.6	Becomes completely oxidized BASALT, few amygdales, red brown.	2147.4				52	100		
190		192.0	Becomes Apache Leap tuff (Talg): moderately welded, oxidized TUFF, light brown to pinkish-red, phenocrysts of biotite and quartz.	2141.0				53	100		
195		197.0	As above.	2136.0				54	100	193 - 250: Hydro test # SI	
200		202.0	As above.	2131.0			112-250ft: 1/4 Coated Bentonite Pellets	55	100		
205		207.0	As above.	2126.0				56	100		
210		212.0	As above.	2121.0				57	100		
215		217.0	As above, increased weathering, weaker.	2116.0				58	100		
220		222.0	As above.	2111.0				59	100		
225		227.0	As above.	2106.0				60	100		
230		232.0	As above.	2101.0				61	100		
235		237.0	Becomes poorly welded TUFF, light brown to dark brown with high FeOx staining, clay alteration, weak.	2096.0				62	100		
240			As above, phenocrysts larger than previous runs.					63	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH17-27 (GT-12)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 14, 2017 13:05
DRILLING END: January 14, 2017 13:05
COORDINATES: N: 832,977 E: 923,488

SHEET: 5 of 5
GS ELEV.: 2333.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	SOIL PROFILE Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE INFO CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0		2093.0							
	HQ3	242.0	As above, phenocrysts larger than previous runs. *(continued)*	2091.0				63	100		
245		245.9	Becomes highly weathered, heavily FeOx, non-welded TUFF, crystal rich, clay altered and weak.	2087.1				64	100		
		247.0	Massive, Contact with Pinal Schist at 246 ft-bgs. Schistose clasts in medium- to coarse-grained sandy clay, clast supported, clast size <~2.5-in., matrix has moderate HCL reaction.	2086.0				65	100		
250		250.0	As above.	2083.0							
			Refusal at 5.0 ft. Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram.								
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

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DH17-27 (GT-12)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH17-28 (GT-23)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 17, 2017 07:13
DRILLING END: January 17, 2017 07:13
COORDINATES: N: 835,599 E: 929,090

SHEET: 1 of 5
GS ELEV.: 2516.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0	HQ3	0.0	Colluvium and weathered conglomerate.	2516.0						0 - 32: Hydro test #1 FHT	
		3.0	Gila Conglomerate (Tcg): completely weathered, matrix washed out, clasts consist of schist, quartz, and tuff, rubble zone.	2513.0				1	33		
5		6.0	As above.	2510.0				2	25		
		8.0	As above.	2508.0				3	33		
10		11.0	Gila Conglomerate (Tcg), brown, clast dominant, subangular to subrounded, fine sandy matrix, clasts of gneiss, schist, quartz, and tuff, weak HCl reaction, competent.	2505.0			0-22.1ft: 1/4 Coated Bentonite Pellets	4	68		
		13.5	As above.	2502.5				5	25		
15		15.5	As above.	2500.5				6	100	16 - 39: Drillers noted some circulation loss from 16 to 39 ft-bgs.	
		16.0	As above.	2500.0							
		21.0	As above. Drillers notice some circulation loss.	2495.0				7	100		
20		24.0	As above, moderately fractured.	2492.0				8	43		
25		29.0	As above.	2487.0				9	100	29 - 104: Hydro test #2 SI & CRI	
30		32.0	As above, rubble.	2484.0				10	100		
		34.0	As above, rubble.	2482.0				11	90		
35		39.0	As above.	2477.0				12	100		
40		44.0	As above. Drillers noticed some circulation loss from 16 to 39 ft-bgs.	2472.0				13	100		
45		49.0	As above.	2467.0				14	100		
50		54.0	As above.	2462.0				15	100		
55		59.0	As above.	2457.0				16	100		
60			As above.					17	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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DH17-28 (GT-23)
1 of 5

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH17-28 (GT-23)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 17, 2017 07:13
DRILLING END: January 17, 2017 07:13
COORDINATES: N: 835,599 E: 929,090

SHEET: 2 of 5
GS ELEV.: 2516.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
60	HQ3	60.0	As above. *(continued)*	2456.0				17	100		
		64.0	As above.	2452.0			22.1-107.2ft: 10/20 Silica Sand Filter Pack 25-105ft: 2 ID sch 40 PVC 0.010 slot	18	100		
65		69.0	As above.	2447.0				19	100		
70		74.0	As above.	2442.0				20	100		
75		79.0	As above.	2437.0				21	100		
80		84.0	As above, few cobbles.	2432.0				22	100		
85		89.0	As above.	2427.0				23	100		
90		94.0	As above.	2422.0				24	100		
95		99.0	As above.	2417.0				25	100		
100		104.0	As above.	2412.0				26	100		
105		109.0	As above.	2407.0				27	100	109 - 250: Hydro test #3 SI	
110		114.0	Continues Gila Conglomerate (Tcg), brown, clast dominant, gravel with few cobbles, fine sandy matrix, clasts of schist, quartz, tuff, and diabase, weak HCl reaction, competent.	2402.0				28	100		
115		119.0	As above.	2397.0				29	100		
120			As above.								

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH17-28 (GT-23)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: January 17, 2017 07:13
DRILLING END: January 17, 2017 07:13
COORDINATES: N: 835,599 E: 929,090
SHEET: 3 of 5
GS ELEV.: 2516.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120	HQ3	120.0	As above. *(continued)*	2396.0				29	100		
		124.0	As above.	2392.0				30	100		
125		129.0	As above, one boulder.	2387.0				31	100		
130		134.0	As above.	2382.0				32	100		
135		139.0	As above.	2377.0				33	100		
140		144.0	As above.	2372.0				35	100		
145		149.0	As above.	2367.0				36	100		
150		154.0	As above.	2362.0				37	100		
155		159.0	As above.	2357.0				38	100		
160		164.0	As above.	2352.0				39	100		
165		169.0	As above.	2347.0				40	100		
170		174.0	As above.	2342.0				41	100		
175		179.0	As above.	2337.0			107.2-250ft: 1/4 Coated Bentonite	42	100		
180			As above.								

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30
LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH17-28 (GT-23)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 17, 2017 07:13
DRILLING END: January 17, 2017 07:13
COORDINATES: N: 835,599 E: 929,090

SHEET: 4 of 5
GS ELEV.: 2516.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0		2336.0			Pellet backfill				
			As above. *(continued)*					42	100		
		184.0		2332.0							
185			As above.					43	100		
		189.0		2327.0							
190			As above.					44	100		
		191.5		2324.5						191.5: Bit went out at 191.5 ft-bgs, lost 0.5 ft. of core.	
			As above.					45	80		
		194.0		2322.0							
195			As above.					46	100		
		199.0		2317.0							
200			As above.					47	100		
		204.0		2312.0							
205			As above.					48	100		
		208.0		2308.0							
210	HQ3		Continues Gila Conglomerate (Tcg), brown, clast dominant, gravel, fine-grained sandy matrix, clasts of schist, quartz, tuff, diabase, and basalt, weak HCl reaction, competent.					49	100		
		213.0		2303.0							
			As above.					50	100		
215		218.0		2298.0							
			As above.					51	100		
220		223.0		2293.0							
			As above.					52	100		
225		228.0		2288.0							
			As above.					53	100		
230		233.0		2283.0							
			As above, few cobbles.					54	100		
235		238.0		2278.0							
			As above, few cobbles.					55	100		
240											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH17-28 (GT-23)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 17, 2017 07:13
DRILLING END: January 17, 2017 07:13
COORDINATES: N: 835,599 E: 929,090

SHEET: 5 of 5
GS ELEV.: 2516.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240	HQ3	240.0	As above, few cobbles. *(continued)*	2276.0				55	100		
		243.0	As above, few cobbles.	2273.0				56	100		
245		248.0	As above, few cobbles.	2268.0				56	100		
250		250.0	Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram.	2266.0							
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kyle Kirtley
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH17-29 (GT-14-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 23, 2017 09:30
DRILLING END: January 23, 2017 09:30
COORDINATES: N: 838,433 E: 923,220

SHEET: 1 of 2
GS ELEV.: 2405.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0	Gila CONGLOMERATE (Tcg): polylithic subangular to subrounded gravel clasts in a silty sand matrix, weakly calcareous cement, variably clast or matrix dominant, no iron oxide staining.	2405.0				1	80	0 - 27: Hydro test #1 FHT	
5								2	100		
10								3	100		
		12.0	Becomes Gila SANDSTONE (Tss): coarse to medium grained, bedding defined by grain size changes, subrounded gravel, slightly to moderately calcareous cement.	2393.0				4	100	14.9: Lost circulation around this depth.	
15											
20								5	100		
		22.0	Becomes Gila CONGLOMERATE (Tcg): polylithic subangular to subrounded gravel clasts in silty sand matrix, weakly calcareous cement, variably clast or matrix dominant, no iron oxide staining.	2383.0				6	90	23 - 62: Hydro test #2 SI & CRI	
25		27.0	Continues Gila CONGLOMERATE, massive few discontinuities, variably matrix supported, intervals of medium to coarse sandstone, immature, variably thick bedding defined by grain size changes, weak HCl reaction throughout.	2378.0				7	96		
30								8	100		
35								9	100		
40								10	100		
45								11	100		
50								12	100		
55								13	100		
60											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH17-29 (GT-14-2)
1 of 2

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH17-29 (GT-14-2)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 23, 2017 09:30
DRILLING END: January 23, 2017 09:30
COORDINATES: N: 838,433 E: 923,220

SHEET: 2 of 2
GS ELEV.: 2405.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
60		60.0		2345.0							
		62.0		2343.0				13	100		
			Bottom of borehole at 62.0 ft. Backfilled with cement bentonite grout.								

65
70
75
80
85
90
95
100
105
110
115
120

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH17-29 (GT-14-2)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH17-30 (GT-25)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 24, 2017 13:45
DRILLING END: January 24, 2017 13:45
COORDINATES: N: 833,472 E: 931,659

SHEET: 1 of 5
GS ELEV.: 2472.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0		2472.0							
		1.5	Surface alluvium, washed gravel and some clayey sand, clasts of granodiorite, pink tuff, and schist.	2470.5				1	100	0 - 32: Hydro test #1 FHT	
		4.0	Continues alluvium, returns are washed cobbles and coarse gravel, clasts of quartz, granodiorite, and pink tuff.	2468.0				2	40		
5		6.0	As above, tuff and quartzite clasts.	2466.0				3	25		
		8.0	As above, returns are foliated chloritized fine grained diabase with epidote, granodiorite, quartz, and quartzite.	2464.0				4	75		
10			As above, predominantly coarse gravel sized clasts of foliated diabase, quartzite, rhyolite, and quartz.					5	33		
		14.0		2458.0				6	67		
15			Becomes Gila Conglomerate (Tcg): slightly weathered, clast supported, coarse sand to cobbles in silty sand matrix, clasts are subrounded to subangular of foliated				0-31ft: 3/8 Bentonite Holeplug	6	100		
		17.5	diabase, quartzite, schist, pink and white tuff, moderate to weak HCl reaction.	2454.5							
20			As above, no HCl reaction.					7	100		
		22.5		2449.5							
			As above, with few vuggy quartz veins with crystals.					8	100		
25		27.5		2444.5							
			As above, no quartz veins, very weak HCl reaction.					9	100		
30		32.5		2439.5							
		33.0	As above.	2439.0			31-33ft: 1/4 Coated Bentonite Pellets	10	100	32.5: 1st run after setting casing, recover washed gravel.	
			Continues CONGLOMERATE, slightly weathered, matrix supported, coarse sand					11	100	33 - 94: Hydro test #2 SI	
35		36.0	to fine gravel in sandy clay matrix, subrounded to angular clasts of quartzite, schist, tuff, and diabase, weak HCl reaction, competent.	2436.0				12	100		
			As above, trace vugs with quartz crystals, strong HCl reaction.								
40		41.5		2430.5				13	100		
			Becomes matrix supported, brown CONGLOMERATE, moderate to strong HCl reaction, gravel and cobbles in sandy clay matrix, clasts of tuff, schist, quartzite, and subophitic diabase, vuggy zones with quartz crystals.								
45		49.0		2423.0				14	100		
50			As above.					15	100		
		54.0		2418.0							
55			As above, zones of slightly more friable matrix, becomes clast supported.					16	100		
		59.0		2413.0							
60			As above.					17	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
P:\2015 PROJECTS\1531436 RCML NEAR WEST TSF GEOTECH\GINT\FINAL GINT PROJECTS\FINAL_OCTOBER 2017\NWTSF_FINAL_WELLS.GPJ

RECORD OF BOREHOLE DH17-30 (GT-25)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 24, 2017 13:45
DRILLING END: January 24, 2017 13:45
COORDINATES: N: 833,472 E: 931,659

SHEET: 2 of 5
GS ELEV.: 2472.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
60		60.0		2412.0							
			As above. *(continued)*					17	100		
		64.0		2408.0							
65			Continues CONGLOMERATE, slightly weathered, matrix supported, coarse gravel, cobbles, and boulders in sandy clay matrix, clasts of tuff, schist, diabase, and quartzite, weak to no HCl reaction.				33-97.3ft: 10/20 Silica Sand Filter Pack 35-95ft: 2 ID sch 40 PVC 0.010 slot	18	100		
		69.0		2403.0							
70			Becomes moderately weathered, weak matrix, few vugs with some calcite and some quartz infill.					19	100		
		74.0		2398.0							
75			As above, matrix becomes very weak, strong HCl reaction.					20	100		
		79.0		2393.0							
80			As above, matrix becomes very weak to weak.					21	100		
		84.0		2388.0							
85			Becomes fresh, CONGLOMERATE, weak, matrix to clast supported, clayey sand matrix, fine gravel to cobbles, subrounded to subangular clasts of tuff, schist, granodiorite, and quartzite. Competent, weak to moderate HCl reaction, few large vugs with quartz crystals.					22	100		
		89.0		2383.0							
90			As above, no vugs.					23	100		
		94.0		2378.0							
95			As above, few vugs with quartz, some clasts of rhyolite and diabase, small zones of calcite coatings on clasts.					24	100	94 - 249: Hydro test #3 SI	
		99.0		2373.0			97.3-249ft: 1/4 Coated Bentonite Pellets				
100			As above, no vugs, very weak HCl reaction.					25	100		
		104.0		2368.0							
105			As above, predominantly clast supported, moderate HCl reaction.					26	100		
		109.0		2363.0						109: Damage from overdrilling.	
110			As above.					27	100		
		114.0		2358.0							
115			As above.					28	100		
		119.0		2353.0							
120			As above.					29	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF BOREHOLE DH17-30 (GT-25)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 24, 2017 13:45
DRILLING END: January 24, 2017 13:45
COORDINATES: N: 833,472 E: 931,659

SHEET: 3 of 5
GS ELEV.: 2472.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120		120.0		2352.0							
		124.0	As above. *(continued)*	2348.0				29	100		
125		129.0	As above, becomes matrix supported, weak HCl reaction, with a silty interbed.	2343.0				30	100		
130		134.0	As above.	2338.0				31	100		
135		139.0	As above, becomes clast supported, coarse gravel and tuff boulder, moderate HCl reaction.	2333.0				32	100		
140		144.0	As above.	2328.0				33	100		
145		149.0	As above.	2323.0				34	100		
150		154.0	As above.	2318.0				35	100		
155		159.0	As above.	2313.0				36	100		
160		164.0	Continues CONGLOMERATE, fresh, matrix to clast supported, fine to medium gravel with cobbles in clayey sand matrix, subrounded to angular clasts of diabase, quartzite, schist, tuff, and quartz. Competent and massive, moderate HCl reaction.	2308.0				37	100		
165		169.0	Becomes slightly weathered CONGLOMERATE, matrix is very weak to weak, continues massive but more easily drilling damaged.	2303.0				38	100		
170		174.0	As above, becomes slightly weathered to fresh.	2298.0				39	100		
175		179.0	As above, becomes matrix supported.	2293.0			97.3-249ft: 1/4 Coated Bentonite Pellets	40	100		
180			As above.					41	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH17-30 (GT-25)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 24, 2017 13:45
DRILLING END: January 24, 2017 13:45
COORDINATES: N: 833,472 E: 931,659

SHEET: 4 of 5
GS ELEV.: 2472.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0	As above. *(continued)*	2292.0				41	100		
		184.0	As above.	2288.0				42	100		
185		189.0	As above.	2283.0				43	100		
190		194.0	As above.	2278.0				44	100		
195		199.0	As above.	2273.0				45	100		
200		204.0	As above.	2268.0				46	100		
205		207.0	As above, weak HCl reaction.	2265.0				47	100		
		212.0	As above, moderate HCl reaction.	2260.0				48	100		
210		214.0	As above.	2258.0				49	100		
215		219.0	As above, with bed of slightly weathered, very weak to weak rock.	2253.0				50	100		
220		224.0	Becomes Gila SANDSTONE, fresh, weak, fine to coarse clayey sand with some fine to coarse subangular gravel, few fine sand interbeds, massive, weak to moderate HCl reaction, gradational contact.	2248.0				51	100		
225		229.0	As above, bedded.	2243.0				52	100		
230		234.0	Becomes Gila CONGLOMERATE, fresh, weak, clast supported, fine to coarse gravel with cobbles, little sandy matrix, subrounded to angular clasts are schist, tuff, rhyolite, quartzite, diabase. Massive, strong HCl reaction.	2238.0				53	100		
235		239.0	As above, becomes matrix supported, with tuff boulder.	2233.0				54	100		
240			As above.								

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH17-30 (GT-25)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 24, 2017 13:45
DRILLING END: January 24, 2017 13:45
COORDINATES: N: 833,472 E: 931,659

SHEET: 5 of 5
GS ELEV.: 2472.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
240		240.0		2232.0							
			As above. *(continued)*					54	100		
		244.0		2228.0						244: Bit wears out at 248 ft-bgs, last 0.5 ft. not recovered.	
245			As above.					55	90		
		249.0		2223.0							
250			Bottom of borehole at 249.0 ft. Completed as well. Refer to diagram.								
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

CORE RECOVERY % scale: 20 40 60 80

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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DH17-30 (GT-25)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:43
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RECORD OF BOREHOLE DH17-31 (GT-34)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 25, 2017 00:00
DRILLING END: January 28, 2017 00:00
COORDINATES: N: 845,356 E: 939,790

SHEET: 1 of 5
GS ELEV.: 2877.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0		2877.0							
			Overburden, gravel to cobbles of limestone and volcanics, fines have been washed out.					1	30	0 - 30: Hydro test #1 FHT	
5		5.0		2872.0							
			Colluvium, limestone cobbles (3-in.), fines are clayey sand.					2	57		
		8.0		2869.0							
		9.0	As above, fines washed out.	2868.0				3	80		
10			As above, weakly cemented colluvium at 10 ft-bgs, gravel to cobble clasts of limestone with clayey fines, strong HCl reaction.					4	83		
		12.0		2865.0							
			Colluvium limestone clasts (3-in.), fines are gravelly clay, strong HCl reaction.					5	50		
15		15.0		2862.0							
			Becomes Apache Leap Tuff (Talg): reddish-brown to gray TUFF, crystal rich, few lithics, phenocrysts of feldspars and euhedral biotite, weak HCl reaction.					6	100		
20		20.0		2857.0							
			As above.					7	100	22 - 67: Hydro test #2 SI & CRI	
25		25.0		2852.0							
			As above, less weathered.					8	100		
30		30.0		2847.0							
			No recovery.					9	0		
		32.0		2845.0							
		33.0	Continues slightly weathered, crystal rich TUFF, few lithics, minor silica veining, red brown.	2844.0				10	100		
35			As above.				0.0-69.7 ft: Cement Grout	11	100		
		38.0		2839.0							
			As above, becomes more fractured.					12	100		
40		42.0		2835.0							
			As above.					13	100		
45		47.0		2830.0							
			As above.					14	100		
50		52.0		2825.0							
			As above, gouge from 52.5 to 55.5 ft-bgs.					15	100		
55		57.0		2820.0							
			As above, becomes massive, competent.					16	100		
60											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH17-31 (GT-34)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: January 25, 2017 00:00
DRILLING END: January 28, 2017 00:00
COORDINATES: N: 845,356 E: 939,790
SHEET: 2 of 5
GS ELEV.: 2877.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
60		60.0		2817.0							
		62.0	As above, becomes massive, competent. *(continued)*	2815.0				16	100	62 - 111: Hydro test #3 SI & GF	
65		67.0	As above.	2810.0				17	100		
70		72.0	As above.	2805.0				18	100		
75		76.0	As above, interval of intense fracturing.	2801.0			69.7-80.7 ft: 1/4" Coated Bentonite Pellets	19	100		
80		81.0	As above.	2796.0				20	100		
		82.5	As above.	2794.5				21	100		
85		87.5	As above.	2789.5				22	100		
90		92.0	As above.	2785.0				23	100		
95		97.0	Continues fresh to slightly weathered, red brown crystal rich TUFF, few lithics, weak fabric defined by phenocryst orientation, weathering increases around joints, manganese oxide coating.	2780.0				24	100		
100		101.0	As above.	2776.0				25	100		
105		106.0	As above, more jointed, more weathered along joints.	2771.0				26	80	104.5: Lost circulation.	
110		111.0	As above, fine veins with some open voids, silica and calcite infill, not interconnected.	2766.0				27	100	107 - 157: Hydro test #4 SI & GF	
115		116.0	Continues light brown-red massive TUFF, ocassional vug with calcite infill.	2761.0				28	100		
		119.0	As above.	2758.0				29	100		
120			As above.					30	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60
LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH17-31 (GT-34)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 25, 2017 00:00
DRILLING END: January 28, 2017 00:00
COORDINATES: N: 845,356 E: 939,790

SHEET: 3 of 5
GS ELEV.: 2877.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120		120.0	As above. *(continued)*	2757.0							
		122.0	As above.	2755.0				30	100		
125		127.0		2750.0				31	100		
		128.0	As above.	2749.0				32	100		
130		131.5	As above, zones of highly weathered rock in broken zones, subtle hydrothermal breccia.	2745.5				33	86		
135		136.5	As above.	2740.5				34	100		
140		141.5	As above.	2735.5				36	100		
		142.0	As above.	2735.0				37	100	141.5 - 142: Drilled without water creating a clay mush out of the core.	
145		143.5	Becomes white-orange TUFF, highly altered, groundmass is oxidized, fresh euhedral biotite, weathered feldspars.	2733.5					100	143 - 207: Some circulation loss from 143 to 207 ft-bgs.	
		148.5	As above.	2728.5			80.7-210 ft: 10/20 Sillica Sand Filter Pack				
150		152.0	As above.	2725.0			90-210 ft: 2" ID sch 40 PVC 0.010" slot		100		
155		155.0	As above.	2722.0					96		
		157.0	Becomes Mescal Limestone (pCmls): fine grained, yellow gray, thinly to moderately bedded fine-grained LIMESTONE, silica and calcite veining.	2720.0						156 - 231: Hydro test #5 Sl & CRI	
160		161.5	As above, abundant silica and calcite veins crosscutting bedding.	2715.5					96		
165		166.5	Continues varicolored red and yellow-gray, bedded LIMESTONE, zones of stockwork calcite veining and hydrothermal breccia, intense silica and calcite veining.	2710.5					100		
		167.0	As above.	2710.0							
170		171.3	Becomes red and black silica flooded brecciated LIMESTONE, FeOx stained strata of silica and carbonate, bands of hematite.	2705.7					100		
175		176.5	Becomes white-gray with red and buff LIMESTONE, medium bedded, abundant silica veining, calcite veining, and hydrothermal breccia.	2700.5					100		
		179.0	As above.	2698.0					92		
180			As above.						100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH17-31 (GT-34)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 25, 2017 00:00
DRILLING END: January 28, 2017 00:00
COORDINATES: N: 845,356 E: 939,790

SHEET: 4 of 5
GS ELEV.: 2877.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0		2697.0							
			As above. *(continued)*								
		182.0		2695.0					100		
			As above, very thinly bedded interval of oxidized hydrothermal breccia.								
185		187.0		2690.0					100		
			As above.								
190		192.0		2685.0					100		
			As above, iron rich red-brown, calcareous, weak to non bedded, stockwork calcite veins.								
195		197.0		2680.0					100		
		198.0	As above.	2679.0					100		
			As above.								
200		202.0		2675.0					100		
			Continues LIMESTONE, mottled light red and black, irregular, wavey banding becomes fine and regularly banded.								
205		207.0		2670.0					100		
			Continues varicolored white and red LIMESTONE, competent, medium bedded defined by color change (iron staining), intense calcite veining.								
210		212.0		2665.0					100		
			As above.								
215		217.0		2660.0					100		
			As above.								
220		222.0		2655.0					100		
			Becomes fine bedded LIMESTONE, predominantly iron rich red beds, highly fractured and weathered, calcite veining.								
225		227.3		2649.7					100		
			Becomes dark gray-brown DIABASE, fine-grained, highly fractured, calcite veining with talc infill, extensive FeOx staining on discontinuities.								
230		231.0		2646.0			215-246 ft: 1/4" Coated Bentonite Pellets		75	231 - 249: Hydro test #6 SI	
			As above, extensive oxidation, abundant fracturing and veining.								
235		235.5		2641.5					96		
			Continues DIABASE, groundmass is extensively oxidized, coarse-grained mm-scale plagioclase lathes.								
240									100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF BOREHOLE DH17-31 (GT-34)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 25, 2017 00:00
DRILLING END: January 28, 2017 00:00
COORDINATES: N: 845,356 E: 939,790

SHEET: 5 of 5
GS ELEV.: 2877.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
240		240.0		2637.0							
		240.5	As above.	2636.5					100		
		244.0		2633.0							
245			As above.						100	246 - 249: Hole caved-in prior to well installation.	
		249.0		2628.0			246-249ft Hole slough				
250			Bottom of borehole at 249.0 ft. Completed as well. Refer to diagram.								
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

CORE RECOVERY % scale: 20 40 60 80

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH17-31 (GT-34)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:44
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RECORD OF BOREHOLE DH17-32 (GT-42)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 28, 2017 13:20
DRILLING END: February 1, 2017 10:00
COORDINATES: N: 837,520 E: 915,556

SHEET: 1 of 5
GS ELEV.: 2234.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0	Surface alluvium, silty sandy gravel, only recover washed gravel.	2234.0				1	18	0 - 33.5: Hydro test #1 FHT	
		4.0	As above.	2230.0				2	15		
5		6.0	(GW), GRAVEL, brown, moderate HCL reaction, ALLUVIUM; Multi-lithic gravel; non-cohesive, compact, N(3"): 1-1-1-2-4-5	2228.0	GW			3	23		
		9.5	Surface alluvium, silty sandy gravel, only recover washed gravel.	2224.5				4	40		
10		12.0	(GM), SILTY GRAVEL, brown, weak HCL reaction, ALLUVIUM; Multi-lithic gravel; non-cohesive, moist, N(3"): 2-3-6-6-5-5	2222.0	GM			5	14		
		13.5	As above.	2220.5			0-28.6ft: Cement Bentonite Grout				
15		17.0	(GW-GC), GRAVEL, gray-brown, ALLUVIUM; Multi-lithic gravel; non-cohesive, compact, moist to wet, N(3"): 3-7-6-4-5-5	2217.0	GW-GC			6	32		
		18.5	No recovery after SPT.	2215.5				7	0		
		19.5	No recovery.	2214.5				8	25		
20		22.0	Recover only 1/2" of sand. N(3"): 2-2-2-2-9-10	2212.0				9	33		
		23.5	Recover washed gravels, quartz, schist, quartzite, diabase.	2210.5				10	43		
		24.0	As above.	2210.0				11	25		
25		27.0	(GW), GRAVEL, gray-brown, ALLUVIUM; Multi-lithic gravel; compact, wet, Rock in shoe. N(3"): 4-8-8-6-5-6	2207.0	GW			12	50		
		28.5	Recover washed gravels, quartz, schist, quartzite, diabase.	2205.5				13	100		
		30.0	As above.	2204.0				14	100	38 - 58: Hydro test #2 FHT	
30		32.0	(GW-GC), GRAVEL, gray-brown, ALLUVIUM; Multi-lithic gravel; non-cohesive, wet, N(3"): 1-3-6-4-9-32	2202.0	GW-GC			15	0	38.1: Drillers set casing. Backfill with holeplug, ream with rockbit, then wash down with casing shoe to 35 ft-bgs.	
		33.5	As above, schist and quartzite cobbles.	2200.5			28.6-37.2ft: 1/4" Coated Bentonite Pellets	16	0		
		34.7	Becomes Pinal Schist (pCpi), moderately weathered, fine to medium-grained, highly foliated, rubbly, no HCl reaction, brownish gray.	2199.3				17	67		
35		36.5	As above.	2197.5				18	100		
		38.5	No recovery.	2195.5				19	100	38.5 - 40: First run after setting casing, no recovery.	
		40.0	No recovery.	2194.0				20	100		
40		41.0	Continues SCHIST, greenish-brownish gray, slightly weathered, fine- to medium-grained, foliated along bedding, jointed.	2193.0				21	75		
		42.5	As above, rubble zone.	2191.5				22	100		
		44.0	As above.	2190.0				23	50		
45		45.0	As above, with quartz veining.	2189.0				24	100		
		46.5	As above.	2187.5				25	100	54 - 145: Hydro test #3 SI & CRI	
		48.5	As above, slightly oxidized.	2185.5				25	10		
50		50.0	As above, slightly silicified, rubble, contact zone.	2184.0				26	40		
		52.0	Becomes DIABASE, brownish orange, aphanitic groundmass with olivine phenocrysts, schist xenoliths, calcite stockwork veins, completely oxidized, massive, weak.	2182.0							
55		56.5	Becomes SCHIST, contact, almost no recovery, recovered material is gray, soft, sandy clay.	2177.5							
		58.5	No recovery.	2175.5							
60		60.0	Log continued on next page	2174.0							

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH17-32 (GT-42)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 28, 2017 13:20
DRILLING END: February 1, 2017 10:00
COORDINATES: N: 837,520 E: 915,556

