

Cresson Project
Amendment 11
Hydrogeochemistry
Evaluation

Prepared for:

**Cripple Creek & Victor Gold Mining
Company**
Victor, Colorado 80860

Date: December 15, 2015

Project No. 1385



AdrianBrown

Innovative Environmental Solutions

130 West Fourth Avenue
Denver, Colorado 80223
303.698-9080 Fax 303.698-9241
www.abch2o.com

1.	INTRODUCTION	1
2.	DEEP CARBONATE INVESTIGATION	3
3.	REGIONAL HYDROLOGY EVALUATION	5
3.1	Climate	5
3.2	Geology	6
3.3	Surface Water	6
3.4	Ground Water	7
3.4.1	<i>Ground Water Flow</i>	<i>7</i>
3.4.2	<i>Water Table</i>	<i>9</i>
3.4.3	<i>Vertical groundwater flow and infiltration</i>	<i>10</i>
3.4.4	<i>Grassy Valley Perched Water Table</i>	<i>12</i>
3.4.5	<i>Hydraulic Conductivity</i>	<i>13</i>
3.5	Groundwater Model	14
3.6	Potential Hydrologic Impact	16
3.6.1	<i>Impact of Additional Surface Mining on Streamflow and Groundwater Flow</i>	<i>16</i>
3.6.2	<i>Impact of Drainage of the East Wall of East Cresson Mine (WHEX) on Surface Vegetation in Grassy Valley</i>	<i>17</i>
3.6.3	<i>Impact of Underground Exploration and Mining</i>	<i>17</i>
3.6.4	<i>Impact of VLF Facilities on Streamflow and Groundwater Flow</i>	<i>17</i>
3.6.5	<i>Impact of Squaw Gulch Overburden Storage Area on Streamflow and Groundwater Flow</i>	<i>17</i>

3.6.6	<i>Impact of East Cresson Overburden Storage Area on the Hydrology of Grassy Valley</i>	18
3.6.7	<i>Formation of Pit Lakes in Worked Out Surface Mines</i>	19
3.7	Conclusion	19
4.	HYDROGEOCHEMICAL EVALUATION	21
4.1	Hydrogeochemical System	21
4.2	Evaluation of Groundwater Flow and Quality at the Cripple Creek Mining District	21
4.2.1	<i>AMD Model Construct</i>	21
4.2.2	<i>Geochemical Model Data</i>	22
4.2.3	<i>Static Evaluation of Performance of the Groundwater Neutralizing System</i>	23
4.2.4	<i>Dynamic Evaluation of the Performance of the Groundwater Neutralizing System</i>	24
4.3	Carlton Tunnel Water Quality Verification	25
4.3.1	<i>Average Water Quality</i>	25
4.3.2	<i>Chemistry History</i>	25
4.3.3	<i>Geochemical Modeling of the Carlton Water Quality</i>	26
4.4	Conclusion	26
5.	CERTIFICATION	27
6.	REFERENCES	28

List of Tables

Table 1 – Cresson Project Production	31
Table 2 - Cresson Mine Precipitation	32
Table 3 – Hydraulic Head & Gradient at the Cresson Project.....	33
Table 4 –Hydraulic Conductivity of Cresson Project Materials	34
Table 5 – Surface Hydrology Impact of Amendment 11 Project....	35
Table 6 – Groundwater Flow Impact of Amendment 11 Project	36

List of Plates

Plate 1 - Location Plan	38
Plate 2 - Amendment 11 Facilities.....	39
Plate 3 – Geology	40
Plate 4 – Diatreme.....	41
Plate 5 - Conceptual Flow Model.....	42
Plate 6 - Grassy Valley Surface Water Flow.....	43
Plate 7 - Grassy Valley Flow Yield	44
Plate 8 - Carlton Tunnel Flow	45
Plate 9 - Cripple Creek District Water Table.....	46
Plate 10 - Vertical Hydraulic Gradient and Water Table	47
Plate 11 - Perched and Bedrock Water Table Depths	48
Plate 12 - Infiltration Capture by Diatreme.....	49
Plate 13 - Hydraulic Conductivity.....	50
Plate 14 - Groundwater Flow Model Results	51
Plate 15 – Amendment 11 Surface Water Impact	52
Plate 16 - Evaluation of Impact Potential for Drainage to WHEX ..	53
Plate 17 - Impact Potential of ECOSA on Grassy Valley	54
Plate 18 – Hydrogeochemical System Schematic	55
Plate 19 - Acid Generating Capacity	56
Plate 20 – Acid Neutralizing Capacity	57
Plate 21 - Cripple Creek District AGP and ANP	58
Plate 22 – CPC14-3 - Acid-Base Accounting	59
Plate 23 – GHC15-1 - Acid Base Accounting	60
Plate 24 - Neutralizing Capacity - All Mined Material.....	61
Plate 25 - Neutralizing Capacity - All Vadose Material	62
Plate 26 - Carlton Tunnel Flow and Chemistry.....	63

List of Attachments

Attachment 1 – CPC14-3 Deep Carbonate Borehole Report....	64
Attachment 2 – GHC15-1 Deep Carbonate Borehole Report ...	65
Attachment 3 – Deep Carbonate Geochemistry Evaluation	66
Attachment 4 – Ground Water Flow Model	67

1. INTRODUCTION

The Cripple Creek Mining District (“District”) is located in a seven square mile volcanic structure known as the Cripple Creek diatreme (“Diatreme”) in the central Colorado Rocky Mountains near the cities of Cripple Creek and Victor, CO (Plate 1 - Location Plan). Gold has been produced from this District for more than a century, primarily from underground mines operated between 1890 and 1940. To facilitate underground mining, the entire District was dewatered by a series of historic tunnels constructed between the late 1800s and 1942. In 1993 large-scale mining was restarted in the District using surface mining methods, with overburden storage near the mines, and ore processing in valley leach facilities (“VLFs”) at the south end of the District (collectively the “Cresson Project”).

Cripple Creek & Victor Gold Mining Company (“CCV”) is proposing to amend its current permit No. M-1980-244 with Amendment, comprising the following:

- Modify the permit boundary to include a portion of Poverty Gulch and to incorporate the Chicago Tunnel / Proper Adit permit (M-1988-026) into the Cresson Project permit;
- Increase the final crest elevation of the East Cresson Overburden Storage Area (“ECOSA”);
- Modify the final stacking plan for the Arequa Gulch VLF;
- Add underground mining methods;
- Modify the mining and backfilling sequence of the Globe Hill/Schist Island and Wild Horse Extension mine areas; and
- Modify the Amendment 10 affected lands boundary to match the proposed Amendment 11 boundary.

The activities associated with Amendment 11 do not significantly increase production over what was permitted as part of MLE2/Amendment 10 with the exception of production from underground mining activities. Current production projects for life of mine are:

- Mining of approximately 573 million total tons of run-of-mine (“ROM”) rock from the Main Cresson and South Cresson portions of the Main Cresson Mine area, Globe Hill and Schist Island portions of the North Cresson Mine area, and WHEX (Wild Horse Extension) portion of the East Cresson Mine area.
- Mining of approximately 714,000 total tons from the underground Chicago Mine, comprising 394,000 tons of high grade ore for milling, and producing 320,000 tons of development rock which will be used to create a mine platform at the portal, with the balance stored underground.
- Placement of approximately 349 million tons of ore on the Squaw Gulch Valley Leach Facility (“SGVLF”) and on the Arequa Gulch Valley Leach Facility (“AGVLF”) for cyanide leaching to recover gold and silver from the ore.
- Milling of 11 million tons of higher grade ore and placement of product from the mill that has been agglomerated with Portland cement on the AGVLF and SGVLF for final leaching.

- Placement of approximately 224 million tons of overburden in the East Cresson Overburden Storage Area (“ECOSA”), and as backfill in the Main Cresson, Schist Island, and WHEX Mine areas.

The locations of the proposed Amendment 11 operations are presented in Plate 2 - Amendment 11 Facilities.

At the completion of mining activities, the following total tonnages will have been mined and processed by the Cresson Project since the inception of large-scale surface mining in the Cripple Creek District in 1993 (Table 1 – Cresson Project Production):

- Higher Grade Ore approximately 12 million tons
- Ore approximately 592 million tons
- Overburden approximately 974 million tons
- Total Material approximately 1,566 million tons

The activities associated with Amendment 11 and previously approved permit amendments will take place within the District. The geohydrology and geochemistry of the District have previously been evaluated in detail in submissions to the State of Colorado, Division of Reclamation, Mining and Safety (“DRMS”), most recently in support of Amendment No. 10 of CC&V’s Mine Permit (CC&V, 2012). In summary, the mining in the district takes place in the throat of a Tertiary-age volcanic diatreme, which was emplaced in an extensive Precambrian-age granitic rockmass. Essentially all water leaving the mining district infiltrates vertically through the diatreme to the regional water table, and flows through historic drainage tunnels under permit to the regional surface water system.

This report presents an update of the system-wide understanding of the regional hydrologic and geochemical processes that control the quantity and quality of water that infiltrates through the elements of the Amendment 11 project into the Diatreme and contiguous rocks, and migrates vertically downward to the regional ground water system. The update is based primarily on the installation of two deep investigation boreholes that were drilled into the Cripple Creek mining district to provide additional information to continue to affirm the two basic hydrogeochemical questions for permitting the mining proposed in this Amendment:

1. Does the Cripple Creek diatreme tunnel system collect all groundwater that infiltrates from mining activities in the District?
2. Does the Cripple Creek diatreme contain sufficient accessible carbonate to neutralize the total inventory of acid rock drainage that may be produced by oxidation of sulfides in all mined material in the district?

2. DEEP CARBONATE INVESTIGATION

The groundwater and geochemical condition of the deep bedrock in the mining district was investigated for Amendment 11 by the installation of two boreholes in the northern portion of the District, where the majority of the proposed mining of Amendment 11 will take place, and are located on Plate 2 - Amendment 11 Facilities.

1. CPC14-3. This borehole was drilled at an angle of approximately 60° to the northeast to a total depth of 4,368 feet, by rotary and core drilling. Complete details of the drilling, sampling, logging, surveying, testing and completion of the borehole are provided in Attachment 1.
2. GHC15-1. This borehole was drilled vertically to a total depth of 3,875 feet, by rotary and core drilling. Complete details of the drilling, sampling, logging, surveying, testing and completion of the borehole are provided in Attachment 2.

Each borehole was evaluated and the results summarized as follows:

1. Drilling: The holes were drilled using rotary and core drilling equipment, utilizing injected water and foam. No major drilling problems occurred, but relatively large amounts of (clean) water and additives were injected due to lost circulation issues in the upper portions of both holes above the water table. Injected water was tagged with fluorescein to allow identification of impact on subsequent water samples. Each hole took approximately a month to drill and test.
2. Rock sampling: Rock samples were taken approximately every 5 feet, logged, crushed, and aggregated into a variety of products for testing. In general core recovery was good to excellent, and core quality adequate for all logging and testing purposes.
3. Water Sampling: Water samples were obtained during drilling from packed-off intervals in the hole using air-lifting and bailer sampling. This was very difficult to achieve, due to problems seating packers, the great depth to water (1,800 feet in CPC14-3 and 2,500 feet in GHC15-1), low submergence of the air-lift technology, low yield from the relatively low permeability rocks, and the impact of the injected drill-water on the samples.
4. Permeability Testing: Permeability tests were performed in packed-off intervals during drilling, using falling head test (FHT) technology with injected (marked) water. A total of six falling head tests were ultimately achieved in the two holes, after identifying and resolving packer-seating and other technical issues resulting from the depth and variable hole diameter (HQ, NQ). The hydraulic conductivity of segments of each hole was variable, ranging from 10^{-4} cm/sec to 10^{-8} cm/sec. Overall, CPC14-3 averaged about 2×10^{-6} cm/sec (low for fractured volcanic rock), while GHC15-1 averaged 9×10^{-5} cm/sec (high for volcanic rock).
5. Survey: The holes were surveyed over the entire depth on completion. There was little deviation in either hole.
6. Completion: After drilling, five vibrating wire piezometers were grouted into each hole to allow long-term piezometric pressure monitoring. The installation was achieved to the great depths in each hole without significant problem by Schlumberger Water Services, by attaching the piezometers to a single fiberglass rod, and grouting in retreat. All installed piezometers are

operational. It has required more than 6 months for the water pressures to equilibrate from the effects of injection of drilling water. The equilibrated (static) groundwater elevations that were calculated from the measurements are 8,285 feet above mean sea level (ft amsl) for CPC14-3 to the north and 7,793 ft amsl for GHC15-1 more to the south. Both static levels are significantly higher than expected, well above the level of the Carlton Tunnel (6,985 ft amsl), and suggest a relatively large hydraulic head gradient (and groundwater flow) from north to south towards the Carlton Tunnel.

7. Geological Logging: The recovered drill chips and core were logged for geology, lithology, and geotechnical characteristics as appropriate. Core was also photographed. The rocks recovered were largely Tertiary volcanics, with some inliers of Precambrian granitics encountered in the lower levels of CPC14-3 to the north as it approached the edge of the diatrema. Rock quality was in general “high” (i.e. low fracturing intensity and high strength), particularly in the saturated portion of CPC14-3, where there was very little fracturing.
8. Solids Analyses: Samples of rock solids were chemically analyzed for carbon, sulfur, metals, Net Acid Generation (NAG), Acid Base Accounting (ABA), and isotopes. In addition a total of 10 Humidity Cell Tests (HCT) are being performed for sulfide oxidation kinetics. The critical chemical parameter for this study is carbonate. In both holes carbonate is limited in the mining zone above 9,000 ft amsl (i.e. about 0.2% calcite), and is higher in the groundwater transport and neutralization zone below 9,000 ft amsl (2% calcite in CPC14-3, and 7% calcite in GHC15-1).
9. Groundwater Analyses: Water samples were analyzed for major ions, metals, and isotopes. The groundwater in the vicinity of the two deep carbonate holes has moderate calcium, sulfate, and bicarbonate, and very low metals. This is similar to Carlton Tunnel water, but at considerably lower concentrations.

The results from this investigation have been aggregated with the results from earlier investigations to address geohydrological and geochemical conditions in the District.

3. REGIONAL HYDROLOGY EVALUATION

The regional ground water system associated with the District is dominated by the Cripple Creek Diatreme, a volcanic caldera approximately 7 square miles in area (Plate 3 – Geology and Plate 4 – Diatreme). The Diatreme is located within the host Precambrian-age granite, granodiorite, gneiss, and schist. The diatremal and immediately adjacent rocks contain the ore bodies in the District, and therefore contain most of the past and proposed mining activities.

The diatremal rocks are moderately permeable, while the surrounding Pikes Peak granite is of lower permeability. As a result, the Diatreme is an enclosed regional ground water regime, with limited hydrologic interaction with the surrounding rockmass. This has been observed from the earliest times of evaluation of the hydrology of the area, as reported in a study performed by Lindgren and Ransome (1906):

“The records of the various drainage tunnels all suggest the same conclusion, namely that the volcanic neck, filled with breccia and eruptive rocks, contains a body of water which is prevented from escaping into the streams of the region by the relatively impervious character of the older crystalline rocks of the prevolcanic plateau. The relation is suggestive of a water-soaked sponge set in a glass cup.

“For all practical purposes, therefore, the underground water of the central part of the Cripple Creek district is to be regarded ... as an underground lake or pond bounded by the steep walls of the old volcanic throat.”

Historic drainage tunnels driven into the Diatreme in the 20th Century have drained the regional ground water flow in the District from the Diatreme and the immediately adjacent granite. The Carlton Tunnel is the deepest (approximate elevation 7,000 ft msl) and most recent (1941), and has created a reduction in the ground water table in the diatremal rockmass to approximately 3,500 feet below the original ground surface.

The source of ground water in the vicinity of the Diatreme – which is at the top of a large hill – is precipitation. The precipitation impinges on the surface of the District and surrounding areas, and then runs off, evaporates, transpires, or infiltrates. Percolating water within and immediately contiguous to the Diatreme moves vertically downwards until it ultimately reaches the deep saturated regional ground water system, and then flows laterally from the region through the Carlton Tunnel.

This conceptual hydrologic flow model of the District is presented schematically in Plate 5 - Conceptual Flow Model.

3.1 Climate

The hydrologic system in the District and surrounding areas is controlled by precipitation. The precipitation in the District has been measured since the current surface mining has been undertaken, and is presented by month in Table 2 - Cresson Mine Precipitation. In the period 1992-2015, the area received an average of 19.30 inches per year of total precipitation; one third of the total fell in the winter and spring (mostly as snow), and two thirds fell in spring and summer.

Season	Months	Precipitation (inches)	
		Average	2015
Winter	Dec-Feb	1.89	4.43
Spring	Mar-May	5.08	9.62
Summer	Jun-Aug	9.44	10.07
Fall	Sep-Nov	2.89	2.17
Year	Jan-Dec	19.30	26.29

It should be noted that the spring thaw period of 2015 was unusually wet, being preceded with twice the normal snowfall in winter, followed in spring with 9.62 inches of total precipitation which is also twice normal; and 6.29 inches of that total fell in May, right during the thaw period. This caused flooding and unusually wet conditions in and around the mining facility.

3.2 Geology

The District is located in the Diatreme; a Tertiary-age volcanic caldera filled with phonolites and welded hydrothermal breccia, surrounded by Precambrian granite, granodiorite, schist, and gneiss (Plate 3 – Geology).

The Diatreme is a breccia-filled volcanic pipe that was formed by volcanic activity at three eruptive centers. The volcanic inclusion extends to great depth, narrowing with a subsurface “mushroom” shape identified by drilling and geophysical evaluation as shown in Plate 4 – Diatreme.

3.3 Surface Water

Streamflow is monitored at a number of locations in the District¹. The monitoring indicates that little water runs off from the Diatreme footprint in any of the streams that flow from the District.

The principal surface water outflow that exits from the Diatreme occurs to the east from the footprint of Grassy Valley, located in the northeast portion of the District. The flow in Grassy Valley has been monitored continuously since 1997, on an approximately monthly spot basis². The results for the principal flow-monitoring station are presented, along with the monthly precipitation, on Plate 6 -

¹ The results of the flow and quality monitoring in the District are presented in the Cresson Project Hydrologic Evaluation, Amendment 11, Volume II, Appendix 2.

² The flow was monitored by hand on a periodic basis (approximately monthly) in Grassy Valley at five locations from 1997 through the present. The results were reported in the MLE2 Hydrogeochemical Report (ABC, 2008). However, the monitoring did not provide an accurate measure of the actual streamflow, because the flow was highly intermittent, with the stream not flowing for much of the year except when the average daily temperature is above zero, and there is precipitation of more than approximately 0.24 inches within the prior two days, or the small spring snowmelt is occurring, typically over a few days in mid-April. Further, flow readings are typically concentrated on periods of precipitation or snowmelt, resulting in an over-estimate of the overall flow from the basin. Continuous monitoring was initiated in September 2009, and has been maintained since. The continuous monitoring of the flow in streams at this elevation presents substantial challenges, due to freezing of the stilling well attached to the flume from mid-October through mid-April, and erosion around and siltation within the Parshall flumes during the remainder of the year due to the storm-driven flash-flood nature of much of the flow. As a result, a substantially complete record has only been obtained at one location (GV-03) for one calendar year (2010). These data are used for the evaluation reported herein.

Grassy Valley Surface Water Flow. The maximum flow observed in the valley is 565 gpm (approximately 1.25 cubic feet per second), which occurred during the spring thaw and heavy precipitation this spring (2015). Almost all of the rest of the time there is no flow in Grassy Valley, or in any of the other small gulches that lead from the District.

The productivity of the Grassy Valley area has been computed using data from 2010, a year where continuous monitoring of flow was successful through the thaw, summer, and the fall until freeze-up. The resulting continuous record of flow is presented in Plate 7 - Grassy Valley Flow Yield. This data was used to compute the basin yield from the precipitation:

Grassy Valley Basin Yield (2010) = 0.103 inches per year = 0.69% of precipitation

This is a very small basin yield; normal montane yields are in the order of 25-40%.

In summary, there is almost no surface water flow in the valleys and gulches that exist over the Diatreme. Most surface water infiltrates to the basin soil and bedrock before forming streams, and none re-emerges from the ground as springs within the footprint of the Diatreme.

3.4 Ground Water

3.4.1 Ground Water Flow

Ground water flow in the District has been collected and removed from the Diatreme since 1903 by three principal historic drainage tunnels (Plate 4 – Diatreme):

1. Moffat Tunnel. The Moffat Tunnel was driven in 1903 from a portal elevation of 8,800 feet from the south of the city of Cripple Creek to the north-east, and is approximately one mile long (Lindgren and Ransome, 1906). Flow from the tunnel was initially as much as 11,000 gpm, reducing to less than 2,000 gpm by 1906. Flow from the tunnel ceased when tunnels at lower elevations reduced the water level in the Diatreme below the elevation of the tunnel.
2. Roosevelt Tunnel. The Roosevelt Tunnel was driven between 1910 and 1917 from a portal located southwest of the city of Cripple Creek, at an elevation of 8,100 feet (Sheldon, 1915). The tunnel was ultimately driven 4.6 miles, reaching into the heart of the District. Flow from the portal rose to nearly 9,000 gpm by 1917, dropping back by the end of that year to about 4,000 gpm (Henderson, 1926). Flow from this tunnel largely ceased when the Carlton Tunnel was installed at a lower elevation.
3. Carlton Tunnel. The Carlton Tunnel was driven in 1939-1942 from a portal elevation of 6,890 feet, with the portal located immediately downstream of the confluence of Cripple Creek with Fourmile Creek (Vivian, 1940). The tunnel was ultimately driven approximately 6 miles and enters the southern portion of the Diatreme at an elevation of 6985 feet. Flow from the tunnel was estimated to be 125,000 gpm after breakthrough into the Portland No. 2 Shaft, but reduced rapidly to its then-normal flow rate of 7,000 gpm (Vivian, 1941). The flow has decreased since, and today is approximately 1,690 gpm. Water from the Carlton Tunnel flows under permit to Fourmile Creek, immediately downstream of its confluence with Cripple Creek (Plate 8 - Carlton Tunnel Flow).

The flow from the Carlton Tunnel portal passes through a sediment pond system, which when constructed in 1989 had a retention capacity of 1 million gallons. Flow from the tunnel was measured at the portal from 1989 through 1996. The monthly flows for this period are presented together with the precipitation in the District in Plate 8 - Carlton Tunnel Flow.

In 1996 major modifications were made at the Carlton Tunnel portal. The four settling ponds were taken out of service and cleaned of sediment, a fifth pond was installed to raise the capacity of the ponds to 1.25 million gallons, and the flow measurement flume and sampling location were moved to a location on the portal bench, immediately downstream of the settling ponds. The reported flow readings in 1996 show a reduction from those measured at the portal, and measured flows in subsequent years are consistently lower than flows prior to these changes (Plate 8 - Carlton Tunnel Flow).

In 2008 further modifications were made to the Carlton Tunnel portal pond system to enhance the sediment-capture performance of the system. A sixth sediment pond was added near the portal of the tunnel, increasing the total pond volume area to 1 acre, and increasing the total pond storage capacity to 1.6 million gallons.

For the purposes of evaluating the regional ground water system, the flow from the Carlton Tunnel portal is required. To achieve this, a correction has been applied to the measured flow, as follows:

1. An increase in the flow measured downstream of the ponds, calibrated by comparing the flow above the ponds and below the ponds after the modifications made in 1996.
2. A further increase in the flow measured downstream of the ponds after the modifications in 2008, calibrated by matching the flow below the ponds before and after the change.

The Carlton tunnel portal flows are shown by month in Plate 8 - Carlton Tunnel Flow. The results show three distinct periods of flow, the pre-mining period through 2002, 2002-2014, and 2015. The periods have different flow rates, different precipitation rates, and different percentages of seepage passing through the diatreme, as shown on Plate 8, and reproduced below:

Time period	1992-2002	2003-2014	2015
Average flow (gpm)	1691	1504	1727
Infiltration area (square miles)	8.7	8.7	8.7
Seepage rate (inches/year)	5.9	5.2	6.0
Precipitation rate (inches/year)	19.47	18.57	25.22
Seepage rate (% precipitation)	30%	28%	24%

The results support the following conceptual model of precipitation infiltration and flow to the Carlton Tunnel:

1. Infiltration is driven by precipitation. The higher the precipitation, the higher the infiltration and the flow from the Carlton Tunnel. The tunnel flow in 2015 was 15% higher than it had been for the previous 11 years, but the precipitation in 2015 was also 14% higher than it had been in the same period.

2. The proportion of precipitation that infiltrates is declining due to mining. Before the current surface mining program, 30% of incident precipitation passed out of the Carlton Tunnel. When the program increased to full mining rate of 50 million tons per year in about in 2002 the flow in the Carlton decreased, such that 28% of precipitation flowed out of the tunnel. And even when the spring storms of 2015 struck, while the flow from the tunnel was large, it represented only 24% of the precipitation. This reduction in basin productivity is due in part to the reduction of the catchment due to the construction of the VLFs; in part to the increasing area covered by thick overburden (including the Main Cresson Mine); and in part to the attenuation effect of overburden, which acts to store some incident precipitation and release it when temperatures are above freezing, and when the precipitation stops. This “store and release” behavior is commonly observed in granular covers (Albright et al, 2010).
3. Response of Carlton flow to high precipitation is rapid. The response time is less than a month, which is clearly shown in the response to the May 2015 precipitation event. Total precipitation in that month was 6.29 inches, the largest thaw period rainfall month on record. It followed a wet winter with a total of 4.43 inches of total precipitation in the first four months of 2015. The combination of rain and thaw caused substantial flooding in the Cripple Creek mining area, which is rare because of the porous diatremal substrate to the district. A significant proportion of the surface flow immediately infiltrated, and caused an almost immediate response in flow in the Carlton Tunnel,
4. Overburden moisture content has largely returned to field capacity. Early in the mine life the dry overburden acted as a “sponge” for incident infiltration, as the incident moisture increased the moisture content of the overburden to the field capacity, at which time vertical through flow can occur. The rapid response to the 2015 spring flooding suggests that much of the overburden in the district has now reached field moisture capacity, and no longer is as effective in attenuating sudden flow events as it was in the prior decade.

3.4.2 Water Table

The groundwater flow system in the Cripple Creek mining district is strongly three-dimensional. Water enters the system at the ground surface by infiltration and in general proceeds vertically downward through the vadose zone under gravity flow. In this zone there is essentially no water pressure. In general the rock is at or close to saturation, with water held in the fracture system by capillary action. In the more permeable Diatremal areas, this vadose zone is hundreds to thousands of feet thick, while in the less permeable Precambrian rock areas it is typically less than a few hundred feet thick.

The groundwater table in the District has been investigated at a total of 37 vertical nests of piezometers installed in the Cripple Creek mining district in recent years (ABC, 2012), and in the two deep carbonate holes installed in 2015 (see Attachment 1 and 2). The locations, depths, and water table elevations determined from these piezometer nests are summarized from the primary documents and presented in Table 3 – Hydraulic Head & Gradient at the Cresson Project. These data have been used, together with the known elevation of the Carlton Tunnel to which groundwater flow proceeds, to determine the piezometric surface, or “water table”, in the District, which is presented on Plate 9 - Cripple Creek District Water Table.

The water table illustrates the groundwater flow system:

1. The water level in the eruptive centers of the diatreme has been reduced from the original elevation of approximately 9,500 – 9,600 ft amsl³ to a current elevation of 7,000 – 8,300 ft amsl, or a reduction of between 1,000 and 2,500 feet.
2. The water level in the eastern overflow apron in the diatreme appears to remain at approximately the original level, which is substantially below the original (and proposed) ground surface, indicating that the hydraulic conductivity is sufficient for vertical flow away from the surface, but only capable of carrying a moderate amount of water into the eruptive centers of the diatreme.
3. The water level in the Precambrian rock external to the diatremal boundary appears to be at or close to the ground surface, indicating insufficient permeability to allow drainage into the diatreme.

The water table is consistent with the conceptual model of groundwater flow in and adjacent to the diatreme. The measurement of water levels in the deep groundwater system achieved in the Amendment 11 investigation provided the first direct verification that the piezometric conditions in the diatreme are such as to guarantee drainage to the diatreme of any fluids passing through overlying material, including mined material.

3.4.3 Vertical groundwater flow and infiltration

When there is no water pressure in a groundwater flow system, this means that there is a unit vertical downward head gradient. Accordingly, in the vadose zone there is a strong energy gradient pulling water downwards. To understand the significance of this gradient, consider the mechanics of infiltration. The amount of (vertical) flow in a groundwater system is governed by Darcy's Law:

$$Q = K_v I A$$

where: K_v = vertical hydraulic conductivity (a constant of proportionality)

I = hydraulic gradient (the head loss over a unit distance, here vertical)

A = cross sectional area

For vertical flow in the vadose zone, the hydraulic gradient is unity, because as the water moves down a unit distance, it loses a unit of head (because the pressure is zero at all levels in the flow system). Using this, and noting that the infiltration rate is equal to the flow per unit surface area (Q/A), Darcy's Law produces:

$$q = K_v$$

where: q = flow per unit area = infiltration rate

Using this relationship it is possible to determine the vertical hydraulic conductivity that can infiltrate into – and through – the vadose zone, as shown in the table below:

³ Lindgren and Ransome, 1906.

q	in/yr	1	2	3	4	5	6	7	8	9	10
K	cm/sec	8.1E-08	1.6E-07	2.4E-07	3.2E-07	4.0E-07	4.8E-07	5.6E-07	6.4E-07	7.2E-07	8.1E-07

The infiltration rate in the diatreme is approximately 6 inches per year, which can pass through the bedrock vertically if the hydraulic conductivity is greater than 5×10^{-7} cm/sec. This indicates that the diatremal rocks and the soils on top of them which form a thick vadose zone when the water table is reduced by the flow to the district tunnels must each have an effective vertical hydraulic conductivity of more than 5×10^{-7} cm/sec. Conversely, in general the Precambrian rocks surrounding the diatreme do not form a significant vadose zone, and so they and the soils on top of them must have an effective vertical hydraulic conductivity generally less than 5×10^{-7} cm/sec. As the soils are essentially the same (clayey boulder till), the restriction on infiltration must be found in the bedrock.

The infiltrating water continues vertically downward until it reaches a pressurized zone, which is generally the top surface of Lindgren and Ransome's "underground lake or pond" of water. Below that point, the water pressure increases with depth, in general at close to a hydrostatic rate, as it would in a lake. In these flow systems, the point vertically at which the water pressure becomes positive is defined as the "water table".

There are still modest vertical head gradients in the saturated flow system, because the water entering the "underground lake" has to have an energy gradient to flow away from the point of entry to the point of exit, in this case the Carlton Tunnel system.

The rate of infiltration of precipitation in the District prior to 2002 represented a seepage rate of 5.9 inches per year, or 30% of the average precipitation at that time of 19.47 inches per year. This is a relatively high infiltration rate; the expected value would be no more than 25%, based on infiltration evaluations of mountain basins in Nevada (Maxey and Eakin, 1949).

The reason for the high infiltration rate is the reduction of the natural water table in the Diatreme by the drainage tunnels. This results in depressurization of the diatremal rockmass down to the elevation of the Carlton Tunnel (approximately elevation 7,000 ft msl, 3,500 feet below ground level). This creates a high downward vertical hydraulic gradient in the diatremal rockmass, and in the adjacent Precambrian rocks.

The infiltration behavior in the diatreme and the Precambrian rockmass immediately adjacent to the diatreme has been established by installation and monitoring of a total of 23 nested well sets and 13 piezometer strings in single boreholes. The piezometric pressure has been monitored continuously in these wells for periods ranging from 1 year to 3 years. These data have been processed to produce piezometric elevations, and then plotted to produce average vertical hydraulic gradients (ABC 2012, Attachment 1).

An example of this processing is shown in Plate 10 - Vertical Hydraulic Gradient and Water Table, for deep carbonate hole CPC14-3. This well shows vertical head conditions that cause essentially complete capture of infiltrating ground water by the depressurized diatremal ground water system:

1. A strong downward vertical hydraulic gradient in the upper sections of the ground water system to an elevation of 7,793 ft amsl, more than 2,500 feet below ground surface, with the ground water system depressurized and flow dominantly vertically downward.
2. A weak downward vertical hydraulic gradient below the water table (approximately 0.08), where the ground water system is pressurized, and flow becomes dominantly horizontal as the water moves laterally towards collection by the Carlton Tunnel drainage system.

The vertical head gradient results for all well clusters analyzed are summarized in Table 3 – Hydraulic Head & Gradient at the Cresson Project and are presented for the District in Plate 12 - Infiltration Capture by Diatreme. The following observations are made:

1. There is a strong downward vertical hydraulic gradient in all locations where the dominant geology is Tertiary volcanic phonolites and welded breccia (i.e. within the Diatreme).
2. There is a strong downward vertical hydraulic gradient in areas of the Precambrian rocks close to the Diatreme where the slope of the interface is steep (e.g. in upper Grassy Valley).
3. There is weak to no downward vertical hydraulic gradient in locations underlain by Precambrian rocks that are distant from the Diatreme, or are adjacent to locations where the interface between the slope of the interface is shallow (e.g. in lower Grassy Valley).

In all areas where there is moderate to strong downward vertical gradient, ground water flow is predominantly vertically downward, and all infiltrating water is captured by the diatremal flow system and flows via the regional ground water system to Carlton Tunnel and flows under permit to Fourmile Creek. The area where infiltration capture occurs is shown on Plate 12 - Infiltration Capture by Diatreme.

3.4.4 Grassy Valley Perched Water Table

Detailed investigation of the groundwater conditions has been conducted in the Grassy Valley, involving installation of paired wells, with one well in the alluvial system in the valley, and others in the same location at greater depth (ABC, 2012). The finding of this investigation is that within Grassy Valley there is a perched aquifer in the alluvial valley fill, with a water table between 0 and 50 feet of the ground surface, overlying a deep bedrock groundwater system, with a deeper water table between zero and 1000 feet below ground surface. The location of the perched water table and the water levels in the two aquifers are shown in Plate 11 - Perched and Bedrock Water Table, which has been developed using data from Table 3 – Hydraulic Head & Gradient at the Cresson Project.

The existence of the perched aquifer in Grassy Valley is an important aspect of the valley, because it holds groundwater near the ground surface, and prevents all the water in the alluvium from draining into the underlying bedrock. This perched water system allows the valley to remain “grassy” even though it has been subject to drainage into the desaturated upper portion of the bedrock system since before any mining in the district.

In addition, the water in the perched aquifer is hydraulically decoupled from the water in the underlying bedrock. As a result, variations in the bedrock water level cannot influence the amount of water that seeps vertically through the alluvial fill in Grassy Valley.

3.4.5 Hydraulic Conductivity

The ground water flow system in the District is controlled by the hydraulic conductivity of the soil and rockmass. The hydraulic conductivity of the District materials has been evaluated by the performance of a total of 75 permeability tests in all available completed boreholes and monitor wells in the District (ABC, 2012). In addition, two permeability tests were performed in CPC14-3 and four permeability tests were performed in GHC15-1 as part of the Amendment 11 program, and are reported in Attachment 1 and Attachment 2 respectively.

The hydraulic conductivities of wells tested to date in the District are presented by location, depth and material in Table 4 –Hydraulic Conductivity of Cresson Project Materials, which contains the summary below:

Material	# Tests	K (cm/sec)	K (ft/yr)
Soil	4	9E-06	9
Colluvium	22	6E-05	59
Tertiary Rock	20	2E-05	16
Precambrian Rock	29	8E-06	8

The following observations are made with respect to the hydraulic conductivity of District materials:

1. Soil. The “soil” refers to four tests in shallow wells located in the thalweg of Grassy Creek. The (horizontal) hydraulic conductivity is approximately 10^{-5} cm/sec, which is typical for soils. The logs of the valley soils indicate that they are strongly layered, so the vertical hydraulic conductivity of these materials would be expected to be approximately an order of magnitude lower, or 10^{-6} cm/sec. This is sufficiently low to significantly retard water seepage through these materials to the underlying bedrock.

Soil horizontal hydraulic conductivity: 10^{-5} cm/sec
Soil vertical hydraulic conductivity: 10^{-6} cm/sec

2. Colluvium. The material described as “colluvium” ranges from boulder clay to sand and gravel outwash, and the measured horizontal hydraulic conductivity range reflects this, ranging from 10^{-6} cm/sec to 10^{-2} cm/sec. The geometric mean of the hydraulic conductivity of the colluvium is 6×10^{-5} cm/sec. The vertical hydraulic conductivity of the material is likely significantly lower, due to the presence in almost all locations of horizontally bedded clayey zones. This material is has been mined and processed in Grassy Valley to provide low-permeability bedding material for VLF liner system construction, with a target hydraulic conductivity of less than 10^{-6} cm/sec, which is reflective of the clayey zones in the in-place colluvium.

Colluvium horizontal hydraulic conductivity: 10^{-5} cm/sec
Colluvium vertical hydraulic conductivity: 10^{-6} cm/sec

3. Tertiary. The Tertiary age materials comprise volcanic phonolites, welded breccias, and occasional lamprophyre dikes and sills (Plate 3 – Geology). The measured horizontal hydraulic conductivity of this material has a geometric mean of 2×10^{-5} cm/sec, with values ranging from 5×10^{-8} cm/sec to 8×10^{-3} cm/sec. This high variability reflects the fact that the hydraulic

conductivity in the material is largely secondary (derived from structures including joints, fractures, and faults). Fracture intensity in the volcanics is highly variable, and so the hydraulic conductivity is similarly variable. The hydraulic conductivity of the Tertiary volcanic rocks is plotted on Plate 13 - Hydraulic Conductivity. This shows that there is a significant variation of hydraulic conductivity, with the highest conductivity occurring in the overflow volcanic apron, and conductivity reducing to the west. The “grain” of the data suggests that there is a preferential hydraulic conductivity in a northwest/southeast direction, which is consistent with the jointing, faulting, and dike intrusion fabric in the District rocks, as evident in Plate 3 – Geology. Vertical hydraulic conductivity is likely dominated by the strong vertical jointing and faulting in this rockmass, generally striking approximately NW-SE. As all the test holes are vertical, these features are likely under-represented in the testing. Accordingly, it is expected that the effective vertical hydraulic conductivity of the volcanics is at least an order of magnitude higher than the horizontal hydraulic conductivity.

	<u>General</u>	<u>Overflow Apron</u>
Tertiary horizontal hydraulic conductivity:	2×10^{-5} cm/sec	2×10^{-4} cm/sec
Tertiary vertical hydraulic conductivity:	2×10^{-4} cm/sec	2×10^{-3} cm/sec

4. Precambrian. The Precambrian-age materials surrounding the Diatreme comprise granite, granodiorite, schist, and gneiss (Plate 3 – Geology). The measured horizontal hydraulic conductivity values of this material have a geometric mean of 8×10^{-6} cm/sec, with values ranging from 3×10^{-8} cm/sec to 3×10^{-3} cm/sec. Intact Precambrian rock is impermeable, and the rockmass derives its permeability from fracturing, faulting, and flow along bedding/schistosity planes. In the District rocks the permeability appears to be increased by alteration, which intensifies as the Precambrian interface with the diatremal rocks is approached. The distribution of hydraulic conductivity in the Precambrian rockmass is shown on Plate 13 - Hydraulic Conductivity, which supports the increased hydraulic conductivity of this material close to the diatremal intrusion into the granitic rockmass. Vertical hydraulic conductivity is not expected to differ significantly from horizontal hydraulic conductivity, as there is no observed preferential joint direction in the Precambrian rock. Both horizontal and vertical hydraulic conductivity are expected to be reasonably similar to the measured hydraulic conductivity.

	<u>General</u>	<u>Beside Diatreme</u>
Precambrian horiz. hydraulic conductivity:	2×10^{-6} cm/sec	2×10^{-5} cm/sec
Precambrian vert. hydraulic conductivity:	2×10^{-6} cm/sec	2×10^{-5} cm/sec

3.5 Groundwater Model

The Diatreme is made up of three main vertical volcanic feeder tubes or eruptive centers, one to the north, one to the west, and one to the east. The Carlton Tunnel penetrates and directly drains the regional ground water regime in the relatively high permeability eastern and southern feeders, which are geologically connected at tunnel level. The Carlton Tunnel indirectly drains the regional ground water regime in the north feeder, by drawing flow to the southern feeders through the relatively low permeability Precambrian rock curtains that separate them. Thus the conceptual model of the hydrology of the District is a large diameter “well” (the Diatreme) that collects infiltrating precipitation from the

surface of the Diatreme and adjacent portions of the surrounding lower-permeability Precambrian rockmass, and then is drained from the regional ground water system via the Carlton Tunnel.

A quantitative model of the District geohydrology has been created for the purpose of allowing analysis of potential hydrologic impacts due to mining within the District (Attachment 4).

The quantitative model was created as follows:

- Surface topography derived from contouring of the reclaimed ground surface on a 500 foot grid spacing.
- Twenty-two vertical layers created, each up to 250 feet thick, extending to 5,500 feet below the topographic surface.
- Hydraulic conductivity applied to all 60,000 model cells based on geology and measured values (Table 4 –Hydraulic Conductivity of Cresson Project Materials).
- Surface infiltration applied to the entire model at a rate of 5.9 inches per year (Plate 8 - Carlton Tunnel Flow).
- Carlton Tunnel installed as a drain at approximately 3,500 feet below the topographic surface (at elevation approximately 7,000 feet msl).

The model was calibrated to the following:

1. Observed piezometric head information presented in Table 3 – Hydraulic Head & Gradient at the Cresson Project and Plate 9 - Cripple Creek District Water Table.
2. Observed flow from the Carlton Tunnel presented in Plate 8 - Carlton Tunnel Flow.
3. Observed (lack of) groundwater-fed flow in streams overlying the Diatreme.

Results of the model for post-closure Amendment 11 conditions are presented in Attachment 4, and are summarized in Plate 14 - Groundwater Flow Model Results.

The results of the model with respect to the fate and transport of infiltration are:

1. Steady-state infiltration of 5.9 inches per year enters the diatremal rock in all locations where the diatreme outcrops, and flows through the diatreme to collection at the Carlton Tunnel approximately 3,000 feet below the ground surface.
2. Steady-state infiltration of 5.9 inches per year in general is sufficiently large to exceed the vertical downward flow capacity of the system in any location where it is underlain by Precambrian rock, resulting in partial infiltration to the rockmass, and partial flow along the top of the rockmass (or the overlying alluvium) to emerge at the ground as surface water flow (seeps).

3.6 Potential Hydrologic Impact

Current permitted mining activities with the addition of Amendment 11 activities will comprise the following (facility locations shown on Plate 2 - Amendment 11 Facilities):

- Mining of approximately 573 million additional total tons of rock from the Main, North, and East Cresson mine areas.
- Mining of approximately 714,000 total tons from the underground Chicago Mine.
- Placement of approximately 349 million tons of ore on Valley Leach Facilities for gold and silver recovery.
- Milling of 11 million tons of higher grade ore and placement of cement-agglomerated tailings on the VLFs.
- Placement of approximately 224 million tons of overburden on ECOSA and as backfill in the Main, North, and East Cresson mine areas.

This section evaluates the incremental impact to hydrology of each of these proposed actions and updates the information that was provided as part of MLE2/Amendment 10. The evaluation is conducted using the results of the infiltration, basin yield, and groundwater modeling for this Amendment, and is applied to the effects of Amendment 11 surface mining, VLF facilities, and overburden storage on surface water flows, groundwater flows, wetlands, and pit lakes.

3.6.1 Impact of Additional Surface Mining on Streamflow and Groundwater Flow

Surface mining creates conical openings that capture incident precipitation and surface flow. In the case of the mining proposed for Amendment 11, the surface mines will expand from their current locations to the envelopes shown in Plate 2 - Amendment 11 Facilities.

The proposed additional mining of Amendment 11 from the current condition has been evaluated in terms of the effect of the additional footprint of the mine in capturing water that would currently flow to the surrounding unmined environment, as shown in Plate 15 – Amendment 11 Surface Water Impact.

The proposed mine footprint by the end of Amendment 11 will have the following impacts:

1. Surface water flow. An estimated 2 gpm of surface runoff to will be prevented from exiting the mine footprints during operation. The flow reduction will primarily occur in the Poverty Gulch catchment, with a smaller occurring in Grassy Valley. After closure, some of this flow reduction will remain, as the current plan is for most of the remaining surface mines to be only partially backfilled, largely preventing surface outflow from the mine footprints.
2. Seepage from Mines. During operation, the mine surfaces will be disturbed, resulting in increased infiltration through the disturbed mine surfaces and un-reclaimed mine backfill into the diatreme. Based on the Carlton Tunnel flow evaluation in Section 3.4.1 above, the increased infiltration while disturbed is estimated at 25%, resulting in an approximately 100 gpm increase in flow to Carlton Tunnel during operation. This increased flow occurs almost entirely as a result of decreased evapotranspirative losses from the disturbed surfaces. Upon closure, there will

likely be a small residual increase in infiltration to the diatreme, due to the internal drainage basins that will remain in Globe Hill, Wildhorse Extension, and the Main Cresson Mines.

These are very small flow increments, which will not be significant in the environments of the receiving waters.

3.6.2 Impact of Drainage of the East Wall of East Cresson Mine (WHEX) on Surface Vegetation in Grassy Valley

Under Amendment 9 the Wild Horse Extension (WHEX) of the East Cresson Mine was extended to a depth up to 700 feet in Precambrian rock in the headwaters of Grassy Valley. Under normal mining conditions, this would be expected to cause inflow into the mine from the surrounding rock, reduction in head in the aquifers supporting the groundwater in the valley, and impacts due to reduction in head in the surrounding valley.

However, in this case there will be no impact due to drainage to the mine, for two reasons that are illustrated in Plate 16 - Evaluation of Impact Potential for Drainage to WHEX:

1. There will be no drainage to the mine, because the head elevation of the water in the Precambrian wall rock is lower than the base of the mine.
2. Even if there were to be water pressure changes in the bedrock below the Grassy Valley perched water table, these can have no impact on Grassy Valley because of the presence of up to 1000 feet of unsaturated rock between the base of the Grassy Valley aquifer and the top of the zone of saturation in the diatreme.

Accordingly, no impact will occur in Grassy Valley due to drainage of groundwater to Amendment 11 surface mines, and no mitigation will be required.

3.6.3 Impact of Underground Exploration and Mining

Amendment 11 includes the excavation of 714,000 total tons from the underground Chicago Mine, located on the western side of the mine district (Plate 2 - Amendment 11 Facilities). The mining will be located entirely in the vadose zone above the water table, and will only intersect meteoric water that infiltrates immediately above the mine workings. This is computed to be in the order of 3 gallons per minute. This interception will have no environmental significance, and no mitigation will be required.

3.6.4 Impact of VLF Facilities on Streamflow and Groundwater Flow

Amendment 11 does not propose to increase the footprint of the SGVLF or the AGVLF. Therefore there will be no incremental impact on surface or groundwater hydrology volumes associated with this amendment due to the VLFs, and no mitigation will be required.

3.6.5 Impact of Squaw Gulch Overburden Storage Area on Streamflow and Groundwater Flow

Amendment 11 does not propose to increase the footprint of the SGOSA. Therefore there will be no incremental impact on surface or groundwater hydrology water volumes associated with this amendment due to the VLFs, and no mitigation will be required.

3.6.6 Impact of East Cresson Overburden Storage Area on the Hydrology of Grassy Valley

Amendment 11 makes changes to ECOSA height to approximately 10,960 ft amsl. This increased height of the facility allows the storage capacity to increase while maintaining the reclamation slope of 2.5:1. The proposed Amendment 11 ECOSA is shown in Plate 17 - Impact Potential of ECOSA on Grassy Valley.

The impacts that will be associated with the proposed changes to ECOSA and their mitigation will be as follows:

1. Seepage from Toe of ECOSA. The northern portion of the Amendment 11 ECOSA is located over the boulder till infill of Grassy Valley. This material is of low (vertical) permeability, and creates a partial barrier to downward flow into the underlying unsaturated bedrock. As a result, under high infiltration conditions (specifically during operation prior to reclamation of the ECOSA surface) some of the infiltrating precipitation water will flow along the surface of the boulder till, and emerge at the northern downhill toe of the ECOSA⁴. When the surface of ECOSA is reclaimed following operation, it is anticipated that the infiltration rate from the steeper surface of the ECOSA will return to less than the natural rate of approximately 5.9 inches per year, which historically did not cause surface flow on the southern slope of Grassy Valley. Seeps from the toe of ECOSA, if any, will be sampled, characterized, and treated if necessary.
2. Surface flow from the ECOSA to Grassy Valley. The construction of the ECOSA creates a porous surface during operation, which essentially eliminates surface water runoff to Grassy Valley from the footprint of ECOSA during operation. The portion of Amendment 11 ECOSA that does not overlie East Cresson Mine has an area of 268 acres, and the surface runoff that is sequestered by that surface during operation is estimated to be 2.3 acre-feet per year. This represents an increase of 0.2 acre-feet per year over the Amendment 10 estimate. From an environmental point of view, this is an insignificant change, and no mitigation is proposed during operation⁵.
3. Seepage from ECOSA. During operation, the ECOSA surfaces will be disturbed, resulting in increased infiltration through the un-reclaimed surfaces into the diatreme. Based on the Carlton Tunnel flow evaluation in Section 3.4.1 above, the increased infiltration while disturbed is estimated at 25%, resulting in an approximately 20 gpm increase in Carlton Tunnel flow during Amendment 11 operation (computation on Plate 17 - Impact Potential of ECOSA on Grassy Valley inset). This increased flow occurs almost entirely as a result of decreased evapotranspirative losses from the disturbed surfaces. Upon closure and revegetation, infiltration

⁴ This condition is currently occurring, particularly following the high intensity thaw/precipitation event in May, 2015. It is considered that this event provided sufficient water to bring the thin toe-area overburden in ECOSA to its field capacity, and allowed the balance of the water to flow to the base of the pile and shed downhill to exit the toe. The underdrain system installed prior to the construction of the ECOSA under Amendment 10 was designed to transport water to the east away from the area of ECOSA underlain by both the boulder till and low permeability Precambrian rock and re-infiltrate it through the till to the diatreme beneath. However, it appears that the till permeability is too low to allow at least this high infiltration rate water to pass vertically to the diatreme, causing the toe seepage.

⁵ Note that water rights augmentation will be adjusted to accommodate this change, likely by addition of water to the Beaver Creek drainage.

from ECOSA to the diatreme will return to natural levels. As there is no environmental impact resulting from seepage changes from ECOSA, no mitigation is necessary.

3.6.7 Formation of Pit Lakes in Worked Out Surface Mines

The lowest planned mine floor elevation is 9,200 ft amsl (North Cresson [Globe Hill]), which is 1,000 feet above the water table in this location in CPC14-3 (8,285 ft amsl). Accordingly, no pit lake can form, no impact will occur, and no mitigation will be required.

3.7 Conclusion

Potential impacts to water flows as a result of all surface mining at the Cresson Project through the implementation of the proposed Amendment 11 mining and processing activities are as follows:

- 1. Surface water flow.**
 - a. A temporary capture during operation of approximately 24 acre-feet per year from the streams leading off the Diatreme, of which approximately 4 acre-feet per year represents a transfer from the Beaver Creek drainage to the Four Mile Creek drainage, via Carlton Tunnel.
 - b. Upon reclamation of the project, the remaining un-backfilled surface mines will capture approximately 7 acre feet of surface water flow per year, and direct it into the diatreme as seepage for flow via Carlton to the Four Mile Creek drainage.
 - c. No net flow will be lost to the surface water system on closure.
 - d. None of the small changes in surface water flow are expected to have environmental significance, so no mitigation is needed.
- 2. Groundwater flow.**
 - a. A temporary decrease in infiltration and flow to Carlton Tunnel of approximately 135 gallons per minute in the flow of water from the regional ground water system via the Carlton Tunnel is due primarily to the installation of the SGVLF liner system that occurred as part of MLE2/Amendment 10. The water is captured and used in the mining process, with appropriate water rights arrangements, and there are no environmentally significant impacts that result.
 - b. A temporary flow from the toe of ECOSA during periods of high infiltration due to the limited seepage capacity of clay till underlying the northern portion of the facility. While it is not expected that there will be any environmentally significant impacts, it is proposed that toe seepage be diverted to runoff control ponds or collected for use in the mining process.
 - c. Upon reclamation of the project, the valley leach facilities will be punctured and any seepage through the spent ore will be directed to the diatreme. This will result in an increase of the flow to the diatreme of 119 gpm over the pre-mining flow. This water would otherwise have flowed to Four Mile Creek via surface flow, resulting in no net impact.

Accordingly, it is concluded that the mining and processing proposed in Amendment 11 will have no significant impact on surface or groundwater flow, and will not require any mitigation activity, except the collection of any seepage from the toe of the ECOSA during operation.

4. HYDROGEOCHEMICAL EVALUATION

4.1 Hydrogeochemical System

By the end of Amendment 11, a total of 1,568 million tons of material will have been produced by CC&V from surface and underground mines in the Cripple Creek Mining District, comprising 592 million tons of ore which will have been processed in two large valley leach facilities, and 974 million tons of overburden which will have been placed in two overburden storage facilities and also used to backfill worked-out surface mines. At the end of the project, all the mine facilities will be reclaimed and revegetated.

All of the mined material produced from the Cripple Creek District contains metal sulfides which begin to oxidize when exposed to the atmosphere by the mining process. This oxidation produces acidic metal sulfates, and this process continues for many years until the sulfides are exhausted.

Infiltration of precipitation through the surface-mined materials mobilizes the soluble oxidation products from the rock, and transports them in the dissolved state through the Cripple Creek Mining District groundwater system described above.

During this transport process, the groundwater seepage and its dissolved load of acidic metal sulfates come into contact with carbonates that are also ubiquitous in the District rock. The acid in the groundwater reacts with the carbonate, neutralizing it, and precipitates gypsum and iron hydroxides, which scavenge most of the dissolved metals in the groundwater by adsorption.

At the end of that process, the groundwater passes out of the Cripple Creek Diatreme through the Carlton Tunnel, and the neutral calcium sulfate-calcium bicarbonate water flows under permit to Four Mile Creek, seven miles to the southwest of the mining area.

This hydrogeochemical system is shown schematically in Plate 18 – Hydrogeochemical System Schematic.

The purpose of this hydrogeochemical evaluation is to determine the fate of the products of sulfide oxidation in the project, over all time, to establish the reliability of the carbonate neutralization

4.2 Evaluation of Groundwater Flow and Quality at the Cripple Creek Mining District

An evaluation of the groundwater fate and transport in the system has been conducted for this study in two parts: a bulk evaluation of the availability of sufficient carbonate in the system to control the release of acid rock drainage (reported here); and a more detailed transient evaluation to determine how long it will take for the sulfide to “burn out” of the system (reported in Attachment 3). Both use the same construct, and similar data, which is described below.

4.2.1 AMD Model Construct

The study evaluates the groundwater system as having three “cells”:

1. Cell 1: Surface Mined Material. This cell comprises the material that has been mined and processed on the Valley Leach facilities and placed in overburden storage and as backfill in

mines. This material will slowly oxidize, releasing products of sulfide oxidation to the groundwater system. Precipitation infiltrates into the upper surface of the mined materials, and seeps through them vertically.

2. Cell 2: Vadose Bedrock. This cell comprises the unmined material between the surface-placed material and the water table in the bedrock, approximately 3,000 feet below ground surface. Groundwater flows through it vertically from Cell 1 above, and exits from the base of the cell after interacting with the material in it.
3. Cell 3: Saturated Bedrock. This cell comprises a zone of saturated bedrock beneath the vadose zone, where flow passes predominantly horizontally across the diatreme and into the Carlton Tunnel to Four Mile Creek.

4.2.2 Geochemical Model Data

The solid phase geochemical data for the model is derived from the CC&V LECO furnace testing program. During exploration and production CC&V maintains a testing program to determine the amount of (inorganic) sulfide and carbon in the rock in the District. To date, a total of 185,000 samples have been taken and analyzed by CC&V since the inception of exploration in 1993, comprising an average of one sample every 20 feet in all drilling. The data from the deep carbonate holes drilled for this Amendment has been added to the database.

The information has been processed by elevation to provide:

1. Acid Generating Potential (AGP). AGP is expressed as the equivalent amount of calcium carbonate that is required to neutralize the acid generated, using the formula:

$$AGP_{MAX} = 31.2 * S_{TOTAL}$$

where: AGP_{MAX} = maximum acid generating potential (t $CaCO_3$ /kt)⁶

S_{TOTAL} = total sulfur content (%)

The AGP for the rocks of the Cripple Creek mining district are presented in Plate 19 - Acid Generating Capacity. The acid generating capacity starts at 15–50 tons of $CaCO_3$ equivalent per kiloton of rock in the upper part of the rockmass, where the majority of the surface mining takes place. This is a relatively low acid rock generating capacity for a sulfide orebody.

The AGP reaches 130 tons per kiloton at the level of the Carlton Tunnel, where the rockmass is generally saturated (and not subject to sulfide oxidation as oxygen cannot access the sulfides). Were this rock available for oxidation, this would be a significant AGP level.

2. Acid Neutralizing Potential (ANP). The rocks of the Cripple Creek mining district also contain significant neutralizing capacity, generally in the form of calcium carbonate (calcite) and calcium-magnesium carbonate (dolomite). The extent of the acid neutralizing capacity (ANP) of the rock is either directly tested by titration with acid, or, more commonly, computed from the

⁶ The unit for AGP that is traditionally used is “tons of calcium carbonate per 1000 tons of rock”, abbreviated to “t $CaCO_3$ /kt”. This is the number of tons of calcium carbonate – limestone or calcite - required to neutralize the maximum amount of acidity generated by the complete oxidation of all of the sulfides in 1,000 tons of rock.

measurements of the total carbon content using LECO furnace technology. The ANP is computed making the assumption that all the inorganic carbon in the rockmass is present in the form of calcium carbonate, and the formula for ANP is:

$$\text{ANP} = [\text{MW}_{\text{CaCO}_3} / \text{MW}_\text{C}] * [\text{C}_{\text{TOTAL}} (\%)] * [10 (\text{ton/kt}) / (\%)]$$

where: ANP = Acid neutralizing potential (t CaCO₃/kt)

MW_{CaCO₃} = Molecular weight of CaCO₃ (g)

MW_C = Molecular weight of carbon (g)

C_{TOTAL} = Total carbon in sample (%)

Thus:

$$\text{ANP} = 83.42 * [\text{C}_{\text{TOTAL}} (\%)]$$

This formula has been applied to the extensive database of total carbon measurements, and the distribution of carbonate in the Cripple Creek mining district materials has been developed, as shown on Plate 20 – Acid Neutralizing Capacity. This relationship is plotted to the same scale as the AGP, which is a benefit of using the same unit (tons of CaCO₃ equivalent per kiloton of rock) for both measures; they are directly comparable.

3. Acid-Base Accounting. Acid-base accounting (“ABA”) is used to determine the performance of sulfide rockmasses when they are exposed to atmospheric oxygen. In general, if a rock has a greater neutralizing potential than its acid generating capacity, it is net neutralizing, and the products of oxidation of any sulfides in the rock will be neutralized at source, reducing the impact of the sulfide oxidation. The product of neutralized oxidation is known as “neutralized rock drainage” (NRD).

If, on the other hand, a rock has a greater acid generating capacity than its acid neutralizing capacity, then when it oxidizes it will generate acidic leachate, known as “acid rock drainage” (ARD).

The rocks of the Cripple Creek district are in general net acid producing, as shown on Plate 21 - Cripple Creek District AGP and ANP. The acid generating potential is approximately twice as large as the acid neutralizing potential.

The corresponding graphs have been provided for the two deep carbonate holes drilled for this Amendment:

- Plate 22 – CPC14-3 - Acid-Base Accounting
- Plate 23 – GHC15-1 - Acid Base Accounting

Both show the same excess AGP over ANP, and are consistent with the general database.

4.2.3 Static Evaluation of Performance of the Groundwater Neutralizing System

The static evaluation of the groundwater flow regime is structured as a cell-to-cell flow model, with the following steps:

1. All the sulfide in the cell is oxidized, to exhaust the sulfide in the cell.

2. The resulting acidic fluid is brought into contact with any neutralizing capacity in the cell, and eliminated.
3. Any residual acid is passed into the next cell, where the process is repeated.

In the event that there is an excess neutralizing capacity in a cell, only that neutralization that is required to eliminate the acid is used up.

Two analyses were conducted:

1. Plate 24 - Neutralizing Capacity - All Mined Material. In this analysis, the entire inventory of sulfide in all the mined material is oxidized, and the products allowed to progress through the cell system. The total inventory of 1,566 million tons of mined rock contains sulfide requiring 58 million tons of CaCO_3 to neutralize the acid it produces when oxidized. This is partly neutralized in the mined rock cell, and the remaining acid flows through vadose zone, which is conservatively assumed to neither provide more acid nor to provide any neutralization. When the remaining acid enters the saturated zone, in Cell 3, no acid is added because the cell is saturated, and sulfide oxidation cannot occur. However the remaining acid is neutralized by the carbonate in the cell. In this case there remains an excess of 600 million tons of neutralizing capacity in Cell 3, and up to 800 million additional tons of neutralizing capacity in the vadose zone.
2. Plate 25 - Neutralizing Capacity - All Vadose Material. The second analysis that was performed is essentially the worst case: not only does the sulfide in the mined rock oxidize, but all of the sulfide in the vadose zone oxidizes as well. This is the equivalent of surface mining the entire diatreme down to the water table. The neutralization in the mined material, the vadose zone, and the saturated rock zone is almost sufficient (short 30 million tons) to provide the neutralization necessary to satisfy the 1,560 million tons calcium carbonate demand of this extreme system.

In summary, the acid generated by the mined material to the completion of Amendment 11 will be readily neutralized by the in-situ inventory of calcium carbonate. The very slow – natural weathering rate – oxidation of the material in the vadose zone can also be accommodated by the system neutralization, providing permanent protection against the flow from the Carlton Tunnel turning acid.

4.2.4 Dynamic Evaluation of the Performance of the Groundwater Neutralizing System⁷

The dynamic evaluation of the groundwater neutralizing system is essentially the same as the static evaluation, except that the oxidation of the sulfides in the mined materials occurs at a (slow) rate determined by kinetic testing of the oxidation using Humidity Cell Tests, and adjustment of the rate to reflect the grain size (and surface area) of the different materials.

⁷ The dynamic evaluation of the groundwater flow regime was conducted by Jeffery Winick of Schlumberger Water Services under my responsible charge, and is presented in Attachment 3.

The results of the dynamic evaluation are as follows:

1. The sulfide in the mined material will take approximately 200 years to be completely oxidized, while the sulfide in the vadose zone will require nearly 8,000 years to completely oxidize.
2. The acid generated by sulfide oxidation in these two cells will consume all the neutralizing capacity in the mined material and the vadose zone, but will ultimately consume only about half of the inventory in the saturated system (Cell 3) before all the sulfide sources are exhausted.

The study concludes that significant residual ANP will remain in-situ in perpetuity, and the entire system will always be maintained at neutral pH and in equilibrium with carbonate and gypsum.

4.3 Carlton Tunnel Water Quality Verification

Verification that the protective geochemical process of neutralization is occurring and will continue to occur in the Diatreme is available by reference to the quality of the regional ground water flow from the Carlton Tunnel. This tunnel collects essentially all of the ground water entering the Diatreme and the immediately contiguous rocks, and forms a single location for monitoring and evaluating the geochemical processes occurring in the Diatreme and contiguous areas.

The water quality data from the Carlton Tunnel provides verification opportunities, as follows.

4.3.1 Average Water Quality

The average water quality in the Carlton Tunnel in the period 1988 to the present is functionally indistinguishable from the quality of the water that is produced by neutralizing effluent from the humidity cell tests with natural calcite (ABC, 2012). This result verifies that carbonate neutralization is occurring in the Diatreme, and that the neutralization process in the Diatreme is protective of the quality of the regional ground water exiting the Diatreme to the Carlton Tunnel.

4.3.2 Chemistry History

The chemistry of the Carlton Tunnel water has been monitored since 1988. A selection of the parameters measured is presented in Plate 26 - Carlton Tunnel Flow and Chemistry for that period. The following is noted:

1. pH. The pH has remained between 7 and 8.5 for the entire history. The value declined slightly after surface mining began in 1993, but has become less variable and higher since 1996. There is evidence that the process(es) controlling pH are strengthening slightly as mining proceeds, consistent with a reducing input of acidic water from all sources.
2. Conductivity. The electrical conductivity is a gross measure of total dissolved solids. The value has increased slightly since the inception of monitoring, but has been essentially constant since 1996⁸. The results indicate great and increasing stability in chemical composition over the surface mining period.

⁸ There are two periods since 1996 when the conductivity suddenly changed: 2002-3 and 2010. It is suspected that these represent periods when the calibration of the conductivity probe was slightly in error.

3. Zinc. Zinc is present at low concentrations (below 1 mg/L) over the history of the monitoring. Peaks formerly occurred during upset periods of high infiltration, particularly in the summer of 1995, 1998, 1999, and 2001. For the next decade the flow had stabilized, and the peaks had been reduced to less than 0.1 mg/L elevation of zinc, which was considered to be the result of attenuation of flow by the covering of overburden material over a significant portion of the diatremal surface. However, the flow and zinc concentration increased during the precipitation event in May 2015, suggesting that the period of attenuation may be over, possibly as a result of the overburden reaching its field capacity, which was expected in 10 to 15 years.

4.3.3 Geochemical Modeling of the Carlton Water Quality

The stable chemical conditions of the Carlton Tunnel flow is believed to be caused by, and sustained by, the neutralization resulting from the presence of an overwhelmingly large amount of carbonate in the diatremal flow system. To test this belief, a PHREEQE geochemical model of the Carlton water quality was performed. The modeling and the results are described in detail in Attachment 3.

The modeling started with Net Acid Generation (NAG) testing effluent, which is an acidic and concentrated analog of acid generation from sulfide oxidation of site materials. The solutions from each of the modeled cells were neutralized by the addition of calcite, and the quality compared with the Carlton Tunnel water. To correctly simulate the Carlton Tunnel water quality it was necessary to include a final step of sorbing metals onto the ferrihydrite substrate that is observed to precipitate at the Tunnel portal, and which is also observed to precipitate in the PHREEQE model. This step explains the almost complete lack of metals in the Carlton Tunnel water, and demonstrates that as long as the neutralization continues, the metal removal will also continue, providing relatively metal-free water at Four Mile Creek.

4.4 Conclusion

Potential impacts to water quality as a result of all surface mining at the Cresson Project through the implementation of the proposed Amendment 11 mining and processing activities are as follows:

1. **No potentially deleterious change in the average regional ground water quality has occurred due to recent surface mining (1993-2015).**
2. **Investigation of carbonate abundance in the diatremal rocks has demonstrated the existence of a mass of carbonate that is more than adequate to neutralize any products of total oxidation of sulfides in all mined materials.**
3. **Evaluation of the sulfide oxidation process demonstrates that there is more than sufficient carbonate in the Diatremal rocks to neutralize the products of complete oxidation of sulfides in the portion of the diatreme above the water table created by flow to the Carlton Tunnel, including all mined material.**
4. **No potentially deleterious change in the average regional ground water quality will ever occur due all surface mining operations to the end of Amendment 11.**

5. CERTIFICATION

This report has been prepared by and under the responsible charge of Adrian Brown, P.E., based on knowledge, information, and belief. The engineering services have been performed in accordance with applicable standards of practice. This certification is not a guaranty or warranty, either expressed or implied.

Signed this Fifteenth Day of December, 2015.

Adrian Brown, P.E.

6. REFERENCES

ABC 1998. *Hydrologic Evaluation - Cresson Project Expansion, Cripple Creek and Victor Gold Mining Company*. Report prepared by Adrian Brown Consultants, Inc., in support of Amendment No. 8, Office of Mined Land Reclamation Permit M-80-244. Dated April 30, 1998.

ABC 2008. *Cresson Project Hydrogeochemical Evaluation*. Report prepared by Adrian Brown Consultants, Inc., in support of Cresson Project Mine Life Extension of Permit M-80-244 (Amendment No. 9), Office of Mined Land Reclamation Permit M-80-244, dated April 2008.

ABC 2012. *Cresson Project Hydrogeochemical Evaluation*. Report prepared by Adrian Brown Consultants, Inc., in support of Cresson Project Mine Life Extension 2 of Permit M-80-244 (Amendment No. 9), Office of Mined Land Reclamation Permit M-80-244, dated February 25, 2012.

Albright WH, Benson CH, Waugh WJ, 2010. *Water Balance Covers for Waste Containment; Principles and Practice*. ASCE Press, 2010.

ASTM 2001. *Standard Test Method for Accelerated Weathering of Solid Materials Using a Modified Humidity Cell*. ASTM Test Method D 5744 – 96 (Reapproved 2001), American Society for Testing Materials, Washington, D.C.

CC&V 2000. *Amendment No. 8, Office of Mined Land Reclamation Permit M-80-244*. Permit Application prepared by Cripple Creek & Victor Gold Mining Company, A Joint Venture - AngloGold (Colorado) Corp., Manager. Dated March 2000.

CC&V 2008. *Cresson Project Mine Life Extension - Permit M-80-244*. Permit Application prepared by Cripple Creek & Victor Gold Mining Company, A Joint Venture - AngloGold (Colorado) Corp., Manager. Dated April 2008.

CC&V 2012. *Cresson Project Mine Life Extension 2 (Amendment No.10) - Permit M-80-244*. Permit Application prepared by Cripple Creek & Victor Gold Mining Company, A Joint Venture - AngloGold (Colorado) Corp., Manager. Dated April 2012.

Davis, G.B., and Ritchie, A.I.M., 1986. *A Model of Oxidation in Pyritic Mine Wastes: Part 1 Equations and Approximate Solution*. Applied Mathematical Modelling, Volume 10, Issue 5, October 1986, pages 314-322

Henderson, C.W., 1926. *Mining in Colorado – A History of Discovery, Development, and Production*. U.S. Geol. Prof. Paper 188, pp. 57-59, 1926.

Lindgren, W., and Ransome, F.L., 1906. *Geology and Gold Deposits of the Cripple Creek District, Colorado*. U.S. Geological Survey Professional Paper No. 54, GPO, Washington.

Maxey, G.B., and T.E. Eakin, 1949. *Ground water in White River Valley, White Pine, Nye, and Lincoln Counties, Nevada*. Water Resources Bulletin No. 8, Nevada State Engineer, 59 p.

Miller, S., Robertson, A. and Donahue, T., 1997. *Advances in Acid Drainage Prediction using the Net Acid Generation (NAG) Test*, Proc. 4th International Conference on Acid Rock Drainage, Vancouver, BC, 533-549.

Miller, S.D., 1998. *Static Net Acid Generation Test Procedure*. Environmental Geochemistry International, May 1998.

Sheldon, T.H., 1915. *Roosevelt Drainage Tunnel, Cripple Creek, Colorado*. Engineering and Mining Journal, Vol. 100, pp 545-549, 1915

Vivian, C.H., 1940. *Carlton Drainage Tunnel to Give Cripple Creek New Life*. Mining Record (?), June 1940.

Vivian, C.H., 1941. *Carlton Tunnel Taps Watercourse*. Mining Record (?), August 1941.

Vivian, C.H., 1941. *Carlton Tunnel Drains Portland Mine*. Mining Record (?), p. 106-107, October 1941 (?).

TABLES

TABLE 1: CRESSON PROJECT PRODUCTION

Year	Ore Tons	Ore Cumulative	Overburden Tons	Overburden Cumulative	Total Tons	Total Cumulative
1994	223,000	223,000	375,000	375,000	598,000	598,000
1995	7,155,000	7,379,000	11,140,000	11,515,000	18,296,000	18,893,000
1996	9,861,000	17,240,000	13,827,000	25,342,000	23,688,000	42,582,000
1997	10,448,000	27,688,000	15,526,000	40,868,000	25,974,000	68,556,000
1998	10,911,000	38,599,000	16,368,000	57,236,000	27,279,000	95,835,000
1999	11,034,000	49,632,000	18,782,000	76,018,000	29,816,000	125,651,000
2000	11,194,000	60,826,000	17,745,000	93,763,000	28,939,000	154,589,000
2001	12,622,000	73,449,000	21,806,000	115,569,000	34,429,000	189,018,000
2002	15,612,000	89,061,000	32,247,000	147,816,000	47,859,000	236,877,000
2003	17,104,000	106,165,000	35,166,000	182,982,000	52,270,000	289,147,000
2004	20,442,000	126,607,000	37,898,000	220,880,000	58,340,000	347,487,000
2005	20,071,000	146,678,000	32,258,000	253,138,000	52,329,000	399,816,000
2006	23,485,000	170,163,000	35,745,000	288,882,000	59,229,000	459,045,000
2007	22,320,000	192,482,000	30,498,000	319,380,000	52,817,000	511,862,000
2008	23,855,000	216,337,000	26,543,000	345,923,000	50,398,000	562,260,000
2009	20,399,000	236,736,000	36,476,000	382,399,000	56,875,000	619,135,000
2010	22,426,000	259,161,000	42,312,000	424,711,000	64,737,000	683,872,000
2011	21,507,000	280,669,000	43,150,000	467,861,000	64,658,000	748,530,000
2012	22,736,000	303,405,000	41,431,000	509,292,000	64,167,000	812,697,000
2013	22,487,000	325,892,000	45,417,000	554,709,000	67,904,000	880,601,000
2014	20,595,000	346,486,000	39,898,000	594,608,000	60,493,000	941,094,000
2015	21,715,000	368,201,000	30,222,000	624,830,000	51,937,000	993,031,000
2016	24,973,000	393,174,000	30,570,000	655,400,000	55,488,000	1,048,519,000
2017	22,509,000	415,683,000	32,491,000	687,891,000	54,653,000	1,103,172,000
2018	23,237,000	438,919,000	43,102,000	730,993,000	66,329,000	1,169,501,000
2019	22,023,000	460,943,000	44,139,000	775,132,000	66,002,000	1,235,504,000
2020	22,189,000	483,131,000	40,388,000	815,520,000	62,503,000	1,298,006,000
2021	21,091,000	504,223,000	33,450,000	848,970,000	54,466,000	1,352,473,000
2022	21,438,000	525,660,000	33,567,000	882,537,000	54,988,000	1,407,461,000
2023	22,123,000	547,784,000	29,262,000	911,799,000	51,408,000	1,458,869,000
2024	21,538,000	569,322,000	33,912,000	945,710,000	53,472,000	1,512,341,000
2025	23,415,000	592,737,000	28,755,000	974,465,000	53,648,000	1,565,989,000

Notes:

1. Tonnage shown is from the start of the CC&V surface mining campaign, in 1994.
2. Amendment 11 tonnage shown in **bold**.
3. Tonnages rounded to the nearest thousand tons, but totals computed from un-rounded values, so totals may not exactly add.