SHEET: 2 of 5
GS ELEV.: 2234.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
60		60.0		2174.0							
		61.0	Continues SCHIST, greenish gray to grayish pink, quartz veins, all rubble.	2173.0				26	40		
			No recovery.					27	0		
65		65.0		2169.0				28	50		
		66.0	Continues SCHIST, gray, foliated, some quartz, rubble.	2168.0				29	100		
		67.5	As above.	2166.5							
			No recovery.					30	0		
		69.5		2164.5			37.2-202.2ft: 10/20 Silica Sand Filter Pack				
70			Continues SCHIST, greenish to brownish					31	100		
		71.0	gray, schistose, fine- to medium-grained,	2163.0				32	100		
		72.0	fractured and sheared, rubble.	2162.0				33	100		
		73.0	As above.	2161.0							
			As above, more brownish gray.								
75			As above, oxidized discontinuities, very weak HCl reaction.				40-200ft: 2" ID sch 40 PVC 0.010" slot	34	88		
		77.0		2157.0							
			As above, quartz veins, rubble.					35	50		
		79.0		2155.0							
80			Becomes chloritized metasiltstone, slightly weathered, green, lightly foliated with quartz/calcite veining, fine-grained, jointed, full FeOx coatings on all discontinuities.					36	70		
		84.0		2150.0							
85		86.0	Continues SCHIST, slightly weathered, grayish pink, fine to med grained, metasandstone, some silica veining along bedding, slightly silicified, foliated along	2148.0				37	50		
		88.0	bedding, fractured and jointed.	2146.0				38	50		
			As above.								
90			As above.					39	100		
		91.5		2142.5							
			As above, becomes completely silicified, very strong.					40	100		
		94.0		2140.0							
95			As above.					41	100		
		98.0		2136.0							
		100.0	As above, with MnOx and crystalline calcite coatings on all discontinuities.	2134.0				42	100		
100			As above.					43	100		
		103.0		2131.0							
			As above.					44	100		
105		105.0		2129.0							
		106.5	As above.	2127.5				45	100		
			No recovery.					45	0	106.5 - 110: Driller notes soft drilling.	
110		110.0		2124.0							
		112.0	Continues grayish pink, silicified SCHIST, very strong, all rubble and poor recovery.	2122.0				46	50		
		113.5	As above, rubble.	2120.5				47	33		
			No recovery.					48	0		
115		116.0		2118.0							
		117.0	As above, rubble and redrill.	2117.0				49	50		
			As above.					50	25		
		119.0		2115.0							
120								51	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
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RECORD OF BOREHOLE DH17-32 (GT-42)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 28, 2017 13:20
DRILLING END: February 1, 2017 10:00
COORDINATES: N: 837,520 E: 915,556

SHEET: 3 of 5
GS ELEV.: 2234.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120		120.0		2114.0							
		121.0	Continues SCHIST, grayish pink to pink, fine-grained, silicified, silica veins, foliated and sheared, FeOx staining and calcite on discontinuities, brecciated and rubbly. *(continued)*	2113.0				51	100		
		123.5		2110.5				52	80		
125			As above, MnOx staining.					53	50		
		126.5	As above.	2107.5				54	33		
		129.5	As above, rubble and redrill.	2104.5				55	100		
130		131.0	As above, continues pink silicified SCHIST, brecciated, calcite and MnOx coatings.	2103.0				56	0		
			No recovery.					57	0		
135		135.0		2099.0				58	100		
		135.5	Rubble and corestone.	2098.5				59	100		
		136.5	Becomes fresh, pinkish-brownish gray, highly silicified, METASANDSTONE and quartz vein, competent and unjointed, weak reaction HCl.	2097.5				60	100		
		138.5		2095.5				60	0		
140		140.5	As above, no HCl reaction.	2093.5				61	33		
			No recovery.					62	33		
		142.0	Continues pink, silicified SCHIST with boudinaged silica veins, only rubble.	2092.0				63	33		
		143.5	As above.	2090.5				64	100		
145		145.0	As above.	2089.0				65	50		
			Becomes brecciated SCHIST, matrix supported, sand to gravel sized clasts with calcite cementation, and soft gougey fault zone.				37.2-202.2ft: 10/20 Silica Sand Filter Pack	65	100		
150		152.5		2081.5				66	100		
		154.0	As above, rubbly.	2080.0				67	38		
			As above, gouge washed out.				40-200ft: 2" ID sch 40 PVC 0.010" slot	66	100		
155		158.0		2076.0				67	40		
		160.0	As above.	2074.0				68	100		
160		162.5	As above.	2071.5				69	100		
		164.0	Becomes massive BRECCIA, matrix is reddish-brown clayey gouge.	2070.0				70	38		
		167.0	As above.	2067.0				71	67		
165			Banded, Becomes gray SCHIST, competent, fractured, rubble with some gouge.					72	100		
		171.0		2063.0				73	100		
170			As above.					74	100		
		176.0		2058.0							
175			As above.								
		179.0		2055.0							
180			As above.								

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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COORDINATES: N: 837,520 E: 915,556

SHEET: 4 of 5
GS ELEV.: 2234.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0		2054.0							
		181.0	As above. *(continued)*	2053.0				74	100		
			As above.					75	100		
		184.0		2050.0							
185			Becomes grayish-brown METASANDSTONE, fine scale banding, very competent.					76	100		
		188.5		2045.5							
			As above.					77	100		
190		190.5		2043.5							
			As above, rubble.					78	100		
		194.0		2040.0							
		194.5	As above.	2039.5				79	100		
195			As above.					80	100		
		197.0		2037.0							
			As above.					81	75		
200								82	80		
		201.5		2032.5							
		202.5	As above.	2031.5				83	100		
		204.0	As above.	2030.0				84	33		
205			Becomes grey to brown SCHIST rubble.					85	20		
		209.0		2025.0							
210		211.0	BECOMES gray METASANDSTONE, calcite veins, fractured.	2023.0				86	100		
			As above.					87	100		
		214.0		2020.0							
215			As above.					88	100		
		218.0		2016.0							
			As above.					89	80		
220		223.0		2011.0							
			As above.					90	100	225 - 250: Hydro test #4 SI	
225							202.2-250ft: 1/4" Coated Bentonite Pellets				
		228.0		2006.0							
			As above.					91	100		
230		232.5		2001.5							
		234.0	As above.	2000.0				92	100		
235		235.5	As above.	1998.5							
			As above.					93	100		
240		239.5		1994.5							

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH17-32 (GT-42)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 28, 2017 13:20
DRILLING END: February 1, 2017 10:00
COORDINATES: N: 837,520 E: 915,556

SHEET: 5 of 5
GS ELEV.: 2234.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0		1994.0							
			As above. *(continued)*					94	100		
		244.0		1990.0					100		
245		245.0	As above.	1989.0				95	100		
			As above, grey to pink, silica banded.					96	75		
250		250.0		1984.0							
			Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram.								
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
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DH17-32 (GT-42)
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RECORD OF BOREHOLE DH17-33 (GT-29)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 30, 2017 10:31
DRILLING END: January 30, 2017 10:31
COORDINATES: N: 842,391 E: 937,371

SHEET: 1 of 5
GS ELEV.: 2709.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0	Polylithic gravel to cobbles alluvium, fines washed out.	2709.0						0 - 22: Hydro test #1 FHT	
									50		
5		5.0	Gila Sandstone (Tss): red-brown, coarse, immature SANDSTONE, abundant diabase coarse sand to gravel, subangular, massive, some FeOx straining on joints, weakly cemented, no HCl reaction.	2704.0							
									100		
10		10.0	As above, few cobbles.	2699.0							
							0-25ft: 1/4" Coated Bentonite Pellets		100		
15		15.0	As above, interval of calcite cement.	2694.0							
									100	18 - 87: Hydro test #3 SI & GF	
20		20.0	Continues very immature coarse SANDSTONE, angular gravel, abundant diabase clasts, moderate HCl reaction, calcite cement.	2689.0							
		22.0	As above.	2687.0					100		
25		26.5	As above, few cobbles, diabase dominant, weak HCl reaction.	2682.5					93		
									100		
30		31.5	As above.	2677.5							
									100		
35		37.0	As above, becoming more cobble rich.	2672.0							
									100		
40		42.0	As above, cobbley with many broken zones due to weathering.	2667.0							
									66	47 - 52: Lost circulation on this run.	
45		47.0	As above, very weathered, oxidized.	2662.0							
							25-73ft: 10/20 Silica Sand Filter Pack		40		
50		51.0	As above, large tuff cobble.	2658.0			30-70ft: 2" ID sch 40 PVC 0.010" slot				
		52.0	Continues SANDSTONE, very coarse, immature, competent, calcite cemented, massive.	2657.0							
55									100		
		57.0	As above.	2652.0						57 - 87: Hydro test #2 SI & CRI	
									100		
60			Log continued on next page								

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH17-33 (GT-29)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: January 30, 2017 10:31
DRILLING END: January 30, 2017 10:31
COORDINATES: N: 842,391 E: 937,371

SHEET: 2 of 5
GS ELEV.: 2709.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
60		60.0		2649.0							
			As above. *(continued)*						100		
		62.0		2647.0							
			As above, poorly to moderately cemented.						100		
65		67.0		2642.0							
			Becomes very poorly cemented, weathered, and weak, resulting in broken zones.						100		
70		72.0		2637.0							
			Continues SANDSTONE alternating between coarse and fine-grained intervals, highly fractured, weak to moderately cemented.						100		
75		77.0		2632.0							
			As above.						80		
80		82.0		2627.0						82 - 152: Hydro test #4a, b SI & CRI	
			Becomes Apache Leap Tuff (Talg), mottled white and light brown TUFF intensely altered to clay, fine-grained, few lithics, euhedral biotite pheoncrysts.						100		
85		87.0		2622.0							
			Continues extremely weathered TUFF, mottled white and buff, altrered to clay, very few lithics.						72		
90		92.0		2617.0							
			Continues extremely weathered light pink TUFF, massive, crystal rich, lithic poor, fine euhedral and unweathered biotite, all feldspars altered to clay, no oxidation, no HCl reaction.						100		
95		97.0		2612.0							
			As above.						100		
100		102.0		2607.0							
			As above, mottled with rounded blebs of white tuff.						100		
105		107.0		2602.0							
			As above, slightly more lithics.						100		
110		112.0		2597.0							
			Continues mottled white and gray TUFF, highly weathered, few lithics, clay alteration, fairly fresh euhedral fine boitite.						100		
115		117.0		2592.0							
			As above.						100		
120											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

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COORDINATES: N: 842,391 E: 937,371

SHEET: 3 of 5
GS ELEV.: 2709.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120		120.0		2589.0							
		122.0	As above. *(continued)*	2587.0					100		
125		127.0	As above.	2582.0					100		
130		132.0	As above.	2577.0					100		
135			As above.				73-198ft: 1/4" Coated Bentonite Pellets		100		
140		142.0		2567.0					100		
145		147.0	Becomes pink, crystal rich TUFF, competent, less weathered but more fractured than above, more lithics, no oxidation.	2562.0					100		
150		152.0	As above.	2557.0					100	151 - 250: Hydro test #5 SI	
155		157.0	As above.	2552.0					94		
160		162.0	Becomes completely weathered gray TUFF, massive, crystal rich, feldspars and groundmass altered to clay, no oxidaton.	2547.0					100		
165		167.0	As above.	2542.0					100		
170		172.0	As above, mottled white and gray TUFF.	2537.0					80		
175		176.5	As above.	2532.5					100		
180			As above.						92		

Log continued on next page

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DRILL RIG: BK60

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SHEET: 4 of 5
GS ELEV.: 2709.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0		2529.0							
		181.5	As above. *(continued)*	2527.5					92		
			As above.								
185									96		
		187.0		2522.0							
			Becomes less weathered gray crystal rich TUFF, no lithics, weak fabric defined by phenocryst alignment, no oxidation, highly clay altered.								
190		192.0		2517.0					100		
			As above.								
195		197.0		2512.0					100		
			As above.								
200		202.0		2507.0					100		
			Continues gray crystal rich TUFF, moderately weathered, moderate eutaxitic texture defined by flattened aligned inclusions of white tuff or possibly welded pumice.								
205		207.0		2502.0					100		
			As above.								
210		212.0		2497.0					100		
			As above, becomes slightly weathered.								
215		217.0		2492.0					100		
			As above, more jointed.								
220		222.0		2487.0					100		
			As above.				◄198-250ft: Hole slough				
225		227.0		2482.0					100		
			Continues massive, fresh, buff crystal rich TUFF, more lithic rich.								
230		232.0		2477.0					100		
			As above.								
235		237.0		2472.0					100		
			As above.								
240									100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:44
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RECORD OF BOREHOLE DH17-33 (GT-29)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: January 30, 2017 10:31
DRILLING END: January 30, 2017 10:31
COORDINATES: N: 842,391 E: 937,371
SHEET: 5 of 5
GS ELEV.: 2709.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0		2469.0							
			As above. *(continued)*						100		
		242.0		2467.0							
			As above.								
245									100		
		247.0		2462.0							
			As above.								
250		250.0		2459.0					100		
			Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram.								
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

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DH17-33 (GT-29)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:44
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RECORD OF BOREHOLE DH17-34 (GT-27)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 17:00
DRILLING END: February 3, 2017 17:00
COORDINATES: N: 837,367 E: 937,530

SHEET: 1 of 5
GS ELEV.: 2648.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
0		0.0	Alluvium, loose, coarse sand to subrounded cobbles of schist, quartz, and diabase.	2648.0				1	0	0 - 19: Hydro test #1 FHT	
5		6.0		2642.0				2	75		
10		11.0	Gila Conglomerate (Tcg): tan, polylithic, CONGLOMERATE, clast supported, subrounded to subangular sand to gravel, clasts of diabase, vein quartz, schist, sandstone, and quartzite, sandy matrix, weak HCl reaction, competent.	2637.0				3	100		
		14.0	Poor recovery, redrill.	2634.0				4	33	11 - 14: Drill mislatch; lost core, redrill.	
15		19.0	Gila Conglomerate (Tcg): tan, polylithic, CONGLOMERATE, clast supported, subrounded to subangular sand to gravel, clasts of diabase, vein quartz, schist, sandstone, and quartzite, sandy matrix, weak HCl reaction, competent.	2629.0				5	100		
20		23.0	As above.	2625.0				6	100		
25		28.0	As above.	2620.0				7	100	25 - 47: Hydro test #2 SI & GF	
30		33.0	As above.	2615.0				8	100		
35		37.0	As above.	2611.0				9	100		
40		42.0	As above, weak HCl reaction.	2606.0				10	60		
		44.0	As above.	2604.0				11	100		
45		47.0	As above.	2601.0				13	100	45 - 104: Hydro test #3 SI & GF	
50		52.0	As above, no HCl reaction.	2596.0				14	100		
55		57.0	As above.	2591.0				15	100		
60			As above.					16	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kerry Paul
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH17-34 (GT-27)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: February 3, 2017 17:00
DRILLING END: February 3, 2017 17:00
COORDINATES: N: 837,367 E: 937,530
SHEET: 2 of 5
GS ELEV.: 2648.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
60		60.0	As above. *(continued)*	2588.0							
		62.0	As above.	2586.0				16	100		
		64.0	As above.	2584.0				17	100		
65		69.0	As above.	2579.0				18	100		
70		74.0	As above.	2574.0				19	100		
75		79.0	As above.	2569.0				20	100		
80		80.0	As above.	2568.0				21	100	80 - 189: Hydro test #4 SI & CRI	
		84.0	As above, weak HCl reaction.	2564.0				22	100		
85		89.0	As above.	2559.0				23	100		
90		94.0	As above.	2554.0				34	100		
95		96.0	As above.	2552.0				36	100		
		97.0	As above.	2551.0				37	80		
100		102.0	As above.	2546.0				38	100		
		104.0	As above.	2544.0				39	100		
105		109.0	Continues tan, polylithic, CONGLOMERATE, gravel to boulder clasts of diabase, vein quartz, schist, sandstone, and quartzite in sandy matrix, weak HCl reaction.	2539.0				40	100		
110		114.0	As above.	2534.0				41	100		
115		119.0	As above.	2529.0				43	100		
120			As above.					44	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30
LOGGED: Kerry Paul
CHECKED: G Smith
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RECORD OF BOREHOLE DH17-34 (GT-27)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 17:00
DRILLING END: February 3, 2017 17:00
COORDINATES: N: 837,367 E: 937,530

SHEET: 3 of 5
GS ELEV.: 2648.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120		120.0	As above. *(continued)*	2528.0				44	100		
		124.0	As above.	2524.0				45	100		
125		129.0	As above.	2519.0				46	100		
130		134.0	As above.	2514.0				47	100		
135		139.0	As above.	2509.0				48	100		
140		144.0	As above.	2504.0				49	100		
145		149.0	As above, strong HCl reaction, some discontinuous coarse sand-sized voids with calcite infill.	2499.0				50	100		
150		154.0	As above, fewer micro-voids, moderate HCl reaction, with few thin fine sand interbeds.	2494.0				51	100		
155		159.0	As above, moderate to strong HCl reaction.	2489.0				52	100		
160		163.0	As above.	2485.0				53	100		
165		168.0	As Above.	2480.0				54	100		
170		173.0	As above.	2475.0				55	100		
		174.0	As above.	2474.0				56	100		
175		179.0		2469.0				57	100		
180			Log continued on next page								

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kerry Paul
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH17-34 (GT-27)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 17:00
DRILLING END: February 3, 2017 17:00
COORDINATES: N: 837,367 E: 937,530

SHEET: 4 of 5
GS ELEV.: 2648.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0		2468.0							
		184.0	Continues Gila CONGLOMERATE, fresh, medium strong, clast supported in coarse sandy matrix, gravel is fine to coarse, subangular to subrounded, in coarse subangular sandy matrix, clasts of quartzite, schist, diabase, quartz, rhyolite, and limestone, moderate to strong HCl reaction, competent and massive. *(continued)*	2464.0				57	100		
185		189.0	As above, few cobbles.	2459.0				58	100	185 - 250: Hydro test #5 SI	
190		194.0	As above, some cobbles, few small voids with calcite crystals.	2454.0				59	100		
195		199.0	As above, massive and competent.	2449.0				60	100		
200		204.0	As above, few voids with calcite, pink tuff boulder.	2444.0				61	100		
205		209.0	As above.	2439.0				62	100		
210		214.0	As above.	2434.0				63	100		
215		219.0	As above.	2429.0				64	100		
220		224.0	As above.	2424.0				65	100		
225		229.0	As above.	2419.0				66	100		
230		234.0	As above, schist clast dominant.	2414.0				67	100		
235		239.0	As above, returns to polylithic, clasts of schist, tuff, diabase, rhyolite, quartzite, and limestone, interbed of matrix supported cobbles.	2409.0				68	100		
240			As above.					69	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kerry Paul
CHECKED: G Smith
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RECORD OF BOREHOLE DH17-34 (GT-27)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 17:00
DRILLING END: February 3, 2017 17:00
COORDINATES: N: 837,367 E: 937,530

SHEET: 5 of 5
GS ELEV.: 2648.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0		2408.0							
			As above. *(continued)*					69	100		
		244.0		2404.0							
245			As above, with tuff boulder.					70	100		
		249.0		2399.0							
250								71	100		
			Bottom of borehole at 250.0 ft. Backfilled with cement grout.								
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Kerry Paul
CHECKED: G Smith
REVIEWED: R Post

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DH17-34 (GT-27)
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RECORD OF BOREHOLE DH17-35 (GT-30)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 09:32
DRILLING END: February 3, 2017 09:32
COORDINATES: N: 842,900 E: 933,749

SHEET: 1 of 5
GS ELEV.: 2710.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0		2710.0							
		2.0	Colluvium, angular diabase gravel to cobbles, no fines.	2708.0				1	50	0 - 22: Hydro test #1 FHT	
		3.0	Continues diabase colluvium, fines washed out.	2707.0				2	100		
5		6.5	DIABASE (pCdiab): dark gray, fine-grained, fractured with abundant FeOx staining and calcite veins.	2703.5				3	94		
		9.0	Becomes brecciated DIABASE, calcite cemented, hydrothermal breccia, highly fractured and oxidized.	2701.0				4	100		
10		10.0	As above, broken zone.	2700.0				5	50		
		11.5	As above, broken zone continues in highly oxidized rock.	2698.5				6	100		
		15.0	Poor recovery, fracture zone continues in oxidized DIABASE.	2695.0			0-29ft: Cement Bentonite Grout	7	43	11.5 - 15: Poor recovery, core escaped core barrel into rods.	
15		20.0	Continues brecciated DIABASE, clast supported hydrothermal breccia, calcite infill, heavily oxidized.	2690.0				8	100	15 - 57: Hydro test #2 FHT	
20		22.0	As above, with calcite cemented and oxidized gouge matrix.	2688.0				9	100		
		27.0	As above.	2683.0				10	100		
25		32.0	As above, with open voids containing crystallized calcite.	2678.0				11	100		
30		37.0	As above.	2673.0			29-40.5ft: 1/4" Coated Bentonite Pellets	12	100		
35		42.0	Becomes matrix dominant brecciated DIABASE, angular to subangular clasts, heavily oxidized matrix.	2668.0				13	100		
40		47.0	Becomes FAULT breccia, matrix supported, subrounded clasts, poorly cemented gouge matrix, heavily oxidized.	2663.0				14	84		
45		52.0	Becomes brown coarse-grained ophitic DIABASE with plagiolase lathes, heavily oxidized.	2658.0				15	90	50 - 141: Hydro test #3 SI	
50		57.0	Becomes brecciated, fine-grained DIABASE, oxidized calcite cemented matrix.	2653.0				16	100		
55			Becomes coarse-grained ophitic DIABASE, minor brecciation and calcite veining.					17	100		
60			Log continued on next page								

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH17-35 (GT-30)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 09:32
DRILLING END: February 3, 2017 09:32
COORDINATES: N: 842,900 E: 933,749

SHEET: 2 of 5
GS ELEV.: 2710.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
60		60.0		2650.0							
		62.0		2648.0				17	100		
			As above.					18	100		
65		67.0		2643.0							
			Becomes brecciated DIABASE, fine-grained matrix, heavily oxidized with calcite veining.					19	100		
70		72.0		2638.0							
			As above.					20	100		
75		77.0		2633.0							
			As above, coarse calcite cemented matrix.					21	100		
80		82.0		2628.0							
			As above.					22	100		
85		87.0		2623.0							
			Becomes coarse-grained ophitic DIABASE with euhedral plagioclase lathes, heavily oxidized.					23	100		
90		92.0		2618.0							
			Becomes FAULT breccia, matrix dominant, subrounded diabase clasts, heavily oxidized.					24	100		
95		97.0		2613.0							
			As above.					25	100		
100		102.0		2608.0			40.5-162.5ft: 10/20 Silica Sand Filter Pack				
			As above.					26	100		
105		107.0		2603.0							
			FAULT, continues intermittant breccia, oxidized clay matrix, clast dominant.				60-160ft: 2" ID sch 40 PVC 0.010" slot	27	100		
110		112.0		2598.0							
			FAULT, dark gray clay gouge, uncemented with fragments of solid diabase, very weak, completely weathered.					28	100		
115		115.0		2595.0							
			Becomes fine-grained aphanitic dark green DIABASE with oxidized discontinuity surfaces, highly fractured.					29	100		
		118.5		2591.5				30	100		
								31	100		
120			As above, highly fractured.					32	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH17-35 (GT-30)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 09:32
DRILLING END: February 3, 2017 09:32
COORDINATES: N: 842,900 E: 933,749

SHEET: 3 of 5
GS ELEV.: 2710.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120		120.0		2590.0							
		121.0	As above, highly fractured. *(continued)*	2589.0				32	100		
			As above.					33	100		
		123.5		2586.5							
125			As above.					34	80		
		126.0		2584.0							
			As above.					35	100		
								36	100		
130		130.0		2580.0							
			As above, less fractured.					37	100		
		132.0		2578.0							
			Becomes FAULT gouge and breccia, matrix dominant, weakly cemented, clay					38	100		
		134.4	rich, rounded clasts of diabase.	2575.6							
135		136.0	As above, includes clasts of limestone as well as fractured and weathered limestone.	2574.0							
			Becomes Mescal Limestone (pCmls), rosey buff, fine-grained LIMESTONE with zones of breccia and intense calcite veining.					39	100	137 - 250: Hydro test #4 SI	
140		141.0		2569.0							
			As above.					40	100		
145		146.0		2564.0							
			As above, contains intervals of breccia, some silicification.					41	100		
150		151.0		2559.0							
			Continues buff to pale green LIMESTONE, very competent, silty interbeds, variable bedding from medium to massive defined by color change.					42	100		
155		156.0		2554.0							
			As above.					43	100		
160		161.0		2549.0							
			Continues fine-grained LIMESTONSE with lenses of gray chert interbeds along bedding planes.					44	100		
165		166.0		2544.0							
			As above.					45	91		
170		171.5		2538.5							
			Continues buff thinly bedded LIMESTONE with chert nodules and interbeds.					46	100		
175		176.5		2533.5							
			As above.					47	100		
180											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH17-35 (GT-30)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 09:32
DRILLING END: February 3, 2017 09:32
COORDINATES: N: 842,900 E: 933,749

SHEET: 4 of 5
GS ELEV.: 2710.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0		2530.0							
		181.5	As above. *(continued)*	2528.5				47	100		
			As above.					48	100		
185		187.0		2523.0							
			As above.					49	100		
190		192.0		2518.0							
			Continues buff, fine-grained LIMESTONE, heavily micro-fractured, with very hard siliceous interbeds.					50	100		
195		197.0		2513.0							
			As above.					51	100		
200		202.0		2508.0							
			Becomes brecciated LIMESTONE with limestone and siliceous clasts, siliceous cement, competent, variably oxidized.					52	100		
205		207.0		2503.0			162.5-250ft: 1/4" Coated Bentonite Pellets				
			Continues silicified LIMESTONE and fault breccia, subrounded limestone clasts, heavily oxidized silica matrix, fine-grained and moderately cemented.					53	100		
210		213.0		2497.0							
			Becomes pink-gray, fine-grained LIMESTONE, medium to thinly bedded, with siliceous interbeds.					54	100		
215		217.0		2493.0							
			As above.					55	100		
220		222.0		2488.0							
			As above.					56	86		
225		227.0		2483.0							
			As above.					57	100		
230		232.0		2478.0							
			As above.					58	100		
235		237.0		2473.0							
			As above.					59	100		
240			Log continued on next page								

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:44
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RECORD OF BOREHOLE DH17-35 (GT-30)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 3, 2017 09:32
DRILLING END: February 3, 2017 09:32
COORDINATES: N: 842,900 E: 933,749

SHEET: 5 of 5
GS ELEV.: 2710.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0	As above. *(continued)*	2470.0							
		242.0	As above.	2468.0				59	100		
245		247.0	As above.	2463.0				60	100		
250		250.0	Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram.	2460.0				61	100		
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Jesse Silverman
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH17-35 (GT-30)
5 of 5

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:44
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RECORD OF BOREHOLE DH17-36 (GT-14-3)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 7, 2017 11:31
DRILLING END: February 7, 2017 15:59
COORDINATES: N: 838,433 E: 923,220

SHEET: 1 of 2
GS ELEV.: 2410.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0		2410.0							
		2.0	Surficial alluvium, silty sandy gravel, no recovery.	2408.0				1	0	0 - 10: Hydro test #1 FHT	
		4.0	Gila Sandstone (Tss): brown, moderately weathered, medium- to coarse-grained sand, subangular to angular, with trace fine to coarse gravel, clasts of quartzite, schist, quartz, diabase, and rhyolite, bedding defined by grain size changes, some small roots, strong HCl reaction.	2406.0				1	100		
5		9.0	As above, clayey interbeds.	2401.0				2	100		
10		10.0	As above.	2400.0				3	100		
		14.0	As above.	2396.0			0-21.3ft: Bentonite Holeplug	4	100		
15		19.0	As above.	2391.0				5	100	15 - 100: Hydro test #2 SI	
20		24.0	As above.	2386.0				6	100		
25		29.0	As above.	2381.0				7	100		
30		34.0	As above.	2376.0				8	100		
35		39.0	As above.	2371.0				9	100		
40		44.0	As above.	2366.0				10	100		
45		49.0	As above.	2361.0				11	100		
50		54.0	As above.	2356.0				12	100		
55		60.0	As above.	2350.0			21.3-100ft: 10/20 Silica Sand Filter Pack 22-92ft: 2" ID sch	13	100		
60								14	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH17-36 (GT-14-3)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 7, 2017 11:31
DRILLING END: February 7, 2017 15:59
COORDINATES: N: 838,433 E: 923,220

SHEET: 2 of 2
GS ELEV.: 2410.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
60		60.0		2350.0			40 0.010" slot				
		61.5	Becomes highly weathered, extremely weak, fine sand to fine gravel with silty interbeds.	2348.5				14	100		
			As above.					14	100		
65								15	100		
		69.0		2341.0							
70			Becomes slightly weathered to fresh, zones of fine to coarse gravel, clasts of rhyolite, diabase, schist, quartzite, and gneiss.					16	100		
		74.0		2336.0							
75			As above.					17	100		
		79.0		2331.0							
80			As above.					18	100		
		84.0		2326.0							
85			As above.					19	100		
		89.0		2321.0							
90			As above.					20	100		
		94.0		2316.0							
95			As above.					21	100		
100		100.0		2310.0				22	100		
			Bottom of borehole at 100.0 ft. Completed as well. Refer to diagram.								
105											
110											
115											
120											

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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DH17-36 (GT-14-3)
2 of 2

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RECORD OF BOREHOLE DH17-37 (GT-28)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 7, 2017 13:41
DRILLING END: February 7, 2017 13:41
COORDINATES: N: 839,358 E: 936,278

SHEET: 1 of 5
GS ELEV.: 2644.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0	Colluvium, fines washed out, subangular to subrounded gravel to cobbles, polylithic but dominantly felsic volcanics, some quartz vein material.	2644.0						0 - 27: Hydro test #1 FHT	
5		5.0	Colluvium, unconsolidated subangular gravel to cobbles, fines are light brown silt with some sand, non plastic, moderate HCl reaction.	2639.0				1	10		
		8.0	Colluvium, unconsolidated multilithic subangular to subrounded cobbles and gravel, some fines which are coarse silty sands, strong HCl reaction.	2636.0				2	17		
10		11.0		2633.0				3	25		
		12.0	Becomes Gila Conglomerate (Tcg): gravel to cobble sized polylithic clasts of schist, tuff, and rhyolite, light brown fine-grained sand matrix, well cemented, no HCl reaction.	2632.0				4	100		
15		17.0	As above.	2627.0			0-27.6ft: Bentonite Backfill	5	60		
20		22.0	As above, becomes more cobble rich, weak HCl reaction.	2622.0				6	100		
25		27.0	As above, matrix becomes coarser sand, no HCl reaction.	2617.0				7	100		
		29.0	As above, clast dominant, weak matrix.	2615.0				8	100		
30		32.0	Continues Gila Conglomerate (Tcg), slightly weathered, weak, clast supported in sandy brown matrix, subrounded to subangular, clasts of diabase, tuff, schist, and quartzite, breaks easily along clast-matrix contact, weak HCl reaction.	2612.0				9	100		
35		37.0	As above, moderate HCl reaction.	2607.0			27.6-106.6ft: 10/20 Silica Sand Filter Pack	10	100	33 - 121: Hydro test #2 SI & CRI	
40		42.0	As above, weathered, weakly cemented matrix.	2602.0			33-93ft: 2" ID sch 40 PVC 0.010" slot	11	100		
45		47.0	As above.	2597.0				12	100		
50		52.0	As above.	2592.0				13	100		
			As above.					14	100		
55		57.0		2587.0				14	100		
								14	100		
60			Becomes slightly weathered, weak, mostly massive, matrix supported, moderate HCl reaction.					15	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF BOREHOLE DH17-37 (GT-28)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 7, 2017 13:41
DRILLING END: February 7, 2017 13:41
COORDINATES: N: 839,358 E: 936,278

SHEET: 2 of 5
GS ELEV.: 2644.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
60		60.0		2584.0							
		62.0		2582.0				15	100		
			As above, with zone of extremely weak, poorly cemented, friable matrix.					16	100		
65		67.0		2577.0				16	100	67: Driller notes reduction in fluid returns.	
			As above.					17	100		
70		72.0		2572.0			27.6-106.6ft: 10/20 Silica Sand Filter Pack; 33-93ft: 2" ID sch 40 PVC 0.010" slot				
			Gila Conglomerate (Tcg), gray-brown, slightly weathered, weak, matrix supported, coarse gravel and cobbles in sandy matrix, clasts of diabase, schist, quartzite, and tuff, moderate HCl reaction.					18	100		
75		77.0		2567.0							
			As above, becomes highly weathered.					19	100		
80		82.0		2562.0						82: Driller reports loss of circulation.	
		84.0	Becomes slightly weathered.	2560.0				20	100		
		87.0	Becomes extremely to very weak, highly weathered, friable, with some rubble.	2557.0				20	100		
85											
			Becomes slightly weathered, weak, strong HCl reaction.					21	100		
90		92.0		2552.0							
			As above.					22	100		
95		97.0		2547.0							
			As above.					23	100		
100		102.0		2542.0						102 - 107: Driller reports loss of fluid returns.	
			Gila Conglomerate (Tcg): matrix poor, predominantly gravel, matrix is very brittle with few fines, breaks easily at clast contacts, strong HCl reaction, some FeOx staining.					24	100		
105		107.0		2537.0							
			As above.					25	100		
110		111.0		2533.0							
			Becomes slightly weathered, weak to medium strong, matrix supported, silty sandy matrix, strong HCl reaction.				106.6-250ft: Bentonite Backfill	26	100	113 - 250: Hydro test #3 SI	
115		116.0		2528.0							
			As above.					27	100		
120											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF BOREHOLE DH17-37 (GT-28)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 7, 2017 13:41
DRILLING END: February 7, 2017 13:41
COORDINATES: N: 839,358 E: 936,278

SHEET: 3 of 5
GS ELEV.: 2644.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120		120.0		2524.0							
		121.0	As above. *(continued)*	2523.0				27	100		
		124.0	As above, zone of moderately to highly weathered rock, very weak, with extremely friable zones.	2520.0				28	100		
125		126.0	Becomes slightly weathered.	2518.0				28	100		
		131.5	As above.	2512.5				29	100		
130		134.0	As above.	2510.0				30	100		
135		137.5	As above, few small voids with calcite crystals.	2506.5				31	100		
		140.6	As above, becomes fresh, matrix supported.	2503.4				32	100		
140		142.0	As above, FeOx staining.	2502.0				32	100		
		147.0	Becomes clast supported, weakly cemented coarse sand matrix, weak iron staining.	2497.0				33	100		
145		152.0	As above, medium strong, moderate HCl reaction.	2492.0				34	100		
150		157.0	Becomes fresh, red brown to brown, matrix supported, strong HCl reaction.	2487.0				35	100		
155		162.0	As above.	2482.0				36	100		
160		167.0	As above.	2477.0				37	100		
165		172.0	As above.	2472.0				38	100		
170		177.0	As above, becomes clast supported, cobbly.	2467.0				39	100		
175			As above, few small voids with calcite infill.					40	100		
180											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH17-37 (GT-28)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 7, 2017 13:41
DRILLING END: February 7, 2017 13:41
COORDINATES: N: 839,358 E: 936,278

SHEET: 4 of 5
GS ELEV.: 2644.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
180		180.0		2464.0							
		182.0	As above, few small voids with calcite infill. *(continued)*	2462.0				40	100		
			As above.								
185							106.6-250ft: Bentonite Backfill	41	100		
		187.0		2457.0							
			As above.					42	100		
190		192.0		2452.0							
			As above.					43	100		
195		197.0		2447.0							
			As above.					44	100		
200		202.0		2442.0							
			As above.					45	100		
205		207.0		2437.0							
			As above, becomes matrix supported, weak HCl reaction.					46	100		
210											
								47	100		
215		215.0		2429.0							
		217.0	Becomes clast supported Gila Conglomerate (Tcg), gray brown, angular to subangular clasts, predominantely cobbles, clasts of limestone, schist, quartzite, tuff, and diabase, matrix is fine gravel and coarse sand, strong HCl reaction, trace calcite crystals in small voids.	2427.0				47	100		
		222.0	As above.	2422.0				48	100		
220			As above.								
								49	100		
225		227.0		2417.0							
			Becomes matrix supported, fresh, medium strong, weak HCl reaction.					50	100		
230		232.0		2412.0							
			Becomes clast supported, cobbly, strong HCl reaction.					51	100		
235		237.0		2407.0							
			As above.					52	100		
240											

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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RECORD OF BOREHOLE DH17-37 (GT-28)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 7, 2017 13:41
DRILLING END: February 7, 2017 13:41
COORDINATES: N: 839,358 E: 936,278

SHEET: 5 of 5
GS ELEV.: 2644.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0		2404.0							
			As above. *(continued)*					52	100		
		242.0		2402.0							
			As above.					53	100		
245		247.0		2397.0							
			As above.					54	100		
250		250.0		2394.0							
			Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram.								
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Royal Johnson
DRILL RIG: BK60

LOGGED: Gwyn Smith
CHECKED: G Smith
REVIEWED: R Post

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DH17-37 (GT-28)
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:44
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RECORD OF BOREHOLE DH17-38 (GT-22)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 8, 2017 12:00
DRILLING END: February 14, 2017 13:30
COORDINATES: N: 837,080 E: 927,269

SHEET: 1 of 5
GS ELEV.: 2406.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
0		0.0	Gravel and cobbles of FeOx stained quartzite, polylithic clasts of schist, quartzite, and volcanics at bottom of run.	2406.0				1	75	0 - 16: Hydro test #1 FHT	
		4.0	Gila Conglomerate (Tcg): polylithic CONGLOMERATE, subrounded cobble sized clasts of quartzite, Pinal Schist, and marble, no HCl reaction, broken rubble zone.	2402.0				2	80		
5		6.5	As above.	2399.5				3	100		
		8.0	As above.	2398.0			0-15.6ft: Cement bentonite grout	4	33		
10		11.0	Continues clast supported CONGLOMERATE, poorly sorted, subangular to subrounded polylithic clasts of quartzite, sandstone, and schist, calcareous matrix, strong HCl reaction.	2395.0				5	100		
		14.0	As above.	2392.0				6	100		
15		19.0	As above.	2387.0			15.6-19.7ft: 1/4 Coated Bentonite pellets	7	100		
20		24.0	As above.	2382.0				8	100	24 - 129: Hydro test #2 SI	
25		29.0	As above.	2377.0				9	100		
30		34.0	As above.	2372.0				10	100		
35		39.0	As above.	2367.0				11	100		
40		44.0	Becomes matrix supported CONGLOMERATE, poorly sorted, subrounded to subangular clasts (~<.1-2 inches) of quartzite, arkose sandstone, poorly welded tuff, schist, FeOx volcanics, and chert, calcaerous cemented sandy matrix.	2362.0				12	100		
45		49.0	As above.	2357.0				13	100		
50		54.0	As above.	2352.0			19.7-124.9ft: 10/20 Silica Sand Filter pack	14	100		
55		59.0	As above.	2347.0				15	100		
60			As above.								

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

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RECORD OF BOREHOLE DH17-38 (GT-22)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona
DRILLING START: February 8, 2017 12:00
DRILLING END: February 14, 2017 13:30
COORDINATES: N: 837,080 E: 927,269
SHEET: 2 of 5
GS ELEV.: 2406.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
60		60.0	As above. *(continued)*	2346.0			22-122ft: 2 ID sch 40 PVC 0.010 slot	15	100		
		64.0	As above.	2342.0				16	100		
65		69.0	As above.	2337.0				17	100		
70		74.0	As above.	2332.0				18	100		
75		79.0	As above.	2327.0				19	100		
80		84.0	As above.	2322.0				20	100		
85		89.0	As above, becomes clast supported.	2317.0				21	100		
90		94.0	As above.	2312.0				22	100		
95		99.0	As above.	2307.0				23	100		
100		104.0	As above.	2302.0				24	100		
105		109.0	As above.	2297.0			19.7-124.9ft: 10/20 Silica Sand Filter pack	25	100		
110		114.0	As above.	2292.0			22-122ft: 2 ID sch 40 PVC 0.010 slot	26	100		
115		119.0	As above, cobble rich.	2287.0				27	100		
120			As above.								

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30
LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:44
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RECORD OF BOREHOLE DH17-38 (GT-22)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 8, 2017 12:00
DRILLING END: February 14, 2017 13:30
COORDINATES: N: 837,080 E: 927,269

SHEET: 3 of 5
GS ELEV.: 2406.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO RUN NO.	CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
120		120.0		2286.0							
		124.0	As above. *(continued)*	2282.0				27	100	124 - 250: Hydro test #3 SI	
125		129.0	Becomes matrix supported CONGLOMERATE, poorly sorted, subrounded to angular clasts, gravel to cobbles, clasts of quartzite, tuff, schist, and chert, weak HCl reation.	2277.0				28	100		
130		134.0	As above.	2272.0				29	100		
135		139.0	As above.	2267.0				30	100		
140		144.0	As above, becomes clast supported.	2262.0				31	100		
145		149.0	As above.	2257.0				32	100		
150		154.0	As above.	2252.0				33	100		
155		159.0	As above.	2247.0				34	100		
160		164.0	As above.	2242.0				35	100		
165		169.0	As above.	2237.0				36	100		
170		174.0	As above, interbeds of coarse sandstone.	2232.0				37	100		
175		179.0	As above.	2227.0				38	100		
180			As above.					39	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:44
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RECORD OF BOREHOLE DH17-38 (GT-22)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 8, 2017 12:00
DRILLING END: February 14, 2017 13:30
COORDINATES: N: 837,080 E: 927,269

SHEET: 4 of 5
GS ELEV.: 2406.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY %	NOTES	ADDITIONAL LAB TESTING
180		180.0		2226.0							
			As above. *(continued)*					39	100		
		184.0		2222.0						184 - 250: Hydro test #4 SI	
185			Continues clast supported CONGLOMERATE, poorly sorted, subrounded to angular clasts, gravel to cobbles, clasts of quartzite, tuff, schist, and chert, weak HCl reation.					40	100		
		189.0		2217.0			124.9-250ft: 1/4 Coated Bentonite Pellets				
190			As above.					41	100		
		194.0		2212.0							
195			As above.					42	100		
		199.0		2207.0							
200			As above.					43	100		
		204.0		2202.0							
205			As above.					44	100		
		209.0		2197.0							
210			As above.					45	100		
		214.0		2192.0							
215			As above.					46	100		
		219.0		2187.0							
220			As above, cobble-rich.					47	100		
		224.0		2182.0							
225			As above.					48	100		
		229.0		2177.0							
230			As above.					49	100		
		234.0		2172.0							
235			As above.					50	100		
		239.0		2167.0							
240			As above.					51	100		

Log continued on next page

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:44
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RECORD OF BOREHOLE DH17-38 (GT-22)

PROJECT: RCML Near West TSF
PROJECT NO.: 1531436
LOCATION: Near West TSF, Superior, Arizona

DRILLING START: February 8, 2017 12:00
DRILLING END: February 14, 2017 13:30
COORDINATES: N: 837,080 E: 927,269

SHEET: 5 of 5
GS ELEV.: 2406.0
TOC ELEV.: na
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	USCS	GRAPHIC LOG	WELL DIAGRAM	CORE INFO: RUN NO.	CORE INFO: CORE RECOVERY % (20 40 60 80)	NOTES	ADDITIONAL LAB TESTING
240		240.0		2166.0							
			As above. *(continued)*					51	100		
		244.0		2162.0							
245			As above.					52	100		
		249.0		2157.0							
250		250.0	As above.	2156.0				53	100		
			Bottom of borehole at 250.0 ft. Completed as well. Refer to diagram.								
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

DRILLING CO.: Boart Longyear
DRILLER: Daniel Dodge
DRILL RIG: BK30

LOGGED: Adriana Garcia
CHECKED: G Smith
REVIEWED: R Post

Golder Associates

DH17-38 (GT-22)
5 of 5

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 10/24/17 16:44
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APPENDIX D
TEST PIT INFORMATION

APPENDIX D-1
RECORDS OF TEST PIT

Golder Associates

RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-01 (TP-10)



DATE: 10-24-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 834600.5 **Easting:** 921637.5

Datum:

Elevation ft: 2327.1 **Length x Width ft:** 28.0 x 5.0

Contractor: Dalmolin Exc (Ruben)

Logged By: JAV

Equipment: CAT308

Water Conditions:
Dry

Surface Conditions:
No Vegetation, Laydown yard

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0	(CH), CLAY, high plasticity, some fine to medium sand, trace fine gravel, brown, no HCL reaction, ALLUVIUM, some roots; cohesive, firm, w < PL, Easy to excavate.	2327.1	CH		GB 1	firm	w < PL	
	3.5		2323.6			GB 2			3: Infiltration Test #1
5		(ML), SANDY SILT, non plastic, fine sand, trace fine gravel, white to light brown, strong cementation, strong HCL reaction; non-cohesive, stiff to very stiff, dry to moist, CALICHE, becomes harder to excavate.		ML		GB 3	stiff to very stiff	dry to moist	5: Infiltration Test #2
						GB 4			6: Percolation Test #1
10	10.0		2317.1			GB 5			
		Bottom of test pit at 10.0 ft. Equipment Reach Refusal. Backfilled with cuttings							
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

03 - GOLDER - TEST PIT LOG WITH PHOTO - TEST V7 2012_01_22B E-M 1A.GPJ - 3/21/17 09:10
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Golder Associates

RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-02 (TP-32)



DATE: 10-25-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 835966.4 **Easting:** 922810.4

Datum:

Elevation ft: 2351.5 **Length x Width ft:** 30.0 x 5.0

Contractor: Dalmolin Exc (Joe)

Logged By: JAV

Equipment: CAT308

Water Conditions:
Dry

Surface Conditions:
Highly Vegetated, Some Gravel

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0	(GC), SANDY CLAYEY GRAVEL, fine to coarse, subrounded, and high plasticity fines, fine sand, brown, no HCL reaction, ALLUVIUM, cobbles, some boulders, trace roots; cohesive, hard, w < PL, boulders to 18 inches. Moderately hard to excavate.	2351.5	GC		GB 1	hard	w < PL	2: Infiltration Test #1
						GB 2			
	4.5	(GC), SANDY CLAYEY GRAVEL, fine to coarse, subrounded, fine to coarse sand, medium plasticity fines, light brown, no HCL reaction, ALLUVIUM, cobbles, some boulders; cohesive, hard, w < PL, boulders to 36 inches. Moderately hard to excavate.	2347.0	GC		GB 3	hard	w < PL	4.5: Infiltration Test #2
5	7.5		2344.0			GB 4			
		Bottom of test pit at 7.5 ft. Ground Refusal. Backfilled with cuttings							
10									
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

03 - GOLDER - TEST PIT LOG WITH PHOTO - TEST V7 2012_01_22B E-M 1A.GPJ - 3/21/17 09:10
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Golder Associates

RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-03 (TP-11)



DATE: 10-25-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 836125.1 **Easting:** 922950.1

Datum:

Elevation ft: 2354.2 **Length x Width ft:** 35.0 x 5.0

Contractor: Dalmolin Exc (Ruben)

Logged By: JAV

Equipment: CAT308

Water Conditions:
Dry

Surface Conditions:
Highly Vegetated, Mostly Gravel

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0	(GC), SANDY CLAYEY GRAVEL, fine to coarse, subrounded, and medium plasticity fines, fine sand, brown-red, no HCL reaction, ALLUVIUM, cobbles, some boulders, trace roots; cohesive, hard, w < PL, 1.5' boulders. Moderately hard to excavate	2354.2	GC		GB 1	hard	w < PL	2.5: Infiltration Test #1
						GB 2			
5	5.0		2349.2			GB 3			4.5: Infiltration Test #2
	8.0	(GW-GC), SANDY GRAVEL, fine to coarse, well graded, subrounded, fine to coarse sand, some low plasticity fines, light brown, no HCL reaction, ALLUVIUM, cobbles, some boulders; non-cohesive, very dense, dry to moist, 2' boulders. Moderately hard to excavate	2346.2	GW-GC		GB 4	very dense	dry to moist	
10		Bottom of test pit at 8.0 ft. Ground Refusal. Backfilled with cuttings							
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

03 - GOLDER - TEST PIT LOG WITH PHOTO - TEST V7 2012_01_22B E-M 1A.GPJ - 3/21/17 09:10
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Golder Associates

RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-04 (TP-09)



DATE: 10-26-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 837235.4 **Easting:** 921929.4

Datum:

Elevation ft: 2351.4 **Length x Width ft:** 30.0 x 5.0

Contractor: Dalmolin Exc (Ruben)

Logged By: JAV

Equipment: CAT308

Water Conditions:
Dry

Surface Conditions:
Highly Vegetated, Sand and Gravel. Light Brown

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0		2351.4						
	1.0	(CL), SANDY SILTY CLAY, medium plasticity, fine sand, trace fine gravel, brown, no HCL reaction, trace roots; cohesive, firm, w < PL, TOPSOIL, moderately hard to excavate.	2350.4	CL		GB 1	firm	w < PL	
		Highly weathered, thinly bedded, brownish-white, medium, strong, LITHIC TUFF, Hard to excavate, with abundant secondary calcium carbonate, strong HCl reaction.				GB 2			
	4.5	Becomes moderately weathered, and very hard to excavate.	2346.9			GB 3			4: Infiltration Test #2
5		Bottom of test pit at 4.5 ft. Ground Refusal. Backfilled with cuttings							
10									
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

03 - GOLDER - TEST PIT LOG WITH PHOTO - TEST V7 2012_01_22B E-M 1A.GPJ - 3/21/17 09:10
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Golder Associates

RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-05 (TP-08)



DATE: 10-27-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 837632.6 **Easting:** 921190.7

Datum:

Elevation ft: 2345.3 **Length x Width ft:** 23.0 x 5.0

Contractor: Dalmolin Exc (Ruben)

Logged By: JAV

Equipment: CAT308

Water Conditions:
Dry

Surface Conditions:
Highly Vegetated, Dark brown clay and gravel

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0		2345.3						
	1.0	(CH), SANDY CLAY, high plasticity, fine sand, some fine gravel, dark brown, no HCL reaction, trace roots; cohesive, stiff, w < PL, TOPSOIL, moderately hard to excavate.	2344.3	CH		GB 1	stiff	w < PL	
		(SM), SILTY SAND, fine to coarse, subrounded to subangular, non plastic fines, trace gravel, pale brown-whitish, strong cementation, strong HCL reaction; non-cohesive, dense, dry to moist, CALICHE, hard to excavate.		SM		GB 2	dense	dry to moist	2.5: Infiltration Test #1
5	5.0	Becomes very hard to excavate.	2340.3			GB 3			5: Infiltration Test #2
		Bottom of test pit at 5.0 ft. Ground Refusal. Backfilled with cuttings							
10									
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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Golder Associates

RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-06 (TP-30)



DATE: 10-28-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 847387.1 **Easting:** 928654.1

Datum:

Elevation ft: 2633.0 **Length x Width ft:** 25.0 x 5.0

Contractor: Dalmolin Exc (Ruben)

Logged By: JAV

Equipment: CAT308

Water Conditions:
Dry

Surface Conditions:
Coarse Gravel with Sand. Highly Vegetated. Light brown to gray

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0		2633.0						
		(CH), SANDY CLAY, high plasticity, fine to medium sand, some fine to coarse subrounded gravel, brown, no HCL reaction, trace roots; cohesive, very stiff, w < PL, TOPSOIL, easy to excavate.		CH		GB 1	very stiff	w < PL	
	1.5		2631.5						
		(SM), GRAVELLY SILTY SAND, fine to coarse, non plastic fines, fine to coarse angular gravel, light white-brown, strong cementation, strong HCL reaction; non-cohesive, dense, dry to moist, CALICHE, moderately hard to excavate.				GB 2			2.5: Infiltration Test #1
5				SM		GB 3	dense	dry to moist	5: Infiltration Test #2
						GB 4			
		Becomes more coarse gravel, very dense, hard to excavate.							
	9.0		2624.0						
10		Bottom of test pit at 9.0 ft. Equipment Reach Refusal. Backfilled with cuttings							
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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Golder Associates

RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-07 (TP-31)



DATE: 11-2-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 845349.6 **Easting:** 917532.3

Datum:

Elevation ft: 2393.4 **Length x Width ft:** 31.0 x 5.0

Contractor: Dalmolin Exc (Joe)

Logged By: JAV

Equipment: CAT308

Water Conditions:
Dry

Surface Conditions:
Gravelly Silty Sand. Located near a wash

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0		2393.4						
		(SC), GRAVELLY CLAYEY SAND, fine to medium, low plasticity fines, fine to coarse subrounded gravel, brown, strong HCL reaction, trace roots; cohesive, firm, w < PL, TOPSOIL, easy to excavate.		SC		GB 1	firm	w < PL	
	1.5		2391.9						
		(GP), SANDY GRAVEL, fine to coarse, poorly graded, subrounded, fine to coarse sand, trace non plastic fines, brown, strong HCL reaction, ALLUVIUM; non-cohesive, compact, dry to moist, moderately easy to excavate, gravel includes quartz, quartzite and limestone, and diabase.		GP		GB 2	compact	dry to moist	2.5: Infiltration Test #1
5						GB 3			5: Infiltration Test #2
	6.0		2387.4						
		(SP), SAND AND GRAVEL, fine to coarse, poorly graded, and fine to coarse GRAVEL, gray, weak cementation, strong HCL reaction, RESIDUUM; non-cohesive, compact, dry to moist, diabase regolith, calcium carbonate veining, moderately easy to excavate.		SP		GB 4	compact	dry to moist	
	9.0		2384.4						
10		Bottom of test pit at 9.0 ft. Equipment Reach Refusal. Backfilled with cuttings							
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

03 - GOLDER - TEST PIT LOG WITH PHOTO - TEST V7 2012_01_22B E-M 1A.GPJ - 3/21/17 09:10
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Golder Associates

RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-08 (TP-06)



DATE: 11-2-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 844241.6 **Easting:** 913961.2

Datum:

Elevation ft: 2316.7 **Length x Width ft:** 30.0 x 5.0

Contractor: Dalmolin Exc (Ruben)

Logged By: JAV

Equipment: CAT308

Water Conditions:
Dry

Surface Conditions:
Gravelly Sand. Fine to Coarse. Light Brown

DEPTH (ft)	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	OTHER TESTS & NOTES
0	0.0	(CL), GRAVELLY SANDY SILTY CLAY, medium plasticity, fine to medium sand, fine to coarse subrounded to subangular gravel, dark brown, no HCL reaction; cohesive, very stiff, w < PL, moderately hard to excavate	2316.7	CL		GB 1	very stiff	w < PL	2.5: Infiltration Test #1
	3.0	(GW), SANDY GRAVEL, fine to coarse, well graded, subrounded to subangular, fine to coarse sand, trace non plastic fines, light brown, no HCL reaction, COLLUVIUM; non-cohesive, very dense, dry to moist, Quartzite Gravel, moderately hard to excavate.	2313.7	GW		GB 2	very dense	dry to moist	
5	5.0	Highly weathered, thinly bedded, reddish-purple, medium strong, QUARTZITE, no HCl reaction, very hard to excavate.	2311.7			GB 3			5: Infiltration Test #2
	7.0	Bottom of test pit at 7.0 ft. Ground Refusal. Backfilled with cuttings	2309.7						
10									
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-09 (TP-07)



DATE: 11-3-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 843939.3 **Easting:** 913917.9

Datum:

Elevation ft: 2307.2 **Length x Width ft:** 31.0 x 5.0

Contractor: Dalmolin Exc (Ruben)

Logged By: JAV

Equipment: CAT308

Water Conditions:
Dry

Surface Conditions:
Vegetated, Gravelly Sand

DEPTH (ft)	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0		2307.2						
	1.0	(CH), GRAVELLY SANDY CLAY, medium plasticity, fine to medium sand, fine to coarse subrounded to subangular gravel, dark brown, no HCL reaction, trace roots; cohesive, very stiff, w < PL, TOPSOIL, moderately hard to excavate.	2306.2	CH		GB 1	very stiff	w < PL	
	4.0	(GW), SANDY GRAVEL, fine to coarse, well graded, subrounded to subangular, fine to coarse sand, trace non plastic fines, light brown, no HCL reaction, COLLUVIUM; non-cohesive, very dense, dry to moist, Quartzite Gravel, moderately hard to excavate.	2303.2	GW		GB 2	very dense	dry to moist	2.5: Infiltration Test #1
5	7.0	Highly weathered, thinly bedded, reddish-purple, medium strong, QUARTZITE, no HCl reaction, very hard to excavate.	2300.2			GB 3			5: Infiltration Test #2
10		Bottom of test pit at 7.0 ft. Ground Refusal. Backfilled with cuttings							
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-10 (TP-05)



DATE: 11-3-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 845170.8 **Easting:** 912879.8

Datum:

Elevation ft: 2273.3 **Length x Width ft:** 25.0 x 5.0

Contractor: Dalmolin Exc (Ruben)

Logged By: JAV

Equipment: CAT308

Water Conditions:
Dry

Surface Conditions:
Highly Vegetated, Sand and Gravel Some Boulders. Next to a wash

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0		2273.3						
	1.5	(SP), SAND, fine to medium, poorly graded, some fine to coarse subrounded gravel, trace non plastic fines, light brown, no HCL reaction, some roots, some cobbles; non-cohesive, very loose, dry to moist, TOPSOIL, easy to excavate.	2271.8	SP		GB 1	very loose	dry to moist	
5	5.0	(GW), SANDY GRAVEL, fine to coarse, well graded, subrounded, fine to coarse sand, trace non plastic fines, light brown, no HCL reaction, ALLUVIUM, cobbles, some boulders; non-cohesive, loose, dry to moist, boulders up to 18 inches, easy to excavate.	2268.3	GW		GB 2	loose	dry to moist	2.5: Infiltration Test #1
	8.0	(GP), SANDY GRAVEL, fine, poorly graded, subrounded, coarse sand, gray-brown, no HCL reaction, ALLUVIUM, cobbles, boulders; non-cohesive, compact, dry to moist, boulders up to 24 inches, material is moderately easy to excavate. Boulders complicate excavation.	2265.3	GP		GB 3	compact	dry to moist	5: Infiltration Test #2
10		Bottom of test pit at 8.0 ft. Ground Refusal. Backfilled with cuttings							
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-11 (TP-03)



DATE: 11-3-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 844417.0 **Easting:** 911511.1

Datum:

Elevation ft: 2250.8 **Length x Width ft:** 26.0 x 5.0

Contractor: Dalmolin Exc (Ruben)

Logged By: JAV

Equipment: CAT308

Water Conditions:
Dry

Surface Conditions:
Vegetated, Sand with rounded gravel

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0	(SP), GRAVELLY SAND, fine to medium, poorly graded, fine to coarse subrounded gravel, light brown, no HCL reaction, ALLUVIUM, some roots; non-cohesive, very loose, dry to moist, clean sand on top. Some layers of fine gravel. Easy to excavate.	2250.8	SP		GB 1	very loose	dry to moist	3: Infiltration Test #1
		Some schist and quartz gravel. Easy to excavate.				GB 2			
5	5.0	(GW), SANDY GRAVEL, fine to coarse, well graded, subrounded, coarse sand, light brown, no HCL reaction, ALLUVIUM, some cobbles, trace boulders; non-cohesive, dense, dry to moist, boulders to 12 inches. Easy to excavate	2245.8	GW		GB 3	dense	dry to moist	5: Infiltration Test #2
						GB 4			
10	10.5	Bottom of test pit at 10.5 ft. Equipment Reach Refusal. Backfilled with cuttings	2240.3						
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-12 (TP-04)



DATE: 11-7-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 843840.9 **Easting:** 911316.0

Datum:

Elevation ft: 2242.1 **Length x Width ft:** 37.0 x 8.0

Contractor: Dalmolin Exc (Ruben)