TABLE 2: CRESSON MINE PRECIPITATION

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1992	0.04	0.12	1.67	0.31	3.28	3.84	2.10	3.13	0.17	0.31	0.80	0.41	16.18
1993	0.24	0.47	0.97	0.48	2.11	1.07	1.38	2.21	2.78	2.11	1.23	0.14	15.19
1994	0.71	0.00	1.20	2.49	5.17	1.63	1.88	6.32	2.18	2.15	0.78	3.06	27.57
1995	1.36	0.85	2.69	2.62	4.03	3.72	2.92	4.36	2.72	0.23	0.30	0.16	25.96
1996	1.98	0.15	0.60	1.30	1.99	1.85	3.23	2.97	1.43	0.70	0.30	0.28	16.78
1997	0.17	0.80	0.50	1.03	2.01	3.78	2.45	3.60	1.59	0.21	0.71	0.31	17.16
1998	0.31	0.79	0.85	0.16	0.09	0.06	10.47	5.40	0.88	0.12	0.00	0.00	19.13
1999	0.00	0.86	0.15	5.44	2.81	1.97	5.95	4.10	0.91	1.39	0.28	0.12	23.98
2000	0.74	0.53	2.25	1.02	1.83	2.04	2.92	5.26	0.50	0.91	0.40	0.47	18.87
2001	0.41	0.64	1.50	1.21	2.53	1.68	4.06	6.68	0.52	0.07	0.98	0.20	20.48
2002	0.45	0.80	0.74	0.23	1.50	0.73	3.76	1.20	1.48	1.65	0.28	0.05	12.87
2003	0.20	1.49	2.43	1.01	1.83	3.18	2.71	3.60	1.25	0.64	0.36	0.26	18.96
2004	0.78	0.62	0.75	3.03	0.49	4.02	4.08	3.40	0.91	0.70	0.43	0.17	19.34
2005	0.80	0.73	1.19	1.52	0.71	1.53	2.29	4.50	1.48	0.41	0.58	0.52	16.26
2006	0.46	0.33	1.57	1.19	1.16	1.17	5.40	5.11	1.35	2.21	0.38	0.67	21.00
2007	1.94	0.90	2.33	2.08	4.06	1.58	4.01	3.91	1.54	0.46	0.23	1.93	24.97
2008	0.89	0.64	1.18	1.04	0.80	0.76	3.04	5.24	1.24	0.37	0.55	1.38	17.13
2009	0.46	0.27	1.11	2.49	2.68	2.93	3.56	1.95	2.33	1.33	0.56	0.40	20.07
2010	0.21	0.56	1.60	1.88	0.77	0.76	3.94	4.00	0.35	0.54	0.17	0.19	14.97
2011	0.41	0.92	0.44	1.92	2.47	0.18	3.65	3.84	1.98	1.95	0.59	0.65	19.00
2012	0.23	0.18	0.08	1.26	1.13	0.57	4.37	1.34	1.88	0.38	0.18	0.50	12.10
2013	0.06	0.88	0.48	1.33	2.35	1.28	3.83	4.96	4.11	0.62	0.67	0.85	21.42
2014	0.76	0.35	0.61	1.62	3.03	0.40	4.15	2.48	2.16	0.84	0.36	0.74	17.50
2015	1.05	2.79	1.45	1.88	6.29	2.78	3.78	3.51	0.76	0.93	0.48	0.59	26.29
Avg	0.61	0.69	1.18	1.61	2.30	1.81	3.75	3.88	1.52	0.88	0.48	0.59	19.30

- Notes:
1. Data taken from Bateman Station at the mine office unless noted below.
 2. DMR data from Guffey, CO station used for 1/92 through 6/94; Florissant Fossil Beds used for 2/92.
 3. Hunter's Data used for 5/98 and during power outage at Bateman in 4/99 and 5/99.
 4. 11/00 data from Carlton Security, 12/00 through 5/01 data from Security Office ("Rigi")
 5. Guffy station data used for 10/95, 11/95, 12/95, 2/96, 3/96, 4/96, 5/96
 6. NOAA data used for 3/97
 7. Belfort rain gauge at Bateman Stations used for 6/98.
 8. Storm water sampler (Sigma 900 Max) gauge used for 7/98 and 8/98.
 9. 2000 data is average of Rigi and Bateman, except Nov and Dec 2000 are only Rigi
 10. 2001 data is average of Rigi and Bateman (Pad), except June-September based on Bateman
 11. 2002 and 2003 data is from Bateman
 12. 2004 data is average of Bateman and Rigi
 13. 2005 and later data is from Rigi
 14. Data in italics are fill for the year based on monthly average.
 15. Seasonal statistics:

Season	Months	Precipitation (inches)	
		Average	2015
Winter	Dec-Feb	1.89	4.43
Spring	Mar-May	5.08	9.62
Summer	Jun-Aug	9.44	10.07
Fall	Sep-Nov	2.89	2.17
Year	Jan-Dec	19.30	26.29

TABLE 3: HYDRAULIC HEAD AND HYDRAULIC GRADIENTS IN THE CRIPPLE CREEK MINING DISTRICT

WELL	EASTING (ft)	NORTHING (ft)	ELEVATION (ft)	DEPTH (ft)	WATER TABLE ELEVATION (ft)	DEPTH TO WATER (ft)	HYDRAULIC GRADIENT (ft/ft)	GEOLOGY	PIEZOMETERS
CAM-01+OSABH-04	43909.00	60459.00	10173.00	506	10155	25	-0.95	Tertiary	5
COB-01+OSABH-02	42555.00	61042.00	10135.00	200	10096	38	-0.07	Precambrian	3
CPC-14-3	38119.05	62679.19	10359.47	4368	8286	2073	-1.0 / -0.01	Tertiary	5
CRMW-03	34045.00	49253.00	9175.00	124	9152	23	-0.05	Precambrian	3
GHC15-1	37812.44	60749.45	10364.54	3875	7793	2572	-1.0 / -0.08	Tertiary	5
GVMW-01	41011.00	64516.00	10152.00	54	10135	17	-0.34	Precambrian	1
GVMW-02	40537.00	63333.00	10173.00	30	10147	26	-0.87	Tertiary	1
GVMW-03	41718.00	63868.00	10096.00	500	<9596	>500	-1.00	Precambrian	2
GVMW-04	43463.00	62789.00	10026.00	480	>9598	438	-0.91	Precambrian	1
GVMW-05	41239.00	63505.00	10123.00	250	>9916	207	-0.83	Precambrian	1
GVMW-06	48843.00	63538.00	10265.00	126	10196	68	-0.35	Precambrian	1
GVMW-07	46216.00	61798.00	9954.00	198	9925	29	0.03	Precambrian	2
GVMW-08+OSABH-	47416.00	59488.00	9882.00	244	9853	28	-0.49	Tertiary	3
GVMW-09	48761.00	62186.00	10207.00	200	>10016	191	-0.95	Precambrian	1
GVMW-10+OSABH-	45966.00	60606.00	9959.00	264	>9753	204	-0.71	Tertiary	2
GVMW-12+GVPZ-0	42494.00	62855.00	10072.00	297	10052	38	-0.93	Precambrian	3
GVMW-13	41696.80	62766.00	10158.00	550	<9609	>550	-1.00	Precambrian	2
GVMW-14	41886.00	63247.00	10088.00	625	<9489	>600	-1.00	Precambrian	2
GVMW-15+OSABH-	42963.00	62427.00	10047.00	1000	9996	52	-0.76	Precambrian	4
GVMW-17	41168.00	63832.00	10120.00	820	<9305	>815	-1.00	Precambrian	2
GVMW-22	50037.00	59301.00	9978.00	92	9974	5	0.02	Precambrian	2
GVMW-23	49945.00	60677.00	9766.00	65	9756	11	-0.02	Precambrian	2
GVMW-24+OSABH-	47855.00	58186.00	9915.00	250	9780-9814	133	-0.22	Tertiary	3
GVPW-01	43819.94	62008.06	10022.51	420	9999	23	0.00	Precambrian	5
GVPW-02	46560.69	59752.42	9919.69	750	9782	50	-0.13	Tertiary	5
GVPW-03	43350.89	62651.23	10027.3	750	10019	30	-0.16	Precambrian	5
GVPW-04	47204.96	57593.76	10154.41	750	9979	175	-0.59	Tertiary	5
GVPW-05	47846.08	58220.06	9913.54	750	9832	108	-0.17	Tertiary	5
GVPW-06	43821.69	60526.58	10167.09	750	10017	>300	-0.91	Tertiary	5
GVPW-07	45582.63	58973.56	10167.06	750	9905	>750	-0.95	Tertiary	5
GVPW-08	41005.19	64493.75	10150.73	750	<9401	>750	-1.00	Precambrian	5
SGMW-03	34902.00	55268.00	9392.00	146	<9391	>147	-0.99	Precambrian	2
SGMW-05	33520.00	54234.00	9200.00	256	<9360	>256	-1.00	Precambrian	1
WLMW-01+OSABH-	45513.00	59010.00	10157.00	750	10145	>750	-0.99	Tertiary	5
WXGW-01	41731.00	61113.00	10243.00	510	10240	50-100	-0.94	Precambrian	6
WXGW-02	41750.00	61653.00	10244.00	510	10120	293	-0.84	Precambrian	6
WXGW-03	41792.00	62129.00	10197.00	510	10118	400	-0.99	Precambrian	6
WXGW-04	41638.00	62575.00	10192.00	510	<9697	>500	-1.00	Precambrian	6
WXGW-05	41265.00	63148.00	10186.00	510	10089	361	-0.96	Precambrian	6

Sources:

CPC14-3: Attachment 1 / CPC14-3 Deep Carbonate Borehole Report / Appendix 6.6-Water Table
GHC15-1: Attachment 2 / GHC15-1 Deep Carbonate Borehole Report / Appendix 6.6-Water Table
All other wells: ABC 2012. Cresson Project Hydrogeochemical Evaluation. Report prepared by Adrian Brown Consultants, Inc., February 25, 2012, Appendix 1: Hydraulic Gradient Test Results

G:\Dropbox (ABC)\AB PROJECTS\1385 - CCAV-U616_Evaluation\HydroGeoChem\11-38- Geochemistry Cleanup.xlsx\T04-Hydraulic Conductivity

TABLE 4: HYDRAULIC CONDUCTIVITY OF CRIPPLE CREEK MINING DISTRICT MATERIALS

SOIL						
Well/Depth	Material	X (ft)	Y (ft)	Z (ft amsl)	K (cm/sec)	K (ft/yr)
GVPZ-01-34	Soil	42560	62981	10090	1.3E-05	13
GVPZ-02-29	Soil	42374	63163	10090	2.1E-05	21
GVPZ-03-19	Soil	42098	63435	10103	5.0E-06	5
GVPZ-04-40	Soil	41581	63707	10133	6.2E-06	6
Geometric Mean					9.5E-06	9

COLLUVIUM						
Well/Depth	Material	X (ft)	Y (ft)	Z (ft amsl)	K (cm/sec)	K (ft/yr)
GVMW-01B-50	Colluvium	41011	64516	10152	1.9E-04	190
GVMW-02B-30	Colluvium	40537	63333	10173	5.0E-04	500
GVMW-03B-50	Colluvium	41719	63863	10096	2.8E-05	28
GVMW-12B-50	Colluvium	42450	62799	10064	7.0E-06	7
GVMW-13C-50	Colluvium	41697	62767	10157	6.0E-06	6
GVMW-22B-30	Colluvium	50032	59310	9979	5.6E-05	56
OSABH-01-49	Colluvium	42957	61456	10085	1.0E-05	10
OSABH-02-44	Colluvium	42564	61057	10135	1.0E-05	10
OSABH-04-39	Colluvium	43963	60401	10180	4.0E-05	40
OSABH-05-30	Colluvium	44592	60760	10091	6.6E-03	6607
OSABH-06-33	Colluvium	44560	59142	10331	5.0E-07	0.5
OSABH-07-29	Colluvium	44976	60105	10117	3.5E-05	35
OSABH-08-29	Colluvium	45401	59078	10173	9.0E-05	90
OSABH-12-39	Colluvium	47856	58169	9916	6.0E-05	60
OSABH-13-30	Colluvium	45993	58875	10121	2.4E-03	2449
OSABH-14-29	Colluvium	47392	59491	9881	2.5E-05	25
OSABH-15-23	Colluvium	46286	59693	9969	2.0E-02	20000
OSABH-16-40	Colluvium	45948	60623	9960	3.0E-05	30
OSABH-17-30	Colluvium	43845	62015	10022	1.5E-04	150
OSABH-18-52	Colluvium	42935	62427	10048	1.5E-05	15
OSABH-19-30	Colluvium	42523	62214	10100	3.8E-05	38
WCMW-02-65	Colluvium	36945	48779	9526	1.8E-05	18
Geometric Mean					5.9E-05	59

SUMMARY			
Material	# Tests	K (cm/sec)	K (ft/yr)
Soil	4	9E-06	9
Colluvium	22	6E-05	59
Tertiary Rock	20	2E-05	16
Precambrian Rock	29	8E-06	8

Sources:

CPC14-3:	Attachment 1 / CPC14-3 Deep Carbonate Borehole Report / Appendix 6.6-Water Table
GHC15-1:	Attachment 2 / GHC15-1 Deep Carbonate Borehole Report / Appendix 6.6-Water Table
All other wells:	ABC 2012. Cresson Project Hydrogeochemical Evaluation. Report prepared by Adrian Brown Consultants, Inc., February 25, 2012, Appendix 1: Hydraulic Gradient Test Results

TERTIARY BEDROCK						
Well/Depth	Material	X (ft)	Y (ft)	Z (ft amsl)	K (cm/sec)	K (ft/yr)
CAM-01A-200	Tertiary	43907	60474	10172	1.0E-05	10
CAM-01B-70	Tertiary	43898	60476	10172	3.0E-07	0
CAM-01C-500	Tertiary	43866	60483	10169	2.3E-06	2
CPC14-3	Tertiary	38119	62679	10359	2.0E-06	2
GHC15-1	Tertiary	37812	60749	10365	8.8E-05	88
GVMW-07B-50	Tertiary	46210	61803	9954	2.3E-05	23
GVMW-08A-250	Tertiary	47418	59488	9883	1.0E-03	1000
GVMW-08B-50	Tertiary	47437	59484	9882	5.5E-05	55
GVMW-10-270	Tertiary	45984	60589	9960	5.8E-03	5800
GVMW-17A-820	Tertiary	41165	63846	10120	5.0E-05	50
GVMW-24A-250	Tertiary	47851	58203	9914	4.0E-08	0.0
GVMW-24B-100	Tertiary	47856	58184	9915	3.5E-04	350
SGMW-03B-52	Tertiary	34902	55268	9392	4.5E-05	45
SGMW-05-256	Tertiary	33520	54234	9200	2.0E-05	20
VIN-02A-270	Tertiary	44929	52306	9894	2.0E-07	0
VIN-02B-140	Tertiary	44923	52310	9896	4.7E-06	5
WLMW-01A-185	Tertiary	45605	58950	10118	1.0E-05	10
WLMW-01B-50	Tertiary	45494	59021	10170	1.1E-05	11
WLMW-01C-500	Tertiary	45551	58989	10167	2.5E-05	25
WLMW-01D-750	Tertiary	45529	59004	10170	8.0E-05	80
Geometric Mean					1.6E-05	16

PRECAMBRIAN BEDROCK						
Well/Depth	Material	X (ft)	Y (ft)	Z (ft amsl)	K (cm/sec)	K (ft/yr)
COB-01A-200	Precambrian	42543.6	61036	10135.9	0.0000015	1.5
COB-01B-60	Precambrian	42557	61034	10135	5.4E-06	5
ESPMW-01-221	Precambrian	35206	48992	9336	1.0E-04	100
GRMW-01A-153	Precambrian	31809	50794		2.9E-06	3
GRMW-02A-149	Precambrian	33706	52456		3.0E-05	30
GRMW-03A-200	Precambrian	33301	50136		1.5E-06	2
GVMW-03A-500	Precambrian	41717	63874	10096	6.5E-06	7
GVMW-04A-480	Precambrian	43463	62789	10026	5.5E-05	55
GVMW-05A-250	Precambrian	41345	63206	10155	1.5E-05	15
GVMW-06A-200	Precambrian	48761	62186	10265	1.0E-06	1
GVMW-07A-200	Precambrian	46221	61794	9954	4.0E-05	40
GVMW-09A-200	Precambrian	48843	63538	10207	2.5E-08	0.0
GVMW-12A-300	Precambrian	42472	62784	10061	1.2E-05	12
GVMW-13B-550	Precambrian	41676	62787	10159	1.0E-04	100
GVMW-14B-100	Precambrian	41873	63257	10089	8.0E-06	8
GVMW-14C-625	Precambrian	41869	63210	10089	1.7E-04	170
GVMW-15A-820	Precambrian	42975	62429	10047	3.4E-05	34
GVMW-15B-102	Precambrian	43007	62409	10045	2.8E-04	280
GVMW-15C-1000	Precambrian	42935	62441	10047	2.7E-08	0
GVMW-16B-102	Precambrian	42158	63492	10177	2.5E-07	0
GVMW-17B-105	Precambrian	41170	63818	10119	3.6E-05	36
GVMW-21A-190	Precambrian	44019	64082	10185	7.0E-08	0
GVMW-22A-90	Precambrian	50041	59292	9978	3.4E-06	3
GVMW-23A-70	Precambrian	49943	60671	9765	8.6E-05	86
GVMW-23B-30	Precambrian	49946	60682	9766	3.5E-05	35
PGMW-02-218	Precambrian	33495	60662		6.5E-05	65
SGMW-03A-150	Precambrian	34902	55268	9392	1.1E-06	1
WCMW-03-134	Precambrian	36189	46703	9700	5.9E-05	59
WCMW-06-234	Precambrian	35221	44485	9133	6.0E-05	60
Geometric Mean					8.3E-06	8

TABLE 5: SURFACE WATER IMPACT OF TOTAL AMENDMENT 11 MINING PROJECT

SURFACE RUNOFF FROM FUTURE MINING AREAS PRIOR TO OPERATION

Facility	Net Runoff Area acres	Contained Runoff Area acres	Net Runoff Area acres	Runoff Rate inches/year	Net Runoff acre-feet per year	Comments
UG MINE	0	0	0	0.103	0	No runoff from underground mines
ECOSA	439	0	439	0.103	4	Covers backfilled Altman Mine
SGOSA	184	0	184	0.103	2	Not including portion covered by SGVLF
AGVLF	327	0	327	0.103	3	
SGVLF	507	0	507	0.103	4	
NORTH CRESSON	310	0	310	0.103	3	
EAST CRESSON	490	0	490	0.103	4	Not including part shared by ECOSA
MAIN CRESSON	485	0	485	0.103	4	
TOTAL	2,743	0	2,743	0.103	24	

SURFACE RUNOFF FROM MINING AREAS DURING OPERATION

Facility	Net Runoff Area acres	Contained Runoff Area acres	Net Runoff Area acres	Runoff Rate inches/year	Net Runoff acre-feet per year	Comments
UG MINE	0	0	0	0.103	0	No runoff from underground mines
ECOSA	439	439	0	0.103	0	Assumes all runoff captured
SGOSA	184	184	0	0.103	0	Assumes all runoff captured
AGVLF	327	327	0	0.103	0	VLF fully contained during operation
SGVLF	507	507	0	0.103	0	VLF fully contained during operation
NORTH CRESSON	310	310	0	0.103	0	Assumes mine fully contained in operation
EAST CRESSON	490	490	0	0.103	0	Assumes mine fully contained in operation
MAIN CRESSON	485	485	0	0.103	0	Assumes mine fully contained in operation
TOTAL	2,743	2,743	0	0.103	0	

SURFACE RUNOFF FROM RECLAIMED MINING AREAS

Facility	Net Runoff Area acres	Contained Runoff Area acres	Net Runoff Area acres	Runoff Rate inches/year	Net Runoff acre-feet per year	Comments
UG MINE	0	0	0	0.103	0	No runoff from underground mines
ECOSA	439	0	439	0.103	4	Covers backfilled Altman Mine
SGOSA	184	0	184	0.103	2	Not including portion covered by SGVLF
AGVLF	327	0	327	0.103	3	
SGVLF	507	0	507	0.103	4	
NORTH CRESSON	310	158	152	0.103	1	Partially backfilled to surface
EAST CRESSON	509	113	396	0.103	3	Partially backfilled to surface
MAIN CRESSON	485	485	0	0.103	0	Completely internally draining
TOTAL	2,762	757	2,005	0.103	17	

TABLE 6: GROUNDWATER FLOW IMPACT OF TOTAL AMENDMENT 11 MINING PROJECT

PRE-MINING CARLTON TUNNEL FLOW THROUGH FUTURE AMENDMENT 11 MINING FACILITY AREAS						
Facility	Infiltration Area acres	Covered Infiltration Area acres	Net Infiltration Area acres	Infiltration Rate inches/year	Net Seepage gallons per minute	Comments
UG MINE	8	0	8	5.9	2	Area net of overlying North Cresson Mine
ECOSA	439	0	439	5.9	134	Covers backfilled Altman Mine
SGOSA	184	0	184	5.9	56	Not including portion covered by SGVLF
AGVLF	162	0	162	5.9	49	Only includes area that will overly the diatreme
SGVLF	282	0	282	5.9	86	Only includes area that will overly the diatreme
NORTH CRESSON	310	0	310	5.9	95	
EAST CRESSON	509	0	509	5.9	155	Not including part to be shared by ECOSA
MAIN CRESSON	485	0	485	5.9	148	
TOTAL	2,379	0	2,379	5.9	725	
CARLTON TUNNEL FLOW THROUGH AMENDMENT 11 MINING AREAS AT END OF OPERATION						
Facility	Infiltration Area acres	Covered Infiltration Area acres	Net Infiltration Area acres	Infiltration Rate inches/year	Net Seepage gallons per minute	Comments
UG MINE	14	6	8	5.9	2	Assumes mine captures all vertical seepage
ECOSA	439	0	439	5.9	134	Covers backfilled Altman Mine
SGOSA	184	0	184	5.9	56	Not including portion covered by SGVLF
AGVLF	162	162	0	5.9	0	Lined to prevent seepage during operation
SGVLF	282	282	0	5.9	0	Lined to prevent seepage during operation
NORTH CRESSON	310	0	310	5.9	95	
EAST CRESSON	509	0	509	5.9	155	Net of part covered by ECOSA
MAIN CRESSON	485	0	485	5.9	148	
TOTAL	2,385	450	1,935	5.9	590	Infiltration rate assumed unchanged by disturbance
POST-RECLAMATION CARLTON TUNNEL FLOW THROUGH AMENDMENT 11 MINING AREAS						
Facility	Infiltration Area acres	Covered Infiltration Area acres	Net Infiltration Area acres	Infiltration Rate inches/year	Net Seepage gallons per minute	Comments
UG MINE	14	6	8	5.9	2	
ECOSA	439	0	439	5.9	134	
SGOSA	184	0	184	5.9	56	
AGVLF	327	0	327	5.9	100	Reclaimed to direct entire area to diatreme
SGVLF	507	0	507	5.9	155	Reclaimed to direct entire area to diatreme
NORTH CRESSON	310	0	310	5.9	95	
EAST CRESSON	509	0	509	5.9	155	Net of part covered by ECOSA
MAIN CRESSON	485	0	485	5.9	148	
TOTAL	2,776	6	2,770	5.9	844	

PLATES



LEGEND

Volcanic Diatreme Boundary

Carlton Tunnel (elevation ~ 7,000 ft msl)

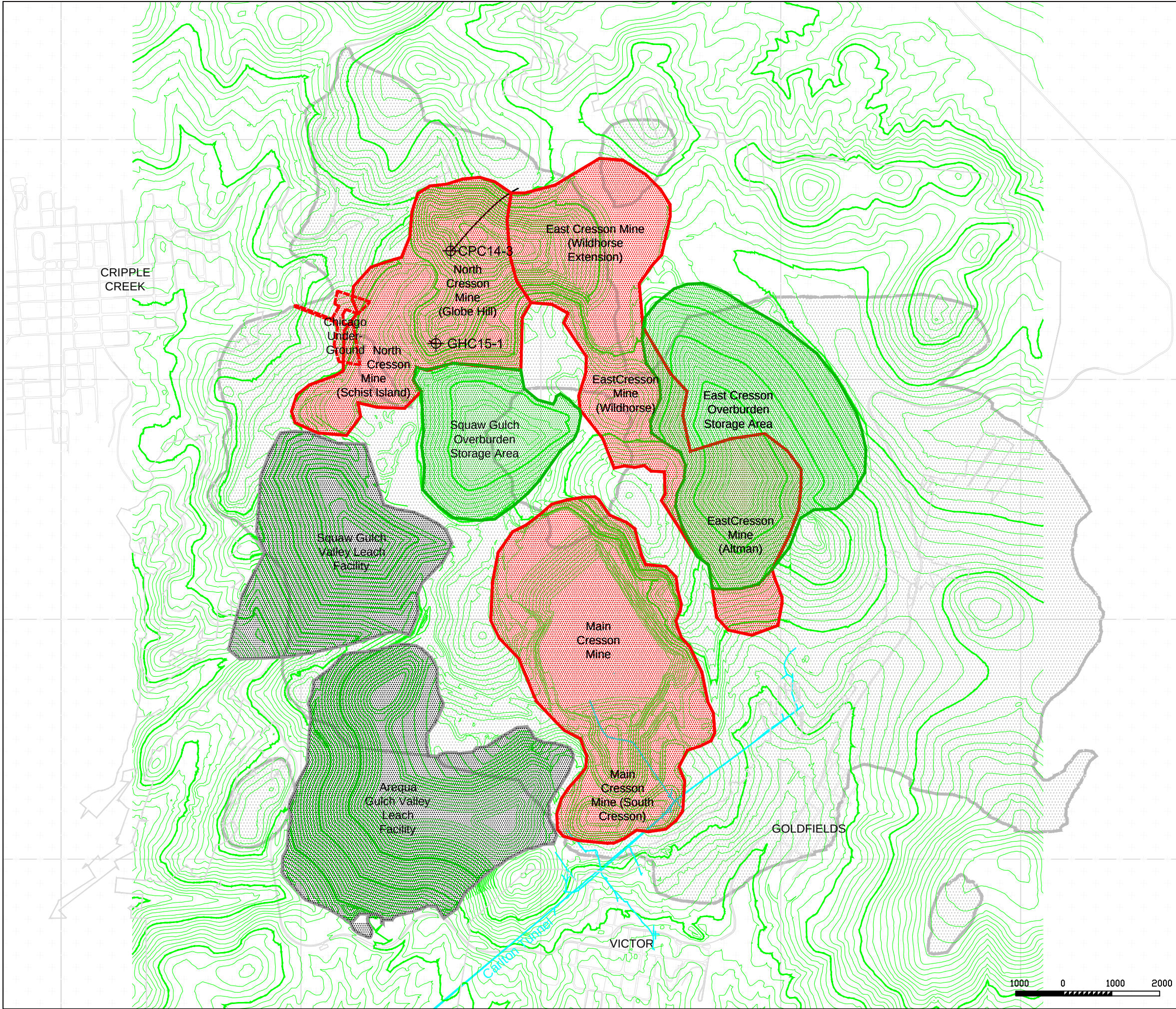
Amendment 11 Permit Boundary

Streams



	Scale:	1" = 2,400' (grid = 5,000 ft)
	Drawn:	A. Brown
	Date:	2015-12-03
CC&V Amemdment 11 Hydrogeochemistry		
PLATE 1		
LOCATION PLAN		

G:\Dropbox (ABC)_AB PROJECTS\1385_CC&V-UGV-Maps\AMI1-Master-89-Report-Plates-17.dwg

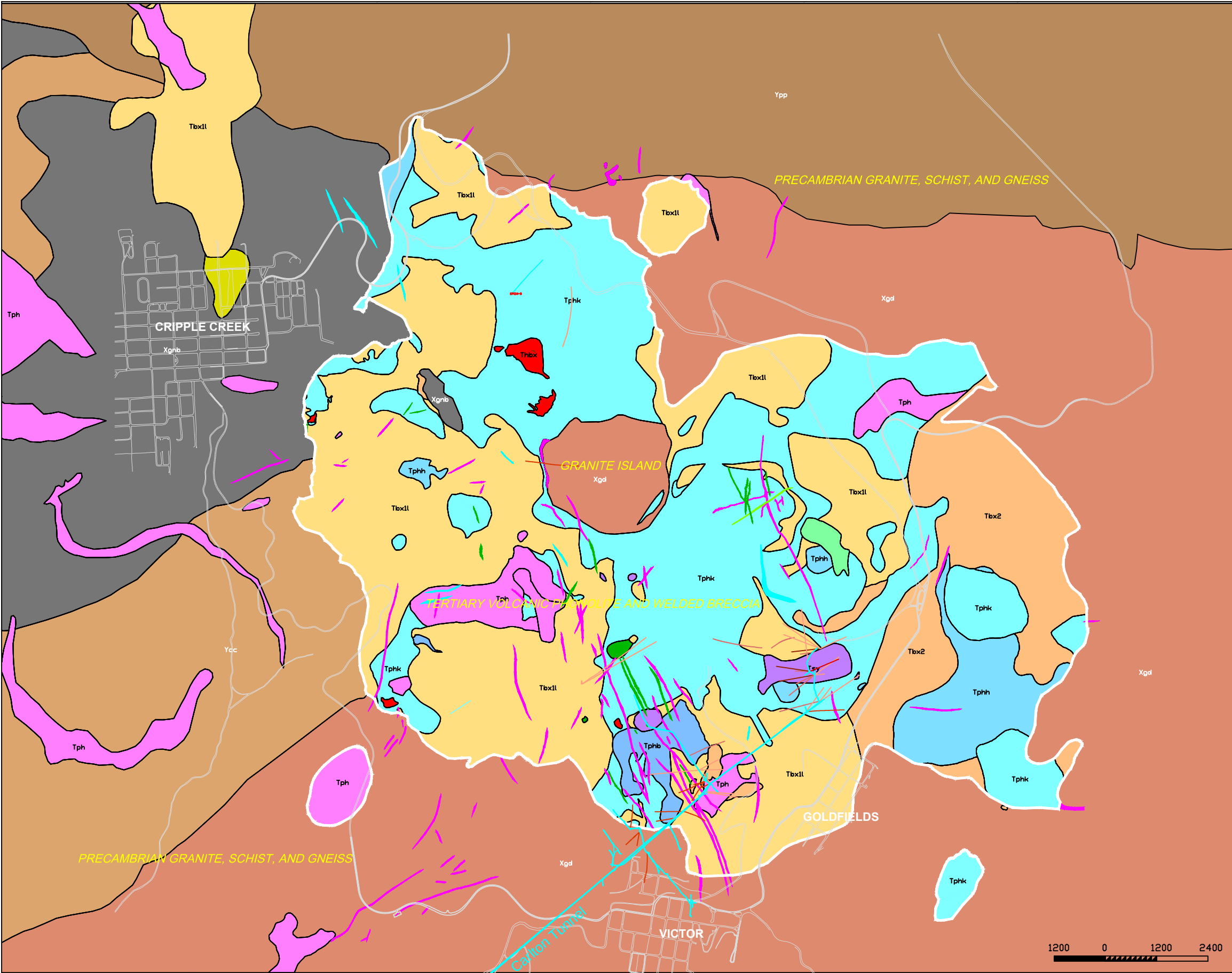


LEGEND

-  Volcanic Diatreme Boundary
-  Reclaimed Surface Contours (2025)
(interval = 35 ft)
-  Carlton Tunnel (elevation ~ 7,000 ft msl)
-  Amendment 11 Permit Boundary
-  CPC14-3 Deep Carbonate Hole
-  GHC15-1 Deep Carbonate Hole

 Adrian Brown	Scale:	1" = 2,000' (grid = 5,000 ft)
	Drawn:	A. Brown
	Date:	2015-12-03
CC&V Amendment 11 Hydrogeochemistry		
PLATE 2		
AMENDMENT 11 FACILITIES		

G:\Dropbox (ABC)_AB PROJECTS\1385_CC&V-UGV-Maps\AMI1-Master-89-Report Plates1-17.dwg



EXPLANATION

- LAMPROPHYRES

Tbxx

Tlh

Tlb

Tlxx

Ttd

Ttd

Tsy
- TERTIARY

Tphd

Tph

Tphkd

Tphk

Tphh

Tphb
- BRECCIAS

Tbx1

Tbx2

Tep
- PRECAMBRIAN

Ypp

Ycc

Xgd

Xgnb
- Tbxx - Hydrothermal Breccia

Tlh - Hornblende bearing - Lamprophyre Dike

Tlb - Biotite bearing - Lamprophyre Dike

Tlxx - Lamprophyre Breccia

Ttd - Phonotephrite

Ttd - Phonotephrite Dike

Tsy - Tephriphonolite

Tphd - Phonolite Dike

Tph - Phonolite

Tphkd - Feldspar bearing - Plagioclase Phonolite Dike

Tphk - Feldspar bearing - Plagioclase Phonolite

Tphh - Hornblende/Pyroxene bearing - Plagioclase Phonolite

Tphb - Biotite bearing - Plagioclase Phonolite

Tbx1 - Cripple Creek Lapilli Breccia

Tbx2 - Cripple Creek Breccia-Bedded (Oligocene)

Tep - Echo Park Alluvium (Eocene)

Ypp - Pike's Peak Granite

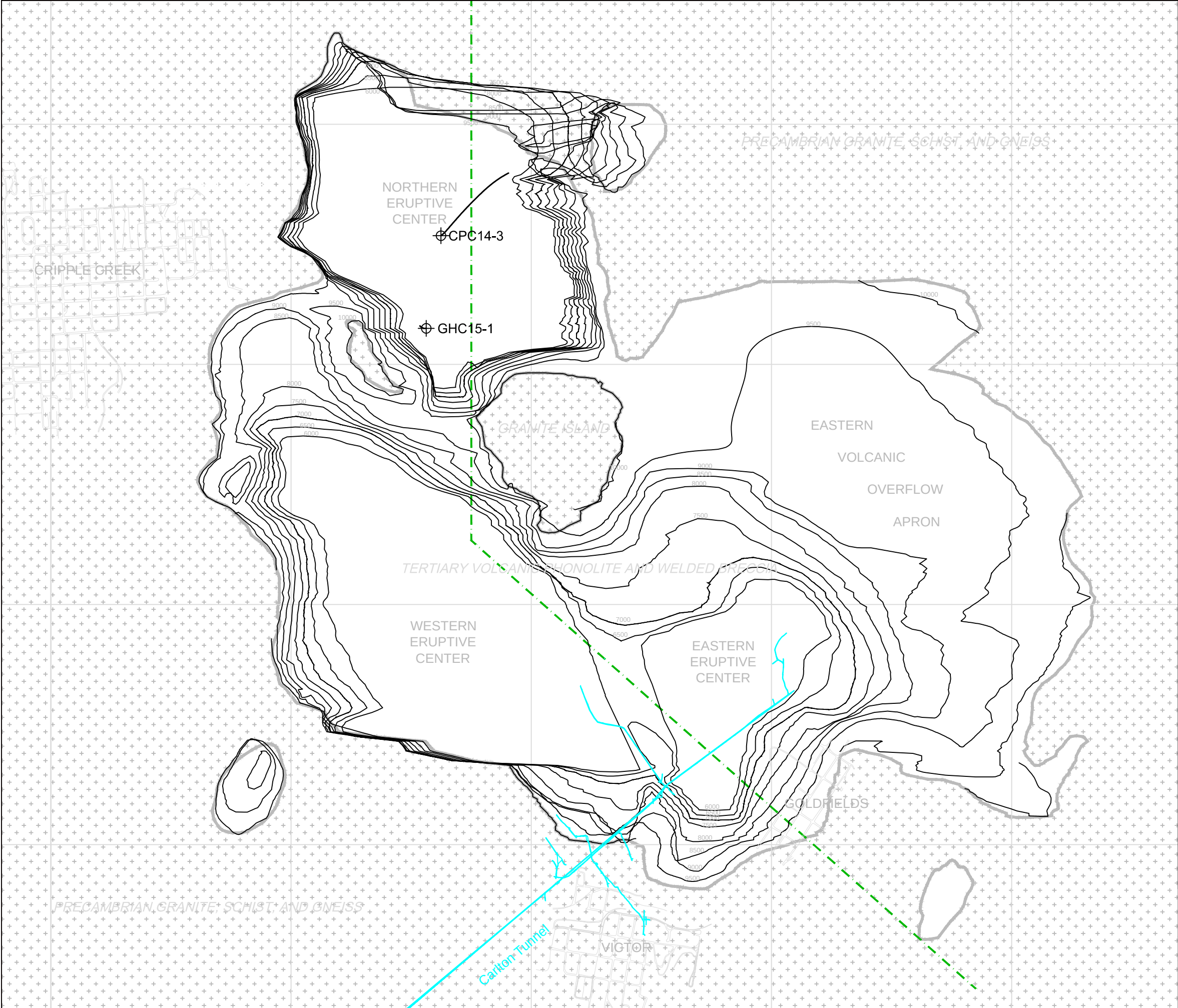
Ycc - Cripple Creek Quartz Monzonite

Xgd - Granodiorite

Xgnb - Biotite Gneiss
- Interpreted Geologic Contact

Surface Projection of Major Veins

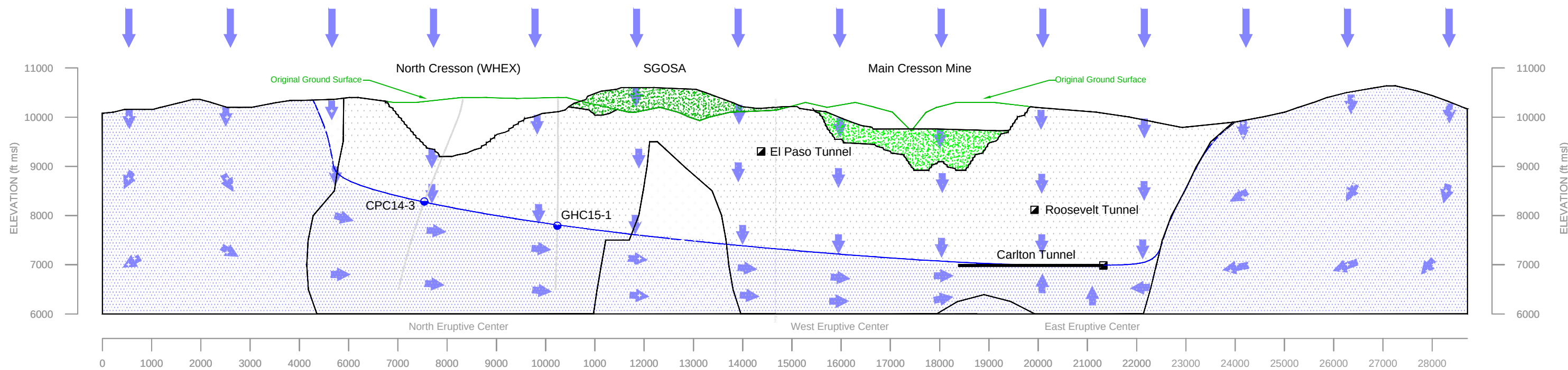
Brecciated Units
- SYMBOLS
-
- 
AdrianBrown
Adrian Brown Consultants, Inc.
130 West 4th Ave, Denver CO
303-698-9080
- | | |
|-----------|-------------------------------|
| Scale | 1" = 2,400' (grid = 5,000 ft) |
| Drawn: | A. Brown 31-Jan-2012 |
| Date: | 2016-12-03 |
| Revision: | 0 |
- CC&V Amendment 11 Hydrogeochemistry
- PLATE 3
- GEOLOGY



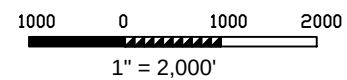
LEGEND

-  Volcanic Diatreme Boundary
-  Volcanic Diatreme Contours
(interval = 500 ft, 7,000 ft darkened)
-  Carlton Tunnel (elevation ~ 7,000 ft msl)
-  Cross Section Location (Plate 5)
(section looking northeast)
-  CPC14-3 Deep Carbonate Hole
-  GHC15-1 Deep Carbonate Hole

	Scale:	1" = 2,000' (grid = 5,000 ft)
	Drawn:	A. Brown
	Date:	2015-12-04
CC&V Amendment 11 Hydrogeochemistry		
PLATE 4		
DIATREME		



CROSS SECTION THROUGH DIATREME LOOKING NORTHEAST



GEOLOGY

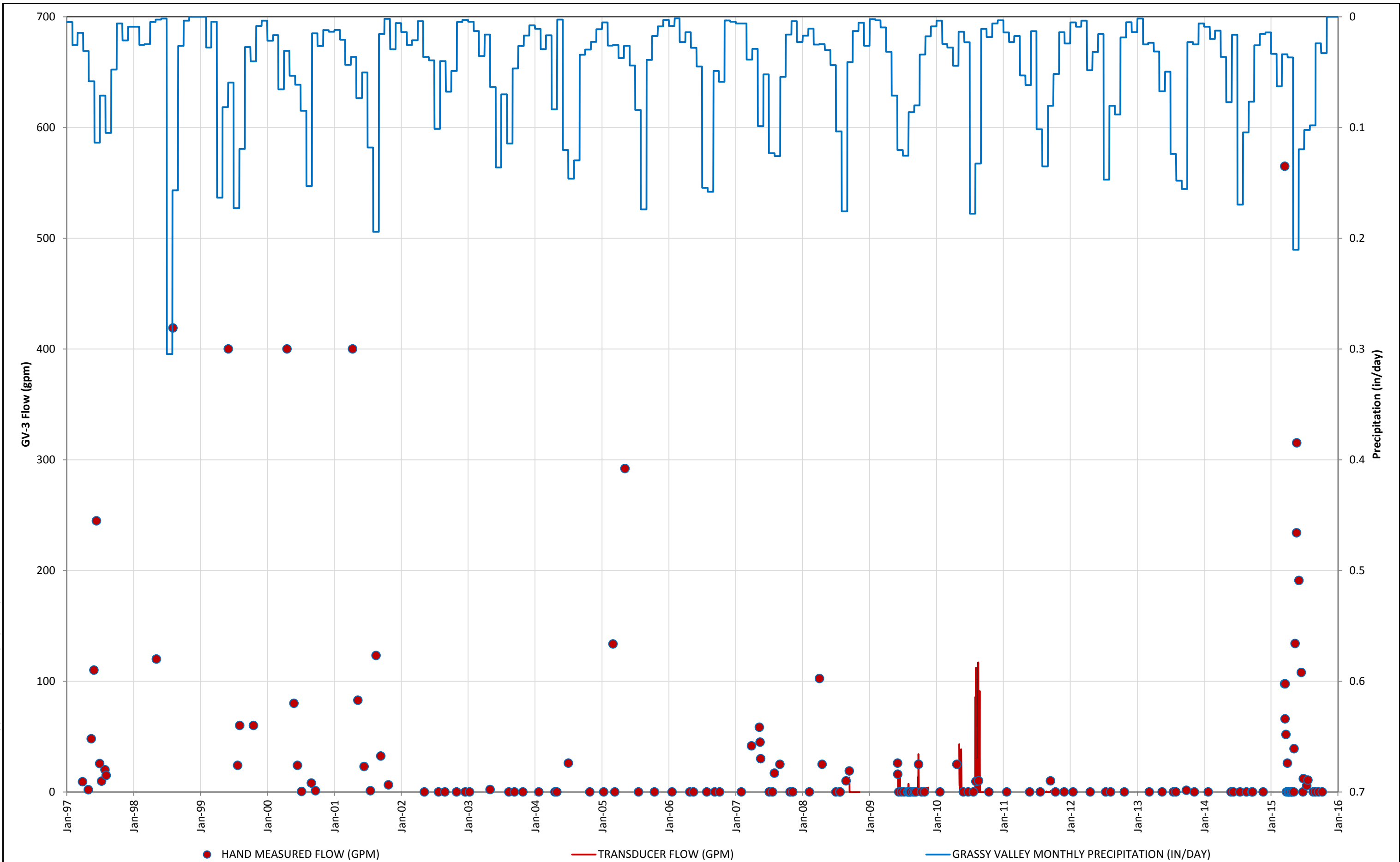
-  Tertiary Volcanic Phonolite and Welded Breccia
-  Precambrian Granite, Schist, and Gneiss
-  Saturated Rock
-  Mine Backfill
-  Overburden Storage

GEOHYDROLOGY

-  Water Table (zero water pressure line)
-  Precipitation
-  Surface Runoff
-  Seepage
-  Water table intercept in deep carbonate borehole piezometers

	Scale:	As shown
	Drawn:	A. Brown
	Date:	2015-12-03
CC&V Amendment 11 Hydrogeochemistry		
PLATE 5		
CONCEPTUAL FLOW MODEL		

G:\Dropbox (ABQ)\LAB PROJECTS\11985_CC&V\UC16_Evaluation\HydroGeoChem\11-22-Grassy.xlsx[P06-Grassy Flow

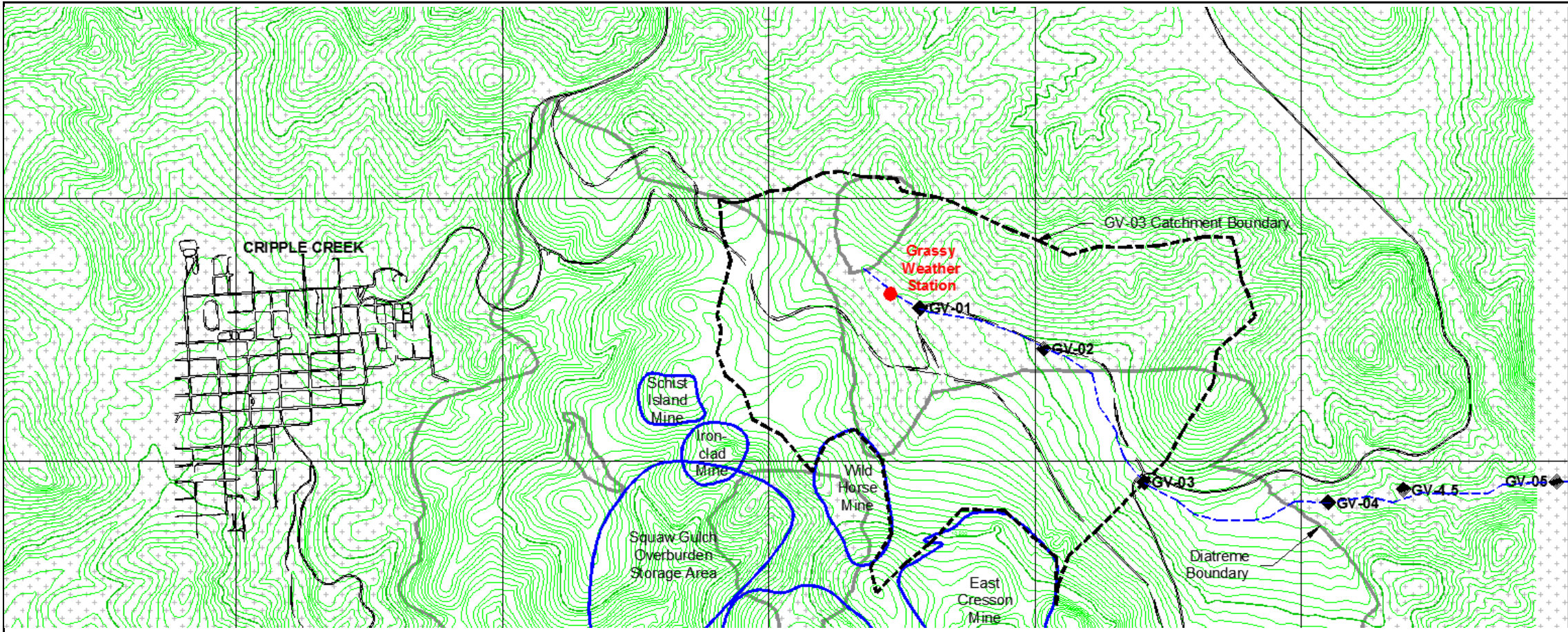


Sources: Hand Measured Flow: GV-3 Flume, CC&V Environmental Department, October 2015
Transducer Flow: GV-3 Flume Hobo Transducer, Environment Department, October 2012
Precipitation: Grassy Valley Weather Station (2002-2015) and Rigi Weather Station (1997-2001, corrected)



Scale: No scale
Drawn: A.Brown
Date: 2015-12-14

CC&V Amendment 11 Hydrogeochemistry
PLATE 6
GRASSY VALLEY SURFACE WATER FLOW



LEGEND

Volcanic Diatreme

Precambrian Rockmass

Streams (intermittent when dashed)

Surface Water Monitoring Flume

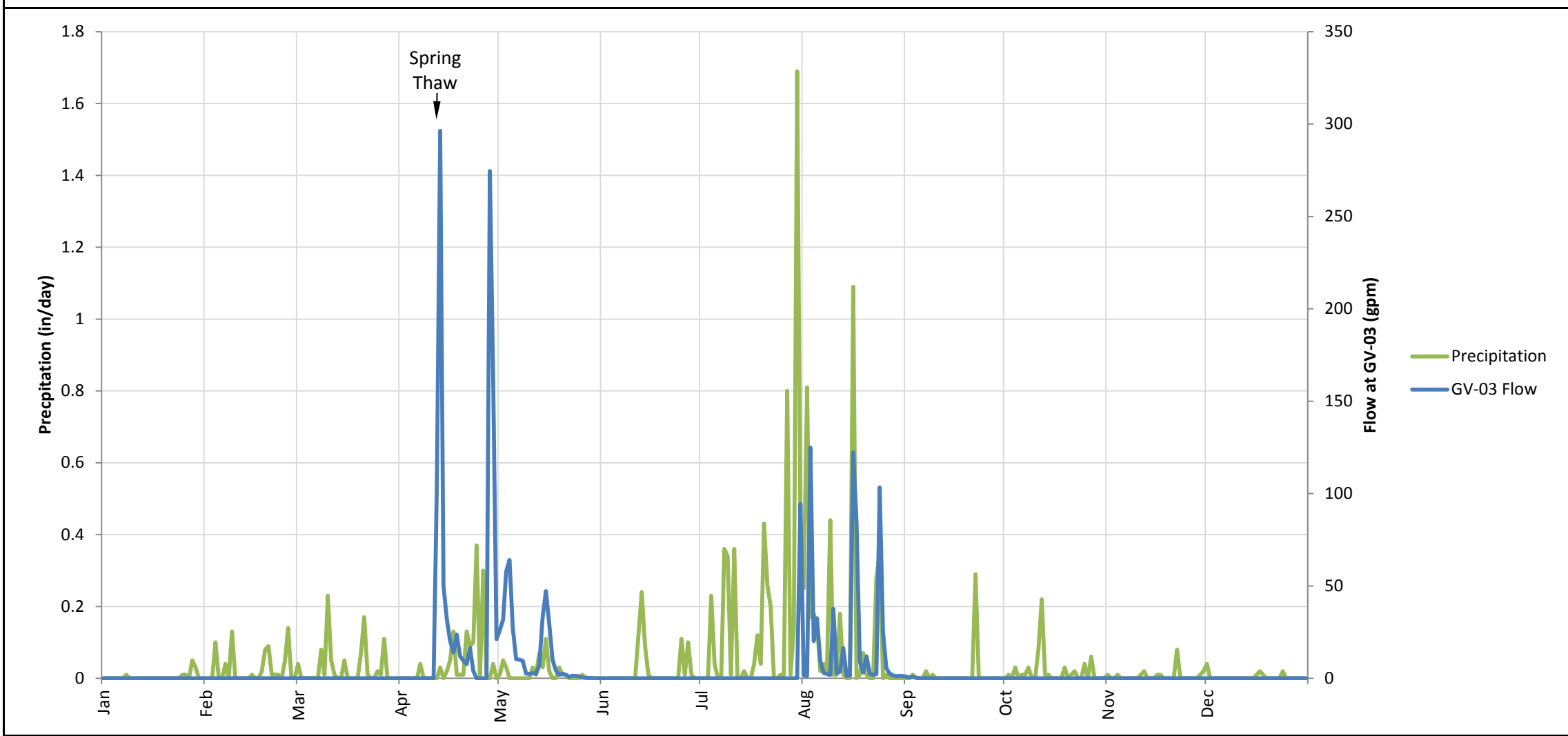
Weather Station

GV-03 Catchment Boundary

Surface Contours -2011 (interval = 25 ft)

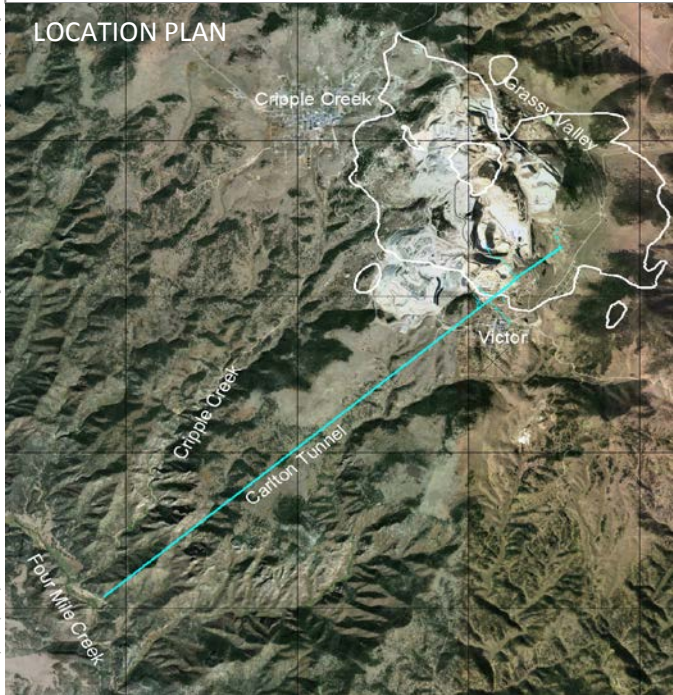
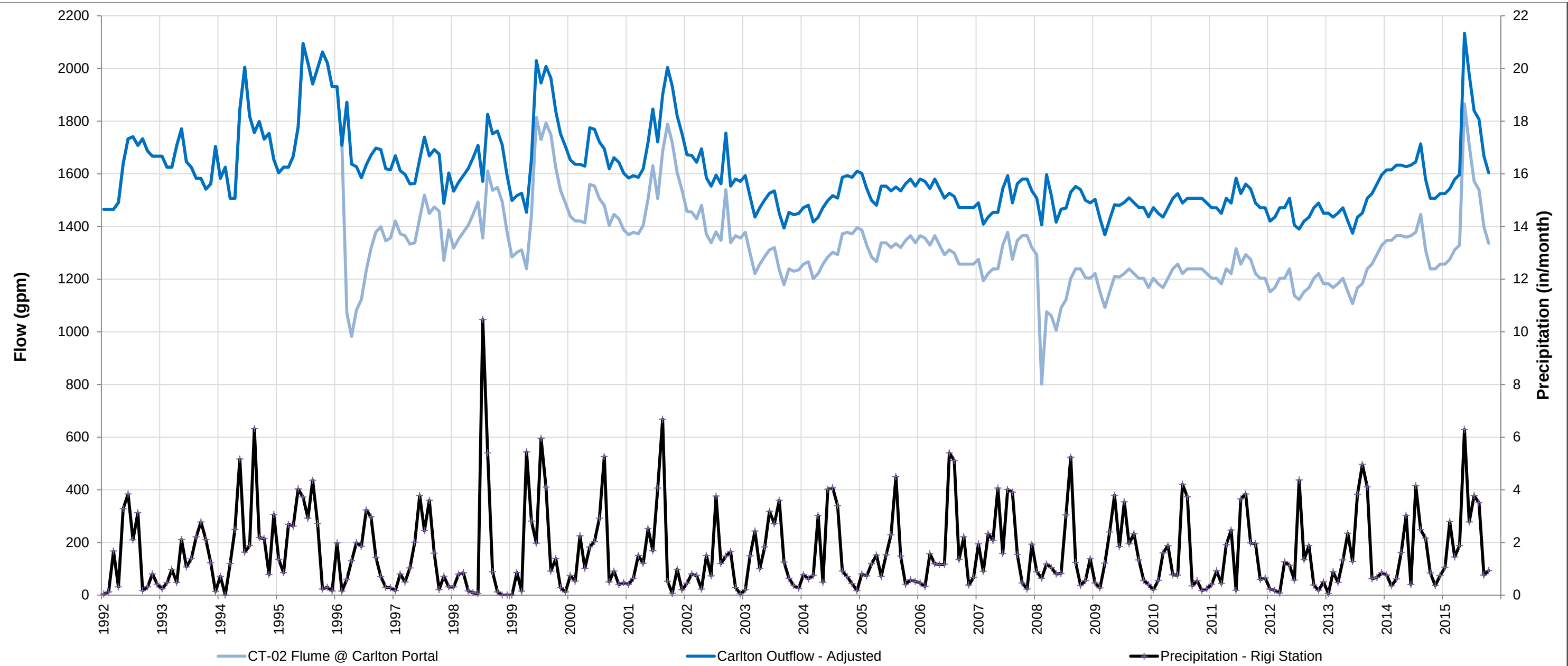
Mine Facility Outlines - 2011

Carlton Tunnel (elevation ~ 7,000 ft msl)



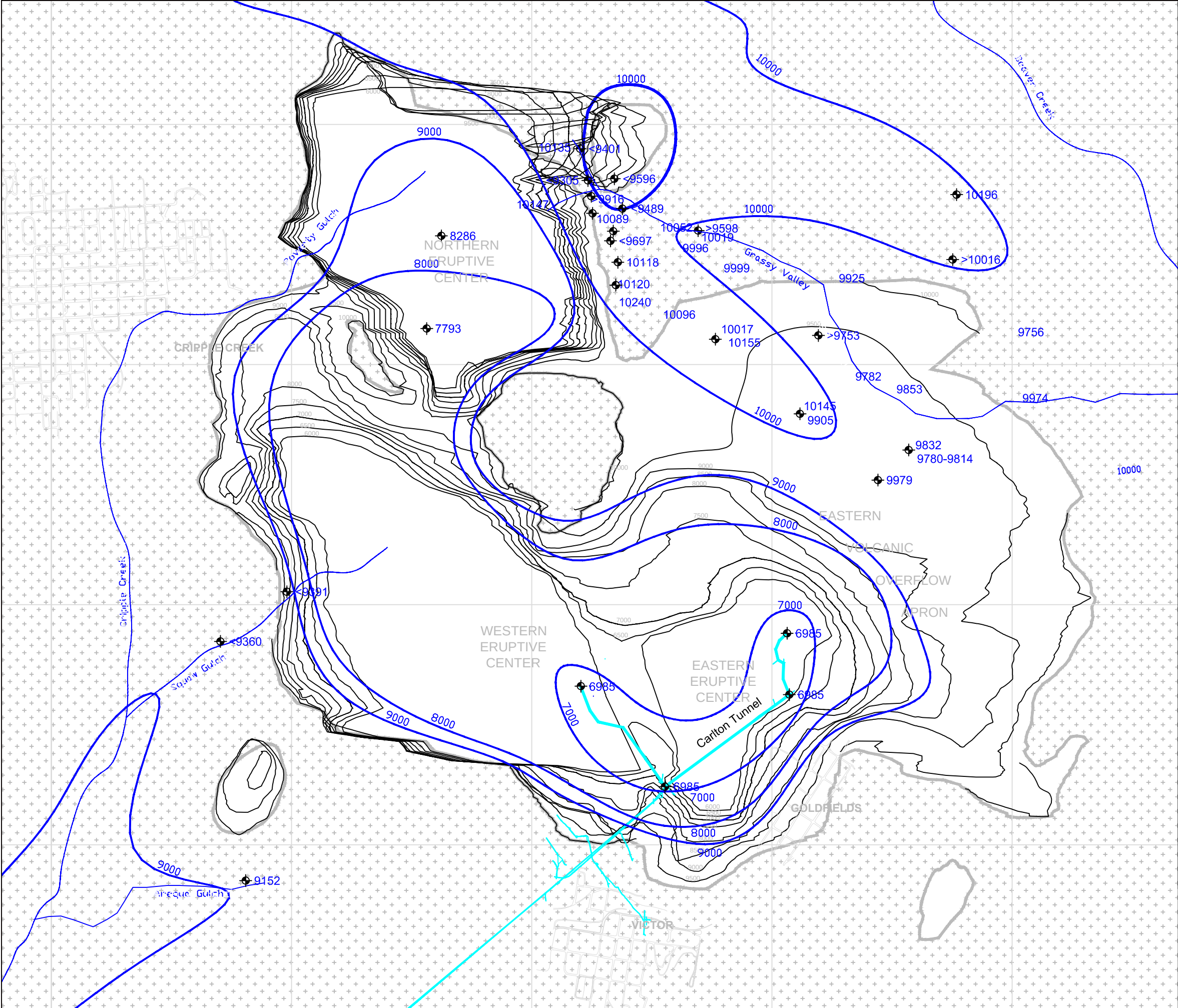
EVALUATION OF GRASSY VALLEY RUNOFF		
Basin Yield		
Catchment area	1124	acres
Runoff	9.6	acre feet
Basin yield	0.103	inches
Precipitation Yield		
Catchment area	1124	acres
Precipitation (Grassy)	14.97	inches
Volume of precipitation	1402	acre feet
Runoff	9.6	acre feet
Precipitation yield	0.69%	
Spring Thaw		
Catchment area	1124	acres
Spring thaw runoff	2.6	acre feet
Spring thaw yield	0.028	inches
NOTES		
1. Precipitation at Grassy Valley station, daily totals for 2010.		
2. Flow at GV-03 for 2010 measured with a Parshall Flume and Hobo water pressure transducer.		
3. Flow between 4/24 and 4/27 not recorded; estimated using precipitation and temperature.		
4. Flow before 4/9 and after 10/15 zero, based on temperature being below 0°C and frozen flume well.		
Scale: 1" = 2,500' (5000' grid) Drawn: A.Brown Date: 2015-12-14		
CC&V Amendment 11 Hydrogeochemistry		
PLATE 7		
GRASSY VALLEY YIELD		

G:\Dropbox (ABC)\AB PROJECTS\1.985_C&V\UG16_Evaluation\GeoChem\11_40a-Geochemistry Cleanup.xls\708-Carlton Flow



SEEPAGE RATE			
Time period	1992-2002	2003-2014	2015
Average flow (gpm)	1691	1504	1727
Infiltration area (sq.mile)	8.7	8.7	8.7
Seepage rate (in/year)	5.9	5.2	6.0
Precipitation rate (in/y)	19.47	18.57	25.22
Seepage rate (% precip)	30%	28%	24%

NOTES	
1. Carlton Tunnel flow measured at portal (1992-1995), below ponds (1996-present). Portal flow adjusted for losses.	
2. Carlton Tunnel flow measured below ponds 1996-present. Flow adjusted to account for losses.	
3. Infiltration area includes the capture area of the Cripple Creek diatreme (Plate 4).	
 AdrianBrown	Scale: ~1" = 2 miles (inset map)
	Drawn: A.Brown
	Date: 2015-12-14
CC&V Amendment 11 Hydrogeochemistry	
PLATE 8	
CARLTON TUNNEL FLOW	



LEGEND



Volcanic Diatreme Boundary
(with 500 foot contours to 6,000 ft amsl)



Precambrian Rock



Groundwater Contours (2012-15)
(interval = 1000 ft)



Water Table Elevation in Bedrock Well



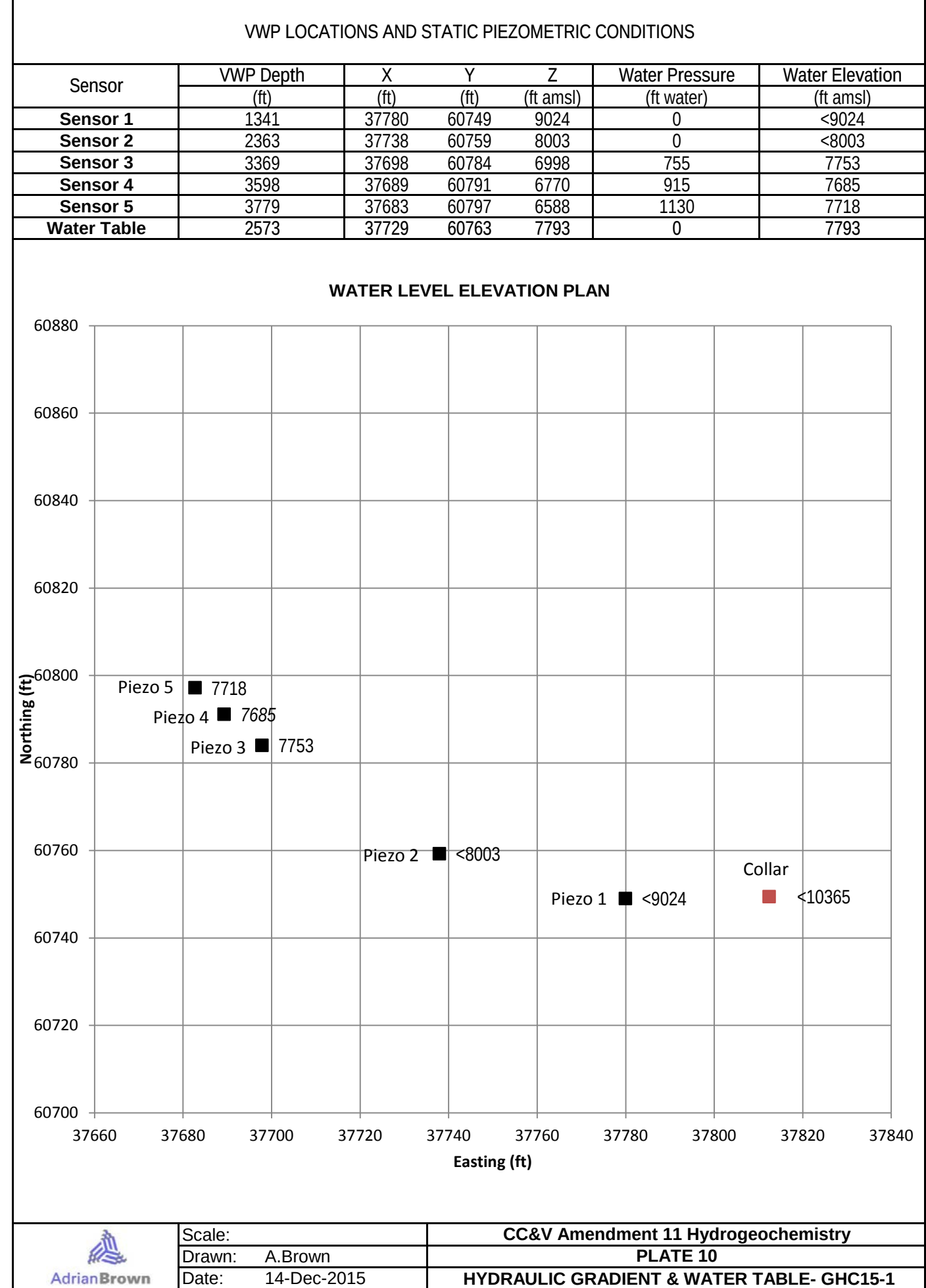
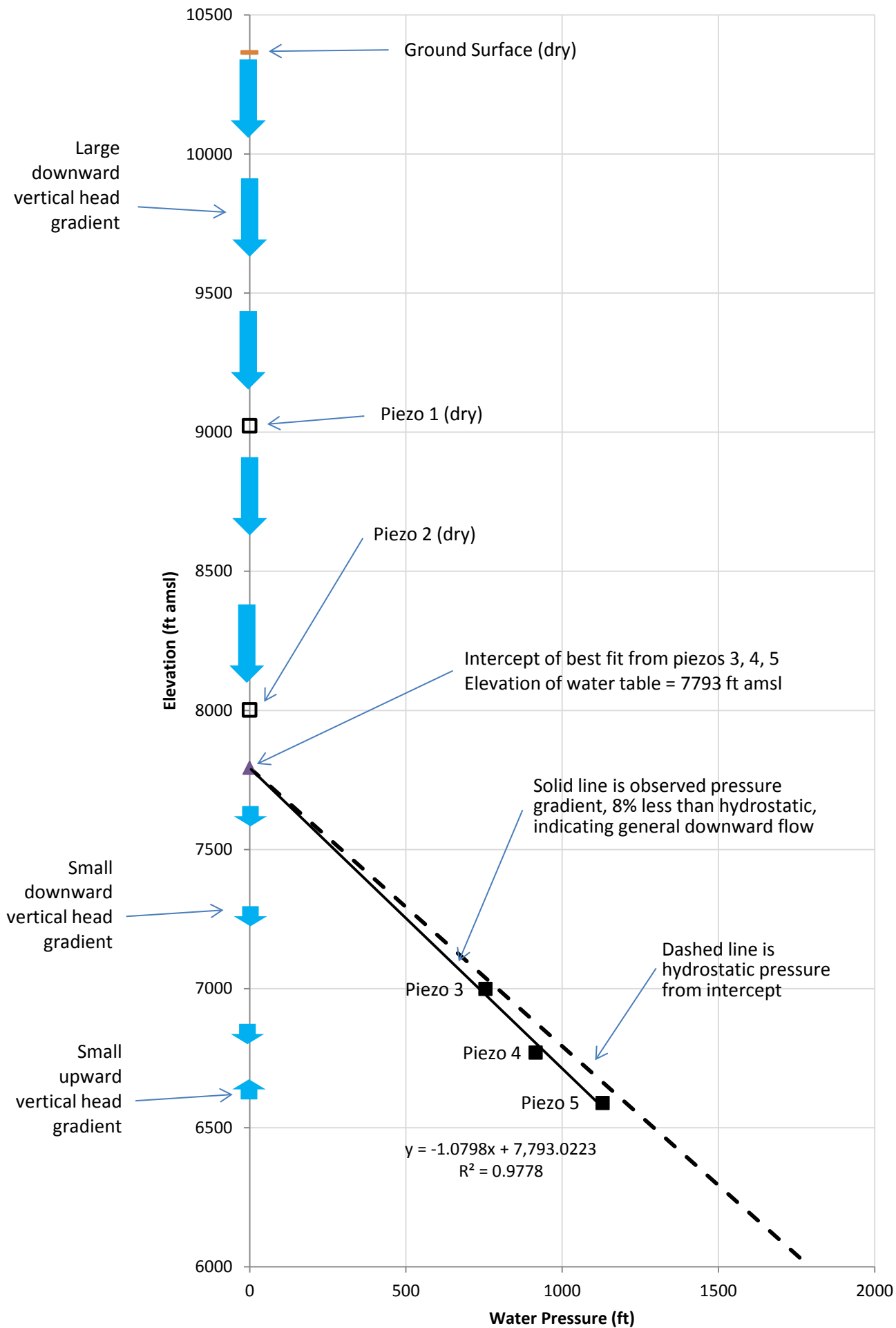
Carlton Tunnel (elevation ~ 6,985 ft amsl)

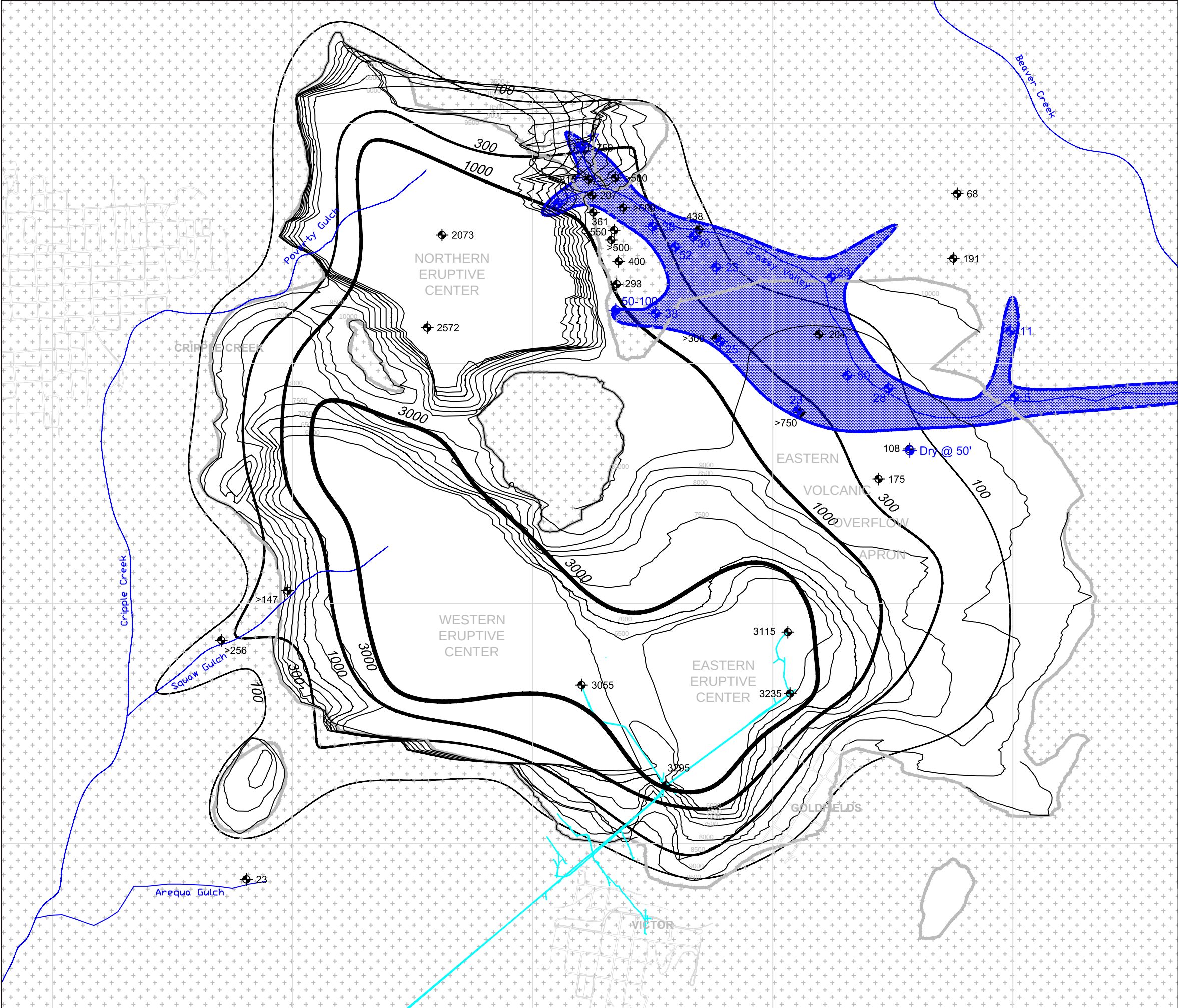


Streams

 AdrianBrown	Scale:	1" = 2,000' (grid = 5,000 ft)
	Drawn:	A. Brown
	Date:	2015-12-03
CC&V Amendment 11 Hydrogeochemistry		
PLATE 9		
CRIPPLE CREEK MINING DISTRICT WATER TABLE		

G:\Dropbox (ABC)\AB PROJECTS\1386 - CC&V-UG16 - Evaluation\HydroGeoChem\11.19-WaterTable.xlsx\PI10_GHC15-1-WaterTable





LEGEND



Volcanic Diatreme Boundary
(with 500 foot contours to 6,000 ft amsl)



Precambrian Rock



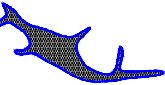
Depth to Water Table at Well Location
(feet from original ground surface)



Depth to Water Table (feet)
(logarithmic interval @ factor of ~3)



Depth to Perched Water Table at Well
(feet from original ground surface)



Grassy Valley Perched Aquifer
(based on well data and topography)



Carlton Tunnel (elevation ~ 6,985 ft amsl)



Streams

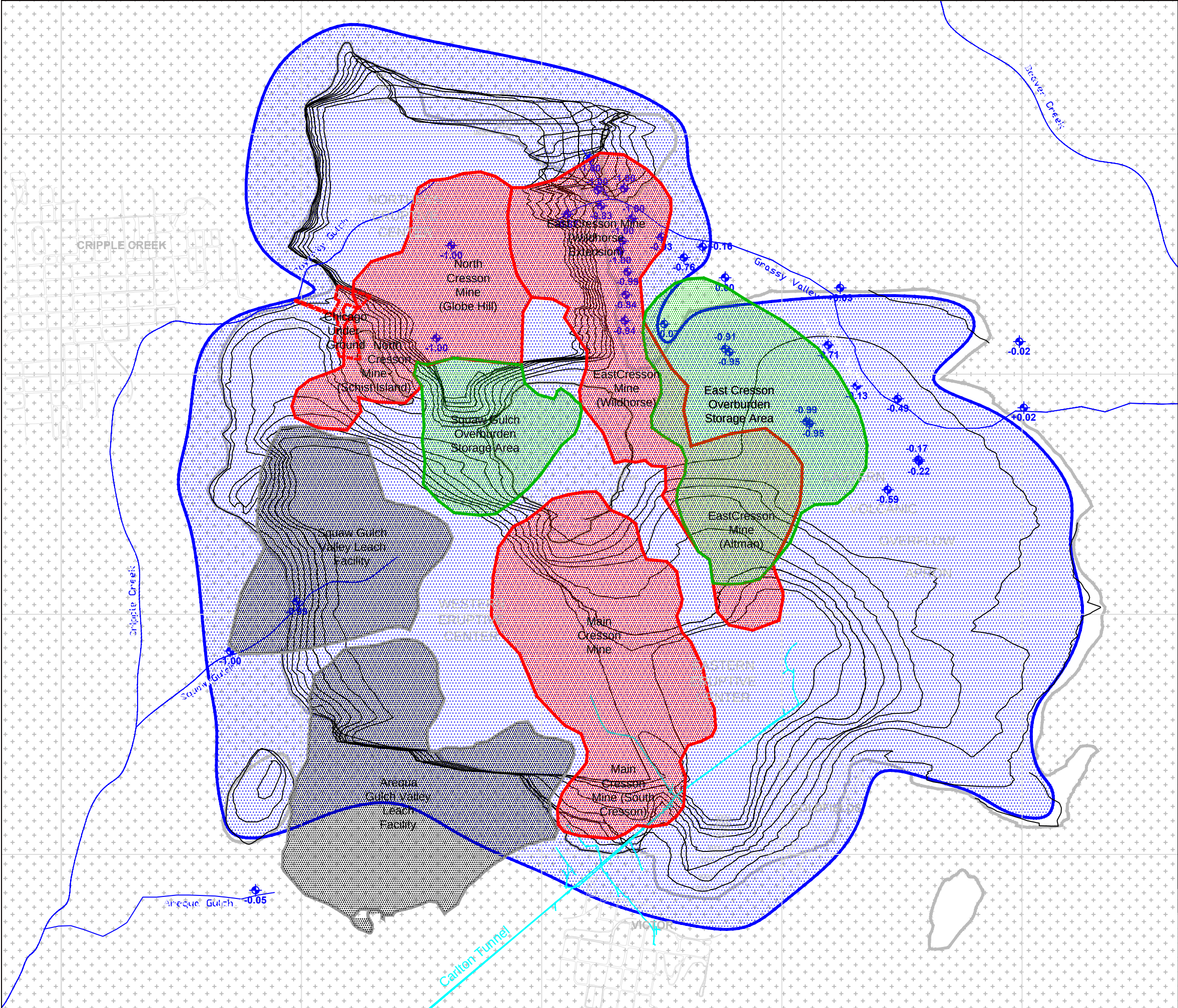


Scale:	1" = 2,000' (grid = 5,000 ft)
Drawn:	A. Brown
Date:	2015-12-03

CC&V Amendment 11 Hydrogeochemistry

PLATE 11

PERCHED AND BEDROCK WATER TABLE DEPTHS



LEGEND



Volcanic Diatreme Boundary
(with 500 foot contours to 6,000 ft amsl)



Precambrian Rock



Zone of infiltration capture by diatreme
(vertical hydraulic gradient ≤ -1)



Vertical Hydraulic Gradient at Well Nest
-1.00



Carlton Tunnel (elevation ~ 6,985 ft amsl)



Streams

FACILITIES



Mines



Overburden Storage Areas



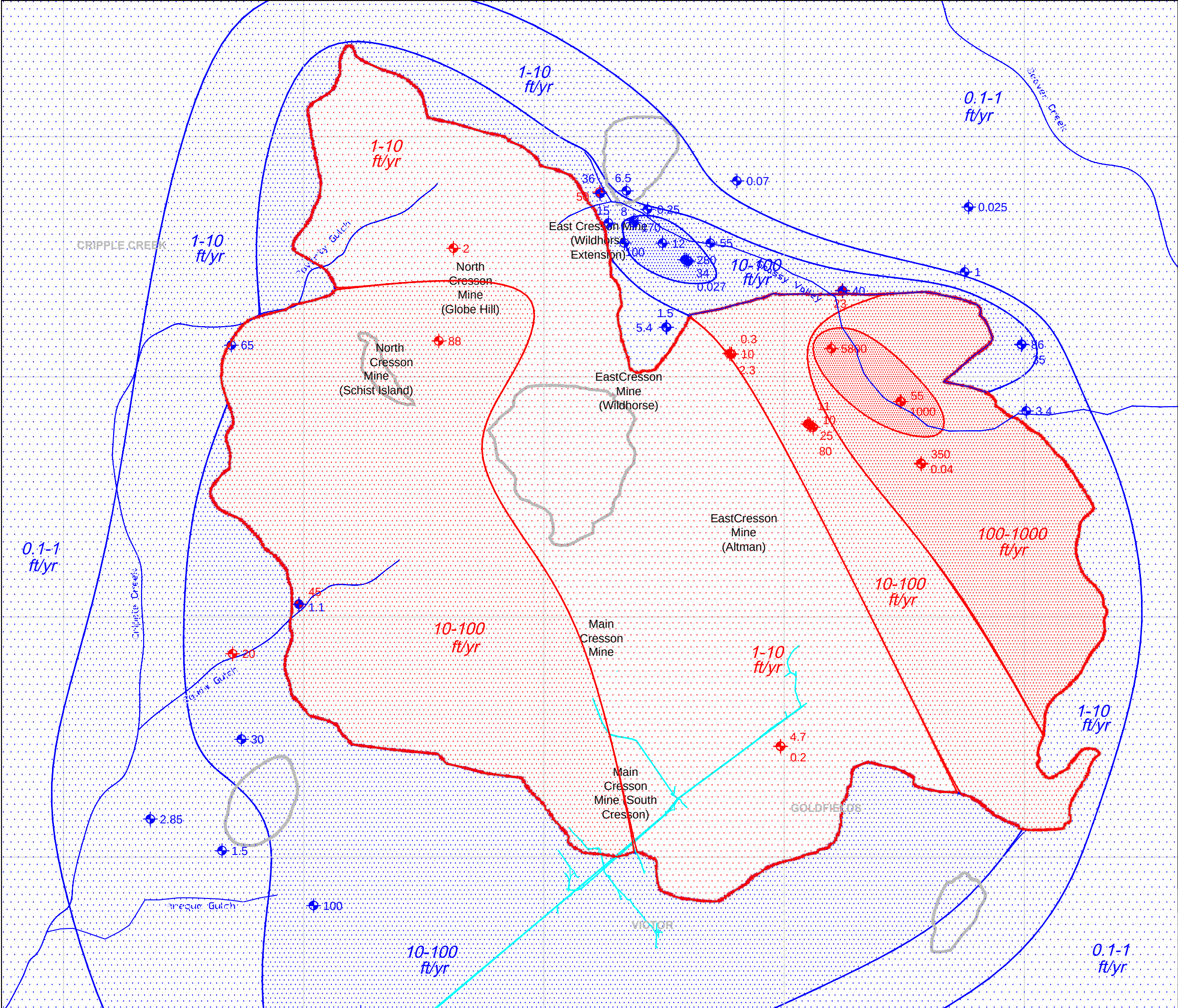
Valley Leach Facilities

 AdrianBrown	Scale:	1" = 2,000' (grid = 5,000 ft)
	Drawn:	A. Brown
	Date:	2015-12-10

CC&V Amendment 11 Hydrogeochemistry

PLATE 12

INFILTRATION CAPTURE BY DIATREME



LEGEND



Volcanic Diatreme Boundary
(with 500 foot contours to 6,000 ft amsl)



0.07
Precambrian Hydraulic Conductivity
(ft/yr = cm/sec x 10⁶)



5800
Tertiary Volcanic Hydraulic Conductivity
(ft/yr = cm/sec x 10⁶)



Carlton Tunnel (elevation ~ 6,985 ft amsl)



Squaw Gulch
Streams

FACILITIES



Mines

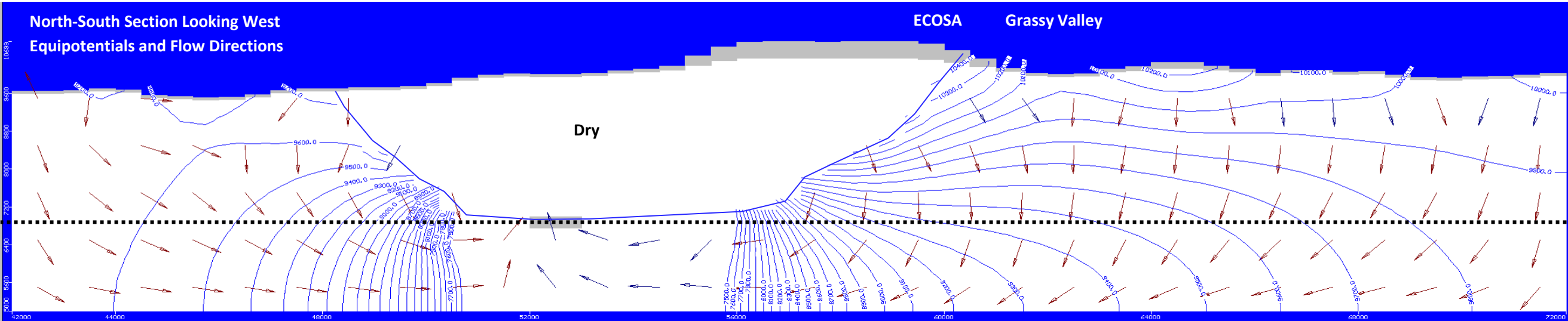
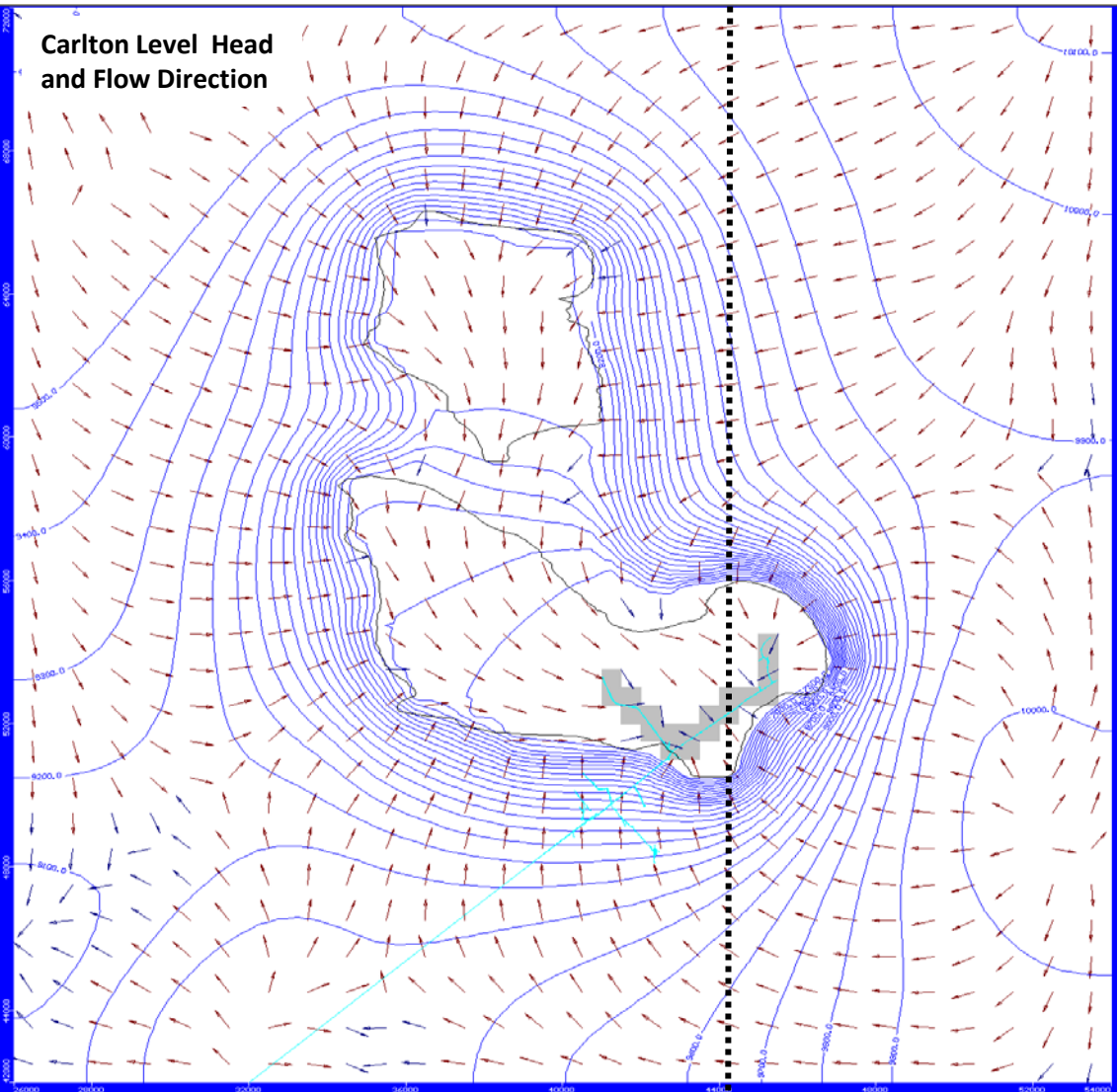
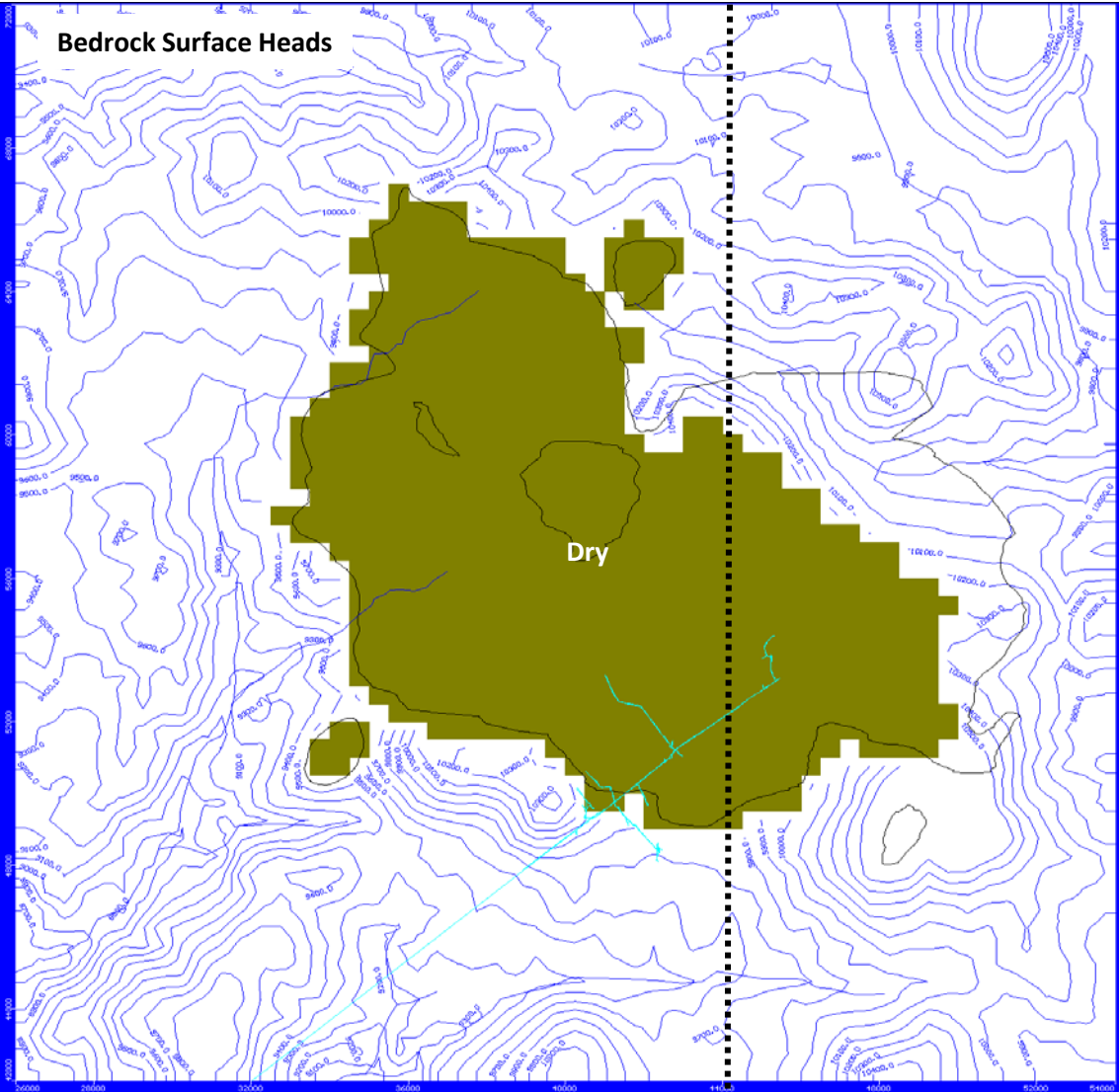


Overburden Storage Areas



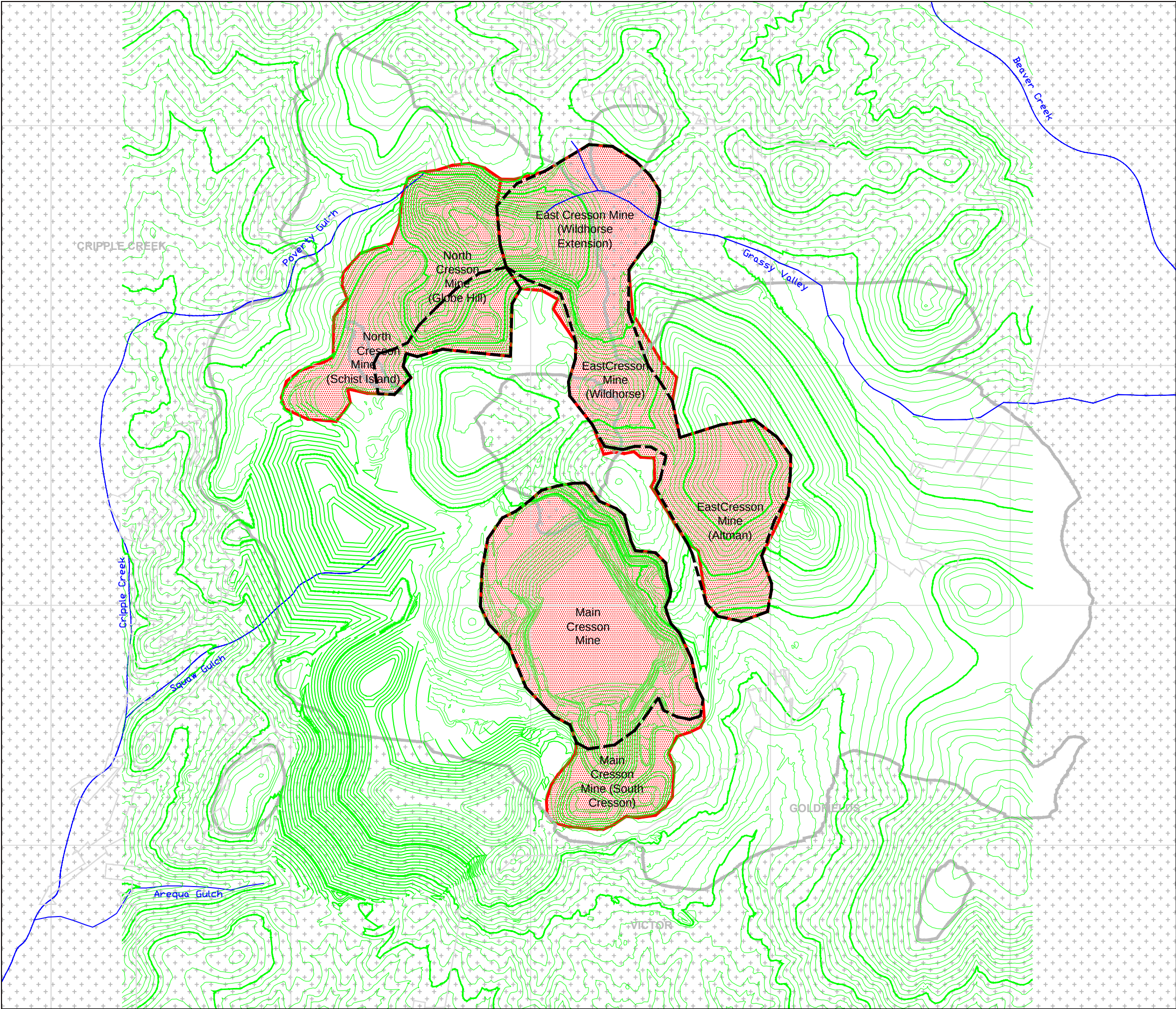
Valley Leach Facilities

 Adrian Brown	Scale:	1" = 2,000' (grid = 5,000 ft)
	Drawn:	A. Brown
	Date:	2015-12-10
CC&V Amendment 11 Hydrogeochemistry		
PLATE 13		
HYDRAULIC CONDUCTIVITY		



Note: Arrows indicate flow direction only, for the location at the tail of the arrow.