Logged By: JAV

Equipment: KOMATSU 220

Water Conditions:
Dry

Surface Conditions:
Fine to coarse gravel. Small wash

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0	(SP), GRAVELLY SAND, fine to coarse, poorly graded, fine subrounded gravel, trace non plastic fines, dark brown, no HCL reaction; non-cohesive, very loose, moist, TOPSOIL, easy to excavate	2242.1	SP		GB 1	very loose	moist	
	2.0	(GW), SANDY GRAVEL, fine to coarse, well graded, subangular to angular, coarse sand, trace non plastic fines, brown, no HCL reaction, ALLUVIUM; non-cohesive, compact, dry to moist, Easy to excavate	2240.1	GW		GB 2	compact	dry to moist	3: Infiltration Test #1
5	4.0	(GP), GRAVEL, fine, poorly graded, trace coarse sand, gray, no HCL reaction, ALLUVIUM; non-cohesive, very loose, dry to moist, Easy to excavate	2238.1	GP		GB 3	very loose	dry to moist	5.5: Infiltration Test #2
	6.0	(SW), SAND, fine to coarse, well graded, trace fine to coarse gravel, trace non plastic fines, brown, no HCL reaction, ALLUVIUM; non-cohesive, loose, dry to moist, Easy to excavate	2236.1	SW		GB 4	loose	dry to moist	
10	13.0		2229.1						
	13.5	Highly weathered, gray, medium strong, SCHIST, very hard to excavate	2228.6			GB 5			
15		Bottom of test pit at 13.5 ft. Ground Refusal. Backfilled with cuttings							

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-13 (TP-01)



DATE: 11-7-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 842154.7 **Easting:** 909538.7

Datum:

Elevation ft: 2217.0 **Length x Width ft:** 34.0 x 8.0

Contractor: Dalmolin Exc (Ruben)

Logged By: JAV

Equipment: KOMATSU 220

Water Conditions:
Dry

Surface Conditions:
Vegetated, fine to coarse gravelly sand

DEPTH (ft)	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	OTHER TESTS & NOTES
0	0.0		2217.0						
		(CL), GRAVELLY SANDY SILTY CLAY, medium plasticity, fine to coarse sand, fine to coarse subrounded gravel, dark brown, no HCL reaction, trace roots; cohesive, soft, w < PL, TOPSOIL, fairly easy to excavate		CL		GB 1	soft	w < PL	
	1.5		2215.5						
		(GW-GC), SANDY GRAVEL, fine to coarse, well graded, subrounded, fine to coarse sand, some non plastic fines, dark brown, no HCL reaction, ALLUVIUM; non-cohesive, dense to very dense, dry to moist, Moderately hard to excavate		GW-GC		GB 2	dense to very dense	dry to moist	3: Infiltration Test #1 5: Infiltration Test #2
5	6.0		2211.0						
		(GP), GRAVEL, fine, poorly graded, subangular, some coarse sand, brown, no HCL reaction, ALLUVIUM; non-cohesive, loose, dry to moist, Easy to excavate		GP		GB 3	loose	dry to moist	
	8.0		2209.0						
	9.0	(GW-GC), SANDY GRAVEL, fine to coarse, well graded, subrounded, fine to coarse sand, some non plastic fines, dark brown, no HCL reaction, ALLUVIUM; non-cohesive, dense to very dense, dry to moist, Moderately hard to excavate	2208.0	GW-GC		GB 4	dense to very dense	dry to moist	
10		Highly weathered to completely weathered, gray, medium strong, SCHIST, very hard to excavate				GB 5			
	11.0		2206.0						
		Bottom of test pit at 11.0 ft. Ground Refusal. Backfilled with cuttings							
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-14 (TP-02)



DATE: 11-8-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 842064.6 **Easting:** 909746.3

Datum:

Elevation ft: 2208.0 **Length x Width ft:** 30.0 x 9.0

Contractor: Dalmolin Exc (Ruben)

Logged By: JAV

Equipment: KOMATSU 220

Water Conditions:
Dry

Surface Conditions:
Vegetated and very close to a wash. Fine to coarse sandy gravel

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0	(SW), GRAVELLY SAND, fine to medium, well graded, fine to coarse subrounded gravel, trace non plastic fines, light brown, no HCL reaction, some roots; non-cohesive, very loose, moist, TOPSOIL, easy to excavate.	2208.0	SW		GB 1	very loose	moist	2.5: Infiltration Test #1
	4.5	(GP), SANDY GRAVEL, fine to coarse, poorly graded, subrounded, coarse sand, light gray-brown, no HCL reaction, ALLUVIUM; non-cohesive, loose, dry to moist, moderately easy to excavate	2203.5	GP		GB 2			
5	6.0	(SW), GRAVELLY SAND, fine to coarse, well graded, fine to coarse subrounded gravel, trace non plastic fines, light brown, no HCL reaction, ALLUVIUM; non-cohesive, dense, dry to moist, harder to excavate. Gravel includes quartz, schist and quartzite.	2202.0	SW		GB 3	loose	dry to moist	5: Infiltration Test #2
10	14.5	Bottom of test pit at 14.5 ft. Target Depth. Backfilled with cuttings	2193.5			GB 4	dense	dry to moist	
15						GB 5			

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-15 (TP-14)



DATE: 11-9-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 834508.4 **Easting:** 923857.0

Datum:

Elevation ft: 2373.5 **Length x Width ft:** 17.0 x 5.0

Contractor: Dalmolin Exc (Ruben)

Logged By: JAV

Equipment: KOMATSU 220

Water Conditions:
Dry

Surface Conditions:
Vegetated, Gravelly, quartz, quartzite and schist

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0		2373.5						
	0.5	(CL), SANDY SILTY CLAY, medium plasticity, medium to coarse sand, trace coarse gravel, dark brown, no HCL reaction; cohesive, soft, w < PL, TOPSOIL, easy to excavate	2373.0	CL		GB 1	soft	w < PL	
5		(ML), SANDY SILT, non plastic, fine sand, trace fine gravel, white to light brown, strong cementation, strong HCL reaction; non-cohesive, stiff to very stiff, dry to moist, CALICHE, hard to excavate		ML		GB 2	stiff to very stiff	dry to moist	
	5.5		2368.0						
		Bottom of test pit at 5.5 ft. Ground Refusal. Backfilled with cuttings							
10									
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-16 (TP-15)



DATE: 11-9-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 834132.2 **Easting:** 924736.7

Datum:

Elevation ft: 2403.3 **Length x Width ft:** 26.0 x 5.0

Contractor: Dalmolin Exc (Ruben)

Logged By: JAV

Equipment: KOMATSU 220

Water Conditions:
Dry

Surface Conditions:
Vegetated, Gravelly, quartz, quartzite and schist

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0	(CH), SANDY CLAY, high plasticity, fine to medium sand, trace fine subrounded gravel, dark brown, no HCL reaction, ALLUVIUM; cohesive, stiff, w < PL, moderately easy to excavate	2403.3	CH		GB 1	stiff	w < PL	
5	2.5	(ML), SANDY SILT, non plastic, fine sand, trace fine gravel, white to light brown, strong cementation, strong HCL reaction; non-cohesive, stiff to very stiff, dry to moist, CALICHE, hard to excavate	2400.8	ML		GB 2	stiff to very stiff	dry to moist	
	5.5	Bottom of test pit at 5.5 ft. Ground Refusal. Backfilled with cuttings	2397.8						
10									
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-17 (TP-16)



DATE: 11-9-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 833875.1 **Easting:** 925733.4

Datum:

Elevation ft: 2408.8 **Length x Width ft:** 13.0 x 5.0

Contractor: Dalmolin Exc (Forest)

Logged By: JAV

Equipment: KOMATSU 220

Water Conditions:
Dry

Surface Conditions:
Vegetated, Sandy Gravel, quartz, quartzite and schist

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0		2408.8						
	1.0	(CH), SANDY CLAY, high plasticity, fine to medium sand, trace fine subrounded gravel, dark brown, none HCL reaction, some roots; cohesive, stiff, w < PL, TOPSOIL, moderately easy to excavate.	2407.8	CH		GB 1	stiff	w < PL	
	2.5	(SM), SILTY SAND, fine to coarse, subangular to angular, non plastic fines, some fine to coarse subrounded to subangular gravel, pale brown-whitish, strong cementation, strong HCL reaction; non-cohesive, very dense, dry to moist, CALICHE, very hard to excavate.	2406.3	SM		GB 2	very dense	dry to moist	
		Bottom of test pit at 2.5 ft. Ground Refusal. Backfilled with cuttings							
5									
10									
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-18 (TP-19)



DATE: 11-9-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 832690.5 **Easting:** 930624.5

Datum:

Elevation ft: 2458.4 **Length x Width ft:** 18.0 x 5.0

Contractor: Dalmolin Exc (Forest)

Logged By: JAV

Equipment: KOMATSU 220

Water Conditions:
Dry

Surface Conditions:
Vegetated, Sandy Gravel, quartz, quartzite and schist

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0	(CH), SANDY CLAY, high plasticity, fine to medium sand, trace fine subrounded gravel, dark brown, no HCL reaction; cohesive, stiff, w < PL, TOPSOIL, moderately easy to excavate	2458.4	CH		GB 1	stiff	w < PL	
5	2.5	(SW-SC), GRAVELLY SAND, fine to coarse, well graded, fine to coarse subrounded to subangular gravel, some medium plasticity fines, brown, moderate HCL reaction, ALLUVIUM; non-cohesive, very stiff to hard, dry to moist, Moderately hard to excavate	2455.9	SW-SC		GB 2 GB 3	very stiff to hard	dry to moist	
10	9.0	(GW), SANDY GRAVEL, fine to coarse, well graded, subrounded, coarse sand, light brown, no HCL reaction, ALLUVIUM; non-cohesive, dense to very dense, dry to moist, Moderately hard to excavate. Schist and Quartz gravel	2449.4	GW		GB 4 GB 5	dense to very dense	dry to moist	
15	15.0	Bottom of test pit at 15.0 ft. Target Depth. Backfilled with cuttings	2443.4						

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-19 (TP-20)



DATE: 11-9-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 832629.9 **Easting:** 930828.5

Datum:

Elevation ft: 2445.8 **Length x Width ft:** 24.0 x 5.0

Contractor: Dalmolin Exc (Forest)

Logged By: JAV

Equipment: KOMATSU 220

Water Conditions:
Dry

Surface Conditions:
Vegetated, Rounded Gravel, Wash

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0	(SW), SAND, fine to coarse, well graded, trace fine subrounded gravel, trace non plastic fines, dark brown, moderate HCL reaction, some roots; non-cohesive, very loose, moist, TOPSOIL, easy to excavate.	2445.8	SW		GB 1	very loose	moist	
	3.0	(SW), GRAVELLY SAND, fine to coarse, well graded, fine to coarse subrounded gravel, trace non plastic fines, brown, weak HCL reaction, ALLUVIUM; non-cohesive, dense, moist, moderately hard to excavate.	2442.8			GB 2			
5		No HCL reaction, ALLUVIUM; becomes more coarse sand, schist and quartz.				GB 3			
				SW			dense	moist	
10						GB 4			
	14.5		2431.3			GB 5			
15		Bottom of test pit at 14.5 ft. Target Depth. Backfilled with cuttings							

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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Golder Associates

RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-20 (TP-21)



DATE: 11-9-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 833496.8 **Easting:** 931618.4

Datum:

Elevation ft: 2477.4 **Length x Width ft:** 18.0 x 5.0

Contractor: Dalmolin Exc (Forest)

Logged By: JAV

Equipment: KOMATSU 220

Water Conditions:
Dry

Surface Conditions:
Vegetated, Sandy Gravel, coarse

DEPTH (ft)	SOIL PROFILE: Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	OTHER TESTS & NOTES
0	0.0		2477.4						
		(CL), SANDY SILTY CLAY, medium plasticity, fine to coarse sand, some fine to coarse subrounded gravel, dark brown, none HCL reaction; cohesive, firm, w < PL, TOPSOIL, cobbles to 6 inches, moderately easy to excavate.		CL		GB 1	firm	w < PL	
	2.0		2475.4						
		(SW), SAND AND GRAVEL, fine to coarse, well graded, and fine to coarse subrounded to subangular GRAVEL, brown, none HCL reaction, ALLUVIUM; non-cohesive, dense, dry to moist, Moderately hard to excavate. Boulders of quartz, granite, quartzite, schists up to 18 inches.		SW		GB 2	dense	dry to moist	
5						GB 3			
	6.0		2471.4						
		(SW), SAND AND GRAVEL, fine to coarse, well graded, and fine to coarse GRAVEL, light gray to white, weak cementation, strong HCL reaction, ALLUVIUM; non-cohesive, very dense, dry, Very hard to excavate. Weak calcic horizon, boulders to 24 inches.		SW		GB 4	very dense	dry	
	8.0		2469.4						
10		Bottom of test pit at 8.0 ft. Ground Refusal. Backfilled with cuttings							
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-21 (TP-22)



DATE: 11-14-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 833442.6 **Easting:** 931802.7

Datum:

Elevation ft: 2470.2 **Length x Width ft:** 30.0 x 5.0

Contractor: Dalmolin Exc (Ruben)

Logged By: SCW

Equipment: KOMATSU 220

Water Conditions:
Dry

Surface Conditions:
Hackberry, mesquite, boulders to 16"

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0	(SM), GRAVELLY SILTY SAND, and non plastic fines, brown, no HCL reaction, ALLUVIUM, some cobbles, trace boulders, trace roots; non-cohesive, loose to compact, dry to moist, boulder at 8 feet.	2470.2	SM		GB 1	loose to compact	dry to moist	
5						GB 2			
	8.0		2462.2						
10		(SW), GRAVELLY SAND, well graded, brown, weak cementation, moderate HCL reaction, ALLUVIUM, some cobbles, some boulders; non-cohesive, dense, dry, some cobbles and boulders.		SW		GB 3	dense	dry	
	11.0		2459.2						
15		Bottom of test pit at 11.0 ft. Ground Refusal. Backfilled with cuttings							

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-22 (TP-24)



DATE: 11-15-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 835815.6 **Easting:** 934410.9

Datum:

Elevation ft: 2556.2 **Length x Width ft:** 25.0 x 4.0

Contractor: Dalmolin Exc (Ruben)

Logged By: SCW

Equipment: KOMATSU 220

Water Conditions:
Dry

Surface Conditions:
Mesquite, paloverde

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0	(GM), SANDY SILTY GRAVEL, coarse, low plasticity fines, dark brown, some cobbles, some boulders, trace roots; non-cohesive, loose to compact, dry to moist, TOPSOIL, boulders to 15 inches	2556.2	GM		GB 1	loose to compact	dry to moist	
	3.0	(GW), SANDY GRAVEL, fine to coarse, well graded, subangular to angular, light brown, moderate cementation, strong HCL reaction, ALLUVIUM, some cobbles; non-cohesive, dense, dry	2553.2	GW		GB 2	dense	dry	
5									
10	11.0		2545.2			GB 3			
		Bottom of test pit at 11.0 ft. Hole Caving. Backfilled with cuttings							
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-23 (TP-23)



DATE: 11-15-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 835935.4 **Easting:** 934229.4

Datum:

Elevation ft: 2548.8 **Length x Width ft:** 24.0 x 3.0

Contractor: Dalmolin Exc (Ruben)

Logged By: SCW

Equipment: KOMATSU 220

Water Conditions:
Dry

Surface Conditions:
Mesquite, hackberry, paloverde

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0	(SM), SILTY SAND, fine, non plastic fines, some fine gravel, dark brown, none HCL reaction, some roots; non-cohesive, loose, moist, TOPSOIL	2548.8	SM		GB 1	loose	moist	
	3.0	(GW), GRAVEL AND SAND, fine to coarse, well graded, subangular to angular, and SAND, light brown, moderate cementation, strong HCL reaction, some cobbles; non-cohesive, dense to very dense, dry to moist, CALICHE, moderately hard to excavate.	2545.8	GW		GB 2	dense to very dense	dry to moist	
5	8.0	(GW), SANDY GRAVEL, fine to coarse, well graded, subangular to angular, trace medium plasticity fines, light brown, weak cementation, weak HCL reaction, some cobbles; non-cohesive, very dense, dry to moist, CALICHE, hard to excavate.	2540.8	GW		GB 3	very dense	dry to moist	
10	13.0	Bottom of test pit at 13.0 ft. Ground Refusal. Backfilled with cuttings	2535.8						
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-24 (TP-26)



DATE: 11-15-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 836446.1 **Easting:** 940434.8

Datum:

Elevation ft: 2744.0 **Length x Width ft:** 25.0 x 3.0

Contractor: Dalmolin Exc (Ruben)

Logged By: SCW

Equipment: KOMATSU 220

Water Conditions:
Dry

Surface Conditions:
Jojoba, paloverde, mesquite

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0	(SW), GRAVELLY SAND, fine to medium, well graded, fine to coarse subangular gravel, trace non plastic fines, dark brown, no HCL reaction, some cobbles; Maximum Grain Size = 10 in.; non-cohesive, compact, dry to moist, TOPSOIL	2744.0	SW		GB 1	compact	dry to moist	
	3.0	(GP-GM), SANDY GRAVEL, coarse, poorly graded, angular, some non plastic fines, dark brown, no HCL reaction, ALLUVIUM, some cobbles; Maximum Grain Size = 5 in.; non-cohesive, dense, dry to moist	2741.0	GP-GM		GB 2	dense	dry to moist	
5	7.0	(GP), SANDY GRAVEL, coarse, poorly graded, angular, light brown, weak cementation, moderate HCL reaction, ALLUVIUM, some cobbles; Maximum Grain Size = 5 in.; non-cohesive, very dense, dry	2737.0	GP		GB 3	very dense	dry	
10	13.0	Bottom of test pit at 13.0 ft. Ground Refusal. Backfilled with cuttings	2731.0						
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-25 (TP-25)



DATE: 11-15-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 837182.3 **Easting:** 936863.4

Datum:

Elevation ft: 2623.7 **Length x Width ft:** 25.0 x 4.0

Contractor: Dalmolin Exc (Ruben)

Logged By: SCW

Equipment: KOMATSU 220

Water Conditions:
Dry

Surface Conditions:
Mesquite, paloverde

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0	(SP-SM), GRAVELLY SAND, fine to medium, poorly graded, fine to coarse gravel, some low plasticity fines, brown, no HCL reaction, trace cobbles, some roots; non-cohesive, loose, moist, TOPSOIL	2623.7	SP-SM		GB 1	loose	moist	
	3.0	(GP), SANDY GRAVEL, coarse, poorly graded, light brown, no HCL reaction, ALLUVIUM, some cobbles; Maximum Grain Size = 8 in.; non-cohesive, dense, dry	2620.7	GP		GB 2	dense	dry	
5	6.0	(GW), SANDY GRAVEL, fine to coarse, well graded, subangular to angular, light brown, no HCL reaction, ALLUVIUM, some cobbles; non-cohesive, very dense, dry,	2617.7	GW		GB 3	very dense	dry	
10	10.0	Refusal on Gila conglomerate at 10 ft.	2613.7						
		Bottom of test pit at 10.0 ft. Ground Refusal. Backfilled with cuttings							
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-26 (TP-29)



DATE: 11-15-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 842383.3 **Easting:** 937412.3

Datum:

Elevation ft: 2702.9 **Length x Width ft:** 23.0 x 3.0

Contractor: Dalmolin Exc (Ruben)

Logged By: SCW

Equipment: KOMATSU 220

Water Conditions:
Dry

Surface Conditions:
Mesquite, hackberry

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0	(SM), GRAVELLY SILTY SAND, fine, fine gravel, low plasticity fines, dark brown, no HCL reaction, trace roots; non-cohesive, loose, moist, TOPSOIL	2702.9	SM		GB 1	loose	moist	
	3.0	(GW-GM), SANDY GRAVEL, fine to coarse, well graded, subangular to angular, some non plastic fines, brown, strong cementation, strong HCL reaction, ALLUVIUM, some cobbles; Maximum Grain Size = 10 in.; non-cohesive, very dense, dry to moist	2699.9	GW-GM		GB 2	very dense	dry to moist	
5	8.0	(SW-SM), SAND, fine to coarse, well graded, some gravel, some low plasticity fines, brown to red-brown, moderate cementation, strong HCL reaction, ALLUVIUM; non-cohesive, very dense, dry to moist,	2694.9	SW-SM		GB 3	very dense	dry to moist	
10	10.0	Refusal at 10 ft on Gila Conglomerate Bottom of test pit at 10.0 ft. Ground Refusal. Backfilled with cuttings	2692.9						
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-27 (TP-27)



DATE: 11-15-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 839004.5 **Easting:** 936129.1

Datum:

Elevation ft: 2626.4 **Length x Width ft:** 19.0 x 3.0

Contractor: Dalmolin Exc (Ruben)

Logged By: SCW

Equipment: KOMATSU 220

Water Conditions:
Dry

Surface Conditions:
Mesquite, paloverde

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0	(SM), SILTY SAND, fine to medium, non plastic fines, trace fine gravel, brown, no HCL reaction, trace roots; non-cohesive, compact, moist, TOPSOIL	2626.4	SM		GB 1	compact	moist	
	3.0	(GP), SANDY GRAVEL, coarse, poorly graded, subangular to angular, light brown, strong cementation, strong HCL reaction, ALLUVIUM, some cobbles; Maximum Grain Size = 12 in.; non-cohesive, very dense, dry	2623.4	GP		GB 2	very dense	dry	
5	8.0	Bottom of test pit at 8.0 ft. Ground Refusal. Backfilled with cuttings	2618.4						
10									
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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RECORD OF TEST PIT LOG

TEST PIT NUMBER TP16-28 (TP-17)



DATE: 11-15-16

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 831625.6 **Easting:** 927466.5

Datum:

Elevation ft: 2389.8 **Length x Width ft:** 18.0 x 3.0

Contractor: Dalmolin Exc (Ruben)

Logged By: SCW

Equipment: KOMATSU 220

Water Conditions:
Dry

Surface Conditions:
Prickly pear, cholla

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0		2389.8						
	1.0	(SM), GRAVELLY SILTY SAND, fine, non plastic fines, brown, moderate cementation, strong HCL reaction; non-cohesive, dense, moist, TOPSOIL, moderately easy to excavate.	2388.8	SM		GB 1	dense	moist	
	3.0	(SC), GRAVELLY CLAYEY SAND, fine, low plasticity fines, light brown, strong cementation, strong HCL reaction; non-cohesive, very dense, dry, CALICHE, very hard to excavate	2386.8	SC		GB 2	very dense	dry	
5		Bottom of test pit at 3.0 ft. Ground Refusal. Backfilled with cuttings							
10									
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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RECORD OF TEST PIT LOG

TEST PIT NUMBER TP17-29 (TP-13)



DATE: 1-26-17

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 837056.1 **Easting:** 923562.3

Datum:

Elevation ft: 2392.8 **Length x Width ft:** 30.0 x 5.0

Contractor: Dalmolin Exc (Ruben)

Logged By: JAV

Equipment: KOMATSU 220

Water Conditions:
Dry

Surface Conditions:
Vegetated, Rounded Gravel and Cobbles

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0	(CH), GRAVELLY SANDY CLAY, high plasticity, fine to coarse sand, fine to coarse subrounded gravel, dark brown, weak HCL reaction, some roots; cohesive, firm, w ~ PL, TOPSOIL, easy to excavate.	2392.8	CH		GB 1	firm	w ~ PL	2: Infiltration tests; Bottomless Bucket and Constant Head
5	3.0	(GM), SANDY SILTY GRAVEL, fine to coarse, subrounded to subangular, fine to coarse sand, non plastic fines, brown, no HCL reaction, ALLUVIUM; non-cohesive, dense, moist, moderately hard to excavate	2389.8	GM		GB 2	dense	moist	5: Infiltration tests; Bottomless Bucket and Constant Head
	6.0	(ML), SANDY SILT, non plastic, fine sand, some fine to coarse subangular gravel, pale brown-whitish, strong cementation, strong HCL reaction; cohesive, very dense, dry to moist, CALICHE, hard to excavate	2386.8	ML		GB 3 GB 4	very dense	dry to moist	
10	9.0	Bottom of test pit at 9.0 ft. Ground Refusal. Backfilled with cuttings	2383.8						
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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RECORD OF TEST PIT LOG

TEST PIT NUMBER TP17-30 (TP-12)



DATE: 1-27-17

PROJECT: RCML Near West TSF

PROJECT No.: 1531436

LOCATION: Near West TSF, Superior, Arizona

Northing: 923939.6 **Easting:** 923939.6

Datum:

Elevation ft: 2402.7 **Length x Width ft:** 30.0 x 5.0

Contractor: Dalmolin Exc (Ruben)

Logged By: JAV

Equipment: KOMATSU 220

Water Conditions:
Dry

Surface Conditions:
Vegetated, Rounded Gravel and Cobbles

DEPTH (ft)	SOIL PROFILE Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	CONSISTENCY[1] OR DENSITY[2]	INSITU, LABORATORY TESTING[1] & NOTES: WATER CONTENT (%)	INSITU, LABORATORY TESTING[1] & NOTES: OTHER TESTS & NOTES
0	0.0	(CH), SANDY GRAVELLY CLAY, high plasticity, fine to coarse subrounded gravel, dark brown-reddish, no HCL reaction, trace roots; cohesive, firm, w ~ PL, TOPSOIL, easy to excavate	2402.7	CH		GB 1	firm	w ~ PL	
	2.0	(GC), SANDY CLAYEY GRAVEL, fine to coarse, subrounded to subangular, fine to coarse sand, low plasticity fines, brown, no HCL reaction, ALLUVIUM, some cobbles; cohesive, stiff to very stiff, w < PL, moderately hard to excavate.	2400.7	GC		GB 1	stiff to very stiff	w < PL	2.5: Infiltration tests; Bottomless Bucket and Constant Head
5	6.0	(SW), GRAVELLY SAND, fine to coarse, well graded, fine to coarse subrounded to subangular gravel, trace non plastic fines, very light brown, no HCL reaction, ALLUVIUM; non-cohesive, very dense, dry to moist, hard to excavate.	2396.7	SW		GB 1 GB 1	very dense	dry to moist	5: Infiltration tests; Bottomless Bucket and Constant Head
10	10.0	Bottom of test pit at 10.0 ft. Ground Refusal. Backfilled with cuttings	2392.7						
15									

Notes: [1] See Legend Sheet for Definition of Terms, Symbols and Abbreviations
[2] Consistency or Density values are estimated based on excavation resistance and/or visual/manual assessment of samples

Checked: G Smith
Reviewed: R Post

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APPENDIX D-2
TEST PIT PHOTOGRAPHS

TP16-01 (TP-10)

10/24/2016


CAT






Project: 1531436
Resolution NW-TSF
TP10-01 (TP-10)
Depth: 0-35ft
Oct 24, 2016



Infiltration Test Set-up

3ft and 5ft










Lateral
wetting
front

Infiltration Test Profile

3ft and 5ft




Completel
y Dry

Percolation Test

6ft to 10ft





TP16-02 (TP-32)

10/25/2016


CAT
CR
CAT







0-7.5ft



Backfilled

Infiltration Test Set-up

2ft and 4.5ft











Lateral wetting front

Infiltration Test Profile

2ft and 4.5ft





Hard to excavate

TP16-03 (TP-11)

10/25/2016









0-8ft



Infiltration Test Set-up

2.5ft and 4.5ft


BETA
TIVOS
HOMER







Lateral wetting front

Infiltration Test Profile

2.5ft and 4.5ft





Boulder beneath test area

TP16-04 (TP-09)

10/26/2016









0-4.5ft



Backfill

Infiltration Test Set-up

2.5ft and 4.5ft



Cleaned surface




CUBETA
MULTIUSOS
DE HOMER



Lateral wetting front 2.5’



Slight Lateral wetting front



Lateral surface flow



Failed test at 2.5’

Infiltration Test Profile

4.5ft



Unable to obtain moisture profile at 4.5’

Conglomerate







TP16-05 (TP-08)

10/27/2016









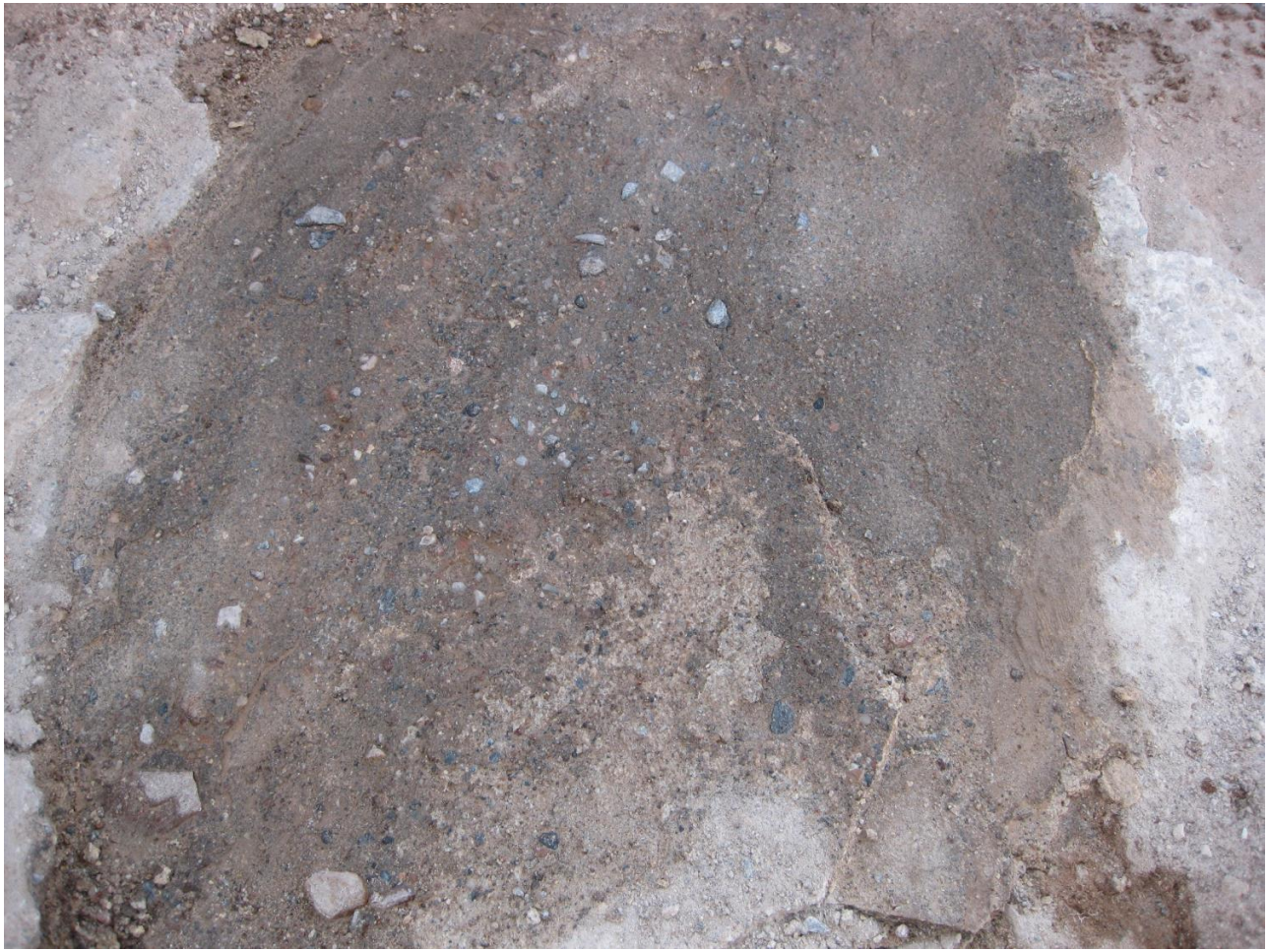
0-5ft



Backfill

Infiltration Test Set-up

2.5ft and 5ft



Cleaned surface


DE HOMER






WARNING
AVISO



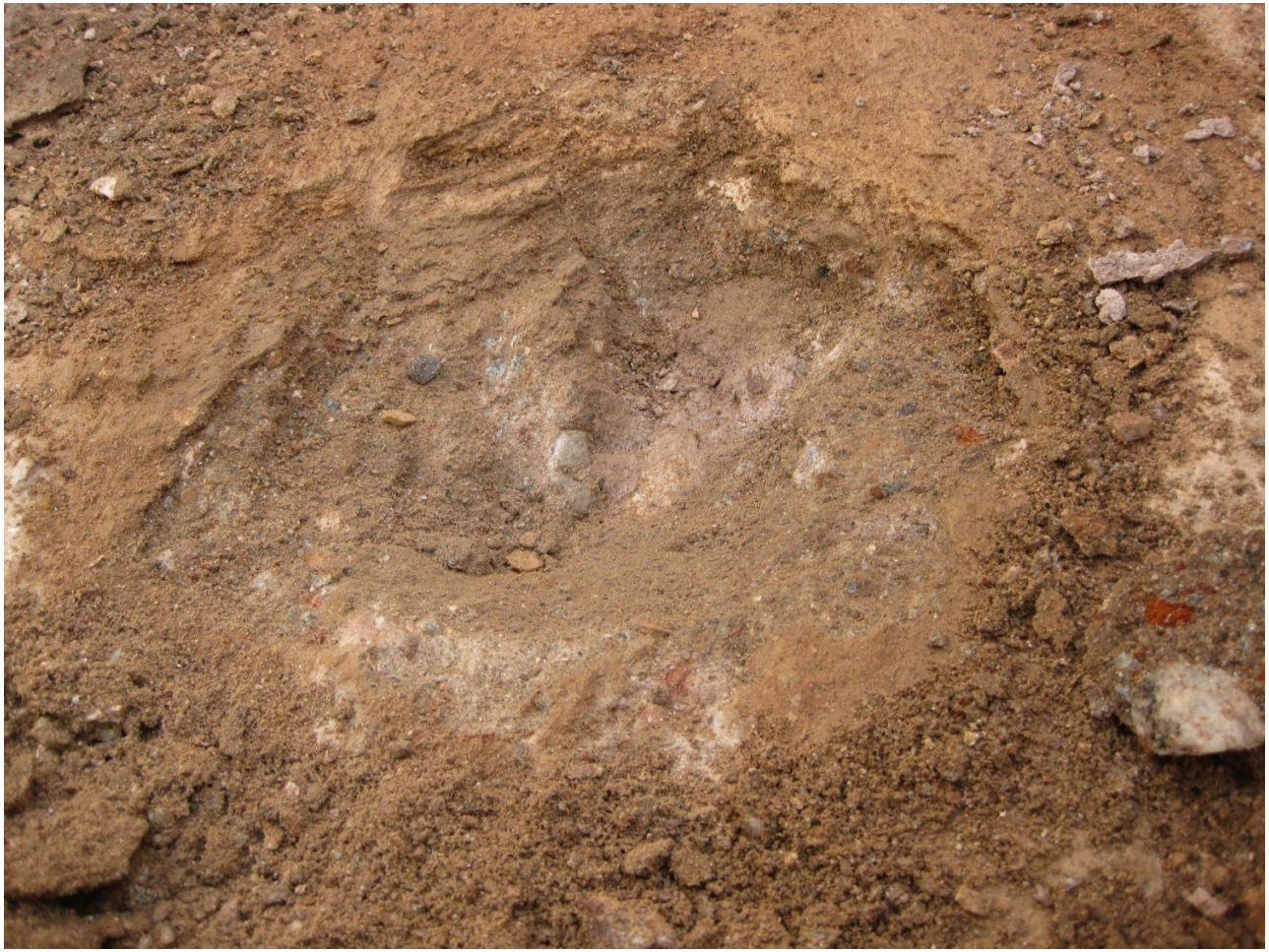



THE HOME DEPOT
MULTIUSO
DE HOMER

Infiltration Test Profile



2.5’



5’

Very hard to excavate. Only a couple of inches wetting.

Conglomerate







TP16-06 (TP-30)

10/28/2016


CAT


CAT







0-8.5ft







Backfill

Infiltration Test Set-up

2.5ft and 5ft



Cleaned surface


MULTIUSOS
DE HOMER
19 Lit







2.5’



5’

Infiltration Test Profile



2.5’



5’

TP16-07 (TP-31)

11/02/2016







0-9ft









Backfill

Injection Test Set-up

2.5ft and 5ft









Injection Test Profile



2.5’



2.5’



2.5’



5’



5’



5’

TP16-08 (TP-06)

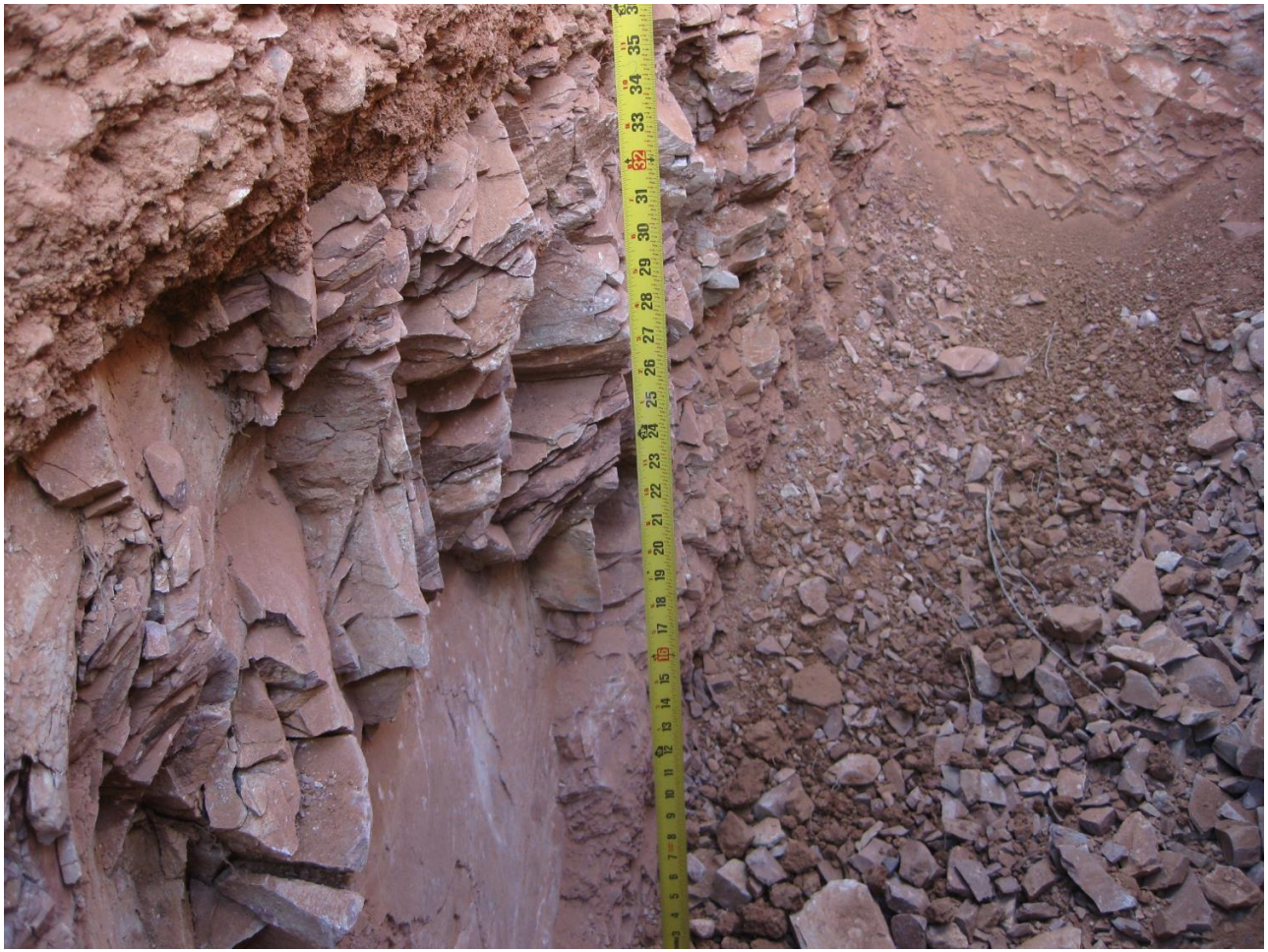
11/02/2016







0-9ft





Backfill

Infiltration Test Set-up

2.5ft and 5ft















Infiltration Test Profile


2.5’



2.5’



2.5’



5’



5’



5’

TP16-09 (TP-07)

11/03/2016







0-7ft











Backfill

Infiltration Test Set-up

2.5ft and 5ft















Infiltration Test Profile



2.5’



2.5’



2.5’



5’



5’



5’

TP16-10 (TP-05)

11/03/2016


CAT





0-8ft







Backfill

Infiltration Test Set-up

2.5ft and 5ft











Infiltration Test Profile



2.5’



2.5’



5’



5’

TP16-11 (TP-03)

11/03/2016







0-10.5ft







Backfill

Infiltration Test Set-up

2.5ft and 5ft









Infiltration Test Profile



3’



3’



3’



5’



5’



5’

TP16-12 (TP-04)

11/07/2016


KOMATSU





0-13ft







Backfill

Infiltration Test Set-up

3ft and 5.5ft









Infiltration Test Profile



3’


3’



3’



5’



5’

TP16-13 (TP-01)

11/07/2016







0-13ft







Infiltration Test Set-up

3ft and 5ft









Infiltration Test Profile


3’



3’



3’



5’



5’



5’

TP16-14 (TP-02)

11/08/2016







0-14.5ft







Infiltration Test Set-up

2.5ft and 5ft









Infiltration Test Profile



3’ Natural soil was wet



3’



3’



5’



5’

TP16-15 (TP-14)

11/09/2016













TP16-16 (TP-15)

11/09/2016













TP16-17 (TP-16)

11/09/2016













TP16-18 (TP-19)

11/09/2016













TP16-19 (TP-20)

11/09/2016













TP16-20 (TP-21)

11/09/2016












KOMATSU

TP17-29 (TP-13)

01/26/2017







Infiltration Tests

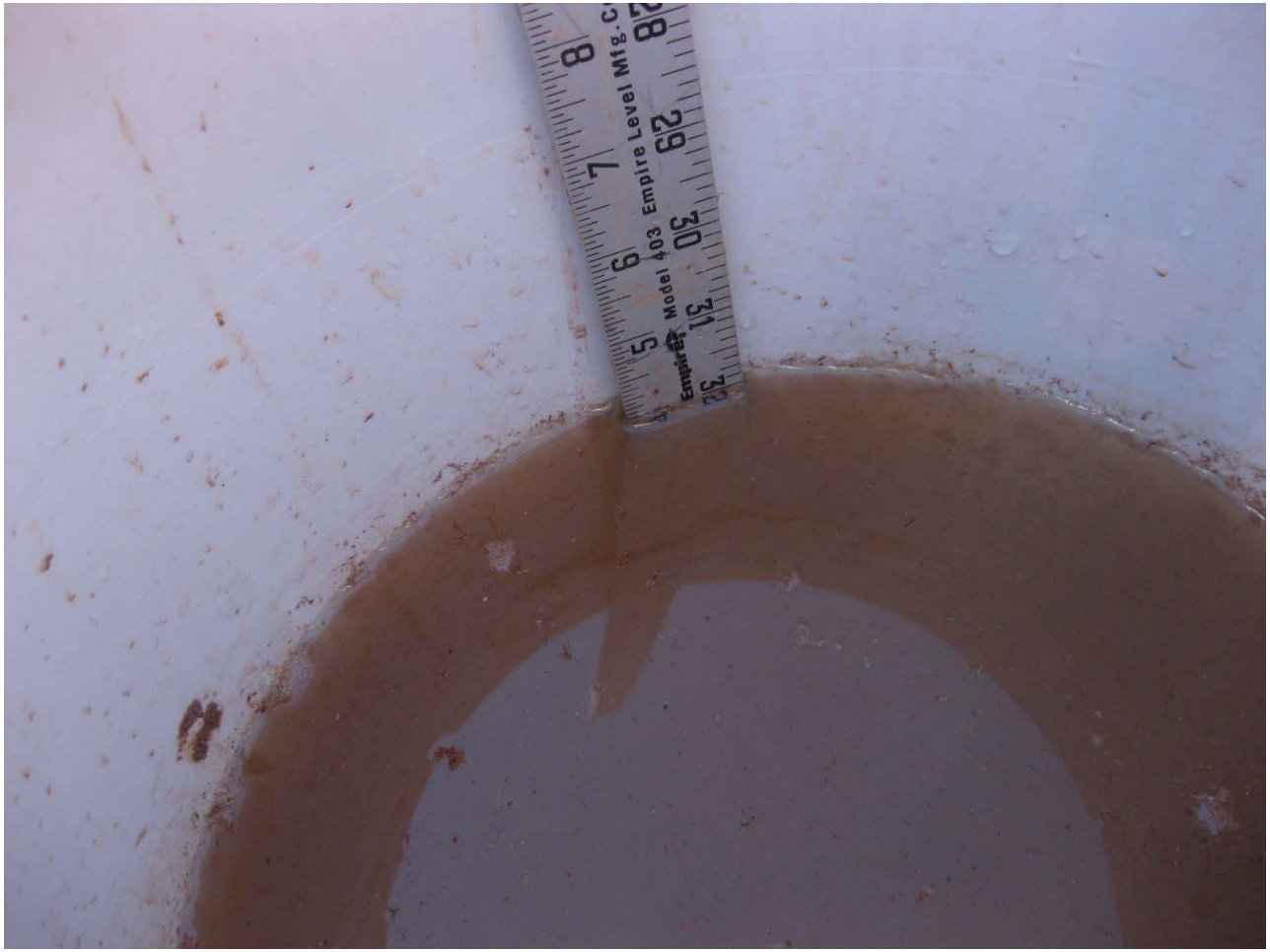
2’ and 5’








Empire Model 403 Empire Level Mfg. Co.


Empire Model 403 Empire Level Mfg.


20 OZ
16
12
8
4
2 CUPS
1 CUP

Infiltration Test

2’



Lateral wetting front not visible due to natural soil moisture conditions



Wetting front not visible due to natural soil moisture conditions

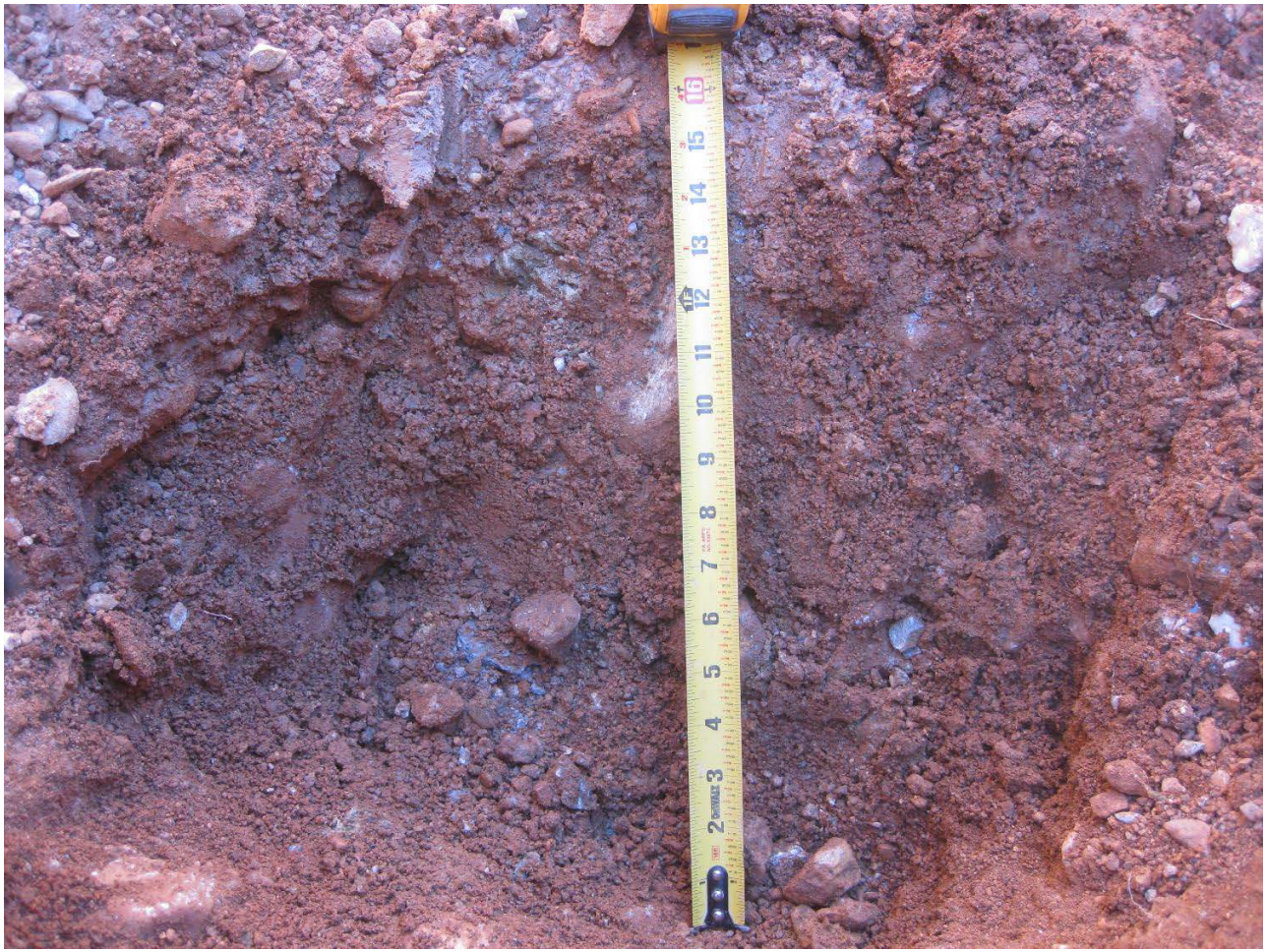


Wetting front not visible due to natural soil moisture conditions

Infiltration Test

5’









Backfill

TP17-30 (TP-12)

01/27/2017









Infiltration Tests

2.5’ and 5’




WARNING
AVISO


THE HOME DEPOT



Infiltration Test

2.5’


Children can fall in to
bucket and drown.
Keep children away from
buckets even with a small
amount of liquid.
DEWALT
2
3
4
5
6
7
8





Infiltration Test

5’


1
2
DeWALT
3
4
5
6
7
8


DEWALT
16'





Backfill

APPENDIX D-3
INFILTRATION TESTING CALCULATIONS

CALCULATIONS

Date:	October 25, 2017	**Made by:**	G. Smith, EIT
Project No.:	1531436	**Checked by:**	R. Blegen, RG
Site Name:	RCM Near West TSF	**Reviewed by:**	M. Grass, PE
Subject	**HYDRAULIC CONDUCTIVITY CALCULATIONS FROM BOTTOMLESS BUCKET INFILTRATION TESTS**		

1.0 OBJECTIVE:

Calculate the field saturated hydraulic conductivity (K_{fs}) from the results of bottomless bucket infiltration tests conducted as part of test pitting activities.

2.0 METHODS

2.1 Bottomless Bucket Infiltration Testing Methods

Bottomless bucket infiltration testing procedures were adapted from procedures described by Nimmo et al (2009) for soils, and Mirus and Perkins (2012) for hard surfaces or rock. The "bottomless bucket" is a standard 5-gallon plastic bucket with the bottom cut off.

For infiltration tests in soil, the procedure:

- Prepare infiltration site. It should be as level as possible, and performed in undisturbed soils. Place the bottomless bucket over the test area, positioned so that no stones or other impediments are located directly under the lower rim, and push the bucket into the soil, twisting gently. The bottom rim should be 2 inches or lower below the ground surface. Attach ruler to the inside of the bucket.
- Pack any remaining loose soil along the outside bucket edge. In coarse-grained soils, the addition of small amounts of bentonite will help minimize lateral leakage. Measure the distance from the upper rim to the inside ground surface at four locations inside the bucket, and record on the logging form. Also record the ground condition, soil description, vegetation, weather conditions, and presence of any water near the site. Take a photograph of the test setup.
- Place the rubber or plastic mat inside the bucket. This minimizes surface disturbance when adding water. Pour in enough water for approximately 0.3 feet (4 inches) of head over ground surface. Remove the mat once the water is poured.
- Record the time it takes for the water to infiltrate, from the start of the test until all water has infiltrated. For coarse-grained soils, this may be very rapid.
- After completion of the test, remove the bucket. Excavate the area of the test and measure the depth and breadth of the wetting front. Photograph the excavated test site.

For infiltration tests on rock or durable surfaces that cannot be excavated (such as caliche or Gila conglomerate):

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Tel: (520) 888-8818 Fax: (520) 888-8817 www.golder.com

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Project No.:	1531436	Made by:	G. Smith, EIT
Site Name:	RCM Near West TSF	Checked by:	R. Blegen, RG
Date:	October 25, 2017	Reviewed by:	M. Grass, PE

- Select and prepare infiltration site. It should be as level as possible. The bucket should be maneuvered to find the best possible fit. In the case of weathered rock or caliche, the test surface should be prepared by shoveling as much material as necessary to expose a relatively hard and level surface.
- Using quick-setting silicone caulk, place an ample bead of sealant around the bottom rim of the bucket to form a seal between the bucket and the ground surface. The silicone bead should be placed on the outside of the bucket to prevent significant overlap onto the test area inside the bucket. Check for visible gaps and seal with additional silicone (gloves may be used to assist with this). For weathered rock or caliche, the silicone will likely not adhere to the ground surface. In this case, instead of silicone, hydrated bentonite can be packed around the outside of the bottom rim of the bucket to form a seal. Hydrated bentonite can also be used to supplement the silicone seals as needed. Attach a ruler to inside of the bucket.
- Measure the distance from the upper rim to the inside ground surface at four locations inside the bucket, and record on the logging from (Appendix E). Also record the ground condition, rock description, vegetation, weather condition, and presence of any water near the site. The rock description should include descriptions of any discontinuities within the test area. Take a picture of the test setup.
- Pour in enough water for approximately 0.3 feet (4 inches) of head over ground surface. Record the time it takes for the water to infiltrate, from the start of the test until all water has infiltrated.
- If significant water level decline occurs due to infiltration, once the water level has declined to just above the test surface, more water can be added to initiate another falling-head cycle. Record any signs of leakage and/or lateral wetting around the bucket. Infiltration tests in soil may also be very slow – in this case, place a lid on the bucket to minimize evaporation loss. A sunshield may also be used.
- After completion of the test, remove the bucket and scrape off and remove any silicone.

2.2 Data Analysis Methods

Using analysis methods as described by Nimmo et al (2009), calculate the field saturated hydraulic conductivity (K_{fs}) of the earth materials. The field saturated hydraulic conductivity equation is as follows:

$$K_{fs} = \frac{L_G}{t} ln\left(\frac{L_G + \lambda + D_o}{L_G + \lambda + D}\right)$$

Where:

K_{fs} = field saturated hydraulic conductivity (centimeters per second (cm/sec))
L_g = ring installation scaling length, and:

$$L_G = C_1 d + C_2 b$$

C_1, C_2 = Reynolds and Elrick constants
d = ring insertion depth (centimeters (cm))
b = ring radius (cm)
λ = macroscopic capillary length of the soil
D = depth of ponding (cm)
D_o = initial depth of ponding (cm)
t = length of test (seconds)

Project No.:	1531436	Made by:	G. Smith, EIT
Site Name:	RCM Near West TSF	Checked by:	R. Blegen, RG
Date:	October 25, 2017	Reviewed by:	M. Grass, PE

The calculation for K_{fs} incorporated the initial depth measurement as D_0. Graphs of the calculated K_{fs} values versus time are shown alongside the field data included in Attachment A. Late-time data for each test that indicated a trend towards equilibration were selected and averaged to provide estimated field saturated hydraulic conductivity values for each test.

3.0 ASSUMPTIONS

- C_1 = 0.993, and C_2 = 0.578, as cited in Nimmo et al (2009).
- Macroscopic Capillary Depth (λ) estimated from soil texture/structure, as described by Warrick (2001):

Gamma (cm)	Material Type
2.8	Coarse and gravelly sands, or highly structured soils with large cracks
8.3	Most structured soils from clays through loams, also unstructured medium and fine sands
25	Soils which are both fine textured (clayey) and unstructured
100	Compacted, structureless, clayey material such as landfill caps and liners, lacustrine or marine sediments, etc.

- K_{fs} was calculated for each time measurement. The final K_{fs} was estimated by averaging the individual K_{fs} from selected late time test data indicating equilibrium or near-equilibrium conditions.

4.0 CALCULATIONS

Calculations were performed in Microsoft Excel ™ spreadsheets developed to calculate estimated Kfs using the equation cited in Section 2.2. The calculation input parameters and calculated outputs are included in Attachment A.

5.0 SUMMARY

Estimated values for K_{fs} values are presented in Table 1. Values ranged from 3 x 10^{-2} cm/sec to 2 x 10^{--5} cm/sec. Due to the level of variability inherent in the test method and the difficulties of collecting the data, the resulting Kfs values are presented in Table 1 to one significant digit.

6.0 REFERENCES

Mirus, B. B., and Perkins, K.S. 2012. Practical estimates of field-saturated hydraulic conductivity of bedrock outcrops using a modified bottomless bucket method. Water Resources Research, Vol. 48, W09602. 2012.

Nimmo, J.R., Schmidt, K.M., Perkins, K.S., and Stock J.D. 2009. Rapid measurement of field-saturated hydraulic conductivity for areal characterization. Vadose Zone Journal. Number 8, 2009. pp. 142-149.

Warrick, A. W. (2001). Soil Physics Companion. CRC Press, pp. 99.