 AdrianBrown	Hydraulic Conductivity	Kx [cm/s]	Ky [cm/s]	Kz [cm/s]	Surface Infiltration	Scale: Plates: 1" = 5,000 ft; Section: 1" = 2,000 ft.	CC&V Amendment 11 Hydrogeochemistry PLATE 14 GROUNDWATER FLOW MODEL RESULTS
	Precambrian	5×10^{-7}	5×10^{-7}	5×10^{-7}	5.9 inches/year	Drawn: Adrian Brown	
	Tertiary general	3×10^{-4}	3×10^{-4}	3×10^{-4}	Swamped	Date: 26-Feb-2012	



LEGEND

- Volcanic Diatreme Boundary
- Streams
- Amendment 11 Permit Boundary
- Amendment 11 Reclaimed Surface (contour interval = 35 feet)

FACILITIES

- Surface Mines (2015)
- Surface Mines (Amendment 11)

COMPUTATIONS

CHANGE IN DISTURBED AREA				
Area	Unit	2015	AM-11	Change
North Cresson	acre	77	310	+233
East Cresson	acre	481	509	+28
Main Cresson	acre	380	509	+129
Total	acre	937	1327	+390

CHANGE IN SURFACE WATER PRODUCTIVITY				
Surface runoff rate = 0.103 inch/year				
Area	Unit	2015	AM-11	Change
North Cresson	gpm	0.4	1.7	+1.2
East Cresson	gpm	2.6	2.7	+0.1
Main Cresson	gpm	2.0	2.7	+0.7
Total	gpm	5.0	7.1	+2.1

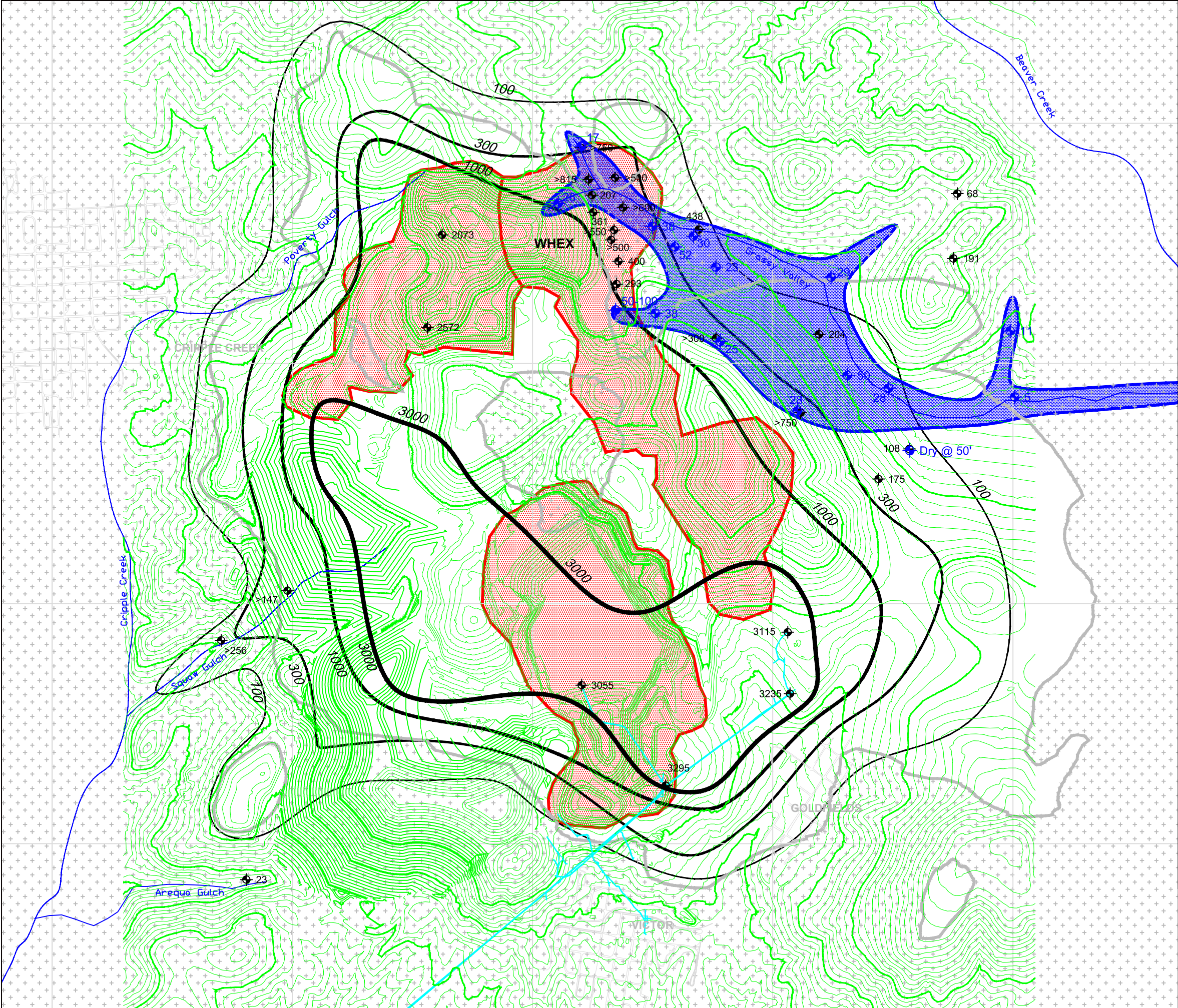
CHANGE IN DIATREME INFILTRATION DURING OPERATION				
Infiltration rate when vegetated = 5.9 inch/year				
Infiltration rate when disturbed = 7.4 inch/year				
Area	Unit	Vegetated	Disturbed	Change
North Cresson	gpm	95	118	+24
East Cresson	gpm	155	194	+39
Main Cresson	gpm	155	194	+39
Total	gpm	405	506	+101

	Scale:	1" = 2,000' (grid = 5,000 ft)
	Drawn:	A. Brown
	Date:	2015-12-10

CC&V Amendment 11 Hydrogeochemistry

PLATE 15

HYDROLOGY IMPACT - SURFACE MINING



LEGEND



Volcanic Diatreme Boundary



Precambrian Rock



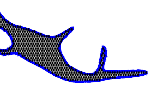
Depth to Water Table at Well Location
(feet from original ground surface)



Depth to Water Table (feet)
(logarithmic interval @ factor of ~3)



Depth to Perched Water Table at Well
(feet from original ground surface)



Grassy Valley Perched Aquifer
(based on well data and topography)



Carlton Tunnel (elevation ~ 6,985 ft amsl)



Streams



Reclaimed Amendment 11 Surface
(contour interval = 35 feet)

FACILITIES



Surface Mines

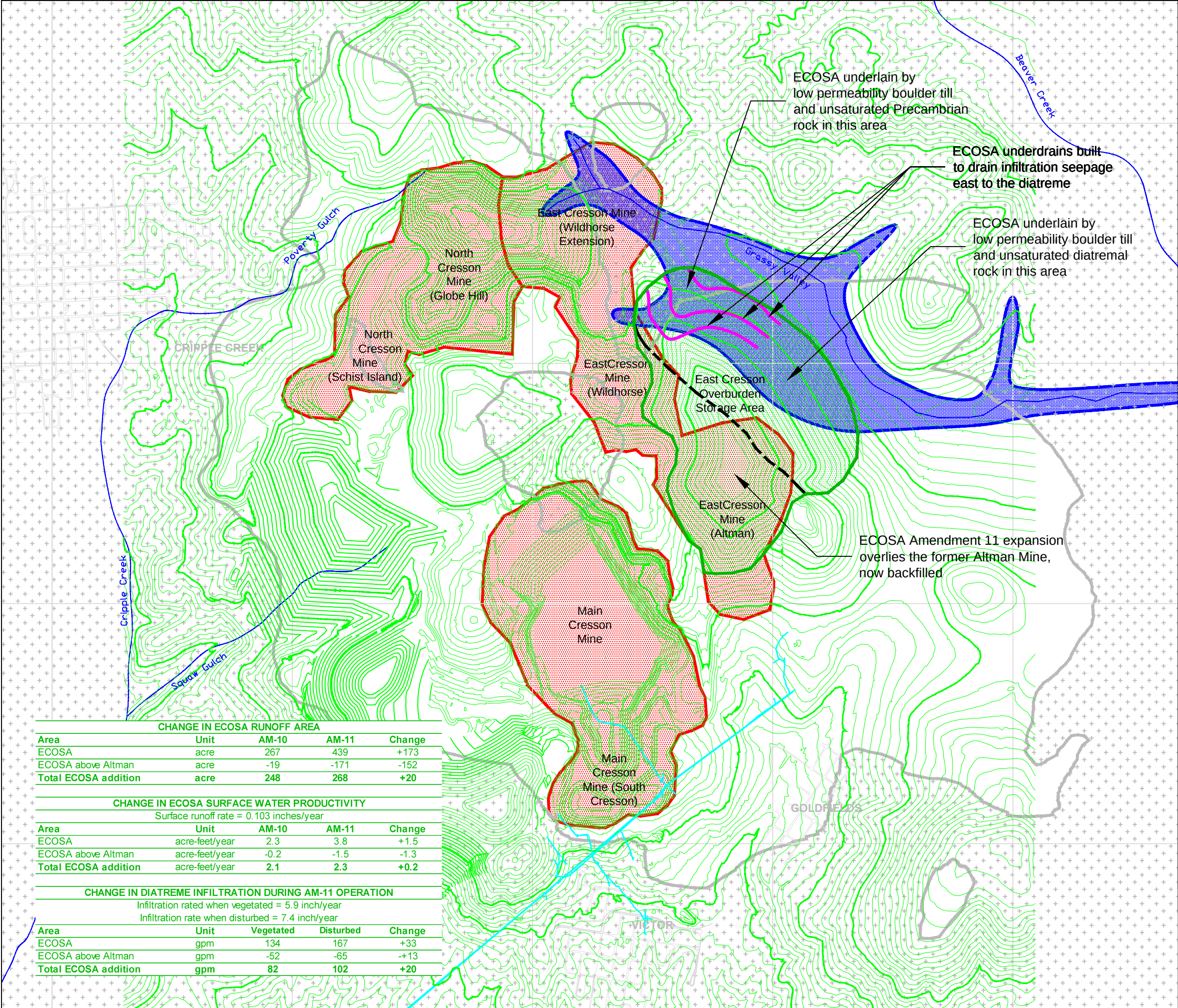


Scale:	1" = 2,000' (grid = 5,000 ft)
Drawn:	A. Brown
Date:	2015-12-03

CC&V Amendment 11 Hydrogeochemistry

PLATE 16

IMPACT POTENTIAL OF DRAINAGE TO WHEX



LEGEND

- Volcanic Diatreme Boundary
- Precambrian Rock
- Grassy Valley Perched Aquifer (based on well data and topography)
- Carlton Tunnel (elevation ~ 6,985 ft amsl)
- Streams
- Reclaimed Amendment 11 Surface (contour interval = 35 feet)

FACILITIES

- Surface Mines
- ECOSA in Amendment 10 Permit
- ECOSA Underdrains (Amendment 10)
- ECOSA at End of Amendment 11

CHANGE IN ECOSA RUNOFF AREA				
Area	Unit	AM-10	AM-11	Change
ECOSA	acre	267	439	+173
ECOSA above Altman	acre	-19	-171	-152
Total ECOSA addition	acre	248	268	+20

CHANGE IN ECOSA SURFACE WATER PRODUCTIVITY				
Surface runoff rate = 0.103 inches/year				
Area	Unit	AM-10	AM-11	Change
ECOSA	acre-feet/year	2.3	3.8	+1.5
ECOSA above Altman	acre-feet/year	-0.2	-1.5	-1.3
Total ECOSA addition	acre-feet/year	2.1	2.3	+0.2

CHANGE IN DIATREME INFILTRATION DURING AM-11 OPERATION				
Infiltration rated when vegetated = 5.9 inch/year				
Infiltration rate when disturbed = 7.4 inch/year				
Area	Unit	Vegetated	Disturbed	Change
ECOSA	gpm	134	167	+33
ECOSA above Altman	gpm	-52	-65	+13
Total ECOSA addition	gpm	82	102	+20

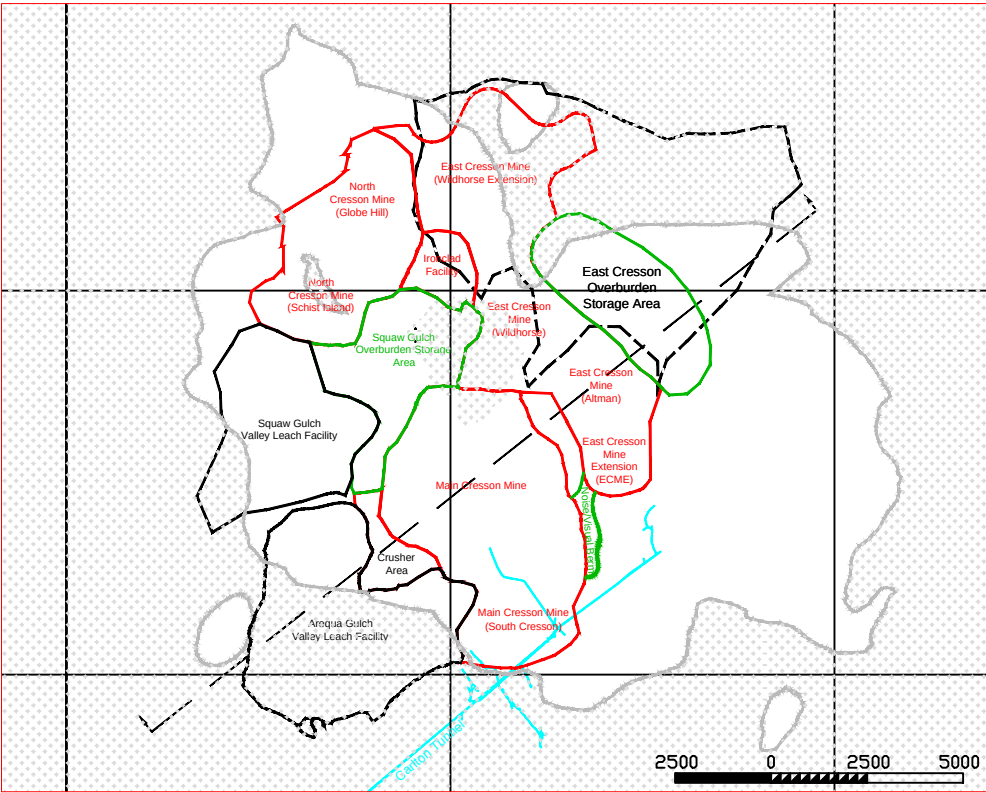
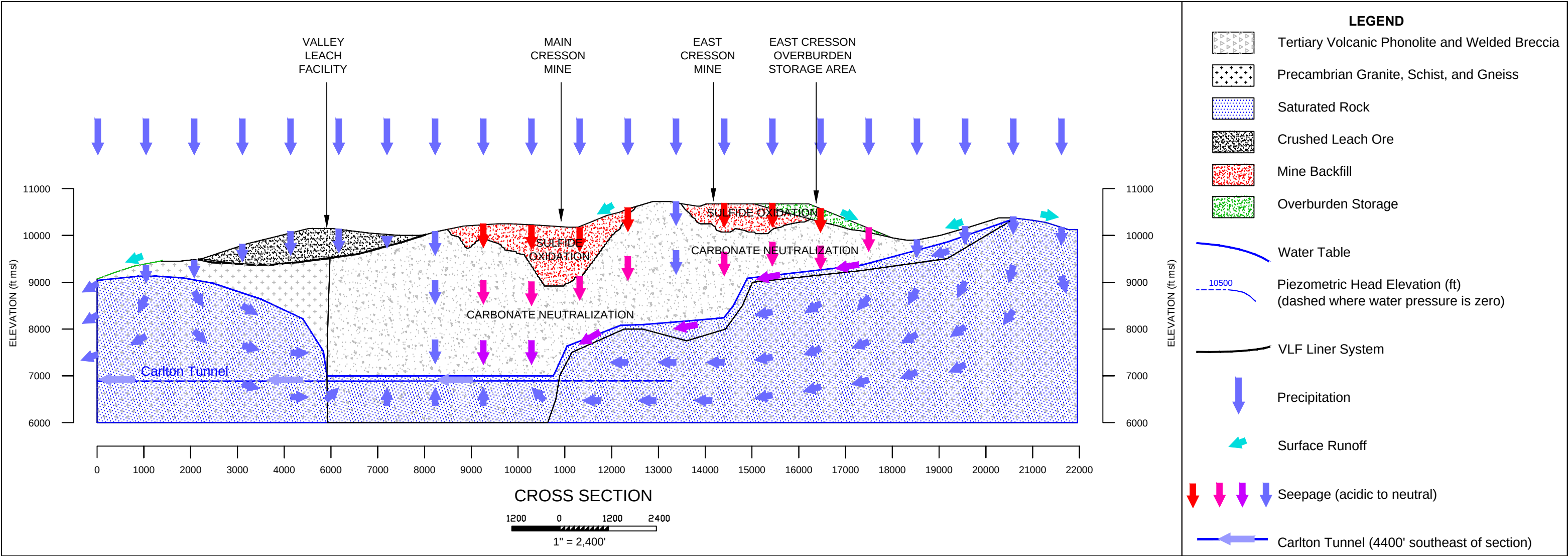
Adrian Brown

Scale:	1" = 2,000' (grid = 5,000 ft)
Drawn:	A. Brown
Date:	2015-12-03

CC&V Amendment 11 Hydrogeochemistry

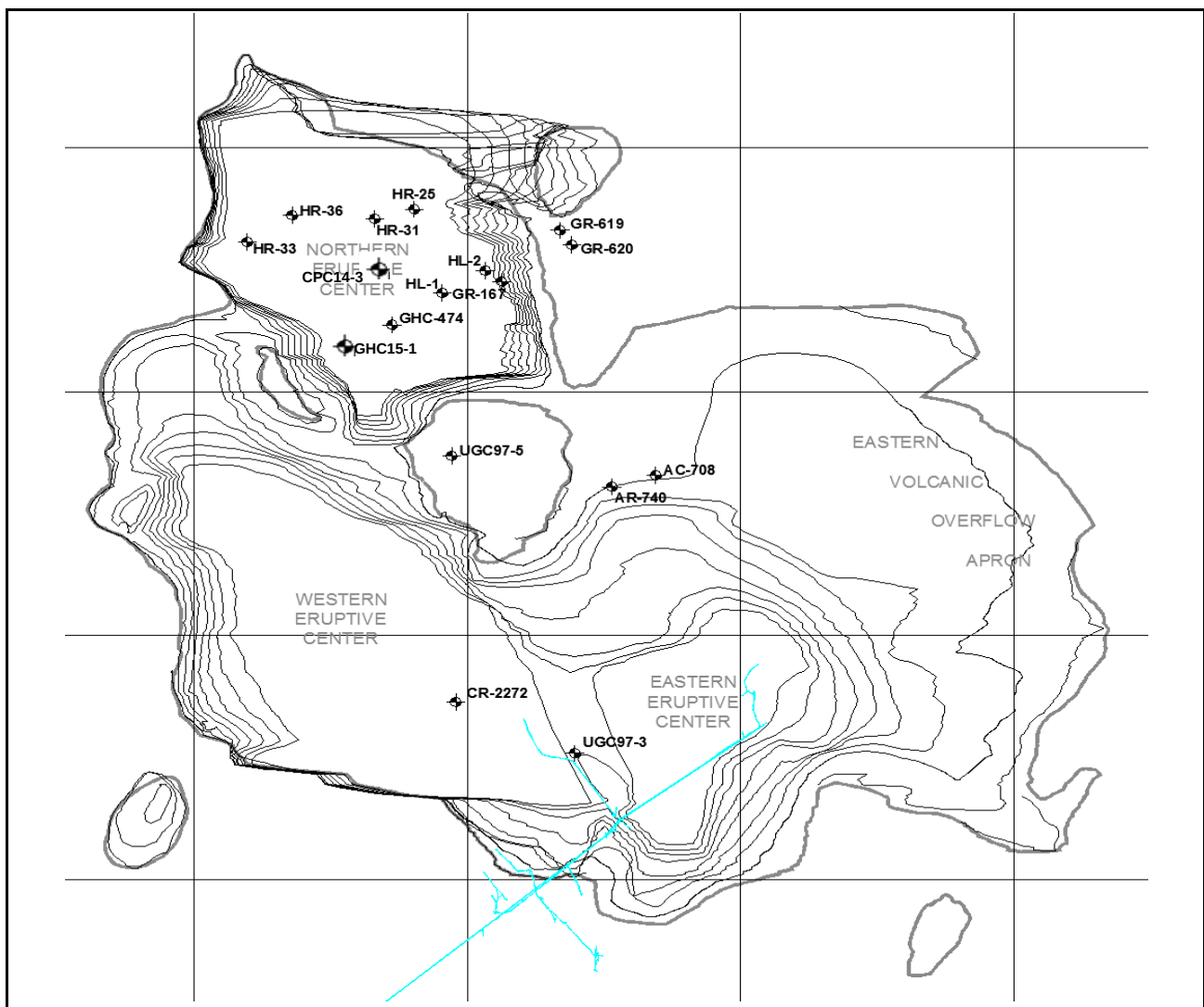
PLATE 17

IMPACT POTENTIAL OF ECOSA ON GRASSY VALLEY

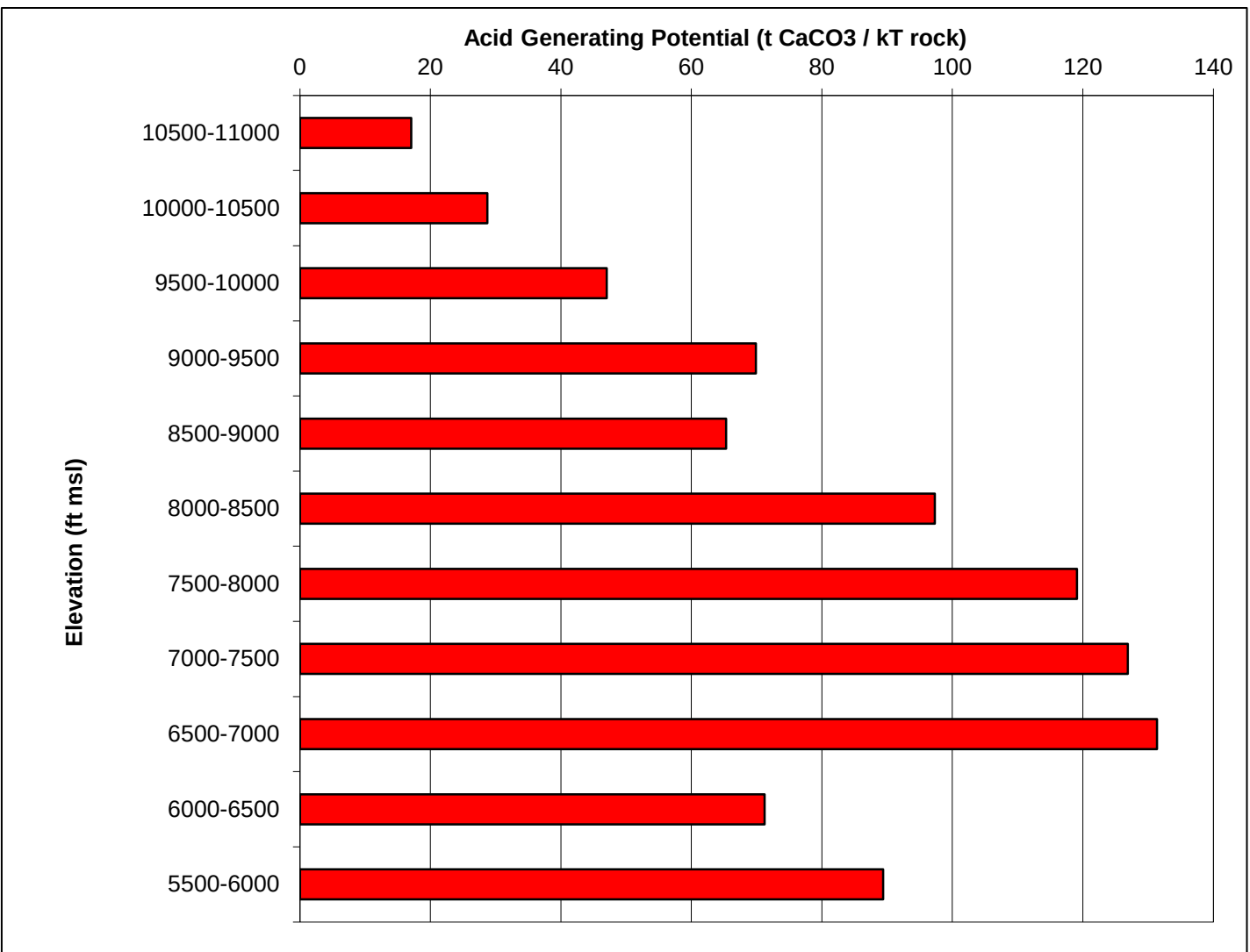


	Scale:	As shown
	Drawn:	A. Brown
	Date:	2015-12-03
CC&V Amendment 11 Hydrogeochemistry		
PLATE 18		
HYDROGEOCHEMICAL SYSTEM SCHEMATIC		

LOCATION OF DEEP CARBONATE EXPLORATION BOREHOLES



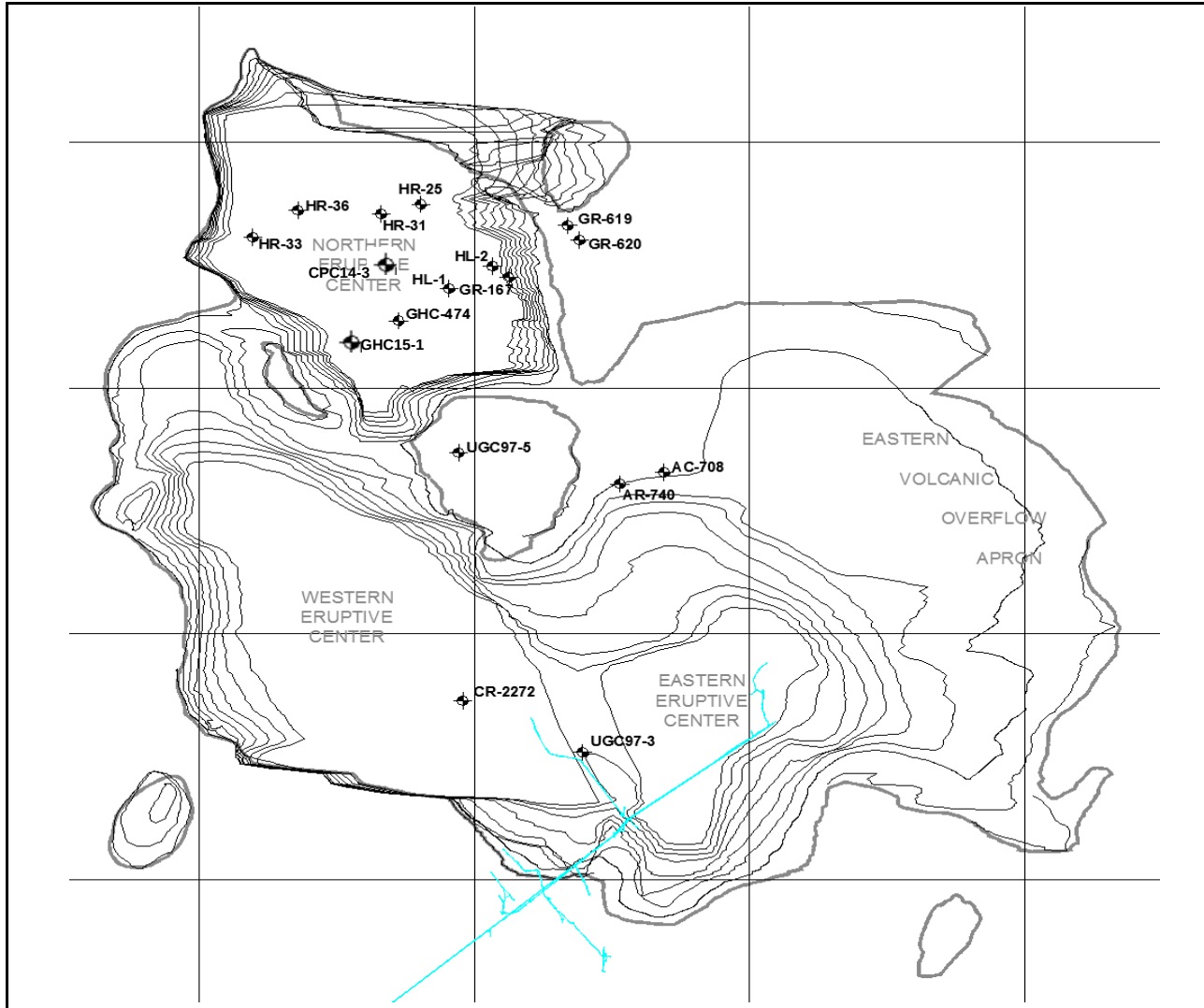
ACID GENERATING POTENTIAL BY ELEVATION



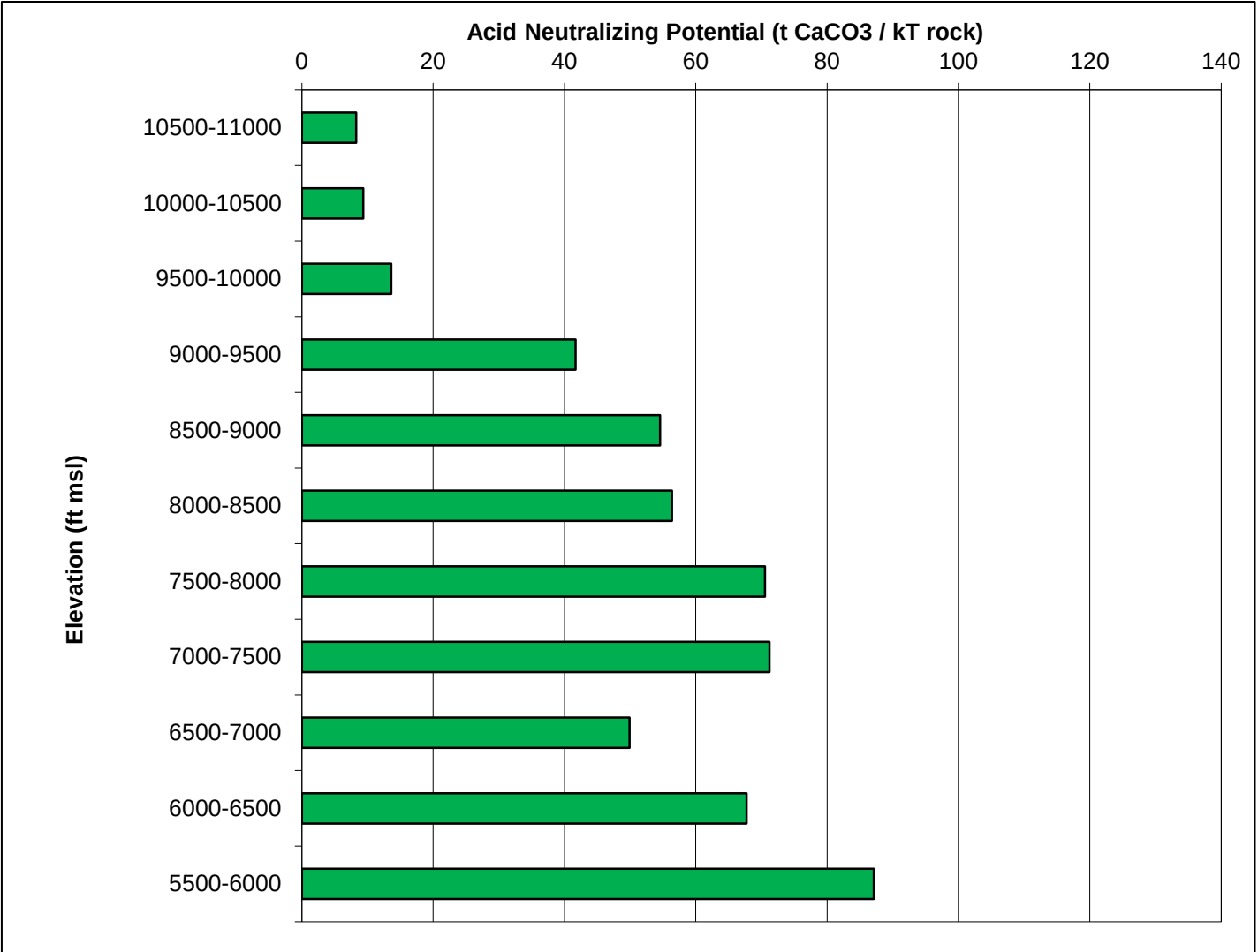
Elevation Range (ft)	ACID GENERATING POTENTIAL IN DEEP BORHEHOLES (equivalent t CaCO3/kT rock)															MINING DISTRICT				
	AC12-1162	AC12-1163	AC13-1171	AC13-2	AC13-3	CC13-3168	CC-2272	CPC14-3	GC-07-704	GHC15-1	GHC-474	SGR-868	UGC96-2	UGC97-4	UGC97-5	Average AGP (t CaCO3/kT)	Rock Mass (million tons)	Total AGP (million tons CaCO3)	Vadose AGP (million tons CaCO3)	Saturated AGP (million tons CaCO3)
10500-11000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17	1,103	19	19	
10000-10500	--	--	--	18	15	--	--	15	--	54	--	--	--	--	--	29	2,206	63	63	
9500-10000	--	1	--	80	53	--	--	17	--	32	--	2	56	79	--	47	4,511	212	212	
9000-9500	69	11	92	52	43	98	--	128	84	114	100	27	82	91	66	70	4,570	319	319	
8500-9000	31	10	64	35	39	101	--	120	77	127	139	24	15	71	79	65	3,902	255	255	
8000-8500	32	9	33	25	16	119	52	161	140	116	305	32	51	68	62	97	3,441	335	335	
7500-8000	28	17	73	72	21	113	113	158	168	180	134	30	38	85	43	119	3,074	366		366
7000-7500	37	--	--	--	--	--	98	113	150	144	--	--	--	--	--	127	2,730	346		346
6500-7000	--	--	--	--	--	--	56	126	--	165	--	--	--	--	--	131	2,427	319		319
6000-6500	--	--	--	--	--	--	69	63	--	162	--	--	--	--	--	71	2,142	153		153
5500-6000	--	--	--	--	--	--	89	--	--	--	--	--	--	--	--	89	1,986	178		178
TOTALS																80	32,093	2,565	1,203	1,361

Notes:	1. Drill Hole CC-2272 was deviated at mid-height to create CR-2272. Values from CC-2272 and CR-2272 averaged by elevation 2. Drill Hole GHC-474 was deviated at mid height to create GHC474D2. Values from GHC-474 and GHC-474D2 averaged by elevation
--------	---

LOCATION OF DEEP CARBONATE EXPLORATION BOREHOLES



ACID NEUTRALIZING POTENTIAL BY ELEVATION



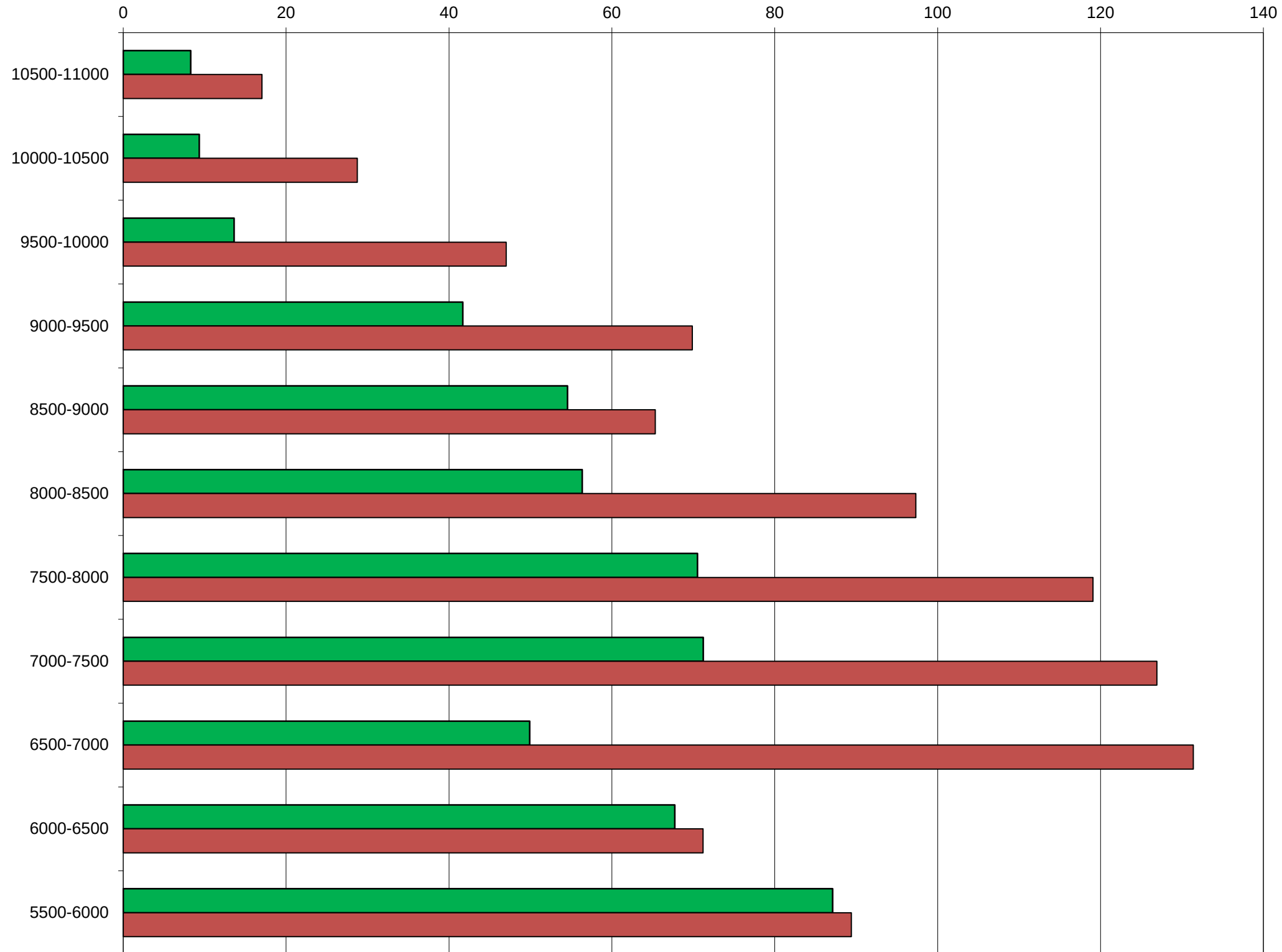
Elevation Range (ft)	ACID NEUTRALIZING POTENTIAL IN DEEP BORHEHOLES (equivalent t CaCO3/kT rock)															MINING DISTRICT				
	AC12-1162	AC12-1163	AC13-1171	AC13-2	AC13-3	CC13-3168	CC-2272	CPC14-3	GC-07-704	GHC15-1	GHC-474	SGR-868	UGC96-2	UGC97-4	UGC97-5	Average ANP (t CaCO3/kT)	Rock Mass (million tons)	Total ANP (million tons CaCO3)	Vadose ANP (million tons CaCO3)	Sat. ANP (million tons CaCO3)
10500-11000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	1,103	9	9	
10000-10500	--	--	--	1	28	--	--	1	--	3	--	--	--	--	--	9	2,206	21	21	
9500-10000	--	22	--	35	128	--	--	1	--	2	--	9	6	8	--	14	4,511	61	61	
9000-9500	110	102	77	72	86	32	--	2	3	2	26	67	48	38	38	42	4,570	191	191	
8500-9000	69	102	55	82	62	29	--	12	16	32	24	98	47	53	65	55	3,902	213	213	
8000-8500	52	92	71	56	72	24	70	17	17	59	74	84	101	88	105	56	3,441	194	194	
7500-8000	74	78	72	99	69	21	27	16	63	62	265	83	198	62	79	71	3,074	217		217
7000-7500	75	--	--	--	--	--	38	31	69	126	--	--	--	--	--	71	2,730	194		194
6500-7000	--	--	--	--	--	--	78	17	--	77	--	--	--	--	--	50	2,427	121		121
6000-6500	--	--	--	--	--	--	80	11	--	80	--	--	--	--	--	68	2,142	145		145
5500-6000	--	--	--	--	--	--	87	--	--	--	--	--	--	--	--	87	1,986	173		173
TOTALS																48	32,093	1,539	689	850

Notes:	1. Drill Hole CC-2272 was deviated at mid-height to create CR-2272. Values from CC-2272 and CR-2272 averaged by elevation 2. Drill Hole GHC-474 was deviated at mid height to create GHC474D2. Values from GHC-474 and GHC-474D2 averaged by elevation
--------	---

G:\Dropbox (ABC)\AB PROJECTS\1385_CC&V\UG16_Evaluation\2_Geochemistry\ABA-MASTER-09-ABA.xlsx\p21-ABA

Elevation (ft msl)

Acid-Base Accouting (t CaCO3 / kT rock)



■ Acid Neutralizing Potential
■ Acid Generating Potential

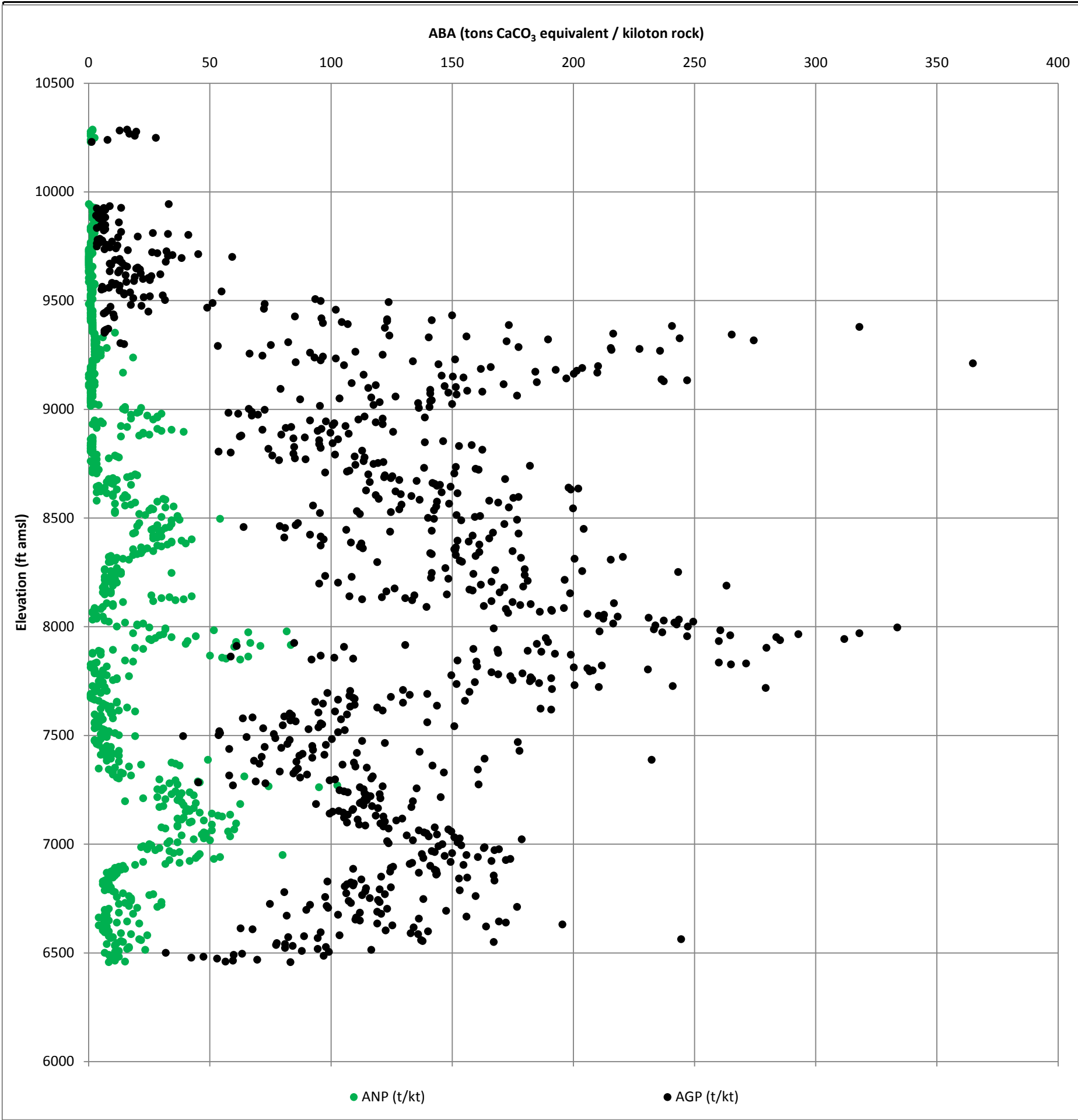


AdrianBrown

Scale: No scale
Drawn: A.Brown
Date: 2015-12-14

CC&V Amendment 11 Hydrogeochemistry
PLATE 21
CRIPPLE CREEK DISTRICT AGP AND ANP

G:\Dropbox (ABC)\LAB PROJECTS\1385_CC&V_UG16_Evaluation2_Geochemistry\ABA-MASTER-10-ABA-Msx\P22-CPC14-3_ABA



ACID BASE ACCOUNTING CONVERSIONS					
MOLECULAR WEIGHTS					
MW(C)	12.0	MW(O)	16.0	MW(CaCO ₃)	100.1
MW(Ca)	40.1	MW(S)	32.1	MW(FeS ₂)	120.0
MW(Fe)	55.8				
ACID GENERATING CAPACITY (AGP)					
AGP = tons of CaCO ₃ required to neutralize sulfide oxidation from 1000 tons of material					
Total Oxidation Of Pyrite To Ferric Hydroxide Solid					
$\text{FeS}_2 + 15/4 \text{ O}_2 + 7/2 \text{ H}_2\text{O} = \text{Fe}(\text{OH})_3 + 2 \text{ SO}_4^{--} + 4 \text{ H}^+$					
$\text{CaCO}_3 + 2\text{H}^+ = \text{Ca}^{++} + \text{H}_2\text{O} + \text{CO}_2$					
$\text{FeS}_2 + 2 \text{ CaCO}_3 + 15/4 \text{ O}_2 + 3/2 \text{ H}_2\text{O} = \text{Fe}(\text{OH})_3 + 2 \text{ Ca}^{2+} + 2 \text{ SO}_4^{2-} + 2 \text{ CO}_2$					
Pyrite Oxidation and Neutralization					
1	g.mol FeS ₂ requires	2	g.mol CaCO ₃ to neutralize		
120.0	g of FeS ₂ requires	200.2	g of CaCO ₃ for neutralization		
1.0	g of FeS ₂ requires	1.67	g of CaCO ₃ for neutralization		
1%	FeS ₂ requires	1.67%	CaCO ₃ for neutralization		
1%	FeS ₂ is equivalent to	16.68	tons/kiloton AGP as CaCO ₃		
Sulfur Oxidation and Neutralization					
1.0	g of FeS ₂ contains	0.535	g of S		
0.535	g of S requires	1.67	g of CaCO ₃ for neutralization		
1.0	g of S requires	3.12	g of CaCO ₃ for neutralization		
1%	S requires	3.12%	CaCO ₃ for neutralization		
1%	S is equivalent to	31.2	tons/kiloton AGP as CaCO ₃		
ACID NEUTRALIZING CAPACITY (ANP)					
ANP = Tons of CaCO ₃ per 1000 tons of material					
1	ton of C is equivalent to	8.342	tons of CaCO ₃		
1%	of C by weight =	0.083	tons/ton of CaCO ₃		
1%	of C by weight =	83.417	tons/kt of CaCO ₃		
ACID-BASE ACCOUNTING - CPC13-4					
From (ft amsl)	To (ft amsl)	Total C %	ANP (t CaCO ₃ /Kt)	Total S %	AGP (t CaCO ₃ /Kt)
10000	10500	0.015	1.3	0.485	15.1
9500	10000	0.014	1.2	0.539	16.8
9000	9500	0.030	2.5	4.098	127.8
8500	9000	0.145	12.1	3.845	119.9
8000	8500	0.209	17.5	5.166	161.1
7500	8000	0.191	15.9	5.068	158.0
7000	7500	0.375	31.2	3.609	112.5
6500	7000	0.201	16.8	4.040	126.0
6000	6500	0.126	10.5	2.026	63.2
Average		0.167	13.9	3.782	118.0
Scale:	No Scale	CC&V Amendment 11 Hydrogeochemistry			
Drawn:	A.Brown	PLATE 22			
Date:	14-Dec-2015	CPC14-3 - ACID BASE ACCOUNTING			



Notes: Data obtained as Total C and Total S from LECO furnace analysis on samples taken every 5 feet down hole
ANP (ton CaCO₃ per 1000 tons rock) = 81.42 * Total C (%)
AGP (ton CaCO₃ equivalent per 1000 tons rock) = 31.2 * Total S (%)

C:\D:\Data\ARC\CLAB PROJECT\BUREAU\CC&V\ACID EVALUATION - Groundwater\AREA MASTER\04-ACID\MWP24-ACID-MINED - CASE

ACID GENERATION COMPUTATION										
Elevation Range (ft)	TOTAL ROCKMASS		CELL 1: MINED ROCK		CELL 2: VADOSE ZONE ROCK		CELL 3: SATURATED ROCK		TOTAL ACID GENERATION	
	Rock Mass (million tons)	Average AGP (t CaCO3/kT)	Mined Rock (million tons)	Mined Rock Acid Generation (million tons CaCO3)	Vadose Zone Rock (million tons)	Vadose Zone Acid Generation (million tons CaCO3)	Saturated Zone Rock (million tons)	Saturated Zone Acid Generation (million tons CaCO3)	TOTAL ROCK (million tons)	TOTAL ACID GENERATION (million tons CaCO3)
10500-11000	1,103	17	313	5	790	0			1,103	5
10000-10500	2,206	29	626	18	1,580	0			2,206	18
9500-10000	4,511	47	391	18	4,119	0			4,511	18
9000-9500	4,570	70	235	16	4,335	0			4,570	16
8500-9000	3,902	65			3,902	0			3,902	0
8000-8500	3,441	97			3,441	0			3,441	0
7500-8000	3,074	119			3,074	0			3,074	0
7000-7500	2,730	127					2,730	0	2,730	0
6500-7000	2,427	131					2,427	0	2,427	0
6000-6500	2,142	71					2,142	0	2,142	0
5500-6000	1,986	89					1,986	0	1,986	0
TOTALS	32,093	80	1,566	58	21,241	0	9,285	0	32,093	58

ACID NEUTRALIZATION COMPUTATION										
Elevation Range (ft)	TOTAL ROCKMASS		CELL 1: MINED ROCK		CELL 2: VADOSE ZONE ROCK		CELL 3: SATURATED ROCK		TOTAL ACID NEUTRALIZATION	
	Rock Mass (million tons)	Average ANP (t CaCO3/kT)	Mined Rock (million tons)	Mined Rock Acid Netralization (million tons CaCO3)	Vadose Zone Rock (million tons)	Vadose Zone Neutralization (million tons CaCO3)	Saturated Zone Rock (million tons)	Saturated Zone Neutralization (million tons CaCO3)	TOTAL ROCK (million tons)	TOTAL NEUTRALIZATION (million tons CaCO3)
10500-11000	1,103	8	313	3	790	0			1,103	3
10000-10500	2,206	9	626	6	1,580	0			2,206	6
9500-10000	4,511	14	391	5	4,119	0			4,511	5
9000-9500	4,570	42	235	10	4,335	0			4,570	10
8500-9000	3,902	55			3,902	0			3,902	0
8000-8500	3,441	56			3,441	0			3,441	0
7500-8000	3,074	71			3,074	0			3,074	0
7000-7500	2,730	71					2,730	194	2,730	194
6500-7000	2,427	50					2,427	121	2,427	121
6000-6500	2,142	68					2,142	145	2,142	145
5500-6000	1,986	87					1,986	173	1,986	173
TOTALS	32,093	48	1,566	24	21,241	0	9,285	634	32,093	657

ACID/BASE ACCOUNTING FLOWSHEET				
ACTIVITY	CELL 1: MINED ROCK million tons CaCO3 acid equiv	CELL 2: VADOSE ZONE ROCK million tons CaCO3 acid equiv	CELL 3: SATURATED ROCK million tons CaCO3 acid equiv	CARLTON TUNNEL million tons CaCO3 acid equiv
Acid Input to cell from above	0	→ 35	→ 35	→ 0
Acid generated in cell	58	0	0	
Acid neutralized in cell	-24	0	-35	
Acid leaving cell	35	← 35	← 0	

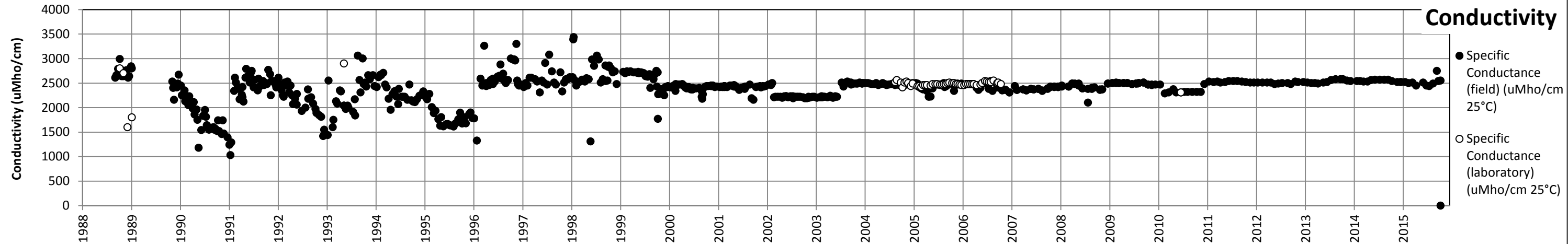
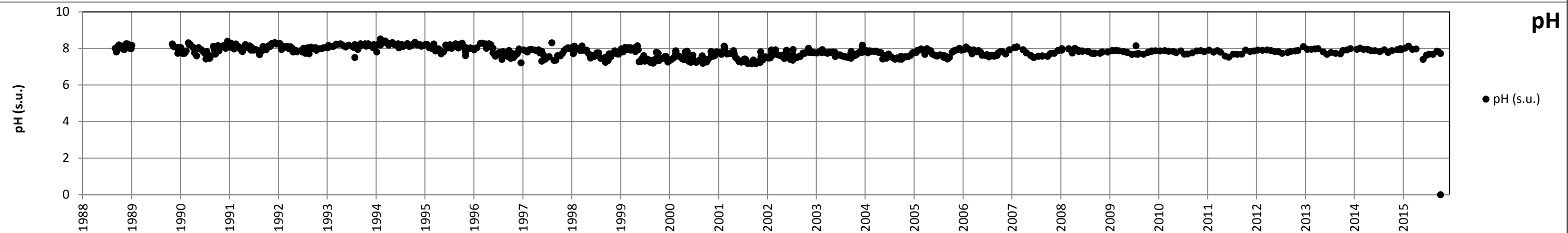
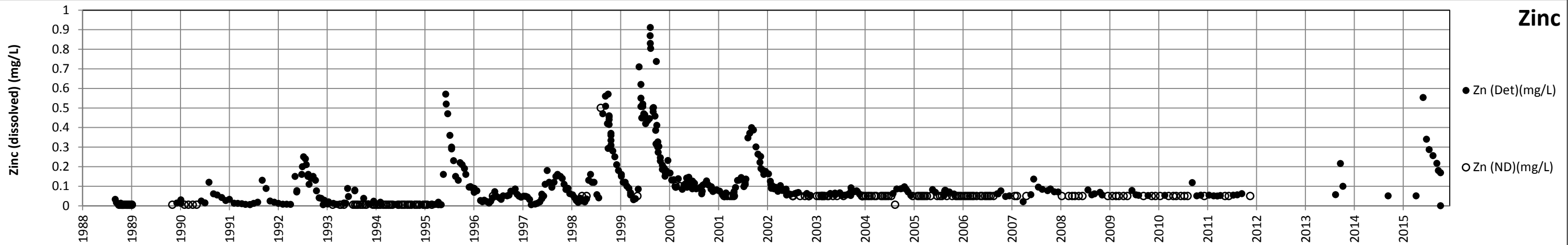
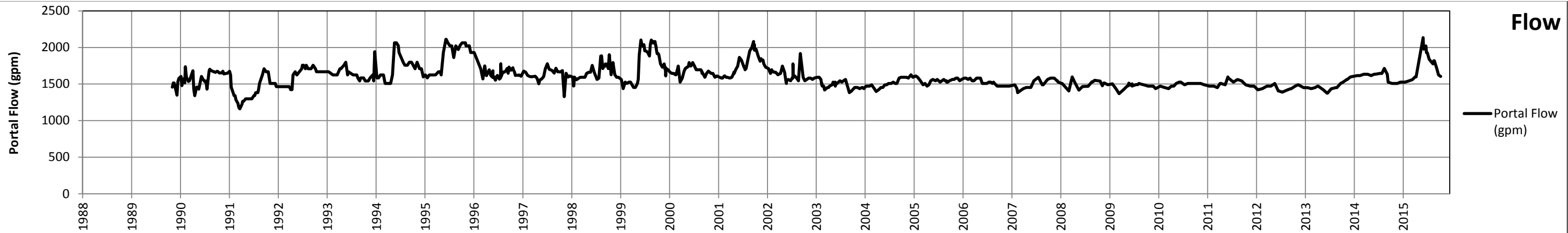


Elevation Range (ft)	TOTAL ROCKMASS		CELL 1: MINED ROCK		CELL 2: VADOSE ZONE ROCK		CELL 3: SATURATED ROCK		TOTAL ACID NEUTRALIZATION	
	Rock Mass (million tons)	Average ANP (t CaCO3/kT)	Mined Rock (million tons)	Mined Rock Acid Netralization (million tons CaCO3)	Vadose Zone Rock (million tons)	Vadose Zone Acid Neutralization (million tons CaCO3)	Saturated Zone Rock (million tons)	Saturated Zone Acid Neutralization (million tons CaCO3)	TOTAL ROCK (million tons)	TOTAL ACID NEUTRALIZATION (million tons CaCO3)
10500-11000	1,103	8	313	3	790	7			1,103	9
10000-10500	2,206	9	626	6	1,580	15			2,206	21
9500-10000	4,511	14	391	5	4,119	56			4,511	61
9000-9500	4,570	42	235	10	4,335	181			4,570	191
8500-9000	3,902	55			3,902	213			3,902	213
8000-8500	3,441	56			3,441	194			3,441	194
7500-8000	3,074	71			3,074	217			3,074	217
7000-7500	2,730	71					2,730	194	2,730	194
6500-7000	2,427	50					2,427	121	2,427	121
6000-6500	2,142	68					2,142	145	2,142	145
5500-6000	1,986	87					1,986	173	1,986	173
TOTALS	32,093	80	1,566	24	21,241	882	9,285	634	32,093	1,539

ACID/BASE ACCOUNTING FLOWSHEET				
ACTIVITY	CELL 1: MINED ROCK million tons CaCO3 equiv	CELL 2: VADOSE ZONE ROCK million tons CaCO3 equiv	CELL 3: SATURATED ROCK million tons CaCO3 equiv	CARLTON TUNNEL million tons CaCO3 equiv
Acid Input to cell from above	0	35	664	30
Acid generated in cell	58	1,511	0	
Acid neutralized in cell	-24	-882	-634	
Acid leaving cell	35	664	30	

Scale:		CC&V Amendment 11 Hydrogeochemistry
Drawn:	A.Brown	PLATE 25
Date:	2015-12-14	NEUTRALIZING CAPACITY EVALUATION - ALL VADOSE MATERIAL

G:\Dropbox (ABC)\LAB PROJECTS\1188_ CC&V\UG16_Evaluation\GeoChem\11_40a-Geochemistry Cleanup.xls\Carlton Chem



Attachment 1 – CPC14-3 Deep Carbonate Borehole Report



CPC14-3 - Deep Carbonate Borehole Report

Report prepared by:

Adrian Brown P.E

Adrian Brown Consultants, Inc.

Dated: April 20, 2015

TABLE OF CONTENTS

1.0 INTRODUCTION.....	3
2.0 GEOLOGY.....	4
3.0 SOLID PHASE SAMPLING AND ANALYSIS.....	5
4.0 LIQUID SAMPLING AND ANALYSIS.....	6
5.0 HYDROLOGY TESTING.....	7
6.0 PIEZOMETRIC DATA.....	8
7.0 CERTIFICATION.....	9

TABLES

Table 1: CPC 14-3 - Borehole summary

Table 2: CPC 14-3 - Water truck fluorescein concentration and field parameters

Table 3: CPC-14-3 - Aqueous samples and field parameters

Table 4: CPC 14-3 - Falling head tests

Table 5: CPC 14-3 - VWP installation summary

Table 6: CPC 14-3 - VWP Piezometric Results

PLATES (Extracted from Appendices)

Plate 1.1: Location

Plate 1.2: Survey

Plate 1.3: As Built

Plate 3.3: Acid Base Accounting

Plate 4.1: Water Chemistry Summary

Plate 5.1: FHT #1 - 3587'-3857' Depth

Plate 5.2: FHT #2 - 2268'-4368' Depth

Plate 6.1: VWP Piezometric Elevations

Plate 6.2: Static Head Elevation - VWP 2_8068

Plate 6.3: Static Head Elevation - VWP 3_6944

Plate 6.4: Static Head Elevation - VWP 4_6753

Plate 6.5: Static Head Elevation - VWP 5_6521

Plate 6.6: Water Table

APPENDICES

Appendix 1: CPC14-3 - Location Plan and Position

Appendix 1.1: CPC14-3 - Location

Appendix 1.2: CPC14-3 - Borehole Survey

Appendix 1.3: CPC14-3 - As-Built Drawing

Appendix 2: CPC14-3 - Geology

Appendix 2.1: CPC14-3 - Geology Log

Appendix 2.2: CPC14-3 - Lithology Log

Appendix 2.3: CPC14-3 - Geotechnical Log

Appendix 2.4: CPC14-3 - Core Photographs

Appendix 3: CPC14-3 - Solids Sampling

Appendix 3.1: CPC14-3 - Solids Analyses

Appendix 3.2: CPC14-3 - Laboratory Reports

Appendix 3.3: CPC14-3 - LECO Testing Results

Appendix 3.4: CPC14-3 - Chemical Database

Appendix 4: CPC14-3 - Water Chemistry

Appendix 5: CPC14-3 - Hydrology Testing

Appendix 5.1: CPC14-3 FHT #1 - 3587'-3857' Depth

Appendix 5.2: CPC14-3 FHT #1 - 2268'-4368' Depth

Appendix 6: CPC14-3 - Vibrating Wire Piezometers

Appendix 6.1: CPC14-3 - Vibrating Wire Piezometers Plot

Appendix 6.2: CPC14-3 - Piezo 2 Equilibration

Appendix 6.3: CPC14-3 - Piezo 3 Equilibration

Appendix 6.4: CPC14-3 - Piezo 4 Equilibration

Appendix 6.5: CPC14-3 - Piezo 5 Equilibration

Appendix 6.6: CPC14-3 - Water Table Evaluation

Appendix 6.7: CPC14-3 – VWP Data

1.0 INTRODUCTION

The Cripple Creek and Victor Goldmine (CC&V) recently completed drilling of a deep angled borehole for the purpose conducting hydraulic testing, collecting solid rock and aqueous water samples, and installing multiple Vibrating Wire Piezometers (VWP). The borehole was initiated by AK Drilling to a depth of 2345 ft Measured Depth (MD) below ground surface (bgs) and completed by Tona Tec drilling with an Atlas Copco 4000 slant core rig to a Total Depth (TD) of 4368 ft MD bgs 6463.5 ft above mean sea level (amsl). The borehole is summarized in Table 1. The location and position are documented in Appendix 1 including plan view location (Appendix 1.1), hole survey (Appendix 1.2) and completion as-built (Appendix 1.3).

Table 1: CPC-14-3 - borehole summary

Borehole ID	Easting	Northing	Elevation (ft amsl)	Inclination (collar)	Azimuth	MD (ft)	TD (ft amsl)
CPC-14-3	38119.05	62679.19	10359.47	-71.44	53.24	4368.0	6463.5

2.0 GEOLOGY

Geologic logging of the borehole was completed by CC&V staff and contractors. The geologic logs are included in Appendix 2, including, Geology log (Appendix 2.1), Lithologic (Appendix 2.2), geotechnical log (Appendix 2.3) and photographic Log (Appendix 2.4).

3.0 SOLID PHASE SAMPLING AND ANALYSIS

Representative drill core were sampled at 5-ft intervals. 5-ft samples were analyzed for LECO carbon and sulfur as well as precious metals assay. 5-ft samples were composited to generate a suite of 200-ft static and 800-ft kinetic composite samples. Static and kinetic geochemistry composites were subjected to analysis for carbon and sulfur speciation, neutralization potential, 4-acid metals by aqua regia digest, Reitveld XRD, net-acid generation (NAG) testing, and metals analysis on NAG leachates. Kinetic geochemistry composites were analyzed for humidity cell testing (ongoing) and grain-size analysis. The solid phase sampling and analysis program is summarized in Appendix 3.1. Laboratory data are compiled and distributed in Appendix 3.2. LECO carbon and sulfur data are provided in Appendix 3.3. All other analytical results have been compiled in an Excel database in Appendix 3.4 (electronic distribution).

4.0 LIQUID SAMPLING AND ANALYSIS

Fluorescein dye was mixed into the drilling water truck prior to injection during drilling in order to provide a qualitative and potentially quantitative method of determining if borehole samples were predominantly injected water or formation water.

Table 2: CPC14-3 - water truck fluorescein concentration and field parameters

Sample	Date	Time	Fluorescein Dye (ppb)	pH (std units)	Temperature °C	Conductivity (µs/cm)	ORP (mV)
Sample 1	08-Feb-15	1:48	215.7	6.59	14.0	112.7	N/A
Sample 2	08-Feb-15	12:00	213.5				
Sample 3	08-Feb-15	23:02	*165.8	7.13	8.6	93.5	N/A
Sample 4	09-Feb-15	22:40	*182.0				
Sample 5	10-Feb-15	12:45	211.1				
Sample 6	13-Feb-15	21:30	*182.7				
Sample 7	13-Feb-15	22:40	*182.6	8.17	1.2	42	N/A

*some ice formation in tank potentially reducing dye concentration in the water

Three borehole samples were collected via airlift at a drilled depth of 3857 ft MD bgs, February 13 and 14, 2015. A water truck sample was also collected for comparison to determine degree of mixing between formation water and injected drilling fluid. Table 3 summarizes the field parameters and samples collected. Samples were also submitted for isotope analysis. All borehole water samples are impacted by drilling fluids. Sample results are included in Appendix 4.1 and compiled as part of the geochemistry database in Appendix 3.2.

Table 3: CPC-14-3 - aqueous samples and field parameters

Sample	Date	Time	Fluorescein Dye (ppb)	pH (std units)	Temperature °C	Conductivity (µs/cm)	ORP (mV)
Water Truck	14-Feb-15	0:15	184.6	8.17	1.2	42.0	61
1 st Produced water	13-Feb-15	23:15	26.0	7.32	7.8	59.8	163
Produced water	14-Feb-15	0:45	9.8	8.26	13.2	133.7	86
Produced water	14-Feb-15	2:00	*ND	8.08	14.1	131.0	92

5.0 HYDROLOGY TESTING

Falling head injection tests were conducted over an interval of 3580 to 3857 ft MD bgs and 2268 to 4368 ft MD bgs. Test results are summarized in Table 4. Test data and analysis are included in Appendix 5.

Table 4: CPC-14-3 falling head test results

Test #	Date	Interval (ft MD bgs)	K (ft/yr)	K (cm/s)
Test #1	13-Feb-15	3580 - 3857	10.3	1.0E-05
Test #2	27-Feb-15	2268 - 4368	1.8	1.7E-06

6.0 PIEZOMETRIC DATA

A multi-level VWP installation was completed in CPC14-3 on March 2, 2015. Sensor installation information is summarized in Table 5. An as-built diagram and recent data collected from the Piezometer installation is included in Appendix 6.

Table 5: CPC-14-3 - VWP installation summary

VWP #	Sensor Type	Serial #	Depth (ft MD bgs)	Elevation (ft amsl)
Sensor #1	4500S 3Mpa	1443019	1466	9058
Sensor #2	4500S 3Mpa	1443018	2646	8068
Sensor #3	4500S 3Mpa	1424147	3828	6944
Sensor #4	4500SH 5Mpa	1424146	4041	6753
Sensor #5	4500SH 5Mpa	1424145	4368	6464
VWP Array			1466-4368	9058-6463

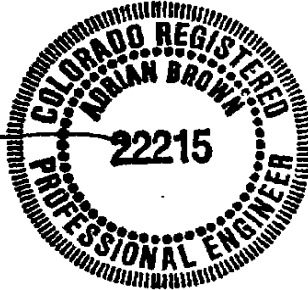
Table 6: CPC 14-3 - VWP Piezometric Results

VWP #	Elevation (ft amsl)	2-Mar-15 (ft amsl)	10-Jul-15 (ft amsl)	Static (ft amsl)
Sensor #1	9058	Dry	Dry	<9058
Sensor #2	8068	8439	8303	8296
Sensor #3	6944	8453	8267	8231
Sensor #4	6753	8679	8486	8444
Sensor #5	6464	8532	8334	8293
VWP Array	9058-6463	8679-8439	8486-8267	8285

7.0 CERTIFICATION

This report has been prepared by and under the responsible charge of Adrian Brown, P.E., based on knowledge, information, and belief. The engineering services have been performed in accordance with applicable standards of practice. This certification is not a guaranty or warranty, either expressed or implied.

Signed this 7th Day of December, 2015.



Adrian Brown, P.E.

G:\Dropbox (ABC)\AB PROJECTS\1385_C&V\UG15_Projects\1 Phase 1_CPC14-3\6_Report\0_Workbook\CPC14-03_25-Final.xlsx/Tables

Table 1: CPC 14-3 - Borehole summary

Borehole ID	Easting	Northing	Elevation (ft amsl)	Inclination (collar)	Azimuth	MD (ft)	TD (ft amsl)
CPC-14-3	38119.05	62679.19	10359.47	-71.44	53.24	4368.0	6463.5

Table 2: CPC 14-3 - Water truck fluorescein concentration and field parameters

Sample	Date	Time	Fluorescein Dye (ppb)	pH (std units)	Temperature °C	Conductivity (µs/cm)	ORP (mV)
Sample 1	08-Feb-15	1:48	215.7	6.59	14.0	112.7	N/A
Sample 2	08-Feb-15	12:00	213.5				
Sample 3	08-Feb-15	23:02	*165.8	7.13	8.6	93.5	N/A
Sample 4	09-Feb-15	22:40	*182.0				
Sample 5	10-Feb-15	12:45	211.1				
Sample 6	13-Feb-15	21:30	*182.7				
Sample 7	13-Feb-15	22:40	*182.6	8.17	1.2	42	N/A

*some ice formation in tank potentially reducing dye concentration in the water

Table 3: CPC-14-3 - Aqueous samples and field parameters

Sample	Date	Time	Fluorescein Dye (ppb)	pH (std units)	Temperature °C	Conductivity (µs/cm)	ORP (mV)
Water Truck	14-Feb-15	0:15	184.6	8.17	1.2	42.0	61
1 st Produced water	13-Feb-15	23:15	26.0	7.32	7.8	59.8	163
Produced water	14-Feb-15	0:45	9.8	8.26	13.2	133.7	86
Produced water	14-Feb-15	2:00	*ND	8.08	14.1	131.0	92

Table 4: CPC 14-3 - Falling head tests

Test #	Date	Interval (ft MD bgs)	K (ft/yr)	K (cm/s)
Test #1	13-Feb-15	3580 - 3857	10.3	1.0E-05
Test #2	27-Feb-15	2268 - 4368	1.8	1.7E-06

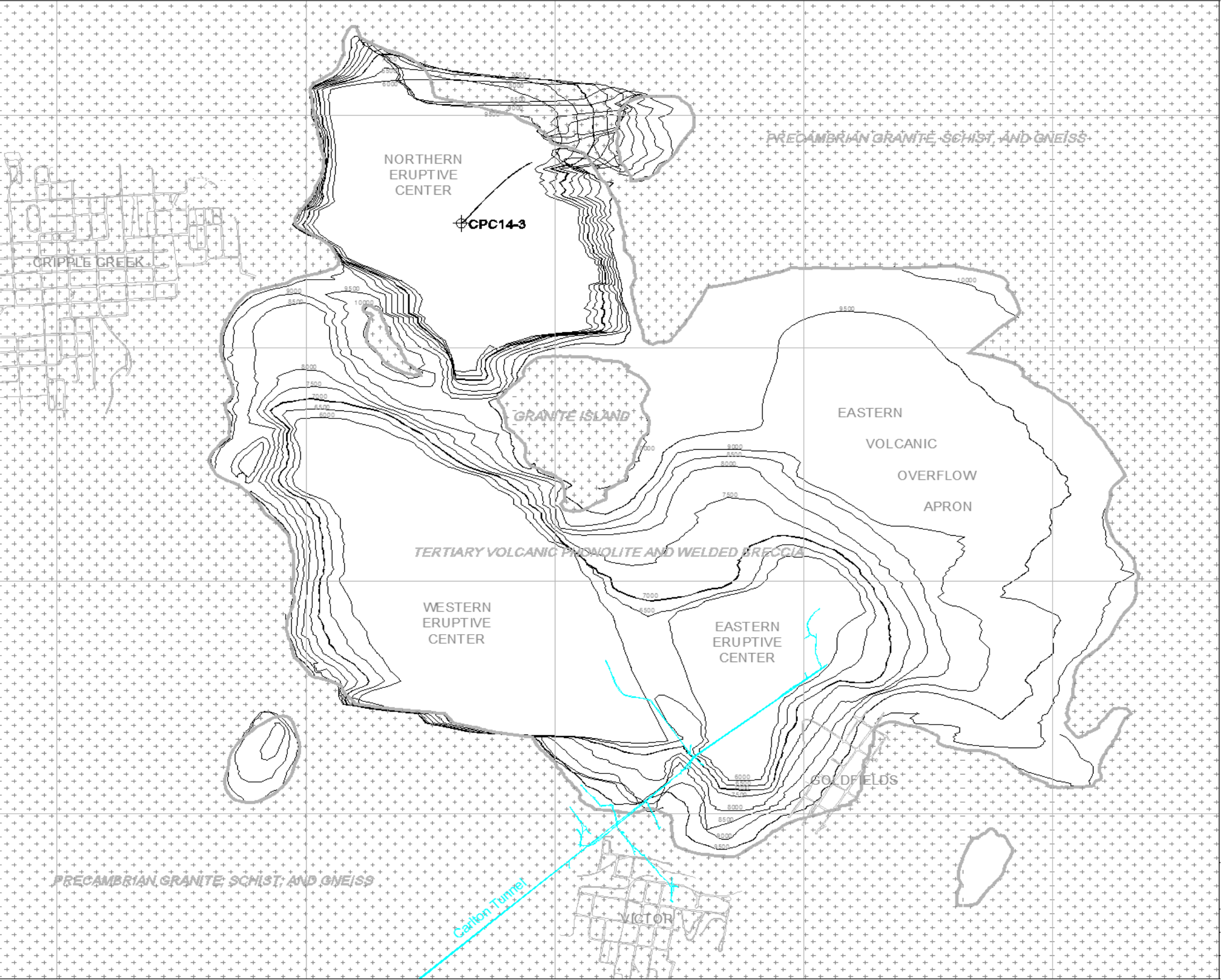
Table 5: CPC 14-3 - VWP installation summary

VWP #	Sensor Type	Serial #	Depth (ft MD bgs)	Elevation (ft amsl)
Sensor #1	4500S 3Mpa	1443019	1466	9058
Sensor #2	4500S 3Mpa	1443018	2646	8068
Sensor #3	4500S 3Mpa	1424147	3828	6944
Sensor #4	4500SH 5Mpa	1424146	4041	6753
Sensor #5	4500SH 5Mpa	1424145	4368	6464
VWP Array			1466-4368	9058-6463

Table 6: CPC 14-3 - VWP Piezometric Results

VWP #	Elevation (ft amsl)	2-Mar-15 (ft amsl)	10-Jul-15 (ft amsl)	Static (ft amsl)
Sensor #1	9058	Dry	Dry	<9058
Sensor #2	8068	8439	8303	8296
Sensor #3	6944	8453	8267	8231
Sensor #4	6753	8679	8486	8444
Sensor #5	6464	8532	8334	8293
VWP Array	9058-6463	8679-8439	8486-8267	8285

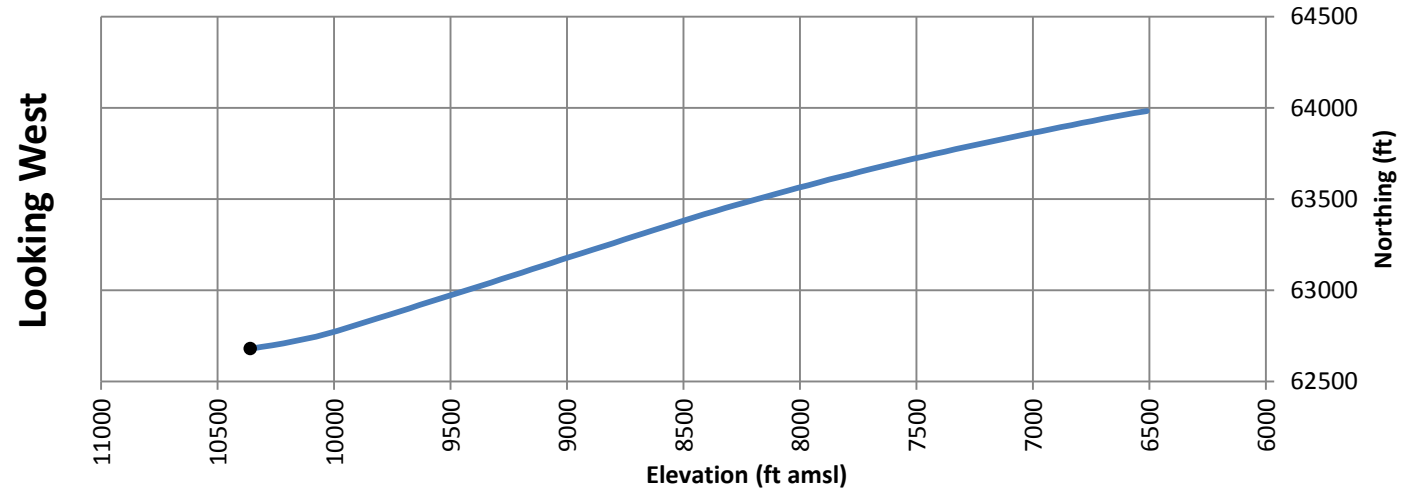
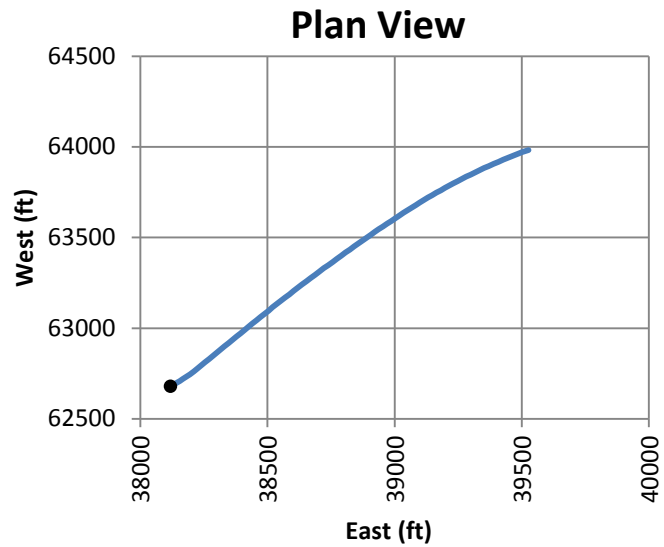
G:\dropbox (ABC)\AB PROJECTS\1385- C&V-UG15- Projects\1- Phase 1- CPC14-36- Report\0- Workbook\CPC14-03-25-Final.xls/PL1



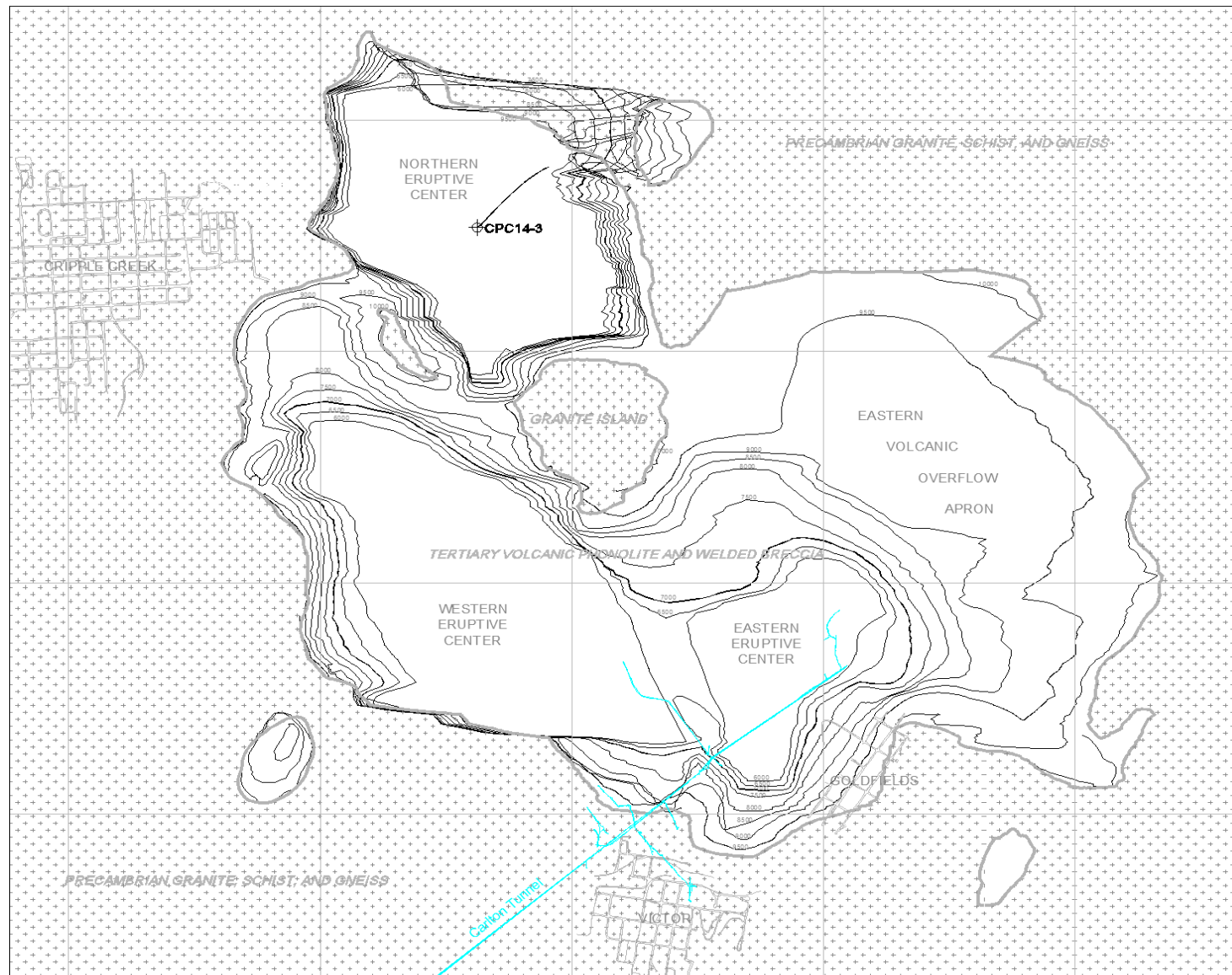
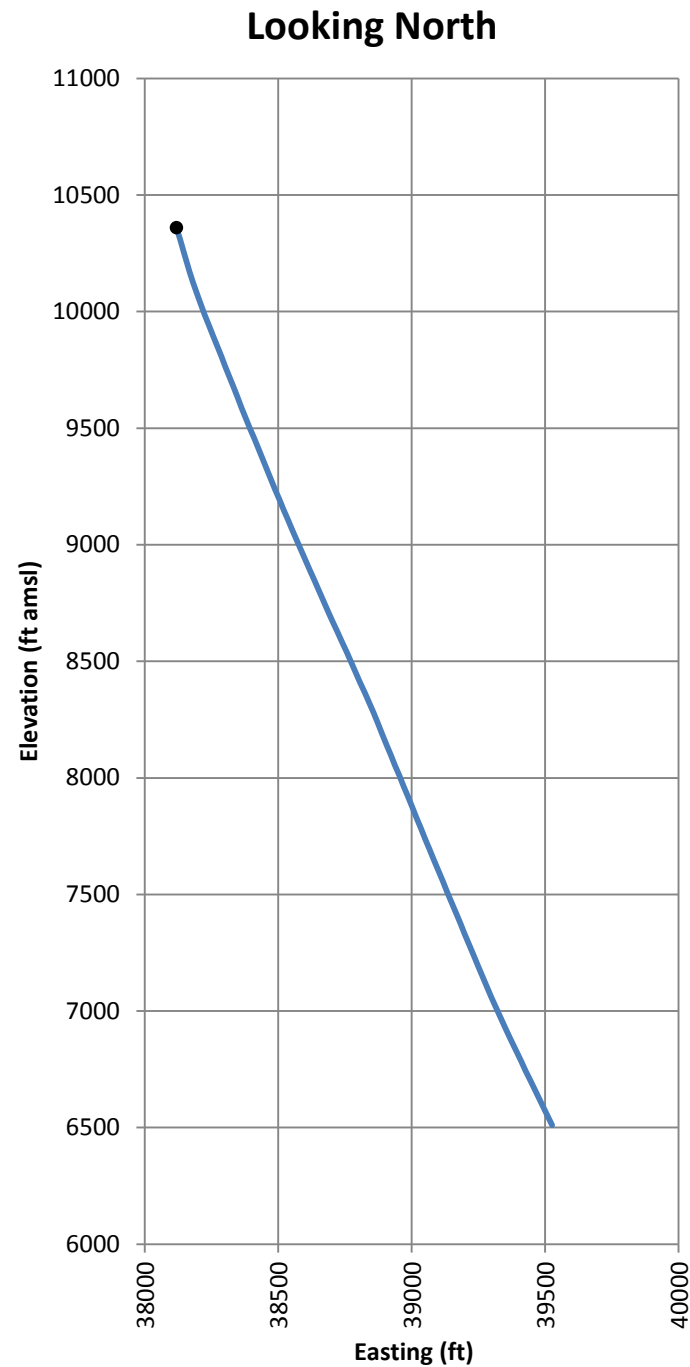
Scale: 1" = 2,000 (5,000 foot grid)
Drawn: A.Brown
Date: 2015-12-09

CPC14-3 - Deep Carbonate Borehole Report
APPENDIX 1.1
LOCATION

G:\Dropbox (ABC)\AB PROJECTS\1385_CCAV\UG15_Projects\1 Phase 1\CPC14-03_25-Final.xls\PI.2