TABLE

Table 1: Infiltration Testing Summary

Test Pit	Date	Depth (ft-bgs)	Type	Kfs (cm/sec)	Material Type
TP16-01 (TP-10)	10/24/2016	3	BB	3.E-04	CH, moist with roots, firm
	10/24/2016	5	BB	4.E-05	ML, moist, strong HCl, stiff to v stiff
	10/24/2016	6	Perc	N/A	ML, moist, strong HCl, stiff to v stiff
TP16-02 (TP-32)	10/25/2016	2	BB	6.E-04	GC, hard to excavate, no HCl reaction
	10/25/2016	4.5	BB	4.E-04	GC, hard to excavate, no HCl reaction
TP16-03 (TP-11)	10/25/2016	2.5	BB	2.E-04	GC, hard to excavate, no HCl reaction
	10/25/2016	4.5	BB	1.E-04	GC, hard to excavate, no HCl reaction
TP16-04 (TP-09)	10/26/2016	2.5	BB	N/A	Test Unsuccessful. Weathered tuff
	10/26/2016	4.5	BB	6.E-04	Weathered tuff
TP16-05 (TP-08)	10/27/2016	2.5	BB	3.E-05	SM, Well cemented caliche, strong
	10/27/2016	4.5	BB	1.E-04	SM, Well cemented caliche, strong
TP16-06 (TP-30)	10/28/2016	2.5	BB	6.E-04	SM, Well cemented caliche, strong
	10/28/2016	5	BB	2.E-04	SM, Well cemented caliche, strong
TP16-07 (TP-31)	11/2/2016	2.5	BB	5.E-03	GW Sandy Gravel
	11/2/2016	5	BB	1.E-02	GW Sandy Gravel
TP16-08 (TP-06)	11/2/2016	2.5	BB	3.E-03	CH, Sandy Gravelly Clay
	11/2/2016	5	BB	2.E-05	Quartzite, weathered
TP16-09 (TP-07)	11/3/2016	2.5	BB	5.E-03	GW, Sandy Gravel, dense
	11/3/2016	5	BB	2.E-05	Quartzite, weathered
TP16-10 (TP-05)	11/3/2016	2.5	BB	5.E-03	GW, Sandy Gravel, loose
	11/3/2016	5	BB	3.E-02	GW, Sandy Gravel, compact
TP16-11 (TP-03)	11/3/2016	3	BB	6.E-03	SW, Gravelly sand, loose
	11/3/2016	5	BB	5.E-03	GW, Sandy Gravel, dense
TP16-12 (TP-04)	11/7/2016	3	BB	5.E-03	GW, Sandy Gravel, compact
	11/7/2016	5.5	BB	2.E-02	GP, Loose Gravel
TP16-13 (TP-01)	11/7/2016	3	BB	1.E-03	GW, Sandy Gravel, dense
	11/7/2016	5	BB	3.E-03	GW, Sandy Gravel, dense
TP16-14 (TP-02)	11/8/2016	2.5	BB	4.E-03	SW, Gravelly sand, loose
	11/8/2016	5	BB	2.E-02	GP, Gravel with sand, loose
TP17-29 (TP-13)	1/26/2017	2	BB	7.E-05	CH, Sandy Gravelly Clay
	1/26/2017	5	BB	2.E-03	GC, Sandy Clayey Gravel
	1/26/2017	2	CH	N/A	Test Unsuccessful. CH, Sandy Gravelly Clay
	1/26/2017	5	CH	1.E-03	GC, Sandy Clayey Gravel
TP17-30 (TP-12)	1/27/2017	2.5	BB	4.E-05	GC, Sandy Clayey Gravel
	1/27/2017	5	BB	5.E-05	GC, Sandy Clayey Gravel
	1/27/2017	2.5	CH	N/A	Test Unsuccessful. GC, Sandy Clayey Gravel
	1/27/2017	5	CH	N/A	Test Unsuccessful. GC, Sandy Clayey Gravel

Notes:

ft-bgs = feet below ground surface

cm/sec = centimeters per second

ATTACHMENT A
TEST PIT INFILTRATION TEST SUMMARIES

APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

Test Pit	TP16-01 (TP-10)	
Depth of test	3	ft-bgs
BB inner diameter	26.5	cm
Bucket embedment, d	0	cm
gamma	25	cm
C1	0.993	
C2	0.578	
Lg	15.317	cm

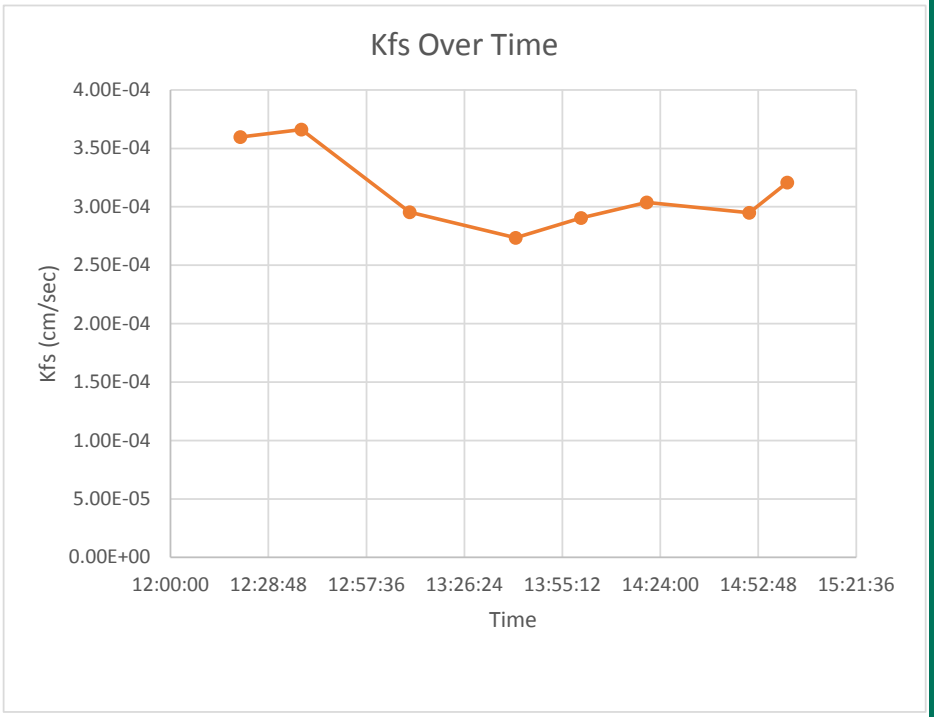
Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):

High plasticity CLAY (CH)

Material is moist with some roots. Firm and fairly easy to excavate. Dark Brown, with no HCL Reaction

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
12:02:30	70	4.0	
12:20:35	70	3.5	3.60E-04
12:38:30	70	3.0	3.66E-04
13:10:20	70	2.5	2.95E-04
13:41:30	70	2.0	2.74E-04
14:00:40	70	1.5	2.90E-04
14:20:00	70	1.0	3.04E-04
14:50:10	70	0.5	2.95E-04
15:01:20	70	0.0	3.21E-04
		AVERAGE:	**3.13E-04**



Resulting Kfs: **3E-04** **cm/sec**

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APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

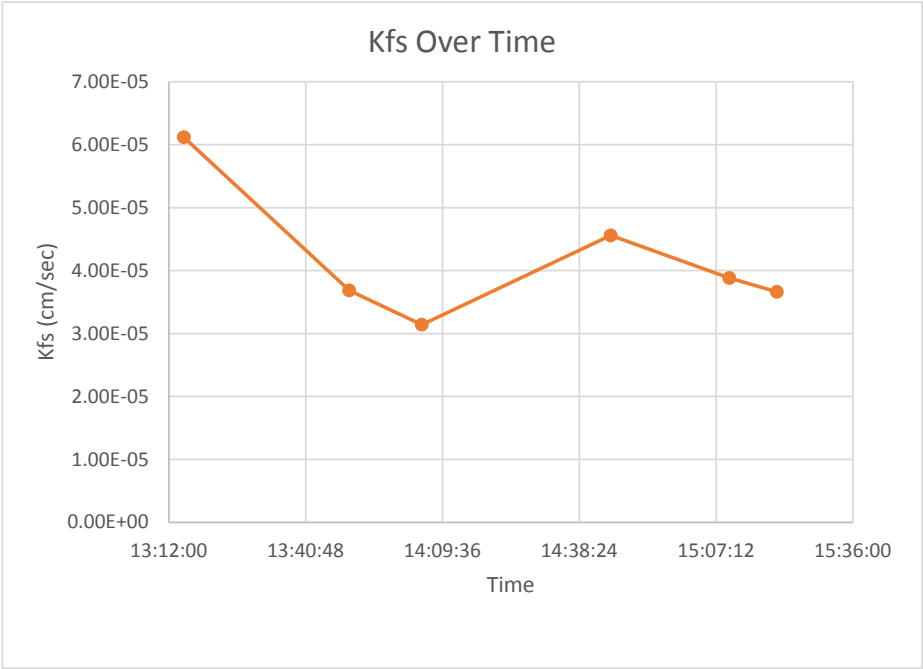
Test Pit	TP16-01 (TP-10)	
Depth of test	5	ft-bgs
BB inner diameter	26.5	cm
Bucket embedment, d	0	cm
gamma	25	cm
C1	0.993	
C2	0.578	
Lg	15.317	cm

Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):

Non-plastic SILT (ML)
White to light brown material (Caliche). Moist. Stiff to very stiff.
Strong HCL Reaction. Moderately hard to excavate

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
12:22:20	70	4.00	
13:15:10	70	3.75	6.12E-05
13:50:00	70	3.75	3.69E-05
14:05:15	70	3.75	3.14E-05
14:45:00	70	3.50	4.56E-05
15:10:00	70	3.50	3.88E-05
15:20:00	70	3.50	3.66E-05
		AVERAGE:	**4.17E-05**



Resulting Kfs: **4E-05** **cm/sec**

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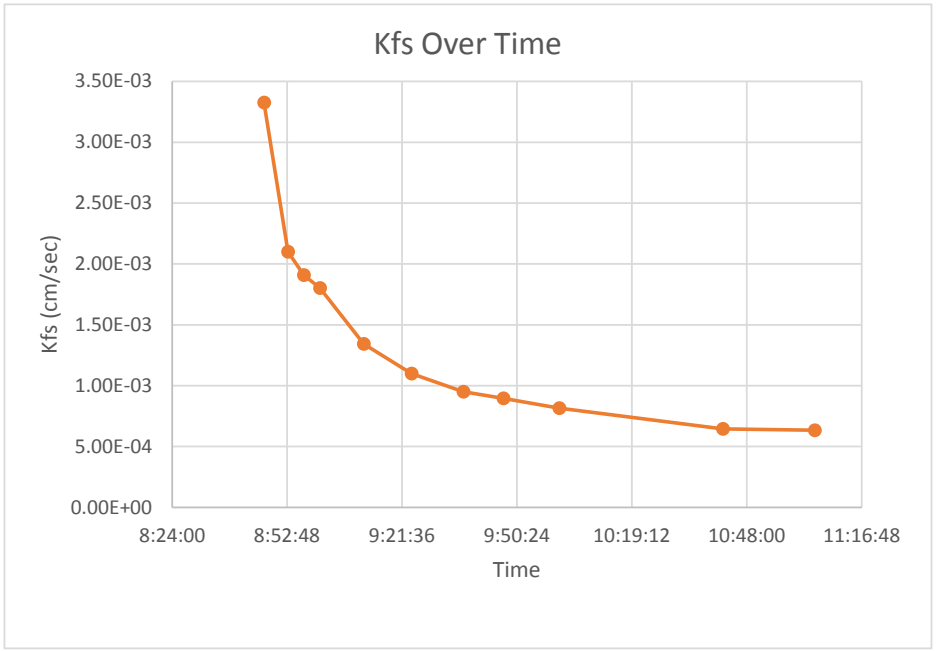
APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

Test Pit	TP16-02 (TP-32)		
Depth of test	2	ft-bgs	**Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):**
BB inner diameter	26.5	cm	
Bucket embedment, d	0	cm	
gamma	8.3	cm	SANDY CLAYEY GRAVEL (GC)
C1	0.993		Hard brown with no HCL Reaction
C2	0.578		Fine to coarse subrounded gravel
Lg	15.317	cm	Hard to excavate

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
8:41:00	70	4.00	
8:47:00	70	3.00	3.33E-03
8:53:00	70	2.75	2.10E-03
8:57:00	70	2.50	1.91E-03
9:01:00	70	2.25	1.80E-03
9:12:00	70	2.00	1.34E-03
9:24:00	70	1.75	1.10E-03
9:37:00	70	1.50	9.49E-04
9:47:00	70	1.25	8.96E-04
10:01:00	70	1.00	8.16E-04
10:42:00	70	0.50	6.44E-04
11:05:00	70	0.00	6.34E-04
		AVERAGE:	**1.41E-03**



Resulting Kfs: **6E-04** **cm/sec**

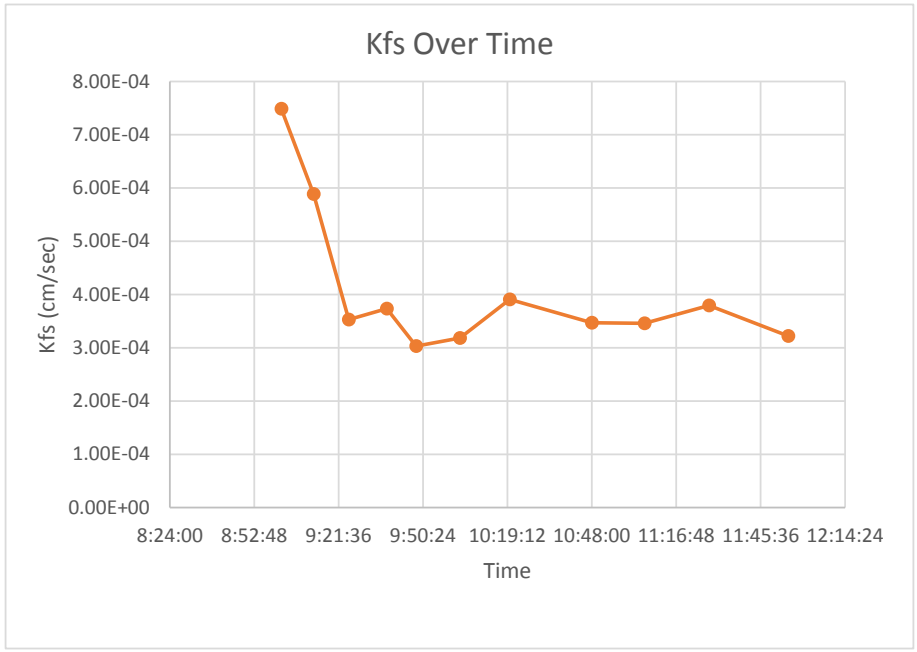
Golder Associates

APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

Test Pit	TP16-02 (TP-32)		
Depth of test	4.5	ft-bgs	**Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):**
BB inner diameter	26.5	cm	
Bucket embedment, d	0	cm	
gamma	8.3	cm	SANDY CLAYEY GRAVEL (GC)
C1	0.993		Hard, brown with no HCL Reaction
C2	0.578		Fine to coarse subrounded gravel
Lg	15.317	cm	Hard to excavate

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
8:55:00	70	3.00	
9:02:00	70	2.75	7.49E-04
9:13:00	70	2.50	5.89E-04
9:25:00	70	2.50	3.53E-04
9:38:00	70	2.25	3.74E-04
9:48:00	70	2.25	3.03E-04
10:03:00	70	2.00	3.18E-04
10:20:00	70	1.50	3.91E-04
10:48:00	70	1.25	3.47E-04
11:06:00	70	1.00	3.46E-04
11:28:00	70	0.50	3.79E-04
11:55:00	70	0.50	3.22E-04
		AVERAGE:	**4.06E-04**



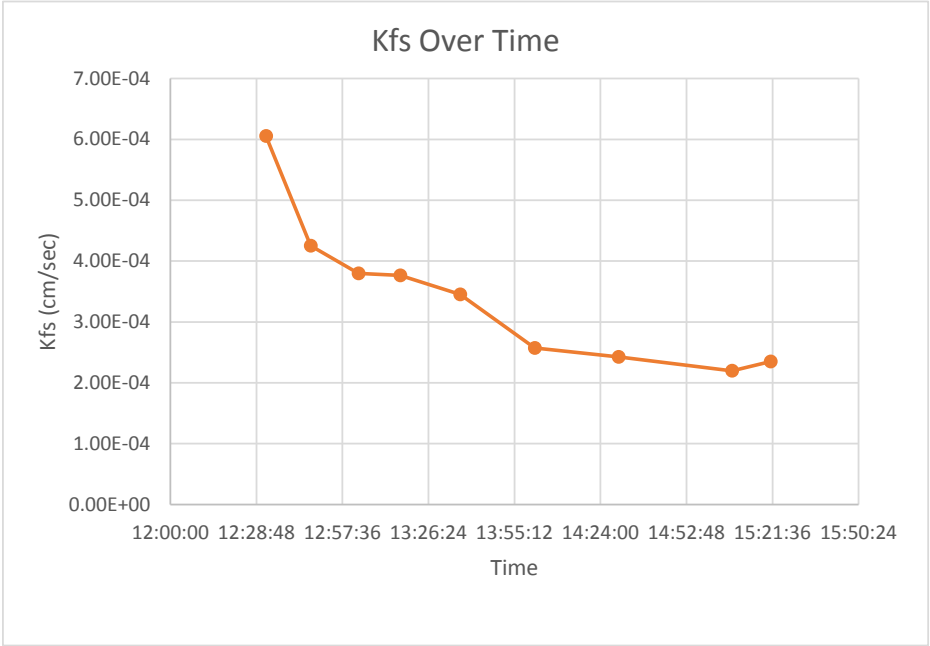
Resulting Kfs: **4E-04** **cm/sec**

APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

Test Pit	TP16-03 (TP-11)		
Depth of test	2.5	ft-bgs	**Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):**
BB inner diameter	26.5	cm	
Bucket embedment, d	0	cm	
gamma	8.3	cm	SANDY CLAYEY GRAVEL (GC)
C1	0.993		Red brown with no HCL Reaction
C2	0.578		Fine to coarse subrounded gravel
Lg	15.317	cm	Hard to excavate

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
12:24:00	70	4.00	
12:32:00	70	3.75	6.06E-04
12:47:00	70	3.50	4.25E-04
13:03:00	70	3.25	3.80E-04
13:17:00	70	3.00	3.77E-04
13:37:00	70	2.75	3.45E-04
14:02:00	70	2.75	2.57E-04
14:30:00	70	2.50	2.42E-04
15:08:00	70	2.25	2.20E-04
15:21:00	70	2.00	2.35E-04
		AVERAGE:	**3.43E-04**



Resulting Kfs: **2E-04** **cm/sec**

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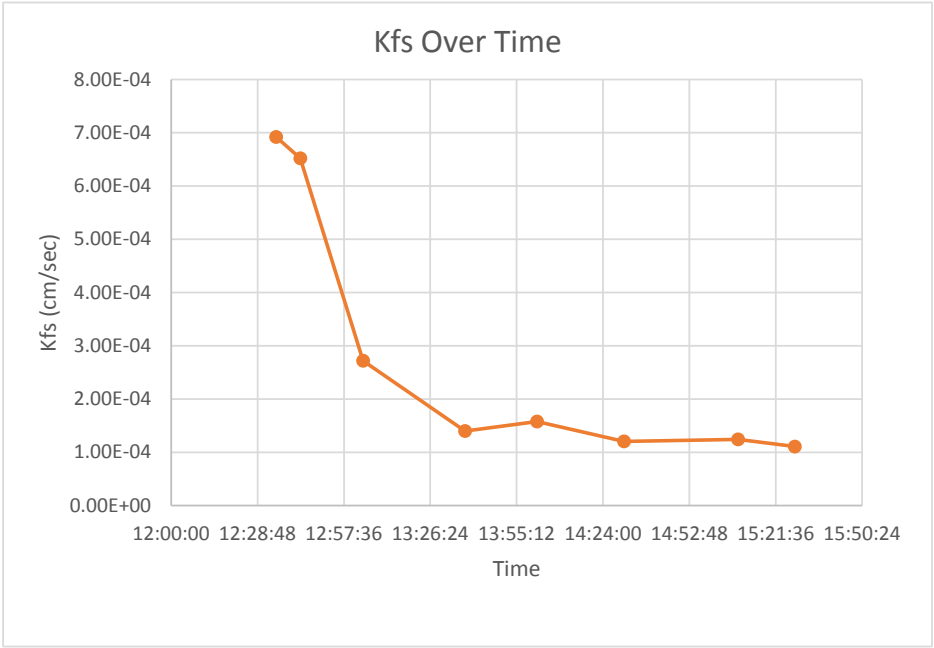
APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

Test Pit	TP16-03 (TP-11)		
Depth of test	4.5	ft-bgs	**Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):**
BB inner diameter	26.5	cm	
Bucket embedment, d	0	cm	
gamma	8.3	cm	SANDY CLAYEY GRAVEL (GC)
C1	0.993		Red brown with no HCL Reaction
C2	0.578		Fine to coarse subrounded gravel
Lg	15.317	cm	Hard to excavate

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
12:28:00	70	4.00	
12:35:00	70	3.75	6.92E-04
12:43:00	70	3.50	6.52E-04
13:04:00	70	3.50	2.72E-04
13:38:00	70	3.50	1.40E-04
14:02:00	70	3.25	1.58E-04
14:31:00	70	3.25	1.20E-04
15:09:00	70	3.00	1.24E-04
15:28:00	70	3.00	1.11E-04
		AVERAGE:	**2.84E-04**



Resulting Kfs: **1E-04** **cm/sec**

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APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

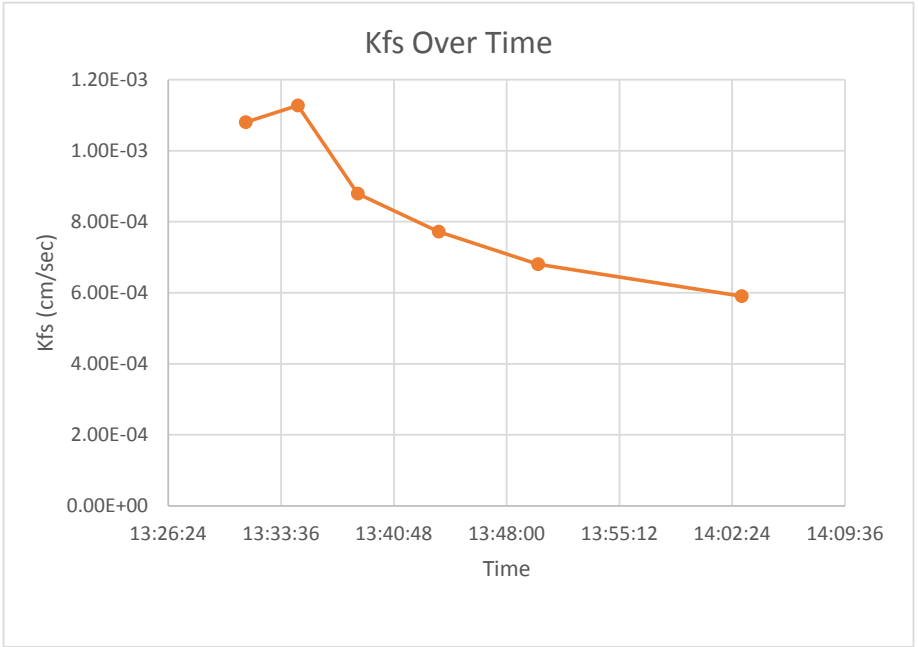
Test Pit	TP16-04 (TP-09)	
Depth of test	4.5	ft-bgs
BB inner diameter	26.5	cm
Bucket embedment, d	0	cm
gamma	100	cm
C1	0.993	
C2	0.578	
Lg	15.317	cm

Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):

Weathered Tuff. Fine grained non plastic. Very dense.
White to very light brown.

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
13:26:30	70	4.00	
13:31:20	70	3.00	1.08E-03
13:34:40	70	2.25	1.13E-03
13:38:30	70	2.00	8.79E-04
13:43:40	70	1.50	7.72E-04
13:50:00	70	1.00	6.81E-04
14:03:00	70	0.00	5.91E-04
		AVERAGE:	**8.55E-04**



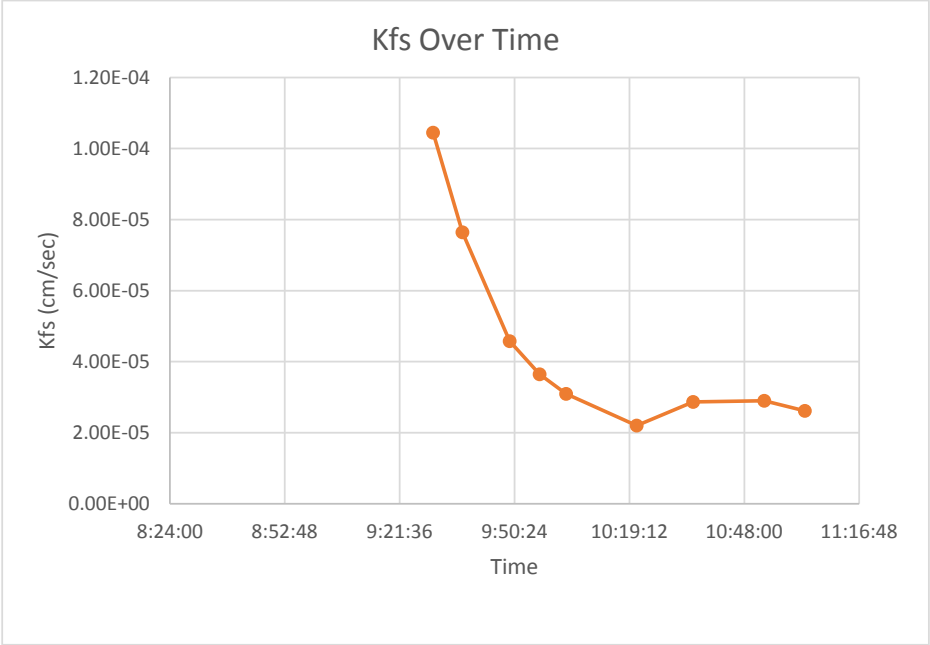
Resulting Kfs: **6E-04** **cm/sec**

APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

Test Pit	TP16-05 (TP-08)		
Depth of test	2.5	ft-bgs	**Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):**
BB inner diameter	26.5	cm	
Bucket embedment, d	0	cm	
gamma	100	cm	Highly Vegetated, Brown clay with gravel on surface.
C1	0.993		Slightly weathered white strong caliche. Hard to excavate.
C2	0.578		Tuff cobbles. Fine to coarse sand. Strong HCL Reaction
Lg	15.317	cm	Very Dense

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
9:19:40	70	2.00	
9:30:00	70	1.80	1.04E-04
9:37:20	70	1.75	7.64E-05
9:49:10	70	1.75	4.58E-05
9:56:40	70	1.75	3.65E-05
10:03:20	70	1.75	3.09E-05
10:21:00	70	1.75	2.20E-05
10:35:10	70	1.60	2.87E-05
10:53:00	70	1.50	2.90E-05
11:03:10	70	1.50	2.62E-05
		AVERAGE:	**4.44E-05**



Resulting Kfs: **3E-05** **cm/sec**

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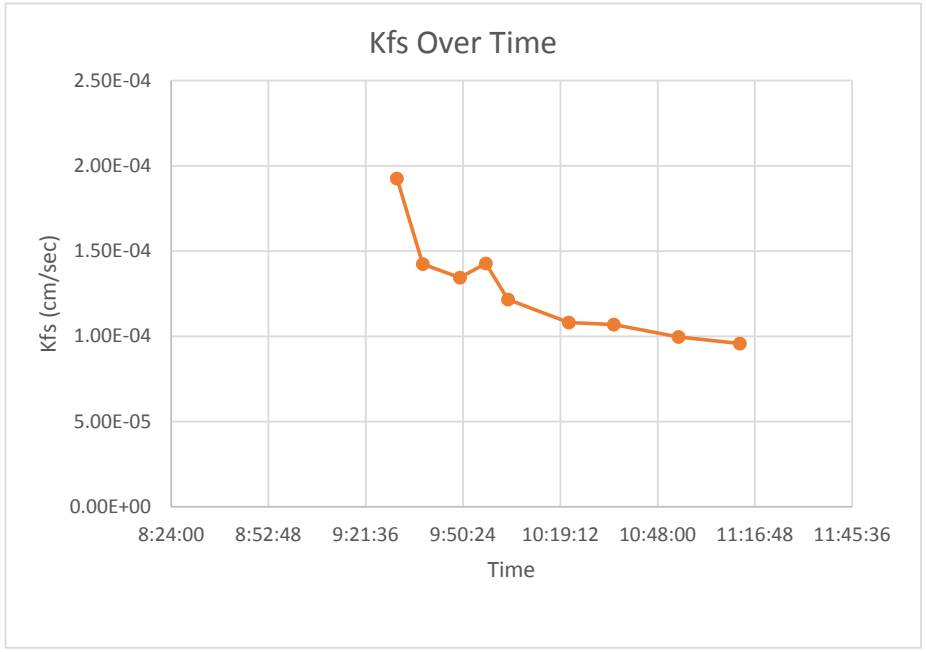
APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

Test Pit	TP16-05 (TP-08)		
Depth of test	4.5	ft-bgs	**Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):**
BB inner diameter	26.5	cm	
Bucket embedment, d	0	cm	
gamma	100	cm	Highly Vegetated, Brown clay with gravel on surface.
C1	0.993		Slightly weathered white strong caliche. Hard to excavate.
C2	0.578		Tuff cobbles. Fine to coarse sand. Strong HCL Reaction
Lg	15.317	cm	Very Dense

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
9:19:50	70	3.00	
9:30:50	70	2.60	1.93E-04
9:38:28	70	2.50	1.42E-04
9:49:30	70	2.25	1.34E-04
9:57:10	70	2.00	1.43E-04
10:03:40	70	2.00	1.22E-04
10:21:40	70	1.75	1.08E-04
10:35:00	70	1.50	1.07E-04
10:54:10	70	1.25	9.97E-05
11:12:20	70	1.00	9.58E-05
		AVERAGE:	**1.27E-04**



Resulting Kfs: **1E-04** **cm/sec**

APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

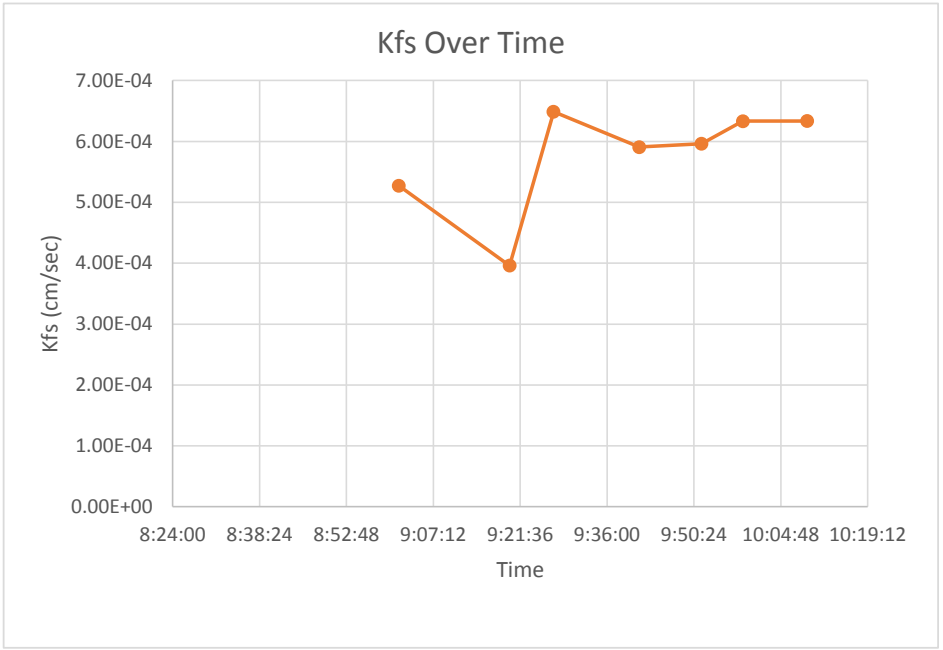
Test Pit	TP16-06 (TP-30)	
Depth of test	2.5	ft-bgs
BB inner diameter	26.5	cm
Bucket embedment, d	0	cm
gamma	8.3	cm
C1	0.993	
C2	0.578	
Lg	15.317	cm

Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):

Highly Vegetated, coarse gravel on surface. 1' of high plasticity clay
Dense sandy silt. Fine to coarse sand and gravel. Light brown to white
Angular gravel with strong HCL reaction

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
8:50:40	70	2.00	
9:01:30	70	1.75	5.27E-04
9:19:50	70	1.50	3.96E-04
9:27:08	70	1.00	6.49E-04
9:41:20	70	0.75	5.91E-04
9:51:40	70	0.50	5.96E-04
9:58:30	70	0.25	6.33E-04
10:09:10	70	0.00	6.34E-04
		AVERAGE:	**5.75E-04**



Resulting Kfs: **6E-04** **cm/sec**

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APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