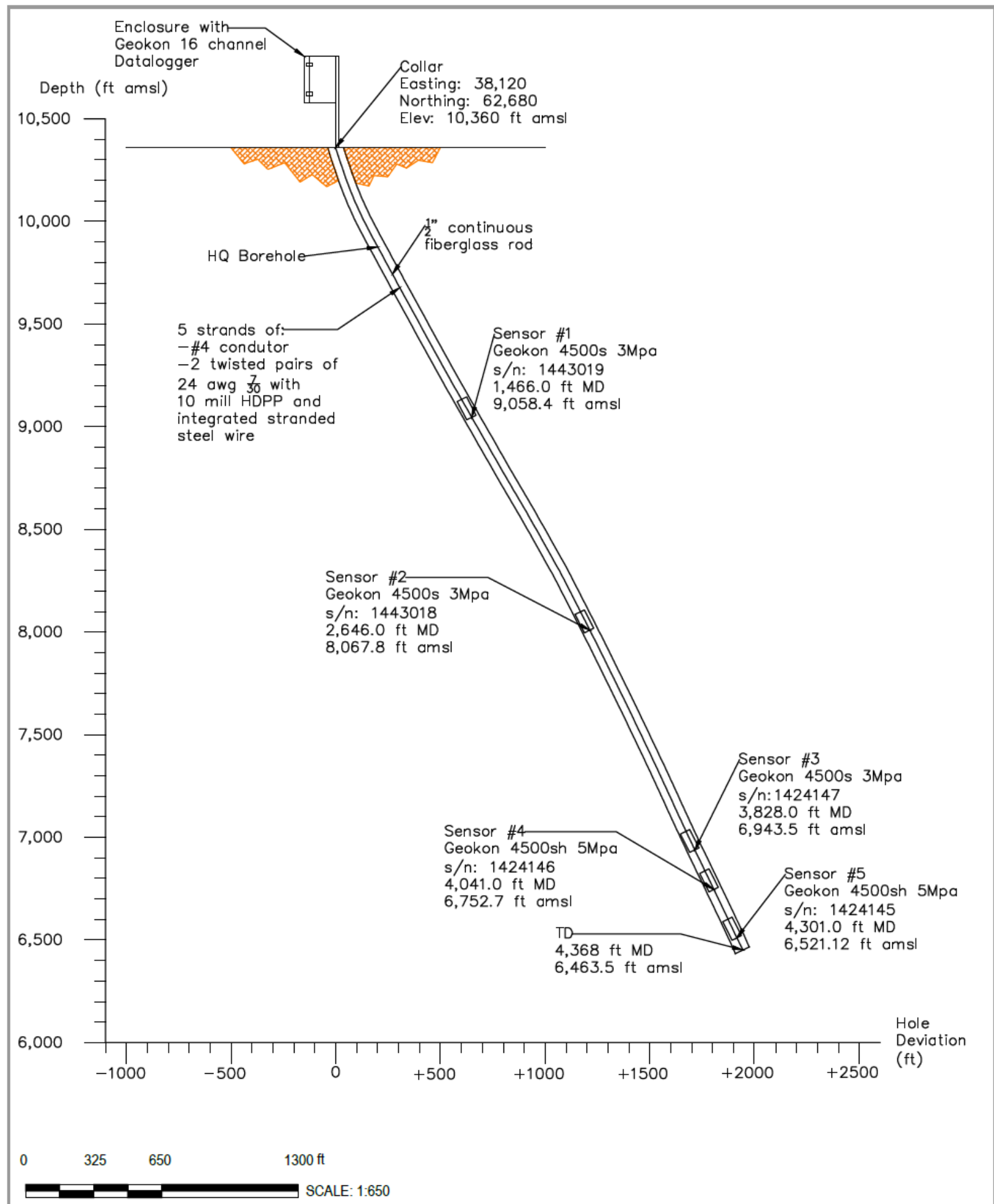
BOREHOLE INFORMATION	
Borehole	CPC-14-3
Easting (ft)	38119.1
Northing (ft)	62679.2
Elevation (ft)	10359.5
Inclination (°)	-71.4
Azimuth (° from N)	53.2
Length (ft)	4368.0
Total Depth (ft amsl)	6463.5



Scale:	As shown (5,000 ft grid on plan)
Drawn:	A.Brown
Date:	2015-12-09

CPC14-3 - Deep Carbonate Borehole Report
APPENDIX 1.2
CPC14-3 - SURVEY

G:\drojbox (ABC)\AB PROJECTS\1385 - C&V\UG15 - Projects\1 - Phase I - CPC14-3\6 - Report\0 - Workbook\CPC14-03_25-Final.xls/Pl 1.3



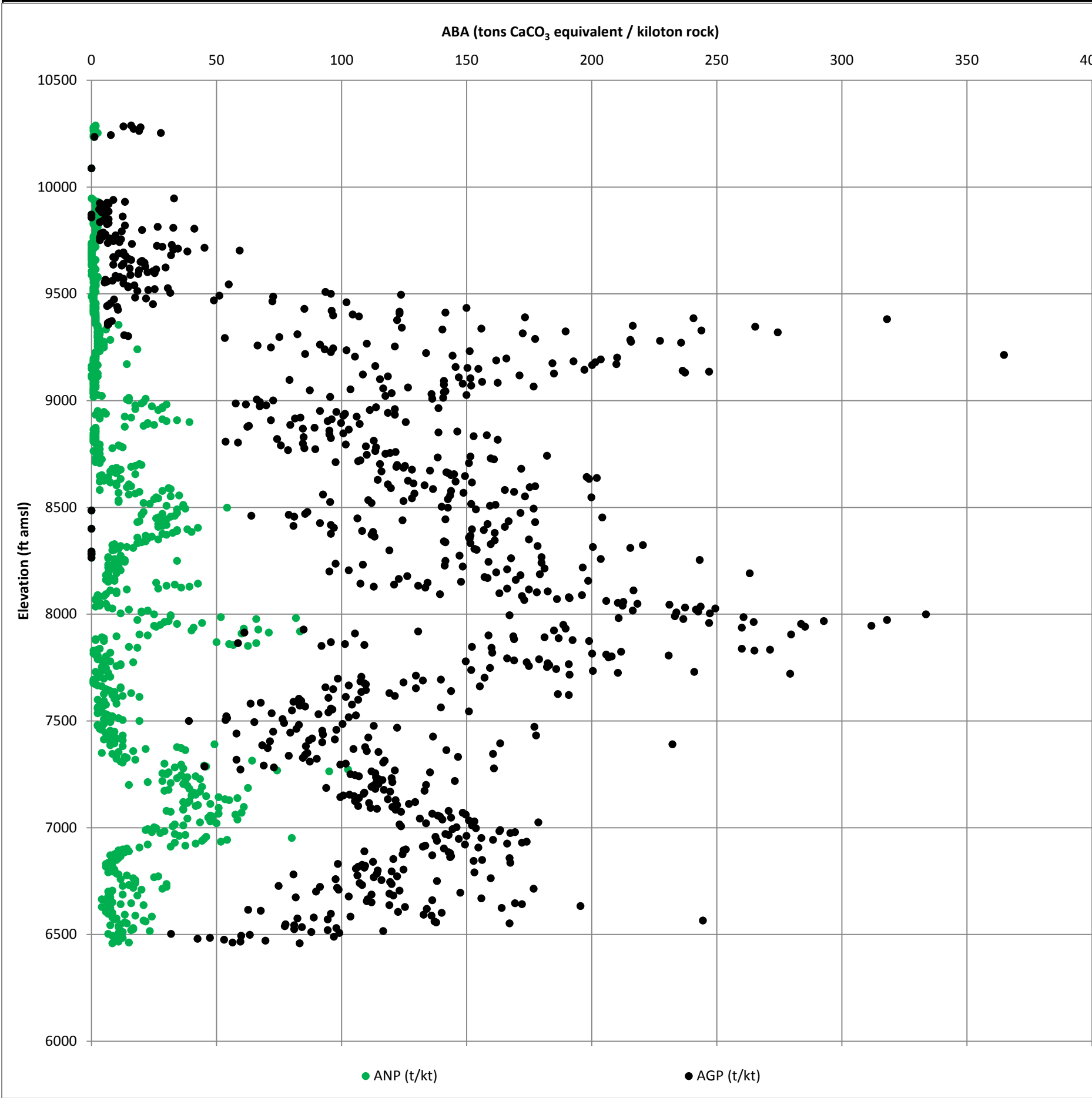
Scale:
Drawn: A. Brown
Date: 2015-12-09

CPC14-3 - Deep Carbonate Borehole Report

APPENDIX 1.3

AS BUILT

G:\Dropbox (ABC)\AB PROJECTS\1395_CC&V\UG15_Projects1_Phase I_CPC14-36_Report10_Workbook\CPC14-03_25-Final.xls\p3.3



ACID BASE ACCOUNTING CONVERSIONS

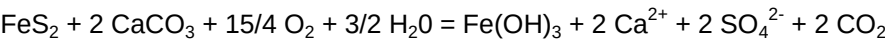
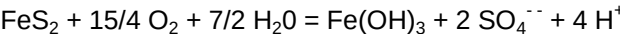
MOLECULAR WEIGHTS

MW(C)	12.0	MW(O)	16.0	MW(CaCO ₃)	100.1
MW(Ca)	40.1	MW(S)	32.1	MW(FeS ₂)	120.0
MW(Fe)	55.8				

ACID GENERATING CAPACITY (AGP)

AGP = tons of CaCO₃ required to neutralize sulfide oxidation from 1000 tons of material

Total Oxidation Of Pyrite To Ferric Hydroxide Solid



Pyrite Oxidation and Neutralization

1	g.mol FeS ₂ requires	2	g.mol CaCO ₃ to neutralize
120.0	g of FeS ₂ requires	200.2	g of CaCO ₃ for neutralization
1.0	g of FeS ₂ requires	1.67	g of CaCO ₃ for neutralization
1%	FeS ₂ requires	1.67%	CaCO ₃ for neutralization
1%	FeS ₂ is equivalent to	16.68	tons/kiloton AGP as CaCO ₃

Sulfur Oxidation and Neutralization

1.0	g of FeS ₂ contains	0.535	g of S
0.535	g of S requires	1.67	g of CaCO ₃ for neutralization
1.0	g of S requires	3.12	g of CaCO ₃ for neutralization
1%	S requires	3.12%	CaCO ₃ for neutralization
1%	S is equivalent to	31.2	tons/kiloton AGP as CaCO ₃

ACID NEUTRALIZING CAPACITY (ANP)

ANP = Tons of CaCO₃ per 1000 tons of material

1	ton of C is equivalent to	8.342	tons of CaCO ₃
1%	of C by weight =	0.083	tons/ton of CaCO ₃
1%	of C by weight =	83.417	tons/kt of CaCO ₃

ACID-BASE ACCOUNTING - CPC13-4

From (ft amsl)	To (ft amsl)	Total C %	ANP (t CaCO ₃ /Kt)	Total S %	AGP (t CaCO ₃ /Kt)
10000	10500	0.015	1.3	0.485	15.1
9500	10000	0.014	1.2	0.539	16.8
9000	9500	0.030	2.5	4.098	127.8
8500	9000	0.145	12.1	3.845	119.9
8000	8500	0.209	17.5	5.166	161.1
7500	8000	0.191	15.9	5.068	158.0
7000	7500	0.375	31.2	3.609	112.5
6500	7000	0.201	16.8	4.040	126.0
6000	6500	0.126	10.5	2.026	63.2
Average		0.167	13.9	3.782	118.0



Notes: Data obtained as Total C and Total S from LECO furnace analysis on samples taken every 5 feet down hole
ANP (ton CaCO₃ per 1000 tons rock) = 81.42 * Total C (%)
AGP (ton CaCO₃ equivalent per 1000 tons rock) = 31.2 * Total S (%)

Scale:	No Scale	CPC14-3 - Deep Carbonate Borehole Report
Drawn:	A.Brown	APPENDIX 3.3
Date:	09-Dec-2015	ACID BASE ACCOUNTING

G:\Dropbox (ABO)_AB PROJECTS\1386_CCAV-UG16_Projects\1. Phase I_CPC14-3\6_Report\0_Workbook\CPC14-03_25-Final.xlsx\p4.1

Sample ID		Water	1st Produced	Produced	Produced
Date	Units	14-Feb-15	13-Feb-15	14-Feb-15	14-Feb-15
Time		00:15	23:15	00:45	02:00
pH	s.u.	8.17	7.32	8.26	8.08
Temperature	°C	1.2	7.8	13.2	14.1
Conductivity	µS/cm	42	59.8	133.7	131
ORP	mV	61	163	86	92
pH	s.u.	7.4	7.6	7.6	7.5
Temperature	°C	21.7	21.2	21.7	21.6
Residue, Filterable (TDS) @180C	mg/L	50	152	90*	90*
Bicarbonate	mg/L as CaCO3	21.2	94.8	53.4	58.7
Carbonate	mg/L as CaCO3	<2	<2	<2	<2
Hydroxide	mg/L as CaCO3	<2	<2	<2	<2
Total Alkalinity	mg/L	21.2	94.8	53.4	58.7
Aluminum, dissolved	mg/L	0.07*	0.04*	0.03*	0.04*
Barium, dissolved	mg/L	0.026	0.933	0.991	0.953
Boron, dissolved	mg/L	<0.01	0.01*	<0.01	0.01*
Calcium, dissolved	mg/L	7.3	26.7	23.8	21.7
Chromium, dissolved	mg/L	<0.01	0.02*	<0.01	<0.01
Cobalt, dissolved	mg/L	<0.01	<0.01	<0.01	0.01*
Copper, dissolved	mg/L	<0.01	<0.01	<0.01	<0.01
Gallium, dissolved	mg/L	<0.1	<0.1	<0.1	<0.1
Iron, dissolved	mg/L	0.04*	3.66	2.71	0.99
Lithium, dissolved	mg/L	<0.008	0.036*	0.016*	0.017*
Magnesium, dissolved	mg/L	1.2	4.1	2.4	2.4
Manganese, dissolved	mg/L	0.031	0.18	0.147	0.233
Molybdenum, dissolved	mg/L	<0.02	0.05*	<0.02	<0.02
Nickel, dissolved	mg/L	<0.008	<0.008	<0.008	<0.008
Potassium, dissolved	mg/L	1.3	3.3	1.8	1.9
Scandium, dissolved	mg/L	<0.1	<0.1	<0.1	<0.1
Silver, dissolved	mg/L	<0.01	<0.01	<0.01	<0.01
Sodium, dissolved	mg/L	3.8	9.7	5.3	5.8
Strontium, dissolved	mg/L	0.037	0.382	0.491	0.304
Titanium, dissolved	mg/L	<0.005	<0.005	<0.005	<0.005
Vanadium, dissolved	mg/L	<0.005	<0.005	<0.005	<0.005
Zinc, dissolved	mg/L	<0.01	0.03*	0.01*	0.11
Chloride	mg/L	2.04*	3.36	2.34*	1.89*
Fluoride	mg/L	2.41	1.12	1	0.82
Sulfate	mg/L	4.04	5.55	18.3	8.88
Bismuth, dissolved	mg/L	<0.04	<0.04	<0.04	<0.04
Tin, dissolved	mg/L	<0.0002	<0.04	<0.04	<0.04
Mercury, dissolved	mg/L	<0.04	<0.0002	<0.0002	<0.0002
Antimony, dissolved	mg/L	<0.0004	0.001*	<0.0004	<0.0004
Arsenic, dissolved	mg/L	<0.0002	<0.0002	<0.0002	<0.0002
Beryllium, dissolved	mg/L	0.00047	<0.00005	<0.00005	0.00006*
Cadmium, dissolved	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Lead, dissolved	mg/L	0.0011	0.0003*	0.0002*	<0.0001
Thallium, dissolved	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Selenium, dissolved	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
TDS (calculated)	mg/L	35.2	116	90.9	80.9
TDS (ratio - meas/calc)		1.42	1.31	0.99	1.11
Ion Balance	%	-1.2%	4.3%	5.9%	6.3%

* Indicates analytical determination was above the method detection limit, but below the practical quantitative limit (EPA "minimum level"). Reported value is estimated

	Scale: 1" = 2,000 (5,000 foot grid)
	Drawn: A.Brown
	Date: 2015-12-09
CPC14-3 - Deep Carbonate Borehole Report	
APPENDIX 4.1	
WATER CHEMISTRY SUMMARY	

C:\Drobox (ABC)\AB PROJECTS\1385 - C&V\UG15 - Projects\1 Phase I - CPC14-3\6 - Report\0 - Workbook\CPC14-03_25-Final_kivipe1

FALLING HEAD TEST SIMULATION ANALYSIS

TEST

The falling head test comprises the following elements:

1. Water is introduced into the well riser, creating excess head in the well relative to the test formation.
2. The excess head causes flow from the wellbore to the formation, resulting in reduction of the water level in the
3. As the water drains out, the water level in the well follows an exponential decay over time towards the static level.

ANALYSIS

The rate that water drains out of the well is controlled by well geometry, and hydraulic conductivity of the formation material.

Consider the conditions at a time t:

E_t = water elevation in the well at time t

E_{stat} = static water level in well

Head (H) driving flow from the wellbore into the formation is:

$H = E_t - E_{stat}$ (1)

Radial flow from the well to the formation is (Theim 1870):

$Q = 2 \pi L K H / \ln(R/r')$ (2)

where:

Q = volumetric flow rate

L = test interval formation length

K = hydraulic conductivity of interval

H = excess head in well relative to formation

R = radius of influence of test

r^* = radius of well bore

Using well completion length L for the radius of influence and applying a form factor for anisotropy (Brown, 2014) gives:

$Q = 2 \alpha \pi L K H / \ln(L/r')$ (3)

where:

α = form factor = 1.12 for $K_h/K_v = 0.1$

α = form factor = 0.87 for $K_h/K_v = 1$

α = form factor = 0.61 for $K_h/K_v = 10$

Flow created by change of water level in the well over time is:

$Q = - \pi r^2 dH/dt$ (4)

where: r = radius of standpipe at the water surface

Equating Q in equation and equation produces:

$2 \alpha \pi L K H / \ln(L/r') = - \pi r^2 dH$ (5)

Rearranging equation produces:

$dH = - 2 \alpha L K / [r^2 \ln(L/r^*)] H dt$ (6)

Integrating over time and noting that $H = H_o$ at $t = 0$ gives:

$H = H_o e^{-\beta t}$ (7)

where:

$\beta = 2 \alpha L K / [r^2 \ln(L/r^*)]$ (8)

Hydraulic conductivity is determined from equation (8):

$K = \beta r^2 \ln(L/r^*) / (2 \alpha L)$ (9)

ANALYSIS METHOD

The method of analysis comprises the following:

1. Fit the exponential curve to the falling head test varying:

E_o = starting water level elevation

E_{stat} = static water level elevation

β = exponent
2. Compute formation hydraulic conductivity from eq. (9):

$K = \beta r^2 \ln(L/r^*) / (2 \alpha L)$

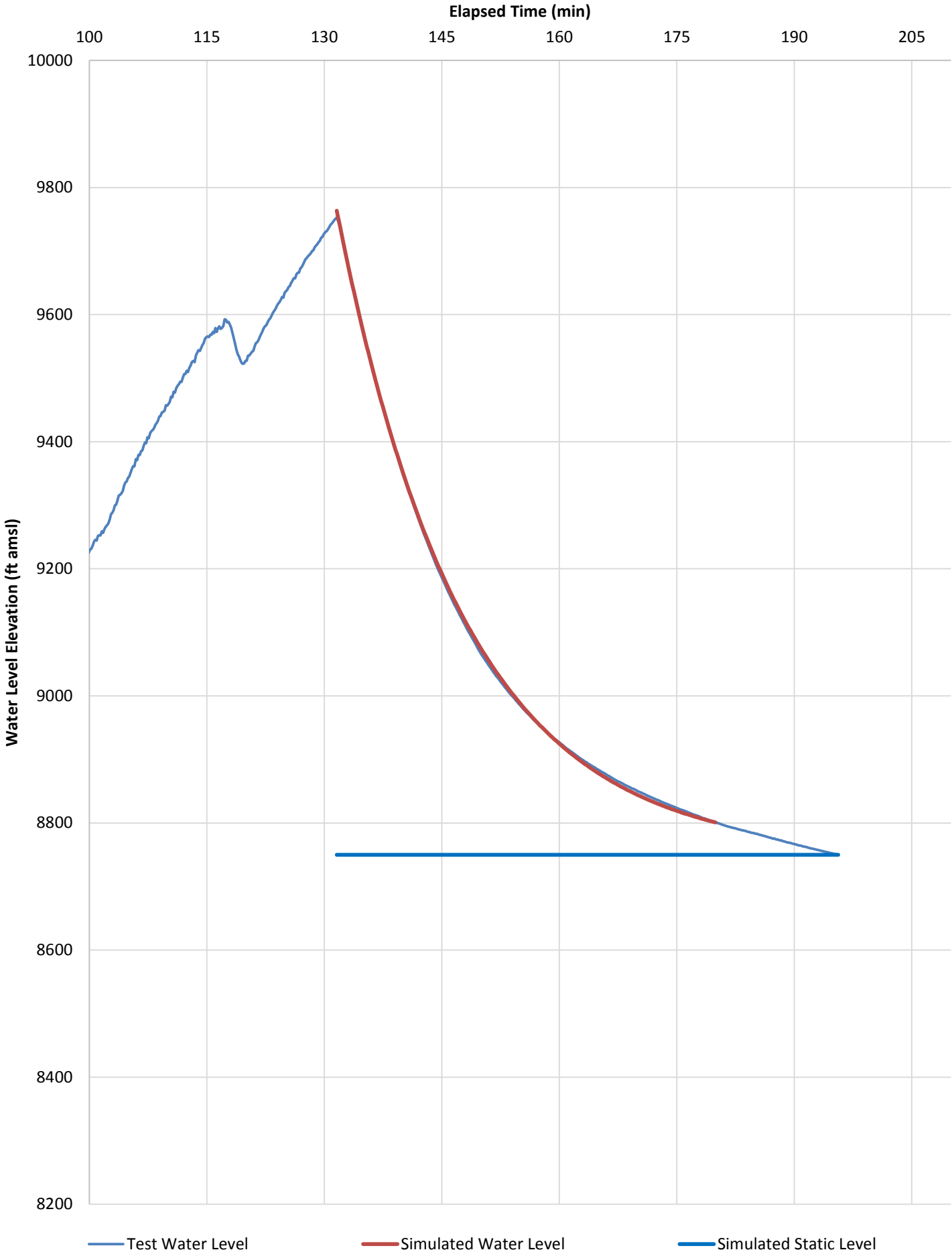
REFERENCES:

Thiem, A., 1870. *The yield of artesian wells, dug wells and filter galleries*. J. Gas Lighting Water Supply (Munich), vol.14

Brown A, 2014. *Reliable Packer Testing and Analysis*. 12th

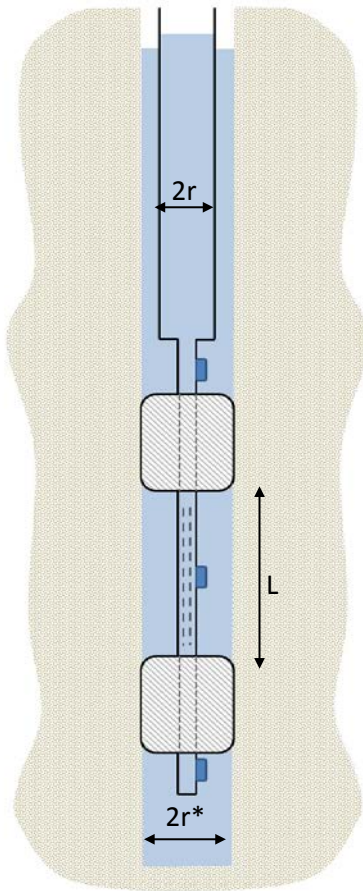
International Mine Water Association Congress, Xuzhou,

FALLING HEAD TEST RESULTS AND BEST-FIT SIMULATION



ANALYSIS OF HYDRAULIC CONDUCTIVITY

TEST INTERVAL GEOMETRY



Stem Radius (r)

ID of HQ (in) 3.06

$r =$ (in) 1.53

Inclination (°) -63.28

r (in) (sloping) 1.71

Well Radius (r*)

OD of NQ^[1] (in) 2.965

$r^* =$ (in) 1.48

Test Interval (L)

Top depth (ft) 3587

Bottom dep (ft) 3857

L (ft) 270

Note [1]:

The hole changed from HQ to NQ just below the packer, so the stem is HQ ID, and the test section is almost entirely NQ bit OD.

BEST FIT TO FALLING HEAD TEST DATA

Parameter	Unit	Simulation 1	Simulation 2
E(start)	ft	9764	9748
E(static)	ft	8750	8750
β (exponent)	/min	0.0619	0.0609
t(start)	min	131.60	131.60
t(end)	min	180.00	165.00
Sum of Error	ft	0.00	0.00
RMS of Error	ft	4.55	6.71

COMPUTATION OF HYDRAULIC CONDUCTIVITY

$K = \beta r^2 \ln(L/r^*) / (2 \alpha L)$

Parameter	Unit	Simulation 1	Simulation 2
β (exponent)	/min	0.0619	0.0609
r (stem radius)	ft	0.143	0.143
L (test interval)	ft	270	270
r^* (well radius)	ft	0.124	0.124
α (form factor)	--	0.87	0.87
K (hyd.cond.)	ft/min	2.1E-05	2.0E-05
	cm/sec	1.0E-05	1.0E-05

	Scale:	As shown
	Drawn:	A.Brown
	Date:	2015-12-09
CPC14-3 - Deep Carbonate Borehole Report		
APPENDIX 5.1		
CPC14-3 FHT #1 - 3587'-3857' DEPTH		

C:\D:\pbox (ABC)_AB PROJECTS\1385_CCBV-UG15_Projects\1 Phase I_CPC14-3\6_Report10_Workbook\CP14-03_25-Final_kivipe2

FALLING HEAD TEST SIMULATION ANALYSIS

TEST

The falling head test comprises the following elements:

1. Water is introduced into the well riser, creating excess head in the well relative to the test formation.
2. The excess head causes flow from the wellbore to the formation, resulting in reduction of the water level in the
3. As the water drains out, the water level in the well follows an exponential decay over time towards the static level.

ANALYSIS

The rate that water drains out of the well is controlled by well geometry, and hydraulic conductivity of the formation material. Consider the conditions at a time t:

E_t = water elevation in the well at time t
 E_{stat} = static water level in well

Head (H) driving flow from the wellbore into the formation is:

$H = E_t - E_{stat}$ (1)

Radial flow from the well to the formation is (Theim 1870):

$Q = 2 \pi L K H / \ln(R/r')$ (2)

where:

Q = volumetric flow rate
 L = test interval formation length
 K = hydraulic conductivity of interval
 H = excess head in well relative to formation
 R = radius of influence of test
 r^* = radius of well bore

Using well completion length L for the radius of influence and applying a form factor for anisotropy (Brown, 2014) gives:

$Q = 2 \alpha \pi L K H / \ln(L/r')$ (3)

where:

α = form factor = 1.12 for $K_h/K_v = 0.1$
 α = form factor = 0.87 for $K_h/K_v = 1$
 α = form factor = 0.61 for $K_h/K_v = 10$

Flow created by change of water level in the well over time is:

$Q = - \pi r^2 dH/dt$ (4)

where: r = radius of standpipe at the water surface

Equating Q in equation and equation produces:

$2 \alpha \pi L K H / \ln(L/r') = - \pi r^2 dH$ (5)

Rearranging equation produces:

$dH = - 2 \alpha L K / [r^2 \ln(L/r^*)] H dt$ (6)

Integrating over time and noting that $H = H_o$ at $t = 0$ gives:

$H = H_o e^{-\beta t}$ (7)

where:

$\beta = 2 \alpha L K / [r^2 \ln(L/r^*)]$ (8)

Hydraulic conductivity is determined from equation (8):

$K = \beta r^2 \ln(L/r^*) / (2 \alpha L)$ (9)

ANALYSIS METHOD

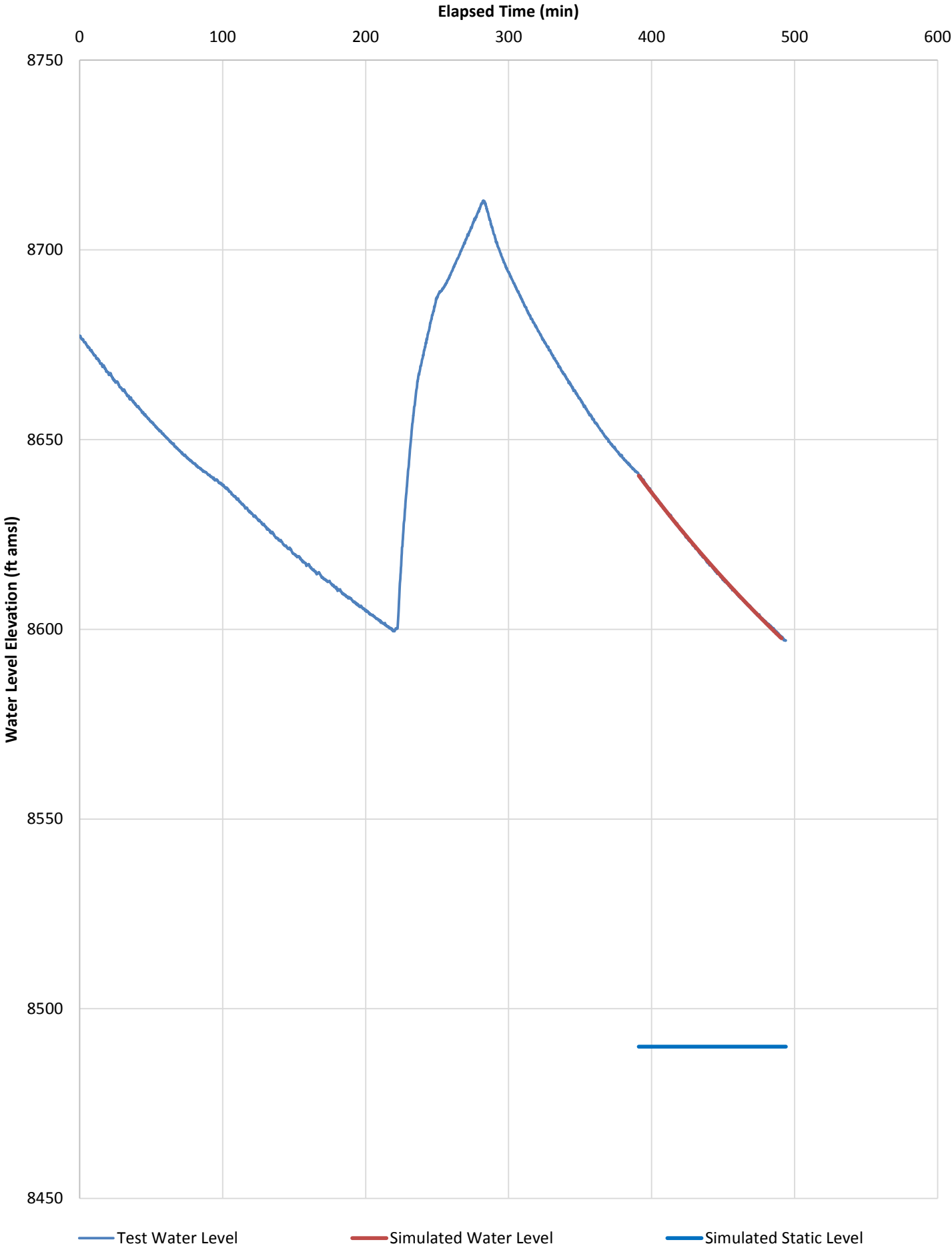
The method of analysis comprises the following:

1. Fit the exponential curve to the falling head test varying:
 E_o = starting water level elevation
 E_{stat} = static water level elevation
 β = exponent
2. Compute formation hydraulic conductivity from eq. (9):
 $K = \beta r^2 \ln(L/r^*) / (2 \alpha L)$

REFERENCES:

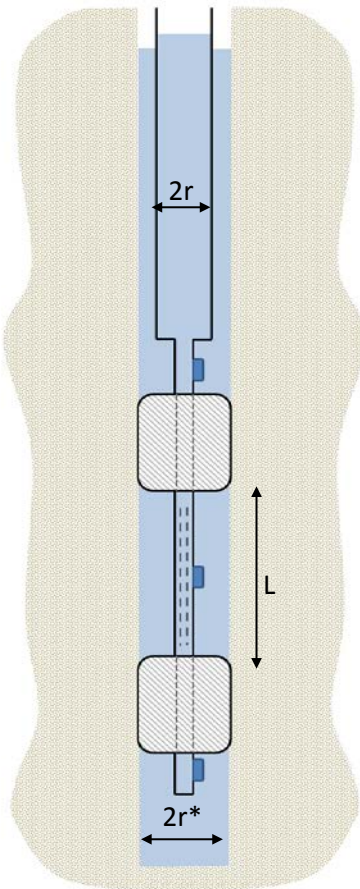
Thiem, A., 1870. *The yield of artesian wells, dug wells and filter galleries*. J. Gas Lighting Water Supply (Munich), vol.14
Brown A, 2014. *Reliable Packer Testing and Analysis*. 12th International Mine Water Association Congress, Xuzhou,

FALLING HEAD TEST RESULTS AND BEST-FIT SIMULATION



ANALYSIS OF HYDRAULIC CONDUCTIVITY

TEST INTERVAL GEOMETRY



Stem Radius (r)
ID of HQ (in) 3.06
 r = (in) 1.53
Inclination (°) -61.18
 r (in) (sloping) 1.75

Well Radius (r*)
OD of NQ^[1] (in) 2.965
 r^* = (in) 1.48

Test Interval (L)
Top depth (ft) 2268
Bottom dep (ft) 4368
 L (ft) 2100

Note [1]:
The upper half of the test section is HQ and the balance is NQ. An average bit radius for the two is used.

BEST FIT TO FALLING HEAD TEST DATA

Parameter	Unit	Early Time	Late Time
E(start)	ft	8711	8641
E(static)	ft	8604.95	8490
β (exponent)	/min	0.0100	0.0034
t(start)	min	284.00	391.00
t(end)	min	384.00	491.00
Sum of Error	ft	0.00	0.00
RMS of Error	ft	0.74	0.26

COMPUTATION OF HYDRAULIC CONDUCTIVITY

$K = \beta r^2 \ln(L/r^*) / (2 \alpha L)$

Parameter	Unit	Early Time	Late Time
β (exponent)	/min	0.0619	0.0609
r (stem radius)	ft	0.146	0.146
L (test interval)	ft	2100	2100
r^* (well radius)	ft	0.124	0.124
α (form factor)	--	0.87	0.87
K (hyd.cond.)	ft/min	3.5E-06	3.4E-06
	cm/sec	1.8E-06	1.7E-06



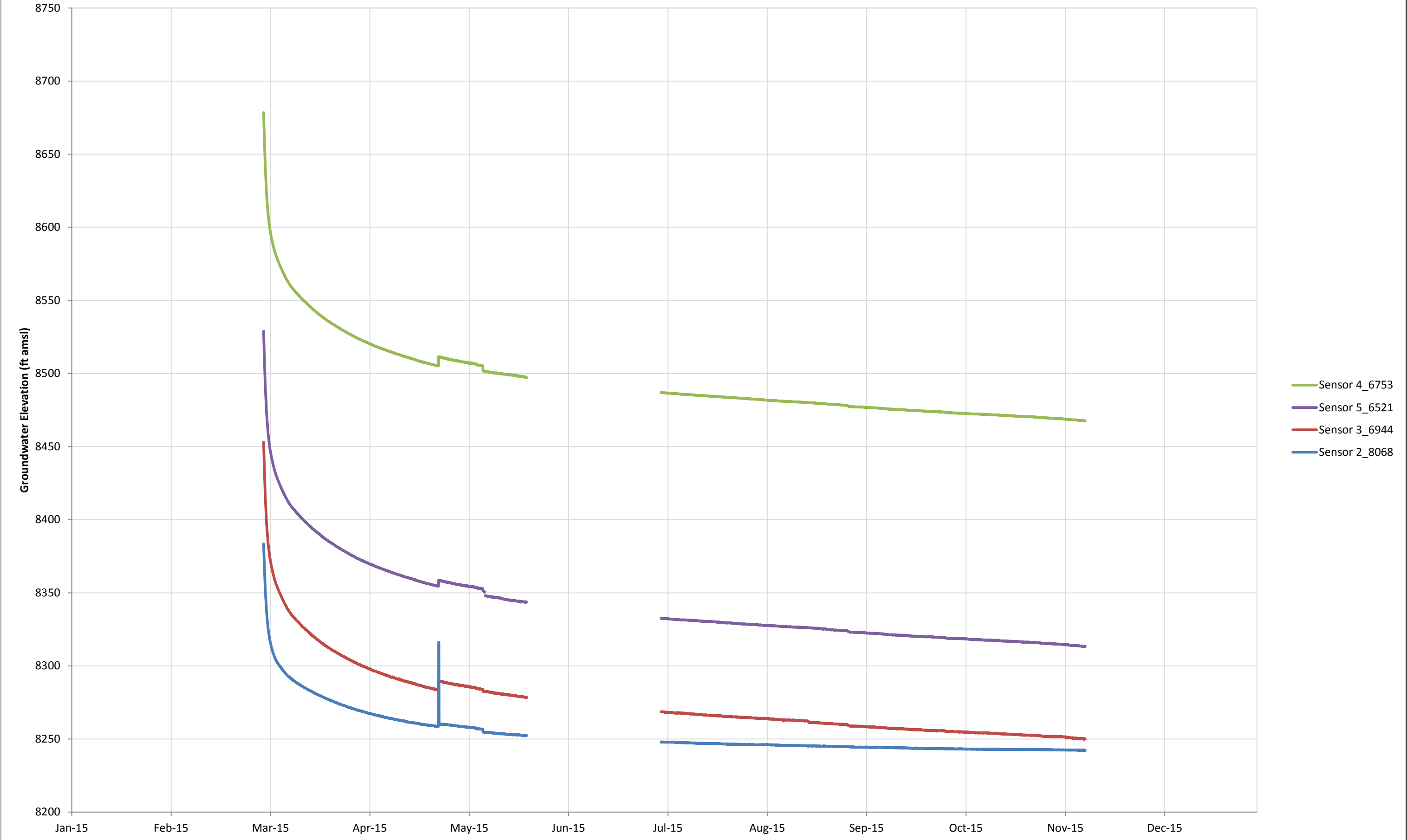
Scale: As shown
Drawn: A.Brown
Date: 2015-12-09

CPC14-3 - Deep Carbonate Borehole Report

APPENDIX 5.2

CPC14-3 FHT #2 - 2268'-4368' DEPTH

CPC14-3 Pressure Transducer Data

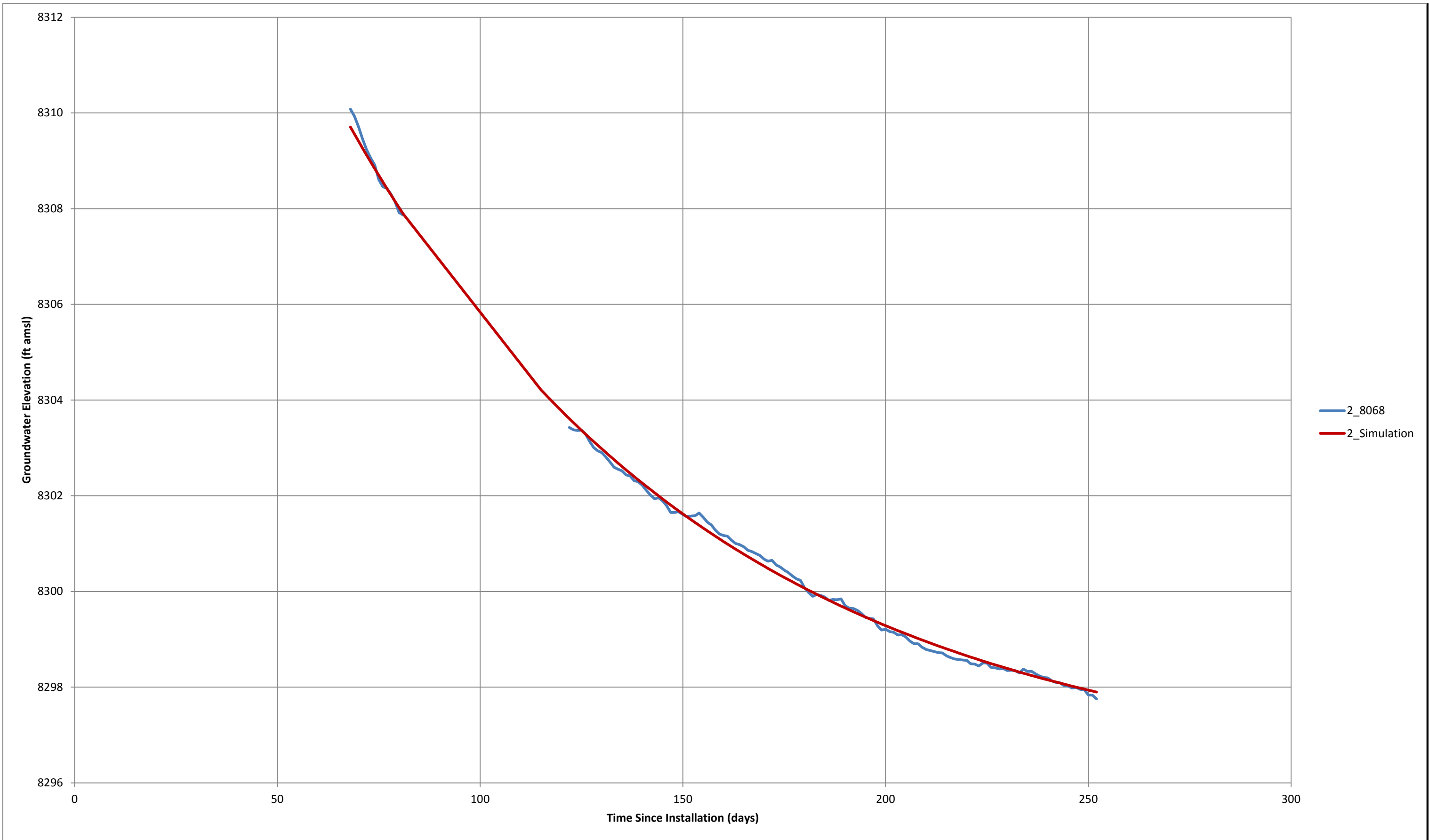


G:\Dropbox (ABC)\AB PROJECTS\1385_CCAV\UG15_Projects\1_Phase 1_CPC14-3\6_Report\0_Workbook\CPC14-03_25-Final.xlsx/p6.1



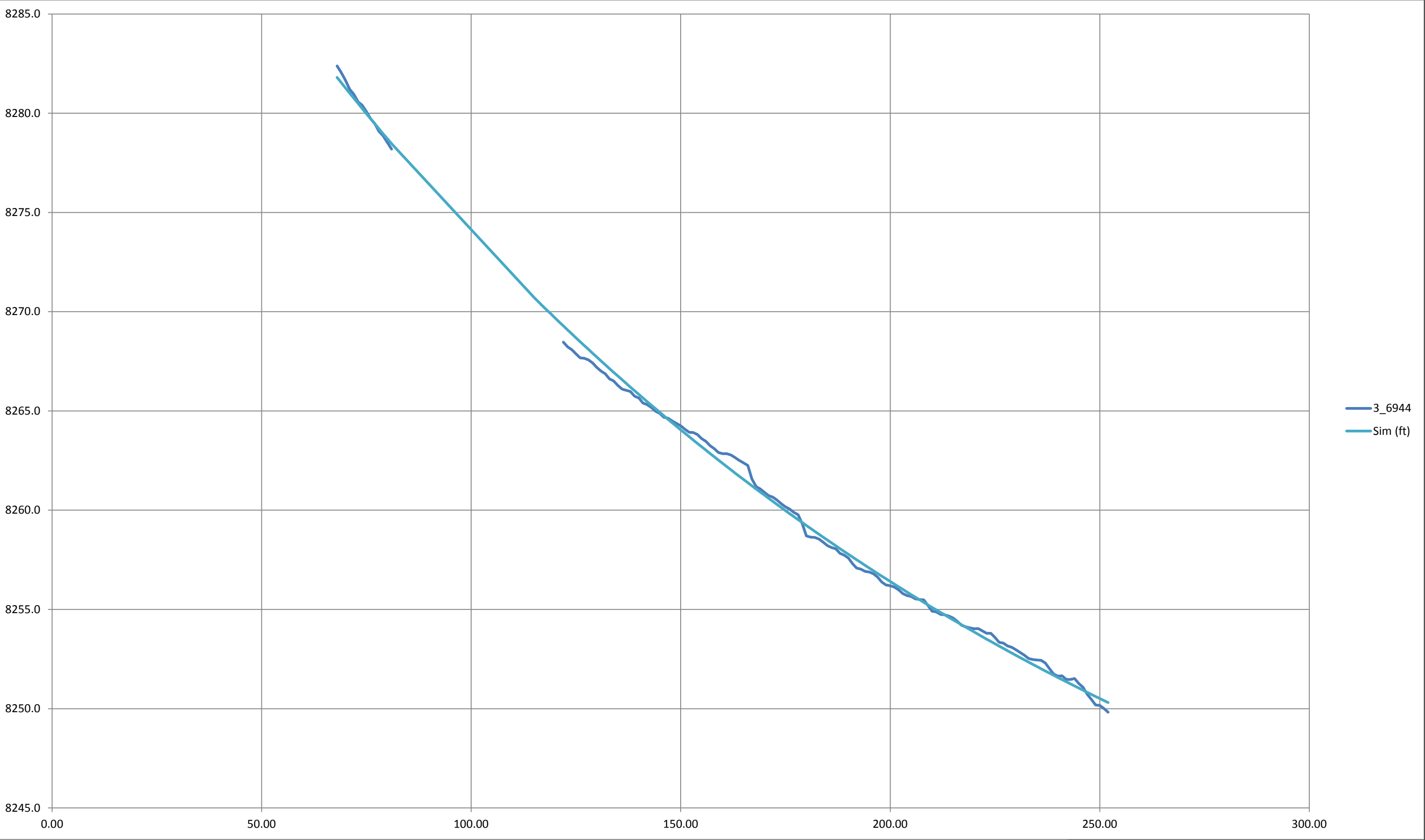
Scale:		CPC14-3 - Deep Carbonate Borehole Report
Drawn:	A.Brown	APPENDIX 6.1
Date:	09-Dec-2015	VWP PIEZOMETRIC ELEVATIONS

G:\Dropbox (ABC)\AB PROJECTS\1385_CCAV-UG5_Projects\1_Report\0_Workbook\CPC14-03_25-Final.xlsx[P6.2



EXPONENTIAL BEST FIT			AdrianBrown CPC14-3 - Deep Carbonate Borehole Report APPENDIX 6.2 STATIC HEAD EVALUATION - VWP 2_8068
Initial Head	Eo	8324.842 ft amsl	
Static Head	Einf	8296.1 ft amsl	
Exponent	Alpha	-0.011 /min	
Average Error	Err	0.000 ft	
RMS Error	RMS Err	0.117 ft	
			Scale:
			Drawn: A.Brown
			Date: 09-Dec-2015

G:\Dropbox (ABC)\AB PROJECTS\1386_CCAV\UG5_Projects\1_Phase_L_CPC14-3\6_Report\0_Workbook\CPC14-03_25-Final.xlsx[P6.3]



EXPONENTIAL BEST FIT

Initial Head	Eo	8303.500	ft amsl
Static Head	Einf	8230.7	ft amsl
Exponent	Alpha	-0.0052	/min
Average Error	Err	0.000	ft
RMS Error	RMS Err	0.352	ft



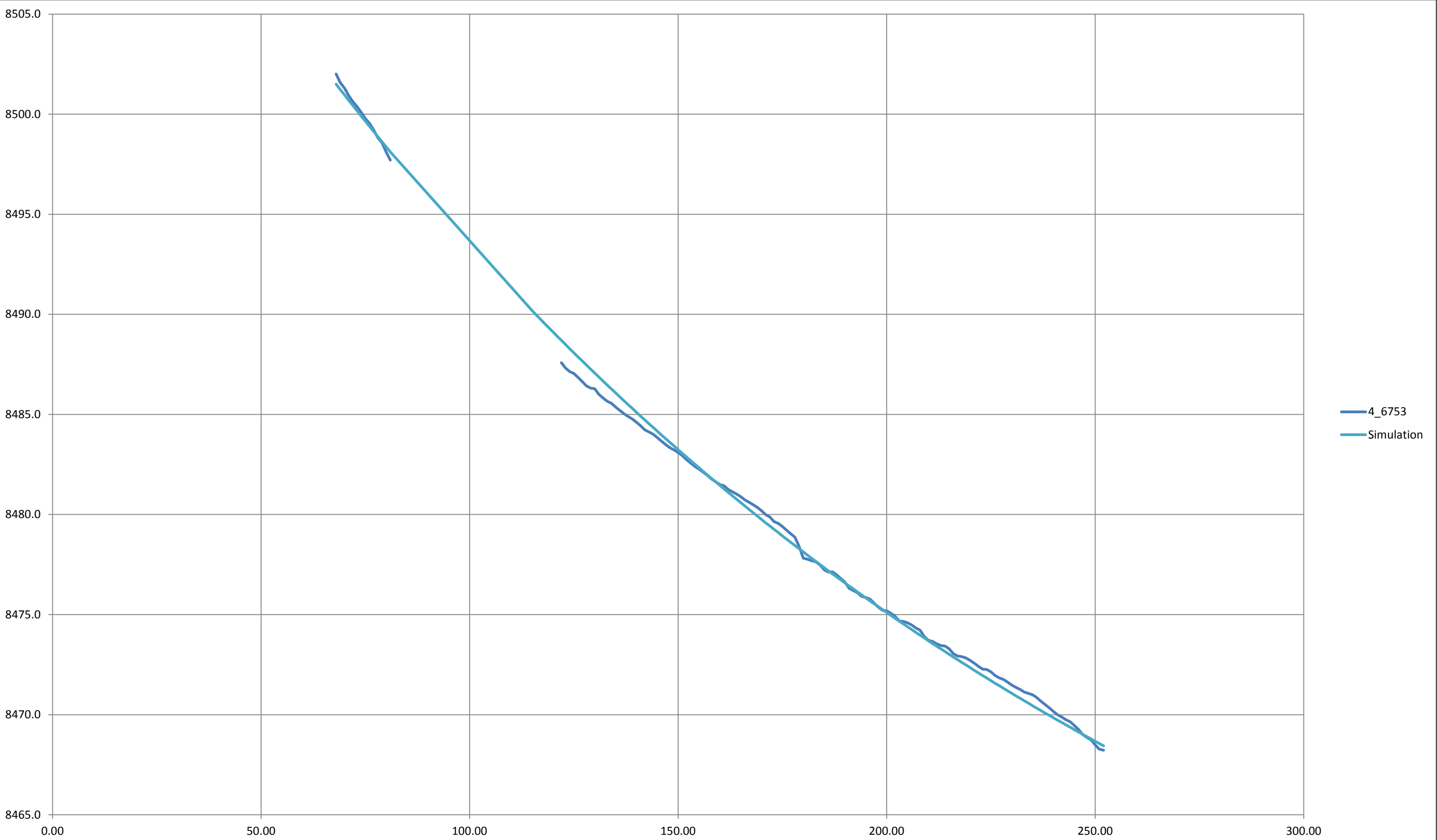
Scale:	
Drawn:	A.Brown
Date:	09-Dec-2015

CPC14-3 - Deep Carbonate Borehole Report

APPENDIX 6.3

STATIC HEAD EVALUATION - VWP 3_6944

G:\Dropbox (ABC)\AB PROJECTS\1386_CCAV\UG5_Projects\1_Phase_L_CPC14-3\6_Report\0_Workbook\1_CPC14-03_25-Final.xlsx\p6.4



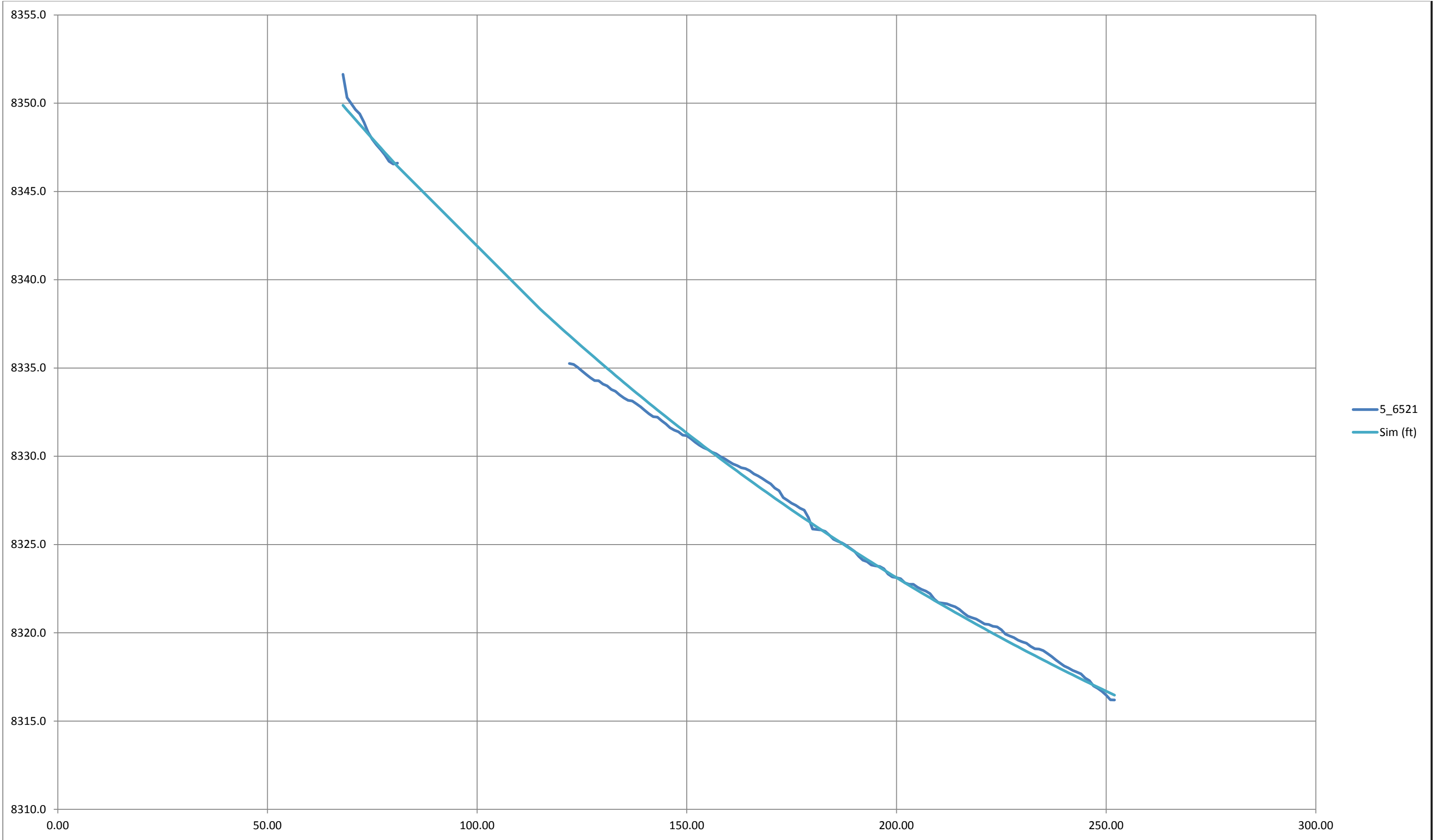
EXPONENTIAL BEST FIT

Initial Head	Eo	8523.000	ft amsl
Static Head	Einf	8444.4	ft amsl
Exponent	Alpha	-0.0047	/min
Average Error	Err	0.000	ft
RMS Error	RMS Err	0.412	ft



Scale:	
Drawn:	A.Brown
Date:	09-Dec-2015
CPC14-3 - Deep Carbonate Borehole Report	
APPENDIX 6.4	
STATIC HEAD EVALUATION - VWP 4_6753	

G:\Dropbox (ABC)\AB PROJECTS\1386_CCAV\UG5_Projects\1_Phase_L_CPC14-3\6_Report\0_Workbook\CPC14-03_25-Final.xlsx[P6.5



EXPONENTIAL BEST FIT

Initial Head	Eo	8372.000 ft amsl
Static Head	Einf	8293.3 ft amsl
Exponent	Alpha	-0.00485 /min
Average Error	Err	0.000 ft
RMS Error	RMS Err	0.520 ft



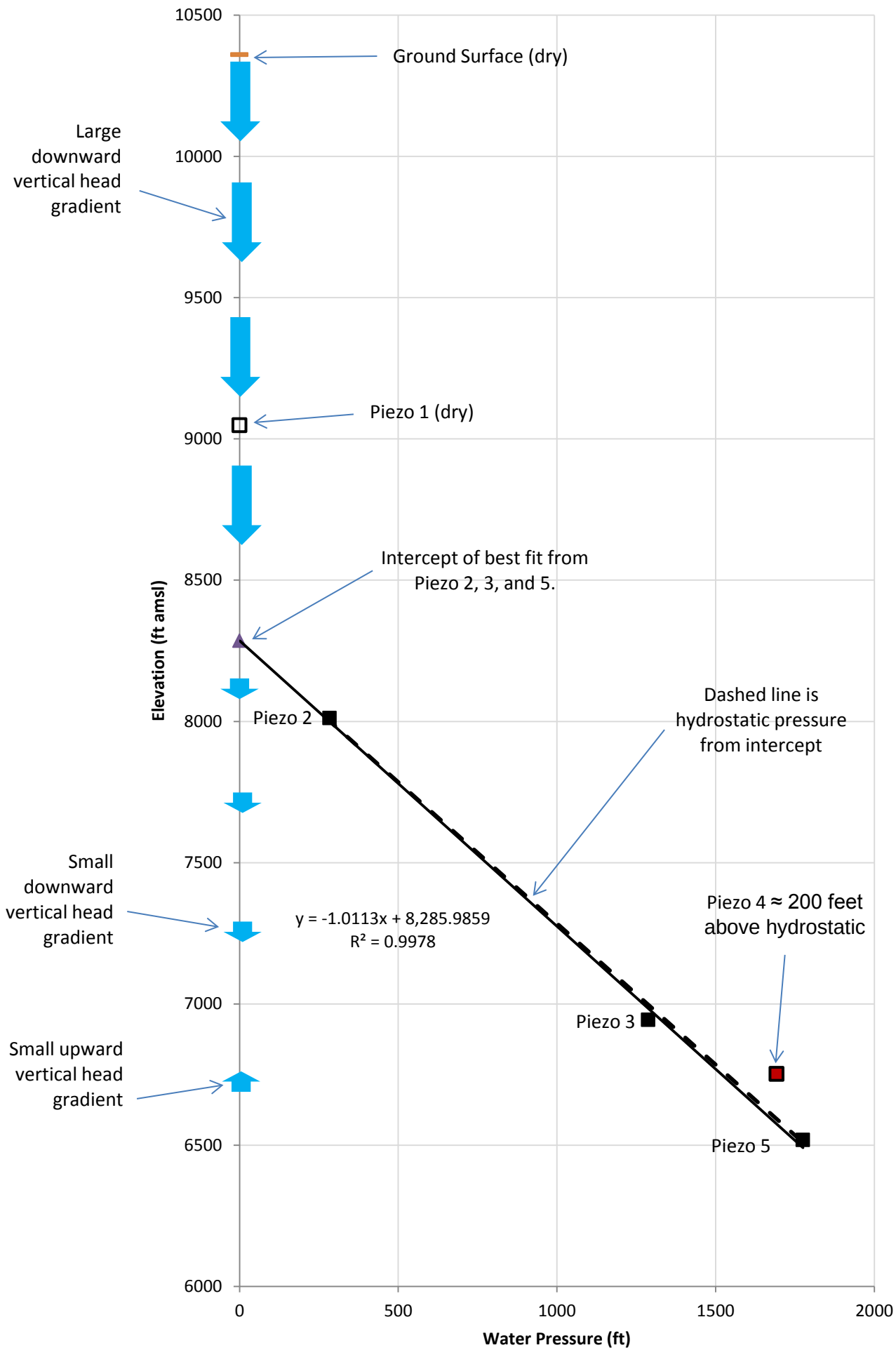
Scale:	
Drawn:	A.Brown
Date:	09-Dec-2015

CPC14-3 - Deep Carbonate Borehole Report

APPENDIX 6.5

STATIC HEAD EVALUATION - VWP 5_6521

G:\Dropbox (ABC)\AB PROJECTS\1385 - CC&V-UGIS - Project\1 - Phase I - CPC14-3\10 - Report\10 - Workbook\CPC14-03_2b-Final.xls/P6.6



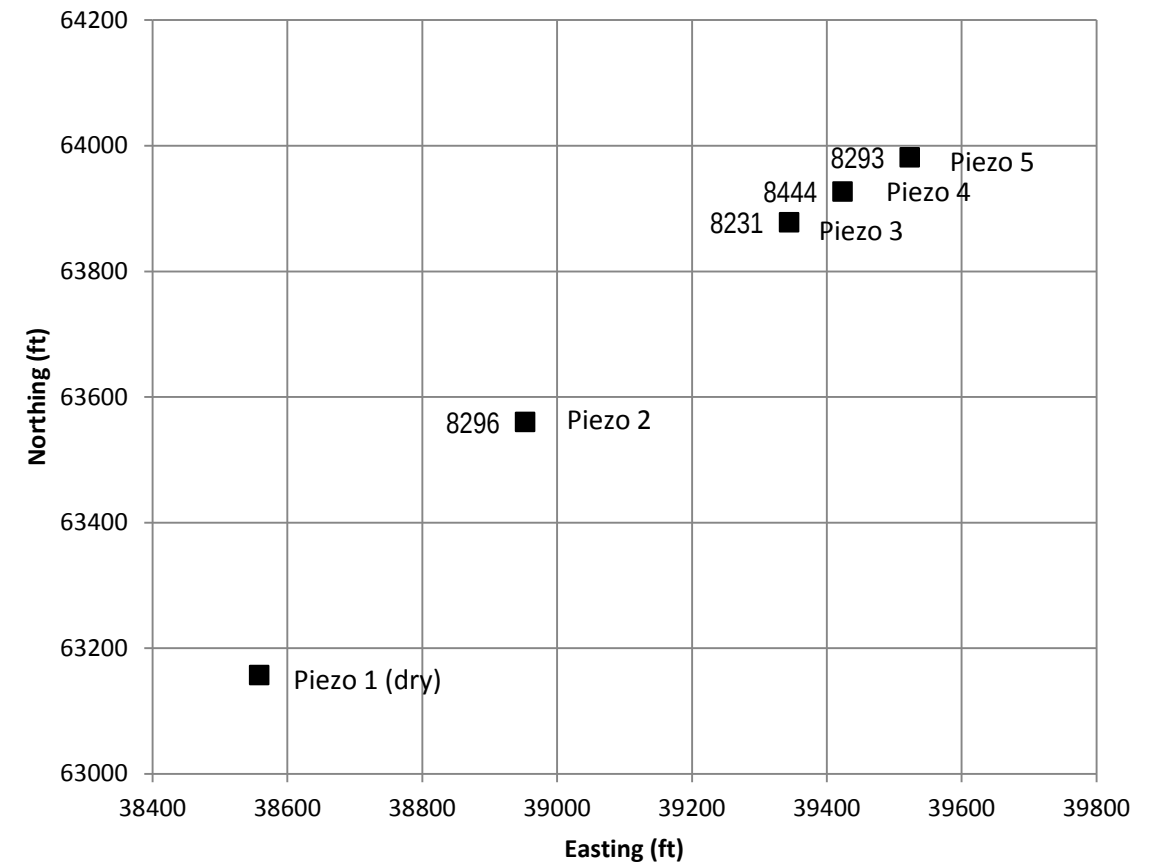
PIEZOMETER LOCATIONS

Location	Depth (ft)	X (ft)	Y (ft)	Z (ft)
Sensor 1	1466	38558	63157	9049
Sensor 2	2646	38953	63560	8012
Sensor 3	3828	39344	63878	6944
Sensor 4	4041	39423	63927	6752
Sensor 5	4301	39523	63982	6518
WTE	2341	38855	63464	8285

WATER PRESSURE AND ELEVATIONS

Location/Elevation	Depth (ft)	X (ft)	Y (ft)	Z (ft)	WLE (ft)	WLP (ft)	Static (ft)
Sensor 1_9058	1466	38558	63157	9049	Dry	Dry	Dry
Sensor 2_8068	2646	38953	63560	8012	8296	284	273
Sensor 3_6944	3828	39344	63878	6944	8231	1287	1341
Sensor 4_6753	4041	39423	63927	6752	8444	1692	1533
Sensor 5_6521	4301	39523	63982	6518	8293	1775	1767

WATER LEVEL ELEVATION PLAN



	Scale:
	Drawn: A.Brown
	Date: 09-Dec-2015
CPC14-3 - Deep Carbonate Borehole Report	
APPENDIX 6.6	
CPC14-3 - WATER TABLE	

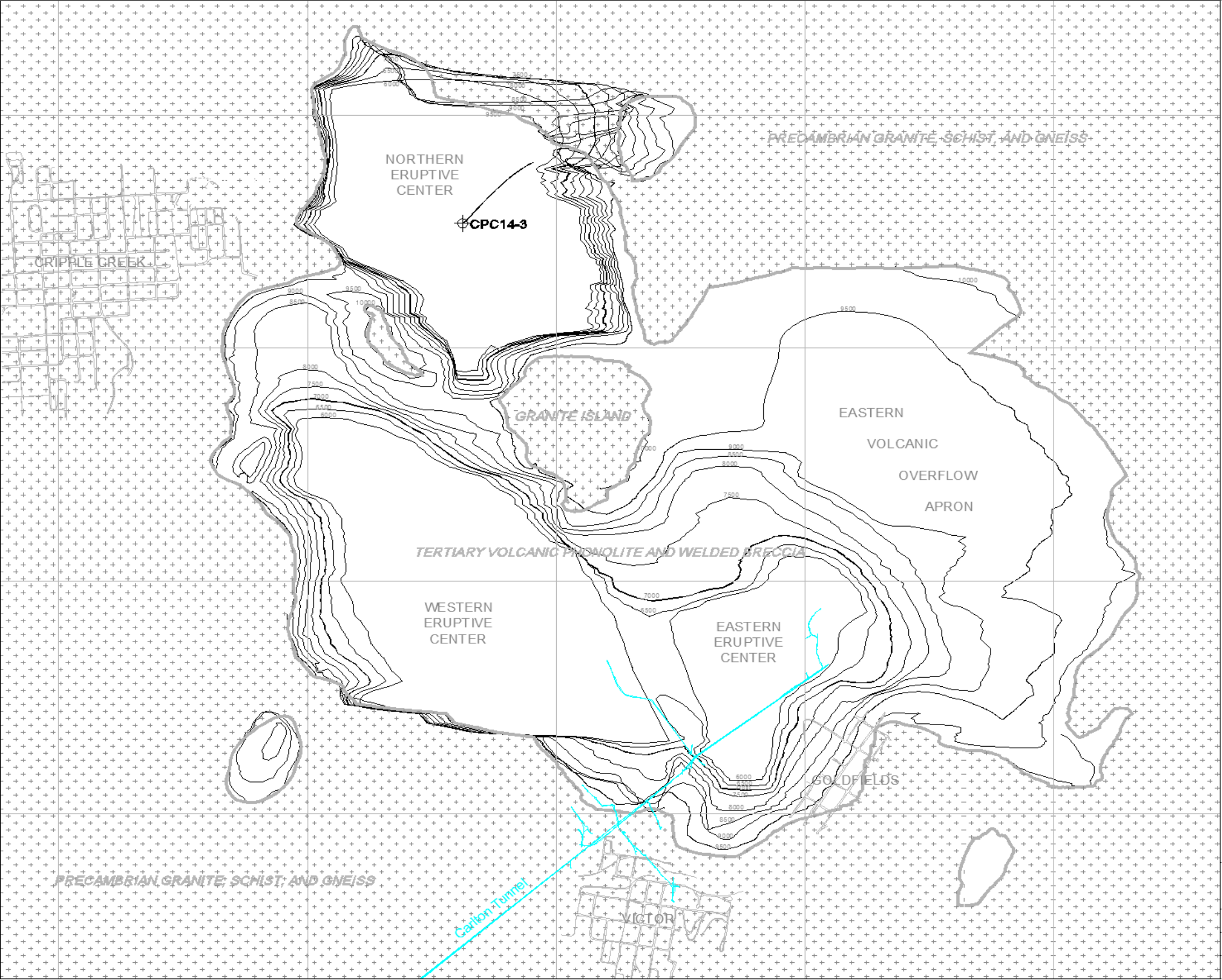
APPENDIX 1

CPC14-3 - LOCATION PLAN AND POSITION

APPENDIX 1.1

CPC14-3 - LOCATION

G:\dropbox (ABC)\AB PROJECTS\1385- C&V-UG15- Projects\1- Phase 1- CPC14-36- Report\0- Workbook\CPC14-03-25-Final.xls\A1.1-Location



APPENDIX 1.2

CPC14-3 - BOREHOLE SURVEY

Appendix A1.2: Survey of CPC14-3

Borehole	Depth (ft)	Azimuth (°)	Inclination (°)	dX (ft)	dY (ft)	dZ (ft)	X (ft)	Y (ft)	Z (ft)	dX/dD	dY/dD	dZ/dD
CPC14-3	0	53.24	-71.44	0.00	0.00	0.00	38119.05	62679.19	10359.47	0.245	0.193	-0.950
CPC14-3	50	50.21	-72.22	12.24	9.66	-47.51	38131.29	62688.85	10311.96	0.239	0.197	-0.951
CPC14-3	100	50.70	-71.67	24.19	19.52	-95.04	38143.24	62698.71	10264.43	0.245	0.208	-0.947
CPC14-3	150	48.69	-70.88	36.43	29.91	-142.40	38155.48	62709.10	10217.07	0.252	0.228	-0.940
CPC14-3	200	47.21	-69.39	49.05	41.29	-189.42	38168.10	62720.48	10170.05	0.266	0.245	-0.932
CPC14-3	250	47.41	-68.17	62.35	53.56	-236.03	38181.40	62732.75	10123.44	0.281	0.267	-0.922
CPC14-3	300	45.45	-66.27	76.38	66.90	-282.13	38195.43	62746.09	10077.34	0.286	0.295	-0.912
CPC14-3	350	42.74	-65.19	90.68	81.66	-327.71	38209.73	62760.85	10031.76	0.291	0.323	-0.901
CPC14-3	400	41.35	-63.29	105.23	97.80	-372.74	38224.28	62776.99	9986.73	0.301	0.343	-0.890
CPC14-3	450	41.18	-62.46	120.27	114.93	-417.25	38239.32	62794.12	9942.22	0.308	0.349	-0.885
CPC14-3	500	41.55	-62.04	135.65	132.41	-461.49	38254.70	62811.60	9897.98	0.312	0.351	-0.883
CPC14-3	550	41.68	-61.90	151.26	149.97	-505.63	38270.31	62829.16	9853.84	0.310	0.353	-0.882
CPC14-3	600	40.87	-61.99	166.77	167.65	-549.75	38285.82	62846.84	9809.72	0.306	0.355	-0.883
CPC14-3	650	40.63	-62.14	182.06	185.39	-593.93	38301.11	62864.58	9765.54	0.306	0.356	-0.883
CPC14-3	700	40.73	-61.89	197.35	203.18	-638.08	38316.41	62882.37	9721.39	0.306	0.361	-0.881
CPC14-3	750	39.84	-61.70	212.63	221.21	-682.15	38331.69	62900.40	9677.32	0.304	0.363	-0.881
CPC14-3	800	40.00	-61.75	227.83	239.38	-726.18	38346.88	62918.57	9633.29	0.308	0.359	-0.881
CPC14-3	850	41.29	-61.83	243.23	257.31	-770.24	38362.28	62936.50	9589.23	0.312	0.355	-0.881
CPC14-3	900	41.38	-61.80	258.82	275.04	-814.31	38377.88	62954.23	9545.16	0.313	0.354	-0.881
CPC14-3	950	41.58	-61.75	274.49	292.76	-858.37	38393.54	62971.95	9501.10	0.315	0.354	-0.881
CPC14-3	1000	41.62	-61.66	290.22	310.48	-902.39	38409.28	62989.67	9457.08	0.316	0.354	-0.880
CPC14-3	1050	41.76	-61.69	306.00	328.20	-946.41	38425.05	63007.39	9413.06	0.315	0.354	-0.880
CPC14-3	1100	41.58	-61.65	321.77	345.92	-990.42	38440.83	63025.11	9369.05	0.315	0.356	-0.880
CPC14-3	1150	41.44	-61.64	337.51	363.70	-1034.42	38456.57	63042.89	9325.05	0.315	0.356	-0.880
CPC14-3	1200	41.56	-61.55	353.27	381.52	-1078.40	38472.33	63060.71	9281.07	0.318	0.358	-0.878
CPC14-3	1250	41.65	-61.22	369.17	399.42	-1122.29	38488.23	63078.61	9237.18	0.321	0.363	-0.875
CPC14-3	1300	41.39	-60.85	385.22	417.55	-1166.04	38504.28	63096.74	9193.43	0.322	0.366	-0.873
CPC14-3	1350	41.25	-60.87	401.30	435.84	-1209.71	38520.35	63115.03	9149.76	0.323	0.365	-0.873
CPC14-3	1400	41.79	-60.80	417.45	454.08	-1253.37	38536.51	63133.27	9106.10	0.327	0.362	-0.873
CPC14-3	1450	42.34	-60.77	433.80	472.20	-1297.01	38552.86	63151.39	9062.46	0.330	0.361	-0.872
CPC14-3	1500	42.53	-60.71	450.29	490.24	-1340.63	38569.35	63169.42	9018.84	0.332	0.359	-0.872
CPC14-3	1550	42.90	-60.78	466.87	508.19	-1384.25	38585.92	63187.38	8975.22	0.332	0.358	-0.873
CPC14-3	1600	42.69	-60.75	483.46	526.11	-1427.88	38602.51	63205.30	8931.59	0.333	0.357	-0.873
CPC14-3	1650	43.33	-60.79	500.11	543.96	-1471.52	38619.17	63223.15	8887.95	0.340	0.351	-0.873
CPC14-3	1700	44.79	-60.74	517.09	561.51	-1515.15	38636.15	63240.70	8844.32	0.337	0.355	-0.872
CPC14-3	1750	42.32	-60.66	533.95	579.24	-1558.75	38653.01	63258.43	8800.72	0.334	0.361	-0.870
CPC14-3	1800	43.22	-60.37	550.67	597.31	-1602.28	38669.72	63276.50	8757.19	0.342	0.357	-0.869
CPC14-3	1850	44.25	-60.41	567.75	615.16	-1645.75	38686.80	63294.35	8713.72	0.345	0.359	-0.867
CPC14-3	1900	43.42	-59.83	585.00	633.13	-1689.10	38704.05	63312.32	8670.37	0.347	0.361	-0.866
CPC14-3	1950	44.26	-60.08	602.34	651.18	-1732.38	38721.39	63330.37	8627.09	0.350	0.352	-0.868
CPC14-3	2000	45.45	-60.35	619.85	668.79	-1775.78	38738.91	63347.98	8583.69	0.342	0.349	-0.872
CPC14-3	2050	43.34	-61.12	636.95	686.26	-1819.40	38756.01	63365.44	8540.07	0.334	0.349	-0.875
CPC14-3	2100	44.17	-61.08	653.67	703.71	-1863.17	38772.72	63382.90	8496.30	0.340	0.344	-0.875
CPC14-3	2150	45.12	-61.07	670.66	720.91	-1906.93	38789.71	63400.10	8452.54	0.343	0.340	-0.876
CPC14-3	2200	45.46	-61.18	687.82	737.90	-1950.72	38806.87	63417.09	8408.75	0.344	0.337	-0.877
CPC14-3	2250	45.75	-61.27	705.02	754.74	-1994.54	38824.07	63433.93	8364.93	0.342	0.337	-0.877
CPC14-3	2300	45.12	-61.39	722.11	771.57	-2038.41	38841.16	63450.76	8321.06	0.329	0.331	-0.884
CPC14-3	2350	44.53	-62.93	738.57	788.13	-2082.62	38857.62	63467.32	8276.85	0.320	0.320	-0.891
CPC14-3	2400	45.47	-63.19	754.59	804.15	-2127.20	38873.64	63483.34	8232.27	0.319	0.318	-0.893
CPC14-3	2450	44.64	-63.28	770.52	820.06	-2171.84	38889.58	63499.25	8187.63	0.319	0.315	-0.894
CPC14-3	2500	46.09	-63.50	786.46	835.79	-2216.54	38905.51	63514.98	8142.93	0.323	0.310	-0.894
CPC14-3	2550	46.23	-63.38	802.59	851.28	-2261.27	38921.64	63530.47	8098.20	0.323	0.308	-0.895
CPC14-3	2600	46.50	-63.59	818.74	866.68	-2306.01	38937.79	63545.87	8053.46	0.325	0.304	-0.895
CPC14-3	2650	47.30	-63.51	835.00	881.90	-2350.78	38954.06	63561.09	8008.69	0.324	0.305	-0.895
CPC14-3	2700	46.26	-63.63	851.22	897.14	-2395.55	38970.27	63576.33	7963.92	0.322	0.303	-0.897

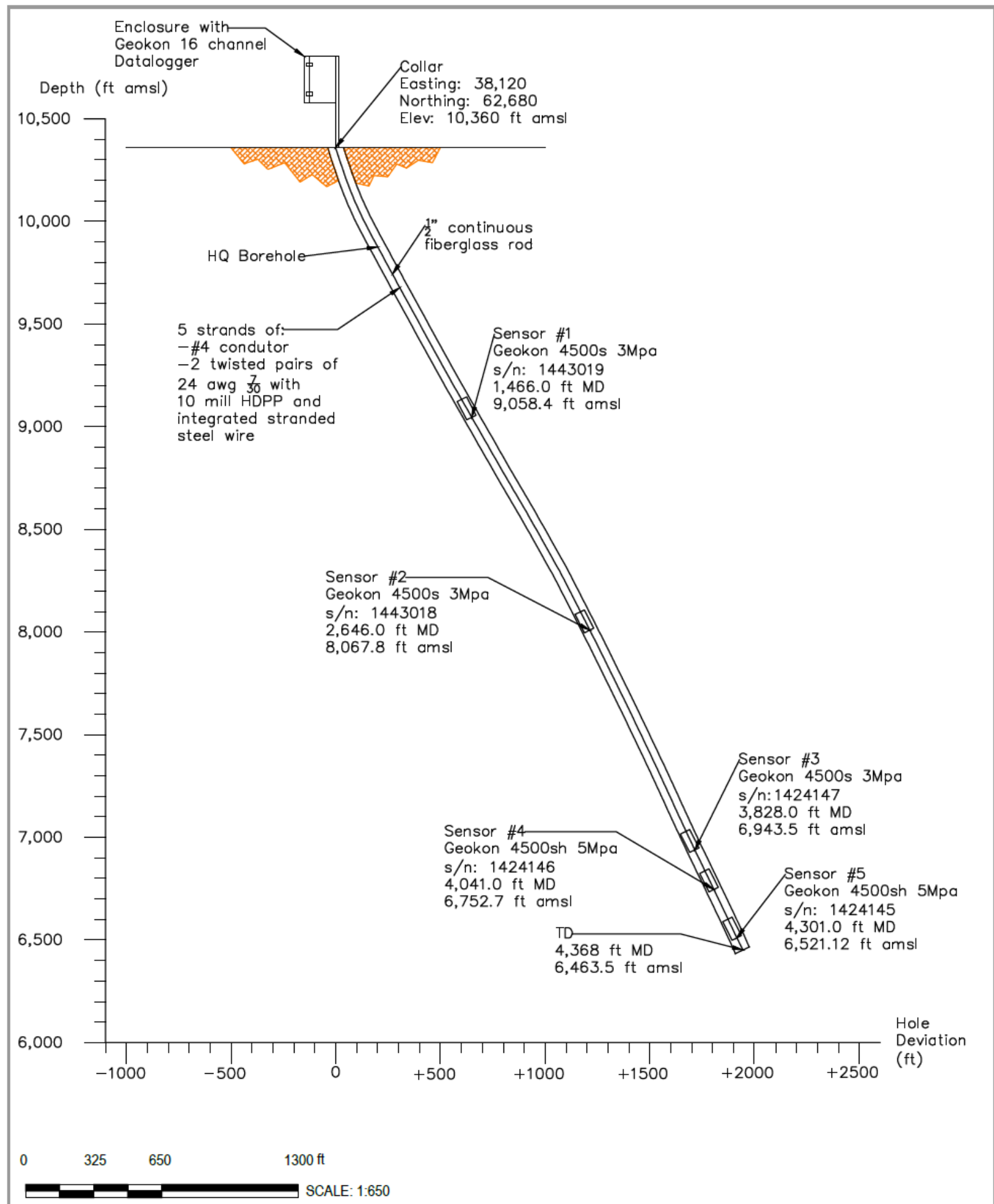
CPC14-3	2750	47.15	-63.88	867.31	912.30	-2440.39	38986.37	63591.49	7919.08	0.320	0.300	-0.899
CPC14-3	2800	46.59	-64.13	883.31	927.28	-2485.34	39002.36	63606.47	7874.13	0.318	0.298	-0.900
CPC14-3	2850	47.00	-64.18	899.19	942.21	-2530.34	39018.25	63621.40	7829.13	0.319	0.295	-0.900
CPC14-3	2900	47.44	-64.25	915.16	956.98	-2575.36	39034.21	63636.17	7784.11	0.323	0.289	-0.901
CPC14-3	2950	49.02	-64.36	931.33	971.42	-2620.41	39050.38	63650.61	7739.06	0.327	0.283	-0.902
CPC14-3	3000	49.12	-64.36	947.67	985.59	-2665.49	39066.73	63664.78	7693.98	0.325	0.284	-0.902
CPC14-3	3050	48.71	-64.51	963.94	999.77	-2710.59	39082.99	63678.96	7648.88	0.323	0.282	-0.903
CPC14-3	3100	49.08	-64.69	980.10	1013.87	-2755.76	39099.15	63693.06	7603.71	0.324	0.277	-0.905
CPC14-3	3150	49.97	-64.84	996.31	1027.71	-2800.99	39115.36	63706.90	7558.48	0.327	0.272	-0.905
CPC14-3	3200	50.52	-64.83	1012.66	1041.31	-2846.24	39131.71	63720.50	7513.23	0.329	0.270	-0.905
CPC14-3	3250	50.55	-64.80	1029.08	1054.83	-2891.49	39148.14	63734.02	7467.98	0.330	0.268	-0.905
CPC14-3	3300	51.25	-64.82	1045.60	1068.25	-2936.74	39164.65	63747.44	7422.73	0.334	0.262	-0.905
CPC14-3	3350	52.36	-64.95	1062.28	1081.38	-2982.01	39181.33	63760.56	7377.46	0.334	0.257	-0.907
CPC14-3	3400	52.41	-65.18	1078.97	1094.24	-3027.35	39198.03	63773.43	7332.12	0.333	0.255	-0.908
CPC14-3	3450	52.81	-65.23	1095.63	1106.97	-3072.74	39214.69	63786.16	7286.73	0.332	0.252	-0.909
CPC14-3	3500	52.91	-65.49	1112.25	1119.56	-3118.19	39231.31	63798.75	7241.28	0.334	0.246	-0.910
CPC14-3	3550	54.37	-65.45	1128.97	1131.87	-3163.67	39248.02	63811.06	7195.80	0.336	0.241	-0.910
CPC14-3	3600	54.29	-65.63	1145.79	1143.94	-3209.19	39264.84	63823.13	7150.28	0.336	0.243	-0.910
CPC14-3	3650	54.01	-65.42	1162.58	1156.07	-3254.69	39281.63	63835.26	7104.78	0.342	0.243	-0.908
CPC14-3	3700	55.21	-64.91	1179.70	1168.23	-3300.07	39298.75	63847.42	7059.40	0.350	0.239	-0.906
CPC14-3	3750	56.22	-64.94	1197.21	1180.17	-3345.36	39316.26	63859.36	7014.11	0.353	0.239	-0.905
CPC14-3	3800	55.73	-64.60	1214.87	1192.10	-3390.59	39333.92	63871.28	6968.88	0.361	0.237	-0.902
CPC14-3	3850	57.64	-64.24	1232.91	1203.95	-3435.69	39351.96	63883.14	6923.78	0.370	0.232	-0.899
CPC14-3	3900	58.21	-63.94	1251.42	1215.55	-3480.66	39370.48	63894.74	6878.81	0.374	0.230	-0.898
CPC14-3	3950	58.63	-63.96	1270.13	1227.05	-3525.58	39389.18	63906.24	6833.89	0.375	0.229	-0.898
CPC14-3	4000	58.64	-63.93	1288.88	1238.48	-3570.50	39407.94	63917.67	6788.97	0.376	0.225	-0.899
CPC14-3	4050	59.43	-64.12	1307.66	1249.75	-3615.45	39426.71	63928.94	6744.02	0.378	0.221	-0.899
CPC14-3	4100	60.09	-63.94	1326.58	1260.78	-3660.40	39445.63	63939.97	6699.07	0.381	0.218	-0.899
CPC14-3	4150	60.27	-64.03	1345.60	1271.68	-3705.33	39464.66	63950.87	6654.14	0.383	0.211	-0.899
CPC14-3	4200	62.10	-64.15	1364.74	1282.21	-3750.31	39483.80	63961.40	6609.16	0.386	0.202	-0.900
CPC14-3	4250	62.64	-64.14	1384.06	1292.33	-3795.30	39503.12	63971.52	6564.17	0.390	0.196	-0.900
CPC14-3	4310.01	64.03	-64.11	1407.47	1304.08	-3849.30	39526.52	63983.27	6510.17	0.390	0.196	-0.900

APPENDIX 1.3

CPC14-3 - AS-BUILT DRAWING

SCHLUMBERGER WATER SERVICES, INC.

G:\drojbox (ABC)\AB PROJECTS\1385 - C&V\UG15 - Projects\1 - Phase 1 - CPC14-3\6 - Report\0 - Report\0 - CPC14-3\25-Final\1385-UG15-1-Phase 1 - CPC14-3 - AS BUILT



Scale:
Drawn: A. Brown
Date: 2015-12-09

CPC14-3 - Deep Carbonate Borehole Report

APPENDIX 1.3

AS BUILT

APPENDIX 2

CPC14-3 - GEOLOGY

APPENDIX 2.1

CPC14-3 - GEOLOGY LOG

CRIPPLE CREEK AND VICTOR GOLD MINING COMPANY, EXPLORATION DEPARTMENT

Cripple Creek-Victor Gold Mining Company

Hole Name: CPC14-3

Collar Azimuth: 53.24

Collar Inclination: -71.44

:

Hole Length: 4368.00

northsouth_decimal: 62679.189

eastwest_decimal: 38119.054

elevation: 10359.47

Print Page 1 of 52

HOLE_ASSAY_SAMPLE

depth_to	RockType	Lithology_Comment	potassic	Spessartine	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematization	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
77	34	or brn, pale red, and m gy porphyritic phonolite w sparse (<5% recognizable) cream feld phenos (1x4	3	0	0	1	0		0	0			3	3		(cont) mm); well fx'd w burnt orange FeOx;	0				0				EXPACPC14-3-002
82	34	as above, with minor porph clasts; mod to strong FeOx fx'd	3	0	0	1	0		0	0			3	3			0				0				EXPACPC14-3-002
87	34	cream feld phenos (1x5mm) hard to see ("ghosted"), but present;	3	0	0	1	0		0	0			3	3			0				0				EXPACPC14-3-002

Scale 1:180

April 15, 2015

01:22 PM

Cripple Creek-Victor Gold Mining Company																												
Hole Name: CPC14-3					Collar Azimuth: 53.24					Collar Inclination: -71.44					:					Hole Length: 4368.00								
northsouth_decimal: 62679.189					eastwest_decimal: 38119.054					elevation: 10359.47										Print Page 2 of 52								
HOLE_ASSAY_SAMPLE																												
depth_to	RockType	Lithology_Comment	potassic	speculante	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematization	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER			
87	34	cream field phenos (fx3mm) hard to see ("abected") but present.	3	0	0	1	0		0	0			3	3			0					0			EXPACPC14-3-003			
97	34	see RQD: gen mod-strong fx'd w poor recovery	3	0	0	1	0		0	0			3	5			0					0			EXPACPC14-3-004			
107	34	< 0.5 ft core (fragments) in 10 ft run	3	0	0	1	0		0	0			3	5			0					0			EXPACPC14-3-005			
117	34	some open fxs with comminuted material and crushed appearance	3	0	0	1	0		0	0			3	3			0					0			EXPACPC14-3-006			
127	34	one 0.4 ft piece of core in 10 ft run; shatter bx'd (Tphu) w stockwork FeOx microfxs;	3	0	0	1	0		0	0			3	5			0					0			EXPACPC14-3-007			
137	34	a/a 8 pieces core (<7cm) in 10 ft run	3	0	0	1	0		0	0			3	5			0					0			EXPACPC14-3-008			
440		no core; hearsay is that this bad ground was tri-coned (sampled?)																							EXPACPC14-3-009			
Scale 1:180										April 15, 2015										01:22 PM								

Cripple Creek-Victor Gold Mining Company																																
Hole Name: CPC14-3				Collar Azimuth: 53.24					Collar Inclination: -71.44					:			Hole Length: 4368.00															
northsouth_decimal: 62679.189				eastwest_decimal: 38119.054					elevation: 10359.47						Print Page 3 of 52																	
HOLE_ASSAY_SAMPLE																																
depth_to	RockType	Lithology_Comment	potassic	Spectante	sification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematization	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER							
440		no core; hearsay is that this bad ground was tri-coned (sampled?)																							EXPACPC14-3-000							
Scale 1:180											April 15, 2015											01:22 PM										

Cripple Creek-Victor Gold Mining Company																																
Hole Name: CPC14-3				Collar Azimuth: 53.24					Collar Inclination: -71.44					:			Hole Length: 4368.00															
northsouth_decimal: 62679.189				eastwest_decimal: 38119.054					elevation: 10359.47						Print Page 4 of 52																	
HOLE_ASSAY_SAMPLE																																
depth_to	RockType	Lithology_Comment	potassic	Spectantite	sulfidation	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematization	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER							
440		no core; hearsay is that this bad ground was tri-coned (sampled?)																							EXPACPC14-3-000							
Scale 1:180											April 15, 2015											01:22 PM										

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 5 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	Specularite	sulfidation	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematization	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
440		no core; hearsay is that this bad ground was tri-coned (sampled?)																							EXPACPC14-3-005

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3		Collar Azimuth: 53.24		Collar Inclination: -71.44		:	Hole Length: 4368.00	
northsouth_decimal: 62679.189		eastwest_decimal: 38119.054		elevation: 10359.47			Print Page 6 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	spessartine	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematization	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
440		no core; hearsay is that this bad ground was tri-coned (sampled?)																							EXPACPC14-3-005
447	34	lith gen a/a: faint fg porph text; shattered w network FeOx micro fxs; locally pitted w mix? hem/MnO	3	0	0	1	0		0	0			4	5		fg botryoidal (hem/MnOx?) texture onn some fxs and in some cavities;	0				0				EXPACPC14-3-010
457	34	many FeOx fxs subparallel to core axis (tca)	3	0	0	1	0		0	0			3	5			0				0				EXPACPC14-3-011
466	30	Minor monolithic Tph bx present; logged as 30 as marker; cannot tell if tectonic, or if matrix is	4	0	1	1	0		0	0		(cont) 462.7; mod-strong K-alt	3			(cont) porph phono.; possible fault? minor cavities lined w qtz; 3 cm zone (25 tca) of qtz vnits at	0				0	qtz? vnits present; ? = cannot do a good scratch test on crumbly rock			EXPACPC14-3-012
467	34	Shatter or crackle bx cont. with dense ne	4	0	0	1	0		0	0		a/a	3	5			0				0				EXPACPC14-3-013
469	34	well fx'd (FeOx) Tphu cont	4	0	0	1	0		0	0		mod -strong K-alt cont.	3	5			0				0				EXPACPC14-3-014
477	34	reddish gy and m gy w network microfxs	3	0	0	1	0		0	0			3	3			0				0				EXPACPC14-3-015
487	34	a/a (as above)	3	0	0	1	0		0	0			3	3			0				0				EXPACPC14-3-016
497	34	cream feld phenos (2x4mm) hard to discern but present; includes lenses or pods that could pass for	3	0	0	1	0		0	0			3	3		(cont) fg CC Bx or lithi lapilli tuff	0				0				EXPACPC14-3-017
506	34	mostly l gy	3	0	0	1	0		0	0			2	3			0				0				EXPACPC14-3-018
510	34	dark specks-flecks may be fg nepheline? phenos	3	0	0	1	0		0	0		1 argil = minor clay on some FeOx fxs	2	3			0				0				EXPACPC14-3-019
515	34	strongly fx'd below 510.5;	4	0	0	1	0		0	0			3	3			0				0				EXPACPC14-3-020

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3		Collar Azimuth: 53.24		Collar Inclination: -71.44		:	Hole Length: 4368.00	
northsouth_decimal: 62679.189		eastwest_decimal: 38119.054		elevation: 10359.47			Print Page 7 of 52	

HOLE_ASSAY_SAMPLE																			
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz
515	34	strongly fx'd below 510.5;	4	0	0	1	0		0	0			3	5			0		
517	34	a/a; strong K-alt and poor recovery suggests possible fault	4	0	0	1	0		0	0			3				0		
522	34		3	0	0	1	0		0	0			2	5			0		
537		Block says:"522-537 no recovery"																	
542	34	strongly fx'd	3	0	0	1	0		0	0			2	5			0		
547		no recovery																	
551	30	Tph bx: cannot tell if tectonic or if bx matrix is porph phono (30 by definition)	3	0	0	1	0		0	0			2	5			0		
555	30	a/a; minor cly on fxs, odd yellow-or FeOx on fxs, and strong K-alt suggests fault (somewhere, 553?)	4	0	0	2	0		0	0		2 argil = yellowish clay on fxs	3				0		
559	34	strongly fx'd, poor recovery (see RQD)	3	0	0	1	0		0	0			2	5			0		
567	30	monolithic Tph bx: possibly tectonic? w subtle fabric (wh clay vnlt) at 70-80 tca; Fault at 566.5?	4	0	0	2	0		0	0		patchy 3-4 K-alt; 2 argil = wh clay vnlt	2				0		
571	34	broken cont.; weak wh clay on fxs	4	0	0	2	0		0	0		a/a	3	5			0		
577	34	minor Tph (monolithic) bx present; 30? first appearance anhydrite on fxs; re-drilled material	4	0	0	2	0		0	0		a/a	2	5			0	12	2
584	34	broken rock cont.	4	0	0	1	0		0	0		solid 4 K-alt	2	5			0	12	2
591	34	poor recovery (<2 ft) and crumbly brick red clay (above 591 block) suggests FAULT	4	0	0	2	0		0	0		2-argil = wh and brick red clay	4				0		
597	34	shatter bx w "stockwork" FeOx micro-fxs; minor Tph bx present	4	0	0	1	0		0	0			3	5			0		
602	34		4	0	0	2	0		0	0			3	5			0	12	2

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3

Collar Azimuth: 53.24

Collar Inclination: -71.44

:

Hole Length: 4368.00

northsouth_decimal: 62679.189

eastwest_decimal: 38119.054

elevation: 10359.47

Print Page 8 of 52

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
602	34	major fxs/minor faults at 599, 600 @ 10-15 tca appear to control shatter bx; also host wh clay vnlt	4	0	0	2	0		0	0			3			(cont), golden yellow accicular min (anhydrite - cannot rule out barite), and possible qtz;	0			12	2	12 = golden yellow anhydrite? - or barite?			EXPACPC14-3-035
607	34	shatter bx cont; possible Tphd dike stringer (0.1 ft) at 606.6;	3	0	0	1	0		0	0			3	3			0				0				EXPACPC14-3-036
616	34	a/a w FeOx stockwork micro-fxs;	4	0	0	1	0		0	0		3-4 K-alt	3	3		FeOx is mostly red (hem)	0				0				EXPACPC14-3-037
620	34	well fractured and shatter bx'd Tphu cont.	3	0	0	1	0		0	0		a/a	4	3			0				0				EXPACPC14-3-038
627	34	rock becoming slightly more competent	3	1	0	1	0		0	0			2	3		trace - 1% vfg dissemin spec	0				0				EXPACPC14-3-039
632	34	shatter bx - mosaic rock (Tphu) w stockwork FeOx microfxs; major fx (6mm FeOx fill) @10tca	4	1	0	1	0		0	0			3	3		locally 2% spec	0				0				EXPACPC14-3-040
636	34	a/a	4	0	0	1	0		0	0			3	3			0				0				EXPACPC14-3-041
642	34	a/a; wh clay chunks and crumbly zone suggest likely FAULT at ~639-640;	4	1	0	2	0		0	0		2-argil = white clay chunks w bx frags in fault zone;	3				0				0				EXPACPC14-3-042
647	34	minor shatter bx/bx and wh clay assoc w FeOx fxs at 25 tca	3	1	0	2	0		0	0		2-argil = wh clay in fxs and in matrix of shatter bx (pods)	3	3			0				0				EXPACPC14-3-043
652	34	rock becoming more competent below 646; l gy and pale red (fx-controlled) Tphu;	3	1	0	2	0		0	0		639-692: zone of increased wh clay fx-fill and matrix of shatter bxs	2	1			0				0				EXPACPC14-3-044
657	34		3	1	0	2	0		0	0			2	2			0				0				EXPACPC14-3-045
662	34	wh clay/FeOx fxs subparallel-20 tca;	3	1	0	2	0	2	0	0			2	3			0				0	locally bleached (w wh clay filled fxs)			EXPACPC14-3-046
667	34		4	1	0	2	0		0	0			2	3			0				0				EXPACPC14-3-047
672	34	mostly shatter bx w possible minor fault at 667.5;	4	1	0	2	0		0	0		3-4 K-alt	3			3-ox = due to stockwork density of FeOx microfxs (not pervasive, still just fx-controlled)	0				0				EXPACPC14-3-048
677	34	fxs at 15 and 30 tca w wh clay in matrix of shatter bx pods; qtz granules-grit (1-3mm) on 45 tca fx	3	1	0	2	0		0	0			2	3		(cont) at 676.4 may be crushed qtz vnlt;	0				0				EXPACPC14-3-049
682	34	mottled l gy, pale red, l brn due to fx-controlled FeOx	3	1	0	2	0		0	0			2	3			0				0				EXPACPC14-3-050
687	34	684, 3-685 2'; l yellowish brn "sandy" band	3	2	0	2	0		0	0			2	2			0				0				EXPACPC14-3-051

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 9 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
687	34	684.3-685.2: l yellowish brn "sandy" band (65 tca to irreg) may be Tphd dike??	3	2	0	2	0		0	0			2	2			0				0				EXPACPC14-3-05
692	34	shatter bx with minor bands/patches true bx; blk min in fxs/cavities (hem+ MnO?)	3	1	0	2	0		0	0			3	3			0				0				EXPACPC14-3-05
697	34	FAULT (10-15 tca) at 692.9 - 696; pyrite present (tr - locally 2%)	4	1	0	1	0		0	0		K-4 alt proximal to fault;	3			py present in hanging wall of fault	2				0				EXPACPC14-3-05
702	34	colorful (Tphu) pale red, l gy, yell-brn, burnt orange w fx-controlled FeOx; well fx'd to shatter bx	4	1	0	1	0		0	0			3	3		(cont) 'd w open cavities/gashes;	0				0				EXPACPC14-3-05
707	34	gen a/a w minor bx band (0.4 ft) at 702; yell-cream "sandy-tuffaceous" bx matrix suggests possible??	4	1	0	0	0		0	0			2			(cont) Tphd dike stringer(?) minor fault just above 707 block;	2				0				EXPACPC14-3-05
712	34	FAULT (15-20 tca, ~1" crumbly brn clay seam) at 708.2 ft;	4	1	0	0	0		0	0		3-4 K-alt	3			locally 3-4% py in unox m gy patches	2				0				EXPACPC14-3-05
717	34	L gy, burnt orange, pale red sparsely porphyritic phonolite (a/a); irreg yell-buff "sandy lense" w m	4	1	0	1	0		0	0		(cont) gashes; 1-argil = minor wh clay	3	2		(cont) minor bx clasts at ~713 - possible Tphd dike stringer?; open micro-fx controlled cavities/gas	1				0				EXPACPC14-3-05
722	34	Gen 5-7% 1x4mm cream phenos w "unsharp" edges (diffuse); gen 3% py in gy unox patches	4	1	0	1	0		0	0		1-argil = minor wh clay in micro-fxs and leached pock-marks;	2	1		locally up to 5% dissemin fg py	3				0				EXPACPC14-3-05
727	34	patches shatter bx w open (FeOx) cavities/gashes	4	1	0	1	0		0	0		3-4 K-alt	3	2		gy with burnt orange FeOx "bleedout" on fxs 35 tca	3				0				EXPACPC14-3-05
732	34	enechelon FeOx fxs at 731.3: possible minor fault w argil selvage;	4	2	0	2	0		0	0			3				0		13	1	13 = possible anhyd in discount vnlt				EXPACPC14-3-06
737	34	enechelon FeOx fxs cont to ~735;	3	2	0	0	0		0	0			3	3			0				0				EXPACPC14-3-06
742	34	shattered in-part w stockwork FeOx micro-fxs	3	2	0	1	0		0	0		1-argil = minor clay in micro-fxs; 3-4 K-alt;	2	2			0				0				EXPACPC14-3-06
747	34	0.2 ft clay-bx seam at 743.6, 30 tca, l brn and wh clay matrix (FAULT);	3	2	0	2	0		0	0			2				0				0				EXPACPC14-3-06
752	34	l gy and red shatter bx (healed mosaic FeOx micro-fxs)	4	2	0	1	0		0	0		3-4 K-alt	2	1			0				0				EXPACPC14-3-06
757	34	a/a mostly brick red and burnt orange	3	2	0	2	0		0	0		2-argil = discount-irreg clay seams/pods	3	2			0				0				EXPACPC14-3-06
762	34	mottled red-burnt orange; "soft" - scratches easily;	2	2	0	2	0		0	0			3	1			0				0				EXPACPC14-3-06
767	34		2	2	0	2	0		0	0			3	2			0				0				EXPACPC14-3-06
772	34	patches shatter bx (red and burnt orange	3	2	0	2	0		0	0			3	1			0				0				EXPACPC14-3-06

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 10 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
772	34	patches shatter bx (red and burnt orange); sparse 2-5 mm l brn clay vnlt w micro-bx	3	2	0	2	0		0	0			3	1			0				0				EXPACPC14-3-088
777	34	major (FeOx) fx at 15 tca at 775;	3	2	0	1	0		0	0			3	2			0				0				EXPACPC14-3-089
782	34	red and burnt orange shatter bx cont.; FeOx fxs at 20 tca; red-brn clay on some fxs;	3	2	0	1	0		0	0			3	2		red rims on burnt orange patches;	0				0				EXPACPC14-3-070
787	34	"crackle bx mosaic" Tphu a/a, mostly orange brown;	3	3	0	2	0		0	0		2-argil = discount clay vnlt (<3mm)	3	2			0				0				EXPACPC14-3-071
792	34	pale red and orange-brn crackle bx a/a (as above); major fx (20 tca) at 790.5;	3	2	0	2	0		0	0			3	2			0				0				EXPACPC14-3-072
797	34	fx-controlled FeOx (red, orange brn) mottling; "soft" (scratches easily) w slight increase clay micr	2	2	0	2	0		0	0			3	2		(cont) microvnlt	0				0				EXPACPC14-3-073
802	34	lengthy FeOx fx at <5 tca, w proximal irreg wh clay vnlt (1-4 mm) and shatter bx (red);	4	2	0	2	0		0	0		shatter bx (along fx) is K-4, otherwise 2-3;	3	3			0				0				EXPACPC14-3-074
807	34	wh clay "gashes" and irreg microvnlt cont;	3	2	0	2	0		0	0			3	2			0				0				EXPACPC14-3-075
812	34	crumbly clayey zone may be minor fault (@~809, 30 tca);	3	2	0	3	0		0	0		3-argil = increase wh clay vnlt proximal to possible fault;	3				0				0				EXPACPC14-3-076
817	34	mostly red and (>) l gy w distinct wh clay "gashes"/pods/discont. microvnlt;	3	2	0	2	0		0	0			4	2			0				0				EXPACPC14-3-077
822	34	FAULT: 819.4 - 822.9, 10-15 tca, w at least 2 subparallel d red brn clay seams w comminuted micro-bx	3	2	0	2	0		0	0		(cont) vnlt;	4			(cont); footwall may be bleached (less FeOx) ; hang wall is shattered w network irreg wh clay microv	0				0				EXPACPC14-3-078
827	34		3	2	0	1	0		0	0			3				0				0				EXPACPC14-3-079
832	34	827-829: odd concentrattion (10%) of possible mafic phenos - or spec replaced feldspar and feldspath	3	2	0	2	0		0	0		2-argil = minor wh clay on fxs;	2	3		(cont) feldspathoids??	0				0				EXPACPC14-3-080
837	34	broken zone w d red brn crumbly clay (833.8 - 834.6) may be fault; shatter bx above and below;	3	1	0	2	0		0	0		2-argil = wispy wh clay micro-vnlt above possible fault;	3				0				0				EXPACPC14-3-081
842	34	burnt orange and red brn Tphu, with darker red bands around subordinate l gy patches	3	2	0	1	0		0	0			3	1			0				0				EXPACPC14-3-082
847	34	healed "horsetail fxs", w minor microbx and open cavities, run subparallel tca;	3	2	0	1	0		0	0			3	2			0				0				EXPACPC14-3-083
852	34	fx-controlled FeOx mottling: red, burnt orange, l gy	3	2	0	1	0		0	0		1-argil = minor pods, gashes, discount microvnlt off wh clay	3	1			0				0				EXPACPC14-3-084
857	34	a/a (as above)	3	2	0	1	0		0	0			3	1			0				0				EXPACPC14-3-085

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 11 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematization	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
857	34	a/a (as above)	3	2	0	1	0		0	0			3	1			0				0				EXPACPC14-3-085
862	34	a/a w increase shatter bx along 20 tca fxs;	3	2	0	1	0		0	0			3	2			0				0				EXPACPC14-3-086
867	34	distinct-looking red/l gy "crackle bx mosaic"; ochre brown powdery clay (and shatter bx bordering on	3	2	0	1	0		0	0			3			(cont) true bx) suggest minor fault at 865.6;	0				0				EXPACPC14-3-087
872	34	a/a w wh clay on fxs 30 tca	3	2	0	2	0		0	0		2-argil = wh clay on fxs and discont vnlts	3	2			0				0				EXPACPC14-3-088
877	34	@ 872.6 color (FeOx) change red to orange brown; shatter bx cont., w minor open cavities/gashes	3	1	0	2	0		0	0			3	1			0				0				EXPACPC14-3-089
882	34	back to bright red at 878;	3	1	0	2	0		0	0			3	1			0				0				EXPACPC14-3-090
887	34	shatter bx w stockwork micro-fxs cont.; FeOx fxs at 15 tca	3	2	0	2	0		0	0			3	3			0				0				EXPACPC14-3-091
892	34	mottled (micro-fx-controlled) red/off wh; lengthy FeOx fx at low < tca;	3	2	0	2	0		0	0			3	3			0				0				EXPACPC14-3-092
897	34	broken zone 895.8 - 897 w increase irreg wh clay vnlts suggests possible fault;	3	3	0	3	0		0	0			3				0				0				EXPACPC14-3-093
902	34	0.1 ft bx seam (40 tca) at 898.6 suggests minor fault; footwall well fx'd to ~904; wh clay is matrix	3	2	0	3	0		0	0			3			(cont) of some shatter bx pods;	0				0				EXPACPC14-3-094
907	34	horsetail wh clay microvnlts (2mm) and fxs subparallel tca;	3	2	0	2	0		0	0			3	3			0				0				EXPACPC14-3-095
912	34	well fx'd w d red brn clay on fxs;	3	2	0	1	0		0	0			3	3			0				0				EXPACPC14-3-096
917	34	mostly shatter bx w minor discont wh clay vnlts;	3	2	0	2	0		0	0			3	2			0				0				EXPACPC14-3-097
922	34	a/a, w distinct "criss-cross" (45 and 40 tca) fabric defined by wh clay micro-vnlts in shatter bx;	3	3	0	3	0		0	0		3-argil = wh clay in "criss-cross" micro-fxs;	3	3			0				0				EXPACPC14-3-098
927	34	at 924.4 start seeing pods (>1 ft) of true bx (monolithic 30?)	3	2	0	2	0		0	0			3	2		Trace py in l gy unox patches	1				0				EXPACPC14-3-099
932	34	"tiger stripes" wh irreg-discont clay micro vnlts to 1.5 cm;	3	2	0	3	0		0	0			3	2			1				0				EXPACPC14-3-100
937	34	bright burnt orange band, 935.9 - 936.8, may represent local ReDox of sorts with less ox below;	3	2	0	2	0		0	0			3	2		(cont) FeOx band coincides roughly w gradational contact to bx (30?) below; (cont) ID phenos in matrix (to make it a Tph-matrix bx) but coded 30; can't	1				0				EXPACPC14-3-101
942	30	935.6 monolithic bx, and subrdn l gy clasts (4mm-4cm, gen <1cm) in m gy	3	1	0	2	0		0	0		(cont) ssible autobx, phreatomagmatic bx, or hyaloclastite (quench	1	1	10		3				0	(cont) lapilli tuff(?) Py gen 2-3%			EXPACPC14-3-102

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 12 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
942	30	(936.8) monolithic bx, ang-submid l gy clasts (4mm-4cm, gen <1cm) in m gy matrix; no positive	3	1	0	2	0		0	0		(cont) ssible autobx, phreatomagmatic bx, or hyaloclastite (quench fragmentation) or even lithic	1	1	10	(cont) id phenos in matrix (to make it a Tph-matrix bx) but coded 30; can't differentiate between ss	3				0	(cont) lapilli tuff(?) Py gen 2-3%			EXPACPC14-3-102
947	30	intimately mixed bx and non-bx; burnt orange and l gy;	3	2	0	2	0		0	0		2-argil = wh discount clay vnlt (1-2 mm) cont.	2	2			2				0				EXPACPC14-3-103
952	30	mostly matrix-support monolithic (Tphu)	3	1	0	1	0		0	0			2	1		(cont) rwise l gy w 2-4% dissem py;	3				0				EXPACPC14-3-104
957	30	a/a wh clay and tr FeOx on fxs;	3	0	0	2	0		0	0			1	2			3			12	1	12 gangue and 1-sulfate = possible anhydrite - or gypsum? - on some fxs			EXPACPC14-3-105
962	34	unable to get good reading on contact (at ~957.4) orientation; Tphu cont. with patchy FeOx; 7-10% cr	3	1	0	1	0		0	0		1-argil = minor discount bluish wh clay vnlt	2	2	10	(cont) cream feld phenos to 5mm;	3			12	1				EXPACPC14-3-106
967	34	burnt orange "selvages" on d red fx-controlled bands;	3	1	0	1	0		0	0			2	1			3				0				EXPACPC14-3-107
972	34	"crackle bx" patches are lim and hem stained; minor open cavities;	3	1	0	1	0		0	0		1-argil = minor clay on fxs	2	2		trace only py	1				0				EXPACPC14-3-108
977	34	a/a w wh clay micro-fxs	3	2	0	2	0		0	0		2-argil = wh clay in "matrix" of shatter bx	2	2			1				0				EXPACPC14-3-109
982	34	pale burnt orange and red Tphu; locally shatter bx'd	4	2	0	1	0		0	0		patchy K-4	2	2			1				0				EXPACPC14-3-110
987	34	0.1 ft bx band (35-40 tca) - w slicks - at 985.8: FAULT	4	1	0	2	0		0	0		a/a; 2-argil = minor wh clay on fxs	2				2				0				EXPACPC14-3-111
992	34		3	1	0	1	0		0	0			2	1		2-3% py	3				0				EXPACPC14-3-112
997	34		3	1	0	1	0		0	0			2	2			3				0				EXPACPC14-3-113
1002	34	colorful: red, burnt orange, l gy, w wh clay "gashes"/discount vnlt	3	2	0	2	0		0	0			3	2			1				0				EXPACPC14-3-114
1007	34		3	2	0	1	0		0	0			3	2			2				0				EXPACPC14-3-115
1012	34	minor shatter bx and open cavities	3	1	0	1	0		0	0			2	1			1				0				EXPACPC14-3-116
1017	34	mostly shatter bx w minor fault at 1012.2 (20 tca, wh clay);	3	1	0	2	0		0	0			3				1				0				EXPACPC14-3-117
1022	34	a/a and well fx'd with enechelon fxs subparallel tca and possible fault zone 1018.7 - 1022; d red cl	3	2	0	2	0		0	0			4			(cont) clay on fxs;	1				0				EXPACPC14-3-118
1027	34	wh clay on fxs (20 tca); odd, very irreg, m gy aphyric lenses (3 cm) at 1026.5;	3	1	0	2	0		0	0			2	3			3				0				EXPACPC14-3-119

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 13 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
1027	34	wh clay on fxs (20 tca); odd, very irreg, m gy aphyric lenses (3 cm) at 1026.5;	3	1	0	2	0		0	0			2	3			3				0				EXPACPC14-3-115
1032	34	major fx w "varved" wh/d gy clay at 1029 (10 tca) and rubble zone (1030-32) w d red clay = minor fau	3	1	0	2	0		0	0			3			(cont) fault?	3				0				EXPACPC14-3-120
1037	34	well fx'd cont w horsetail microfxs at ~20 tca; mostly burnt orange (FeOx)	3	1	0	2	0		0	0			3	3			1				0				EXPACPC14-3-121
1042	34	less FeOx below 45 tca FeOx fx at 1038.4;	3	1	0	1	0		0	0			2	2			3				0				EXPACPC14-3-122
1047	34	still porphyritic but feld phenos finer grained and hard to discern;	3	0	0	2	0		0	0			1	2			3			12	1	12 gangue = mats fibrous yellowish acicular min (anhydrite? celestite?) on fxs w wh clay			EXPACPC14-3-123
1052	34	minor "bleedout" selvages on FeOx fxs (many w just wh clay);	3	0	0	2	0		0	0		2-argil = wh clay on fxs	1	2		3-4% py	3			12	1				EXPACPC14-3-124
1057	34	long fxs subparallel tca w wh clay and anhydrite?	3	0	0	2	0		0	0			1	2			3			12	1				EXPACPC14-3-125
1062	22	~ 1 ft gossanous black and red rubble w botryoidal FeOx below 1057 block; possible fault? nearest	3	0	0	2	0		0	0		2-argil = horsetail microfxs w clay/py	2			(cont) fx at 30 tca; cannot rule out that rock below (fault?) is Tphd dike (sparse phenos);	2			12	0	anhydrite? celestite? (pale yellow fibrous needles)			EXPACPC14-3-126
1067	22	mostly burnt orange and shattered; appears aphyric, may be Tphd dike? Minor fault (30 tca, clay w sl	3	0	0	2	0		0	0			3			(cont) slicks) at 1065.0	2				0				EXPACPC14-3-127
1072	34	possible contact at 1067.0, at 20 tca; minor open cavities and bx w wh clay matrix; shatter bx and F	3	0	0	2	0		0	0		2-argil = wh clay "gashes"/streaks	2	1		(cont) FeOx to ~1069; 2-3 % py;	3				0				EXPACPC14-3-128
1077	34	still not distinctly porphyritic/feld phyric, but grainier than possible dike above;	3	0	0	2	0		0	0		a/a + wh clay on fxs	0	2			3				0				EXPACPC14-3-129
1082	34	well fx'd and bleached off wh w 3-5% disseminated py;	2	0	0	3	0	3	0	0		3-argil = wh clay on most fxs;	0	3		3-5% py	4				0				EXPACPC14-3-130
1087	34	bleached clay coated rubble; slicks present: likely fault	2	0	0	3	0	3	0	0			0				4			12	1	a/a			EXPACPC14-3-131
1092	34	well fx'd cont. w true bx 1087.5 - 1090; clast supported w wh clay matrix; FeOx in footwall;	2	0	0	3	0	2	0	0		3-argil = wh clay matrix in bx	2			~3% py	3				0				EXPACPC14-3-132
1097	34	well fx'd, w bx pods cont.; mostly shades of red (porphyritic!, Tphu); fxs at 20 tca	2	2	0	2	0	0	0	0			3	3			0				0				EXPACPC14-3-133
1102	34	bx seams cont.; well oxidized;	3	2	0	2	0		0	0		gy patches K-3	3	3			1				0				EXPACPC14-3-134
1107	34	Tphd dike at 1105.4, 20-25 tca; Note: not breaking anything < 5ft out, as per logging protocol for "	2	2	0	2	0		0	0			3	3		(cont) environmental permitting/hydrogeology drill hole" (sampling)	0				0				EXPACPC14-3-135
1112	22	at 1109.6 bx and red clay seam (0.3 ft, 20 tca) and FAULT;	2	1	0	2	0		0	0		2-argil = wh clay on some fxs	3				0				0				EXPACPC14-3-136

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 14 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
1112	22	at 1109.6 bx and red clay seam (0.3 ft, 20 tca) and FAULT;	2	1	0	2	0		0	0		2-argil = wh clay on some fxs	3				0				0				EXPACPC14-3-136
1117	22	Tphd dike cont., l brn, with subsidiary Fault at 1115 ft, 30 tca: shatter bx w open cavities;	2	1	0	1	0		0	0			3				0				0				EXPACPC14-3-137
1122	21	Tphd contact at 1117.?? (not sure); then back into Tphu w unusual d gy lenses as per 1026.5 (could p	3	0	0	2	0		0	0		2-argil = minor wh clay vnlt (discont)	0	1		(cont) pass for xtl tuff w "hiatus" mudstone lenses; 3-4% py;	3				0	15 min = cg granular py on fx (w anhyd? celestite?) at 1118.4, 20 tca			EXPACPC14-3-138
1127	21	odd/irreg d gy lenses cont., and "mudchip"-like fragments (see above);	3	0	0	2	0		0	0			1	1		Tr FeOx (w wh clay) on fxs; streaky bands py present (20 tca);	3				0				EXPACPC14-3-139
1132	21	sparse phenos, but not Tphd; minor fault at 1129.2 (25 tca wh clay slicks nearly perpend tca)	3	0	0	2	0		0	0			1				3				0	62 = trace sphalerite or galena? too fine grained to get good id;			EXPACPC14-3-140
1137	21	l gy - cream off wh vfg "porphyritic" rock - speckled w py clusters after fg (1-2mm) phenos - could	3	0	0	2	0		0	0			1	1		(cont) pass for xtl tuff or mafic phonolite(??) w py after mafics?	3				0				EXPACPC14-3-141
1142	21	21? fg 36 (Tphm) w py after 1-2mm mafic phenos? I do not know what this rock is - other than phonoli	3	0	0	2	0		0	0			1	2			3				0				EXPACPC14-3-142
1147	21	l gy gen aphanitic w sparse (2%) fg phenos (<2mm) and locally up to 5% py, possibly after fg mafic p	3	0	0	2	0		0	0			0	1		(cont) phenos; wh clay and py on fxs;	4				0				EXPACPC14-3-143
1152	21	fg mafic phono? (altered and pyritic) See comments 1247-1252;	3	0	0	2	0		0	0			0	2		3-5% py - after mafics??	4				0				EXPACPC14-3-144
1157	21	21? vfg 36? blotchy mgy/darker gy/ greenish d gy; 32? 36? see comments 1247-52;	3	0	0	2	0		2	0		propylitically alt'd (mafic?) phonolite; wh clay and py on fxs cont.	0	3		5% py	4				0				EXPACPC14-3-145
1162	21	FAULT 1159.7 - 1164 at low < tca w oblique (40 tca) greasy clay slicks	3	0	0	3	0		2	0		3-argil = clayey (wh) broken zone along fault;	0				3				0				EXPACPC14-3-146
1167	21	at 1164.6 becomes l brn w FeOx banding; skeletal phenos 1-2 mm;	2	1	0	2	0		0	0			3				3				0				EXPACPC14-3-147
1172	21	21? shattered and crumbly (at 1166.8) w FAULT possibly at 1171 (rubble to 1171.5)	3	1	0	1	0		0	0			3				0				0				EXPACPC14-3-148
1177	21	shatter bx to approx 1174 w l brn FeOx to 1175.3 (minor fault at 30 tca w slicks 45-50 tca)	2	0	0	1	0		0	0			3				2				0				EXPACPC14-3-149
1182	21	FAULT ZONE: 1159.7 - 1175.3; 21, Tph is l-m gy finely speckled phyric rock with ~1mm phenos;	2	0	0	2	0		0	0		2-argil = weak clay (+ py) on fxs;	1	1		py/l gy clay microvnlt (1-2mm) present;	3				0				EXPACPC14-3-150
1187	21	1183-1185: patch l brn FeOx w minor shatter bx; speckled vfg phyric phonolite	3	0	0	1	0		0	0			2	3		2-3% py	3				0				EXPACPC14-3-151
1192	21	fault at 1187.7 (20 tca w clay wh and m gy slicks 60 tca);	3	0	0	1	0		0	0		1-argil = greasy wh and m gy clay on fault plane;	0			3-4% py w locally up to 5%;	3				0				EXPACPC14-3-152
1197	21		3	0	0	1	0		0	0			0	2			3				0				EXPACPC14-3-153

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
--------------------	-----------------------	----------------------------	---	----------------------

northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 15 of 52
-------------------------------	-----------------------------	---------------------	---------------------

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
1197	21		3	0	0	1	0		0	0			0	2			3				0				EXPACPC14-3-153
1202	21	m gy, rock borders on being fg phaneritic w sparse wh flecks (1x2mm) that are "ghosted" feld phenos;	2	0	0	1	0		0	0		1-argil = gen clayey nature of rock (scratches easily) and irreg m gy clay lenses/vnlts	0	1			3				0				EXPACPC14-3-154
1207	21		2	0	0	2	0		0	0		2-argil = a/a	0	1			3				0				EXPACPC14-3-155
1212	21	minor fault at 1207.2 (10 tca, w clay slicks 65 tca);	2	0	0	2	0		0	0			0				3				0				EXPACPC14-3-156
1217	21	minor fault at 1212.4 (clay, 10-15 tca)	2	1	0	2	0		0	0			0				3				0				EXPACPC14-3-157
1222	21	crushed comminuted clayey micro-bx lenses (up to 0.2 ft, 60 tca) present	2	0	0	2	0		0	0			0				3				0				EXPACPC14-3-158
1227	21	mostly l brn FeOx stained "shatter bx"; horsetail fxs at 15 tca	2	1	0	2	0		0	0			2	2			2				0				EXPACPC14-3-159
1232	21	minor fault (10 tca) at 1228.6, clay with slicks (80 tca);	2	0	0	2	0		0	0			1				3				0				EXPACPC14-3-160
1237	21	minor faults at low < tca cont; clayey (w slicks) w weak FeOx	2	0	0	2	0		0	0			1				3				0				EXPACPC14-3-161
1242	21		2	0	0	2	0		0	0			0	2			3				0				EXPACPC14-3-162
1247	21	wh clay coated frax at 20 tca	2	0	0	2	0		0	0			1	2			3				0				EXPACPC14-3-163
1252	36	36 used to denote possible protolith (biotite phonolite): small m-d gy relict patch (at 1252) unalt'd	3	0	0	1	0		1	0			0	2		phonolite w biotite suggests 21 is altered 32 or 36 (mafic and/or biotite phonolite);	3				0				EXPACPC14-3-164
1257	21	(block at 1253.5 - but sampled every 5 ft for water hole enviro purposes)	3	0	0	1	0		0	0			0	2		4 py = 3mm py vnlts and py on fxs (3-5%)	4				0				EXPACPC14-3-165
1262	21	minor fault (25 tca w clay slicks 65 tca) at 1260.6 w increase py in microfxs;	2	0	0	2	0		0	0			0				4				0				EXPACPC14-3-166
1267	21	coarsely granular py in 0.1 ft vn at 1265.8, ~20 tca;	3	0	0	1	0		0	0			0	3			4				0				EXPACPC14-3-167
1272	2	d gy patches host biotite (relict patches of unalt'd protolith? see above); can't rule out biotite l	2	0	0	2	0		2	0		(cont) to be increase py on selvages of possible lamp dike;	0	3		(cont) biotite lamprophyre dike (1266.8-1270.2) - weakly magnetic, n/calc; broken rock, but appears	3				0				EXPACPC14-3-168
1277	21	(note that this hole is being logged for enviro purposes (5 ft samples) without breaking out lith) b	3	0	0	1	0		0	0			0			(cont) broken zone with coarse gran py vns (10 tca) and fx coatings	4				0				EXPACPC14-3-169
1282	31	(rubble cont to ~1281, rock below ~1278 (rubble) increasingly feld-phyric - could pass for Tabbk;	3	0	0	1	0		0	0		1-argil = weak wh clay on fxs	0			likely fault between 1277-78;	4				0	strong py to 1278;			EXPACPC14-3-170

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3		Collar Azimuth: 53.24		Collar Inclination: -71.44		:	Hole Length: 4368.00	
northsouth_decimal: 62679.189		eastwest_decimal: 38119.054		elevation: 10359.47			Print Page 16 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	spessartine	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
1282	31	rubble cont to ~1281; rock below ~1278 (rubble) increasingly feld-phyrlic - could	3	0	0	1	0		0	0		1-argil = weak wh clay on fxs	0			likely fault between 1277-78;	4				0	strong py to 1278;			EXPACPC14-3-170
1287	31	Can't rule out 38: seriate porphyritic phonolite;	3	0	0	1	0		0	0			0	2			3				0				EXPACPC14-3-171
1292	31		3	0	0	1	0		0	0			0	2			3				0				EXPACPC14-3-172
1297	31		3	0	0	1	0		0	0			0	2			3				0				EXPACPC14-3-173
1302	31	broken	3	0	0	1	0		0	0			0	3			3				0				EXPACPC14-3-174
1307	31	a/a	3	0	0	1	0		0	0			0	3			3				0				EXPACPC14-3-175
1312	31	below ~1309.4 rock becomes aphyric - with no real contact; slicks in rubble suggest possible fault ~	3	1	0	1	0		0	0			0			(cont) ~1308 ft.	4				0				EXPACPC14-3-176
1317	31	31 = patches still porphyritic (mixed aphyric/porphyritic)	3	0	0	1	0		0	0			0	2		4-5% py	4				0				EXPACPC14-3-177
1322	31		3	0	0	1	0		0	0		1-argil = weak clay on fxs cont.	0	2			4				0				EXPACPC14-3-178
1327	31	mostly broken	3	0	0	1	0		0	0			0	3			4				0				EXPACPC14-3-179
1332	31	(block at 1331) mostly broken to end of table, 1403 ft.	4	0	0	1	0		0	0		3-4 K-alt	0	3			4				0				EXPACPC14-3-180
1337	31		3	0	0	1	0		0	0			0	3		3-4% py	3				0				EXPACPC14-3-181
1342	31	1340-1344: crumbly	3	0	0	2	0		0	0		2-argil = crumbly w weak clay on fxs	0	3			3				0				EXPACPC14-3-182
1347	31		3	0	0	2	0		0	0			0	3			3				0				EXPACPC14-3-183
1352	31		3	0	0	2	0		0	0			0	3			3				0				EXPACPC14-3-184
1357	31		3	0	0	2	0		1	0			0	3			3				0				EXPACPC14-3-185
1362	A A A A A	at approx (broken) 1358.6 - 1359.8 pos	0	0	0	1	0		3	0			0	3		(cont) phaneritic, mafics gone to py? n/mag, n/calc;	4				0				EXPACPC14-3-186
1367	21	m gy vlg phaneritic to "micro-porphyritic" rock (feld 1 - < 2mm); can't rule out alt'd mafic phono	3	0	0	1	0		0	0		py after mafics = propyl alt'd??	0	3			3				0				EXPACPC14-3-187

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 17 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	spessartine	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
1367	21	m gy vfg phaneritic to "micro-porphyritic"	3	0	0	1	0		0	0		py after mafics = propyl alt'd??	0	3			3				0				EXPACPC14-3-18
1372	21	technically not aphanitic(21) - but not porphyritic either; fg Tphk?	3	0	0	1	0		0	0			0	3		3-5% py (after mafics?)	4				0				EXPACPC14-3-18
1377	21	broken cont.	3	0	0	1	0		0	0			0	3			3				0				EXPACPC14-3-18
1382	31	not clear where contact is, but some pieces distinctly feld-phyric (porphyritic, Tphk)	3	0	0	1	0		0	0			0	3			3				0				EXPACPC14-3-19
1387	31	Tphk	3	0	0	1	0		0	0			0	3			3				0				EXPACPC14-3-19
1392	31		3	0	0	1	0		0	0			0	3			3				0				EXPACPC14-3-19
1397	31		3	0	0	1	0		0	0			0	3			3				0				EXPACPC14-3-19
1402	31		4	0	0	0	0		0	0		patchy k-4	0	3			3				0				EXPACPC14-3-19
1407	31	broken Tphk cont.; only one RQD point load reading for entire table (1403-1596);	3	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-19
1412	38	no real contact, porphyritic texture is just more distinct w "ragged"-irreg shaped phenos (seriate)	4	0	0	0	0		0	0		a/a	0	3			3				0				EXPACPC14-3-19
1417	38	seriate porphyritic phonolite w zones that can pass for Tphk	3	0	0	0	0		0	0			0	3		4-py = locally up to 5% (micro-fxs)	4				0				EXPACPC14-3-19
1422	30	30 used for monolithic clast and matrix supported Tph bx; l gy ang frags w m gy aphanitic to vfg pha	4	0	0	0	0		0	0		3-4 k-alt	0	3		(cont) phaneritic matrix; possible hyaloclastite or auto bx?	3				0				EXPACPC14-3-19
1427	34	can't really get a good look at this rubble: defaulted to 34 (undiff porph Tph)	3	0	0	0	0		0	0			1	3		trace only FeOx	3				0				EXPACPC14-3-19
1432	34	minor bx (30) present)	4	0	0	0	0		0	0		a/a	1	3			3				0				EXPACPC14-3-20
1437	30	bx cont; m-d gy matrix material is aphanitic w snowflake-like (devit?) vfg flecks; can't rule out tu	4	0	0	0	0		0	0			1	3		(cont) tuff bx;	3				0				EXPACPC14-3-20
1442	30		3	0	0	0	0		0	0			1	3			3				0				EXPACPC14-3-20
1447	30	monolithic Tph bx still present, but not sure how much;	4	0	0	0	0		0	0			1	3			3				0				EXPACPC14-3-20
1452	30	~ 1449-50: mostly d gy aphanitic matrix material w sparse porphyritic clasts; locally "bx" is just a	4	0	0	0	0		0	0			0	3		(cont) shatter bx w vnlt-s-seams d gy aphanitic (matrix) material;	3				0				EXPACPC14-3-20

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 18 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	spessartine	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematization	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
1452	30	~ 1449-50: mostly d qv aphanitic matrix n	4	0	0	0	0		0	0			0	3		(cont) shatter bx w vnltls-seams d qv apha	3				0				EXPACPC14-3-204
1457	30		3	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-205
1462	30	bx to about 1460, then Tphs (seriate porphyritic phonolite) dike;	4	0	0	0	0		0	0		3-4 k-alt	2	3		2-ox = weak FeOx at Tphs dike contact (1460-61);	3				0				EXPACPC14-3-206
1467	38	Tphs is m gy	4	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-207
1472	34	minor bx (30 as above) present (below ~1470 ft.)	4	0	0	0	0		0	0			1	3			3				0				EXPACPC14-3-208
1477	30		4	0	0	0	0		0	0			1	3		locally up to 5% py (gen 3-4%);	4				0				EXPACPC14-3-209
1482	30	rock below ~1478 rock is mostly d gy vfg matrix material, w sparse fg bx clasts (<1 cm - like a lith	4	0	0	0	0		0	0			0	3		(cont) lithic lapilli tuff);	3				0				EXPACPC14-3-210
1487	30	possible (minor) heterolithic clasts - could pass for CC Bx	4	0	0	0	0		0	0			1	3			3				0				EXPACPC14-3-211
1492	30	monolithic (Tph) bx cont.	3	0	0	0	0		0	0		strong k-3 alt	0	3			3				0				EXPACPC14-3-212
1497	30	volc bx to ~ 1494.5, then Tphs dike (core is strongly fractured and rubble-like)	3	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-213
1502	38	possible minor fault at 1501, w trace jarosite? and gn or sp?	4	0	0	0	0		0	0			1				3				0	59 min = d gy (vfg) sulfide: gn? sp?			EXPACPC14-3-214
1507	30	Tphs dike to ~ 1504, then back into monolithic (Tph) clast-supported bx;	4	0	0	0	0		0	0		3-4 k-alt	0	3			3				0				EXPACPC14-3-215
1512	30		4	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-216
1517	38	Tphs dike at ~1511	4	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-217
1522	38		4	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-218
1533	38	1522-1533: lost core, actually <3 ft core to sample (see RQD and photos)	3	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-219
1538	38		4	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-220

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3		Collar Azimuth: 53.24		Collar Inclination: -71.44		:	Hole Length: 4368.00	
northsouth_decimal: 62679.189		eastwest_decimal: 38119.054		elevation: 10359.47			Print Page 19 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	spessartine	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematization	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
1538	38		4	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-220
1543	38		4	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-221
1548	38		4	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-222
1553	38		4	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-223
1558	30	Tphs dike to approx (rubble) 1555, then into clast-supported Tph bx;	3	0	0	0	0		0	0			0	5			3				0				EXPACPC14-3-224
1563	30		4	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-225
1568	30	l gy porphyritic (Tph) clasts in m gy vfg matrix cont.	4	0	0	0	0		0	0			0	3		3-4% py	3				0				EXPACPC14-3-226
1573	41	logged as "ash breccia"(41) just to emphasize that rock is mostly m gy fg matrix material (as above)	4	0	0	0	0		0	0			0	3		(cont) w fg clasts; subtle layering suggests possible crystal-lithic lapilli tuff;	3				0				EXPACPC14-3-227
1578	42	bx, gen matrix-support; crude layering and (minor) heterolithic clasts suggest CC Bx - but similar t	3	0	0	0	0		0	0			0	3		(cont) to above Tph bx; still, curvilinear clast margins suggest hyaloclastite (quench fragmentation	3				0				EXPACPC14-3-228
1583	42		3	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-229
1588	42	42 or 30? clasts mostly porphyritic phonolite;	4	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-230
1593	42	a/a	4	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-231
1598	34	last positive id Bx at 1592, then porphyritic phonolite (vuggy in part w increase py)	4	0	0	0	0		0	0			0	5		4 py = locally 5%	4				0				EXPACPC14-3-232
1603	34	Highly fx'd to rubbly nature of core hampers quality lith logging; SEE RQD and PHOTOS	4	0	0	0	0		0	0			0	5		3-5% py	4				0				EXPACPC14-3-233
1608	34	34 = fg porphyritic, but not distinctly so (fg feld-phyric porph text not prominent)	4	0	0	0	0		0	0			0	5			4				0				EXPACPC14-3-234
1613	31	patches could pass for Tphk (7-10% 2-3 mm cream feld)	4	0	0	0	0		0	0		3-4 k-alt	0	5			4				0				EXPACPC14-3-235
1618	34		4	0	0	0	0		0	0			0	5			4				0				EXPACPC14-3-236
1623	34	possible biotite (w py), but no positive id;	4	0	0	0	2		0	0			0	5			4				0				EXPACPC14-3-237

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 20 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematization	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
1623	34	possible biotite (w py), but no positive id;	4	0	0	0	2		0	0			0	3			4				0				EXPACPC14-3-23
1628	31	clay slicks suggest minor fault; Tphk w possible biotite(?)	4	0	0	0	2		0	0			0			3-4% py	3				0				EXPACPC14-3-238
1633	31		4	0	0	0	2		0	0	12%		0	3			3				0	2 biotite = can't rule out that biotite? isn't a product of alteration			EXPACPC14-3-239
1638	31	biotite? can't rule out Tphb (32)	4	0	0	0	2		0	0			0	3			3				0				EXPACPC14-3-240
1643	32	logged as 32 to bring attention to possible biotite; granulated shatter bx immed below 1639 block su	3	0	0	0	2		0	0	12%		0				3				0	a/a			EXPACPC14-3-241
1648	31		3	0	0	0	2		0	0			0	3			3				0				EXPACPC14-3-242
1653	34	probably Tphk, but good lith hard to observe in fragments (core is strongly broken, see RQD)	4	0	0	0	1		0	0			0	3			3				0				EXPACPC14-3-243
1658	34		4	0	0	0	1		0	0			0	3			3				0				EXPACPC14-3-244
1663	34		4	0	0	0	1		0	0			0	3		gen a/a w locally up to 5% py	4				0				EXPACPC14-3-245
1668	34	Tphk? Tphb?	3	0	0	0	1		0	0		py after biotite?	0	3			3				0				EXPACPC14-3-246
1673	34		4	0	0	0	1		0	0			0	3			3				0				EXPACPC14-3-247
1678	34		4	0	0	0	1		0	0			0	3			4				0				EXPACPC14-3-248
1683	34	friable crush-bx immed below 1682 block suggests likely fault in vicinity; (MAJOR FAULT? - see below	4	0	0	0	0		0	0		3 and 4 k-alt	0				3				0				EXPACPC14-3-249
1688	34	vuggy, crumbly footwall of fault;	3	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-250
1693	34	clast-supported shatter bx present immed below 1692 block (fault zone cont.)	3	0	0	0	0		0	0			0	3			4				0				EXPACPC14-3-251
1698	34	friable rubble	3	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-252
1703	34	crush bx present; trace Qtz microvnlts (2-3mm)	4	0	0	0	0		0	0			0	3			4				0	trace l gy Qtz (2-3mm vnl)			EXPACPC14-3-253
1708	34	friable shatter bx'd phonolite cont.	4	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-254

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3		Collar Azimuth: 53.24		Collar Inclination: -71.44		:	Hole Length: 4368.00	
northsouth_decimal: 62679.189		eastwest_decimal: 38119.054		elevation: 10359.47			Print Page 21 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	Speckling	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
1708	34	friable shatter bx'd phonolite cont.	4	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-25
1713	30	30 = minor clast-support bx present: can't tell if tectonic or Tph intrusive/autobx	4	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-25
1718	31	looks like typical Tphk here - not friable! and only mod fx'd;	4	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-25
1723	31	back into highly fx'd rock; py microvnlts (1 mm) present w unident d gy min and possible moly	4	1	0	0	0		0	0			0	3		spec?	3				0	59 min = unident d gy min: sp? spec? gn? + possible moly			EXPACPC14-3-25
1728	31		4	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-25
1733	34	~1727.5 - 1728.7: clast-support bx (mono Tphk) then rock that is likely still Tphk, but less promine	4	0	0	0	0		0	0			0	3		(cont) prominently feld-phyric (porphyritic);	4				0				EXPACPC14-3-25
1738	34		4	1	0	0	0		0	0			0	3			4				0				EXPACPC14-3-26
1743	38	Tphs dike at ~1736, 7-10% cream ragged anhedral-subhedral feld phenos to 9 mm, some glomerophyric, i	5	0	0	0	0		0	0			0	3		(cont) in m gy aphanitic matrix; strong k-5 alt; super-fine dissemin py (3-5%)	4				0				EXPACPC14-3-26
1748	38	Tphs dike includes slivers of country rock (Tphu)	5	0	0	0	0		0	0			0	3			4				0				EXPACPC14-3-26
1753	38	Tphs dike cont to approx (broken) 1754;	5	0	0	0	0		0	0			1	3		trace FeOx may be post-drilling(?)	4				0				EXPACPC14-3-26
1758	31	Tphk?	5	0	0	0	0		0	0			0	3			4				0				EXPACPC14-3-26
1763	31	Tphk +/- biotite(? alt'd)	5	0	0	2	2		0	0		2-argil = minor white clay on fxs	0	3			3				0				EXPACPC14-3-26
1768	31		5	0	0	2	2		0	0		k-5 cont. (unusual width)	0	3		3-5% py	4				0				EXPACPC14-3-26
1773	31		5	0	0	2	1		0	0	11		0	3			4				0	1-biotite = appears fx-controlled and therefore a product of alt?			EXPACPC14-3-26
1778	31	Tphk +/- biotite?	5	0	0	2	2		0	0		4-5 k-alt; wh clay on fxs cont.	0	3			3				0	5 qtz = trace hairline qtz microvnlts			EXPACPC14-3-26
1783	34	34 (Tphu) = feld-phyric (porphyritic) texture not as prominent as above;	4	0	0	2	1		0	0			0	3			4				0				EXPACPC14-3-26
1788	36	logged as Tphm (mafic porphyritic) to bring attention to minor patches that are speckled w ragged bi	4	0	0	0	1		0	0			0	3		(cont) biotite? hbld? Tphb unalt'd protolith?	3				0				EXPACPC14-3-27
1793	34	severely broken core (see ROD, photos); What is AK Drilling doing to this rock?? Bad equip? Bad tech	4	0	0	0	0		0	0			0	3		(cont) nique? Helper beating the heck out of core tube??	3				0				EXPACPC14-3-27

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3		Collar Azimuth: 53.24		Collar Inclination: -71.44		:	Hole Length: 4368.00	
northsouth_decimal: 62679.189		eastwest_decimal: 38119.054		elevation: 10359.47			Print Page 22 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericite	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
1793	34	severely broken core (see RCU) - no loss	4	0	0	0	0		0	0			0	5		round biotite? Flaked peeling the back on	4				0				EXPACPC14-3-272
1798	31	looks like Tphk w minor darker gy patches that host ragged biotite (no positive id)	4	0	0	0	1		0	0		1 sericite = sericite after biotite??	0	5		gen 3-4% py, and locally up to 5%;	4				0				EXPACPC14-3-273
1803	34	34 (Tphu, undiff) probably = Tphk, but not distinctly/prominently feld-phyric porphyritic;	4	0	0	1	0		0	0		1-argil = minor wh clay on fxs	0	5			4				0				EXPACPC14-3-274
1808	34		4	0	0	1	0		0	0		a/a	0	5			4				0				EXPACPC14-3-275
1813	34		4	0	0	0	0		0	0			0	5			3				0				EXPACPC14-3-276
1818	31	ENTIRE TABLE is HIGHLY FX'D / BROKEN ROCK (poor drill technique??)	4	0	0	0	0		0	0			0	5			4				0				EXPACPC14-3-277
1823	34		4	0	0	0	0		0	0			0	5			4				0				EXPACPC14-3-278
1828	34		4	0	0	0	0		0	0			0	5			4				0				EXPACPC14-3-279
1833	34	orange brn (in photos) is drill fluid gunk;	4	0	0	0	0		0	0			0	5			3				0				EXPACPC14-3-280
1838	34	crumbly rock above 1835 block suggest possible fault;	4	0	0	0	0		0	0			0				4				0				EXPACPC14-3-281
1843	38	Tphs dike approx (broken rubble) 1839.3 - 1842;	5	0	0	0	0		0	0			0	5		increase py in dike selvages (in Tphu)	3				0				EXPACPC14-3-282
1848	34	crumbly rubble @ ~1846 suggest possible fault; comminuted grit may include qtz??	4	0	0	0	0		0	0			0				4		11		0	possible? comminuted qtz vnlit grit in fault?			EXPACPC14-3-283
1853	38	another seriate porphyritic phono dike at ~1848 - 1851;	5	0	0	0	0		0	0			0	3			3				0				EXPACPC14-3-284
1858	38	possible fault (crumbly rubble) at 1855, and more Tphs dike material ~1856 - 1857.2;	5	0	0	0	0		0	0			0				4				0				EXPACPC14-3-285
1863	34	undiff Tph includes minor Tphs dike stringers	4	0	0	0	0		0	0			0	5			3				0				EXPACPC14-3-286
1868	31	looks like mostly Tphk w well developed feld-phyric fg porph texture;	4	0	0	0	0		0	0			0	5			4				0				EXPACPC14-3-287
1873	31		4	0	0	0	0		0	0			0	5			3		11		0	11 qtz = possible qtz (hairline) in py microvnlts;			EXPACPC14-3-288
1878	31		4	0	0	0	0		0	0			0	5			4				0				EXPACPC14-3-289

Cripple Creek-Victor Gold Mining Company																										
Hole Name: CPC14-3				Collar Azimuth: 53.24					Collar Inclination: -71.44								Hole Length: 4368.00									
northsouth_decimal: 62679.189				eastwest_decimal: 38119.054					elevation: 10359.47										Print Page 23 of 52							
HOLE_ASSAY_SAMPLE																										
depth_to	RockType	Lithology_Comment	potassic	speculante	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER	
1878	31		4	0	0	0	0		0	0			0	5			4				0				EXPACPC14-3-285	
1883	34	many core frags that aren't rubble host open microfxs (w py and tr fluorite)	4	0	0	0	0		0	0			0	5			4			41	0	41 Gangue = dissem fluorite assoc w open microfxs			EXPACPC14-3-286	
1888	34		4	1	0	0	0		0	0			0	5		1 spec = unident vfg d gy min, could be base metal?	4				0	looked for fluorite			EXPACPC14-3-290	
1893	31		4	0	0	0	0		0	0			0	5			4				0				EXPACPC14-3-291	
1898	34		4	0	0	0	0		0	0			0	5			4				0				EXPACPC14-3-292	
1903	31		4	0	0	0	0		0	0			0	5			4				0				EXPACPC14-3-293	
1908	31		4	0	0	0	0		0	0			0	5		3-5%py	4				0				EXPACPC14-3-294	
1913	31		4	0	0	0	0		0	0			0	5			4				0				EXPACPC14-3-295	
1918	31		4	0	0	0	0		0	0			0	5			4				0				EXPACPC14-3-296	
1923	31		4	0	0	0	0		0	0			0	5			4				0				EXPACPC14-3-297	
1928	31	increase py to 4-7% w tr possible moly (bluish gy min)	4	0	0	0	0		0	0			0	5			4				0	61 min = moly? (trace)			EXPACPC14-3-298	
1933	34		4	0	0	0	0		0	0			0	5			4				0				EXPACPC14-3-299	
1938	34		4	0	0	0	0		0	0			0	5			4				0				EXPACPC14-3-300	
1943	34		4	0	0	1	0		0	0			0				4				0				EXPACPC14-3-301	
1948	34		3	0	0	0	0		0	0		K-3 alt (change)	0	5			4				0				EXPACPC14-3-302	
1953	34		4	0	0	0	0		0	0		3-4 K-alt	0	5			4				0				EXPACPC14-3-303	
1958	34		4	0	0	0	0		0	0			0	5			4				0				EXPACPC14-3-304	
1963	34		4	0	0	0	0		0	0			0	5		4-5% py	4				0				EXPACPC14-3-305	
1968	34	6% (Tobin) is probably Tobin	4	0	0	0	0		0	0			0	5			4				0				EXPACPC14-3-306	
Scale 1:180										April 15, 2015										01:22 PM						

Cripple Creek-Victor Gold Mining Company																										
Hole Name: CPC14-3				Collar Azimuth: 53.24				Collar Inclination: -71.44				:				Hole Length: 4368.00										
northsouth_decimal: 62679.189				eastwest_decimal: 38119.054				elevation: 10359.47												Print Page 24 of 52						
HOLE_ASSAY_SAMPLE																										
depth_to	RockType	Lithology_Comment	potassic	specularite	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematization	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER	
1968	34	34 (Tphu) is probably Tphk	4	0	0	0	0		0	0			0	3			4				0				EXPACPC14-3-308	
1973	31	at ~ 1962 nature of "rubble" changes, bcmg more like fx'd core (core pieces) than unconsol rubble;	3	0	0	0	0		0	0		3 and 4 K-alt	0	3			4				0				EXPACPC14-3-309	
1978	31		4	0	0	0	0		0	0			0	3			4				0				EXPACPC14-3-308	
1983	31		4	0	0	0	0		0	0			0	3			4				0				EXPACPC14-3-308	
1988	31	at ~1886 changes back into rubble, with RC-like cuttings (< 2cm) below 1995 ft.	4	0	0	0	0		0	0			0	3			4				0				EXPACPC14-3-310	
1993	31		4	0	0	0	0		0	0			0	3			4				0	62-min = possible sp: 1-2 mm d gy metallic granules (trace) could be blackjack sphalerite?			EXPACPC14-3-311	
1998	31	mostly chip-size rubble; possible heavy trace blackjack sphalerite(?; see above 62-min)	3	0	0	0	0		0	0		3 and 4 K-alt;	0	3			4				0				EXPACPC14-3-312	
2003	31		4	1	0	0	0		0	0			0	3		3-5% py; cannot rule out that vfg d gy min is specularite (and not blackjack sp - see above min)	4				0				EXPACPC14-3-313	
2008	31		4	0	0	0	0		0	0			0	3			4				0				EXPACPC14-3-314	
2013	31		4	1	0	0	0		0	0			0	3		spec? (vfg d gy min)	4				0				EXPACPC14-3-315	
2018	31		4	0	0	0	0		0	0			0	3			4				0				EXPACPC14-3-316	
2023	31		4	0	0	0	0		0	0			0	3			4				0				EXPACPC14-3-317	
2028	34	34 = a/a (Tphk-like), but not as prominently feld-phyric/porphyritic; rubble, see RQD;	4	0	0	0	0		0	0		3-4 k-alt;	0	3			4				0				EXPACPC14-3-318	
2033	36	logged as 36 (Tphm) to bring attention to py laths - py after hblnd?? ie mafic phonolite protolith?	4	0	0	0	0		0	0			0	3			4				0				EXPACPC14-3-319	
2038	36	Tphh?	4	0	0	0	0		0	0			0	3			4				0				EXPACPC14-3-320	
2043	34		4	0	0	0	0		0	0			0	3		4-7% py	4				0				EXPACPC14-3-321	
2048	36	phonolite bcmg slightly darker gy with increase py in dark patches (py after biotite??)	4	0	0	0	2		0	0	12	2 sericite? Can sericite form after biotite?	0	3			4				0	can't tell if biotite (? no positive id, just dark ragged patches assoc w py) is secondary or primar			EXPACPC14-3-322	
2053	36		4	0	0	0	1		0	0	12		0	3			4				0				EXPACPC14-3-323	
Scale 1:180										April 15, 2015										01:22 PM						

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
--------------------	-----------------------	----------------------------	---	----------------------

northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 25 of 52
-------------------------------	-----------------------------	---------------------	---------------------

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitic	illitic	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
2053	36		4	0	0	0	1		0	0	11		0	5			4				0				EXPACPC14-3-325
2058	31	looks like typical l gy feld-phyric Tphk here, less alter'd than above??	4	0	0	0	0		0	0			0	5			3				0				EXPACPC14-3-326
2063	31		4	0	0	0	0		0	0			0	5			3				0				EXPACPC14-3-327
2068	31		4	0	0	0	0		0	0			0	5			3				0				EXPACPC14-3-328
2073	36	phono w dark splotches w intimately assoc py; secondary biotite (no positive id) in alt'd Tphk? or T	4	0	0	0	2		0	0	12	sericite? after biotite??	0	5		(cont) Tphb/Tphm??(36)	4				0				EXPACPC14-3-329
2078	36		4	0	0	0	2		0	0	12		0	5			4				0				EXPACPC14-3-328
2083	36	Tphb? biotite alt'd Tphk?? a/a w py intimately assoc w dark patches (biotite?)	4	0	0	0	2		0	0	12		0	5			4				0				EXPACPC14-3-329
2088	36		4	0	0	0	2		0	0	12		0	5			4				0				EXPACPC14-3-330
2093	36		4	0	0	0	2		0	0	12		0	5			4				0				EXPACPC14-3-331
2098	31	looks like Tphk + biotite/py here;	4	0	0	0	1		0	0	11		0	5			4				0				EXPACPC14-3-332
2103	31		4	0	0	0	1		0	0	11		0	3		4-5% py	4				0				EXPACPC14-3-333
2106	36		4	0	0	0	1		0	0	12		0	5			4				0				EXPACPC14-3-334
2116		No recovery between 2106 and 2116 blocks																							EXPACPC14-3-335
2121	34	one relatively intact piece shows horsetail microfxs (subparallel tca) w lenses microbx;	4	0	0	0	1		0	0	12		0	5			4				0				EXPACPC14-3-336
2126	36	several wh vnltis (5 mm)w open central cavities at ~2124.5; looks like dolo but does not fizz - poss	4	0	0	0	1		0	0	12		0	5		(cont) possibly qtz-adularia? vnltis;	4		11		0	11-qtz = possible qtz-adularia? vnltis			EXPACPC14-3-337
2131	36	mafic phono? or just biotite alt'd phono? as above (broken)	4	0	0	0	1		0	0	12		0	5			4		11		0	a/a (zeolite?)			EXPACPC14-3-338
2136	36	a/a	4	0	0	0	1		0	0	12		0	5			4				0				EXPACPC14-3-339

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 26 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
2136	36	a/a	4	0	0	0	1		0	0	2		0	5			4				0				EXPACPC14-3-338
2141	36	py/biotite clots?	4	0	0	0	1		0	0	2		0	5			4				0				EXPACPC14-3-340
2146	36		4	0	0	0	1		0	0	2		0	5			4				0				EXPACPC14-3-341
2151	36	phonolite w biotite?-py vnlt;	4	0	0	0	2		0	0	3	biotite is secondary? alteration product?	0	5		up to 10% py, commonly in biotite? bands	5				0				EXPACPC14-3-342
2156	31	mix: some of this rock looks like typ Tphk (l gy); and some, darker, m gy, w black (biotite?) patch	4	0	0	0	2		0	0	3		0	5		(cont) es, looks like Tphb or Tphm; gen 5-7% py, locally 10%	5				0				EXPACPC14-3-343
2161	34	a/a, pyritic	4	0	0	0	1		0	0	2		0	5			5				0				EXPACPC14-3-344
2166	34	mixed Tphk and Tphm or Tphb a/a;	4	0	0	0	1		0	0	1		0	5			4				0				EXPACPC14-3-345
2171	31	can pass for Tphk, w horsetail microfxs (+/- py and possible qtz?)	4	0	0	0	1		0	0	1		0	5		3-5% py;	4				0	hairline microfxs may host qtz?			EXPACPC14-3-346
2176	31	a/a, tr only biotite, pyritic;	4	0	0	0	0		0	0	0		0	5		4-7% py, and locally up to 10%	5				0				EXPACPC14-3-347
2181	31		4	0	0	0	0		0	0			0	5		py as above	5				0				EXPACPC14-3-348
2186	31		4	0	0	0	0		0	0			0	5			5				0				EXPACPC14-3-349
2191	36	py and biotite? in microfxs supports likelihood that biotite is alteration feature and that 36 (Tphm	4	0	0	0	2		0	0	2	sericite? after biotite?? or vfg specks dolo?? after biotite? (need microscope work)	0	5		(cont)) is an altreation facies (K-alt w biotite) of Tphk;	4				0				EXPACPC14-3-350
2196	36	36 (mafic porphyr phono) is likely alt facies (K-alt w biotite) of Tphk	4	0	0	0	2		0	0	2		0	5			5				0				EXPACPC14-3-351
2201	36		4	0	0	0	2		0	0	2		0	5			4				0				EXPACPC14-3-352
2206	36		4	0	0	0	1		0	0	2		0	5			4				0				EXPACPC14-3-353
2210.5		no recovery																							EXPACPC14-3-354
2213	36		4	0	0	0	2		0	0	2		0	5			4				0				EXPACPC14-3-355
2218	36	py/biotite? clots cont.	4	0	0	0	2		0	0	2		0	5			4				0				EXPACPC14-3-356
2223	36		4	0	0	0	2		0	0	2		0	5			4				0				EXPACPC14-3-357

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3		Collar Azimuth: 53.24		Collar Inclination: -71.44		:	Hole Length: 4368.00	
northsouth_decimal: 62679.189		eastwest_decimal: 38119.054		elevation: 10359.47			Print Page 27 of 52	

HOLE_ASSAY_SAMPLE																			
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	pyrrhotite	quartz
2223	36		4	0	0	0	2		0	0	12		0	3			4		
2228	36		4	0	0	0	2		0	0	12		0	3			4		
2233	36	clots and dark patches py/biotite? (? = no positive id biotite)	4	0	0	0	2		0	0	12		0	3		gen 4-7% py	4		
2238	36		4	0	0	0	2		0	0	12		0	3			4		
2243	36		4	0	0	0	2		0	0	12		0	3			4		
2248	31	less biotite (alteration): looks more like Tphk (31) here;	4	0	0	0	1		0	0	14		0	3			4		
2253	31		4	0	0	0	1		0	0	14		0	3			4		
2258	31		4	0	0	0	1		0	0	14		0	3			4		
2263	31		4	0	0	0	1		0	0	14		0	3			4		
2268	31		4	0	0	0	1		0	0	14		0	3			4		
2273	31	trace dolomite on fxs	4	0	0	0	1		0	1	14		0	3			4		1 carbonate = trace dolomite on fxs
2278	31		4	1	0	0	1		0	1	14		0	3		spec? too fg to id - may be vfg biotite?	4		
2283	36	biot alt'd Tphk a/a	4	1	0	0	1		0	0	12		0	3			4		
2288	36		4	0	0	0	1		0	0	12		0	3			4		
2293	31	hvy tr wh qtz microvnlts (to 5 mm) at 2290.7 - 2292.2, with vfg d gy min (spec, sphalerite?)	4	1	0	0	1		0	0	14		0	3		3-5% py; unident vfg d gy min: spec? sphalerite?	4		
2298	31	RC cutting-size core frags, 2295.5 - 2297.5, suggest possible fault;	4	0	0	0	1		0	0	14		0				4		
2303	34	Tphu = Tphk? but speckled feld-phyric texture not prominent; trace (only) py-biot?-qtz microvnlts	4	0	0	0	1		0	0	14		0	3			4		
2308	34		4	0	0	0	1		0	0	14		0	3			4		

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 28 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	spessartine	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
2308	34		4	0	0	0	1		0	0	1		0	3			4				0				EXPACPC14-3-374
2313	36	looks like py-biot alt'd Tphk	4	0	0	0	2		0	0	3		0	3		5 py = 4-7% py, and locally 10%	5				0				EXPACPC14-3-375
2318	31	orange discoloration (photos) due to some drill fluid? (re-drilled, tumbled material present)	4	0	0	0	1		0	0	1		0	3			4				0				EXPACPC14-3-376
2323	31	mostly Tphk, but tumbled/re-drilled material (including Tphs cave?) puts sample reliability in doubt	4	0	0	0	1		0	0	1		0	3			4				0				EXPACPC14-3-377
2325	31	a/a;	4	0	0	0	1		0	0	1		0	3			4				0				EXPACPC14-3-378
2335	34	less than 0.75 ft tumbled rubble; one piece hosts 2 mm l gy qtz vnlit; note on drill daily says cored	4	0	0	0	1		0	0	1	(cont) hole"tail" to 4370 ft.)	0	3		(cont) to 2345 ft - with no recovery. END AK HOLE (re-entered by Tonatec for environmental water ho	4				0	5 qtz = 2 mm l gy qtz vnlit in one piece core;			EXPACPC14-3-379
2345		no recovery; Tonatec starts drilling (HQ cont) at approx 2347 ft;																							EXPACPC14-3-380
2347		slight discrepancy between bottomm of AK hole(2345) and top of Tonatec tail																							EXPACPC14-3-381
2357	34	less than 1.5 ft Tphu-Tphk rubble (NOT	4		0	0	1		0	0	1		0	3		(cont) re-drilled cave;	4			42	0	42-G = trace fluorite (+py) on fxs			EXPACPC14-3-382
2362	34	rubble (<2 ft) as above;	4	0	0	0	1		0	0			0	3			4				0				EXPACPC14-3-383
2364		no recovery																							EXPACPC14-3-384
2367	34	block at 2366; Tphu, some pieces look like Tphk; dissem fluorite! Hope this is in situ (rubble)	4	0	0	0	0		0	0		looks like biotite alt is tapering off in transition to gyp/calc veining (below);	0	3		both rubble and mod fx'd	4			42	0	dissem fluorite on fxs			EXPACPC14-3-385
2372	31	0.5 ft rubble, then ~1 ft mod fx'd rock, then "stickrock" starting at approx 2368.3; Tphk? l-m gy r	5	1	0	0	0		0	0		(cont) veined (2-4 mm, 10-30 tca) w fibrous gypsum; 3-4% py - up to 5%; 4-5! K-alt;	0	3		(cont) rock (phonolite) is finely speckled (feld-phyrlic) w ~10-15% 1-3 mm cream subhedral phenos and	3			3	looked for fluorite; 3 sulfate = gyp vnltis			EXPACPC14-3-386	
2377	31	subtle layering of minor lapilli-like feld-phyrlic "pods" (5-10mm) suggests possible lithic-xtl tuff	5	1	0	0	0		0	0			0	1			3				3				EXPACPC14-3-387
2382	31		5	1	0	0	0		0	0			0	1			3				3	clear hairline horsetail microvnltis could be qtz, but likely gyp;			EXPACPC14-3-388
2387	31	WALLROCK starts to be weakly CALCAREOUS (weak fizz, including gyp vnltis)	5	1	0	0	0		0	2		2 carbonate = weakly calcareous wallrock;	0	1		gen 3-5% py;	4				3				EXPACPC14-3-389
2392	31	monolithic bx (or lapilli tuff) texture bcmg common below 2390;	5	1	0	0	0		0	2			0	1			4				3				EXPACPC14-3-390

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
--------------------	-----------------------	----------------------------	---	----------------------

northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 29 of 52
-------------------------------	-----------------------------	---------------------	---------------------

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	spessartine	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
2392	31	monolithic bx (or lapilli tuff) texture became common below 2390'	5	1	0	0	0		0	2			0	1			4				3				EXPACPC14-3-392
2397	43	43 = xtl lithic bx (or 20: aphanitic phono-matrix bx?); monolithic (feld-phyrlic) 3mm-3cm subrnd clas	5	1	0	0	0		0	2		strong K-alt masks frag/lapilli contacts (blurry, ill-defined)	0	1		(cont) clasts/lapilli;	3				3				EXPACPC14-3-393
2402	31	a/a to ~ 2398, then back into sparsely feld-phyrlic Tphk-like rock w odd d brn-gy-pyritic blotches (3	5	1	0	0	0		0	2			0	1		(cont) 3-6 mm) - some w nucleous like an accretionary lapilli (look like worm burrows)	3				3				EXPACPC14-3-394
2407	31	crystal-rich and crystal-poor (feld phenos) zones suggests possible "stratified" xtl tuff(?)	5	1	0	0	2		0	2		2 sericite? = cannot tell if I am looking at sericite or carbonate	0	1			3				3				EXPACPC14-3-395
2412	31	could pass for Tphk w sparse phenos (5%)	5	1	0	0	0		0	2			0	1			3				3				EXPACPC14-3-396
2417	43	mostly bx (mixed volc clasts, no positive id pC); clasts up to 5 cm;	5	1	0	0	0		0	2			0	1			3				3	3-sulfate = gyp vnltts cont.; 2 carbonate = wall rock effervescense			EXPACPC14-3-397
2422	43	bx texture masked by strong K-5 alt	5	1	0	0	0		0	3			0	1			4				3				EXPACPC14-3-398
2427	31	at ~2422.5 back into Tphk (31) or feld xtl tuff(?)	5	1	0	0	0		0	3			0	1			3				3				EXPACPC14-3-399
2432	31		5	2	0	0	0		0	2			0	1			3				3				EXPACPC14-3-400
2437	43	back into xtl-lithic lapilli tuff (volc bx)	5	1	0	0	0		0	2			0	1			3				3				EXPACPC14-3-401
2442	43	crude streaky layering	5	1	0	0	0		0	3			0	1			3				3				EXPACPC14-3-402
2447	43	anastomosing "horsetail" calc-py microvnltts: hairline to 2 mm, 10 tca;	5	1	0	0	0		0	3			0	1		4 py (5-7%) includes py vnltts	4			22	2				EXPACPC14-3-403
2452	43		5	1	0	0	0		0	2			0	1			3				3				EXPACPC14-3-404
2457	43	feld-phyrlic clasts (lapilli) up to 13 cm	5	1	0	0	0		0	2			0	1		4-5% py	4				2				EXPACPC14-3-405
2462	43		5	1	0	0	0		0	2			0	1			3				2				EXPACPC14-3-406
2467	43		5	1	0	0	0		0	2			0	1			3				2				EXPACPC14-3-407
2472	43	lapilli tuff/volc bx includes streaky banding and some pumice-like frags w eutaxitic texture	5	1	0	0	0		0	2			0	1			3				2				EXPACPC14-3-408
2477	43		5	1	0	0	0		0	2			0	1			3				2				EXPACPC14-3-409

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 30 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitized	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematization	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
2477	43		5	1	0	0	0		0	2			0	1			3				2				EXPACPC14-3-402
2482	43	clasts/lapilli dominantly feld-phyric and Tphk-like;	5	1	0	0	0		0	2			0	1			3				2				EXPACPC14-3-408
2487	43	subtle streaky banding, 60-65 tca;	5	1	0	0	0		0	2			0	1			3				2				EXPACPC14-3-409
2492	43		5	1	0	0	0		0	2			0	1		py selvages on gyp vnlt	3				2				EXPACPC14-3-410
2497	43	xtl-lithic lapilli tuff to 2495, then seriate porphyritic phono dike? contact at 60 tca	5	1	0	0	0		0	1		calcareousness (fizz) diminished - along w number of gyp vnlt	0	1			3				1				EXPACPC14-3-411
2502	38	gyp vnlt present (cont) in Tphs (weakly calcareous)	5	1	0	0	2		0	1		2 sericite = sparkling feld phenos (probably sericitized)	0	1			3				1				EXPACPC14-3-412
2507	38		5	1	0	0	2		0	2			0	1			3				2				EXPACPC14-3-413
2512	38		5	1	0	0	2		0	2			0	1			3				2				EXPACPC14-3-414
2517	38		5	2	0	0	2		0	2			0	1			3				2				EXPACPC14-3-415
2522	38		5	1	0	0	2		0	2			0	1			3				2	2-sulfate = gyp vnlt cont; 2 carbonate = calcareous wallrock cont.			EXPACPC14-3-416
2527	43	Tphs (dike?) to 2523.8 (contact ~20 tca), then transition zone to xtl-lithic lapilli tuff (volc bx)	5	1	0	0	1		0	2			0	1		(cont) at 2526.3; banding at 60 tca;	4				2				EXPACPC14-3-417
2532	43		5	1	0	0	0		0	3	11		0	1			4				2	1-biotite = trace biotite-py flecks?			EXPACPC14-3-418
2537	43	streaky banding at ~25 tca; shattered w network hairline calc microfxs; sparse lapilli/frags;	5	1	0	0	0		0	3			0	1			4				2				EXPACPC14-3-419
2542	31	contact at ~30 tca; looks like Tphk, except that some feld phenos rather large (9x4 mm); odd dark br	5	1	0	0	0		0	3			0	1		(cont) brownish blotches as per 2402 (some tabular and calcareous - alt'd mafic min?)	4				1				EXPACPC14-3-420
2547	31	a/a, looks like Tphk, but not typical, with larger feld phenos than usual, but not "mega-crystic"	5	1	0	0	0		0	2			0	1			4				1	1-sulfate = gyp/anhyd vnlt present but sparse (3 in 5 ft); calcareous wallrock cont.			EXPACPC14-3-421
2552	31		5	1	0	0	0		0	2			0	1		gen 3-5% py	4				1				EXPACPC14-3-422
2557	31		5	1	0	0	0		0	2			0	1			4				1				EXPACPC14-3-423
2562	31	weak network (healed) py microfxs	5	2	0	0	0		0	2			0	1			4				1				EXPACPC14-3-424

Cripple Creek-Victor Gold Mining Company																										
Hole Name: CPC14-3				Collar Azimuth: 53.24				Collar Inclination: -71.44				:				Hole Length: 4368.00										
northsouth_decimal: 62679.189				eastwest_decimal: 38119.054				elevation: 10359.47									Print Page 31 of 52									
HOLE_ASSAY_SAMPLE																										
depth_to	RockType	Lithology_Comment	potassic	sericitic	illitic	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER	
2562	31	weak network (healed) py microfxs	5	2	0	0	0		0	2			0	1			4				1				EXPACPC14-3-42	
2567	31	start seeing bx clasts (Tphk) and darker gy aphanitic, pyritic seams w vfg "debris" at 2566	5	1	0	0	0		0	2			0	1			4				1				EXPACPC14-3-42	
2572	31	Tphk? borders on being seriate textured (38)	5	2	0	0	0		0	2		4-5 k-alt	0	1			4				1				EXPACPC14-3-42	
2577	31	less distinctly-prominently feld-phyric porphyritic; gyp -or anhyd?- on fxs at 25 tca;	4	2	0	0	0		0	2			0	1			4				2				EXPACPC14-3-42	
2582	31	below 2579: subtle patches 30 (porphyritic phonolite-matrix bx)	4	1	0	0	0		0	2		4 and 5 k-alt	0	1			4				1				EXPACPC14-3-42	
2587	31	Tphk? Tphs? a/a	4	1	0	0	0		0	2			0	1			4				1				EXPACPC14-3-42	
2592	31	minor bx (Tphk clasts) a/a, irreg m gy "debris seams" at low < tca;	5	1	0	0	0		0	2			0	1			4				1				EXPACPC14-3-43	
2597	30	more (intrusive? auto?) bx than not	4	1	0	0	0		0	2	11		0	1			4				1	trace biotite = some clasts appear biotite alt'd			EXPACPC14-3-43	
2602	31	only minor (monolithic) bx	5	1	0	0	0		0	2			0	1			4				1				EXPACPC14-3-43	
2607	31		5	1	0	0	0		0	2			0	1			4				1				EXPACPC14-3-43	
2612	30	irreg patches "bx", patches fg porphyritic and patches cg porphyritic Tphk;	5	1	0	0	0		0	2			0	1			4				1				EXPACPC14-3-43	
2617	31	subtle streaky banding - w clasts feld-phyric phono - at approx 10-15 tca; minor bx cont.	5	1	0	0	0		0	2			0	1			4				1				EXPACPC14-3-43	
2622	31	fg phaneritic (vfg feld-phyric, felty) and only sparsely porphyritic;	4	1	0	0	0		0	2			0	1			4				1	1-sulfate = white gyp or anhyd? vnits (to 5 mm) cont.; calcareous wallrock cont.			EXPACPC14-3-43	
2627	30	d gy bx seam, ~0.4-0.5 ft wide, at 20 tca, between 2622-2624; d gy aphanitic pyritic matrix w matrix	5	1	0	0	0		0	1			0	1		(cont) -supported volc clasts 1 mm - 5 cm;	4				1				EXPACPC14-3-43	
2632	34	34 = undiff "porphyritic" phono w d brownish splotches (see 2402) that may be biotite-py after mafic	4	1	0	0	0		0	2	12		0	1		(cont) phenos(?)	4				1	2-biotite = possible biotite, w py, in splotches - some rectangular 9x3 mm (mafic phenos?)			EXPACPC14-3-43	
2637	36	decide to code 36 to emphasize possible? mafic nature of phonolite (brown biot-py splotches)	4	1	0	0	0		0	2	12		0	1		4-7% py	4				1				EXPACPC14-3-43	
2642	20	mostly volc bx below 2635.5 w streaky banding at 20 tca; feld-phyric (3x5 mm anhedral feld) clasts i	5	2	0	0	0		0	2	12	(cont) in part w microbx/py in microfxs;	0	1		(cont) in d gy aphanitic pyritic (10%) matrix; used code 20 - because of aphanitic matrix; shattered	5				1	2-biotite = no positive id, but suspect biotite in dark bx matrix;			EXPACPC14-3-44	
2647	20	matrix and clast-supported volc bx; clasts (2 mm - 5 cm) are mostly coarsely feld-phyric Tphk - or p	5	1	0	0	0		0	1	12		0	1		(cont) possibly Tphs (brecciated dike?)	5				1				EXPACPC14-3-44	
Scale 1:180										April 15, 2015										01:22 PM						

Cripple Creek-Victor Gold Mining Company																										
Hole Name: CPC14-3				Collar Azimuth: 53.24				Collar Inclination: -71.44				:				Hole Length: 4368.00										
northsouth_decimal: 62679.189				eastwest_decimal: 38119.054				elevation: 10359.47									Print Page 32 of 52									
HOLE_ASSAY_SAMPLE																										
depth_to	RockType	Lithology_Comment	potassic	specularite	sulfidation	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER	
2647	20	matrix and clast-supported volc bx: clasts	5	1	0	0	0		0	1	2		0	1		(cont) possibly Tphs (brecciated dike?)	5				1				EXPACPC14-3-44	
2652	36	mafic porphyritic phonolite w black laths (10%, up to 4x1 mm, but more common 1x2);	4	1	0	0	0		2	1	2	is py after mafic phenos propylitic alteration?	0	1			5				3	2 biotite = biotite after pyrox/hblnd? 3-sulfate = horsetail gyp/anhy vnltls 5-10 tca; only v wkly ca			EXPACPC14-3-442	
2657	36	below 2650.5 increasingly feld-phyric, but still a mafic phonolite w accicular and tabular phenos;	5	1	0	0	0		2	1	2		0	1		4-7% py - mostly replacing mafic phenos	4				2				EXPACPC14-3-443	
2662	37	starting at ~2655.5, a monolithic bx; most likely a Tphm bx; (finely dark speckled clasts in darker	5	1	0	0	0		2	2	2		0	1		(cont) aphanitic pyritic matrix);	5				2				EXPACPC14-3-444	
2667	37	mafic phono bx cont, gen a/a, but less matrix, more clast supported, w some feld-phyric clasts;	5	1	0	0	0		2	2	2		0	1			4				2				EXPACPC14-3-445	
2672	37	Tphmbx cont, w minor feld-phyric clasts;	5	1	0	0	0		2	2	2		0	1		7-10% py, vfg	5				2				EXPACPC14-3-446	
2677	36	possible 0.5 ft Tphs dike stringer or clast? at 2672, then fg mafic porphyritic phono cont.; only mi	4	1	0	0	0		2	1	2		0	1		(cont) minor bx, and phono is more phaneritic than porphyritic;	4				1				EXPACPC14-3-447	
2682	36	mafic phenos present but not always evident (py is); some horizons exhibit a trachytic/felty texture	5	1	0	0	0		2	2	2		0	1		4-7% py;	4				1				EXPACPC14-3-448	
2687	36	not sure what this lith is: m gy, finely speckled rock w small (1-2mm) cream laths - and only hint o	5	1	0	0	0		2	1	1		0			(cont) of mafic phenos; alt'd Tphm?	4				1				EXPACPC14-3-448	
2692	34	"black & tan" band (20 tca) at 2685.2 is contact of sorts. Black rock is Tphm, tan is ?? Hint of fg	5	1	0	0	0		0	2	1	(cont) d-like comminuted material - possible healed FAULT? (10 structure above) - or ignimbrite??	0	1		(cont) mafics suggest still in (alt'd) Tphm; 0.4 ft tan band is actually layer of fg fragmental-shar	4				1				EXPACPC14-3-450	
2697	37	back into Tphm bx - with a few clasts Tphs	4	1	0	0	0		2	1	3		0	1			4				1	increase (secondary?) biotite			EXPACPC14-3-451	
2702	36	Tphm cont. w minor Tphk or Tphs feld-phyric bx clasts between 2698-99	5	0	0	0	0		2	1	2		0	1		4-5% py;	4				1				EXPACPC14-3-452	
2707	36	phaneritic to fg porphyritic w skeletal mafics	4	0	0	0	0		2	1	2		0	1			4				1	carbonate (1) more in microfxs than in wallrock			EXPACPC14-3-453	
2712	36		4	0	0	0	0		2	2	2		0	1		4-7% py	4				1				EXPACPC14-3-454	
2717	37	below 2714.2 bx with Tphm and Tphk/Tphs clasts in segregated patches	4	1	0	0	0		2	1	2		0	1			4				1				EXPACPC14-3-455	
2722	37	bx cont w more feld-phyric clasts than mafic;	5	0	0	0	0		1	1	1		0	1		5-7% py	4				1				EXPACPC14-3-456	
2727	36	subtle banding(35 tca) at 2723.5 (w bx above) suggests possibility of "bx" being xtl-lithic (lapilli)	4	0	0	0	0		1	2	2		0	1		(cont) tuff (43); rock immed below "bx" is fg phaneritic "salt & pepper" and could pass for syenite;	4				1				EXPACPC14-3-457	
2732	37	bx cont., grading down (2729) to Tphm; clasts both mafic and Tphk-like; lithic lapilli tuff??	4	0	0	0	0		1	2	2		0	1		3-5% py	4				1				EXPACPC14-3-458	
Scale 1:180										April 15, 2015										01:22 PM						