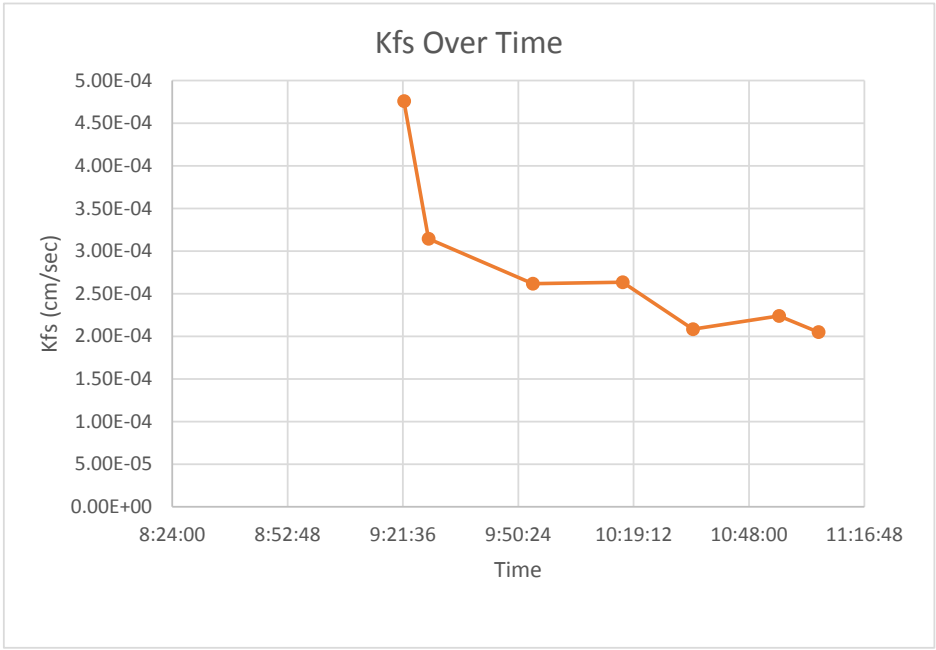
Test Pit	TP16-06 (TP-30)	
Depth of test	5	ft-bgs
BB inner diameter	26.5	cm
Bucket embedment, d	0	cm
gamma	8.3	cm
C1	0.993	
C2	0.578	
Lg	15.317	cm

Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):

Highly Vegetated, coarse gravel on surface. 1' of high plasticity clay
Sandy silt with gravel. Fine to coarse sand and gravel. Light brown to white
Coarse angular gravel with strong HCL reaction.
Very Dense and hard to excavate
Some weak Tuff cobbles

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
9:09:50	70	2.00	
9:21:50	70	1.75	4.76E-04
9:28:00	70	1.75	3.14E-04
9:54:00	70	1.50	2.62E-04
10:16:25	70	1.25	2.63E-04
10:34:00	70	1.25	2.08E-04
10:55:30	70	1.00	2.24E-04
11:05:20	70	1.00	2.05E-04
		AVERAGE:	**2.79E-04**



Resulting Kfs: **2E-04** **cm/sec**

APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

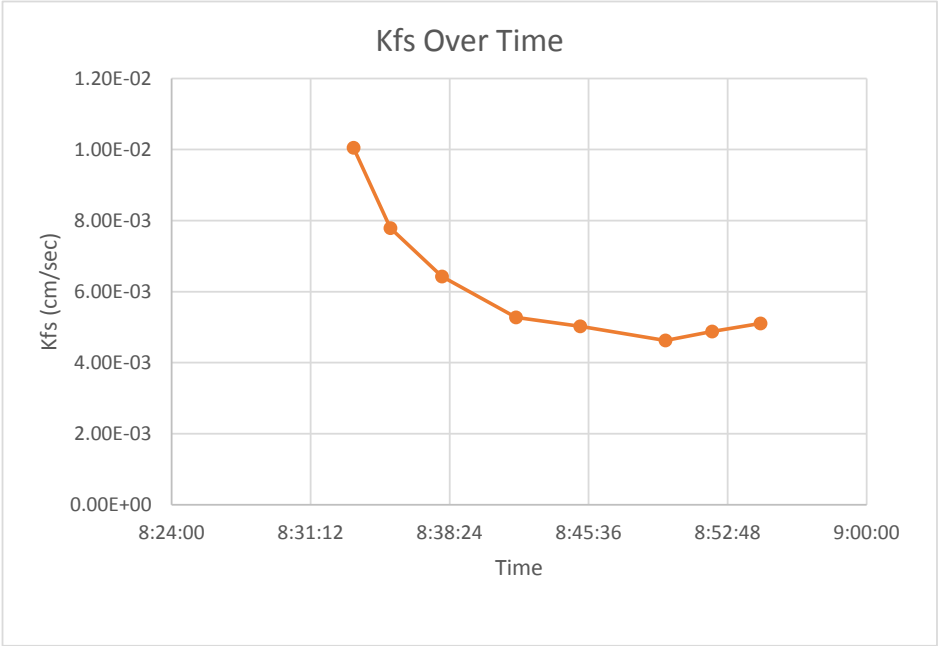
Test Pit	TP16-07 (TP-31)	
Depth of test	2.5	ft-bgs
BB inner diameter	26.5	cm
Bucket embedment, d	0	cm
gamma	2.8	cm
C1	0.993	
C2	0.578	
Lg	15.317	cm

Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):

Site is near a wash. Sandy Gravel. Loose
Able to embed bucket 3". Poorly graded. Brown
Angular gravel with strong HCL reaction

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
8:32:15	70	4.00	
8:33:25	70	3.50	1.01E-02
8:35:20	70	3.00	7.79E-03
8:38:00	70	2.50	6.43E-03
8:41:50	70	2.00	5.28E-03
8:45:10	70	1.50	5.03E-03
8:49:35	70	1.00	4.62E-03
8:52:00	70	0.50	4.88E-03
8:54:30	70	0.00	5.11E-03
		AVERAGE:	**6.15E-03**



Resulting Kfs: **5E-03** **cm/sec**

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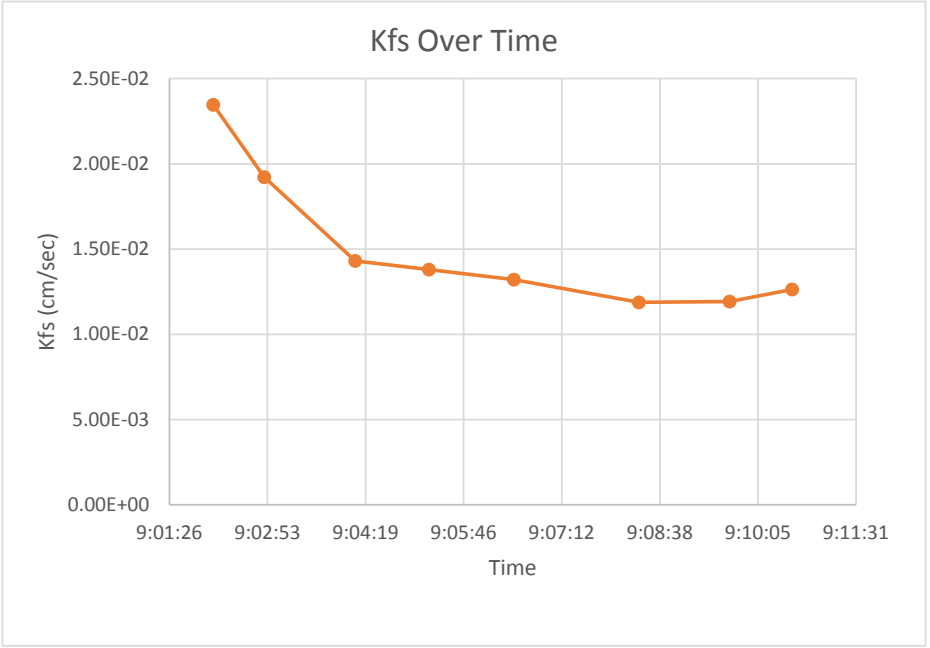
APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

Test Pit	TP16-07 (TP-31)		
Depth of test	5	ft-bgs	**Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):**
BB inner diameter	26.5	cm	
Bucket embedment, d	0	cm	
gamma	2.8	cm	Site is near a wash. Sandy Gravel. Loose
C1	0.993		Able to embbed bucket 3". Poorly graded. Brown
C2	0.578		Angular gravel with strong HCL reaction
Lg	15.317	cm	Slightly Coarser

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
9:01:35	70	4.00	
9:02:05	70	3.50	2.35E-02
9:02:50	70	3.00	1.92E-02
9:04:10	70	2.50	1.43E-02
9:05:15	70	2.00	1.38E-02
9:06:30	70	1.50	1.32E-02
9:08:20	70	1.00	1.19E-02
9:09:40	70	0.50	1.19E-02
9:10:35	70	0.00	1.26E-02
		AVERAGE:	**1.51E-02**



Resulting Kfs: **1E-02** **cm/sec**

APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

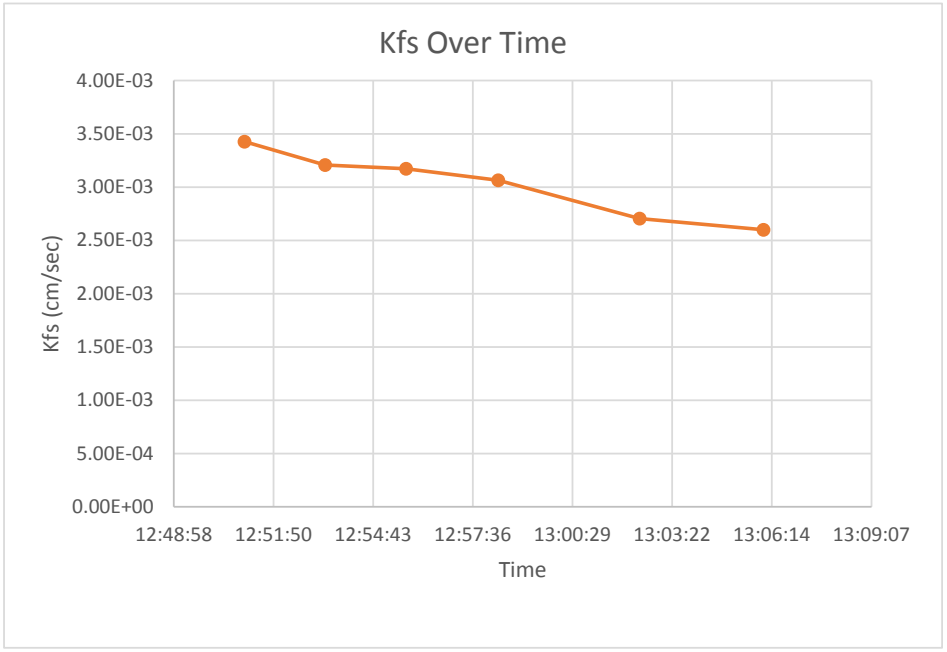
Test Pit	TP16-08 (TP-06)	
Depth of test	2.5	ft-bgs
BB inner diameter	26.5	cm
Bucket embedment, d	0	cm
gamma	25	cm
C1	0.993	
C2	0.578	
Lg	15.317	cm

Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):

Highly Vegetated, coarse gravel with sand on surface.
Gravelly Clay with sand. Fine to med sand. Fine to coarse Gravel
Well graded with no HCL Reaction

Paste In Field Data Here:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
12:49:00	70	3.00	
12:51:00	70	2.50	3.43E-03
12:53:20	70	2.00	3.21E-03
12:55:40	70	1.50	3.17E-03
12:58:20	70	1.00	3.06E-03
13:02:25	70	0.50	2.70E-03
13:06:00	70	0.00	2.60E-03
		AVERAGE:	**3.03E-03**



Resulting Kfs: **3E-03** **cm/sec**

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APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

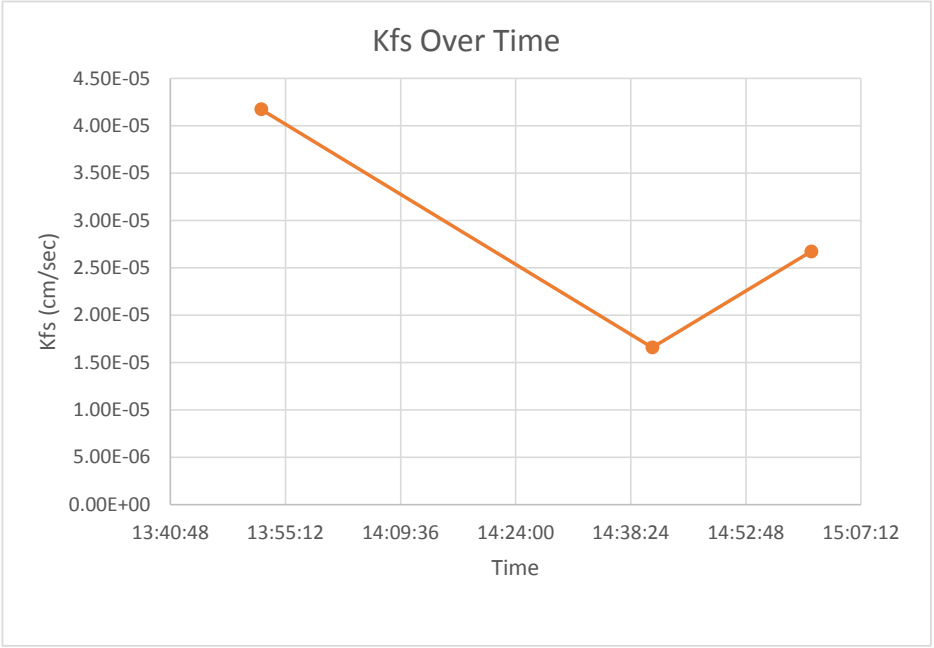
Test Pit	TP16-08 (TP-06)	
Depth of test	5	ft-bgs
BB inner diameter	26.5	cm
Bucket embedment, d	0	cm
gamma	100	cm
C1	0.993	
C2	0.578	
Lg	15.317	cm

Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):

Highly Vegetated, coarse gravel with sand on surface.
Fractured weathered Quartzite Bedrock
No hcl Reaction

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
13:19:50	70	2.00	
13:52:10	70	1.75	4.18E-05
14:41:06	70	1.75	1.66E-05
15:01:00	70	1.50	2.68E-05
		AVERAGE:	**2.84E-05**



Resulting Kfs: **2E-05** **cm/sec**

APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

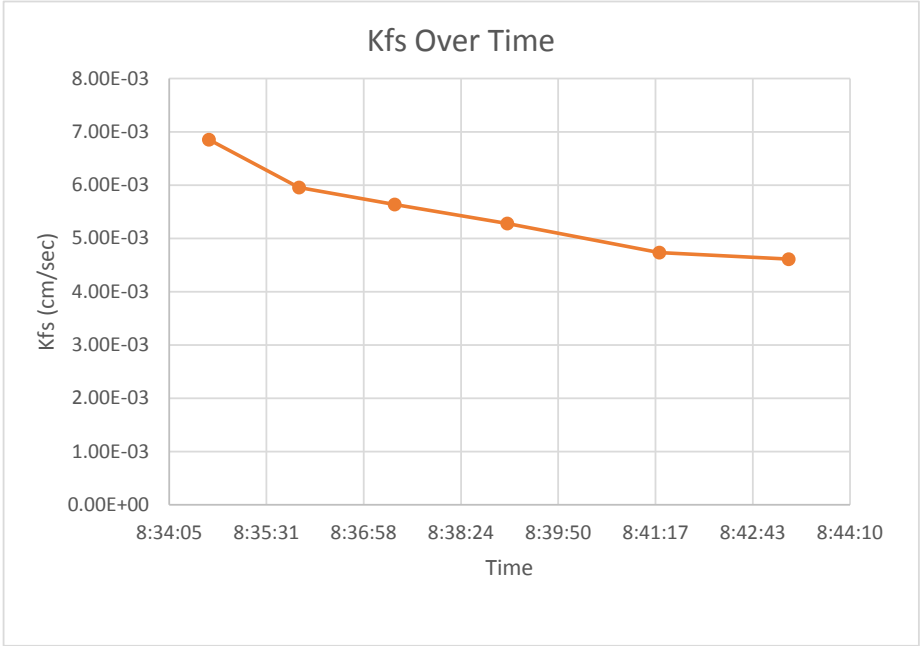
Test Pit	TP16-09 (TP-07)	
Depth of test	2.5	ft-bgs
BB inner diameter	26.5	cm
Bucket embedment, d	0	cm
gamma	25	cm
C1	0.993	
C2	0.578	
Lg	15.317	cm

Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):

Highly Vegetated, coarse gravel with sand on surface.
Gravelly Clay with sand. Fine to med sand. Fine to coarse Gravel
Well graded with no HCL Reaction

Field Data

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
8:33:40	70	3.00	
8:34:40	70	2.50	6.85E-03
8:36:00	70	2.00	5.96E-03
8:37:25	70	1.50	5.64E-03
8:39:05	70	1.00	5.28E-03
8:41:20	70	0.50	4.73E-03
8:43:15	70	0.00	4.61E-03
		AVERAGE:	**5.51E-03**



Resulting Kfs: **5E-03** **cm/sec**

APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

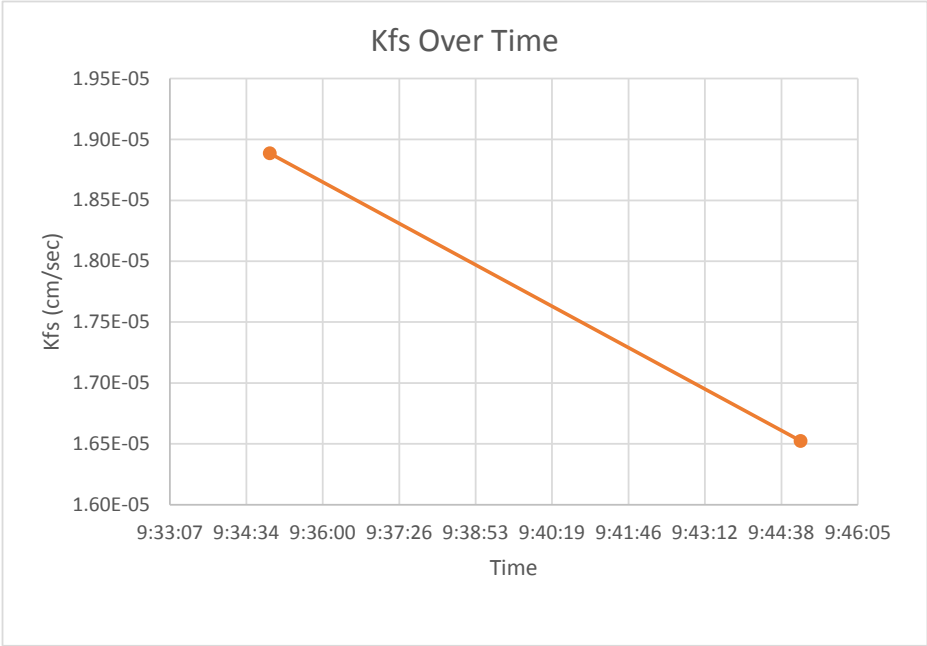
Test Pit	TP16-09 (TP-07)	
Depth of test	5	ft-bgs
BB inner diameter	26.5	cm
Bucket embedment, d	0	cm
gamma	100	cm
C1	0.993	
C2	0.578	
Lg	15.317	cm

Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):

Highly Vegetated, coarse gravel with sand on surface.
Fractured weathered Quartzite Bedrock
No hcl Reaction

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
8:25:00	70	3.00	
9:35:00	70	2.75	1.89E-05
9:45:00	70	2.75	1.65E-05
		AVERAGE:	**1.77E-05**



Resulting Kfs: **2E-05** **cm/sec**

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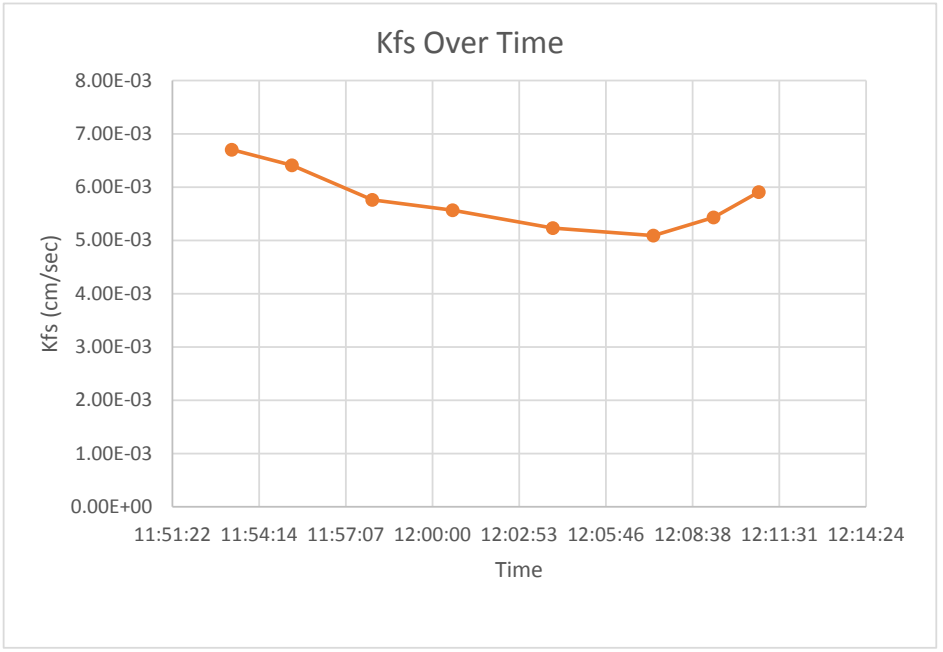
APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

Test Pit	TP16-010 (TP-05)		
Depth of test	2.5	ft-bgs	**Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):**
BB inner diameter	26.5	cm	
Bucket embedment, d	0	cm	
gamma	2.8	cm	Highly Vegetated, sand with some coarse gravel on surface.
C1	0.993		Fine to coarse Sand and Gravel
C2	0.578		Well graded with no HCL Reaction
Lg	15.317	cm	Able to embed bucket

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
11:51:35	70	4.00	
11:53:20	70	3.50	6.70E-03
11:55:20	70	3.00	6.41E-03
11:58:00	70	2.50	5.76E-03
12:00:40	70	2.00	5.57E-03
12:04:00	70	1.50	5.23E-03
12:07:20	70	1.00	5.09E-03
12:09:20	70	0.50	5.43E-03
12:10:50	70	0.00	5.90E-03
		AVERAGE:	**5.76E-03**



Resulting Kfs: **5E-03** **cm/sec**

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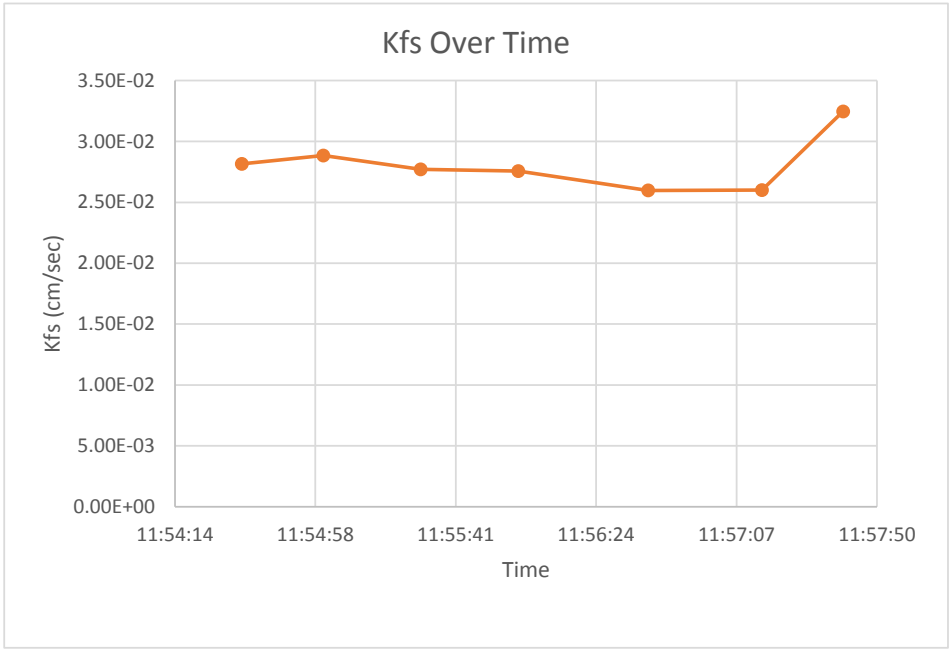
APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

Test Pit	TP16-010 (TP-05)		
Depth of test	5	ft-bgs	**Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):**
BB inner diameter	26.5	cm	
Bucket embedment, d	0	cm	
gamma	2.8	cm	Highly Vegetated, sand with some coarse gravel on surface.
C1	0.993		Fine to coarse Sand and Gravel
C2	0.578		Well graded with no HCL Reaction
Lg	15.317	cm	Able to embed bucket

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
11:54:10	70	4.00	
11:54:35	70	3.50	2.82E-02
11:55:00	70	3.00	2.88E-02
11:55:30	70	2.50	2.77E-02
11:56:00	70	2.00	2.76E-02
11:56:40	70	1.50	2.60E-02
11:57:15	70	1.00	2.60E-02
11:57:40	70	0.00	3.25E-02
		AVERAGE:	**2.81E-02**



Resulting Kfs: **3E-02** **cm/sec**

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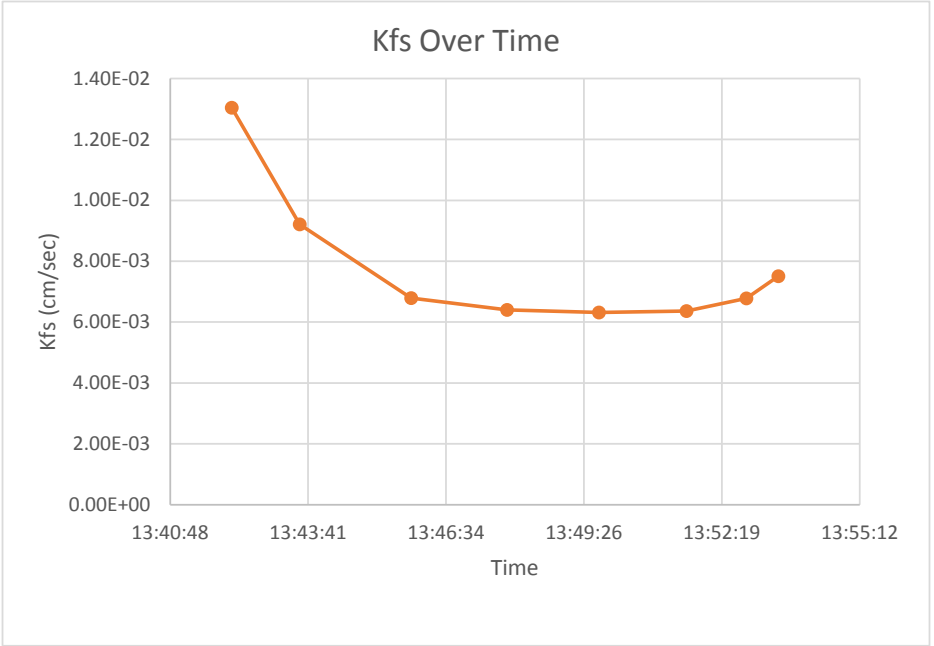
APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

Test Pit	TP16-11 (TP-03)		
Depth of test	3	ft-bgs	**Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):**
BB inner diameter	26.5	cm	
Bucket embedment, d	0	cm	
gamma	8.3	cm	Highly Vegetated, sand with some coarse gravel on surface.
C1	0.993		Clean medium Sand with some gravel
C2	0.578		Poorly graded with no HCL Reaction
Lg	15.317	cm	Able to embed bucket
			Very Loose

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
13:41:20	70	4.00	
13:42:05	70	3.50	1.30E-02
13:43:30	70	3.00	9.21E-03
13:45:50	70	2.50	6.79E-03
13:47:50	70	2.00	6.40E-03
13:49:45	70	1.50	6.32E-03
13:51:35	70	1.00	6.37E-03
13:52:50	70	0.50	6.78E-03
13:53:30	70	0.00	7.51E-03
		AVERAGE:	**7.80E-03**



Resulting Kfs: **6E-03** **cm/sec**

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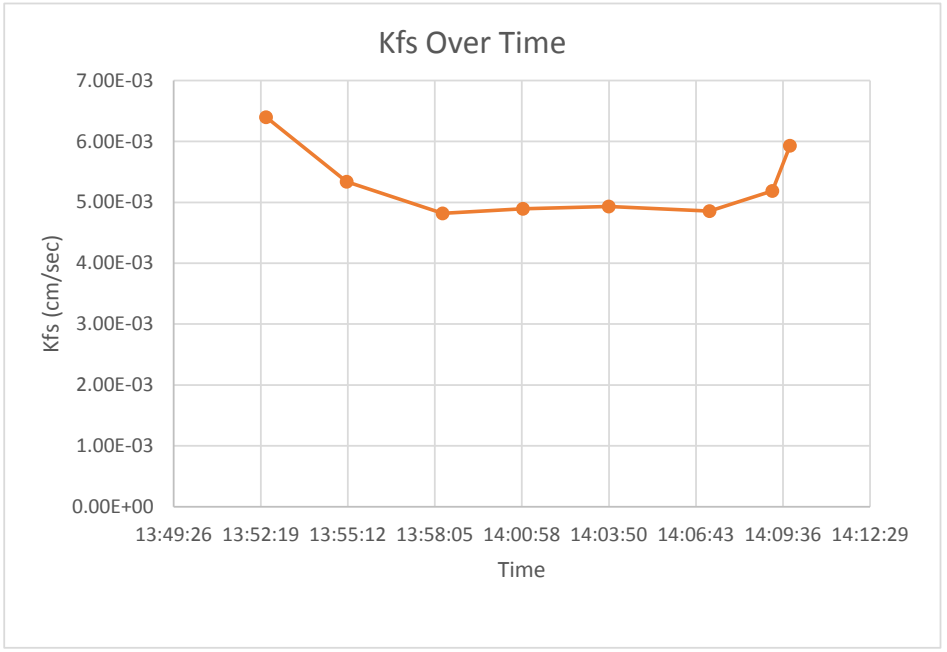
APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