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 33 of 52	

HOLE_ASSAY_SAMPLE																			
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz
2732	37	bx cont. grading down 2729.1 to Tphm; sharp contact Tphs dike at 2733 (20 tca); includes slivers brecciated Tphm wallrock 2736-2737.3 w di	4	0	0	0	0		1	2	2		0	1		3-5% nv	4		
2737	38		5	0	0	0	0		1	2	1		0	1		(cont) dissem blackjack sphalerite at contacts	4		
2742	38	Tphs dike cont.	5	1	0	0	2		0	1	0		0	1		3-4% py	3		
2747	38	small sliver wallrock (Tphm?) between 2744-45 (lost core) w possible sp? on same fxs as gyp/anhyd	5	1	0	0	2		0	1	0		0	1			3		
2752	38	Tphs dike cont. to 2749.4 then intimate mix Tphs and Tphm? bx; Dike in fault zone?	5	1	0	0	2		0	2	2		0	1		4-5% py	4		
2757	38	mostly Tphs dike, starting at 2752.3;	5	1	0	0	2		0	1	2		0	1			3		
2762	38	equal parts intimate mix Tphs dike and pyritic Tphm? bx; gyp/anhyd vnlt at 0-10 tca; cut both dike	5	1	0	0	2		0	2	3		0	1		(cont) and country rock; locally up to 10% py - in matrix of Tphm bx;	5		
2767	37	coded as Tphmbx but actually mixed lith clasts (Tphm and Tphk/Tphs?) Tphs dike stringer (20 tca) at	5	0	0	0	1		0	1	3		0	1		(cont) 2762-63; micro bx present in some microfxs;	4		
2772	38	Tphs dike stringer (curved contact: 20 and -10 tca) 2767.6-2769.2 in matrix-support bx; thin-banded	5	0	0	0	1		0	2	1		0	1		(cont) micro-bx at contact; heterolithic bx could pass for CC bx.	4		
2777	30	above bx grades down into (2771.6) more of a Tphk/Tphk bx;	5	2	0	0	0		0	2	0		0	1		3-4% py	4		
2782	42	above bx grades down into a more heterolithic (pC frags?) at ~ 2776.9; some d green chloritized frag	5	0	0	0	0		0	2	0		0	1		(cont) s; bx matrix speckled w wh feld phenos and/or pheno frags; 5-7% py	4		
2787	42	CC bx w finely speckled feld-phyric matrix (xtl-lithic tuff)	5	0	0	0	0		0	2	0		0	1		4-5% py	4		
2792	42		5	0	0	0	0		0	2	0		0	1			4		
2797	42	heterolithic CC bx w possible pC clasts; subround cobble-like clasts to 12 cm;	5	0	0	0	0		0	1	0		0	1			4		
2802	42	clasts mostly Tert (Tphk), but pC present	5	0	0	0	0		0	2			0	1			4		
2807	38	Tphs (seriate porphyritic phono) dike at 2802.5 (40 tca); fx-controlled l gy/d gy mottling; this Tph	5	2	0	0	2		0	1	2	(cont) cannot tell if biotite-Tphs is less alt'd Tphs than above (with relict biotite), or if more	0	1		(cont) Tphs is different than above Tphs with presence (5%) of fg biotite (+/- mag, py, sericite);	3		
2812	38	biotite Tphs or Tphb? (32); weakly magnetic;	5	2	0	0	2		0	1	2		0	1		2-spec is probably mostly fg mag;	3		
2817	38	a/a, mottled l gy/ d gy w less and more biotite; locally glomerophytic;	5	2	0	0	2		0	1	2		0	1		3 py = 3-4%	3		

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 34 of 52	

HOLE_ASSAY_SAMPLE																			
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz
2817	38	old mineral flow / flow mass and more m...	5	2	0	0	2		0	2	12		0	↑		3 py = 3-4%	3		
2822	38	biotite-Tphs or Tphb cont.	5	2	0	0	2		0	2	12		0	↑					
2827	38	darker gy more magnetic than l gy (n/mag)	5	2	0	0	2		0	1	12		0	↑		4 py = up to 5% vlg disse py	4		41
2832	38	l to m gy w diminished biotite; subtle banding at ~30 tca;	4	2	0	0	2		0	1	11		0	↑		can't tell difference (%) between spec and mag;	4		
2837	38		5	1	0	0	2		0	1	11		0	↑			4		
2842	31	less Tphs-like and more Tphk-like below distinct band at 2836 (25 tca); odd pyritic brownish blotche	4	1	0	0	2		0	1	0		0	↑		(cont) s (after mafic phenos?) as observed uphole ("wormburrows", 2402 ft)	4		
2847	31		4	0	0	0	2		0	1	0		0	↑			4		
2852	42	sharp contact at 2848.1 (60 tca); heterolithic bx, but most clasts porph phono (could pass for xtl-l	4	0	0	0	0		0	1	0		0	↑		(cont) lithic lapilli tuff, along with Tphk rock immed below Tphs); up to 7% super fg py	4		
2857	42		4	0	0	0	0		0	1	0		0	↑			4		41
2862	42		5	1	0	0	0		0	1	0		0	↑			4		
2867	42	locally clast-supported (bx)	4	1	0	0	0		0	1			0	↑			4		
2872	42	could pass for xtl (feld-phryic) - lithic lapilli tuff (43), or even Tphkbx (30)	4	1	0	0	0		0	2			0	↑			4		
2877	42		4	1	0	0	0		0	1			0	↑			4		
2882	42		5	1	0	0	0		0	2			0	↑			4		
2887	42	5 cm gyp/anhyd vn at 2882.4 (40 tca)	5	1	0	0	0		0	1			0	↑			4		
2892	42		4	2	0	0	0		0	2			0	↑			4		
2897	42	matrix-support and clast-support define crude stratification; some clasts shattered w microfxs;	5	1	0	0	0		0	2			0	↑			4		41
2902	42	matrix-support and clast-support define crude stratification; some clasts shattered w network microf	5	1	0	0	0		0	1			0	↑		(cont) microfxs	4		

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 35 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
2902	42	mainly shatter and glass shatter debris	5	2	0	0	0		0	1			0	1		(cont) microfxs	4				1				EXPACPC14-3-493
2907	42	increasingly heterolithic (lapilli) and more like typical CC Bx;	5	2	0	0	0		0	1			0	1							1				EXPACPC14-3-494
2912	42		4	2	0	0	0		0	2			0	1		3-4% py and 1-2% d gy fg min (spec?)	4				2				EXPACPC14-3-495
2917	42	microfxs/gyp vnltls cut (refract) thru clasts;	4	2	0	0	0		0	2			0	1							2				EXPACPC14-3-496
2922	42		5	2	0	0	0		0	2			0	1							2				EXPACPC14-3-498
2927	42	change at 2925.4 w sharp, yet gradational, cntct from matrix supported CC Bx to clast-supported pC d	4	1	0	0	0		0	1			0	1		(cont) debris (abundant leucogranite, clasts to 9 cm); contact roughly at 25 tca;	4				1				EXPACPC14-3-497
2932	85	used code 85, "CC quartz monzonite bx", to denote a bx that consists mostly (>90%) of pC clasts (peg	4	1	0	0	1		2	2		(cont) of; poorly sorted w grit to >1m; relatively fresh (weak propyl); gen 3-4% py, up to 5-7%;	0	1		(cont) matite- leucogranite and foliated biotite granite-granodiorite and schistose varieties thereof	4				2				EXPACPC14-3-498
2937	85	dense, tightly packed pC debris; py selvages on gyp/anhyd vnltls	4	1	0	0	1		2	2			0	1							2				EXPACPC14-3-499
2942	85	shattered appearance w network microfxs and horsetail mylonite-like microbx seams; possible fingers	4	1	0	0	1		2	1			0	1		(cont) Tphd or m gy xtl tuff material;	4				1	5 qtz = possible? qtz in shatter-microvnltls, no positive id;			EXPACPC14-3-500
2947	85	2945.3 - 2946.6: interbed CC Bx (Tert); pC debris includes rock that looks like a fg biotite graphic	4	1	0	0	1		2	1			0	1		(cont) -granite;	4				1				EXPACPC14-3-501
2952	85	mostly salt n'pepper (biotite bearing) pC debris w thin seams that could pass for CC Bx;	4	1	0	0	1		2	1			0	1							1				EXPACPC14-3-502
2957	85	~2956 - 2973.6: seam CC Bx like rock w feld-phyrlic phonolite clasts; clast boundaries not clear (blu	4	1	0	0	1		2	1			0	1		(cont) blurry)	4				1				EXPACPC14-3-503
2962	42	mostly CC Bx - w Tert volc clasts; crude banding at 50 tca;	5	1	0	0	0		0	1			0	1							2				EXPACPC14-3-504
2967	42	a/a, mostly (>95%) Tert clasts, feld-phyrlic	5	1	0	0	0		0	1			0	1		4-7% py	4				1				EXPACPC14-3-505
2972	42	bx texture almost obliterated (k-4 and 5 alt'd)	5	1	0	0	0		0	1			0	1							1				EXPACPC14-3-506
2977	85	2973.5-73.8: irreg transition zone to mostly pC debris a/a (used code 85 for pC bx)	4	1	0	0	1		1	1			0	1							1				EXPACPC14-3-507
2982	85	mostly foliated (biotite) qtz-monz to granodiorite; pC blocks up to 8.5 ft (consistent foliation at	3	1	0	0	1		1	1			0	1		(cont) 30 tca)	4				1				EXPACPC14-3-508
2987	85	bands cg leucogranite and foliated biotite "granodiorite" (big picture = gneiss)	3	1	0	0	1		1	1			0	1							1				EXPACPC14-3-509
2992	85	mostly pC debris a/a (used code 85 for pC bx)	4	1	0	0	1		1	1			0	1		(cont) w leucogranite clast? or wall rock?	4				1				EXPACPC14-3-510

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3		Collar Azimuth: 53.24		Collar Inclination: -71.44		:		Hole Length: 4368.00	
northsouth_decimal: 62679.189			eastwest_decimal: 38119.054		elevation: 10359.47			Print Page 36 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
2992	85	0.1 ft phonolite dike stringer at 2988.8 - or layer CC bx? ~2991-91.7: Cc bx (fx fill?, 30 tca cntc	4	1	0	0	1		1	1			0	1		(cont) w leucogranite clast? or wall rock?)	3				1				EXPACPC14-3-510
2997	31	logged as feld-phyrlic phonolite to bring attention to possible dike (~2991-2994.7); cntc w leucogran	5	1	0	0	1		1	1			0	1		(cont) ite at 2994.7 is subparallel (20 tca) to cntc at 2991.6 (implications for in-situ pC bedrock?	4				1				EXPACPC14-3-511
3002	85	mostly pC (foliated biot gd and leucogranite), but Tph dike? stringers cont.; shattered leucogranite	5	1	0	0	1		1	1			0	1		(cont) w stockwork microfxs at Tph contact (eg 3001-02)	4				1				EXPACPC14-3-512
3007	85	mostly pC leucogranite, w subordinate feld-phyrlic Tert component (3004-3005.3: dike? xtl tuff?)	4	1	0	0	1		1	1			0	1			3				1				EXPACPC14-3-513
3012	85	a/a, w Tert (Tph) dike stringers?, cobbles? fx-fill? minor fault (20 tca) w py slicks at 3012; slick	4	1	0	0	1		1	1			0	1		(cont) s at ~50 tca (on face at 20 tca);	4				1				EXPACPC14-3-514
3017	85	a/a, w few irreg pods feld-phyrlic Tert rock;	4	1	0	0	1		1	1			0	1			4				1	only minor gyp/anhyd vnlt and onlytrace-weak HCL fizz			EXPACPC14-3-515
3022	85	multiple contacts Tph pods/lenses w leucogranite at 30 tca (eg 3019, 3021,why? fx in bedrock??); dis	4	1	0	0	1		1	1			0	1		(cont) distinct "runic" texture in graphic granite at 3019.5;	3				1				EXPACPC14-3-516
3027	85	leucogranite w (sparse) irreg pods/lenses feld-phyrlic Tph; hard pressed to find any clast boundaries	4	1	0	0	1		1	1			0	1			3				1				EXPACPC14-3-517
3032	85	a/a w pods vfg (gritty) CC bx;	4	1	0	0	1		1	1			0	1			3				1				EXPACPC14-3-518
3037	85	(42) good place to see well defined pC clasts engulfed by vfg CC bx;	4	1	0	0	1		1	1			0	1			4				3				EXPACPC14-3-519
3042	71	at 3037.3, biotite shist, biotite gneiss, and some leucogranite; pygmatic folds present; foliation	4	1	0	0	1		1	1			0	1		(cont) at 45-60 tca; cannot rule out BEDROCK;	4				2				EXPACPC14-3-520
3047	72	a/a, mostly biotite schist	4	1	0	0	1		1	1			0	1			4				2				EXPACPC14-3-521
3052	71	a/a, w pegmatitic leucogranite below 3049; foliation at 60 tca; BEDROCK?	4	1	0	0	1		1	1			0	1			4				2				EXPACPC14-3-522
3057	72	biotite shist and gneiss a/a (mostly shist, w relatively fresh biotite)	4	1	0	0	1		1	1			0	1			4				1	trace only weak fizz (carbonate); minor thin (1-2 mm) gyp/anhyd vnlt;			EXPACPC14-3-523
3062	72	foliation at ~60 tca (has been consistent since 3037, implying one big caved block (in diatreme) or	4	1	0	0	1		1	1		(cont) of irreg caldera wall?)	0	1		(cont) BEDROCK below or outside diatreme; pC horst block? in caldera floor; irreg "inlier" in rim o	0				1				EXPACPC14-3-524
3067	71	dark bands (3 cm) biotite along fxs in leucogranite suggests some biotite secondary	4	0	0	0	1		1	1	12		0	1		trace only spec if present	0				1	2-biotite = biotite selvages on fxs;			EXPACPC14-3-525
3072	72	mostly biotite shist, w subordinate bands leucogranite;	4	0	0	0	1		1	1	12		0	1			4				1	a/a, biotite selvages on fxs and gyp vnlt			EXPACPC14-3-526
3077	71	minor pinch and swell schist pods in leuc	4	0	0	0	1		1	1	12		0	1		then 4-5% py. w locally up to 10% in gneiss	4				3				EXPACPC14-3-527

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3		Collar Azimuth: 53.24		Collar Inclination: -71.44		:	Hole Length: 4368.00	
northsouth_decimal: 62679.189		eastwest_decimal: 38119.054		elevation: 10359.47			Print Page 37 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
3077	71	minor pinch and swell schist pods in leucogranite along healed fxs/gyp vnlt;	4	0	0	0	1		1	1			0	↑		gen 4-5% py, w locally up to 10% in gyp/anhyd vnlt;	4				3				EXPACPC14-3-527
3082	71	coarsely granular py on gyp/anhyd? fxs (30 and 20 tca)	4	0	0	0	1		1	1			0	↑			4				2				EXPACPC14-3-528
3087	71		4	0	0	0	1		1	1			0	↑			4				2				EXPACPC14-3-529
3092	71	foliation at ~55 tca (cont) BEDROCK; 2-3 mm gyp/anhyd? vnlt; subparallel tca;	4	0	0	0	1		1	1			0	↑			4				3				EXPACPC14-3-530
3097	64	CHANGE: last biotite schist band at approx 3093, then mostly (>95%) m-cg speckled off-wh/ m gy leuco	4	0	0	0	1		1	0		(cont) feldspar (ortho? plag?) 4 mm to more commonly ~1cm, and <5% biotite; overall blotchy-coarse	0	↑		(cont) leucogranite: holocrystalline, hypidiomorphic-granular, w ~15 % m gy qtz, subhedral off-wh fe	3				1	(cont) y speckled appearance that borders on looking porphyritic;			EXPACPC14-3-531
3102	64	more like 15-20% m gy qtz (interstitial to feld)	4	0	0	0	1		1	0		1 prop and 1 sericite mostly applies to biotite alt.	0	↑		3-4% py, bright;	3				1	n/calc			EXPACPC14-3-532
3107	64		4	0	0	0	1		1	0			0	↑			3				1				EXPACPC14-3-533
3112	64		4	0	0	0	1		1	0			0	↑			3				2				EXPACPC14-3-534
3117	64	coarse py / gyp on fxs at 35-40 tca;	4	0	0	0	1		1	0			0	↑			4				2				EXPACPC14-3-535
3122	64		4	0	0	0	1		1	0			0	↑		3-5% py includes py on fxs (w gyp/anhyd)	4				2				EXPACPC14-3-536
3127	64		4	0	0	0	1		1	0			0	↑		a/a, cg	4				2				EXPACPC14-3-537
3132	64		4	0	0	0	1		1	0			0	↑			4				2	n/calc cont.; gyp/anhyd on fxs cont.			EXPACPC14-3-538
3137	64	gyp/anhyd? vnlt; (20 tca) to 1 cm;	4	0	0	0	1		1	0			0	↑			4				2				EXPACPC14-3-539
3142	64		4	0	0	0	1		1	0			0	↑			4				2				EXPACPC14-3-540
3147	64	5 cm wh gyp/anhyd? vn (30 tca) w py granules at 3143.3;	4	0	0	0	1		1	0			0	↑			4				3				EXPACPC14-3-541
3152	64	multiple 1-2 mm py/gyp vnlt; at 5 tca w stockwork microfxs in-between;	4	0	0	0	1		1	0			0	↑			4				2				EXPACPC14-3-542
3157	64		4	0	0	0	1		1	0			0	↑			4				2				EXPACPC14-3-543
3162	64		4	0	0	0	1		1	0			0	↑			4				1				EXPACPC14-3-544

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3		Collar Azimuth: 53.24		Collar Inclination: -71.44		:	Hole Length: 4368.00	
northsouth_decimal: 62679.189		eastwest_decimal: 38119.054		elevation: 10359.47			Print Page 38 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
3162	64		4	0	0	0	1		1	0			0	↑			4				1				EXPACPC14-3-544
3167	64	horsetail py/gyp vnits (<3mm) at 15 tca; irreg m gy patches, possibly micro-porphyritic, could be	4	0	0	0	1		1	1			0	↑		(cont) "stringers" Tert dike?	4				2				EXPACPC14-3-545
3172	64		4	2	0	0	1		1	2			0	↑		purplish bands in gyp/anhyd vns (1.5 cm, 30 and 45 tca) could be spec (2)	4				2	weak CaCo3 fizz			EXPACPC14-3-546
3177	64	leucogranite cont., weakly calcareous	4	0	0	0	1		1	1			0	↑			4				1				EXPACPC14-3-547
3182	64	sharp contact (45 tca) m gy (mouse gy) aphanitic dike at 3180.1 (to 3185.4, lower cntc 10-15 tca)	5	0	0	0	1		1	1		propyl and ser alt refer to leucogranite; 5-k to dike;	0	↑		py in Tert. dike is super fg;	4				3	3 sulfate = gyp/anhyd? fx-fill in dike; 1 calc applies to both dike and leucogranite;			EXPACPC14-3-548
3187	22	dike cont. (see above) w slivers wall rock; m mouse gy not typical Tphd color: may be mafic dike? (a	5	0	0	0	1		1	1			0	↑			4				2				EXPACPC14-3-549
3192	64	leucogranite cont.	3	1	0	0	1		1	1			0	↑		3-5% py (includes fxs) cont. w up to 1% spec; py selvages on gyp/anhyd vnits;	4				2				EXPACPC14-3-550
3197	64		3	1	0	0	1		1	0			0	↑		trace only spec	4				2				EXPACPC14-3-551
3202	64		3	0	0	0	1		1	1	↑		0	↑			3				1	1 biotite = minor selvages on fxs			EXPACPC14-3-552
3207	64		3	1	0	0	1		1	1			0	↑		spec selvages on gyp/anhyd fxs	3				2				EXPACPC14-3-553
3212	64		3	1	0	0	1		1	1			0	↑			4				2				EXPACPC14-3-554
3217	64	tabular feldspar laths to 13 mm becoming more common;	3	1	0	0	1		1	0			0	↑			3				1				EXPACPC14-3-555
3222	64		3	1	0	0	1		1	1	↑		0	↑		gen 3-4% py	3				1				EXPACPC14-3-556
3227	64	6 mm m gy qtz vnlit (45 tca) at 3222.9	3	0	0	0	1		1	2	↑		0	↑			3				2				EXPACPC14-3-557
3232	64	py/gyp fx-fill cont.; biotite <2%;	4	1	0	0	1		1	1			0	↑		spec w py in gyp vnlit selvages (v weakly magnetic, probably includes tr magnetite)	3				2				EXPACPC14-3-558
3237	64	below 0.8 ft pegmatitic horizon (biotite to 13 mm) at 3234, feld laths (to 1.5 cm) are distinctly al	4	1	0	0	1		1	2			0	↑		(cont) aligned at~45 tca (sub-parallel arrangement fits mine description of "CC Qtz Monzonite" unit	3				2				EXPACPC14-3-559
3242	64	alligned feld laths a/a cont to internal contact-of-sorts at 3240.5;	4	1	0	0	1		1	2			0	↑			3				3	3-sulf = 3 cm gyp/anhyd?/py vn (45 tca) at 3240.7			EXPACPC14-3-560
3247	64	sparse biotite (<2%); py and spec on fxs	4	2	0	0	1		1	2			0	↑			3				2				EXPACPC14-3-561

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 39 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
3247	64	sparse biotite (<2%); py and spec on fxs	4	2	0	0	1		1	2			0	↑			3				2				EXPACPC14-3-563
3252	64	start seeing patches without typical coarsely xlin (feld) or pseudo-porphyrific texture	4	1	0	0	1		1	2			0	↑			3				2				EXPACPC14-3-562
3257	64		4	1	0	0	1		1	1			0	↑			3				2				EXPACPC14-3-563
3262	64	horsetail gyp/py/spec microvnlt subparallel tca	4	2	0	0	1		1	2		3-4 k-alt	0	↑			3				3				EXPACPC14-3-564
3267	64		4	2	0	0	1		1	2			0	↑		just over 1% spec	3				2				EXPACPC14-3-565
3272	64		4	1	0	0	1		1	1			0	↑			3				1				EXPACPC14-3-566
3277	64	feld mega-pheno (porphyroblast) at 3277.9 (3cm x 9mm)	4	1	0	0	1		1	1			0	↑			3				1				EXPACPC14-3-567
3282	64	v minor fault/gyp vnlt (60 tca) at 3281.5 with odd peripheral stylolite-microfxs;	4	2	0	0	1		1	1			0	↑		spec? in stylolite-microfxs	3				1				EXPACPC14-3-568
3287	64		4	2	0	0	1		1	1			0	↑		4 py = slight increase on fxs (3-5% total py)	4				1				EXPACPC14-3-569
3292	38	Tphs dike; irreg (and not sharp) contact at approx 3288.3;	5	1	0	0	2		0	3			0	↑		4-7% py, much of it in hairline micro-fxs	4				1	3-calc: suprised that dike is weak to mod calcareous;			EXPACPC14-3-570
3297	38	seriate porphyritic phonolite dike cont.; minor banding at 30 tca	5	1	0	0	2		0	2			0	↑			4				0				EXPACPC14-3-571
3302	38	trace fluorite!	5	1	0	0	2		0	3			0	↑		3-5% py	4			41	1	41 gangue = vfg fluorite dissem and in micro-fxs; very minor gyp vnlt; calcareous dike!			EXPACPC14-3-572
3307	38		5	1	0	0	2		0	2			0	↑			4			41	1				EXPACPC14-3-573
3312	38	tr fluorite cont.	5	2	0	0	2		0	1			0	↑		4-5% py and 1-2% assoc d gy min (spec?)	4			41	1				EXPACPC14-3-574
3317	38		5	1	0	0	2		0	1			0	↑			4			41	1	up to 1% fg dissem fluorite			EXPACPC14-3-575
3322	38		5	1	0	0	2		0	1			0	↑			4			41	1				EXPACPC14-3-576
3327	38		5	1	0	0	2		0	1			0	↑			4			41	1				EXPACPC14-3-577
3332	38	Tphs dike to approx 3331 then steep contc (15-20 tca) with calcareous	5	1	0	0	2		0	3		(cont) gyp vn; can't rule out that "calc gyp" vn is dolomite??	0	↑		(cont) -30 tca; 10 struc = probable healed fault (dike and thick gyp vn);	4			41	4	wall rock (Tphs) esp calcareous near calcareous gyp vn; galena on fxs - w possible op2			EXPACPC14-3-578

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 40 of 52	

HOLE_ASSAY_SAMPLE																										
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER	
3332	38	Tphs dike to approx 3331 then steep contc (15-20 tca) with calcareous gyp/anhydrite to 3333.1 (det 25)	5	1	0	0	2		0	3		(cont) gyp vn; can't rule out that "calc gyp" vn is dolomite??	0			(cont) ~30 tca; 10 struc = probable healed fault (dike and thick gyp vn); odd magnetite flecks in g	4			4	4	wall rock (Tphs) esp calcareous near calcareous gyp vn; galena on fxs - w possible cp?			EXPACPC14-3-578	
3337	64	dissem fluorite cont on into pC leucogranite;	4	1	0	0	1		2	0			0	1		3 py = gen 3-4%	3			4	4				EXPACPC14-3-579	
3342	64	start seeing black biotite patches in non-foliated leucogranite at ~3339.4, along w lenticular feld	3	1	0	0	1		2	1		(cont) closely assoc biotite;	0	1		(cont) porphyroblasts (irreg 3x1 cm) that could pass for augen (as in augen gneiss); increase py w c	4				1	looked for fluorite			EXPACPC14-3-580	
3347	71	odd stretched feld porphyroblasts: augen gneiss-like;	3	1	0	0	1		2	1			0	1			3				2				EXPACPC14-3-581	
3352	72	gneiss grades into (calcareous) biotite schist at ~3347.5;	3	1	0	0	1		2	3			0	1			3				2	calcareous biotite schist;			EXPACPC14-3-582	
3357	72		3	1	0	0	1		2	1			0	1			3				2				EXPACPC14-3-583	
3362	72	mostly black biotite schist w subordinate lenses leucogranite	3	1	0	0	1		2	1			0	1			3				2				EXPACPC14-3-584	
3367	72		3	1	0	0	1		2	2			0	1			3				2				EXPACPC14-3-585	
3372	71	schist to 3369, then mostly leucogranite;	4	1	0	0	1		2	1			0	1			3				2				EXPACPC14-3-586	
3377	71	curvilinear foliation: -20 to +20 tca;	4	1	0	0	1		2	1			0	1			3				2				EXPACPC14-3-587	
3382	71	mostly leucogranite w deformed pods / (lava lamp) blobs schist; augen-like porphyroblast alligned at	4	1	0	0	1		2	1			0	1		(cont) 50-60 tca;	4				1				EXPACPC14-3-588	
3387	71	"spindle" porphyroblasts (eg 6 cm x 8mm) at 30-35 tca;	4	2	0	0	1		2	1			0	1			3				1				EXPACPC14-3-589	
3392	64	mostly leucogranite w pegmatitic patches	4	1	0	0	1		2	1			0	1			3				2	60-min = possible vfg galena (w py and gyp/anhyd?) on fxs;			EXPACPC14-3-590	
3397	71	gneiss: foliation at 35 tca - and 45 tca;	4	1	0	0	1		2	1			0	1			3				2				EXPACPC14-3-591	
3402	71		4	1	0	0	1		2	1			0	1			3				2				EXPACPC14-3-592	
3407	71	stretched augen-like felsic porphyroblasts at 35-40 tca;	4	1	0	0	1		2	1			0	1			3				1				EXPACPC14-3-593	
3412	64	below 3409 mostly leucogranite, with very distinct myrmekitic texture (3410.7 - 3414.4)	4	1	0	0	1		1	1			0	1			3				1				EXPACPC14-3-594	
3417	71	thinly foliated biotite gneiss, w foliation at 50 tca (and locally folded/curved)	4	1	0	0	1		2	0			0	1			3			4	1	41-min = dissem fluorite w py on some fxs;			EXPACPC14-3-595	

Cripple Creek-Victor Gold Mining Company																										
Hole Name: CPC14-3			Collar Azimuth: 53.24				Collar Inclination: -71.44							Hole Length: 4368.00												
northsouth_decimal: 62679.189			eastwest_decimal: 38119.054				elevation: 10359.47						Print Page 41 of 52													
HOLE_ASSAY_SAMPLE																										
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER	
3417	71	thinly foliated biotite gneiss, w foliation at 50 tca (and locally folded/curved)	4	1	0	0	1		2	0			0	1			3			41	1	41-min = disse fluorite w py on some fxs;			EXPACPC14-3-598	
3422	71	7 mm py-fluor-gyp-calcite vnlit (25 tca) at 3420.6; sharp, planar, almost lamellar, foliation at 3422	4	1	0	0	1		2	2			0	1		(cont) see photo;	4			42	1	42 = calcite-fluorite-py-gyp vnlit			EXPACPC14-3-599	
3427	64	mostly leucogranite with <0.6 ft schist bands; irreg dike contact at 3425.7;	4	1	0	0	1		1	1			0	1			3			41	1	tr fluorite assoc w gyp/anhyd vnlt;			EXPACPC14-3-597	
3432	22	m gy aphanitic phonolite dike w 2-3% 1.5 x 6mm feld phenos; lower cntc 75-80 tca;	5	0	0	0	1		0	2			0	1			4			41	0	2-carb = calcareous Tphd dike! Also, tr calcite vnlt (2mm); 60 = trace galena? (vfg d gy min)			EXPACPC14-3-598	
3437	64	leucogranite w sparse streaky bands / lenses biotite schist (20 tca); dike cntc at 3434.3 (20 tca)	4	1	0	0	1		1	1			0	1			3				1	looked for fluorite;			EXPACPC14-3-599	
3442	38	Tphs dike (3434.3 - 3439.7); lower cntct (25 tca) w 0.2 ft black biotite schist band (25 tca), then	5	1	0	0	3		0	1			0	1		(cont) leucogranite;	4				1	a/a; dike is very weakly calcareous			EXPACPC14-3-600	
3447	72	black biotite schist, w 1-3mm gyp/anhyd vnlt, starts at 3441;	3	1	0	0	1		2	1			0	1			3				2				EXPACPC14-3-601	
3452	72	a/a, foliation at ~25 tca; weak fizz to "gyp/anhyd" vnlt (10 tca); could be combination w calcite -	3	1	0	0	1		2	2			0	1		(cont) or even dolomite? 2-3% py;	3				2				EXPACPC14-3-602	
3457	71	ptygmatic folds at schist/leucogranite (gneiss) cntc at 3454.8 (migmatite?); gneiss foliation at 35	3	1	0	0	1		2	1			0	1		2-4% py	3				2				EXPACPC14-3-603	
3462	71	possible mafic dike (calc lampro?) finger 3459.2-3460.2 w irreg cntc w schist;	3	1	0	0	1		2	3		lamprophyre or mafic dike is 3-4 k-alt	0	1			4				3				EXPACPC14-3-604	
3467	72	irreg contact w Tphu dike (slightly feld-phyric: too much for Tphd? Tphk?) at 3465.2 (-3468.3) Note:	5	1	0	0	2		2	2		(cont) eg dike and 3 ft sample; k-5 refers to dike, as does sericite, fluorite.	0	1		(cont) for "envirinmental (hole)" purposes, asked to log at 5 ft intervals and not break out lith, e	3			41	2	Sulf and carb refers to schist;			EXPACPC14-3-605	
3472	71	diffuse-gradational cntc dike w biotite gneiss at 3468.3; fluorite and minor cream-wh clay assoc w	3	1	0	2	1	3	3	1		(cont) greenish-gy (chlor?); 2-argil = minor wh clay assoc w gyp-fluor vnlt;	0	1		(cont) with gyp/anhyd vnlt at 20 tca; at 3471.3, black biotite schist is bleached to more of a m gr	4			41	2			EXPACPC14-3-606		
3477	22	Tphd? dike w 2-3% feld phenos starts at 3474.1 (irreg cntct), immed below ~1.1 ft of heterolith schi	5	1	0	0	2		3	1		(cont) 20 tca;5-k is dike	0			(cont) schist-Tph bx; dike intruded into fault? jump in fluorite% and presence of clear gyp vnlt (2	4			41	2	41 = trace to 3% disse fluorite (in bx)			EXPACPC14-3-607	
3482	71	lower dike contact w leucogranite at 3476.6 (sharp, 70 tca); could pass for mylonite gneiss w augen-	4	1	0	0	1		1	1			0	1		(cont)-like lenses and subtle granulation texture; foliation at 20 tca, as well as 60;	4			41	1	trace only fluorite (as compared to above)			EXPACPC14-3-608	
3487	42	above rock (71, to 3483.8) is actually more of a thinly foliated (mylonitic? shear zone) leucogranit	4	1	0	0	1		0	1		(cont) mixed bx clasts at 3483.9; could actually pass for Tphkx to ~3486;	0	1		(cont) e w little biotite; start seeing streaky lenses (20 tca) feld-phyric phono at 3483.8, then mi	4			41	1	1-2% fluorite			EXPACPC14-3-609	
3492	42	CC Bx or Tphkx? Clasts (porphyritic) poorly defined w possible feld-phyric (bx) matrix; clasts mostl	4	1	0	0	3		0	1		weak k-4	0	1		(cont) phono w subord pC; positive id bx-in-bx clasts; gen 4-5% py, w locally 7%;	4			41	1	trace only carbonate			EXPACPC14-3-610	
3497	42	42 or 30? a/a gen matrix-supported heterolithic (Tert and pC) bx; still can't tell if matrix is xtl	4	1	0	0	3		0	1			0	1		(cont) tuff or phyrlic phonolite;	4			41	1	a/a			EXPACPC14-3-611	
3502	42	WILL LOG as 42, but some intercepts look like Tphkx (30)	4	1	0	0	2		0	1			0	1			4			41	1	patches w up to 3% fluorite; some select bx frags higher;			EXPACPC14-3-612	
Scale 1:180											April 15, 2015											01:23 PM				

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3		Collar Azimuth: 53.24		Collar Inclination: -71.44		:		Hole Length: 4368.00	
northsouth_decimal: 62679.189			eastwest_decimal: 38119.054		elevation: 10359.47			Print Page 42 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	mineralization	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
3502	42	WILL LOG as 42, but some intercepts look like Tphkbx (30)	4	1	0	0	2		0	1			0	1			4			4	1	patches w up to 3% fluorite; some select bx frags higher;			EXPACPC14-3-612
3507	30	here logged as 30 to bring attention to CC bx vs Tphkbx "dilema" (looks like Tphkbx here - is matrix	4	1	0	0	2		0	0			0	1		(cont) xtl tuff or feld-phyric phono??)	4			4	0				EXPACPC14-3-613
3512	42	fluorite grains commonly assoc w py	4	1	0	0	2		0	0			0	1		tr only spec, if present at all;	4			4	0				EXPACPC14-3-614
3517	42	1 cm gyp/anh? - fluorite-py-qtz (xtls) vnlt at 3512.4 (25 tca);	4	1	0	0	2		0	1			0	1			4			4	2	5-qtz = qtz xtls in gyp/anhyd vnlt			EXPACPC14-3-615
3522	42	patches can pass for Tphs w heterolithic bx clasts; major fx (10 tca, gyp/anhyd vn) at 3521	4	1	0	0	2		0	0			0	1			4			4	1				EXPACPC14-3-616
3527	42	leucogranite clasts to 10 cm; 42 vs 30 (Tphsbnx)? cont.; fluor-py fxs present	4	1	0	0	2		0	0			0	1			4			4	0				EXPACPC14-3-617
3532	42	as above, can't tell if Tphs is clasts or bx matrix? 1-2mm gyp/anhv vnlt at 20-25 tca;	4	1	0	0	2		0	1			0	1			4			4	2				EXPACPC14-3-618
3537	42	need rock code for "undiff volc bx"!	4	1	0	0	2		0	1		strong k-4 alt	0	1			4			4	1				EXPACPC14-3-619
3542	42	1 cm "window pane" clear gyp vnlt at 3537.7 (25 tca); d gy vfg n/mag min in selvage (spec? sp? gn?)	4	1	0	0	2		0	1			0	1			4			4	3	~ 2% dissemin fluorite			EXPACPC14-3-620
3547	38	~ 4-5? cm clear, coarsely xtl'n "window pane" gyp vn extends from 3545 to 3546.7; gyp surrounds (x-se	5	1	0	0	2		0	2		(cont) a Tphs dike; gyp vn and Tphs dike ~ 15-20 tca;	0	1		(cont) ctions of qtz xtls to 1 cm dia.; rock ~3543 to 3546.7 footwall of vn is clast-free and likely	4			4	4	5-qtz = qtz xtls in gyp vn			EXPACPC14-3-621
3552	42	CC Bx or Tphs bx cont.; 1 cm py-fluorite-qtz? (hard to tell w k-5 wall rock) vnlt at 3552 (30 tca)	5	1	0	0	2		0	1		(cont) NOT split a vnlt into two 5 ft samples. D'oh! 4-5 k-alt	0	1		(cont) REMEMBER: this hole is sampled every 5 ft for environmental considerations (otherwise would N	4			4	0				EXPACPC14-3-622
3557	42	uplish gyp/anhvd vnlt (<5mm, 15 tca) w fluorite selvages present;	4	1	0	0	2		0	1		strong k-4	0	1			4			4	3	42 = fx-fill fluorite			EXPACPC14-3-623
3562	42	5 mm gyp/anhvd/fluorite vnlt at 3557 (15 tca) expands to 1.5 cm immed below; qtx xtls in clear "wind	5	1	0	0	2		0	1			0	1		(cont) "window pane" gyp up to 1 cm diameter.	4			4	4	5-qtz = qtz xtls in gyp vn; trace only calcareous ("pinhead" sources)			EXPACPC14-3-624
3567	42	6-10mm qtz-fluor-gyp-py vnlt (20 tca) at 3563;	4	1	0	0	2		0	1		k-5 "selvage" on qtx-fluor-py vnlt	0	1			4			4	3				EXPACPC14-3-625
3572	42	(30, Tphsbnx) 3cm qtz-fluorite vn (3 cm, 20-30 tca) at 3570.6; cntr of vn is chalcedonic banded (clr/	4	1	0	0	2		0	2			0	1		(cont) milky wh) qtz;	4			4	2	2-qtz = chalcedonic-banded qtz in center of fluorite vn (only minor py; tr gn? vfg tell??)			EXPACPC14-3-626
3577	42	IMPORTANT: Rx below are several intimately mixed varieties of hetero (Tert, pC) volc bx; for simplif	4	1	0	0	2		0	1		(cont) s are "broken-out" using (rx code) in lith column. Varieties are: (42), true CC Bx; (30), Tp	0	1		(cont) ication purposes (modelling) used 42 (CC Bx) to group all varieties. Where possible, varietie	4			4	2	(cont) Tphkbx and Tphsbnx (bx with Tphk and/or Tphs matrix; and (43), xtl-lithic bx (xtl-lithic lapil			EXPACPC14-3-627
3582	42	(30, Tphsbnx); could pass for Tphs w pC and Tert clasts;	4	1	0	0	2		0	2			0	1		3-5% py;	4			4	0				EXPACPC14-3-628
3587	42	(30) a/a, sparse lithics;	3	1	0	0	2		0	2			0	1			4			4	1				EXPACPC14-3-629

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 43 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	Spessartine	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematization	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
3587	42	(30) a/a, sparse lithics;	3	1	0	0	2		0	2			0	1			4			41	1				EXPACPC14-3-629
3592	42	(30) looks like Tphk w sparse fg (<1cm) lithics;	3	1	0	0	2		0	2			0	1			4				1	looked for fluorite, trace only if present;			EXPACPC14-3-630
3597	42	(30) looks like Tphs w sparse (<5%, gen < 2cm) lithics	4	1	0	0	2		0	2			0	1			4			42	1	42 = 2-3 mm qtz-fluor vnlt at 3595.4 (10 tca) and 96-97;			EXPACPC14-3-631
3600	42	(43) 3 ft sample = end HQ; deformed lenticular "lapilli" Tphs and subtle eutaxitic texture suggest possible	4	1	0	0	2		0	1			0	1		(cont) ibble welded tuff;	4				0	looked for fluorite;			EXPACPC14-3-632
3605	42	(30) No recovery 3601-04	4	1	0	0	2		0	0			0	1			4				0				EXPACPC14-3-633
3610	42	(30, Tphkx)	3	1	0	0	2		0	0			0	1			4				0				EXPACPC14-3-634
3615	42	(30) possible Tphk dike (no clasts) at 3614.1-3623.4; upper cntc ~50 tca, lower, 15 tca;	4	1	0	0	2		0	0			0	1			4				0				EXPACPC14-3-635
3620	34	possible Tphm? - w skeletal mafics? - dike	5	1	0	0	2		2	0		2-propyl = possible alt'd skeletal mafics	0	1		3-5% py cont.	4				2				EXPACPC14-3-636
3625	34		5	1	0	0	2		2	0			0	1			4			41	2	trace dissem fluorite + in microfxs			EXPACPC14-3-637
3630	42	(30, Tphk/Tphs bx) looks like mixed patches Tphk and Tphs w sparse lithics;	4	1	0	0	2		0	0			0	1			4			41	0				EXPACPC14-3-638
3635	42	(30, Tphkbx); increase clasts but still predom matrix-supported	3	1	0	0	2		0	0			0	1			4			41	1				EXPACPC14-3-639
3640	42	(30) here looks like typ CC Bx - only matrix is Tphk;	4	1	0	0	2		0	0			0	1			4			41	0	1% dissem fluorite			EXPACPC14-3-640
3645	42	(30); 1.5 cm gyp/anhyd? vn (20 tca) at 3641;	4	1	0	0	2		0	0			0	1		locally consistent 5% py	4			41	2				EXPACPC14-3-641
3650	42	(42, CC Bx) at ~3643.4 becomes more like typical CC bx, with patches that are typ Tphk	4	0	0	0	2		0	0			0	1			4			41	2				EXPACPC14-3-642
3655	42	(30, Tphkbx) pC lapilli/clasts not uncommon;	4	1	0	0	2		0	0			0	1			4			41	0	trace only dissem fluorite			EXPACPC14-3-643
3660	42	(30, Tphkbx) Tphs clasts not uncommon;	4	1	0	0	2		0	0			0	1			4			41	1	a/a			EXPACPC14-3-644
3665	42	(43) subtle eutaxitic texture (not prevalent) suggest possible welded xtl-lithic lapilli tuff;	4	1	0	0	2		0	0		patches k-5 alt	0	1			4			41	1	a/a			EXPACPC14-3-645
3670	42	(30, Tphkbx)	4	0	0	0	2		0	0			0	1			4			41	1	1-2% dissem fg fluorite			EXPACPC14-3-646
3675	42	(30) Tphs w sparse lithics; looks like Tphs w sparse lithics	4	0	0	0	2		0	0			0	1			4			41	1	trace only fluorite			EXPACPC14-3-647

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3		Collar Azimuth: 53.24		Collar Inclination: -71.44		:		Hole Length: 4368.00	
northsouth_decimal: 62679.189			eastwest_decimal: 38119.054		elevation: 10359.47			Print Page 44 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	mineralization	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
3675	42	(30, Tphsbx) looks like Tphs w sparse lithics (including pC)	4	0	0	0	2		0	0			0	1			4			41	1	trace only fluorite			EXPACPC14-3-642
3680	42	(30, Tphsbx) real "dogs breakfast" melange; some feld-phyric bands (~45 tca) may be dike stringers?	5	1	0	0	2		0	2		4-5 k-alt	0	1		(cont) or bedded xtl tufts?	4			41	2	2-carb = some calcite assoc w gyp/anhyd vnlt			EXPACPC14-3-648
3685	42	(30, Tphkbx)	5	0	0	0	2		0	0		4-5 k-alt	0	1			4			41	1	1% fluor			EXPACPC14-3-648
3690	42	(30, Tphsbx); 1.5 cm clear gyp vnlt (+/- dolo or calcite?) 15 tca at 3689.5; some feld phenos appear	5	1	0	0	2		0	2		solid k-5	0	1		(cont) fragmental, as per an explosive xtl tuff - or tectonic? (see below)	4			41	2				EXPACPC14-3-650
3695	82	used 82 for clast-support tect bx (do not like "late-stage" nomenclature); appear to be 2 healed bx	5	1	0	0	2		0	2			0			(cont) bx bands (15-25 tca) at 3694 and 3696 w a 6-8 cm gyp vn (+/- dolo? calcite), 25 tca, at 3695;	4			41	4				EXPACPC14-3-651
3700	82	healed tectonic bx (k-5) extends to ~3696, then more CC Bx-like Tphkbx (30)	5	0	0	0	2		0	0			0				4			41	1	>1% dissemin fluorite;			EXPACPC14-3-652
3705	42	(30, Tphkbx) looks like Tphk w sparse bx clasts (lapilli); ~1cm fluorite-gyp-py vns at 3704 and 3705	5	1	0	0	2		0	2			0	1		(cont) vns at 25 tca;	4			43	3	2-carb = weak fizz to fluorite-gyp vns			EXPACPC14-3-653
3710	42	(30, Tphsbx) same bx a/a but more of a seriate-porphyrific texture (matrix); impressive stretch of k	5	0	0	0	2		0	1			0	1		(cont) k-5 alt'd rock (mineralized?)	4			43	3				EXPACPC14-3-654
3715	42	(42! CC Bx) another 6-8mm fluor-gyp vn (15 tca, 3710.5) - this one with qtz, calc, dolo? and a thin	4	0	0	0	2		0	2			0	1		(cont) py selvage;	4			43	3	5-qtz = qtz in fluorite vn at 3710.5			EXPACPC14-3-655
3720	42	(42) pC lapilli present; possible Tphk dike stringer - or clast? - (0.3 ft) at ~3719;	4	0	0	0	2		0	0			0	1		up to 7% py	4			41	2				EXPACPC14-3-656
3725	42	(42, CC Bx)	3	0	0	0	2		0	0			0	1			4				2	looked for fluorite; 3mm gyp vnlt mostly at 10 tca			EXPACPC14-3-657
3730	42	(42, CC Bx) 1 cm fluorite-gyp-qtz-py vnlt at 3726.7 (20 tca)	4	0	0	0	2		0	2			0	1			4			43	3	2-carb = weak fizz to fluor-gyp vn (dolo? minor calcite?)			EXPACPC14-3-658
3735	42	(42, CC Bx)	4	0	0	0	2		0	2			0	1			4			41	2	2-carb = weak fizz in gyp vnlt			EXPACPC14-3-659
3740	42	(30, Tphkbx) below 3733.3, becomes more of a (heterolithic) Tphk-matrix bx;	4	0	0	0	2		0	0			0	1			4			41	1				EXPACPC14-3-660
3745	42	(30, Tphkbx)	4	1	0	0	2		0	1			0	1			4			41	2				EXPACPC14-3-661
3750	42	(30, Tphkbx)	4	1	0	0	2		0	0			0	1			4				1	looked for fluorite;			EXPACPC14-3-662
3755	42	(30, Tphkbx)	4	1	0	0	2		0	0			0	1			4				1				EXPACPC14-3-663
3760	31	possible Tphk dike at 3756.7 (50 tca?)	4	1	0	0	2		0	0		weak k-4	0	1			4				2	avo/anhyd? vnlt? (1-3mm) subparallel tca			EXPACPC14-3-664

Cripple Creek-Victor Gold Mining Company																										
Hole Name: CPC14-3			Collar Azimuth: 53.24				Collar Inclination: -71.44							Hole Length: 4368.00												
northsouth_decimal: 62679.189			eastwest_decimal: 38119.054				elevation: 10359.47													Print Page 45 of 52						
HOLE_ASSAY_SAMPLE																										
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER	
3760	31	possible Tphk dike at 3756.7 (50 tca?);	4	1	0	0	2		0	0		weak k-4	0	↑			4				2	gyp/anhyd? vnltls (1-3mm) subparallel tca;			EXPACPC14-3-664	
3765	31	a/a, start seeing sparse lith frags at 3763.3, then very gradational cntct to actual Tphkbx at ~3764	4	0	0	0	2		0	0			0	↑		(cont) 3764.5;	4				2	a/a cont.			EXPACPC14-3-665	
3770	42	(30, Tphkbx)	3	1	0	0	2		0	0			0	↑			4				0				EXPACPC14-3-666	
3775	42	(30, Tphkbx) start seeing "mylonite-gneiss" frags (to 13 cm) as per shear-zone pC/Tert contact at ~3	4	1	0	0	2		0	0			0	↑		(cont.) 3480	4				0	even pC frags are not calcareous			EXPACPC14-3-667	
3780	42	(30, Tphkbx) bleaching (alteration) obscures Tphk feld-phyric matrix;	3	2	0	0	2		0	0			0	↑			4				1				EXPACPC14-3-668	
3785	42	(30, Tphkbx)	4	1	0	0	2		0	0			0	↑			4			4	1				EXPACPC14-3-669	
3790	42	(30, Tphkbx) a/a, but with patches seriate texture;	3	1	0	0	2		0	0			0	↑			4			4	1				EXPACPC14-3-670	
3795	42	(30, Tphkbx) pyritization of select clasts	4	0	0	0	2		0	0			0	↑			4			4	0				EXPACPC14-3-671	
3800	42	(30, Tphkbx)	4	0	0	0	2		0	0		weak k-4	0	↑			4			4	1				EXPACPC14-3-672	
3805	42	(30, Tphsxb) mostly seriate porphyritic (matrix) texture; sparse lapilli - could locally pass for Tp	4	0	0	0	2		0	0			0	↑		(cont) Tphs	4			4	1	1% dissem fg fluorite			EXPACPC14-3-673	
3810	42	(30, Tphsxb) a/a	4	0	0	0	2		0	0			0	↑			4			4	0				EXPACPC14-3-674	
3815	42	(30, Tphsxb) hairline fluorite micro-vnltls subparallel tca	4	0	0	0	2		0	1			0	↑			4			4	1	a/a + micro-fx 5 tca; trace carbonate in fluorite micro-fxs			EXPACPC14-3-675	
3820	42	(30, Tphsxb) looks like Tphs w sparse lithics; calcareous gyp/fluorite microvnltls a/a;	4	0	0	0	2		0	1			0	↑			4			4	2				EXPACPC14-3-676	
3825	42	(30, Tphsxb)	4	0	0	0	2		0	0			0	↑			4			4	1	1-2% dissem fluorite; "horsetail" gyp vnltls (subparallel tca) "die out" ~3821;			EXPACPC14-3-677	
3830	42	(42, CC bx) Tert and pC clasts to 14 cm;	4	0	0	0	2		0	0			0	↑			4			4	0				EXPACPC14-3-678	
3835	42	(30, Tphsxb) mostly Tphs matrix;	4	0	0	0	2		0	0			0	↑			4			4	0				EXPACPC14-3-679	
3840	42	(42, CC bx) below 3834.5 looks like CC Bx; k-5 alt'd w increase fg py (to 7%)	5	0	0	0	2		0	0			0	↑		up to 7% vf-fg dissem py;	4			4	1				EXPACPC14-3-680	
3845	42	(42, CC bx) CC Bx to ~3843, then more T	5	0	2	0	2		0	0		bnds/lenses suggest possible Qtz flooding	0	↑		a/a	4		4	2	11-Qtz = odd irreg. lense (3mm x 3cm) bluish Qtz at			EXPACPC14-3-681		
Scale 1:180													April 15, 2015										01:23 PM			

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 46 of 52	

HOLE_ASSAY_SAMPLE																										
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER	
3845	42	(42, CC bx) CC Bx to ~3843, then more like a Tphs w sparse lith frags;	5	0	2	0	2		0	0		2-silic: odd, irreg qtz pods/lenses suggest possible qtz flooding	0	↑		a/a	4		11	41	2	11-qtz = odd irreg lense (3mm x 3cm) bluish qtz at ~3840.9; dissem fluor in gyp vnlt;			EXPACPC14-3-685	
3850	42	(30, Tphs bx); 3843.3 - 3852.3: series of at least 5 fluorite-gyp vnlt (5mm - 2 cm, 20-25 tca) that	4	0	0	0	2		0	2			0	↑		(cont) appear to part and join ("braided")	4			43	4	2-carb = weakly calcareous fluor-gyp vns			EXPACPC14-3-685	
3855	38	lith frags become scarce below 3851.3: logged as Tphs;	5	0	0	0	3		0	1		k 4-5;	0	↑			4			43	3				EXPACPC14-3-685	
3860	38	Tphs w <3% lith frags;	4	1	0	0	2		0	2			0	↑			4			43	2	1-2 mm fluorite vnlt cont; weak calc assoc w gyp/anhyd vnlt a/a			EXPACPC14-3-685	
3865	38		4	0	0	0	2		0	0			0	↑			4			41	0				EXPACPC14-3-685	
3870	38		3	0	0	0	2		0	1		3-4 k-alt	0	↑			4			41	1				EXPACPC14-3-685	
3875	38		3	1	0	0	2		0	0			0	↑			4				1	looked for fluorite;			EXPACPC14-3-685	
3880	38		4	1	0	0	2		0	1			0	↑			4			42	1	fluorite in gyp vnlt			EXPACPC14-3-685	
3885	38	slight increase lith frags (to 7 cm, still <3%)	3	2	0	0	2		0	1			0	↑			4				2				EXPACPC14-3-685	
3890	42	(30, Tphs bx) a/a w ~5% frags in select horizons (most still looks like Tphs)	4	1	0	0	2		0	2			0	↑			4				2	4 mm gyp vnlt at 10 tca; entire rock fizzes - not just gyp vnlt selvages/margins			EXPACPC14-3-685	
3895	42	(30, Tphs bx) ~7-10% frags including pC	4	1	0	0	2		0	2			0	↑			4			41	1	clasts fizz more than Tphs			EXPACPC14-3-685	
3900	38		4	0	0	0	2		0	1			0	↑			4			41	1				EXPACPC14-3-685	
3905	38	Tphs w sparse lith frags cont; 4mm fluorite vnlt (10 tca) at 3904;	4	1	0	0	2		0	0			0	↑			4			43	1				EXPACPC14-3-685	
3910	38		4	1	0	0	2		0	2			0	↑			4			43	0	1-2 mm fluorite micro-vnlt present;			EXPACPC14-3-685	
3915	38	contains odd pods (to 0.7 ft) m gy apanitic rock w 2-3% slender feld laths (1x5mm); xtl tuff??	4	1	0	0	2		0	1		weak k-4	0	↑			4			41	1				EXPACPC14-3-685	
3920	38	Tphs w almost no lith frags	4	1	0	0	2		0	0			0	↑			4				1				EXPACPC14-3-685	
3925	38		4	2	0	0	2		0	1			0	↑			4			41	1				EXPACPC14-3-685	
3930	42	(30, Tphs bx) mixed frag matrix-supported	4	2	0	0	2		0	0			0	↑			4				1				EXPACPC14-3-685	

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 47 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitic	silicification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
3930	42	(30, Tphsbx) mixed frag matrix-supported Tphs bx (~10% frags)	4	2	0	0	2		0	0			0	↑			4				1				EXPACPC14-3-698
3935	38	mostly Tphs (lith frags still present)	4	1	0	0	2		0	0			0	↑			4			41	1				EXPACPC14-3-699
3940	42	(30, Tphsbx) Is this a lithic lapilli xtl tuff??	4	1	0	0	2		0	0			0	↑		up to 7% py	4				1				EXPACPC14-3-700
3945	42	(30, Tphsbx) in and out of zones with and without lithic lapilli;	3	1	0	0	2		0	0			0	↑			4				1				EXPACPC14-3-701
3950	42	volc bx a/a to 3946 - then mystery rock: k-5 shatter bx w stockwork py to ~3946.8; fluorite (+/-qtz)	5	1	3	0	0		0	0		(cont) eral to fluor vn/fault; back into volc. bx at ~3948; could be dike (3946-48) in re-act. fault	0			(cont) vn (8mm, 25-30 tca) may be minor fault? odd eutaxitic-like banding (40 tca) in patches periph	4			43	1	5-qtz= appears to be qtz below py-fluor in vn			EXPACPC14-3-702
3955	38	mostly Tphs w sparse lithics;	4	1	0	0	2		0	0		3-silic (above) refers to possible silic in shatter bx'd "dike"; low-grade min?	0	↑			4				1				EXPACPC14-3-703
3960	38	a/a w two fluor-gyp vns (7 mm, 15 tca) at 3959, 3960;	4	1	0	0	2		0	2			0	↑			4				43	3			EXPACPC14-3-704
3965	42	(30, Tphsbx)	4	2	0	0	2		0	0			0	↑			4				41	1			EXPACPC14-3-705
3970	38	a/a w fewer lithics (to 7 cm)	4	2	0	0	2		0	0			0	↑			4					1			EXPACPC14-3-706
3975	42	(30, Tphsbx); fluorite microvnls (1mm, 5 tca) are different than gyp vnls here;	3	2	0	0	2		0	0		3 and 4 k-alt	0	↑			4				42	2			EXPACPC14-3-707
3980	38	odd mottled texture (devitrification?) with "vermicular" patches; lithic lapilli sparse but present;	4	1	0	0	2		0	2			0	↑			4				42	1	fluor fxs cont.; wall rock calcareous		EXPACPC14-3-708
3985	38	a/a; xtl tuff??	4	2	0	0	2		0	1		strong k-4;	0	↑			4					2			EXPACPC14-3-709
3990	42	(30, Tphsbx) (lithics circled in blue for photos)	4	1	0	0	2		0	0			0	↑			4					0			EXPACPC14-3-710
3995	42	(30, Tphsbx) odd mottled (l gy/m gy) texture - could be k-4/5 alteration;	5	1	0	0	2		0	0		k-4 and 5;	0	↑			4					1			EXPACPC14-3-711
4000	42	(30, Tphsbx) still < 5% clasts (in Tphs-like matrix); can't rule out massive lithic-xtl tuff;	5	1	0	0	2		0	1			0	↑			4					1			EXPACPC14-3-712
4005	42	(30, Tphsbx) subtle (lithic xtl tuff?) banding at 60 tca; 4003.3-4009.9 is zone of multiple minor fa	5	2	0	0	2		0	1			0				4				43	3	5-qtz = discont qtz present in some fluor vns		EXPACPC14-3-713
4010	42	(30, Tphsbx); 4003.3-4009.9 "sheeted" (fault) zone cont.; main fault limb - w comminuted material an	5	1	0	0	2		0	1		k 4-5;	0			(cont) and slivers possible Tphd dike material at 4008-09;	4				43	3	some very "bright" py - cannot rule out vfg tellurides; carb mostly assoc w fluorite vns;		EXPACPC14-3-714
4015	42	(30, Tphsbx) increase lith frags (to ~15%	4	1	0	0	3		0	0			0	↑			4				41	2	1-2% dissem fluorite; gyp/anhyd? vnls cut across b		EXPACPC14-3-715

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 48 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
4015	42	(30, 1 phs bx) increase lith frags (to ~15%); pC clasts (to 18 cm) strongly sericitized;	4	1	0	0	3		0	0			0	1			4			4	2	1-2% dissem fluorite; gyp/anhyd? vnlt cut across bx frags (lapilli)			EXPACPC14-3-715
4020	42	(42, CC bx) logged as true 42: seriate feld-phyric matrix texture not as prominent as above; 20-25%	4	1	0	0	3		0	1		strong k-4	0	1		(cont) lith frags, some with bleached rims;	4			4	1				EXPACPC14-3-716
4025	42	(42, CC bx) 30-40% clasts, locally clast-supported;	4	1	0	0	3		0	0			0	1		gen 3-5% py and 1% spec	4			4	1	~1% fluor			EXPACPC14-3-717
4030	42	(42, CC bx) below 4027: >75% frags, good mix lithologies; matrix is fg debris and commonly m gy apha	5	1	0	0	3		0	2		Tert matrix material is k-5 alt'd; gyp/anhyd vnlt host fluorite only where they cut clasts;	0	1		(cont) aphanitic material w ~3-5% vfg (1-5mm) feld phenos (xtl tuff?); patches cg py in leucogranite	4			42	1	leucogranite (cobbles, boulders) is weakly calcareous			EXPACPC14-3-718
4035	42	(42, CC bx) mostly leucogranite w ~15% Tert matrix material;	5	1	0	0	3		0	1		k-5 refers to bx/congl matrix and sericite 3 to leucogranite boulder/cobble "clasts"	0	1			4			4	0				EXPACPC14-3-719
4040	42	(42, CC bx) rock type is dominantly leucogranite, but Tert volc clasts still present; matrix is m gy	5	1	0	0	2		0	1			0	1		(cont) feld-phyric (fg) material;	4			4	2	dissem fluorite mostly in leucogranite; most carbonate assoc w gyp/anhyd? vnlt			EXPACPC14-3-720
4045	42	(42, CC bx) last good Tert matrix/lense is at 4045.3; clasts (cobbles, boulders?) mostly leucogranit	5	1	0	0	2		0	1		k-5 = Tert volc matrix	0	1		(cont) e and biotite schist (minor);	3			4	2				EXPACPC14-3-721
4050	42	(42, CC bx) matrix appears to be mostly fg Tert and pC "grit"	4	2	0	0	2		0	1			0	1			4			4	0				EXPACPC14-3-722
4055	64	64, leucogranite = 5.1 ft boulder, 4048.7-4053.8; (LOGGED ROCK TYPE for ENVIRO Goals - still in mixe	4	1	0	0	2		0	1			0	1		(cont) d lith bx/conglomerate;	4			42	2	fluorite in microfxs(+py) and dissem;			EXPACPC14-3-723
4060	72	72 = schist cobbles in bx/conglomerate (to 0.7 ft) STILL in TERTIARY! bx-conglomerate;	4	0	0	0	2		0	1			0	1			4			43	2	4 mm gyp-fluorite vnlt present - with 2cm! bleached selvages;			EXPACPC14-3-724
4065	42	(42, CC bx) Tert volc clasts sparse, but still present;	5	2	0	0	2		0	0			0	1			4			4	1				EXPACPC14-3-725
4070	22	4067.5-4072.7: possible Tphd dike/sill/flow (45 tca, both cntcs) w ~3% fg slender (up to 1x9mm) feld	4	0	0	0	3		0	0		Tphd = 4 to 5 K-alt	0	1		(cont) phenos; below Tphd, rock (boulder?) is an augen-like biotite gneiss; 4-5% vfg py in Tphd	4			4	1				EXPACPC14-3-726
4075	22	see above: augen-like biotite gneiss below dike/sill/flow;	5	0	0	0	3		0	0			0	1			4			4	1				EXPACPC14-3-727
4080	42	used CC bx code, but few Tert clasts and little Tert matrix; v difficult to distinguish between pC c	4	0	0	0	2		0	0			0	1		(cont) clasts and granitic grus-like grit matrix;	4			4	1				EXPACPC14-3-728
4085	42	80% leucogranite and 20% l gy aphanitic rock w sparse fg feld laths (a/a); can't rule out that volc	4	1	0	0	2		0	0			0	1		(cont) "matrix" is fingers of dike (see above 22)	4			4	1				EXPACPC14-3-729
4090	42	similar to above; Tert volc clasts sparse, but present;	5	1	0	0	2		0	0			0	1			4			4	0				EXPACPC14-3-730
4095	42	a/a, mostly leucogranite (cobbles, boulders?) w irreg pods l gy xtl-tuff-like	4	1	0	0	2		0	0			0	1		(cont) ible interstitial grus-like grit; 3-5% py	3				0	looked for dissem fluorite			EXPACPC14-3-731
4100	42	42 Tphd rock and possi component; fragmental to 4098.4 then	4	1	0	0	2		0	0			0	1		(cont) grus-grit? Hard to tell difference between clasts and matrix)	3				1				EXPACPC14-3-732

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
--------------------	-----------------------	----------------------------	---	----------------------

northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 49 of 52
-------------------------------	-----------------------------	---------------------	---------------------

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	Speckled	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
4100	42	42 = pC debris w minor Tert volc component; fragmental to 4098.4 then massive leucogranite (and augen)	4	1	0	0	2		0	0			0	1		(cont) grus-grit? Hard to tell difference between clasts and matrix)	3				1				EXPACPC14-3-732
4105	42	a/a, mostly biotite gneiss and schist; positive id Tert feld-phyric clasts below 4104.3;	4	1	0	0	2		0	0			0	1			4				1				EXPACPC14-3-733
4110	42	leucogranite clasts (cobbles) well defined in m gy xtl-lithic tuff-like matrix;	5	1	3	0	2		0	1		3 silic = odd pods/lenses l-m gy qtz suggests possible silica flooding	0	1			3				1				EXPACPC14-3-734
4115	42	matrix-supported pC and Tert debris cont; includes biot schist; irreg feld-phyric lenses present	5	1	3	0	4		0	0		Tert volc = k-5; strong sericite alt of some pC clasts	0	1			4				2				EXPACPC14-3-735
4120	42	spectacular (countertop!) biot schist bx; matrix mostly granitic grit, but feld-phyric Tert clasts p	5	0	3	0	2		0	1		silica flooding is speculation only (knife leaves metal streak on m gy patches)	0	1		(cont) present;	4				2				EXPACPC14-3-736
4125	64	~0.4 ft band of mixed (including Tert) "pebbles and grit" above (irreg planar cntc, ~90 tca) leucogr	4	0	0	0	2		0	0		irreg l gy feld-phyric lense (1 cm, at 4121) may be filling of crack in bedrock or dike finger??	0	1		(cont.) -granite may be contact w pC "basement" of CC diatreme?? (will see on next table?)	4				0				EXPACPC14-3-737
4130	64	in-situ leucogranite? can't tell.	4	1	0	0	2		0	0			0	1		3-5% py	4				0				EXPACPC14-3-738
4135	85	back into mixed (pC+Tert) clast bx; use code 85, "Pre-C breccia" from manual for, pC clast bx w ~+90	4	0	0	0	2		0	0	12	K-4 of volc clasts (to 9 cm)	0	1		(cont) % pC clasts and gen <10 Tert volc clasts; ie. NOT "pre-Cambrian bx" but pC CLAST bx;	4				0	2-biot = (2%) possible secondary biotite? in leucogranite			EXPACPC14-3-739
4140	85	MASS-WASTING = rockslide off pC diatreme wall or horstblock? mostly leucogranite and comminuted grus	4	1	0	0	2		0	0	12		0	1		(cont) grus-like debris thereof;	4				0				EXPACPC14-3-740
4145	85	pC clast bx with <5% Tert clasts hosts 1 round (5cm) aplite "pebble";	5	0	0	0	2		0	0	11	k-5 refers to Tert. volc clasts;	0	1			4				1				EXPACPC14-3-741
4150	85	some bx clasts are broken-up/segmented schist bands;	4	0	0	0	2		0	0	11		0	1			4				1				EXPACPC14-3-742
4155	85	m gy grit matrix, subrnd to ang (<1-3mm); positive id feld-phyric phono clasts (5 cm)	5	0	0	0	2		0	0	11		0	1			4				0	1-2? will stop logging as is just speculation;			EXPACPC14-3-743
4160	85	here looks like matrix may be (Tert) volcanoclastic w possible feld pheno frags? Positive id phono f	5	1	0	0	2		0	1			0	1		(cont) bx clasts;	4				1	trace calc assoc w gyp/anhyd? vnltis;			EXPACPC14-3-744
4165	85	good mix bx frags incl augen-gneiss; biot schist, leucogr, feld-phyric phono; both clast and matrix-	5	0	0	0	2		0	0			0	1		(cont)-supported;	4				2				EXPACPC14-3-745
4170	38	38 = (4167.5-4170.2) Tphs-like rock: dike? sill? xtl tuff? planar lower cntc @85 tca;	5	1	0	0	3		0	1		3-sericite = "sparkling" feld phenos;	0	1			4				2				EXPACPC14-3-746
4175	85	85= pre-Cambrian CLAST bx cont; Tert clasts present (<5%)	4	1	0	0	2		0	0			0	1			4				1				EXPACPC14-3-747
4180	85		4	1	0	0	2		0	1			0	1			4				1				EXPACPC14-3-748
4185	85		4	1	0	0	2		0	1			0	1		locally up to 7% py;	4				1				EXPACPC14-3-749

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 50 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	spessartine	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	hematite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
4185	85		4	1	0	0	2		0	1			0	1		locally up to 7% py;	4				1				EXPACPC14-3-745
4190	85	very sparse Tert clasts - but still preset;	4	0	0	0	2		0	0			0	1			4				1				EXPACPC14-3-750
4195	64	4189.3-~4199.8: almost all leucogranite, possibly in-situ?? at ~4199.8 becomes a leucogranite bx w m	4	2	0	0	2		0	1			0	1		(cont) matrix almost indistinguishable from clasts ("grus"-like matrix); 2-spec after biotite	4				1				EXPACPC14-3-755
4200	64		4	1	0	0	2		0	0			0	1			4				0				EXPACPC14-3-752
4205	85	increase matrix at 4201 - up to 35% w some matrix-support bx;	4	0	0	0	2		0	1			0	1			4				1				EXPACPC14-3-753
4210	85		5	1	0	0	2		0	0		Tert bx clasts K-5 alt'd	0	1			4				2				EXPACPC14-3-754
4215	85	feld-phyric phono bx clast up to 14 cm;	5	1	0	0	2		0	0			0	1			4				1				EXPACPC14-3-755
4220	85	biot schist bx frags to 15 cm	5	1	0	0	2		0	0			0	1			4				1				EXPACPC14-3-756
4225	85		4	1	0	0	4		0	0		locally (patches) strong sericite;	0	1			4		41	1	1	trace fluorite!			EXPACPC14-3-757
4230	85	2 cm gyp/anh? vnlt (30 tca) w fluor @ 4228.3;	4	0	0	0	4		0	1		select bx frags strong sericite	0	1			4				3				EXPACPC14-3-758
4235	71	bx texture present but subtle; abundant augen-gneiss; positive id Tert frag;	4	1	0	0	3		0	0		a/a	0	1			4		41	0	0	a/a			EXPACPC14-3-759
4240	71	4231.2 - 4240: could be in-situ (consistent)	4	0	0	0	2		4	0		(cont) 'd patches rich in biotite (block of in-situ schist in fault cntct w augen-gneiss??)	0	1		(cont) starting @4240; bx lense is in contact w d brownish gy rock that appears to have relict unalt	4				0				EXPACPC14-3-760
4245	72		2	0	0	2	2		4	0		2-argil = wh clay flecks in alt'd schist - don't know what clay is replacing;	0			up to 7-8% py in schist	4				0	5-qtz = trace qtz microvnlt in schist			EXPACPC14-3-761
4250	85	back into "pC-clast bx" at ~4250.1 (vague cntc @~ 35 tca); clasts of biot schist and leucogranite;	5	0	0	1	2		2	0			0			5-py = 7-10% py dissem and in stockwork microfxs; shatter-bx overprint suggests nearby fault (4250?)	5			41	0	41 = 1% dissem fg fluorite			EXPACPC14-3-762
4255	21	at 4255.1 cntct (55 tca) bx/d gy mystery rock w aligned vfg accicular py (after ?); n/mag, n/calc =	5	0	0	1	2		2	2		(cont) clay pinhead spots; sparse vfg feld-phyric lithic clasts suggest xtl-lithic tuff - or Tphd;	0			(cont) probably not a lamp; mafic dike?? at 4251.5 cntc (25 tca) w m gy aphanitic rock speckled w wh	4			41	3	>1% dissem fluorite in "dike"			EXPACPC14-3-763
4260	85	Tph dike? (above) necks down into bx-bound "channel" (4252.5-4253.5) w wavy gyp/fluor 1 cm vnlt exte	5	1	0	0	2		0	2		(cont) furcating horsetail py vnlt extend to ~4263; (photos show augen gneiss and schist, but other	0			(cont)-nding from there to ~4255.5 (5-10 tca); vn host micro-bx slivers; from there, bx seams and bi	4			41	2	(cont) side of core is bx!) "dike" stringers in bx are k-5;			EXPACPC14-3-764
4265	85	bx pinches out w py vnlt at ~4262.6, then biotite gneiss (fol 35-60 tca) and summary of above); possible	4	1	3	0	2		0	1		3-silic = possible silica flooding along fault, assoc w py-qtz vnlt	0				4			41	1	5-qtz = m gy qtz (vnlt?) w horsetail py vnlt			EXPACPC14-3-765
4270	85	low-grade MINERALIZED ZONE (4246-4262.6): shatter-bx w py	4	1	0	0	2		3	1		(cont) cont. - w no positive id Tert clasts; 3-propyl = alt'd schist	0	1		(cont) hangwall of fault/dike, then py (+/-qtz) horsetail vnlt in footwall to 4262.6 - 4263.1	4				1	1 carb: gyp/anhyd? vnlt weak fizz			EXPACPC14-3-766

Cripple Creek-Victor Gold Mining Company



Hole Name: CPC14-3	Collar Azimuth: 53.24	Collar Inclination: -71.44	:	Hole Length: 4368.00
northsouth_decimal: 62679.189	eastwest_decimal: 38119.054	elevation: 10359.47	Print Page 51 of 52	

HOLE_ASSAY_SAMPLE																									
depth_to	RockType	Lithology_Comment	potassic	sericitic	silification	argillic	Sericitic	bleached	Propylitic	carbonate	biotite	alt_comment	Oxidation	structure	contact	ox_comment	pyrite	marcasite	quartz	gangue	Sulfate	min_Comment	AuAvg_OPT_FA	AuAvg_OPT_SL	SAMPLE_NUMBER
		SUMMARY (of above): possible low-grade MINERALIZED ZONE (4246-4262.6): shatter-bx w py (85) "pC-clast bx"; Tert frags id'd in gritty m gy matrix; gyp vnlt (10 tca) cut matrix and clasts;																							
4270	85	sharp bx/gneiss cntct 4277.3 - could be large gneiss boulder? or in-situ gneiss? fol 35-40 tca;	4	1	0	0	2		3	1		(cont) cont. - w no positive id Tert clasts; 3-propyl = alt'd schist	0	1		(cont) hangwall of fault/dike, then py (+/-qtz) horsetail vnlt in footwall to	4				1	1 carb: gyp/anhyd? vnlt weak fizz			EXPACPC14-3-766
4275	85	sharp contact gneiss (above) w bx (4281.1); long stretches n/bx (2.2 ft) and consistent foliation (	4	0	0	0	2		2	1			0	1			4			41	2				EXPACPC14-3-767
4280	71	coded (34) undiff porph phono because no code for xtl tuff, suggested by fragmental feld phenos (7-1	4	2	0	0	2		0	0			0	1			3				0				EXPACPC14-3-768
4285	85	(85) "pC-clast bx" cont., can't find any Tert. clasts; clasts are pegmatite, biotite gneiss, and leu	4	1	0	0	2		0	1			0	1		(cont) (35 tca): boulders or in-situ pC?? Tert clasts rare but preset;	4			41	1				EXPACPC14-3-769
4290	34	a/a, looking for Tert clasts (none);	5	1	0	0	2		0	0		(cont) irreg contacts (4287.8-4291.6) w 15cm leucogranite clast at bottom;	0	1		(cont)-10%); accicular py (after?) suggests mafic component (Tphm); can't rule out dike or sill; irr	4				0			EXPACPC14-3-770	
4295	85	bx to 4302.5, then biotite gneiss (fol ~50 tca); at 4301.2 ~1cm gyp-fluor-tr qtz vnlt (10-30 tca); a	4	1	0	0	2		0	1			0	1		(cont) leucogranite, w comminuted grus-like matrix;	4				1				EXPACPC14-3-771
4300	85	biotite augen-gneiss cont.; BASEMENT BEDROCK? 5 mm py vnlt (subparallel ca) w blurry selvage cont.	4	1	0	0	2		0	1		k-4? don't know how to eval k-alt in pC, but bx matrix very hard;	0	1			4				1				EXPACPC14-3-772
4305	85	gyp (1.5 cm, small < tca) vns cont w "intermittent" qtz bands and tr fluorite; py vnlt are seperate	4	0	2	0	2		0	1		2-silic = blurred-out selvages on py vnlt may be silica flooding?? (very hard)	0	1		(cont) 4304.5 8mm py vnlt (20 tca) w 3-4 cm texture-destroyed selvage (or possible dike stringer??)	4			43	3	5-qtz = trace qtz in gyp-fluorite vnlt;			EXPACPC14-3-773
4310	71	all leucogranite w minor lenses/txs microbx (+/- py, tr fluorite	4	0	2	0	0		0	1			0	1			4			42	1	42 fluorite = trace in weakly calc gyp vnlt; 55-min = vn py			EXPACPC14-3-774
4315	64	rubble and re-drilled core: unable to decipher much except for bx seam -possibly tectonic- at ~10tca	4	1	2	0	3		0	1		3-sericite = coarse muscovite books next to gyp-qtz vn;	0	1		- blurred-out (aphanitic) selvages could be silica flooding??	4			42	3				EXPACPC14-3-775
4320	64	biot augen gneiss and leucogr (4322.5-4326.5) then back into "pC-clast bx", includes apite cobbles;	3	0	0	0	3		0	0		k-3? have no idea really (no experience w pC here); 3 sericite = interspersed fg muscovite flakes;	0	1			3				0				EXPACPC14-3-776
4325	89	sharp contact at 65 tca	4	0	3	0	2		0	0		3-silic? bx matrix hosts dissem fluorite	0				3			41	0	41-fluor = dissem in bx matrix;			EXPACPC14-3-777
4330	85	massive leucogranite below (4342) "myrmekite"; sharp contact at 65 tca	4	1	0	0	2		0	0			0	1			4				0				EXPACPC14-3-778
4335	85	leucogranite cont. w slight increase (secondary?) biotite;	4	1	0	0	2		0	0			0	1			4				0				EXPACPC14-3-779
4340	64	minor fault at 4355; 30 tca; 5mm gyp vnlt w 5 cm k-5 pyritic selvage; slicks at 55 tca; (as seen at 30	5	1	0	0	3		0	0			0	1		(cont) coarse pegmatite; minor py microvnlt an tr dissem fluorite	3			41	0				EXPACPC14-3-780
4345	64		5	0	0	0	2		0	0			0	1			4				0	5-qtz = possible qtz in several 1-3mm py micro-vnlt;			EXPACPC14-3-781
4350	64		3	2	0	0	1		0	0			0	1		increase spec w biotite	3				0				EXPACPC14-3-782
4355	64		5	0	0	0	1		0	1			0				4			41	3	41= = trace only vfg dissem fluorite; carb assoc w gyp vn;			EXPACPC14-3-783

APPENDIX 2.2

CPC14-3 - LITHOLOGY LOG

CRIPPLE CREEK AND VICTOR GOLD MINING COMPANY, EXPLORATION DEPARTMENT

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	72.5	77	EXPACPC14-3-001	34	3	0	0	1	0	3	0	0	0	or brn, pale red, and m gy porphyritic phonolite w sparse (<5% recognizable) cream field phenos (1x4)	3	0						(cont) mm); well fx'd w burnt orange FeOx;		
CPC14-3	77	82	EXPACPC14-3-002	34	3	0	0	1	0	3	0	0	0	as above, with minor porph clasts; mod to strong FeOx fx'd	3	0								
CPC14-3	82	87	EXPACPC14-3-003	34	3	0	0	1	0	3	0	0	0	cream field phenos (1x5mm) hard to see ("ghosted"), but present;	3	0								
CPC14-3	87	97	EXPACPC14-3-004	34	3	0	0	1	0	3	0	0	0	see RQD: gen mod-strong fx'd w poor recovery	5	0								
CPC14-3	97	107	EXPACPC14-3-005	34	3	0	0	1	0	3	0	0	0	< 0.5 ft core (fragments) in 10 ft run	5	0								
CPC14-3	107	117	EXPACPC14-3-006	34	3	0	0	1	0	3	0	0	0	some open fxs with comminuted material and crushed appearance	3	0								
CPC14-3	117	127	EXPACPC14-3-007	34	3	0	0	1	0	3	0	0	0	one 0.4 ft piece of core in 10 ft run; shatter bx'd (Tphu) w stockwork FeOx microfxs;	5	0								
CPC14-3	127	137	EXPACPC14-3-008	34	3	0	0	1	0	3	0	0	0	a/a 8 pieces core (<7cm) in 10 ft run	5	0								
CPC14-3	137	440	EXPACPC14-3-009	-999										no core; hearsay is that this bad ground was tri-coned (sampled?)										
CPC14-3	440	447	EXPACPC14-3-010	34	4	0	0	1	0	3	0	0	0	lith gen a/a: faint fg porph text; shattered w network FeOx micro fxs; locally pitted w mix? hem/MnO	5	0						fg botryoidal (hem/MnOx?) texture onn some fxs and in some cavities;		
CPC14-3	447	457	EXPACPC14-3-011	34	3	0	0	1	0	3	0	0	0	many FeOx fxs subparallel to core axis (tca)	5	0								
CPC14-3	457	466	EXPACPC14-3-012	30	3	0	0	1	0	4	0	1	0	Minor monolithic Tph bx present: logged as 30 as marker; cannot tell if tectonic, or if matrix is	10	0			(cont) 462.7; mod-strong K-alt		qtz? vnlts present; ? = cannot do a good scratch test on crumbly rock	(cont) porph phono.; possible fault? minor cavities lined w qtz; 3 cm zone (25 tca) of qtz vnlts at		5
CPC14-3	466	467	EXPACPC14-3-013	34	3	0	0	1	0	4	0	0	0	Shatter or crackle bx cont. with dense network FeOx microfxs	5	0			a/a					
CPC14-3	467	469	EXPACPC14-3-014	34	3	0	0	1	0	4	0	0	0	well fx'd (FeOx) Tphu cont	5	0			mod -strong K-alt cont.					
CPC14-3	469	477	EXPACPC14-3-015	34	3	0	0	1	0	3	0	0	0	reddish gy and m gy w network microfxs	3	0								
CPC14-3	477	487	EXPACPC14-3-016	34	3	0	0	1	0	3	0	0	0	a/a (as above)	3	0								
CPC14-3	487	497	EXPACPC14-3-017	34	3	0	0	1	0	3	0	0	0	cream field phenos (2x4mm) hard to discern but present; includes lenses or pods that could pass for	3	0						(cont) fg CC Bx or lithi lapilli tuff		
CPC14-3	497	506	EXPACPC14-3-018	34	2	0	0	1	0	3	0	0	0	mostly l gy	3	0								
CPC14-3	506	510	EXPACPC14-3-019	34	2	0	0	1	0	3	0	0	0	dark specks-flecks may be fg nepheline? phenos	3	0			1 argil = minor clay on some FeOx fxs					
CPC14-3	510	515	EXPACPC14-3-020	34	3	0	0	1	0	4	0	0	0	strongly fx'd below 510.5;	5	0								
CPC14-3	515	517	EXPACPC14-3-021	34	3	0	0	1	0	4	0	0	0	a/a; strong K-alt and poor recovery suggests possible fault	10	0								

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz	
CPC14-3	517	522	EXPACPC14-3-022	34	2	0	0	1	0	3	0	0	0		5	0									
CPC14-3	522	537	EXPACPC14-3-023	-999										Block says:"522-537 no recovery"											
CPC14-3	537	542	EXPACPC14-3-024	34	2	0	0	1	0	3	0	0	0	strongly fx'd	5	0									
CPC14-3	542	547	EXPACPC14-3-025	-999										no recovery											
CPC14-3	547	551	EXPACPC14-3-026	30	2	0	0	1	0	3	0	0	0	Tph bx: cannot tell if tectonic or if bx matrix is porph phono (30 by definition)	5	0									
CPC14-3	551	555	EXPACPC14-3-027	30	3	0	0	2	0	4	0	0	0	a/a; minor cly on fxs, odd yellow-or FeOx on fxs, and strong K-alt suggests fault (somewhere, 553?)	10	0			2 argil = yellowish clay on fxs						
CPC14-3	555	559	EXPACPC14-3-028	34	2	0	0	1	0	3	0	0	0	strongly fx'd, poor recovery (see RQD)	5	0									
CPC14-3	559	567	EXPACPC14-3-029	30	2	0	0	2	0	4	0	0	0	monolithic Tph bx: possibly tectonic? w subtle fabric (wh clay vnlt) at 70-80 tca; Fault at 566.5?	10	0			patchy 3-4 K-alt; 2 argil = wh clay vnlt						
CPC14-3	567	571	EXPACPC14-3-030	34	3	0	0	2	0	4	0	0	0	broken cont.; weak wh clay on fxs	5	0			a/a						
CPC14-3	571	577	EXPACPC14-3-031	34	2	0	0	2	0	4	0	0	2	minor Tph (monolithic) bx present; 30? first appearance anhydrite on fxs; re-drilled material	5	0			a/a		12 gangue = anhydrite on fxs		12		
CPC14-3	577	584	EXPACPC14-3-032	34	2	0	0	1	0	4	0	0	2	broken rock cont.	5	0			solid 4 K-alt					12	
CPC14-3	584	591	EXPACPC14-3-033	34	4	0	0	2	0	4	0	0	0	poor recovery (<2 ft) and crumbly brick red clay (above 591 block) suggests FAULT	10	0			2-argil = wh and brick red clay						
CPC14-3	591	597	EXPACPC14-3-034	34	3	0	0	1	0	4	0	0	0	shatter bx w "stockwork" FeOx micro-fxs; minor Tph bx present	5	0									
CPC14-3	597	602	EXPACPC14-3-035	34	3	0	0	2	0	4	0	0	2	major fxs/minor faults at 599, 600 @ 10-15 tca appear to control shatter bx; also host wh clay vnlt	10	0					12 = golden yellow anhydrite? - or barite?	(cont), golden yellow accicular min (anhydrite - cannot rule out barite), and possible qtz;	12	5	
CPC14-3	602	607	EXPACPC14-3-036	34	3	0	0	1	0	3	0	0	0	shatter bx cont; possible Tphd dike stringer (0.1 ft) at 606.6;	3	0									
CPC14-3	607	616	EXPACPC14-3-037	34	3	0	0	1	0	4	0	0	0	a/a w FeOx stockwork micro-fxs;	3	0			3-4 K-alt				FeOx is mostly red (hem)		
CPC14-3	616	620	EXPACPC14-3-038	34	4	0	0	1	0	3	0	0	0	well fractured and shatter bx'd Tphu cont.	5	0			a/a						
CPC14-3	620	627	EXPACPC14-3-039	34	2	0	1	1	0	3	0	0	0	rock becoming slightly more competent	3	0							trace - 1% vfg dissem spec		
CPC14-3	627	632	EXPACPC14-3-040	34	3	0	1	1	0	4	0	0	0	shatter bx - mosaic rock (Tphu) w stockwork FeOx microfxs; major fx (6mm FeOx fill) @10tca	3	0							locally 2% spec		
CPC14-3	632	636	EXPACPC14-3-041	34	3	0	0	1	0	4	0	0	0	a/a	5	0									
CPC14-3	636	642	EXPACPC14-3-042	34	3	0	1	2	0	4	0	0	0	a/a; wh clay chunks and crumbly zone suggest likely FAULT at ~639-640;	10	0			2-argil = white clay chunks w bx frags in fault zone;						

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz	
CPC14-3	642	647	EXPACPC14-3-043	34	3	0	1	2	0	3	0	0	0	minor shatter bx/bx and wh clay assoc w FeOx fxs at 25 tca	3	0			2-argil = wh clay in fxs and in matrix of shatter bx (pods)						
CPC14-3	647	652	EXPACPC14-3-044	34	2	0	1	2	0	3	0	0	0	rock becoming more competent below 646; l gy and pale red (fx-controlled) Tphu;	1	0			639-692: zone of increased wh clay fx-fill and matrix of shatter bxs						
CPC14-3	652	657	EXPACPC14-3-045	34	2	0	1	2	0	3	0	0	0		2	0									
CPC14-3	657	662	EXPACPC14-3-046	34	2	0	1	2	0	3	0	0	0	wh clay/FeOx fxs subparallel-20 tca;	3	0	2			locally bleached (w wh clay filled fxs)					
CPC14-3	662	667	EXPACPC14-3-047	34	2	0	1	2	0	4	0	0	0		3	0									
CPC14-3	667	672	EXPACPC14-3-048	34	3	0	1	2	0	4	0	0	0	mostly shatter bx w possible minor fault at 667.5;	10	0			3-4 K-alt			3-ox = due to stockwork density of FeOx microfxs (not pervasive, still just fx-controlled)			
CPC14-3	672	677	EXPACPC14-3-049	34	2	0	1	2	0	3	0	0	0	fxs at 15 and 30 tca w wh clay in matrix of shatter bx pods; qtz granules-grit (1-3mm) on 45 tca fx	3	0					(cont) at 676.4 may be crushed qtz vnl;		5		
CPC14-3	677	682	EXPACPC14-3-050	34	2	0	1	2	0	3	0	0	0	mottled l gy, pale red, l brn due to fx-controlled FeOx	3	0									
CPC14-3	682	687	EXPACPC14-3-051	34	2	0	2	2	0	3	0	0	0	684.3-685.2: l yellowish brn "sandy" band (65 tca to irreg) may be Tphd dike??	2	0									
CPC14-3	687	692	EXPACPC14-3-052	34	3	0	1	2	0	3	0	0	0	shatter bx with minor bands/patches true bx; blk min in fxs/cavities (hem+ MnO?)	3	0									
CPC14-3	692	697	EXPACPC14-3-053	34	3	2	1	1	0	4	0	0	0	FAULT (10-15 tca) at 692.9 - 696; pyrite present (tr - locally 2%)	10	0			K-4 alt proximal to fault;			py present in hanging wall of fault			
CPC14-3	697	702	EXPACPC14-3-054	34	3	0	1	1	0	4	0	0	0	colorful (Tphu) pale red, l gy, yell-brn, burnt orange w fx-controlled FeOx; well fx'd to shatter bx	3	0					(cont) 'd w open cavities/gashes;				
CPC14-3	702	707	EXPACPC14-3-055	34	2	2	1	0	0	4	0	0	0	gen a/a w minor bx band (0.4 ft) at 702; yell-cream "sandy-tuffaceous" bx matrix suggests possible??	10	0					(cont) Tphd dike stringer(?) minor fault just above 707 block;				
CPC14-3	707	712	EXPACPC14-3-056	34	3	2	1	0	0	4	0	0	0	FAULT (15-20 tca, ~1" crumbly brn clay seam) at 708.2 ft;	10	0			3-4 K-alt			locally 3-4% py in unox m gy patches			
CPC14-3	712	717	EXPACPC14-3-057	34	3	1	1	1	0	4	0	0	0	L gy, burnt orange, pale red sparsely porphyritic phonolite (a/a); irreg yell-buff "sandy lense" w m	2	0			(cont) gashes; 1-argil = minor wh clay			(cont) minor bx clasts at ~713 - possible Tphd dike stringer?; open micro-fx controlled cavities/gas			

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz	
CPC14-3	717	722	EXPACPC14-3-058	34	2	3	1	1	0	4	0	0	0	Gen 5-7% 1x4mm cream phenos w "unsharp" edges (diffuse); gen 3% py in gy unox patches	1	0			1-argil = minor wh clay in micro-fxs and leached pock-marks;			locally up to 5% dissem fg py			
CPC14-3	722	727	EXPACPC14-3-059	34	3	3	1	1	0	4	0	0	0	patches shatter bx w open (FeOx) cavities/gashes	2	0			3-4 K-alt			gy with burnt orange FeOx "bleedout" on fxs 35 tca			
CPC14-3	727	732	EXPACPC14-3-060	34	3	0	2	2	0	4	0	0	1	enechelon FeOx fxs at 731.3: possible minor fault w argil selvage;	10	0					13 = possible anhyd in discount vnlt		13		
CPC14-3	732	737	EXPACPC14-3-061	34	3	0	2	0	0	3	0	0	0	enechelon FeOx fxs cont to ~735;	3	0									
CPC14-3	737	742	EXPACPC14-3-062	34	2	0	2	1	0	3	0	0	0	shattered in-part w stockwork FeOx micro-fxs	2	0			1-argil = minor clay in micro-fxs; 3-4 K-alt;						
CPC14-3	742	747	EXPACPC14-3-063	34	2	0	2	2	0	3	0	0	0	0.2 ft clay-bx seam at 743.6, 30 tca, l brn and wh clay matrix (FAULT);	10	0									
CPC14-3	747	752	EXPACPC14-3-064	34	2	0	2	1	0	4	0	0	0	l gy and red shatter bx (healed mosaic FeOx micro-fxs)	1	0			3-4 K-alt						
CPC14-3	752	757	EXPACPC14-3-065	34	3	0	2	2	0	3	0	0	0	a/a mostly brick red and burnt orange mottled red-burnt orange; "soft" - scratches easily;	2	0			2-argil = discount-irreg clay seams/pods						
CPC14-3	757	762	EXPACPC14-3-066	34	3	0	2	2	0	2	0	0	0		1	0									
CPC14-3	762	767	EXPACPC14-3-067	34	3	0	2	2	0	2	0	0	0		2	0									
CPC14-3	767	772	EXPACPC14-3-068	34	3	0	2	2	0	3	0	0	0	patches shatter bx (red and burnt orange); sparse 2-5 mm l brn clay vnlt w micro-bx	1	0									
CPC14-3	772	777	EXPACPC14-3-069	34	3	0	2	1	0	3	0	0	0	major (FeOx) fx at 15 tca at 775;	2	0									
CPC14-3	777	782	EXPACPC14-3-070	34	3	0	2	1	0	3	0	0	0	red and burnt orange shatter bx cont.; FeOx fxs at 20 tca; red-brn clay on some fxs;	2	0						red rims on burnt orange patches;			
CPC14-3	782	787	EXPACPC14-3-071	34	3	0	3	2	0	3	0	0	0	"crackle bx mosaic" Tphu a/a, mostly orange brown;	2	0			2-argil = discount clay vnlt (<3mm)						
CPC14-3	787	792	EXPACPC14-3-072	34	3	0	2	2	0	3	0	0	0	pale red and orange-brn crackle bx a/a (as above); major fx (20 tca) at 790.5;	2	0									
CPC14-3	792	797	EXPACPC14-3-073	34	3	0	2	2	0	2	0	0	0	fx-controlled FeOx (red, orange brn) mottling; "soft" (scratches easily) w slight increase clay micr	2	0						(cont) microvnlt			
CPC14-3	797	802	EXPACPC14-3-074	34	3	0	2	2	0	4	0	0	0	lengthy FeOx fx at <5 tca, w proximal irreg wh clay vnlt (1-4 mm) and shatter bx (red);	3	0			shatter bx (along fx) is K-4, otherwise 2-3;						
CPC14-3	802	807	EXPACPC14-3-075	34	3	0	2	2	0	3	0	0	0	wh clay "gashes" and irreg microvnlt cont;	2	0									

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	807	812	EXPACPC14-3-076	34	3	0	2	3	0	3	0	0	0	crumbly clayey zone may be minor fault (@~809, 30 tca);	10	0			3-argil = increase wh clay vnlt proximal to possible fault;					
CPC14-3	812	817	EXPACPC14-3-077	34	4	0	2	2	0	3	0	0	0	mostly red and (>) l gy w distinct wh clay "gashes"/pods/discont. microvnlt;	2	0								
CPC14-3	817	822	EXPACPC14-3-078	34	4	0	2	2	0	3	0	0	0	FAULT: 819.4 - 822.9, 10-15 tca, w at least 2 subparallel d red brn clay seams w comminuted micro-bx	10	0			(cont) vnlt;			(cont); footwall may be bleached (less FeOx) ; hang wall is shattered w network irreg wh clay microv		
CPC14-3	822	827	EXPACPC14-3-079	34	3	0	2	1	0	3	0	0	0		10	0								
CPC14-3	827	832	EXPACPC14-3-080	34	2	0	2	2	0	3	0	0	0	827-829: odd concentrattion (10%) of possible mafic phenos - or spec replaced feldspar and feldspath	3	0			2-argil = minor wh clay on fxs;			(cont) feldspathoids??		
CPC14-3	832	837	EXPACPC14-3-081	34	3	0	1	2	0	3	0	0	0	broken zone w d red brn crumbly clay (833.8 - 834.6) may be fault; shatter bx above and below;	10	0			2-argil = wispy wh clay micro-vnlt above possible fault;					
CPC14-3	837	842	EXPACPC14-3-082	34	3	0	2	1	0	3	0	0	0	burnt orange and red brn Tphu, with darker red bands around subordinate l gy patches	1	0								
CPC14-3	842	847	EXPACPC14-3-083	34	3	0	2	1	0	3	0	0	0	healed "horsetail fxs", w minor microbx and open cavities, run subparallel tca;	2	0								
CPC14-3	847	852	EXPACPC14-3-084	34	3	0	2	1	0	3	0	0	0	fx-controlled FeOx mottling: red, burnt orange, l gy	1	0			1-argil = minor pods, gashes, discont microvnlt off wh clay					
CPC14-3	852	857	EXPACPC14-3-085	34	3	0	2	1	0	3	0	0	0	a/a (as above)	1	0								
CPC14-3	857	862	EXPACPC14-3-086	34	3	0	2	1	0	3	0	0	0	a/a w increase shatter bx along 20 tca fxs;	2	0								
CPC14-3	862	867	EXPACPC14-3-087	34	3	0	2	1	0	3	0	0	0	distinct-looking red/l gy "crackle bx mosaic"; ochre brown powdery clay (and shatter bx bordering on	10	0						(cont) true bx) suggest minor fault at 865.6;		
CPC14-3	867	872	EXPACPC14-3-088	34	3	0	2	2	0	3	0	0	0	a/a w wh clay on fxs 30 tca	2	0			2-argil = wh clay on fxs and discont vnlt					
CPC14-3	872	877	EXPACPC14-3-089	34	3	0	1	2	0	3	0	0	0	@ 872.6 color (FeOx) change red to orange brown; shatter bx cont., w minor open cavities/gashes	1	0								
CPC14-3	877	882	EXPACPC14-3-090	34	3	0	1	2	0	3	0	0	0	back to bright red at 878;	1	0								

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	882	887	EXPACPC14-3-091	34	3	0	2	2	0	3	0	0	0	shatter bx w stockwork micro-fxs cont.; FeOx fxs at 15 tca	3	0								
CPC14-3	887	892	EXPACPC14-3-092	34	3	0	2	2	0	3	0	0	0	mottled (micro-fx-controlledled) red/off wh; lengthy FeOx fx at low < tca;	3	0								
CPC14-3	892	897	EXPACPC14-3-093	34	3	0	3	3	0	3	0	0	0	broken zone 895.8 - 897 w increase irreg wh clay vnltz suggests possible fault;	10	0								
CPC14-3	897	902	EXPACPC14-3-094	34	3	0	2	3	0	3	0	0	0	0.1 ft bx seam (40 tca) at 898.6 suggests minor fault; footwall well fx'd to ~904; wh clay is matrix	10	0						(cont) of some shatter bx pods;		
CPC14-3	902	907	EXPACPC14-3-095	34	3	0	2	2	0	3	0	0	0	horsetail wh clay microvnltz (2mm) and fxs subparallel tca;	3	0								
CPC14-3	907	912	EXPACPC14-3-096	34	3	0	2	1	0	3	0	0	0	well fx'd w d red brn clay on fxs;	3	0								
CPC14-3	912	917	EXPACPC14-3-097	34	3	0	2	2	0	3	0	0	0	mostly shatter bx w minor discount wh clay vnltz;	2	0								
CPC14-3	917	922	EXPACPC14-3-098	34	3	0	3	3	0	3	0	0	0	a/a, w distinct "criss-cross" (45 and 40 tca) fabric defined by wh clay micro-vnltz in shatter bx;	3	0			3-argil = wh clay in "criss-cross" micro-fxs;					
CPC14-3	922	927	EXPACPC14-3-099	34	3	1	2	2	0	3	0	0	0	at 924.4 start seeing pods (>1 ft) of true bx (monolithic 30?)	2	0						Trace py in l gy unox patches		
CPC14-3	927	932	EXPACPC14-3-100	34	3	1	2	3	0	3	0	0	0	"tiger stripes" wh irreg-discont clay micro vnltz to 1.5 cm;	2	0								
CPC14-3	932	937	EXPACPC14-3-101	34	3	1	2	2	0	3	0	0	0	bright burnt orange band, 935.9 - 936.8, may represent local ReDox of sorts, with rx less ox below;	2	0						(cont) FeOx band coincides roughly w gradational contact to bx (30?) below;		
CPC14-3	937	942	EXPACPC14-3-102	30	1	3	1	2	0	3	0	0	0	(936.6) monolithic bx; ang-subrnd l gy clasts (4mm-4cm, gen <1cm) in m gy aphan matrix; no positive	1	0			(cont) ssible autobx, phreatomagmatic bx, or hyaloclastite (quench fragmentation) - or even lithic		(cont) lapilli tuff(?) Py gen 2-3%	(cont) ID phenos in matrix (to make it a Tph-matrix bx) but coded 30; can't differentiate between po		
CPC14-3	942	947	EXPACPC14-3-103	30	2	2	2	2	0	3	0	0	0	intimately mixed bx and non-bx; burnt orange and l gy;	2	0			2-argil = wh discount clay vnltz (1-2 mm) cont.					
CPC14-3	947	952	EXPACPC14-3-104	30	2	3	1	1	0	3	0	0	0	mostly matrix-support monolithic (Tphu) bx; only ~1 ft orange brn (w crude liesegang banding), othe	1	0						(cont) rwise l gy w 2-4% dissem py;		
CPC14-3	952	957	EXPACPC14-3-105	30	1	3	0	2	0	3	0	0	1	a/a wh clay and tr FeOx on fxs;	2	0					12 gangue and 1-sulfate = possible anhydrite - or gypsum? - on some fxs		12	

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineralization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	957	962	EXPACPC14-3-106	34	2	3	1	1	0	3	0	0	1	unable to get good reading on contact (at ~957.4) orientation; Tphu cont. with patchy FeOx; 7-10% cr	2	0			1-argil = minor discount bluish wh clay vnlt			(cont) cream field phenos to 5mm;	12	
CPC14-3	962	967	EXPACPC14-3-107	34	2	3	1	1	0	3	0	0	0	burnt orange "selvages" on d red fx-controlled bands;	1	0								
CPC14-3	967	972	EXPACPC14-3-108	34	2	1	1	1	0	3	0	0	0	"crackle bx" patches are lim and hem stained; minor open cavities;	2	0			1-argil = minor clay on fxs			trace only py		
CPC14-3	972	977	EXPACPC14-3-109	34	2	1	2	2	0	3	0	0	0	a/a w wh clay micro-fxs	2	0			2-argil = wh clay in "matrix" of shatter bx					
CPC14-3	977	982	EXPACPC14-3-110	34	2	1	2	1	0	4	0	0	0	pale burnt orange and red Tphu; locally shatter bx'd	2	0			patchy K-4					
CPC14-3	982	987	EXPACPC14-3-111	34	2	2	1	2	0	4	0	0	0	0.1 ft bx band (35-40 tca) - w slicks - at 985.8: FAULT	10	0			a/a; 2-argil = minor wh clay on fxs					
CPC14-3	987	992	EXPACPC14-3-112	34	2	3	1	1	0	3	0	0	0		1	0						2-3% py		
CPC14-3	992	997	EXPACPC14-3-113	34	2	3	1	1	0	3	0	0	0		2	0								
CPC14-3	997	1002	EXPACPC14-3-114	34	3	1	2	2	0	3	0	0	0	colorful: red, burnt orange, l gy, w wh clay "gashes"/discount vnlt	2	0								
CPC14-3	1002	1007	EXPACPC14-3-115	34	3	2	2	1	0	3	0	0	0		2	0								
CPC14-3	1007	1012	EXPACPC14-3-116	34	2	1	1	1	0	3	0	0	0	minor shatter bx and open cavities	1	0								
CPC14-3	1012	1017	EXPACPC14-3-117	34	3	1	1	2	0	3	0	0	0	mostly shatter bx w minor fault at 1012.2 (20 tca, wh clay);	10	0								
CPC14-3	1017	1022	EXPACPC14-3-118	34	4	1	2	2	0	3	0	0	0	a/a and well fx'd with enechelon fxs subparallel tca and possible fault zone 1018.7 - 1022; d red cl	10	0						(cont) clay on fxs;		
CPC14-3	1022	1027	EXPACPC14-3-119	34	2	3	1	2	0	3	0	0	0	wh clay on fxs (20 tca); odd, very irreg, m gy aphyric lenses (3 cm) at 1026.5;	3	0								
CPC14-3	1027	1032	EXPACPC14-3-120	34	3	3	1	2	0	3	0	0	0	major fx w "varved" wh/d gy clay at 1029 (10 tca) and rubble zone (1030-32) w d red clay = minor fau	10	0						(cont) fault?		
CPC14-3	1032	1037	EXPACPC14-3-121	34	3	1	1	2	0	3	0	0	0	well fx'd cont w horsetail microfxs at ~20 tca; mostly burnt orange (FeOx)	3	0								
CPC14-3	1037	1042	EXPACPC14-3-122	34	2	3	1	1	0	3	0	0	0	less FeOx below 45 tca FeOx fx at 1038.4;	2	0								
CPC14-3	1042	1047	EXPACPC14-3-123	34	1	3	0	2	0	3	0	0	1	still porphyritic but feld phenos finer grained and hard to discern;	2	0					12 gangue = mats fibrous yellowish acicular min (anhyrite? celestite?) on fxs w wh clay		12	
CPC14-3	1047	1052	EXPACPC14-3-124	34	1	3	0	2	0	3	0	0	1	minor "bleedout" selvages on FeOx fxs (many w just wh clay);	2	0			2-argil = wh clay on fxs			3-4% py	12	
CPC14-3	1052	1057	EXPACPC14-3-125	34	1	3	0	2	0	3	0	0	1	long fxs subparallel tca w wh clay and anhydrite?	2	0							12	

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz	
CPC14-3	1057	1062	EXPACPC14-3-126	22	2	2	0	2	0	3	0	0	0	~ 1 ft gossanous black and red rubble w botryoidal FeOx below 1057 block; possible fault? nearest	10	0			2-argil = horsetail microfxs w clay/py		anhydrite? celestite? (pale yellow fibrous needles)	(cont) fx at 30 tca; cannot rule out that rock below (fault?) is Tphd dike (sparse phenos);	12		
CPC14-3	1062	1067	EXPACPC14-3-127	22	3	2	0	2	0	3	0	0	0	mostly burnt orange and shattered; appears aphyric, may be Tphd dike? Minor fault (30 tca, clay w sl	10	0						(cont) slicks) at 1065.0			
CPC14-3	1067	1072	EXPACPC14-3-128	34	2	3	0	2	0	3	0	0	0	possible contact at 1067.0, at 20 tca; minor open cavities and bx w wh clay matrix; shatter bx and F	1	0			2-argil = wh clay "gashes"/streaks			(cont) FeOx to ~1069; 2-3 % py;			
CPC14-3	1072	1077	EXPACPC14-3-129	34	0	3	0	2	0	3	0	0	0	still not distinctly porphyritic/feld phyric, but grainier than possible dike above;	2	0			a/a + wh clay on fxs						
CPC14-3	1077	1082	EXPACPC14-3-130	34	0	4	0	3	0	2	0	0	0	well fx'd and bleached off wh w 3-5% dissem py;	5	0	3		3-argil = wh clay on most fxs;			3-5% py			
CPC14-3	1082	1087	EXPACPC14-3-131	34	0	4	0	3	0	2	0	0	1	bleached clay coated rubble; slicks present: likely fault	10	0	3				a/a		12		
CPC14-3	1087	1092	EXPACPC14-3-132	34	2	3	0	3	0	2	0	0	0	well fx'd cont. w true bx 1087.5 - 1090; clast supported w wh clay matrix; FeOx in footwall;	10	0	2		3-argil = wh clay matrix in bx			~3% py			
CPC14-3	1092	1097	EXPACPC14-3-133	34	3	0	2	2	0	2	0	0	0	well fx'd, w bx pods cont.; mostly shades of red (porphyritic!, Tphu); fxs at 20 tca	3	0	0								
CPC14-3	1097	1102	EXPACPC14-3-134	34	3	1	2	2	0	3	0	0	0	bx seams cont.; well oxidized;	3	0			gy patches K-3						
CPC14-3	1102	1107	EXPACPC14-3-135	34	3	0	2	2	0	2	0	0	0	Tphd dike at 1105.4, 20-25 tca; Note: not breaking anything < 5ft out, as per logging protocol for "	3	0						(cont) environmental permitting/hydrogeology drill hole" (sampling)			
CPC14-3	1107	1112	EXPACPC14-3-136	22	3	0	1	2	0	2	0	0	0	at 1109.6 bx and red clay seam (0.3 ft, 20 tca) and FAULT;	10	0			2-argil = wh clay on some fxs						
CPC14-3	1112	1117	EXPACPC14-3-137	22	3	0	1	1	0	2	0	0	0	Tphd dike cont., l brn, with subsidiary Fault at 1115 ft, 30 tca: shatter bx w open cavities;	10	0									
CPC14-3	1117	1122	EXPACPC14-3-138	21	0	3	0	2	0	3	0	0	0	Tphd contact at 1117.7? (not sure); then back into Tphu w unusual d gy lenses as per 1026.5 (could p	1	0			2-argil = minor wh clay vnls (discont)	15		(cont) pass for xtl tuff w "hiatus" mudstone lenses; 3-4% py;			
CPC14-3	1122	1127	EXPACPC14-3-139	21	1	3	0	2	0	3	0	0	0	odd/irreg d gy lenses cont., and "mudchip"-like fragments (see above);	1	0						Tr FeOx (w wh clay) on fxs; streaky bands py present (20 tca);			
CPC14-3	1127	1132	EXPACPC14-3-140	21	1	3	0	2	0	3	0	0	0	sparse phenos, but not Tphd; minor fault at 1129.2 (25 tca wh clay slicks nearly perpend tca)	10	0				62 = trace sphalerite or galena? too fine grained to get good id;					

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	1132	1137	EXPACPC14-3-141	21	1	3	0	2	0	3	0	0	0	l gy - cream off wh vfg "porphyritic" rock - speckled w py clusters after fg (1-2mm) phenos - could	1	0						(cont) pass for xtl tuff or mafic phonolite(??) w py after mafics?		
CPC14-3	1137	1142	EXPACPC14-3-142	21	1	3	0	2	0	3	0	0	0	21? fg 36 (Tphm) w py after 1-2mm mafic phenos? I do not know what this rock is - other than phonoli	2	0								
CPC14-3	1142	1147	EXPACPC14-3-143	21	0	4	0	2	0	3	0	0	0	l gy gen aphanitic w sparse (2%) fg phenos (<2mm) and locally up to 5% py, possibly after fg mafic p	1	0						(cont) phenos; wh clay and py on fxs;		
CPC14-3	1147	1152	EXPACPC14-3-144	21	0	4	0	2	0	3	0	0	0	fg mafic phono? (altered and pyritic) See comments 1247-1252;	2	0						3-5% py - after mafics??		
CPC14-3	1152	1157	EXPACPC14-3-145	21	0	4	0	2	0	3	2	0	0	21? vfg 36? blotchy mgy/darker gy/ greenish d gy; 32? 36? see comments 1247-52;	3	0			propylitically alt'd (mafic?) phonolite; wh clay and py on fxs cont.			5% py		
CPC14-3	1157	1162	EXPACPC14-3-146	21	0	3	0	3	0	3	2	0	0	FAULT 1159.7 - 1164 at low < tca w oblique (40 tca) greasy clay slicks	10	0			3-argil = clayey (wh) broken zone along fault;					
CPC14-3	1162	1167	EXPACPC14-3-147	21	3	3	1	2	0	2	0	0	0	at 1164.6 becomes l brn w FeOx banding; skeletal phenos 1-2 mm;	10	0								
CPC14-3	1167	1172	EXPACPC14-3-148	21	3	0	1	1	0	3	0	0	0	21? shattered and crumbly (at 1166.8) w FAULT possibly at 1171 (rubble to 1171.5)	10	0								
CPC14-3	1172	1177	EXPACPC14-3-149	21	3	2	0	1	0	2	0	0	0	shatter bx to approx 1174 w l brn FeOx to 1175.3 (minor fault at 30 tca w slicks 45-50 tca)	10	0								
CPC14-3	1177	1182	EXPACPC14-3-150	21	1	3	0	2	0	2	0	0	0	FAULT ZONE: 1159.7 - 1175.3; 21, Tph is l-m gy finely speckled phyric rock with ~1mm phenos;	1	0			2-argil = weak clay (+ py) on fxs;			py/l gy clay microvnlt (1-2mm) present;		
CPC14-3	1182	1187	EXPACPC14-3-151	21	2	3	0	1	0	3	0	0	0	1183-1185: patch l brn FeOx w minor shatter bx; speckled vfg phyric phonolite	3	0						2-3% py		
CPC14-3	1187	1192	EXPACPC14-3-152	21	0	3	0	1	0	3	0	0	0	fault at 1187.7 (20 tca w clay wh and m gy slicks 60 tca);	10	0			1-argil = greasy wh and m gy clay on fault plane;			3-4% py w locally up to 5%;		
CPC14-3	1192	1197	EXPACPC14-3-153	21	0	3	0	1	0	3	0	0	0		2	0								
CPC14-3	1197	1202	EXPACPC14-3-154	21	0	3	0	1	0	2	0	0	0	m gy, rock borders on being fg phaneritic w sparse wh flecks (1x2mm) that are "ghosted" feld phenos;	1	0			1-argil = gen clayey nature of rock (scratches easily) and irreg m gy clay lenses/vnlts					

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineralization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	1202	1207	EXPACPC14-3-155	21	0	3	0	2	0	2	0	0	0		1	0			2-argil = a/a					
CPC14-3	1207	1212	EXPACPC14-3-156	21	0	3	0	2	0	2	0	0	0	minor fault at 1207.2 (10 tca, w clay slicks 65 tca);	10	0								
CPC14-3	1212	1217	EXPACPC14-3-157	21	0	3	1	2	0	2	0	0	0	minor fault at 1212.4 (clay, 10-15 tca)	10	0								
CPC14-3	1217	1222	EXPACPC14-3-158	21	0	3	0	2	0	2	0	0	0	crushed comminuted clayey micro-bx lenses (up to 0.2 ft, 60 tca) present	10	0								
CPC14-3	1222	1227	EXPACPC14-3-159	21	2	2	1	2	0	2	0	0	0	mostly l brn FeOx stained "shatter bx"; horsetail fxs at 15 tca	2	0								
CPC14-3	1227	1232	EXPACPC14-3-160	21	1	3	0	2	0	2	0	0	0	minor fault (10 tca) at 1228.6, clay with slicks (80 tca);	10	0								
CPC14-3	1232	1237	EXPACPC14-3-161	21	1	3	0	2	0	2	0	0	0	minor faults at low < tca cont; clayey (w slicks) w weak FeOx	10	0								
CPC14-3	1237	1242	EXPACPC14-3-162	21	0	3	0	2	0	2	0	0	0		2	0								
CPC14-3	1242	1247	EXPACPC14-3-163	21	1	3	0	2	0	2	0	0	0	wh clay coated frax at 20 tca	2	0								
CPC14-3	1247	1252	EXPACPC14-3-164	36	0	3	0	1	0	3	1	0	0	36 used to denote possible protolith (biotite phonolite): small m-d gy relict patch (at 1252) unaltd	2	0						phonolite w biotite suggests 21 is altered 32 or 36 (mafic and/or biotite phonolite);		
CPC14-3	1252	1257	EXPACPC14-3-165	21	0	4	0	1	0	3	0	0	0	(block at 1253.5 - but sampled every 5 ft for water hole enviro purposes)	2	0						4 py = 3mm py vnlts and py on fxs (3-5%)		
CPC14-3	1257	1262	EXPACPC14-3-166	21	0	4	0	2	0	2	0	0	0	minor fault (25 tca w clay slicks 65 tca) at 1260.6 w increase py in microfxs;	10	0								
CPC14-3	1262	1267	EXPACPC14-3-167	21	0	4	0	1	0	3	0	0	0	coarsely granular py in 0.1 ft vn at 1265.8, ~20 tca;	3	0				15				
CPC14-3	1267	1272	EXPACPC14-3-168	2	0	3	0	2	0	2	2	0	0	d gy patches host biotite (relict patches of unalt'd protolith? see above); can't rule out biotite l	3	0			(cont) to be increase py on selvages of possible lamp dike;			(cont) biotite lamprophyre dike (1266.8-1270.2) - weakly magnetic, n/calc); broken rock, but appears		
CPC14-3	1272	1277	EXPACPC14-3-169	21	0	4	0	1	0	3	0	0	0	(note that this hole is being logged for enviro purposes (5 ft samples) without breaking out lith) b	10	0				15		(cont) broken zone with coarse gran py vns (10 tca) and fx coatings		
CPC14-3	1277	1282	EXPACPC14-3-170	31	0	4	0	1	0	3	0	0	0	rubble cont to ~1281; rock below ~1278 (rubble) increasingly feld-phyric - could pass for Tphk;	10	0			1-argil = weak wh clay on fxs	15	strong py to 1278;	likely fault between 1277-78;		
CPC14-3	1282	1287	EXPACPC14-3-171	31	0	3	0	1	0	3	0	0	0	Can't rule out 38: seriate porphyritic phonolite;	2	0								
CPC14-3	1287	1292	EXPACPC14-3-172	31	0	3	0	1	0	3	0	0	0		2	0								
CPC14-3	1292	1297	EXPACPC14-3-173	31	0	3	0	1	0	3	0	0	0		2	0								
CPC14-3	1297	1302	EXPACPC14-3-174	31	0	3	0	1	0	3	0	0	0	broken	3	0								
CPC14-3	1302	1307	EXPACPC14-3-175	31	0	3	0	1	0	3	0	0	0	a/a	3	0								

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	1307	1312	EXPACPC14-3-176	31	0	4	1	1	0	3	0	0	0	below ~1309.4 rock becomes aphyric - with no real contact; slicks in rubble suggest possible fault ~	10	0						(cont) ~1308 ft.		
CPC14-3	1312	1317	EXPACPC14-3-177	31	0	4	0	1	0	3	0	0	0	31 = patches still porphyritic (mixed aphyric/porphyritic)	2	0						4-5% py		
CPC14-3	1317	1322	EXPACPC14-3-178	31	0	4	0	1	0	3	0	0	0		2	0			1-argil = weak clay on fxs cont.					
CPC14-3	1322	1327	EXPACPC14-3-179	31	0	4	0	1	0	3	0	0	0	mostly broken	3	0								
CPC14-3	1327	1332	EXPACPC14-3-180	31	0	4	0	1	0	4	0	0	0	(block at 1331) mostly broken to end of table, 1403 ft.	3	0			3-4 K-alt					
CPC14-3	1332	1337	EXPACPC14-3-181	31	0	3	0	1	0	3	0	0	0		3	0						3-4% py		
CPC14-3	1337	1342	EXPACPC14-3-182	31	0	3	0	2	0	3	0	0	0	1340-1344: crumbly	5	0			2-argil = crumbly w weak clay on fxs					
CPC14-3	1342	1347	EXPACPC14-3-183	31	0	3	0	2	0	3	0	0	0		5	0								
CPC14-3	1347	1352	EXPACPC14-3-184	31	0	3	0	2	0	3	0	0	0		5	0								
CPC14-3	1352	1357	EXPACPC14-3-185	31	0	3	0	2	0	3	1	0	0		5	0								
CPC14-3	1357	1362	EXPACPC14-3-186	7	0	4	0	1	0	0	3	0	0	at approx (broken) 1358.6 - 1359.8 possible trachydolerite dike; brownish m gy vfg	3	0						(cont) phaneritic, mafics gone to py? n/mag, n/calc;		
CPC14-3	1362	1367	EXPACPC14-3-187	21	0	3	0	1	0	3	0	0	0	m gy vfg phaneritic to "micro-porphyritic" rock (feld 1 - < 2mm); can't rule out alt'd mafic phono	3	0			py after mafics = propyl alt'd??					
CPC14-3	1367	1372	EXPACPC14-3-188	21	0	4	0	1	0	3	0	0	0	technically not aphanitic(21) - but not porphyritic either; fg Tphk?	5	0						3-5% py (after mafics?)		
CPC14-3	1372	1377	EXPACPC14-3-189	21	0	3	0	1	0	3	0	0	0	broken cont.	5	0								
CPC14-3	1377	1382	EXPACPC14-3-190	31	0	3	0	1	0	3	0	0	0	not clear where contact is, but some pieces distinctly feld-phyric (porphyritic, Tphk)	5	0								
CPC14-3	1382	1387	EXPACPC14-3-191	31	0	3	0	1	0	3	0	0	0	Tphk	3	0								
CPC14-3	1387	1392	EXPACPC14-3-192	31	0	3	0	1	0	3	0	0	0		5	0								
CPC14-3	1392	1397	EXPACPC14-3-193	31	0	3	0	1	0	3	0	0	0		3	0								
CPC14-3	1397	1402	EXPACPC14-3-194	31	0	3	0	0	0	4	0	0	0		3	0			patchy k-4					
CPC14-3	1402	1407	EXPACPC14-3-195	31	0	3	0	0	0	3	0	0	0	broken Tphk cont.; only one RQD point load reading for entire table (1403-1596);	3	0								
CPC14-3	1407	1412	EXPACPC14-3-196	38	0	3	0	0	0	4	0	0	0	no real contact, porphyritic texture is just more distinct w "ragged"-irreg shaped phenos (seriate)	3	0			a/a					
CPC14-3	1412	1417	EXPACPC14-3-197	38	0	4	0	0	0	3	0	0	0	seriate porphyritic phonolite w zones that can pass for Tphk	3	0						4-py = locally up to 5% (micro-fxs)		
CPC14-3	1417	1422	EXPACPC14-3-198	30	0	3	0	0	0	4	0	0	0	30 used for monolithic clast and matrix supported Tph bx; l gy ang frags w m gy aphanitic to vfg pha	3	0			3-4 k-alt			(cont) phaneritic matrix; possible hyaloclastite or auto bx?		

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineralization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	1422	1427	EXPACPC14-3-199	34	1	3	0	0	0	3	0	0	0	can't really get a good look at this rubble: defaulted to 34 (undiff porph Tph)	5	0						trace only FeOx		
CPC14-3	1427	1432	EXPACPC14-3-200	34	1	3	0	0	0	4	0	0	0	minor bx (30) present)	3	0			a/a					
CPC14-3	1432	1437	EXPACPC14-3-201	30	1	3	0	0	0	4	0	0	0	bx cont; m-d gy matrix material is aphanitic w snowflake-like (devit?) vfg flecks; can't rule out tu	3	0						(cont) tuff bx;		
CPC14-3	1437	1442	EXPACPC14-3-202	30	1	3	0	0	0	3	0	0	0		5	0								
CPC14-3	1442	1447	EXPACPC14-3-203	30	1	3	0	0	0	4	0	0	0	monolithic Tph bx still present, but not sure how much;	5	0								
CPC14-3	1447	1452	EXPACPC14-3-204	30	0	3	0	0	0	4	0	0	0	~ 1449-50: mostly d gy aphanitic matrix material w sparse porphyritic clasts; locally "bx" is just a	3	0						(cont) shatter bx w vnlt-seams d gy aphanitic (matrix) material;		
CPC14-3	1452	1457	EXPACPC14-3-205	30	0	3	0	0	0	3	0	0	0		5	0								
CPC14-3	1457	1462	EXPACPC14-3-206	30	2	3	0	0	0	4	0	0	0	bx to about 1460, then Tphs (seriate porphyritic phonolite) dike;	5	0			3-4 k-alt			2-ox = weak FeOx at Tphs dike contact (1460-61);		
CPC14-3	1462	1467	EXPACPC14-3-207	38	0	3	0	0	0	4	0	0	0	Tphs is m gy	5	0								
CPC14-3	1467	1472	EXPACPC14-3-208	34	1	3	0	0	0	4	0	0	0	minor bx (30 as above) present (below ~1470 ft.)	3	0								
CPC14-3	1472	1477	EXPACPC14-3-209	30	1	4	0	0	0	4	0	0	0		5	0						locally up to 5% py (gen 3-4%);		
CPC14-3	1477	1482	EXPACPC14-3-210	30	0	3	0	0	0	4	0	0	0	rock below ~1478 rock is mostly d gy vfg matrix material, w sparse fg bx clasts (<1 cm - like a lith	5	0						(cont) lithic lapilli tuff);		
CPC14-3	1482	1487	EXPACPC14-3-211	30	1	3	0	0	0	4	0	0	0	possible (minor) heterolithic clasts - could pass for CC Bx	3	0								
CPC14-3	1487	1492	EXPACPC14-3-212	30	0	3	0	0	0	3	0	0	0	monolithic (Tph) bx cont.	5	0			strong k-3 alt					
CPC14-3	1492	1497	EXPACPC14-3-213	30	0	3	0	0	0	3	0	0	0	volc bx to ~ 1494.5, then Tphs dike (core is strongly fractured and rubble-like)	3	0								
CPC14-3	1497	1502	EXPACPC14-3-214	38	1	3	0	0	0	4	0	0	0	possible minor fault at 1501, w trace jarosite? and gn or sp?	10	0				59 min = d gy (vfg) sulfide: gn? sp?				
CPC14-3	1502	1507	EXPACPC14-3-215	30	0	3	0	0	0	4	0	0	0	Tphs dike to ~ 1504, then back into monolithic (Tph) clast-supported bx;	5	0			3-4 k-alt					
CPC14-3	1507	1512	EXPACPC14-3-216	30	0	3	0	0	0	4	0	0	0		3	0								
CPC14-3	1512	1517	EXPACPC14-3-217	38	0	3	0	0	0	4	0	0	0	Tphs dike at ~1511	3	0								
CPC14-3	1517	1522	EXPACPC14-3-218	38	0	3	0	0	0	4	0	0	0		3	0								
CPC14-3	1522	1533	EXPACPC14-3-219	38	0	3	0	0	0	3	0	0	0	1522-1533: lost core, actually <3 ft core to sample (see RQD and photos)	3	0								
CPC14-3	1533	1538	EXPACPC14-3-220	38	0	3	0	0	0	4	0	0	0		3	0								
CPC14-3	1538	1543	EXPACPC14-3-221	38	0	3	0	0	0	4	0	0	0		3	0								
CPC14-3	1543	1548	EXPACPC14-3-222	38	0	3	0	0	0	4	0	0	0		3	0								
CPC14-3	1548	1553	EXPACPC14-3-223	38	0	3	0	0	0	4	0	0	0		3	0								
CPC14-3	1553	1558	EXPACPC14-3-224	30	0	3	0	0	0	3	0	0	0	Tphs dike to approx (rubble) 1555, then into clast-supported Tph bx;	5	0								
CPC14-3	1558	1563	EXPACPC14-3-225	30	0	3	0	0	0	4	0	0	0		3	0								

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz	
CPC14-3	1563	1568	EXPACPC14-3-226	30	0	3	0	0	0	4	0	0	0	l gy porphyritic (Tph) clasts in m gy vfg matrix cont.	3	0						3-4% py			
CPC14-3	1568	1573	EXPACPC14-3-227	41	0	3	0	0	0	4	0	0	0	logged as "ash breccia"(41) just to emphasize that rock is mostly m gy fg matrix material (as above)	3	0						(cont) w fg clasts; subtle layering suggests possible crystal-lithic lapilli tuff;			
CPC14-3	1573	1578	EXPACPC14-3-228	42	0	3	0	0	0	3	0	0	0	bx, gen matrix-support; crude layering and (minor) heterolithic clasts suggest CC Bx - but similar t	3	0						(cont) to above Tph bx; still, curviplanar clast margins suggest hyaloclastite (quench fragmentation			
CPC14-3	1578	1583	EXPACPC14-3-229	42	0	3	0	0	0	3	0	0	0		3	0									
CPC14-3	1583	1588	EXPACPC14-3-230	42	0	3	0	0	0	4	0	0	0	42 or 30? clasts mostly porphyritic phonolite;	3	0									
CPC14-3	1588	1593	EXPACPC14-3-231	42	0	3	0	0	0	4	0	0	0	a/a	3	0									
CPC14-3	1593	1598	EXPACPC14-3-232	34	0	4	0	0	0	4	0	0	0	last positive id Bx at 1592, then porphyritic phonolite (vuggy in part w increase py)	5	0						4 py = locally 5%			
CPC14-3	1598	1603	EXPACPC14-3-233	34	0	4	0	0	0	4	0	0	0	Highly fx'd to rubbly nature of core hampers quality lith logging; SEE RQD and PHOTOS	5	0						3-5% py			
CPC14-3	1603	1608	EXPACPC14-3-234	34	0	4	0	0	0	4	0	0	0	34 = fg porphyritic, but not distinctly so (fg feld-phyric porph text not prominent)	5	0									
CPC14-3	1608	1613	EXPACPC14-3-235	31	0	4	0	0	0	4	0	0	0	patches could pass for Tphk (7-10% 2-3 mm cream feld)	5	0			3-4 k-alt						
CPC14-3	1613	1618	EXPACPC14-3-236	34	0	4	0	0	0	4	0	0	0		5	0									
CPC14-3	1618	1623	EXPACPC14-3-237	34	0	4	0	0	2	4	0	0	0	possible biotite (w py), but no positive id;	5	0									
CPC14-3	1623	1628	EXPACPC14-3-238	31	0	3	0	0	2	4	0	0	0	clay slicks suggest minor fault; Tphk w possible biotite(?)	10	0						3-4% py			
CPC14-3	1628	1633	EXPACPC14-3-239	31	0	3	0	0	2	4	0	0	0		5	0		2			2 biotite = can't rule out that biotite? isn't a product of alteration				
CPC14-3	1633	1638	EXPACPC14-3-240	31	0	3	0	0	2	4	0	0	0	biotite? can't rule out Tphb (32)	5	0									
CPC14-3	1638	1643	EXPACPC14-3-241	32	0	3	0	0	2	3	0	0	0	logged as 32 to bring attention to possible biotite; granulated shatter bx immed below 1639 block su	10	0		2			a/a				
CPC14-3	1643	1648	EXPACPC14-3-242	31	0	3	0	0	2	3	0	0	0		5	0									
CPC14-3	1648	1653	EXPACPC14-3-243	34	0	3	0	0	1	4	0	0	0	probably Tphk, but good lith hard to observe in fragments (core is strongly broken, see RQD)	5	0									
CPC14-3	1653	1658	EXPACPC14-3-244	34	0	3	0	0	1	4	0	0	0		5	0									
CPC14-3	1658	1663	EXPACPC14-3-245	34	0	4	0	0	1	4	0	0	0		5	0						gen a/a w locally up to 5% py			
CPC14-3	1663	1668	EXPACPC14-3-246	34	0	3	0	0	1	3	0	0	0	Tphk? Tphb?	5	0			py after biotite?						

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	1668	1673	EXPACPC14-3-247	34	0	3	0	0	1	4	0	0	0		5	0								
CPC14-3	1673	1678	EXPACPC14-3-248	34	0	4	0	0	1	4	0	0	0		5	0								
CPC14-3	1678	1683	EXPACPC14-3-249	34	0	3	0	0	0	4	0	0	0	friable crush-bx immed below 1682 block suggests likely fault in vicinity; (MAJOR FAULT? - see below	10	0			3 and 4 k-alt					
CPC14-3	1683	1688	EXPACPC14-3-250	34	0	3	0	0	0	3	0	0	0	vuggy, crumbly footwall of fault;	5	0								
CPC14-3	1688	1693	EXPACPC14-3-251	34	0	4	0	0	0	3	0	0	0	clast-supported shatter bx present immed below 1692 block (fault zone cont.)	5	0								
CPC14-3	1693	1698	EXPACPC14-3-252	34	0	3	0	0	0	3	0	0	0	friable rubble	5	0								
CPC14-3	1698	1703	EXPACPC14-3-253	34	0	4	0	0	0	4	0	0	0	crush bx present; trace qtz microvnlt (2-3mm)	5	0					trace l gy qtz (2-3mm vnlt)			5
CPC14-3	1703	1708	EXPACPC14-3-254	34	0	3	0	0	0	4	0	0	0	friable shatter bx'd phonolite cont.	5	0								
CPC14-3	1708	1713	EXPACPC14-3-255	30	0	3	0	0	0	4	0	0	0	30 = minor clast-support bx present: can't tell if tectonic or Tph intrusive/autobx	5	0								
CPC14-3	1713	1718	EXPACPC14-3-256	31	0	3	0	0	0	4	0	0	0	looks like typical Tphk here - not friable! and only mod fx'd;	3	0								
CPC14-3	1718	1723	EXPACPC14-3-257	31	0	3	1	0	0	4	0	0	0	back into highly fx'd rock; py microvnlt (1 mm) present w unident d gy min and possible moly	5	0				59 min = unident d gy min: sp? spec? gn? + possible moly	spec?			
CPC14-3	1723	1728	EXPACPC14-3-258	31	0	3	0	0	0	4	0	0	0		5	0								
CPC14-3	1728	1733	EXPACPC14-3-259	34	0	4	0	0	0	4	0	0	0	~1727.5 - 1728.7: clast-support bx (mono Tphk) then rock that is likely still Tphk, but less promine	5	0					(cont) prominently feld-phyr (porphyritic);			
CPC14-3	1733	1738	EXPACPC14-3-260	34	0	4	1	0	0	4	0	0	0		5	0								
CPC14-3	1738	1743	EXPACPC14-3-261	38	0	4	0	0	0	5	0	0	0	Tphs dike at ~1736, 7-10% cream ragged anhedral-subhedral feld phenos to 9 mm, some glomerophyr, i	3	0					(cont) in m gy aphanitic matrix; strong k-5 alt; super-fine dissem py (3-5%)			
CPC14-3	1743	1748	EXPACPC14-3-262	38	0	4	0	0	0	5	0	0	0	Tphs dike includes slivers of country rock (Tphu)	5	0								
CPC14-3	1748	1753	EXPACPC14-3-263	38	1	4	0	0	0	5	0	0	0	Tphs dike cont to approx (broken) 1754;	5	0						trace FeOx may be post-drilling(?)		
CPC14-3	1753	1758	EXPACPC14-3-264	31	0	4	0	0	0	5	0	0	0	Tphk?	3	0								
CPC14-3	1758	1763	EXPACPC14-3-265	31	0	3	0	2	2	5	0	0	0	Tphk +/- biotite(? alt'd)	3	0			2-argil = minor white clay on fxs					
CPC14-3	1763	1768	EXPACPC14-3-266	31	0	4	0	2	2	5	0	0	0		5	0			k-5 cont. (unusual width)			3-5% py		
CPC14-3	1768	1773	EXPACPC14-3-267	31	0	4	0	2	1	5	0	0	0		3	0		1			1-biotite = appears fx-controlled and therefore a product of alt?			
CPC14-3	1773	1778	EXPACPC14-3-268	31	0	3	0	2	2	5	0	0	0	Tphk +/- biotite?	3	0			4-5 k-alt; wh clay on fxs cont.		5 qtz = trace hairline qtz microvnlt			5

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	1778	1783	EXPACPC14-3-269	34	0	4	0	2	1	4	0	0	0	34 (Tphu) = feld-phyric (porphyritic) texture not as prominent as above;	3	0								
CPC14-3	1783	1788	EXPACPC14-3-270	36	0	3	0	0	1	4	0	0	0	logged as Tphm (mafic porphyritic) to bring attention to minor patches that are speckled w ragged bi	5	0						(cont) biotite? hblnd? Tphb unalt'd protolith?		
CPC14-3	1788	1793	EXPACPC14-3-271	34	0	3	0	0	0	4	0	0	0	severely broken core (see RQD, photos); What is AK Drilling doing to this rock?? Bad equip? Bad tech	5	0						(cont) nique? Helper beating the heck out of core tube??		
CPC14-3	1793	1798	EXPACPC14-3-272	31	0	4	0	0	1	4	0	0	0	looks like Tphk w minor darker gy patches that host ragged biotite (no positive id)	5	0			1 sericite = sericite after biotite??			gen 3-4% py, and locally up to 5%;		
CPC14-3	1798	1803	EXPACPC14-3-273	34	0	4	0	1	0	4	0	0	0	34 (Tphu, undiff) probably = Tphk, but not distinctly/prominently feld-phyric porphyritic;	5	0			1-argil = minor wh clay on fxs					
CPC14-3	1803	1808	EXPACPC14-3-274	34	0	4	0	1	0	4	0	0	0		5	0			a/a					
CPC14-3	1808	1813	EXPACPC14-3-275	34	0	3	0	0	0	4	0	0	0		5	0								
CPC14-3	1813	1818	EXPACPC14-3-276	31	0	4	0	0	0	4	0	0	0	ENTIRE TABLE is HIGHLY FX'D / BROKEN ROCK (poor drill technique??)	5	0								
CPC14-3	1818	1823	EXPACPC14-3-277	34	0	4	0	0	0	4	0	0	0		5	0								
CPC14-3	1823	1828	EXPACPC14-3-278	34	0	4	0	0	0	4	0	0	0		5	0								
CPC14-3	1828	1833	EXPACPC14-3-279	34	0	3	0	0	0	4	0	0	0	orange brn (in photos) is drill fluid gunk;	5	0								
CPC14-3	1833	1838	EXPACPC14-3-280	34	0	4	0	0	0	4	0	0	0	crumbly rock above 1835 block suggest possible fault;	10	0								
CPC14-3	1838	1843	EXPACPC14-3-281	38	0	3	0	0	0	5	0	0	0	Tphs dike approx (broken rubble) 1839.3 - 1842;	5	0						increase py in dike selvages (in Tphu)		
CPC14-3	1843	1848	EXPACPC14-3-282	34	0	4	0	0	0	4	0	0	0	crumbly rubble @ ~1846 suggest possible fault; comminuted grit may include qtz??	10	0					possible? comminuted qtz vnl't grit in fault?			11
CPC14-3	1848	1853	EXPACPC14-3-283	38	0	3	0	0	0	5	0	0	0	another seriate porphyritic phono dike at ~1848 - 1851;	3	0								
CPC14-3	1853	1858	EXPACPC14-3-284	38	0	4	0	0	0	5	0	0	0	possible fault (crumbly rubble) at 1855, and more Tphs dike material ~1856 - 1857.2;	10	0								
CPC14-3	1858	1863	EXPACPC14-3-285	34	0	3	0	0	0	4	0	0	0	undiff Tph includes minor Tphs dike stringers	5	0								
CPC14-3	1863	1868	EXPACPC14-3-286	31	0	4	0	0	0	4	0	0	0	looks like mostly Tphk w well developed feld-phyric fg porph texture;	5	0								
CPC14-3	1868	1873	EXPACPC14-3-287	31	0	3	0	0	0	4	0	0	0		5	0					11 qtz = possible qtz (hairline) in py microvnl'ts;			11
CPC14-3	1873	1878	EXPACPC14-3-288	31	0	4	0	0	0	4	0	0	0		5	0								
CPC14-3	1878	1883	EXPACPC14-3-289	34	0	4	0	0	0	4	0	0	0	many core frags that aren't rubble host open microfxs (w py and tr fluorite)	5	0					41 Gangue = dissem fluorite assoc w open microfxs		41	

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	1883	1888	EXPACPC14-3-290	34	0	4	1	0	0	4	0	0	0		5	0					looked for fluorite	1 spec = unident vfg d gy min, could be base metal?		
CPC14-3	1888	1893	EXPACPC14-3-291	31	0	4	0	0	0	4	0	0	0		5	0								
CPC14-3	1893	1898	EXPACPC14-3-292	34	0	4	0	0	0	4	0	0	0		5	0								
CPC14-3	1898	1903	EXPACPC14-3-293	31	0	4	0	0	0	4	0	0	0		5	0								
CPC14-3	1903	1908	EXPACPC14-3-294	31	0	4	0	0	0	4	0	0	0		5	0						3-5%py		
CPC14-3	1908	1913	EXPACPC14-3-295	31	0	4	0	0	0	4	0	0	0		5	0								
CPC14-3	1913	1918	EXPACPC14-3-296	31	0	4	0	0	0	4	0	0	0		5	0								
CPC14-3	1918	1923	EXPACPC14-3-297	31	0	4	0	0	0	4	0	0	0		5	0								
CPC14-3	1923	1928	EXPACPC14-3-298	31	0	4	0	0	0	4	0	0	0	increase py to 4-7% w tr possible moly (bluish gy min)	5	0				61	61 min = moly? (trace)			
CPC14-3	1928	1933	EXPACPC14-3-299	34	0	4	0	0	0	4	0	0	0		5	0								
CPC14-3	1933	1938	EXPACPC14-3-300	34	0	4	0	0	0	4	0	0	0		5	0								
CPC14-3	1938	1943	EXPACPC14-3-301	34	0	4	0	1	0	4	0	0	0		10	0								
CPC14-3	1943	1948	EXPACPC14-3-302	34	0	4	0	0	0	3	0	0	0		5	0			K-3 alt (change)					
CPC14-3	1948	1953	EXPACPC14-3-303	34	0	4	0	0	0	4	0	0	0		5	0			3-4 K-alt					
CPC14-3	1953	1958	EXPACPC14-3-304	34	0	4	0	0	0	4	0	0	0		5	0								
CPC14-3	1958	1963	EXPACPC14-3-305	34	0	4	0	0	0	4	0	0	0		5	0						4-5% py		
CPC14-3	1963	1968	EXPACPC14-3-306	34	0	4	0	0	0	4	0	0	0	34 (Tphu) is probably Tphk	5	0								
CPC14-3	1968	1973	EXPACPC14-3-307	31	0	4	0	0	0	3	0	0	0	at ~ 1962 nature of "rubble" changes, bcmg more like fx'd core (core pieces) than unconsol rubble;	5	0			3 and 4 K-alt					
CPC14-3	1973	1978	EXPACPC14-3-308	31	0	4	0	0	0	4	0	0	0		5	0								
CPC14-3	1978	1983	EXPACPC14-3-309	31	0	4	0	0	0	4	0	0	0		5	0								
CPC14-3	1983	1988	EXPACPC14-3-310	31	0	4	0	0	0	4	0	0	0	at ~1886 changes back into rubble, with RC-like cuttings (< 2cm) below 1995 ft.	5	0								
CPC14-3	1988	1993	EXPACPC14-3-311	31	0	4	0	0	0	4	0	0	0		5	0				62	62-min = possible sp: 1-2 mm d gy metallic granules (trace) could be blackjack sphalerite?			
CPC14-3	1993	1998	EXPACPC14-3-312	31	0	4	0	0	0	3	0	0	0	mostly chip-size rubble; possible heavy trace blackjack sphalerite(?; see above 62-min)	5	0			3 and 4 K-alt;	62				
CPC14-3	1998	2003	EXPACPC14-3-313	31	0	4	1	0	0	4	0	0	0		5	0						3-5% py; cannot rule out that vfg d gy min is specularite (and not blackjack sp - see above min)		
CPC14-3	2003	2008	EXPACPC14-3-314	31	0	4	0	0	0	4	0	0	0		3	0								
CPC14-3	2008	2013	EXPACPC14-3-315	31	0	4	1	0	0	4	0	0	0		5	0						spec? (vfg d gy min)		
CPC14-3	2013	2018	EXPACPC14-3-316	31	0	4	0	0	0	4	0	0	0		5	0								
CPC14-3	2018	2023	EXPACPC14-3-317	31	0	4	0	0	0	4	0	0	0		5	0								

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	2023	2028	EXPACPC14-3-318	34	0	4	0	0	0	4	0	0	0	34 = a/a (Tphk-like), but not as prominently feld-phyric/porphyritic; rubble, see RQD;	5	0			3-4 k-alt;					
CPC14-3	2028	2033	EXPACPC14-3-319	36	0	4	0	0	0	4	0	0	0	logged as 36 (Tphm) to bring attention to py laths - py after hblnd?? ie mafic phonolite protolith?	5	0								
CPC14-3	2033	2038	EXPACPC14-3-320	36	0	4	0	0	0	4	0	0	0	Tphh?	5	0								
CPC14-3	2038	2043	EXPACPC14-3-321	34	0	4	0	0	0	4	0	0	0		5	0						4-7% py		
CPC14-3	2043	2048	EXPACPC14-3-322	36	0	4	0	0	2	4	0	0	0	phonolite bcmg slightly darker gy with increase py in dark patches (py after biotite??)	5	0		2	2 sericite? Can sericite form after biotite?		can't tell if biotite (? no positive id, just dark ragged patches assoc w py) is secondary or primar			
CPC14-3	2048	2053	EXPACPC14-3-323	36	0	4	0	0	1	4	0	0	0		5	0		1						
CPC14-3	2053	2058	EXPACPC14-3-324	31	0	3	0	0	0	4	0	0	0	looks like typical l gy feld-phyric Tphk here, less alter'd than above??	5	0								
CPC14-3	2058	2063	EXPACPC14-3-325	31	0	3	0	0	0	4	0	0	0		5	0								
CPC14-3	2063	2068	EXPACPC14-3-326	31	0	3	0	0	0	4	0	0	0		5	0								
CPC14-3	2068	2073	EXPACPC14-3-327	36	0	4	0	0	2	4	0	0	0	phono w dark splotches w intimately assoc py: secondary biotite (no positive id) in alt'd Tphk? or T	5	0		2	sericite? after biotite??		(cont) Tphb/Tphm??(36)			
CPC14-3	2073	2078	EXPACPC14-3-328	36	0	4	0	0	2	4	0	0	0		5	0		2						
CPC14-3	2078	2083	EXPACPC14-3-329	36	0	4	0	0	2	4	0	0	0	Tphb? biotite alt'd Tphk?? a/a w py intimately assoc w dark patches (biotite?)	5	0		2						
CPC14-3	2083	2088	EXPACPC14-3-330	36	0	4	0	0	2	4	0	0	0		5	0		2						
CPC14-3	2088	2093	EXPACPC14-3-331	36	0	4	0	0	2	4	0	0	0		5	0		2						
CPC14-3	2093	2098	EXPACPC14-3-332	31	0	4	0	0	1	4	0	0	0	looks like Tphk + biotite/py here;	5	0		1						
CPC14-3	2098	2103	EXPACPC14-3-333	31	0	4	0	0	1	4	0	0	0		3	0		1				4-5% py		
CPC14-3	2103	2106	EXPACPC14-3-334	36	0	4	0	0	1	4	0	0	0		5	0		2						
CPC14-3	2106	2116	EXPACPC14-3-335	-999										No recovery between 2106 and 2116 blocks	-9999									
CPC14-3	2116	2121	EXPACPC14-3-336	34	0	4	0	0	1	4	0	0	0	one relatively intact piece shows horsetail microfxs (subparallel tca) w lenses microbx;	5	0		2						
CPC14-3	2121	2126	EXPACPC14-3-337	36	0	4	0	0	1	4	0	0	0	several wh vnlt (5 mm)w open central cavities at ~2124.5; looks like dolo but does not fizz - poss	5	0		2		11-qtz = possible qtz-adularia? vnlt	(cont) possibly qtz-adularia? vnlt;			11
CPC14-3	2126	2131	EXPACPC14-3-338	36	0	4	0	0	1	4	0	0	0	mafic phono? or just biotite alt'd phono? as above (broken)	5	0		2		a/a (zeolite?)				11
CPC14-3	2131	2136	EXPACPC14-3-339	36	0	4	0	0	1	4	0	0	0	a/a	5	0		2						
CPC14-3	2136	2141	EXPACPC14-3-340	36	0	4	0	0	1	4	0	0	0	py/biotite clots?	5	0		2						
CPC14-3	2141	2146	EXPACPC14-3-341	36	0	4	0	0	1	4	0	0	0		5	0		2						

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	2146	2151	EXPACPC14-3-342	36	0	5	0	0	2	4	0	0	0	phonolite w biotite?-py vnlt;	5	0		3	biotite is secondary? alteration product?			up to 10% py, commonly in biotite? bands		
CPC14-3	2151	2156	EXPACPC14-3-343	31	0	5	0	0	2	4	0	0	0	mix: some of this rock looks like typ Tphk (l gy); and some, darker, m gy, w black (biotite?) patch	5	0		3				(cont) es, looks like Tphb or Tphm; gen 5-7% py, locally 10%		
CPC14-3	2156	2161	EXPACPC14-3-344	34	0	5	0	0	1	4	0	0	0	a/a, pyritic	5	0		2						
CPC14-3	2161	2166	EXPACPC14-3-345	34	0	4	0	0	1	4	0	0	0	mixed Tphk and Tphm or Tphb a/a;	5	0		1						
CPC14-3	2166	2171	EXPACPC14-3-346	31	0	4	0	0	1	4	0	0	0	can pass for Tphk, w horsetail microfxs (+/- py and possible qtz?)	5	0		1		hairline microfxs may host qtz?		3-5% py;		5
CPC14-3	2171	2176	EXPACPC14-3-347	31	0	5	0	0	0	4	0	0	0	a/a, tr only biotite, pyritic;	5	0		0				4-7% py, and locally up to 10%		
CPC14-3	2176	2181	EXPACPC14-3-348	31	0	5	0	0	0	4	0	0	0		5	0						py as above		
CPC14-3	2181	2186	EXPACPC14-3-349	31	0	5	0	0	0	4	0	0	0		5	0								
CPC14-3	2186	2191	EXPACPC14-3-350	36	0	4	0	0	2	4	0	0	0	py and biotite? in microfxs supports likelihood that biotite is alteration feature and that 36 (Tphm	5	0		2	sericite? after biotite?? or vfg specks dolo?? after biotite? (need microscope work)			(cont)) is an altreation facies (K-alt w biotite) of Tphk;		
CPC14-3	2191	2196	EXPACPC14-3-351	36	0	5	0	0	2	4	0	0	0	36 (mafic porphyr phono) is likely alt facies (K-alt w biotite) of Tphk	5	0		2						
CPC14-3	2196	2201	EXPACPC14-3-352	36	0	4	0	0	2	4	0	0	0		5	0		2						
CPC14-3	2201	2206	EXPACPC14-3-353	36	0	4	0	0	1	4	0	0	0		5	0		2						
CPC14-3	2206	2211	EXPACPC14-3-354	-999										no recovery										
CPC14-3	2211	2213	EXPACPC14-3-355	36	0	4	0	0	2	4	0	0	0		5	0		2						
CPC14-3	2213	2218	EXPACPC14-3-356	36	0	4	0	0	2	4	0	0	0	py/biotite? clots cont.	5	0		2						
CPC14-3	2218	2223	EXPACPC14-3-357	36	0	4	0	0	2	4	0	0	0		5	0		2						
CPC14-3	2223	2228	EXPACPC14-3-358	36	0	4	0	0	2	4	0	0	0		5	0		2						
CPC14-3	2228	2233	EXPACPC14-3-359	36	0	4	0	0	2	4	0	0	0	clots and dark patches py/biotite? (? = no positive id biotite)	5	0		2				gen 4-7% py		
CPC14-3	2233	2238	EXPACPC14-3-360	36	0	4	0	0	2	4	0	0	0		5	0		2						
CPC14-3	2238	2243	EXPACPC14-3-361	36	0	4	0	0	2	4	0	0	0		5	0		2						
CPC14-3	2243	2248	EXPACPC14-3-362	31	0	4	0	0	1	4	0	0	0	less biotite (alteration): looks more like Tphk (31) here;	5	0		1						
CPC14-3	2248	2253	EXPACPC14-3-363	31	0	4	0	0	1	4	0	0	0		5	0		1						
CPC14-3	2253	2258	EXPACPC14-3-364	31	0	4	0	0	1	4	0	0	0		5	0		1						
CPC14-3	2258	2263	EXPACPC14-3-365	31	0	4	0	0	1	4	0	0	0		5	0		1						
CPC14-3	2263	2268	EXPACPC14-3-366	31	0	4	0	0	1	4	0	0	0		5	0		1						
CPC14-3	2268	2273	EXPACPC14-3-367	31	0	4	0	0	1	4	0	0	0	trace dolomite on fxs	5	1		1		1 carbonate = trace dolomite on fxs				
CPC14-3	2273	2278	EXPACPC14-3-368	31	0	4	1	0	1	4	0	0	0		5	1		1				spec? too fg to id - may be vfg biotite?		
CPC14-3	2278	2283	EXPACPC14-3-369	36	0	4	1	0	1	4	0	0	0	biot alt'd Tphk a/a	5	0		2						
CPC14-3	2283	2288	EXPACPC14-3-370	36	0	4	0	0	1	4	0	0	0		5	0		2						

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	2288	2293	EXPACPC14-3-371	31	0	4	1	0	1	4	0	0	0	hvy tr wh qtz mivrovnlts (to 5 mm) at 2290.7 - 2292.2, with vfg d gy min (spec, sphalerite?)	5	0		1		62		3-5% py; unident vfg d gy min: spec? sphalerite?		5
CPC14-3	2293	2298	EXPACPC14-3-372	31	0	4	0	0	1	4	0	0	0	RC cutting-size core frags, 2295.5 - 2297.5, suggest possible fault;	10	0		1						
CPC14-3	2298	2303	EXPACPC14-3-373	34	0	4	0	0	1	4	0	0	0	Tphu = Tphk? but speckled feld-phyric texture not prominent; trace (only) py-biot?-qtz microvnlts	5	0		1						5
CPC14-3	2303	2308	EXPACPC14-3-374	34	0	4	0	0	1	4	0	0	0		5	0		1						
CPC14-3	2308	2313	EXPACPC14-3-375	36	0	5	0	0	2	4	0	0	0	looks like py-biot alt'd Tphk	5	0		3				5 py = 4-7% py, and locally 10%		
CPC14-3	2313	2318	EXPACPC14-3-376	31	0	4	0	0	1	4	0	0	0	orange discoloration (photos) due to some drill fluid? (re-drilled, tumbled material present)	5	0		1						
CPC14-3	2318	2323	EXPACPC14-3-377	31	0	4	0	0	1	4	0	0	0	mostly Tphk, but tumbled/re-drilled material (including Tphs cave?) puts sample reliability in doubt	5	0		1						
CPC14-3	2323	2325	EXPACPC14-3-378	31	0	4	0	0	1	4	0	0	0	a/a;	5	0		1						
CPC14-3	2325	2335	EXPACPC14-3-379	34	0	4	0	0	1	4	0	0	0	less than 0.75 ft tumbled rubble; one piece hosts 2 mm l gy qtz vnlt; note on drill daily says cored	5	0		1	(cont) hole"tail" to 4370 ft.)		5 qtz = 2 mm l gy qtz vnlt in one piece core;	(cont) to 2345 ft - with no recovery. END AK HOLE (re-entered by Tonatec for environmental water ho		5
CPC14-3	2335	2345	EXPACPC14-3-380	-999										no recovery; Tonatec starts drilling (HQ cont) at approx 2347 ft;										
CPC14-3	2345	2347	EXPACPC14-3-381	-999										slight discrepancy between bottomm of AK hole(2345) and top of Tonatec tail (2347) - or just rubble.										
CPC14-3	2347	2357	EXPACPC14-3-382	34	0	4		0	1	4	0	0	0	less than 1.5 ft Tphu-Tphk rubble (NOT 10 ft sample!) - also, don't know if in-situ, could be (re-d	5	0		1			42-G = trace fluorite (+py) on fxs	(cont) re-drilled cave;	42	
CPC14-3	2357	2362	EXPACPC14-3-383	34	0	4	0	0	1	4	0	0	0	rubble (<2 ft) as above;	5	0								
CPC14-3	2362	2364	EXPACPC14-3-384	-999										no recovery										
CPC14-3	2364	2367	EXPACPC14-3-385	34	0	4	0	0	0	4	0	0	0	block at 2366; Tphu, some pieces look like Tphk; dissem fluorite! Hope this is in-situ (rubble)	3	0			looks like biotite alt is tapering off in transition to gyp/calc veining (below);		dissem fluorite on fxs	both rubble and mod fx'd	42	

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	2367	2372	EXPACPC14-3-386	31	0	3	1	0	0	5	0	0	3	0.5 ft rubble, then ~1 ft mod fx'd rock, then "stickrock" starting at approx 2368.3; Tphk? l-m gy r	3	0			(cont) veined (2-4 mm, 10-30 tca) w fibrous gypsum; 3-4% py - up to 5%; 4-5! K-alt;		looked for fluorite; 3 sulfate = gyp vnlt	(cont) rock (phonolite) is finely speckled (feld-phyric) w ~10-15% 1-3 mm cream subhedral phenos and		
CPC14-3	2372	2377	EXPACPC14-3-387	31	0	3	1	0	0	5	0	0	3	subtle layering of minor lapilli-like feld-phyric "pods" (5-10mm) suggests possible lithic-xtl tuff	1	0								
CPC14-3	2377	2382	EXPACPC14-3-388	31	0	3	1	0	0	5	0	0	3		1	0					clear hairline horsetail microvnlt could be qtz, but likely gyp;			
CPC14-3	2382	2387	EXPACPC14-3-389	31	0	4	1	0	0	5	0	0	3	WALLROCK starts to be weakly CALCAREOUS (weak fizz, including gyp vnlt)	1	2			2 carbonate = weakly calcareous wallrock;			gen 3-5% py;		
CPC14-3	2387	2392	EXPACPC14-3-390	31	0	4	1	0	0	5	0	0	3	monolithic bx (or lapilli tuff) texture bcmg common below 2390;	1	2								
CPC14-3	2392	2397	EXPACPC14-3-391	43	0	3	1	0	0	5	0	0	3	43 = xtl lithic bx (or 20: aphanitic phono-matrix bx?); monolithic (feld-phyric) 3mm-3cm subrnd clas	1	2			strong K-alt masks frag/lapilli contacts (blurry, ill-defined)			(cont) clasts/lapilli;		
CPC14-3	2397	2402	EXPACPC14-3-392	31	0	3	1	0	0	5	0	0	3	a/a to ~ 2398, then back into sparsely feld-phyric Tphk-like rock w odd d brn-gy-pyritic blotches (3	1	2					(cont) 3-6 mm) - some w nucleous like an accretionary lapilli (look like worm burrows)			
CPC14-3	2402	2407	EXPACPC14-3-393	31	0	3	1	0	2	5	0	0	3	crystal-rich and crystal-poor (feld phenos) zones suggests possible "stratified" xtl tuff(?)	1	2			2 sericite? = cannot tell if I am looking at sericite or carbonate					
CPC14-3	2407	2412	EXPACPC14-3-394	31	0	3	1	0	0	5	0	0	3	could pass for Tphk w sparse phenos (5%)	1	2								
CPC14-3	2412	2417	EXPACPC14-3-395	43	0	3	1	0	0	5	0	0	3	mostly bx (mixed volc clasts, no positive id pC); clasts up to 5 cm;	1	2					3-sulfate = gyp vnlt cont.; 2 carbonate = wall rock effervescence			
CPC14-3	2417	2422	EXPACPC14-3-396	43	0	4	1	0	0	5	0	0	3	bx texture masked by strong K-5 alt	1	3								
CPC14-3	2422	2427	EXPACPC14-3-397	31	0	3	1	0	0	5	0	0	3	at ~2422.5 back into Tphk (31) or feld xtl tuff(?)	1	3								
CPC14-3	2427	2432	EXPACPC14-3-398	31	0	3	2	0	0	5	0	0	3		1	2								

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	2432	2437	EXPACPC14-3-399	43	0	3	1	0	0	5	0	0	3	back into xtl-lithic lapilli tuff (volc bx)	1	2								
CPC14-3	2437	2442	EXPACPC14-3-400	43	0	3	1	0	0	5	0	0	3	crude streaky layering	1	3								
CPC14-3	2442	2447	EXPACPC14-3-401	43	0	4	1	0	0	5	0	0	2	anastomosing "horsetail" calc-py microvnls: hairline to 2 mm, 10 tca;	1	3						4 py (5-7%) includes py vnls	22	
CPC14-3	2447	2452	EXPACPC14-3-402	43	0	3	1	0	0	5	0	0	3		1	2								
CPC14-3	2452	2457	EXPACPC14-3-403	43	0	4	1	0	0	5	0	0	2	feld-phyric clasts (lapilli) up to 13 cm	1	2						4-5% py		
CPC14-3	2457	2462	EXPACPC14-3-404	43	0	3	1	0	0	5	0	0	2		1	2								
CPC14-3	2462	2467	EXPACPC14-3-405	43	0	3	1	0	0	5	0	0	2		1	2								
CPC14-3	2467	2472	EXPACPC14-3-406	43	0	3	1	0	0	5	0	0	2	lapilli tuff/volc bx includes streaky banding and some pumice-like frags w eutaxitic texture	1	2								
CPC14-3	2472	2477	EXPACPC14-3-407	43	0	3	1	0	0	5	0	0	2		1	2								
CPC14-3	2477	2482	EXPACPC14-3-408	43	0	3	1	0	0	5	0	0	2	clasts/lapilli dominantly feld-phyric and Tphk-like;	1	2								
CPC14-3	2482	2487	EXPACPC14-3-409	43	0	3	1	0	0	5	0	0	2	subtle streaky banding, 60-65 tca;	1	2								
CPC14-3	2487	2492	EXPACPC14-3-410	43	0	3	1	0	0	5	0	0	2		1	2						py selvages on gyp vnls		
CPC14-3	2492	2497	EXPACPC14-3-411	43	0	3	1	0	0	5	0	0	1	xtl-lithic lapilli tuff to 2495, then seriate porphyritic phono dike? contact at 60 tca	1	1			calcareousness (fizz) diminished - along w number of gyp vnls					
CPC14-3	2497	2502	EXPACPC14-3-412	38	0	3	1	0	2	5	0	0	1	gyp vnls present (cont) in Tphs (weakly clcareous)	1	1			2 sericite = sparkling feld phenos (probably sericitized)					
CPC14-3	2502	2507	EXPACPC14-3-413	38	0	3	1	0	2	5	0	0	2		1	2								
CPC14-3	2507	2512	EXPACPC14-3-414	38	0	3	1	0	2	5	0	0	2		1	2								
CPC14-3	2512	2517	EXPACPC14-3-415	38	0	3	2	0	2	5	0	0	2		1	2								
CPC14-3	2517	2522	EXPACPC14-3-416	38	0	3	1	0	2	5	0	0	2		1	2					2-sulfate = gyp vnls cont; 2 carbonate = calcareous wallrock cont.			
CPC14-3	2522	2527	EXPACPC14-3-417	43	0	4	1	0	1	5	0	0	2	Tphs (dike?) to 2523.8 (contact ~20 tca), then transition zone to xtl-lithic lapilli tuff (volc bx)	1	2						(cont) at 2526.3; banding at 60 tca;		
CPC14-3	2527	2532	EXPACPC14-3-418	43	0	4	1	0	0	5	0	0	2		1	3		1			1-biotite = trace biotite-py flecks?			
CPC14-3	2532	2537	EXPACPC14-3-419	43	0	4	1	0	0	5	0	0	2	streaky banding at ~25 tca; shattered w network hairline calc microfxs; sparse lapilli/frags;	1	3								

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz	
CPC14-3	2537	2542	EXPACPC14-3-420	31	0	4	1	0	0	5	0	0	1	contact at 30 tca; looks like Tphk, except that some feld phenos rather large (9x4 mm); odd dark br	1	3						(cont) brownish blotches as per 2402 (some tabular and calcareous - alt'd mafic min?)			
CPC14-3	2542	2547	EXPACPC14-3-421	31	0	4	1	0	0	5	0	0	1	a/a, looks like Tphk, but not typical, with larger feld phenos than usual, but not "mega-crystic"	1	2					1-sulfate = gyp/anhyd vnlt's present but sparse (3 in 5 ft); calcareous wallrock cont.				
CPC14-3	2547	2552	EXPACPC14-3-422	31	0	4	1	0	0	5	0	0	1		1	2						gen 3-5% py			
CPC14-3	2552	2557	EXPACPC14-3-423	31	0	4	1	0	0	5	0	0	1		1	2									
CPC14-3	2557	2562	EXPACPC14-3-424	31	0	4	2	0	0	5	0	0	1	weak network (healed) py microfxs	1	2									
CPC14-3	2562	2567	EXPACPC14-3-425	31	0	4	1	0	0	5	0	0	1	start seeing bx clasts (Tphk) and darker gy aphanitic, pyritic seams w vfg "debris" at 2566	1	2									
CPC14-3	2567	2572	EXPACPC14-3-426	31	0	4	2	0	0	5	0	0	1	Tphk? borders on being seriate textured (38)	1	2			4-5 k-alt						
CPC14-3	2572	2577	EXPACPC14-3-427	31	0	4	2	0	0	4	0	0	2	less distinctly-prominently feld-phyric porphyritic; gyp -or anhyd?- on fxs at 25 tca;	1	2									
CPC14-3	2577	2582	EXPACPC14-3-428	31	0	4	1	0	0	4	0	0	1	below 2579: subtle patches 30 (porphyritic phonolite-matrix bx)	1	2			4 and 5 k-alt						
CPC14-3	2582	2587	EXPACPC14-3-429	31	0	4	1	0	0	4	0	0	1	Tphk? Tphs? a/a	1	2									
CPC14-3	2587	2592	EXPACPC14-3-430	31	0	4	1	0	0	5	0	0	1	minor bx (Tphk clasts) a/a, irreg m gy "debris seams" at low < tca;	1	2									
CPC14-3	2592	2597	EXPACPC14-3-431	30	0	4	1	0	0	4	0	0	1	more (intrusive? auto?) bx than not	1	2		1			trace biotite = some clasts appear biotite alt'd				
CPC14-3	2597	2602	EXPACPC14-3-432	31	0	4	1	0	0	5	0	0	1	only minor (monolithic) bx	1	2									
CPC14-3	2602	2607	EXPACPC14-3-433	31	0	4	1	0	0	5	0	0	1		1	2									
CPC14-3	2607	2612	EXPACPC14-3-434	30	0	4	1	0	0	5	0	0	1	irreg patches "bx", patches fg porphyritic and patches cg porphyritic Tphk;	1	2									
CPC14-3	2612	2617	EXPACPC14-3-435	31	0	4	1	0	0	5	0	0	1	subtle streaky banding - w clasts feld-phyric phono - at approx 10-15 tca; minor bx cont.	1	2									
CPC14-3	2617	2622	EXPACPC14-3-436	31	0	4	1	0	0	4	0	0	1	fg phaneritic (vfg feld-phyric, felty) and only sparsely porphyritic;	1	2					1-sulfate = white gyp or anhyd? vnlt's (to 5 mm) cont.; calcareous wallrock cont.				
CPC14-3	2622	2627	EXPACPC14-3-437	30	0	4	1	0	0	5	0	0	1	d gy bx seam, ~0.4-0.5 ft wide, at 20 tca, between 2622-2624; d gy aphanitic pyritic matrix w matrix	1	1						(cont) -supported volc clasts 1 mm - 5 cm;			
CPC14-3	2627	2632	EXPACPC14-3-438	34	0	4	1	0	0	4	0	0	1	34 = undiff "porphyritic" phono w d brownish splotches (see 2402) that may be biotite-py after mafic	1	2		2			2-biotite = possible biotite, w py, in splotches - some rectangular 9x3 mm (mafic phenos?)	(cont) phenos(?)			