Test Pit	TP16-11 (TP-03)		
Depth of test	5	ft-bgs	**Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):**
BB inner diameter	26.5	cm	
Bucket embedment, d	0	cm	
gamma	2.8	cm	Highly Vegetated, sand with some coarse gravel on surface.
C1	0.993		Fine to coarse Sandy Gravel
C2	0.578		Well graded with no HCL Reaction
Lg	15.317	cm	Able to embed bucket
			Loose

Paste In Field Data Here:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
13:50:40	70	4.00	
13:52:30	70	3.50	6.40E-03
13:55:10	70	3.00	5.34E-03
13:58:20	70	2.50	4.82E-03
14:01:00	70	2.00	4.89E-03
14:03:50	70	1.50	4.93E-03
14:07:10	70	1.00	4.86E-03
14:09:15	70	0.50	5.19E-03
14:09:50	70	0.00	5.93E-03
		AVERAGE:	**5.29E-03**



Resulting Kfs: **5E-03** **cm/sec**

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APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

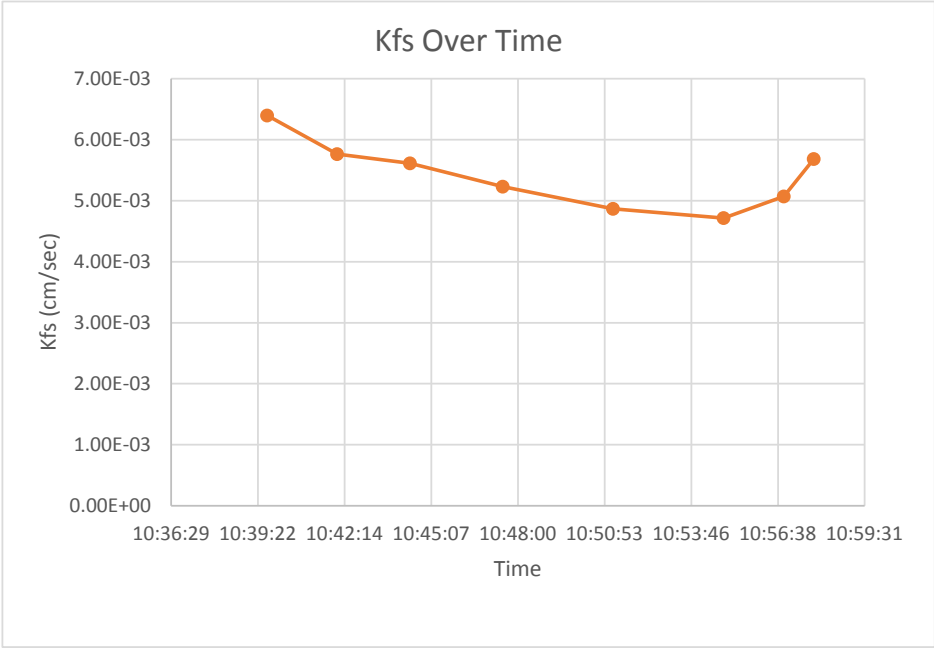
Test Pit	TP16-12 (TP-04)	
Depth of test	3	ft-bgs
BB inner diameter	26.5	cm
Bucket embedment, d	0	cm
gamma	2.8	cm
C1	0.993	
C2	0.578	
Lg	15.317	cm

Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):

Surface is highly vegetated with well graded sandy gravel
Looks like a small wash
Test was performed on sandy gravel with traces of fines
Dark brown with no HCL Reaction.
Dry to moist with subangular gravel

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
10:37:50	70	4.00	
10:39:40	70	3.50	6.40E-03
10:42:00	70	3.00	5.77E-03
10:44:25	70	2.50	5.61E-03
10:47:30	70	2.00	5.23E-03
10:51:10	70	1.50	4.87E-03
10:54:50	70	1.00	4.72E-03
10:56:50	70	0.50	5.07E-03
10:57:50	70	0.00	5.68E-03
		AVERAGE:	**5.42E-03**



Resulting Kfs: **5E-03** **cm/sec**

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APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

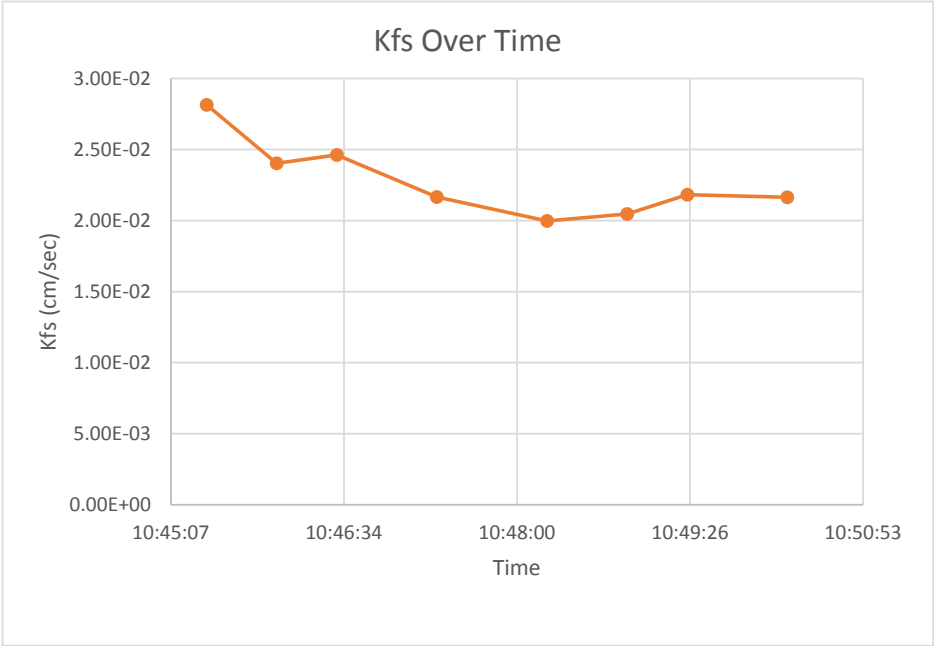
Test Pit	TP16-12 (TP-04)	
Depth of test	5.5	ft-bgs
BB inner diameter	26.5	cm
Bucket embedment, d	0	cm
gamma	2.8	cm
C1	0.993	
C2	0.578	
Lg	15.317	cm

Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):

Surface is highly vegetated with well graded sandy gravel
Looks like a small wash
Test was performed on gravel with traces of sand. Quartz, Schist and Quartzite
Grey with no HCL Reaction.
Dry to moist with subangular gravel

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
10:45:00	70	4.00	
10:45:25	70	3.50	2.82E-02
10:46:00	70	3.00	2.40E-02
10:46:30	70	2.50	2.46E-02
10:47:20	70	2.00	2.17E-02
10:48:15	70	1.50	2.00E-02
10:48:55	70	1.00	2.05E-02
10:49:25	70	0.50	2.18E-02
10:50:15	70	0.00	2.16E-02
		AVERAGE:	**2.28E-02**



Resulting Kfs: **2E-02** **cm/sec**

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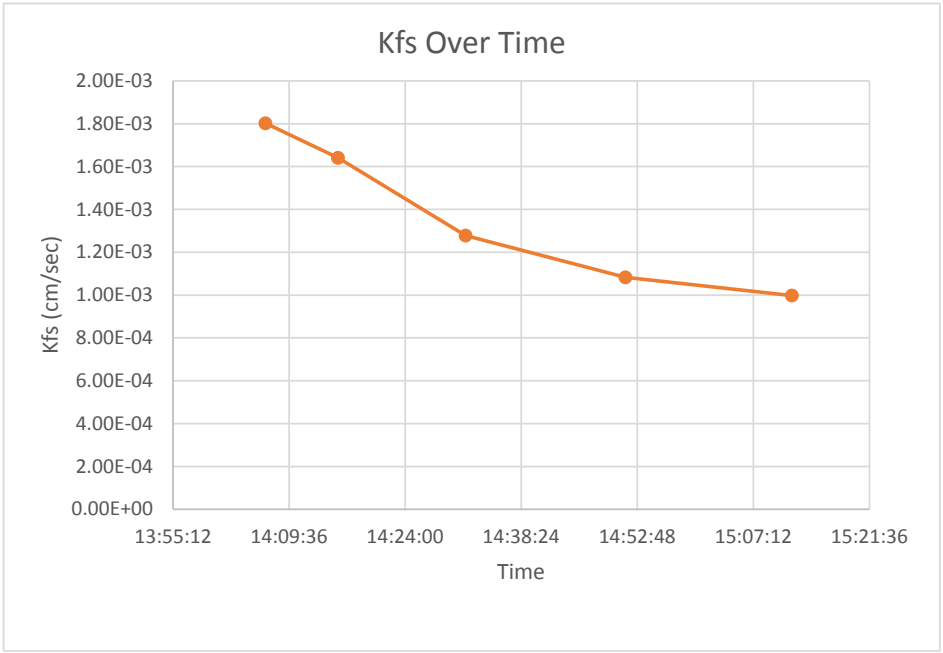
APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

Test Pit	TP16-13 (TP-01)		
Depth of test	3	ft-bgs	**Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):**
BB inner diameter	26.5	cm	
Bucket embedment, d	0	cm	
gamma	2.8	cm	Surface is highly vegetated with well graded gravelly sand
C1	0.993		Test was performed on sandy gravel with clayey fines
C2	0.578		Dark brown with no HCL Reaction.
Lg	15.317	cm	Dense

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
13:59:30	70	3.00	
14:06:40	70	2.50	1.80E-03
14:15:40	70	2.00	1.64E-03
14:31:30	70	1.50	1.28E-03
14:51:20	70	1.00	1.08E-03
15:12:00	70	0.50	9.98E-04
		AVERAGE:	**1.36E-03**



Resulting Kfs: **1E-03** **cm/sec**

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APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

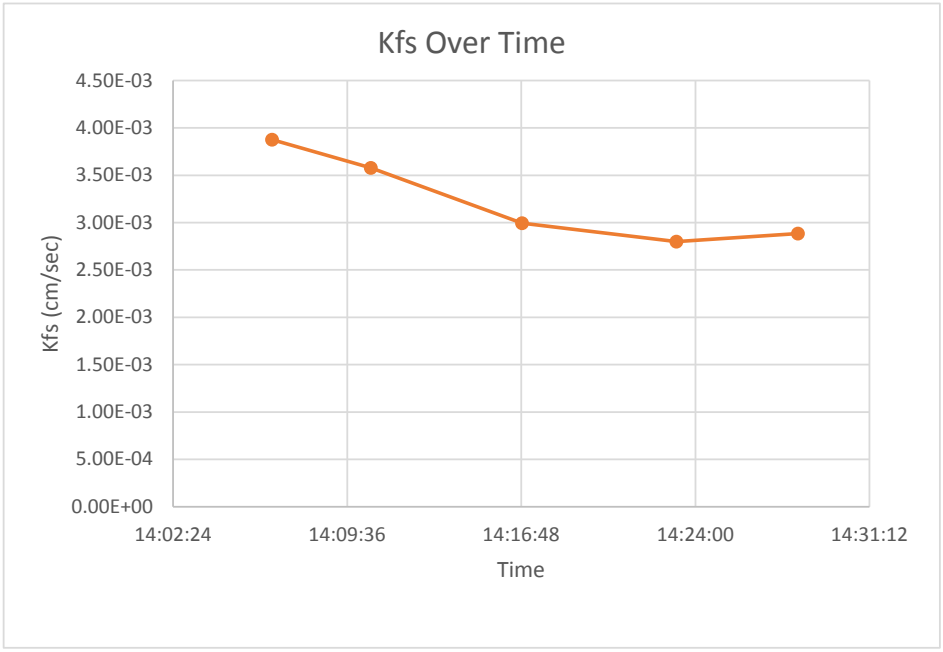
Test Pit	TP16-13 (TP-01)	
Depth of test	5	ft-bgs
BB inner diameter	26.5	cm
Bucket embedment, d	0	cm
gamma	2.8	cm
C1	0.993	
C2	0.578	
Lg	15.317	cm

Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):

Surface is highly vegetated with well graded gravelly sand
Test was performed on sandy gravel with clayey fines. More gravel content
Dark brown with no HCL Reaction.
Dense

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
14:03:10	70	3.00	
14:06:30	70	2.50	3.88E-03
14:10:35	70	2.00	3.58E-03
14:16:50	70	1.50	2.99E-03
14:23:13	70	1.00	2.80E-03
14:28:15	70	0.50	2.88E-03
		AVERAGE:	**3.23E-03**



Resulting Kfs: **3E-03** **cm/sec**

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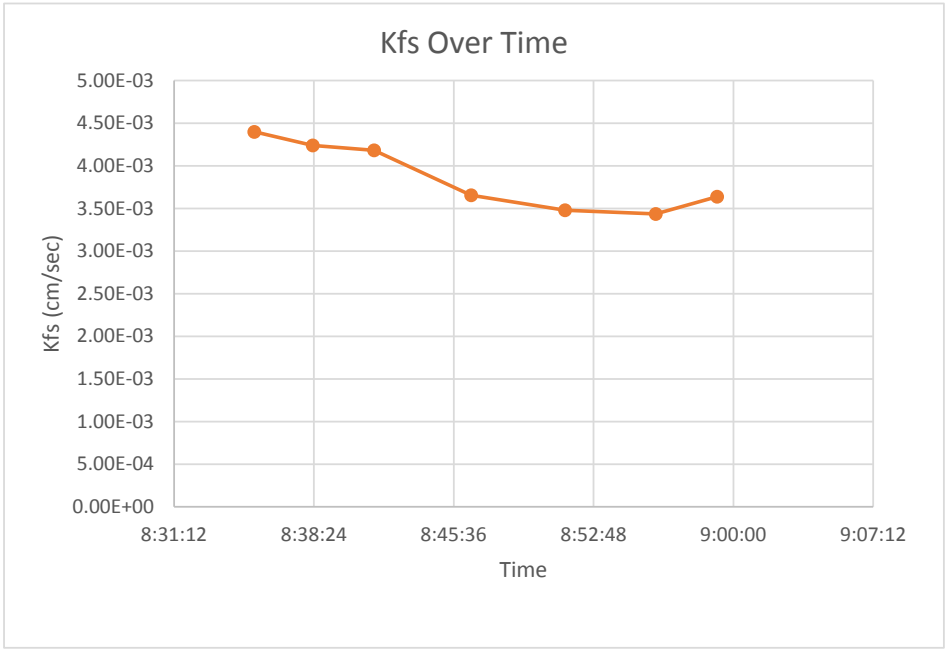
APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

Test Pit	TP16-14 (TP-02)		
Depth of test	2.5	ft-bgs	**Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):**
BB inner diameter	26.5	cm	
Bucket embedment, d	0	cm	
gamma	2.8	cm	Surface is vegetated with well graded sandy gravel
C1	0.993		Test was performed on poorly graded Gravelly sand
C2	0.578		Light brown with no HCL Reaction.
Lg	15.317	cm	Loose

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
8:32:40	70	4.00	
8:35:20	70	3.50	4.40E-03
8:38:20	70	3.00	4.24E-03
8:41:30	70	2.50	4.18E-03
8:46:30	70	2.00	3.65E-03
8:51:20	70	1.50	3.48E-03
8:56:00	70	1.00	3.44E-03
8:59:10	70	0.50	3.64E-03
		AVERAGE:	**3.86E-03**



Resulting Kfs: **4E-03** **cm/sec**

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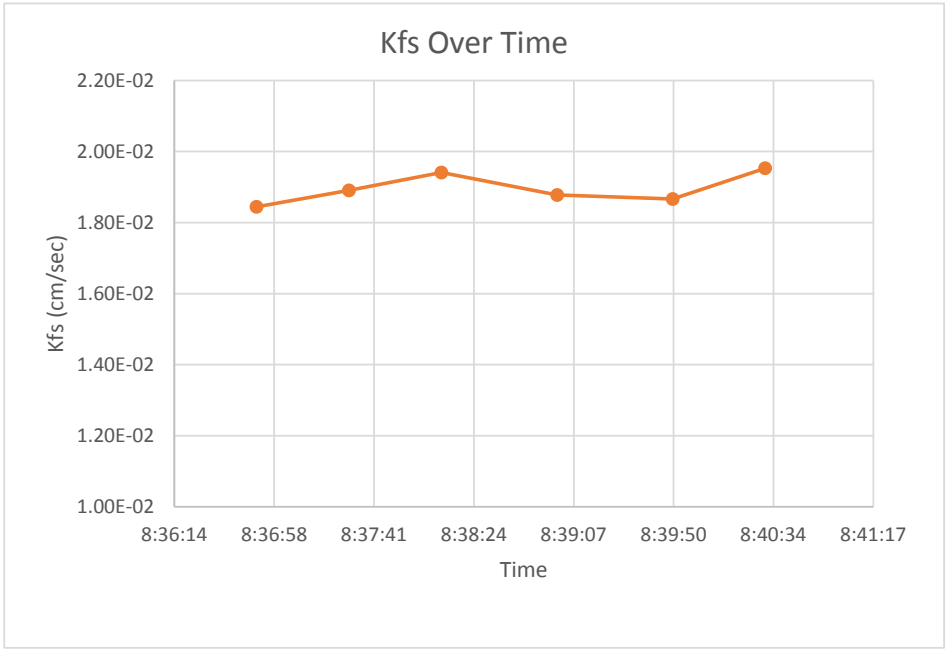
APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

Test Pit	TP16-14 (TP-02)		
Depth of test	5	ft-bgs	**Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):**
BB inner diameter	26.5	cm	
Bucket embedment, d	0	cm	
gamma	2.8	cm	Surface is vegetated with well graded sandy gravel
C1	0.993		Test was performed on poorly graded Gravel with sand
C2	0.578		Light brown with no HCL Reaction.
Lg	15.317	cm	Loose

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
8:36:10	70	3.50	
8:36:50	70	3.00	1.84E-02
8:37:30	70	2.50	1.89E-02
8:38:10	70	2.00	1.94E-02
8:39:00	70	1.50	1.88E-02
8:39:50	70	1.00	1.87E-02
8:40:30	70	0.50	1.95E-02
		AVERAGE:	**1.90E-02**



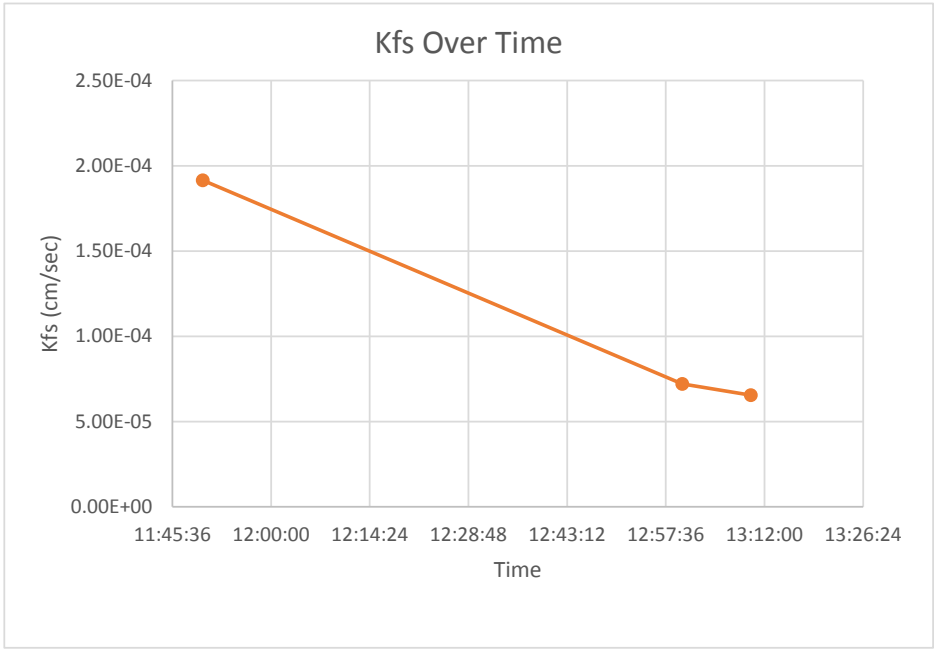
Resulting Kfs: **2E-02** **cm/sec**

APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

Test Pit	TP17-29 (TP-13)		
Depth of test	2	ft-bgs	**Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):**
BB inner diameter	26.5	cm	
Bucket embedment, d	2.5	cm	
gamma	25	cm	Surface is vegetated with Gravel
C1	0.993		SANDY GRAVELLY CLAY (CH)
C2	0.578		Brown with no HCL Reaction.
Lg	17.7995	cm	Soil was wet due to recent rain in the area

Paste In Field Data Here:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
11:20:00	70	4.00	
11:50:00	70	3.60	1.92E-04
13:00:00	70	3.50	7.20E-05
13:10:00	70	3.50	6.55E-05
		AVERAGE:	**1.10E-04**



Resulting Kfs: **7E-05** **cm/sec**

APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

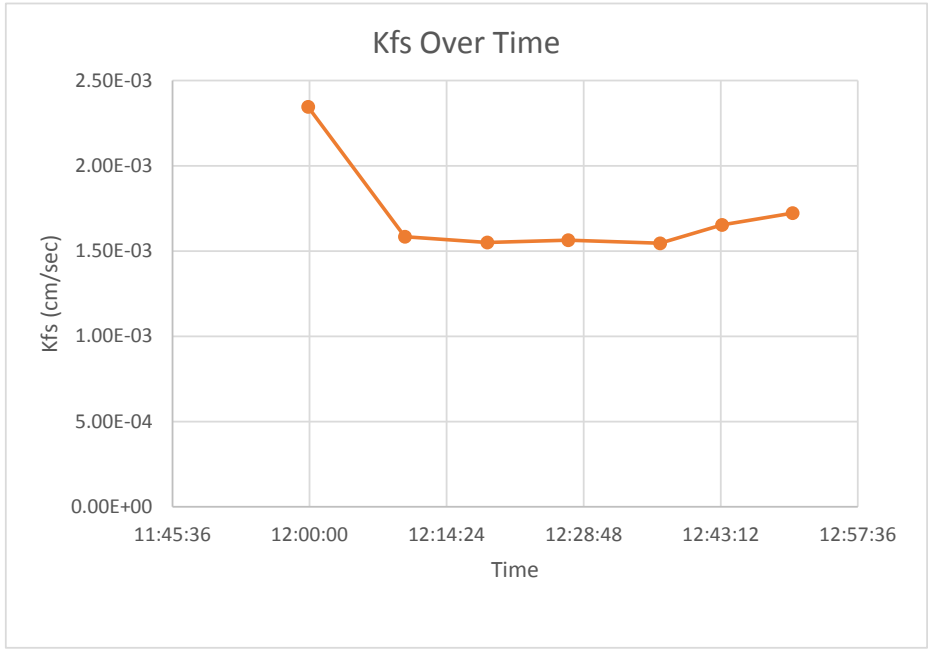
Test Pit	TP17-29 (TP-13)	
Depth of test	5	ft-bgs
BB inner diameter	26.5	cm
Bucket embedment, d	0	cm
gamma	2.8	cm
C1	0.993	
C2	0.578	
Lg	15.317	cm

Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):

Surface is vegetated with Gravel
SANDY CLAYEY GRAVEL (GC)
Brown with no HCL Reaction.

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
11:54:50	70	4.00	
11:59:50	70	3.50	2.35E-03
12:10:00	70	3.00	1.58E-03
12:18:40	70	2.50	1.55E-03
12:27:10	70	2.00	1.56E-03
12:36:50	70	1.50	1.55E-03
12:43:20	70	1.00	1.65E-03
12:50:45	70	0.50	1.72E-03
		AVERAGE:	**1.71E-03**



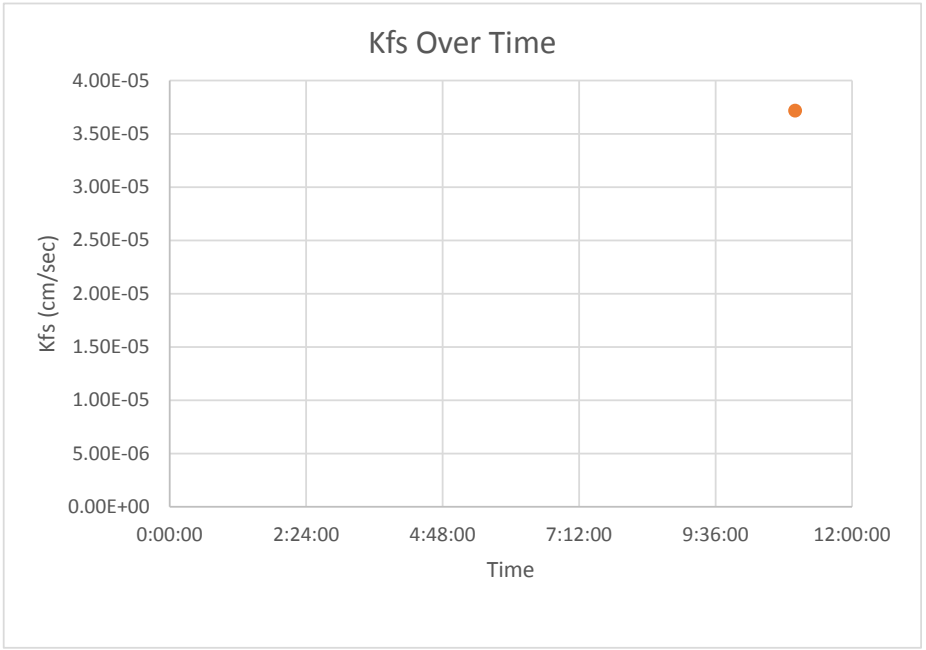
Resulting Kfs: **2E-03** **cm/sec**

APPENDIX D-3 TEST PIT INFILTRATION CALCULATIONS

Test Pit	TP17-30 (TP-12)		
Depth of test	2.5	ft-bgs	**Description of Test location (soil/rock material description, site type, ground disturbances, vegetation, etc.):**
BB inner diameter	26.5	cm	
Bucket embedment, d	0	cm	
gamma	25	cm	Surface is vegetated with Gravel
C1	0.993		SANDY CLAYEY GRAVEL (GC)
C2	0.578		Brown with no HCL Reaction.
Lg	15.317	cm	Soil was wet due to recent rain in the area

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
9:10:00	70	3.00	
11:00:00	70	2.70	3.72E-05
		AVERAGE:	**3.72E-05**

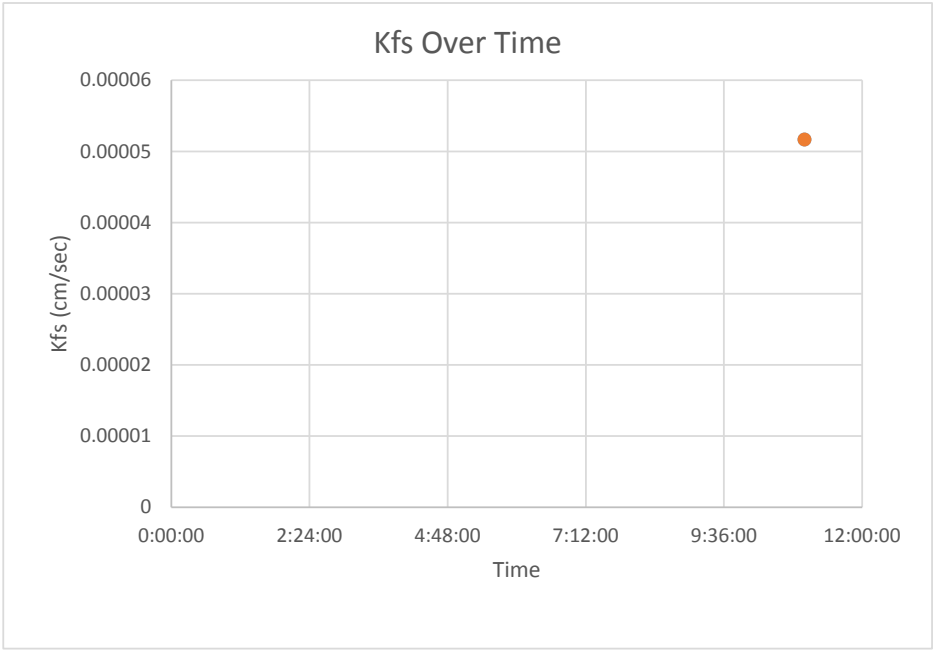


Resulting Kfs: **4E-05** **cm/sec**

Test Pit	TP17-30 (TP-12)		
Depth of test	5	ft-bgs	**Description of Test location (soil/rock material description,**
BB inner diameter	26.5	cm	**site type, ground disturbances, vegetation, etc.):**
Bucket embedment, d	0	cm	Surface is vegetated with Gravel
lambda	25	cm	SANDY CLAYEY GRAVEL (GC)
C1	0.993		Brown with no HCL Reaction.
C2	0.578		Soil was wet due to recent rain in the area
Lg	15.317	cm	

Field Data:

Time (hh:mm:ss)	Temp (°F)	Head (in.)	Kfs (cm/sec)
9:19:35	70	4.00	
11:00:00	70	3.60	5.17E-05
		AVERAGE:	**5.17E-05**



Resulting Kfs: **5E-05** **cm/sec**

Golder Associates

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Golder Associates

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November 2, 2017

US Forest Service
Supervisor's Office
2324 East McDowell Road
Phoenix, AZ 85006-2496

Subject: Resolution Copper Mining, LLC – Mine Plan of Operations and Land Exchange – Baseline Geotechnical Information

Dear Ms. Rasmussen,

Enclosed for your review and consideration, please find copies of the following baseline geotechnical report listed below:

Document Title	Document Date	Author (Organization)	File Key
Near West TSF Geotechnical Field Investigation Summary Report	OCT 2017	Golder Associates	1531436-R-016-Rev0-20171025.pdf

Should you have any questions or require further information please do not hesitate to contact me.

Sincerely,

Vicky Peacey,
Senior Manager, Permitting and Approvals; Resolution Copper Company, as Manager of Resolution Copper Mining, LLC

Cc: Ms. Mary Morissette; Senior Environmental Specialist; Resolution Copper Company

Enclosure(s): Resolution Copper Mining, LLC – Mine Plan of Operations and Land Exchange – Baseline Geotechnical Information