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	2632	2637	EXPACPC14-3-439	36	0	4	1	0	0	4	0	0	1	decide to code 36 to emphasize possible? mafic nature of phonolite (brown biot-py sploches)	1	2		2				4-7% py		
CPC14-3	2637	2642	EXPACPC14-3-440	20	0	5	2	0	0	5	0	0	1	mostly volc bx below 2635.5 w streaky banding at 20 tca; feld-phyric (3x5 mm anhedral feld) clasts i	1	2		2	(cont) in part w microbx/py in microfxs;		2-biotite = no positive id, but suspect biotite in dark bx matrix;	(cont) in d gy aphanitic pyritic (10%) matrix; used code 20 - because of aphanitic matrix; shattered		
CPC14-3	2642	2647	EXPACPC14-3-441	20	0	5	1	0	0	5	0	0	1	matrix and clast-supported volc bx; clasts (2 mm - 5 cm) are mostly coarsely feld-phyric Tphk - or p	1	1		2				(cont) possibly Tphs (brecciated dike?)		
CPC14-3	2647	2652	EXPACPC14-3-442	36	0	5	1	0	0	4	2	0	3	mafic porphyritic phonolite w black laths (10%, up to 4x1 mm, but more common 1x2);	1	1		2	is py after mafic phenos propylitic alteration?		2 biotite = biotite after pyrox/hblnd? 3-sulfate = horsetail gyp/anhy vnlt 5-10 tca; only v wkly ca			
CPC14-3	2652	2657	EXPACPC14-3-443	36	0	4	1	0	0	5	2	0	2	below 2650.5 increasingly feld-phyric, but still a mafic phonolite w accicular and tabular phenos;	1	1		2				4-7% py - mostly replacing mafic phenos		
CPC14-3	2657	2662	EXPACPC14-3-444	37	0	5	1	0	0	5	2	0	2	starting at ~2655.5, a monolithic bx; most likely a Tphm bx; (finely dark speckled clasts in darker	1	2		2				(cont) aphanitic pyritic matrix);		
CPC14-3	2662	2667	EXPACPC14-3-445	37	0	4	1	0	0	5	2	0	2	mafic phono bx cont, gen a/a, but less matrix, more clast supported, w some feld-phyric clasts;	1	2		2						
CPC14-3	2667	2672	EXPACPC14-3-446	37	0	5	1	0	0	5	2	0	2	Tphmbx cont, w minor feld-phyric clasts;	1	2		2				7-10% py, vfg		
CPC14-3	2672	2677	EXPACPC14-3-447	36	0	4	1	0	0	4	2	0	1	possible 0.5 ft Tphs dike stringer or clast? at 2672, then fg mafic porphyritic phono cont.; only mi	1	1		2				(cont) minor bx, and phono is more phaneritic than porphyritic;		
CPC14-3	2677	2682	EXPACPC14-3-448	36	0	4	1	0	0	5	2	0	1	mafic phenos present but not always evident (py is); some horizons exhibit a trachytic/felty texture	1	2		2				4-7% py;		
CPC14-3	2682	2687	EXPACPC14-3-449	36	0	4	1	0	0	5	2	0	1	not sure what this lith is: m gy, finely speckled rock w small (1-2mm) cream laths - and only hint o	10	1		1				(cont) of mafic phenos; alt'd Tphm?		
CPC14-3	2687	2692	EXPACPC14-3-450	34	0	4	1	0	0	5	0	0	1	"black & tan" band (20 tca) at 2685.2 is contact of sorts. Black rock is Tphm, tan is ?? Hint of fg	1	2		1	(cont) d-like comminuted material - possible healed FAULT? (10 structure above) - or ignimbrite??			(cont) mafics suggest still in (alt'd) Tphm; 0.4 ft tan band is actually layer of fg fragmental-shar		
CPC14-3	2692	2697	EXPACPC14-3-451	37	0	4	1	0	0	4	2	0	1	back into Tphm bx - with a few clasts Tphs	1	1		3			increase (secondary?) biotite			

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	2697	2702	EXPACPC14-3-452	36	0	4	0	0	0	5	2	0	1	Tphm cont. w minor Tphk or Tphs feld-phyric bx clasts between 2698-99	1	1		2				4-5% py;		
CPC14-3	2702	2707	EXPACPC14-3-453	36	0	4	0	0	0	4	2	0	1	phaneritic to fg porphyritic w skeletal mafics	1	1		2			carbonate (1) more in microfxs than in wallrock			
CPC14-3	2707	2712	EXPACPC14-3-454	36	0	4	0	0	0	4	2	0	1		1	2		2				4-7% py		
CPC14-3	2712	2717	EXPACPC14-3-455	37	0	4	1	0	0	4	2	0	1	below 2714.2 bx with Tphm and Tphk/Tphs clasts in segregated patches	1	1		2						
CPC14-3	2717	2722	EXPACPC14-3-456	37	0	4	0	0	0	5	1	0	1	bx cont w more feld-phyric clasts than mafic;	1	1		1				5-7% py		
CPC14-3	2722	2727	EXPACPC14-3-457	36	0	4	0	0	0	4	1	0	1	subtle banding(35 tca) at 2723.5 (w bx above) suggests possibilty of "bx" being xtl-lithic (lapilli)	1	2		2				(cont) tuff (43); rock immed below "bx" is fg phaneritic "salt & pepper" and could pass for syenite;		
CPC14-3	2727	2732	EXPACPC14-3-458	37	0	4	0	0	0	4	1	0	1	bx cont., grading down (2729) to Tphm; clasts both mafic and Tphk-like; lithic lapilli tuff??	1	2		2				3-5% py		
CPC14-3	2732	2737	EXPACPC14-3-459	38	0	4	0	0	0	5	1	0	1	sharp contact Tphs dike at 2733 (20 tca); includes slivers brecciated Tphm wallrock 2736-2737.3 w di	1	2		1		62	62 min = fg dissem sphalerite (? d gy sulfide) at dike contact microbx; Tphm more calcareous than Tp	(cont) dissem blackjack sphalerite at contacts		
CPC14-3	2737	2742	EXPACPC14-3-460	38	0	3	1	0	2	5	0	0	0	Tphs dike cont.	1	1		0				3-4% py		
CPC14-3	2742	2747	EXPACPC14-3-461	38	0	3	1	0	2	5	0	0	1	small sliver wallrock (Tphm?) between 2744-45 (lost core) w possible sp? on same fxs as gyp/anhyd	1	1		0		62				
CPC14-3	2747	2752	EXPACPC14-3-462	38	0	4	1	0	2	5	0	0	2	Tphs dike cont. to 2749.4 then intimate mix Tphs and Tphm? bx; Dike in fault zone?	1	2		2			biotite? selvages on microfxs; unable to differentiate between calc wallrock and poddible calc vnlt	4-5% py		
CPC14-3	2752	2757	EXPACPC14-3-463	38	0	3	1	0	2	5	0	0	1	mostly Tphs dike, starting at 2752.3;	1	1		2						
CPC14-3	2757	2762	EXPACPC14-3-464	38	0	5	1	0	2	5	0	0	2	equal parts intimate mix Tphs dike and pyritic Tphm? bx; gyp/anhyd vnlt at 0-10 tca; cut both dike	1	2		3			3-biotite: can't tell how much is Tphm primary - and how much is secondary;	(cont) and country rock; locally up to 10% py - in matrix of Tphm bx;		
CPC14-3	2762	2767	EXPACPC14-3-465	37	0	4	0	0	1	5	0	0	2	coded as Tphmbx but actually mixed lith clasts (Tphm and Tphk/Tphs?) Tphs dike stringer (20 tca) at	1	1		3				(cont) 2762-63; micro bx present in some microfxs;		

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	2767	2772	EXPACPC14-3-466	38	0	4	0	0	1	5	0	0	1	Tphs dike stringer (curved contact: 20 and -10 tca) 2767.6-2769.2 in matrix-support bx; thin-banded	1	2		1				(cont) micro-bx at contact; heterolithic bx could pass for CC bx.		
CPC14-3	2772	2777	EXPACPC14-3-467	30	0	4	2	0	0	5	0	0	1	above bx grades down into (2771.6) more of a Tphk/Tphk bx;	1	2		0		61	61 = trace moly? Possible hairline qtz microvnlts (<5 tca) - too thin for positive id;	3-4% py		5
CPC14-3	2777	2782	EXPACPC14-3-468	42	0	4	0	0	0	5	0	0	1	above bx grades down into a more heterolithic (pC frags?) at ~ 2776.9; some d green chloritized frag	1	2		0				(cont) s; bx matrix speckled w wh feld phenos and/or pheno frags; 5-7% py		
CPC14-3	2782	2787	EXPACPC14-3-469	42	0	4	0	0	0	5	0	0	1	CC bx w finely speckled feld-phyric matrix (xtl-lithic tuff)	1	2		0			2-carbonate = calcareous wallrock and microfxs	4-5% py		
CPC14-3	2787	2792	EXPACPC14-3-470	42	0	4	0	0	0	5	0	0	1		1	2		0			clasts more calcareous than matrix			
CPC14-3	2792	2797	EXPACPC14-3-471	42	0	4	0	0	0	5	0	0	1	heterolithic CC bx w possible pC clasts; subround cobble-like clasts to 12 cm;	1	1		0						
CPC14-3	2797	2802	EXPACPC14-3-472	42	0	4	0	0	0	5	0	0	1	clasts mostly Tert (Tphk), but pC present	1	2								
CPC14-3	2802	2807	EXPACPC14-3-473	38	0	3	2	0	2	5	0	0	1	Tphs (seriate porphyritic phono) dike at 2802.5 (40 tca); fx-controlled l gy/d gy mottling; this Tph	1	1		2	(cont) cannot tell if biotite-Tphs is less alt'd Tphs than above (with relict biotite), or if more	62	(cont) alt'd w secondary biotite; 2-spec includes mag (after biotite)	(cont) Tphs is different than above Tphs with presence (5%) of fg biotite (+/- mag, py, sericite);		
CPC14-3	2807	2812	EXPACPC14-3-474	38	0	3	2	0	2	5	0	0	2	biotite Tphs or Tphb? (32); weakly magnetic;	1	1		2		62	2-biot: really can't tell if biotite is primary or secondary? carb mostly in microfxs	2-spec is probably mostly fg mag;		
CPC14-3	2812	2817	EXPACPC14-3-475	38	0	3	2	0	2	5	0	0	2	a/a, mottled l gy/ d gy w less and more biotite; locally glomerophyric;	1	1		2		62	can't rule out vfg sphalerite w py in gyp/anhd vnlt selvages;	3 py = 3-4%		
CPC14-3	2817	2822	EXPACPC14-3-476	38	0	3	2	0	2	5	0	0	2	biotite-Tphs or Tphb cont.	1	2		2		62				
CPC14-3	2822	2827	EXPACPC14-3-477	38	0	4	2	0	2	5	0	0	2	darker gy more magnetic than l gy (n/mag)	1	1		2			trace fluorite in microfxs	4 py = up to 5% vfg dissem py	41	
CPC14-3	2827	2832	EXPACPC14-3-478	38	0	4	2	0	2	4	0	0	2	l to m gy w diminished biotite; subtle banding at ~30 tca;	1	1		1			gyp/anhyd vnlt to 1 cm (25 tca)	can't tell difference (%) between spec and mag;		
CPC14-3	2832	2837	EXPACPC14-3-479	38	0	4	1	0	2	5	0	0	2		1	1		1						

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	2837	2842	EXPACPC14-3-480	31	0	4	1	0	2	4	0	0	2	less Tphs-like and more Tphk-like below distinct band at 2836 (25 tca); odd pyritic brownish blotche	1	1		0				(cont) s (after mafic phenos?) as observed uphole ("wormburrows", 2402 ft)		
CPC14-3	2842	2847	EXPACPC14-3-481	31	0	4	0	0	2	4	0	0	2		1	1		0						
CPC14-3	2847	2852	EXPACPC14-3-482	42	0	4	0	0	0	4	0	0	1	sharp contact at 2848.1 (60 tca); heterolithic bx, but most clasts porph phono (could pass for xtl-l	1	1		0				(cont) lithic lapilli tuff, along with Tphk rock immed below Tphs); up to 7% super fg py		
CPC14-3	2852	2857	EXPACPC14-3-483	42	0	4	0	0	0	4	0	0	1		1	1		0					41	
CPC14-3	2857	2862	EXPACPC14-3-484	42	0	4	1	0	0	5	0	0	2		1	1		0						
CPC14-3	2862	2867	EXPACPC14-3-485	42	0	4	1	0	0	4	0	0	2	locally clast-supported (bx)	1	1				62				
CPC14-3	2867	2872	EXPACPC14-3-486	42	0	4	1	0	0	4	0	0	1	could pass for xtl (feld-phyric) - lithic lapilli tuff (43), or even Tphkx (30)	1	2								
CPC14-3	2872	2877	EXPACPC14-3-487	42	0	4	1	0	0	4	0	0	2		1	1								
CPC14-3	2877	2882	EXPACPC14-3-488	42	0	4	1	0	0	5	0	0	1		1	2								
CPC14-3	2882	2887	EXPACPC14-3-489	42	0	4	1	0	0	5	0	0	3	5 cm gyp/anhyd vn at 2882.4 (40 tca)	1	1								
CPC14-3	2887	2892	EXPACPC14-3-490	42	0	4	2	0	0	4	0	0	2		1	2								
CPC14-3	2892	2897	EXPACPC14-3-491	42	0	4	1	0	0	5	0	0	2	matrix-support and clast-support define crude stratification; some clasts shattered w microfxs;	1	2					trace fluorite in microfxs		41	
CPC14-3	2897	2902	EXPACPC14-3-492	42	0	4	1	0	0	5	0	0	1	matrix-support and clast-support define crude stratification; some clasts shattered w network microf	1	1						(cont) microfxs		
CPC14-3	2902	2907	EXPACPC14-3-493	42	0	4	2	0	0	5	0	0	1	increasingly heterolithic (lapilli) and more like typical CC Bx;	1	1								
CPC14-3	2907	2912	EXPACPC14-3-494	42	0	4	2	0	0	4	0	0	2		1	2						3-4% py and 1-2% d gy fg min (spec?)		
CPC14-3	2912	2917	EXPACPC14-3-495	42	0	4	2	0	0	4	0	0	2	microfxs/gyp vnlt cut (refract) thru clasts;	1	2								
CPC14-3	2917	2922	EXPACPC14-3-496	42	0	4	2	0	0	5	0	0	2		1	2								
CPC14-3	2922	2927	EXPACPC14-3-497	42	0	4	1	0	0	4	0	0	1	change at 2925.4 w sharp, yet gradational, cntct from matrix supported CC Bx to clast-supported pC d	1	1						(cont) debris (abundant leucogranite, clasts to 9 cm); contact roughly at 25 tca;		
CPC14-3	2927	2932	EXPACPC14-3-498	85	0	4	1	0	1	4	2	0	2	used code 85, "CC quartz monzonite bx", to denote a bx that consists mostly (>90%) of pC clasts (peg	1	2			(cont) of; poorly sorted w grit to >1m; relatively fresh (weak propyl); gen 3-4% py, up to 5-7%;			(cont) matite-leucogranite and foliated biotite granite-granodiorite and schistose varieties thereof		
CPC14-3	2932	2937	EXPACPC14-3-499	85	0	4	1	0	1	4	2	0	2	dense, tightly packed pC debris; py selvages on gyp/anhyd vnlt	1	2								

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	2937	2942	EXPACPC14-3-500	85	0	4	1	0	1	4	2	0	1	shattered appearance w network microfxs and horsetail mylonite-like microbx seams; possible fingers	1	1					5 qtz = possible? qtz in shatter-microvnlts, no positive id;	(cont) Tphd or m gy xtl tuff material;		5
CPC14-3	2942	2947	EXPACPC14-3-501	85	0	4	1	0	1	4	2	0	1	2945.3 - 2946.6: interbed CC Bx (Tert); pC debris includes rock that looks like a fg biotite graphic	1	1						(cont) -granite;		
CPC14-3	2947	2952	EXPACPC14-3-502	85	0	4	1	0	1	4	2	0	1	mostly salt n'pepper (biotite bearing) pC debris w thin seams that could pass for CC Bx;	1	1								
CPC14-3	2952	2957	EXPACPC14-3-503	85	0	4	1	0	1	4	2	0	1	~2956 - 2973.6: seam CC Bx like rock w feld-phyric phonolite clasts; clast boundaries not clear (blu	1	1						(cont) blurry)		
CPC14-3	2957	2962	EXPACPC14-3-504	42	0	4	1	0	0	5	0	0	2	mostlly CC Bx - w Tert volc clasts; crude banding at 50 tca;	1	1								
CPC14-3	2962	2967	EXPACPC14-3-505	42	0	4	1	0	0	5	0	0	1	a/a, mostly (>95%) Tert clasts, feld-phyric	1	1						4-7% py		
CPC14-3	2967	2972	EXPACPC14-3-506	42	0	4	1	0	0	5	0	0	1	bx texture almost obliterated (k-4 and 5 alt'd)	1	1								
CPC14-3	2972	2977	EXPACPC14-3-507	85	0	4	1	0	1	4	1	0	1	2973.5-73.8: irreg transition zone to mostly pC debris a/a (used code 85 for pC bx)	1	1								
CPC14-3	2977	2982	EXPACPC14-3-508	85	0	4	1	0	1	3	1	0	1	mostly foliated (biotite) qtz-monz to granodiorite; pC blocks up to 8.5 ft (consistent foliation at	1	1						(cont) 30 tca)		
CPC14-3	2982	2987	EXPACPC14-3-509	85	0	4	1	0	1	3	1	0	1	bands cg leucogranite and foliated biotite "granodiorite" (big picture = gneiss)	1	1								
CPC14-3	2987	2992	EXPACPC14-3-510	85	0	3	1	0	1	4	1	0	1	0.1 ft phonolite dike stringer at 2988.8 - or layer CC bx? ~2991-91.7: Cc bx (fx fill?, 30 tca cntc	1	1					(cont) w leucogranite clast? or wall rock?)			
CPC14-3	2992	2997	EXPACPC14-3-511	31	0	4	1	0	1	5	1	0	1	logged as feld-phyric phonolite to bring attention to possible dike (~2991-2994.7); cntc w leucogran	1	1					(cont) ite at 2994.7 is subparallel (20 tca) to cntc at 2991.6 (implications for in-situ pC bedrock?)			
CPC14-3	2997	3002	EXPACPC14-3-512	85	0	4	1	0	1	5	1	0	1	mostly pC (foliated biot gd and leucogranite), but Tph dike? stringers cont.; shattered leucogranite	1	1					(cont) w stockwork microfxs at Tph contact (eg 3001-02)			
CPC14-3	3002	3007	EXPACPC14-3-513	85	0	3	1	0	1	4	1	0	1	mostly pC leucogranite, w subordinate feld-phyric Tert component (3004-3005.3: dike? xtl tuff?)	1	1								
CPC14-3	3007	3012	EXPACPC14-3-514	85	0	4	1	0	1	4	1	0	1	a/a, w Tert (Tph) dike stringers?, cobbles? fx-fill? minor fault (20 tca) w py slicks at 3012; slick	1	1					(cont) s at ~50 tca (on face at 20 tca);			

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	3012	3017	EXPACPC14-3-515	85	0	4	1	0	1	4	1	0	1	a/a, w few irreg pods feld-phyric Tert rock;	1	1					only minor gyp/anhyd vnltls and onlytrace-weak HCL fizz			
CPC14-3	3017	3022	EXPACPC14-3-516	85	0	3	1	0	1	4	1	0	1	multiple contacts Tph pods/lenses w leucogranite at 30 tca (eg 3019, 3021,why? fx in bedrock??); dis	1	1						(cont) distinct "runic" texture in graphic granite at 3019.5;		
CPC14-3	3022	3027	EXPACPC14-3-517	85	0	3	1	0	1	4	1	0	1	leucogranite w (sparse) irreg pods/lenses feld-phyric Tph; hard pressed to find any clast boundaries	1	1								
CPC14-3	3027	3032	EXPACPC14-3-518	85	0	3	1	0	1	4	1	0	1	a/a w pods vfg (gritty) CC bx;	1	1								
CPC14-3	3032	3037	EXPACPC14-3-519	85	0	4	1	0	1	4	1	0	3	(42) good place to see well defined pC clasts engulfed by vfg CC bx;	1	1								
CPC14-3	3037	3042	EXPACPC14-3-520	71	0	4	1	0	1	4	1	0	2	at 3037.3, biotite schist, biotite gneiss, and some leucogranite; ptymatic folds present; foliation	1	1						(cont) at 45-60 tca; cannot rule out BEDROCK;		
CPC14-3	3042	3047	EXPACPC14-3-521	72	0	4	1	0	1	4	1	0	2	a/a, mostly biotite schist	1	1								
CPC14-3	3047	3052	EXPACPC14-3-522	71	0	4	1	0	1	4	1	0	2	a/a, w pegmatitic leucogranite below 3049; foliation at 60 tca; BEDROCK?	1	1								
CPC14-3	3052	3057	EXPACPC14-3-523	72	0	4	1	0	1	4	1	0	1	biotite schist and gneiss a/a (mostly schist, w relatively fresh biotite)	1	1					trace only weak fizz (carbonate); minor thin (1-2 mm) gyp/anhyd vnltls;			
CPC14-3	3057	3062	EXPACPC14-3-524	72	0	0	1	0	1	4	1	0	1	foliation at ~60 tca (has been consistent since 3037, implying one big caved block (in diatreme) or	1	1		(cont) of irreg caldera wall?)				(cont) BEDROCK below or outside diatreme; pC horst block? in caldera floor; irreg "inlier" in rim o		
CPC14-3	3062	3067	EXPACPC14-3-525	71	0	0	0	0	1	4	1	0	1	dark bands (3 cm) biotite along fxs in leucogranite suggests some biotite secondary	1	1		2			2-biotite = biotite selvages on fxs;	trace only spec if present		
CPC14-3	3067	3072	EXPACPC14-3-526	72	0	4	0	0	1	4	1	0	1	mostly biotite schist, w subordinate bands leucogranite;	1	1		2			a/a, biotite selvages on fxs and gyp vnltls			
CPC14-3	3072	3077	EXPACPC14-3-527	71	0	4	0	0	1	4	1	0	3	minor pinch and swell schist pods in leucogranite along healed fxs/gyp vnltls;	1	1						gen 4-5% py, w locally up to 10% in gyp/anhyd vnltls		
CPC14-3	3077	3082	EXPACPC14-3-528	71	0	4	0	0	1	4	1	0	2	coarsely granular py on gyp/anhyd? fxs (30 and 20 tca)	1	1								
CPC14-3	3082	3087	EXPACPC14-3-529	71	0	4	0	0	1	4	1	0	2		1	1								
CPC14-3	3087	3092	EXPACPC14-3-530	71	0	4	0	0	1	4	1	0	3	foliation at ~55 tca (cont) BEDROCK; 2-3 mm gyp/anhyd? vnltls subparallel tca;	1	1								

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	3092	3097	EXPACPC14-3-531	64	0	3	0	0	1	4	1	0	1	CHANGE: last biotite schist band at approx 3093, then mostly (>95%) m-cg speckled off-wh/ m gy leuco	1	0			(cont) feldspar (ortho? plag?) 4 mm to more commonly ~1cm, and <5% biotite; overall blotchy-coarsel		(cont) y speckled appearance that borders on looking porphyritic;	(cont) leucogranite: holocrystalline, hypidiomorphic-granular, w ~15 % m gy qtz, subhedral off-wh fe		
CPC14-3	3097	3102	EXPACPC14-3-532	64	0	3	0	0	1	4	1	0	1	more like 15-20% m gy qtz (interstitial to feld)	1	0			1 prop and 1 sericite mostly applies to biotite alt.		n/calc	3-4% py, bright;		
CPC14-3	3102	3107	EXPACPC14-3-533	64	0	3	0	0	1	4	1	0	1		1	0								
CPC14-3	3107	3112	EXPACPC14-3-534	64	0	3	0	0	1	4	1	0	2		1	0								
CPC14-3	3112	3117	EXPACPC14-3-535	64	0	4	0	0	1	4	1	0	2	coarse py / gyp on fxs at 35-40 tca;	1	0								
CPC14-3	3117	3122	EXPACPC14-3-536	64	0	4	0	0	1	4	1	0	2		1	0						3-5% py includes py on fxs (w gyp/anhyd)		
CPC14-3	3122	3127	EXPACPC14-3-537	64	0	4	0	0	1	4	1	0	2		1	0						a/a, cg		
CPC14-3	3127	3132	EXPACPC14-3-538	64	0	4	0	0	1	4	1	0	2		1	0					n/calc cont.; gyp/anhyd on fxs cont.			
CPC14-3	3132	3137	EXPACPC14-3-539	64	0	4	0	0	1	4	1	0	2	gyp/anhyd? vnlt (20 tca) to 1 cm;	1	0								
CPC14-3	3137	3142	EXPACPC14-3-540	64	0	4	0	0	1	4	1	0	2		1	0								
CPC14-3	3142	3147	EXPACPC14-3-541	64	0	4	0	0	1	4	1	0	3	5 cm wh gyp/anhyd? vn (30 tca) w py granules at 3143.3;	1	0								
CPC14-3	3147	3152	EXPACPC14-3-542	64	0	4	0	0	1	4	1	0	2	multiple 1-2 mm py/gyp vnlt at 5 tca w stockwork microfxs in-between;	1	0								
CPC14-3	3152	3157	EXPACPC14-3-543	64	0	4	0	0	1	4	1	0	2		1	0								
CPC14-3	3157	3162	EXPACPC14-3-544	64	0	4	0	0	1	4	1	0	1		1	0								
CPC14-3	3162	3167	EXPACPC14-3-545	64	0	4	0	0	1	4	1	0	2	horsetail py/gyp vnlt (<3mm) at 15 tca; irreg m gy patches, possibly micro-porphyritic, could be	1	1						(cont) "stringers" Tert dike?		
CPC14-3	3167	3172	EXPACPC14-3-546	64	0	4	2	0	1	4	1	0	2		1	2					weak CaCo3 fizz	purplish bands in gyp/anhyd vns (1.5 cm, 30 and 45 tca) could be spec (2)		
CPC14-3	3172	3177	EXPACPC14-3-547	64	0	4	0	0	1	4	1	0	1	leucogranite cont., weakly calcareous	1	1								
CPC14-3	3177	3182	EXPACPC14-3-548	64	0	4	0	0	1	5	1	0	3	sharp contact (45 tca) m gy (mouse gy) aphanitic dike at 3180.1 (to 3185.4, lower cntc 10-15 tca)	1	1			propyl and ser alt refer to leucogranite; 5-k to dike;		3 sulfate = gyp/anhyd? fx-fill in dike; 1 calc applies to both dike and leucogranite;	py in Tert. dike is super fg;		

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	3182	3187	EXPACPC14-3-549	22	0	4	0	0	1	5	1	0	2	dike cont. (see above) w slivers wall rock; m mouse gy not typical Tphd color: may be mafic dike? (a	1	1								
CPC14-3	3187	3192	EXPACPC14-3-550	64	0	4	1	0	1	3	1	0	2	leucogranite cont.	1	1						3-5% py (includes fxs) cont. w up to 1% spec; py selvages on gyp/anhyd vnlt;		
CPC14-3	3192	3197	EXPACPC14-3-551	64	0	4	1	0	1	3	1	0	2		1	0						trace only spec		
CPC14-3	3197	3202	EXPACPC14-3-552	64	0	3	0	0	1	3	1	0	1		1	1		1			1 biotite = minor selvages on fxs			
CPC14-3	3202	3207	EXPACPC14-3-553	64	0	3	1	0	1	3	1	0	2		1	1						spec selvages on gyp/anhyd fxs		
CPC14-3	3207	3212	EXPACPC14-3-554	64	0	4	1	0	1	3	1	0	2		1	1								
CPC14-3	3212	3217	EXPACPC14-3-555	64	0	3	1	0	1	3	1	0	1	tabular feldspar laths to 13 mm becoming more common;	1	0								
CPC14-3	3217	3222	EXPACPC14-3-556	64	0	3	1	0	1	3	1	0	1		1	1		1				gen 3-4% py		
CPC14-3	3222	3227	EXPACPC14-3-557	64	0	3	0	0	1	3	1	0	2	6 mm m gy qtz vnlt (45 tca) at 3222.9	1	2		1						5
CPC14-3	3227	3232	EXPACPC14-3-558	64	0	3	1	0	1	4	1	0	2	py/gyp fx-fill cont.; biotite <2%;	1	1						spec w py in gyp vnlt selvages (v weakly magnetic, probably includes tr magnetite)		
CPC14-3	3232	3237	EXPACPC14-3-559	64	0	3	1	0	1	4	1	0	2	below 0.8 ft pegmatitic horizon (biotite to 13 mm) at 3234, feld laths (to 1.5 cm) are distinctly al	1	2					(cont) aligned at~45 tca (sub-parallel arrangement fits mine description of "CC Qtz Monzonite" unit			
CPC14-3	3237	3242	EXPACPC14-3-560	64	0	3	1	0	1	4	1	0	3	alligned feld laths a/a cont to internal contact-of-sorts at 3240.5;	1	2					3-sulf = 3 cm gyp/anhyd?/py vn (45 tca) at 3240.7			
CPC14-3	3242	3247	EXPACPC14-3-561	64	0	3	2	0	1	4	1	0	2	sparse biotite (<2%); py and spec on fxs	1	2								
CPC14-3	3247	3252	EXPACPC14-3-562	64	0	3	1	0	1	4	1	0	2	start seeing patches without typical coarsely xtln (feld) or pseudo-porphyritic texture	1	2								
CPC14-3	3252	3257	EXPACPC14-3-563	64	0	3	1	0	1	4	1	0	2		1	1								
CPC14-3	3257	3262	EXPACPC14-3-564	64	0	3	2	0	1	4	1	0	3	horsetail gyp/py/spec microvnlt subparallel tca	1	2			3-4 k-alt					
CPC14-3	3262	3267	EXPACPC14-3-565	64	0	3	2	0	1	4	1	0	2		1	2						just over 1% spec		
CPC14-3	3267	3272	EXPACPC14-3-566	64	0	3	1	0	1	4	1	0	1		1	1								
CPC14-3	3272	3277	EXPACPC14-3-567	64	0	3	1	0	1	4	1	0	1	feld mega-pheno (porphyroblast) at 3277.9 (3cm x 9mm)	1	1								
CPC14-3	3277	3282	EXPACPC14-3-568	64	0	3	2	0	1	4	1	0	1	v minor fault/gyp vnlt (60 tca) at 3281.5 with odd peripheral stylolite-microfxs;	1	1						spec? in stylolite-microfxs		
CPC14-3	3282	3287	EXPACPC14-3-569	64	0	4	2	0	1	4	1	0	1		1	1						4 py = slight increase on fxs (3-5% total py)		
CPC14-3	3287	3292	EXPACPC14-3-570	38	0	4	1	0	2	5	0	0	1	Tphs dike; irreg (and not sharp) contact at approx 3288.3;	1	3					3-calc: suprised that dike is weak to mod calcareous;	4-7% py, much of it in hairline micro-fxs		

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	3292	3297	EXPACPC14-3-571	38	0	4	1	0	2	5	0	0	0	seriate porphyritic phonolite dike cont.; minor banding at 30 tca	1	2								
CPC14-3	3297	3302	EXPACPC14-3-572	38	0	4	1	0	2	5	0	0	1	trace fluorite!	1	3					41 gangue = vfg fluorite dissem and in micro-fxs; very minor gyp vnlt; calcareous dike!	3-5% py	41	
CPC14-3	3302	3307	EXPACPC14-3-573	38	0	4	1	0	2	5	0	0	1		1	2							41	
CPC14-3	3307	3312	EXPACPC14-3-574	38	0	4	2	0	2	5	0	0	1	tr fluorite cont.	1	1						4-5% py and 1-2% assoc d gy min (spec?)	41	
CPC14-3	3312	3317	EXPACPC14-3-575	38	0	4	1	0	2	5	0	0	1		1	1					up to 1% fg dissem fluorite		41	
CPC14-3	3317	3322	EXPACPC14-3-576	38	0	4	1	0	2	5	0	0	1		1	1							41	
CPC14-3	3322	3327	EXPACPC14-3-577	38	0	4	1	0	2	5	0	0	1		1	1							41	
CPC14-3	3327	3332	EXPACPC14-3-578	38	0	4	1	0	2	5	0	0	4	Tphs dike to approx 3331 then steep cntc (15-20 tca) with calcareous gyp/anhy? vn to 3333.1 (ctct 25	10	3			(cont) gyp vn; can't rule out that "calc gyp" vn is dolomite??	60	wall rock (Tphs) esp calcareous near calcareous gyp vn; galena on fxs - w possible cp?	(cont) -30 tca; 10 struc = probable healed fault (dike and thick gyp vn); odd magnetite flecks in g	41	
CPC14-3	3332	3337	EXPACPC14-3-579	64	0	3	1	0	1	4	2	0	4	dissem fluorite cont on into pC leucogranite;	1	0						3 py = gen 3-4%	41	
CPC14-3	3337	3342	EXPACPC14-3-580	64	0	4	1	0	1	3	2	0	1	start seeing black biotite patches in non-foliated leucogranite at ~3339.4, along w lenticular feld	1	1			(cont) closely assoc biotite;		looked for fluorite	(cont) porphyroblasts (irreg 3x1 cm) that could pass for augen (as in augen gneiss); increase py w c		
CPC14-3	3342	3347	EXPACPC14-3-581	71	0	3	1	0	1	3	2	0	2	odd stretched feld porphyroblasts: augen gneiss-like;	1	1								
CPC14-3	3347	3352	EXPACPC14-3-582	72	0	3	1	0	1	3	2	0	2	gneiss grades into (calcareous) biotite schist at ~3347.5;	1	3					calcareous biotite schist;			
CPC14-3	3352	3357	EXPACPC14-3-583	72	0	3	1	0	1	3	2	0	2		1	1								
CPC14-3	3357	3362	EXPACPC14-3-584	72	0	3	1	0	1	3	2	0	2	mostly black biotite schist w subordinate lenses leucogranite	1	1								
CPC14-3	3362	3367	EXPACPC14-3-585	72	0	3	1	0	1	3	2	0	2		1	2								
CPC14-3	3367	3372	EXPACPC14-3-586	71	0	3	1	0	1	4	2	0	2	schist to 3369, then mostly leucogranite;	1	1								
CPC14-3	3372	3377	EXPACPC14-3-587	71	0	3	1	0	1	4	2	0	2	curvilinear foliation: -20 to +20 tca;	1	1								
CPC14-3	3377	3382	EXPACPC14-3-588	71	0	4	1	0	1	4	2	0	1	mostly leucogranite w deformed pods / (lava lamp) blobs schist; augen-like porphyroblast aligned at	1	1						(cont) 50-60 tca;		
CPC14-3	3382	3387	EXPACPC14-3-589	71	0	3	2	0	1	4	2	0	1	"spindle" porphyroblasts (eg 6 cm x 8mm) at 30-35 tca;	1	1								
CPC14-3	3387	3392	EXPACPC14-3-590	64	0	3	1	0	1	4	2	0	2	mostly leucogranite w pegmatitic patches	1	1				60	60-min = possible vfg galena (w py and gyp/anhyd?) on fxs;			
CPC14-3	3392	3397	EXPACPC14-3-591	71	0	3	1	0	1	4	2	0	2	gneiss: foliation at 35 tca - and 45 tca;	1	1								
CPC14-3	3397	3402	EXPACPC14-3-592	71	0	3	1	0	1	4	2	0	2		1	1								

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	3402	3407	EXPACPC14-3-593	71	0	3	1	0	1	4	2	0	1	stretched augen-like felsic porphyroblasts at 35-40 tca;	1	1								
CPC14-3	3407	3412	EXPACPC14-3-594	64	0	3	1	0	1	4	1	0	1	below 3409 mostly leucogranite, with very distinct myrmekitic texture (3410.7 - 3414.4)	1	1								
CPC14-3	3412	3417	EXPACPC14-3-595	71	0	3	1	0	1	4	2	0	1	thinly foliated biotite gneiss, w foliation at 50 tca (and locally folded/curved)	1	0					41-min = dissem fluorite w py on some fxs;		41	
CPC14-3	3417	3422	EXPACPC14-3-596	71	0	4	1	0	1	4	2	0	1	7 mm py-fluor-gyp-calcite vnlt (25 tca) at 3420.6; sharp, planar, almost lamellar, foliation at 3422	1	2					42 = calcite-fluorite-py-gyp vnlt	(cont) see photo;	42	
CPC14-3	3422	3427	EXPACPC14-3-597	64	0	3	1	0	1	4	1	0	1	mostly leucogranite with <0.6 ft schist bands; irreg dike contact at 3425.7;	1	1					tr fluorite assoc w gyp/anhyd vnlt;		41	
CPC14-3	3427	3432	EXPACPC14-3-598	22	0	4	0	0	1	5	0	0	0	m gy aphanitic phonolite dike w 2-3% 1.5 x 6mm feld phenos; lower cntc 75-80 tca;	1	2				60	2-carb = calcareous Tphd dike! Also, tr calcite vnlt (2mm); 60 = trace galena? (vfg d gy min)		41	
CPC14-3	3432	3437	EXPACPC14-3-599	64	0	3	1	0	1	4	1	0	1	leucogranite w sparse streaky bands / lenses biotite schist (20 tca); dike cntc at 3434.3 (20 tca)	1	1					looked for fluorite;			
CPC14-3	3437	3442	EXPACPC14-3-600	38	0	4	1	0	3	5	0	0	1	Tphs dike (3434.3 - 3439.7); lower cntct (25 tca) w 0.2 ft black biotite schist band (25 tca), then	1	1					a/a; dike is very weakly calcareous	(cont) leucogranite;		
CPC14-3	3442	3447	EXPACPC14-3-601	72	0	3	1	0	1	3	2	0	2	black biotite schist, w 1-3mm gyp/anhyd vnlt, starts at 3441;	1	1								
CPC14-3	3447	3452	EXPACPC14-3-602	72	0	3	1	0	1	3	2	0	2	a/a, foliation at ~25 tca; weak fizz to "gyp/anhyd" vnlt (10 tca): could be combination w calcite -	1	2						(cont) or even dolomite? 2-3% py;		
CPC14-3	3452	3457	EXPACPC14-3-603	71	0	3	1	0	1	3	2	0	2	ptygmatic folds at schist/leucogranite (gneiss) cntc at 3454.8 (migmatite?); gneiss foliation at 35	1	1						2-4% py		
CPC14-3	3457	3462	EXPACPC14-3-604	71	0	4	1	0	1	3	2	0	3	possible mafic dike (calc lampro?) finger 3459.2-3460.2 w irreg cntc w schist;	1	3			lamprophyre or mafic dike is 3-4 k-alt					
CPC14-3	3462	3467	EXPACPC14-3-605	72	0	3	1	0	2	5	2	0	2	irreg contact w Tphu dike (slightly feld-phyric: too much for Tphd? Tphk?) at 3465.2 (-3468.3) Note:	1	2			(cont) eg dike and 3 ft sample; k-5 refers to dike, as does sericite, fluorite.		Sulf and carb refers to schist;	(cont) for "envirinmental (hole)" purposes, asked to log at 5 ft intervals and not break out lith, e	41	

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	3467	3472	EXPACPC14-3-606	71	0	4	1	2	1	3	3	0	2	diffuse-gradational cntc dike w biotite gneiss at 3468.3; fluorite and minor cream-wh clay assoc wi	1	1	3		(cont) greenish-gy (chlor?); 2-argil = minor wh clay assoc w gyp-fluor vnls;			(cont) with gyp/anhyd vnls at 20 tca; at 3471.3, black biotite schist is bleached to more of a m gr	41	
CPC14-3	3472	3477	EXPACPC14-3-607	22	0	4	1	0	2	5	3	0	2	Tphd? dike w 2-3% feld phenos starts at 3474.1 (irreg cntct), immed below ~1.1 ft of heterolith schi	10	1			(cont) 20 tca; 5-k is dike		41 = trace to 3% dissem fluorite (in bx)	(cont) schist-Tph bx; dike intruded into fault? jump in fluorite% and presence of clear gyp vnls (2	41	
CPC14-3	3477	3482	EXPACPC14-3-608	71	0	4	1	0	1	4	1	0	1	lower dike contact w leucogranite at 3476.6 (sharp, 70 tca); could pass for mylonite gneiss w augen-	1	1					trace only fluorite (as compared to above)	(cont)-like lenses and subtle granulation texture; foliation at 20 tca, as well as 60;	41	
CPC14-3	3482	3487	EXPACPC14-3-609	42	0	4	1	0	1	4	0	0	1	above rock (71, to 3483.8) is actually more of a thinly foliated (mylonitic? shear zone) leucogranit	1	1			(cont) mixed bx clasts at 3483.9; could actually pass for Tphkxbx to ~3486;		1-2% fluorite	(cont) e w little biotite; start seeing streaky lenses (20 tca) feld-phyric phono at 3483.8, then mi	41	
CPC14-3	3487	3492	EXPACPC14-3-610	42	0	4	1	0	3	4	0	0	1	CC Bx or Tphkxbx? Clasts (porphyritic) poorly defined w possible feld-phyric (bx) matrix; clasts mostl	1	1			weak k-4		trace only carbonate	(cont) phono w subord pC; positive id bx-in-bx clasts; gen 4-5% py, w locally 7%;	41	
CPC14-3	3492	3497	EXPACPC14-3-611	42	0	4	1	0	3	4	0	0	1	42 or 30? a/a gen matrix-supported heterolithic (Tert and pC) bx; still can't tell if matrix is xtl	1	1					a/a	(cont) tuff or phyric phonolite;	41	
CPC14-3	3497	3502	EXPACPC14-3-612	42	0	4	1	0	2	4	0	0	1	WILL LOG as 42, but some intercepts look like Tphkxbx (30)	1	1					patches w up to 3% fluorite; some select bx frags higher;		41	
CPC14-3	3502	3507	EXPACPC14-3-613	30	0	4	1	0	2	4	0	0	0	here logged as 30 to bring attention to CC bx vs Tphkxbx "dilema" (looks like Tphkxbx here - is matrix	1	0						(cont) xtl tuff or feld-phyric phono??)	41	
CPC14-3	3507	3512	EXPACPC14-3-614	42	0	4	1	0	2	4	0	0	0	fluorite grains commonly assoc w py	1	0						tr only spec, if present at all;	41	
CPC14-3	3512	3517	EXPACPC14-3-615	42	0	4	1	0	2	4	0	0	2	1 cm gyp/anhy?- fluorite-py-qtz (xtls) vnlt at 3512.4 (25 tca);	1	1					5-qtz = qtz xtls in gyp/anhyd vnlt		41	5
CPC14-3	3517	3522	EXPACPC14-3-616	42	0	4	1	0	2	4	0	0	1	patches can pass for Tphs w heterolithic bx clasts; major fx (10 tca, gyp/anhyd vn) at 3521	1	0							41	
CPC14-3	3522	3527	EXPACPC14-3-617	42	0	4	1	0	2	4	0	0	0	leucogranite clasts to 10 cm; 42 vs 30 (Tphs bx)? cont.; fluor-py fxs present	1	0							41	
CPC14-3	3527	3532	EXPACPC14-3-618	42	0	4	1	0	2	4	0	0	2	as above, can't tell if Tphs is clasts or bx matrix? 1-2mm gyp/anhy vnls at 20-25 tca;	1	1							41	

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	3532	3537	EXPACPC14-3-619	42	0	4	1	0	2	4	0	0	1	need rock code for "undiff volc bx"!	1	1			strong k-4 alt				41	
CPC14-3	3537	3542	EXPACPC14-3-620	42	0	4	1	0	2	4	0	0	3	1 cm "window pane" clear gyp vnlt at 3537.7 (25 tca); d gy vfg n/mag min in selvage (spec? sp? gn?)	1	1					~ 2% dissem fluorite		41	
CPC14-3	3542	3547	EXPACPC14-3-621	38	0	4	1	0	2	5	0	0	4	~ 4-5? cm clear, coarsely xtl'n "window pane" gyp vn extends from 3545 to 3546.7; gyp surrounds (x-se	1	2			(cont) a Tphs dike; gyp vn and Tphs dike ~ 15-20 tca;		5-qtz = qtz xtls in gyp vn	(cont) ctions of qtz xtls to 1 cm dia.; rock ~3543 to 3546.7 footwall of vn is clast-free and likely	41	5
CPC14-3	3547	3552	EXPACPC14-3-622	42	0	4	1	0	2	5	0	0	0	CC Bx or Tphs bx cont.; 1 cm py-fluorite-qtz? (hard to tell w k-5 wall rock) vnlt at 3552 (30 tca)	1	1			(cont) NOT split a vnlt into two 5 ft samples. D'oh! 4-5 k-alt			(cont) REMEMBER: this hole is sampled every 5 ft for environmental considerations (otherwise would N	41	
CPC14-3	3552	3557	EXPACPC14-3-623	42	0	4	1	0	2	4	0	0	3	puplish gyp/anhyd vnlt (<5mm, 15 tca) w fluorite selvages present;	1	1			strong k-4		42 = fx-fill fluorite		42	
CPC14-3	3557	3562	EXPACPC14-3-624	42	0	4	1	0	2	5	0	0	4	5 mm gyp/anhyd/fluorite vnlt at 3557 (15 tca) expands to 1.5 cm immed below; qtx xtls in clear "wind	1	1					5-qtz = qtz xtls in gyp vn; trace only calcareous ("pinhead" sources)	(cont) "window pane" gyp up to 1 cm diameter.	41	5
CPC14-3	3562	3567	EXPACPC14-3-625	42	0	4	1	0	2	4	0	0	3	6-10mm qtz-fluor-gyp-py vnlt (20 tca) at 3563;	1	1			k-5 "selvage" on qtx-fluor-py vnlt				43	5
CPC14-3	3567	3572	EXPACPC14-3-626	42	0	4	1	0	2	4	0	0	2	(30, Tphsbx) 3cm qtz-fluorite vn (3 cm, 20-30 tca) at 3570.6; cntr of vn is chalcedonic banded (clr/	1	2					60 2-qtz = chalcedonic-banded qtz in center of fluorite vn (only minor py; tr gn? vfg tell??)	(cont) milky wh) qtz;	43	2
CPC14-3	3572	3577	EXPACPC14-3-627	42	0	4	1	0	2	4	0	0	2	IMPORTANT: Rx below are several intimately mixed varieties of hetero (Tert, pC) volc bx; for simplif	1	1			(cont) s are "broken-out" using (rx code) in lith column. Varieties are: (42), true CC Bx; (30), Tp		(cont) Tphkbx and Tphsbx (bx with Tphk and/or Tphs matrix; and (43), xtl-lithic bx (xtl-lithic lapil	(cont) ication purposes (modelling) used 42 (CC Bx) to group all varieties. Where possible, varietie	41	
CPC14-3	3577	3582	EXPACPC14-3-628	42	0	4	1	0	2	4	0	0	0	(30, Tphsbx), could pass for Tphs w pC and Tert clasts;	1	2						3-5% py;	41	
CPC14-3	3582	3587	EXPACPC14-3-629	42	0	4	1	0	2	3	0	0	1	(30) a/a, sparse lithics;	1	2							41	
CPC14-3	3587	3592	EXPACPC14-3-630	42	0	4	1	0	2	3	0	0	1	(30) looks like Tphk w sparse fg (<1cm) lithics;	1	2					looked for fluorite, trace only if present;			
CPC14-3	3592	3597	EXPACPC14-3-631	42	0	4	1	0	2	4	0	0	1	(30) looks like Tphs w sparse (<5%, gen < 2cm) lithics	1	2					42 = 2-3 mm qtz-fluor vnlt at 3595.4 (10 tca) and 96-97;		42	5
CPC14-3	3597	3600	EXPACPC14-3-632	42	0	4	1	0	2	4	0	0	0	(43) 3 ft sample = end HQ; deformed lenticular "lapilli" Tphs and subtle eutaxitic text suggest poss	1	1					looked for fluorite;	(cont) ibble welded tuff;		

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	3600	3605	EXPACPC14-3-633	42	0	4	1	0	2	4	0	0	0	(30) No recovery 3601-04	1	0								
CPC14-3	3605	3610	EXPACPC14-3-634	42	0	4	1	0	2	3	0	0	0	(30, Tphkx)	1	0								
CPC14-3	3610	3615	EXPACPC14-3-635	42	0	4	1	0	2	4	0	0	0	(30) possible Tphk dike (no clasts) at 3614.1-3623.4; upper cntc ~50 tca, lower, 15 tca;	1	0								
CPC14-3	3615	3620	EXPACPC14-3-636	34	0	4	1	0	2	5	2	0	2	possible Tphm? - w skeletal mafics? - dike	1	0			2-propyl = possible alt'd skeletal mafics			3-5% py cont.		
CPC14-3	3620	3625	EXPACPC14-3-637	34	0	4	1	0	2	5	2	0	2		1	0					trace dissem fluorite + in microfxs		41	
CPC14-3	3625	3630	EXPACPC14-3-638	42	0	4	1	0	2	4	0	0	0	(30, Tphk/Tphs bx) looks like mixed patches Tphk and Tphs w sparse lithics;	1	0							41	
CPC14-3	3630	3635	EXPACPC14-3-639	42	0	4	1	0	2	3	0	0	1	(30, Tphkxbx); increase clasts but still predom matrix-supported	1	0							41	
CPC14-3	3635	3640	EXPACPC14-3-640	42	0	4	1	0	2	4	0	0	0	(30) here looks like typ CC Bx - only matrix is Tphk;	1	0					1% dissem fluorite		41	
CPC14-3	3640	3645	EXPACPC14-3-641	42	0	4	1	0	2	4	0	0	2	(30); 1.5 cm gyp/anhyd? vn (20 tca) at 3641;	1	0						locally consistent 5% py	41	
CPC14-3	3645	3650	EXPACPC14-3-642	42	0	4	0	0	2	4	0	0	2	(42, CC Bx) at ~3643.4 becomes more like typical CC bx, with patches that are typ Tphk	1	0							41	
CPC14-3	3650	3655	EXPACPC14-3-643	42	0	4	1	0	2	4	0	0	0	(30, Tphkxbx) pC lapilli/clasts not uncommon;	1	0					trace only dissem fluorite		41	
CPC14-3	3655	3660	EXPACPC14-3-644	42	0	4	1	0	2	4	0	0	1	(30, Tphkxbx) Tphs clasts not uncommon;	1	0					a/a		41	
CPC14-3	3660	3665	EXPACPC14-3-645	42	0	4	1	0	2	4	0	0	1	(43) subtle eutaxitic texture (not prevalent) suggest possible welded xtl-lithic lapilli tuff;	1	0			patches k-5 alt		a/a		41	
CPC14-3	3665	3670	EXPACPC14-3-646	42	0	4	0	0	2	4	0	0	1	(30, Tphkxbx)	1	0					1-2% dissem fg fluorite		41	
CPC14-3	3670	3675	EXPACPC14-3-647	42	0	4	0	0	2	4	0	0	1	(30, Tphsxbx) looks like Tphs w sparse lithics (including pC)	1	0					trace only fluorite		41	
CPC14-3	3675	3680	EXPACPC14-3-648	42	0	4	1	0	2	5	0	0	2	(30, Tphsxbx) real "dogs breakfast" melange; some feld-phyric bands (~45 tca) may be dike stringers?	1	2			4-5 k-alt		2-carb = some calcite assoc w gyp/anhyd vnlt	(cont) or bedded xtl tuffs?	41	
CPC14-3	3680	3685	EXPACPC14-3-649	42	0	4	0	0	2	5	0	0	1	(30, Tphkxbx)	1	0			4-5 k-alt		1% fluor		41	
CPC14-3	3685	3690	EXPACPC14-3-650	42	0	4	1	0	2	5	0	0	2	(30, Tphsxbx); 1.5 cm clear gyp vnlt (+/- dolo or calcite?) 15 tca at 3689.5; some feld phenos appear	1	2			solid k-5			(cont) fragmental, as per an explosive xtl tuff - or tectonic? (see below)	41	
CPC14-3	3690	3695	EXPACPC14-3-651	82	0	4	1	0	2	5	0	0	4	used 82 for clast-support tect bx (do not like "late-stage" nomenclature); appear to be 2 healed bx	10	2						(cont) bx bands (15-25 tca) at 3694 and 3696 w a 6-8 cm gyp vn (+/- dolo? calcite), 25 tca, at 3695;	41	
CPC14-3	3695	3700	EXPACPC14-3-652	82	0	4	0	0	2	5	0	0	1	healed tectonic bx (k-5) extends to ~3696, then more CC Bx-like Tphkxbx (30)	10	0					>1% dissem fluorite;		41	

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	3700	3705	EXPACPC14-3-653	42	0	4	1	0	2	5	0	0	3	(30, Tphkbx) looks like Tphk w sparse bx clasts (lapilli); ~1cm fluorite-gyp-py vns at 3704 and 3705	1	2					2-carb = weak fizz to fluorite-gyp vns	(cont) vns at 25 tca;	43	
CPC14-3	3705	3710	EXPACPC14-3-654	42	0	4	0	0	2	5	0	0	3	(30, Tphsbn) same bx a/a but more of a seriate-porphyrritic texture (matrix); impressive stretch of k	1	1						(cont) k-5 alt'd rock (mineralized?)	43	
CPC14-3	3710	3715	EXPACPC14-3-655	42	0	4	0	0	2	4	0	0	3	(42! CC Bx) another 6-8mm fluor-gyp vn (15 tca, 3710.5) - this one with qtz, calc, dolo? and a thin	1	2					5-qtz = qtz in fluorite vn at 3710.5	(cont) py selvage;	43	5
CPC14-3	3715	3720	EXPACPC14-3-656	42	0	4	0	0	2	4	0	0	2	(42) pC lapilli present; possible Tphk dike stringer - or clast? - (0.3 ft) at ~3719;	1	0						up to 7% py	41	
CPC14-3	3720	3725	EXPACPC14-3-657	42	0	4	0	0	2	3	0	0	2	(42, CC Bx)	1	0					looked for fluorite; 3mm gyp vnls mostly at 10 tca			
CPC14-3	3725	3730	EXPACPC14-3-658	42	0	4	0	0	2	4	0	0	3	(42, CC Bx) 1 cm fluorite-gyp-qtz-py vnlt at 3726.7 (20 tca)	1	2					2-carb = weak fizz to fluor-gyp vn (dolo? minor calcite?)		43	5
CPC14-3	3730	3735	EXPACPC14-3-659	42	0	4	0	0	2	4	0	0	2	(42, CC Bx)	1	2					2-carb = weak fizz in gyp vnls		41	
CPC14-3	3735	3740	EXPACPC14-3-660	42	0	4	0	0	2	4	0	0	1	(30, Tphkbn) below 3733.3, becomes more of a (heterolithic) Tphk-matrix bx;	1	0							41	
CPC14-3	3740	3745	EXPACPC14-3-661	42	0	4	1	0	2	4	0	0	2	(30, Tphkbn)	1	1							41	
CPC14-3	3745	3750	EXPACPC14-3-662	42	0	4	1	0	2	4	0	0	1	(30, Tphkbn)	1	0					looked for fluorite;			
CPC14-3	3750	3755	EXPACPC14-3-663	42	0	4	1	0	2	4	0	0	1	(30, Tphkbn)	1	0								
CPC14-3	3755	3760	EXPACPC14-3-664	31	0	4	1	0	2	4	0	0	2	possible Tphk dike at 3756.7 (50 tca?);	1	0			weak k-4		gyp/anhyd? vnls (1-3mm) subparallel tca;			
CPC14-3	3760	3765	EXPACPC14-3-665	31	0	4	0	0	2	4	0	0	2	a/a, start seeing sparse lith frags at 3763.3, then very gradational cntct to actual Tphkbn at ~3764	1	0					a/a cont.	(cont) 3764.5;		
CPC14-3	3765	3770	EXPACPC14-3-666	42	0	4	1	0	2	3	0	0	0	(30, Tphkbn)	1	0								
CPC14-3	3770	3775	EXPACPC14-3-667	42	0	4	1	0	2	4	0	0	0	(30, Tphkbn) start seeing "mylonite-gneiss" frags (to 13 cm) as per shear-zone pC/Tert contact at ~3	1	0					even pC frags are not calcareous	(cont.) 3480		
CPC14-3	3775	3780	EXPACPC14-3-668	42	0	4	2	0	2	3	0	0	1	(30, Tphkbn) bleaching (alteration) obscures Tphk feld-phyric matrix;	1	0								
CPC14-3	3780	3785	EXPACPC14-3-669	42	0	4	1	0	2	4	0	0	1	(30, Tphkbn)	1	0							41	
CPC14-3	3785	3790	EXPACPC14-3-670	42	0	4	1	0	2	3	0	0	1	(30, Tphkbn) a/a, but with patches seriate texture;	1	0							41	
CPC14-3	3790	3795	EXPACPC14-3-671	42	0	4	0	0	2	4	0	0	0	(30, Tphkbn) pyritization of select clasts	1	0							41	
CPC14-3	3795	3800	EXPACPC14-3-672	42	0	4	0	0	2	4	0	0	1	(30, Tphkbn)	1	0			weak k-4				41	
CPC14-3	3800	3805	EXPACPC14-3-673	42	0	4	0	0	2	4	0	0	1	(30, Tphsbn) mostly seriate porphyritic (matrix) texture; sparse lapilli - could locally pass for Tp	1	0					1% dissem fg fluorite	(cont) Tphs	41	
CPC14-3	3805	3810	EXPACPC14-3-674	42	0	4	0	0	2	4	0	0	0	(30, Tphsbn) a/a	1	0							41	

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	3810	3815	EXPACPC14-3-675	42	0	4	0	0	2	4	0	0	1	(30, Tphs bx) hairline fluorite micro-vnlts subparallel tca	1	1					a/a + micro-fx 5 tca; trace carbonate in fluorite micro-fxs		42	
CPC14-3	3815	3820	EXPACPC14-3-676	42	0	4	0	0	2	4	0	0	2	(30, Tphs bx) looks like Tphs w sparse lithics; calcareous gyp/fluorite microvnlts a/a;	1	1							41	
CPC14-3	3820	3825	EXPACPC14-3-677	42	0	4	0	0	2	4	0	0	1	(30, Tphs bx)	1	0					1-2% dissem fluorite; "horsetail" gyp vnlts (subparallel tca) "die out" ~3821;		41	
CPC14-3	3825	3830	EXPACPC14-3-678	42	0	4	0	0	2	4	0	0	0	(42, CC bx) Tert and pC clasts to 14 cm;	1	0							41	
CPC14-3	3830	3835	EXPACPC14-3-679	42	0	4	0	0	2	4	0	0	0	(30, Tphs bx) mostly Tphs matrix;	1	0							41	
CPC14-3	3835	3840	EXPACPC14-3-680	42	0	4	0	0	2	5	0	0	1	(42, CC bx) below 3834.5 looks like CC Bx; k-5 alt'd w increase fg py (to 7%)	1	0						up to 7% vf-fg dissem py;	41	
CPC14-3	3840	3845	EXPACPC14-3-681	42	0	4	0	0	2	5	0	2	2	(42, CC bx) CC Bx to ~3843, then more like a Tphs w sparse lith frags;	1	0		2-silic: odd, irreg qtz pods/lenses suggest possible qtz flooding			11-qtz = odd irreg lense (3mm x 3cm) bluish qtz at ~3840.9; dissem fluor in gyp vnlts;	a/a	41	11
CPC14-3	3845	3850	EXPACPC14-3-682	42	0	4	0	0	2	4	0	0	4	(30, Tphs bx); 3843.3 - 3852.3: series of at least 5 fluorite-gyp vnlts (5mm - 2 cm, 20-25 tca) that	1	2					2-carb = weakly calcareous fluor-gyp vns	(cont) appear to part and join ("braided")	43	
CPC14-3	3850	3855	EXPACPC14-3-683	38	0	4	0	0	3	5	0	0	3	lith frags become scarce below 3851.3: logged as Tphs;	1	1		k 4-5;					43	
CPC14-3	3855	3860	EXPACPC14-3-684	38	0	4	1	0	2	4	0	0	2	Tphs w <3% lith frags;	1	2					1-2 mm fluorite vnlts cont; weak calc assoc w gyp/anhyd vnlts a/a		43	
CPC14-3	3860	3865	EXPACPC14-3-685	38	0	4	0	0	2	4	0	0	0		1	0							41	
CPC14-3	3865	3870	EXPACPC14-3-686	38	0	4	0	0	2	3	0	0	1		1	1			3-4 k-alt				41	
CPC14-3	3870	3875	EXPACPC14-3-687	38	0	4	1	0	2	3	0	0	1		1	0					looked for fluorite;			
CPC14-3	3875	3880	EXPACPC14-3-688	38	0	4	1	0	2	4	0	0	1		1	1					fluorite in gyp vnlts		42	
CPC14-3	3880	3885	EXPACPC14-3-689	38	0	4	2	0	2	3	0	0	2	slight increase lith frags (to 7 cm, still <3%)	1	1								
CPC14-3	3885	3890	EXPACPC14-3-690	42	0	4	1	0	2	4	0	0	2	(30, Tphs bx) a/a w ~5% frags in select horizons (most still looks like Tphs)	1	2					4 mm gyp vnlts at 10 tca; entire rock fizzes - not just gyp vnlts selvages/margins			
CPC14-3	3890	3895	EXPACPC14-3-691	42	0	4	1	0	2	4	0	0	1	(30, Tphs bx) ~7-10% frags including pC	1	2					clasts fizz more than Tphs		41	
CPC14-3	3895	3900	EXPACPC14-3-692	38	0	4	0	0	2	4	0	0	1		1	1							41	
CPC14-3	3900	3905	EXPACPC14-3-693	38	0	4	1	0	2	4	0	0	1	Tphs w sparse lith frags cont; 4mm fluorite vnlts (10 tca) at 3904;	1	0							43	
CPC14-3	3905	3910	EXPACPC14-3-694	38	0	4	1	0	2	4	0	0	0		1	2					1-2 mm fluorite micro-vnlts present;		43	
CPC14-3	3910	3915	EXPACPC14-3-695	38	0	4	1	0	2	4	0	0	1	contains odd pods (to 0.7 ft) m gy apanitic rock w 2-3% slender feld laths (1x5mm); xtl tuff??	1	1		weak k-4					41	

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	3915	3920	EXPACPC14-3-696	38	0	4	1	0	2	4	0	0	1	Tphs w almost no lith frags	1	0								
CPC14-3	3920	3925	EXPACPC14-3-697	38	0	4	2	0	2	4	0	0	1		1	1							41	
CPC14-3	3925	3930	EXPACPC14-3-698	42	0	4	2	0	2	4	0	0	1	(30, Tphs bx) mixed frag matrix-supported Tphs bx (~10% frags)	1	0								
CPC14-3	3930	3935	EXPACPC14-3-699	38	0	4	1	0	2	4	0	0	1	mostly Tphs (lith frags still present)	1	0							41	
CPC14-3	3935	3940	EXPACPC14-3-700	42	0	4	1	0	2	4	0	0	1	(30, Tphs bx) Is this a lithic lapilli xtl tuff??	1	0						up to 7% py		
CPC14-3	3940	3945	EXPACPC14-3-701	42	0	4	1	0	2	3	0	0	1	(30, Tphs bx) in and out of zones with and without lithic lapilli;	1	0								
CPC14-3	3945	3950	EXPACPC14-3-702	42	0	4	1	0	0	5	0	3	1	volc bx a/a to 3946 - then mystery rock: k-5 shatter bx w stockwork py to ~3946.8; fluorite (+/-qtz)	10	0			(cont) eral to fluor vn/fault; back into volc. bx at ~3948; could be dike (3946-48) in re-act. fault		5-qtz= appears to be qtz below py-fluor in vn	(cont) vn (8mm, 25-30 tca) may be minor fault? odd eutaxitic-like banding (40 tca) in patches periph	43	5
CPC14-3	3950	3955	EXPACPC14-3-703	38	0	4	1	0	2	4	0	0	1	mostly Tphs w sparse lithics;	1	0			3-silic (above) refers to possible silic in shatter bx'd "dike"; low-grade min?					
CPC14-3	3955	3960	EXPACPC14-3-704	38	0	4	1	0	2	4	0	0	3	a/a w two fluor-gyp vns (7 mm, 15 tca) at 3959, 3960;	1	2							43	
CPC14-3	3960	3965	EXPACPC14-3-705	42	0	4	2	0	2	4	0	0	1	(30, Tphs bx)	1	0							41	
CPC14-3	3965	3970	EXPACPC14-3-706	38	0	4	2	0	2	4	0	0	1	a/a w fewer lithics (to 7 cm)	1	0								
CPC14-3	3970	3975	EXPACPC14-3-707	42	0	4	2	0	2	3	0	0	2	(30, Tphs bx); fluorite microvnls (1mm, 5 tca) are different than gyp vnls here;	1	0			3 and 4 k-alt				42	
CPC14-3	3975	3980	EXPACPC14-3-708	38	0	4	1	0	2	4	0	0	1	odd mottled texture (devitrification?) with "vermicular" patches; lithic lapilli sparse but present;	1	2					fluor fxs cont.; wall rock calcareous		42	
CPC14-3	3980	3985	EXPACPC14-3-709	38	0	4	2	0	2	4	0	0	2	a/a; xtl tuff??	1	1			strong k-4;					
CPC14-3	3985	3990	EXPACPC14-3-710	42	0	4	1	0	2	4	0	0	0	(30, Tphs bx) (lithics circled in blue for photos)	1	0								
CPC14-3	3990	3995	EXPACPC14-3-711	42	0	4	1	0	2	5	0	0	1	(30, Tphs bx) odd mottled (l gy/m gy) texture - could be k-4/5 alteration;	1	0			k-4 and 5;					
CPC14-3	3995	4000	EXPACPC14-3-712	42	0	4	1	0	2	5	0	0	1	(30, Tphs bx) still < 5% clasts (in Tphs-like matrix); can't rule out massive lithic-xtl tuff;	1	1								
CPC14-3	4000	4005	EXPACPC14-3-713	42	0	4	2	0	2	5	0	0	3	(30, Tphs bx) subtle (lithic xtl tuff?) banding at 60 tca; 4003.3-4009.9 is zone of multiple minor fa	10	1					5-qtz = discount qtz present in some fluor vns		43	5

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	4005	4010	EXPACPC14-3-714	42	0	4	1	0	2	5	0	0	3	(30, Tphs bx); 4003.3-4009.9 "sheeted" (fault) zone cont.; main fault limb - w comminuted material an	10	1			k 4-5;		some very "bright" py - cannot rule out vfg tellurides; carb mostly assoc w fluorite vns;	(cont) and slivers possible Tphd dike material at 4008-09;	43	5
CPC14-3	4010	4015	EXPACPC14-3-715	42	0	4	1	0	3	4	0	0	2	(30, Tphs bx) increase lith frags (to ~15%); pC clasts (to 18 cm) strongly sericitized;	1	0					1-2% dissem fluorite; gyp/anhyd? vnlt cut across bx frags (lapilli)		41	
CPC14-3	4015	4020	EXPACPC14-3-716	42	0	4	1	0	3	4	0	0	1	(42, CC bx) logged as true 42: seriate feld-phyric matrix texture not as prominent as above; 20-25%	1	1			strong k-4			(cont) lith frags, some with bleached rims;	41	
CPC14-3	4020	4025	EXPACPC14-3-717	42	0	4	1	0	3	4	0	0	1	(42, CC bx) 30-40% clasts, locally clast-supported;	1	0					~1% fluor	gen 3-5% py and 1% spec	41	
CPC14-3	4025	4030	EXPACPC14-3-718	42	0	4	1	0	3	5	0	0	1	(42, CC bx) below 4027: >75% frags, good mix lithologies; matrix is fg debris and commonly m gy apha	1	2			Tert matrix material is k-5 alt'd; gyp/anhyd vnlt host fluorite only where they cut clasts;		leucogranite (cobbles, boulders) is weakly calcareous	(cont) aphanitic material w ~3-5% vfg (1-5mm) feld phenos (xtl tuff?); patches cg py in leucogranite	42	
CPC14-3	4030	4035	EXPACPC14-3-719	42	0	4	1	0	3	5	0	0	0	(42, CC bx) mostly leucogranite w ~15% Tert matrix material;	1	1			k-5 refers to bx/congl matrix and sericite 3 to leucogranite boulder/cobbl e "clasts"				41	
CPC14-3	4035	4040	EXPACPC14-3-720	42	0	4	1	0	2	5	0	0	2	(42, CC bx) rock type is dominantly leucogranite, but Tert volc clasts still present; matrix is m gy	1	1					dissem fluorite mostly in leucogranite; most carbonate assoc w gyp/anhyd? vnlt	(cont) feld-phyric (fg) material;	41	
CPC14-3	4040	4045	EXPACPC14-3-721	42	0	3	1	0	2	5	0	0	2	(42, CC bx) last good Tert matrix/lense is at 4045.3; clasts (cobbles, boulders?) mostly leucogranit	1	1			k-5 = Tert volc matrix			(cont) e and biotite schist (minor);	41	
CPC14-3	4045	4050	EXPACPC14-3-722	42	0	4	2	0	2	4	0	0	0	(42, CC bx) matrix appears to be mostly fg Tert and pC "grit"	1	1							41	
CPC14-3	4050	4055	EXPACPC14-3-723	64	0	4	1	0	2	4	0	0	2	64, leucogranite = 5.1 ft boulder, 4048.7-4053.8; (LOGGED ROCK TYPE for ENVIRO Goals - still in mixe	1	1					fluorite in microfxs(+py) and dissem;	(cont) d lith bx/conglomerate;	42	
CPC14-3	4055	4060	EXPACPC14-3-724	72	0	4	0	0	2	4	0	0	2	72 = schist cobbles in bx/conglomerate (to 0.7 ft) STILL in TERTIARY! bx-conglomerate;	1	1					4 mm gyp-fluorite vnlt present - with 2cm! bleached selvages;		43	
CPC14-3	4060	4065	EXPACPC14-3-725	42	0	4	2	0	2	5	0	0	1	(42, CC bx) Tert volc clasts sparse, but still present;	1	0							41	

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	4065	4070	EXPACPC14-3-726	22	0	4	0	0	3	4	0	0	1	4067.5-4072.7: possible Tphd dike/sill/flow (45 tca, both cntcs) w ~3% fg slender (up to 1x9mm) feld	1	0			Tphd = 4 to 5 K-alt			(cont) phenos; below Tphd, rock (boulder?) is an augen-like biotite gneiss; 4-5% vfg py in Tphd	41	
CPC14-3	4070	4075	EXPACPC14-3-727	22	0	4	0	0	3	5	0	0	1	see above: augen-like biotite gneiss below dike/sill/flow;	1	0							41	
CPC14-3	4075	4080	EXPACPC14-3-728	42	0	4	0	0	2	4	0	0	1	used CC bx code, but few Tert clasts and little Tert matrix; v difficult to distinguish between pC c	1	0						(cont) clasts and granitic grus-like grit matrix;	41	
CPC14-3	4080	4085	EXPACPC14-3-729	42	0	4	1	0	2	4	0	0	1	80% leucogranite and 20% l gy aphanitic rock w sparse fg feld laths (a/a); can't rule out that volc	1	0						(cont) "matrix" is fingers of dike (see above 22)	41	
CPC14-3	4085	4090	EXPACPC14-3-730	42	0	4	1	0	2	5	0	0	0	similar to above; Tert volc clasts sparse,but present;	1	0							41	
CPC14-3	4090	4095	EXPACPC14-3-731	42	0	3	1	0	2	4	0	0	0	a/a, mostly leucogranite (cobbles, boulders?) w irreg pods l gy xtl-tuff-like or Tphd rock and possi	1	0				looked for dissem fluorite	(cont) ible interstitial grus-like grit; 3-5% py			
CPC14-3	4095	4100	EXPACPC14-3-732	42	0	3	1	0	2	4	0	0	1	42 = pC debris w minor Tert volc component; fragmental to 4098.4 then massive leucogranite (and grus	1	0						(cont) grus-grit? Hard to tell difference between clasts and matrix)		
CPC14-3	4100	4105	EXPACPC14-3-733	42	0	4	1	0	2	4	0	0	1	a/a, mostly biotite gneiss and schist; positive id Tert feld-phyric clasts below 4104.3;	1	0								
CPC14-3	4105	4110	EXPACPC14-3-734	42	0	3	1	0	2	5	0	3	1	leucogranite clasts (cobbles) well defined in m gy xtl-lithic tuff-like matrix;	1	1			3 silic = odd pods/lenses l-m gy qtz suggests possible silica flooding					
CPC14-3	4110	4115	EXPACPC14-3-735	42	0	4	1	0	4	5	0	3	2	matrix-supported pC and Tert debris cont; includes biot schist; irreg feld-phyric lenses present	1	0			Tert volc = k-5; strong sericite alt of some pC clasts					
CPC14-3	4115	4120	EXPACPC14-3-736	42	0	4	0	0	2	5	0	3	2	spectacular (countertop!) biot schist bx; matrix mostly granitic grit, but feld-phyric Tert clasts p	1	1			silica flooding is speculation only (knife leaves metal streak on m gy patches)			(cont) present;		

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	4120	4125	EXPACPC14-3-737	64	0	4	0	0	2	4	0	0	0	~0.4 ft band of mixed (including Tert) "pebbles and grit" above (irreg planar cntc,~90 tca) leucogr	1	0			irreg l gy feld-phyric lense (1 cm, at 4121) may be filling of crack in bedrock or dike finger??			(cont.) -granite may be contact w pC "basement" of CC diatrema?? (will see on next table?)		
CPC14-3	4125	4130	EXPACPC14-3-738	64	0	4	1	0	2	4	0	0	0	in-situ leucogranite? can't tell.	1	0						3-5% py		
CPC14-3	4130	4135	EXPACPC14-3-739	85	0	4	0	0	2	4	0	0	0	back into mixed (pC+Tert) clast bx; use code 85, "Pre-C breccia" from manual for, pC clast bx w ~+90	1	0		2	K-4 of volc clasts (to 9 cm)		2-biot = (2%) possible secondary biotite? in leucogranite	(cont) % pC clasts and gen <10 Tert volc clasts; ie. NOT "pre-Cambrian bx" but pC CLAST bx;		
CPC14-3	4135	4140	EXPACPC14-3-740	85	0	4	1	0	2	4	0	0	0	MASS-WASTING = rockslide off pC diatrema wall or horstblock? mostly leucogranite and comminuted grus	1	0		2				(cont) grus-like debris thereof;		
CPC14-3	4140	4145	EXPACPC14-3-741	85	0	4	0	0	2	5	0	0	1	pC clast bx with <5% Tert clasts hosts 1 round (5cm) aplite "pebble";	1	0		1	k-5 refers to Tert. volc clasts;					
CPC14-3	4145	4150	EXPACPC14-3-742	85	0	4	0	0	2	4	0	0	1	some bx clasts are broken-up/segmented schist bands;	1	0		1						
CPC14-3	4150	4155	EXPACPC14-3-743	85	0	4	0	0	2	5	0	0	0	m gy grit matrix, subrnd to ang (<1-3mm); positive id feld-phyric phono clasts (5 cm)	1	0		1			1-2? will stop logging as is just speculation;			
CPC14-3	4155	4160	EXPACPC14-3-744	85	0	4	1	0	2	5	0	0	1	here looks like matrix may be (Tert) volcanoclastic w possible feld pheno frags? Positive id phono f	1	1					trace calc assoc w gyp/anhyd? vnlt; (cont) bx clasts;			
CPC14-3	4160	4165	EXPACPC14-3-745	85	0	4	0	0	2	5	0	0	2	good mix bx frags incl augen-gneiss; biot schist, leucogr, feld-phyric phono; both clast and matrix-	1	0					(cont)-supported;			
CPC14-3	4165	4170	EXPACPC14-3-746	38	0	4	1	0	3	5	0	0	2	38 = (4167.5-4170.2) Tphs-like rock: dike? sill? xtl tuff? planar lower cntc @85 tca;	1	1			3-sericite = "sparkling" feld phenos;					
CPC14-3	4170	4175	EXPACPC14-3-747	85	0	4	1	0	2	4	0	0	1	85= pre-Cambrian CLAST bx cont; Tert clasts present (<5%)	1	0								
CPC14-3	4175	4180	EXPACPC14-3-748	85	0	4	1	0	2	4	0	0	1		1	1								
CPC14-3	4180	4185	EXPACPC14-3-749	85	0	4	1	0	2	4	0	0	1		1	1						locally up to 7% py;		
CPC14-3	4185	4190	EXPACPC14-3-750	85	0	4	0	0	2	4	0	0	1	very sparse Tert clasts - but still preset;	1	0								
CPC14-3	4190	4195	EXPACPC14-3-751	64	0	4	2	0	2	4	0	0	1	4189.3~4199.8: almost all leucogranite, possibly in-situ?? at ~4199.8 becomes a leucogranite bx w m	1	1					(cont) matrix almost indistinguishable from clasts ("grus"-like matrix); 2-spec after biotite			
CPC14-3	4195	4200	EXPACPC14-3-752	64	0	4	1	0	2	4	0	0	0		1	0								

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	4200	4205	EXPACPC14-3-753	85	0	4	0	0	2	4	0	0	1	increase matrix at 4201 - up to 35% w some matrix-support bx;	1	1								
CPC14-3	4205	4210	EXPACPC14-3-754	85	0	4	1	0	2	5	0	0	2		1	0			Tert bx clasts K-5 alt'd					
CPC14-3	4210	4215	EXPACPC14-3-755	85	0	4	1	0	2	5	0	0	1	feld-phyric phono bx clast up to 14 cm;	1	0								
CPC14-3	4215	4220	EXPACPC14-3-756	85	0	4	1	0	2	5	0	0	1	biot schist bx frags to 15 cm	1	0								
CPC14-3	4220	4225	EXPACPC14-3-757	85	0	4	1	0	4	4	0	0	1		1	0			locally (patches) strong sericite;		trace fluorite!		41	
CPC14-3	4225	4230	EXPACPC14-3-758	85	0	4	0	0	4	4	0	0	3	2 cm gyp/anhy? vnlt (30 tca) w fluor @ 4228.3;	1	1			select bx frags strong sericite					
CPC14-3	4230	4235	EXPACPC14-3-759	71	0	4	1	0	3	4	0	0	0	bx texture present but subtle; abundant augen-gneiss; positive id Tert frag;	1	0			a/a		a/a		41	
CPC14-3	4235	4240	EXPACPC14-3-760	71	0	4	0	0	2	4	4	0	0	4231.2 - 4240: could be in-situ (consistent foliation, ~ 70 tca); then wedge-lense of bx (~10 tca)	1	0			(cont) 'd patches rich in biotite (block of in-situ schist in fault cntct w augen-gneiss??)			(cont) starting @4240; bx lense is in contact w d brownish gy rock that appears to have relict unalt		
CPC14-3	4240	4245	EXPACPC14-3-761	72	0	4	0	2	2	2	4	0	0		10	0			2-argil = wh clay flecks in alt'd schist - don't know what clay is replacing;		5-qtz = trace qtz microvnlt in schist	up to 7-8% py in schist		5
CPC14-3	4245	4250	EXPACPC14-3-762	85	0	5	0	1	2	5	2	0	0	back into "pC-clast bx" at ~4250.1 (vague cntc @~ 35 tca); clasts of biot schist and leucogranite;	10	0					41 = 1% dissemin fg fluorite	5-py = 7-10% py dissemin and in stockwork microfxs; shatter-bx overprint suggests nearby fault (4250?)	41	
CPC14-3	4250	4255	EXPACPC14-3-763	21	0	4	0	1	2	5	2	0	3	at 4255.1 cntct (55 tca) bx/d gy mystery rock w aligned vfg accicular py (after ?); n/mag, n/calc =	10	2			(cont) clay pinhead spots; sparse vfg feld-phyric lithic clasts suggest xtl-lithic tuff - or Tphd;		>1% dissemin fluorite in "dike"	(cont) probably not a lamp; mafic dike?? at 4251.5 cntc (25 tca) w mgy aphanitic rock speckled w wh	41	

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	4255	4260	EXPACPC14-3-764	85	0	4	1	0	2	5	0	0	2	Tph dike? (above) necks down into bx-bound "channel" (4252.5-4253.5) w wavy gyp/fluor 1 cm vnlt exte	10	2			(cont) furcating horsetail py vnlt extend to ~4263; (photos show augen gneiss and schist, but other		(cont) side of core is bx!) "dike" stringers in bx are k-5;	(cont)-nding from there to ~4255.5 (5-10 tca); vn host micro-bx slivers; from there, bx seams and bi	41	
CPC14-3	4260	4265	EXPACPC14-3-765	85	0	4	1	0	2	4	0	3	1	bx pinches out w py vnlt at ~4262.6, then biotite gneiss (fol 35-60 tca) and leucogranite;	10	1			3-silic = possible silica flooding along fault, assoc w py-qtz vnlt		5-qtz = m gy qtz (vnlt?) w horsetail py vnlt		41	5
CPC14-3	4265	4270	EXPACPC14-3-766	85	0	4	1	0	2	4	3	0	1	SUMMARY (of above): possible low-grade MINERALIZED ZONE (4246-4262.6): shatter-bx w py stockwork in	1	1			(cont) cont. - w no positive id Tert clasts; 3-propyl = alt'd schist		1 carb: gyp/anhyd? vnlt weak fizz	(cont) hangwall of fault/dike, then py (+/- qtz) horsetail vnlt in footwall to 4262.6; pC-clast bx c		
CPC14-3	4270	4275	EXPACPC14-3-767	85	0	4	0	0	2	4	2	0	2	(85) "pC-clast bx"; Tert frags id'd in gritty m gy matrix; gyp vnlt (10 tca) cut matrix and clasts;	1	1							41	
CPC14-3	4275	4280	EXPACPC14-3-768	71	0	3	2	0	2	4	0	0	0	sharp bx/gneiss cntct 4277.3 - could be large gneiss boulder? or in-situ gneiss? fol 35-40 tca;	1	0								
CPC14-3	4280	4285	EXPACPC14-3-769	85	0	4	1	0	2	4	0	0	1	sharp contact gneiss (above) w bx (4281.1); long stretches n/bx (2.2 ft) and consitent foliation (	1	1						(cont) (35 tca): boulders or in-situ pC?? Tert clasts rare but preset;	41	
CPC14-3	4285	4290	EXPACPC14-3-770	34	0	4	1	0	2	5	0	0	0	coded (34) undiff porph phono because no code for xtl tuff, suggested by fragmental feld phenos (7-1	1	0			(cont) irreg contacts (4287.8-4291.6) w 15cm leucogranite clast at bottom;			(cont)-10%); accicular py (after?) suggests mafic component (Tphm); can't rule out dike or sill; irr		
CPC14-3	4290	4295	EXPACPC14-3-771	85	0	4	1	0	2	4	0	0	1	(85) "pC-clast bx" cont., can't find any Tert. clasts; clasts are pegmatite, biotite gneiss, and leu	1	1						(cont) leucogranite, w comminuted grs-like matrix;		
CPC14-3	4295	4300	EXPACPC14-3-772	85	0	4	1	0	2	4	0	0	1	a/a, looking for Tert clasts (none);	1	1			k-4? don't know how to eval k-alt in pC, but bx matrix very hard;					

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	4300	4305	EXPACPC14-3-773	85	0	4	0	0	2	4	0	2	3	bx to 4302.5, then biotite gneiss (fol ~50 tca); at 4301.2 ~1cm gyp-fluor-tr qtz vnlt (10-30 tca); a	1	1			2-silic = blurred-out selvages on py vnlt; may be silica flooding?? (very hard)	55	5-qtz = trace qtz in gyp-fluorite vnlt;	(cont) 4304.5 8mm py vnlt (20 tca) w 3-4 cm texture-destroyed selvage (or possible dike stringer??)	43	5
CPC14-3	4305	4310	EXPACPC14-3-774	71	0	4	0	0	0	4	0	2	1	biotite augen-gneiss cont.; BASEMENT BEDROCK? 5 mm py vnlt (subparallel ca) w blurry selvage cont.	1	1				55	42 fluorite = trace in weakly calc gyp vnlt; 55-min = vn py		42	
CPC14-3	4310	4315	EXPACPC14-3-775	64	0	4	1	0	3	4	0	2	3	gyp (1.5 cm, small < tca) vns cont w "intermitent" qtz bands and tr fluorite; py vnlt; are sepearate	1	1			3-sericite = coarse muscovite books next to gyp-qtz vn;			#NAME?	42	
CPC14-3	4315	4320	EXPACPC14-3-776	64	0	3	0	0	3	3	0	0	0	all leucogranite w minor lenses/fox microbx (+/- py, tr fluorite	1	0			k-3? have no idea really (no experience w pC here); 3 sericite = interspersed fg muscovite flakes;					
CPC14-3	4320	4325	EXPACPC14-3-777	89	0	3	0	0	2	4	0	3	0	rubble and re-drilled core: unable to decipher much except for bx seam - possibly tectonic- at ~10tca	10	0			3-silic? bx matrix hosts disse fluorite		41-fluor = disse in bx matrix;		41	
CPC14-3	4325	4330	EXPACPC14-3-778	85	0	4	1	0	2	4	0	0	0	biot augen gneiss and leucogr (4322.5-4326.5) then back into "pC-clast bx", includes aplite cobbles;	1	0								
CPC14-3	4330	4335	EXPACPC14-3-779	85	0	4	1	0	2	4	0	0	0	bx cont; mostly leucogranite (did not find any Tert clasts)	1	0								
CPC14-3	4335	4340	EXPACPC14-3-780	64	0	3	1	0	3	5	0	0	0	bx ends ~4334.6, then leucogr to 4338 at sharp cntc (80 tca) w pale pinkish-tan "myrmekite" w lenses	1	0						(cont) coarse pegmatite; minor py microvnlt; an tr disse fluorite	41	
CPC14-3	4340	4345	EXPACPC14-3-781	64	0	4	0	0	2	5	0	0	0	massive leucogranite below (4342) "myrmekite"; sharp contact at 65 tca	1	0					5-qtz = possible qtz in several 1-3mm py micro-vnlt;;			5
CPC14-3	4345	4350	EXPACPC14-3-782	64	0	3	2	0	1	3	0	0	0	leucogranite cont. w slight increase (secondary?) biotite;	1	0						increase spec w biotite		
CPC14-3	4350	4355	EXPACPC14-3-783	64	0	4	0	0	1	5	0	0	3	minor fault at 4355, 30 tca, 5mm gyp vn w 5 cm k-5 pyritic selvage; slicks at 55 tca (on face at 30	10	1					41= = trace only vfg disse fluorite; carb assoc w gyp vn;	41		
CPC14-3	4355	4360	EXPACPC14-3-784	64	0	3	2	0	1	4	0	0	1	biotite "enriched" leucogranite w peg lenses;	1	1								
CPC14-3	4360	4365	EXPACPC14-3-785	64	0	3	2	0	1	3	0	0	2	py-gyp vnlt (7mm, 20 tca) at 4365;	1	2				60	60 = trace gn on fxs		41	

Hole Number	Depth from	Depth to	Sample Number	Rock Type	Oxidation	Pyrite	Specularite	Argillic	Sericitic	Potassic	Propylitic	Silification	Sulfate	Lithology Comment	Structure	Carbonate	Bleached	Biotite	Alteration comment	Mineral-ization	Mineralogy comment	Oxidation comment	Gangue	Quartz
CPC14-3	4365	4368	EXPACPC14-3-786	64	0	3	1	0	1	3	2	0	0	leucogranite w one 3-4mm py vnlt at 20 tca; End of Hole: 4368 ft. total depth.	1	1			2-prop = alt'd biotite;	55	trace only vfg disseminated fluorite; 1 carb = weak fizz to py vnlt;		41	

APPENDIX 2.3

CPC14-3 - GEOTECHNICAL LOG

CRIPPLE CREEK AND VICTOR GOLD MINING COMPANY, EXPLORATION DEPARTMENT

Hole Number	RQD ID	Depth from	Depth to	Geotech lithology	Core diameter	Length	Length recovered	Rubble length	RQD length	Total fractures	RQD Percent	Core recovered	Joint roughness	Joint condition	Joint aperture	Hardness	RQD comments	Point length	Point depth	Point Load	Pt load comments
CPC14-3	36478	0	72.5	-999	2.5	73	0					0					First block at 77 ft; measured back to approx 72.5				
CPC14-3	36479	72.5	77	34	2.5	4.5	4.5	0	2.3	17	51	100	3	Oxide	1	1		0.5	72.9	1071	
CPC14-3	36480	77	82	34	2.5	5	3.4	0.4	0.4	41	8	68	3	Oxide	1	2		0.45	77.6	1368	
CPC14-3	36481	82	87	34	2.5	5	3	0.7	1	33	20	60	3	Oxide	1	1		0.6	84.5	184	
CPC14-3	36482	707	717	34	2.5	10	8.5	0	6.5	17	65	85	5	Oxide	3	1	likely minor fault @ 708.2	0.6	716.7	929	
CPC14-3	36483	697	707	34	2.5	10	10	0	7.8	16	78	100	4	Oxide	1	1		0.4	704.6	667	
CPC14-3	36484	687	697	34	2.5	10	7.4	0	6.5	9	65	74	5	Clay	2	1	likely fault @ 693	0.8	696.6	358	
CPC14-3	36485	677	687	34	2.5	10	9.5	0	7.4	20	74	95	3	Clay	2	1		0.5	686	420	
CPC14-3	36486	667	677	34	2.5	10	9.8	0.4	6.9	21	69	98	4	Clay	3	1	likely fault @ 667.3; shatter bx w wh cly matrix	0.7	675.9	47	
CPC14-3	36487	657	667	34	2.5	10	9.6	0	4.2	41	42	96	3	Clay	1	1	a/a	0.6	666.7	113	
CPC14-3	36488	647	657	34	2.5	10	10.1	0	8.2	12	82	101	3	Oxide	1	1	weak FeOx and weak wh clay on fxs	0.6	656.7	27	
CPC14-3	36489	642	647	34	2.5	5	4.8	0	0.9	29	18	96	3	Clay	1	1	rock competency improves below 644	0.6	644.4	32	
CPC14-3	36490	636	642	34	2.5	6	4.9	2.2	0	100	0	81.667	3	Clay	4	1	chunks wh cly suggest fault at 639				a/a
CPC14-3	36491	627	636	34	2.5	9	9.6	0.5	1.8	67	20	106.67	4	Oxide	4	1	shatter bx w possible fault at 632	0.4	631.2	1379	
CPC14-3	36492	620	627	34	2.5	7	6.5	0.5	1.6	54	23	92.857	5	Oxide	1	1	FeOx and weak wh clay on fxs	0.6	620.7	70	
CPC14-3	36493	616	620	34	2.5	4	3	0.6	0.4	50	10	75	4	Oxide	1	1					as above (a/a)
CPC14-3	36494	607	616	34	2.5	9	7.2	0	4.3	18	48	80	4	Oxide	1	1	mostly hem FeOx on fxs	0.55	611.8	324	
CPC14-3	36495	602	607	34	2.5	5	4.9	0.5	1.8	35	36	98	4	Oxide	1	1	shatter bx cont.	0.65	605.8	209	
CPC14-3	36496	597	602	30	2.5	5	5.2	0.5	0	60	0	104	3	Oxide	1	1	FeOx and weak wh clay on fxs; rock is shatter bx				Point Load not possible
CPC14-3	36497	591	597	30	2.5	6	6.2	0.5	0.9	65	15	103.33	4	Oxide	1	1		0.9	592.8	256	
CPC14-3	36498	584	591	30	2.5	7	1.5	1	0	50	0	21.429	3	Oxide	1	1	a/a + wh clay; crumbly red cly @591 suggests fault				a/a
CPC14-3	36499	577	584	30	2.5	7	4	1.5	0	100	0	57.143	4	Oxide	1	1	FeOx on fxs				a/a
CPC14-3	36500	571	577	30	2.5	6	3.5	0.5	0.4	45	7	58.333	3	Clay	1	1	a/a + anhydrite	0.4	572.5	31	
CPC14-3	36501	567	571	30	2.5	4	3.2	0.5	0	75	0	80	3	Clay	1	1	Weak wh clay on fxs				a/a
CPC14-3	36502	559	567	30	2.5	8	4.5	3	0	100	0	56.25	3	Oxide	1	1	a/a				a/a
CPC14-3	36503	555	559	34	2.5	4	2.2	1	0	100	0	55	3	Oxide	1	1	Weak FeOx and weak clay on fxs				a/a
CPC14-3	36504	551	555	30	2.5	4	3.1	0	0	50	0	77.5	3	Oxide	1	1					a/a
CPC14-3	36505	547	551	30	2.5	4	1.5	0.9	0	50	0	37.5	4	Oxide	1	1					a/a
CPC14-3	36506	542	547	-999		5									1		Block says: no recovery				
CPC14-3	36507	537	542	34	2.5	5	2.9	2.3	0	100	0	58	4	Oxide	1	1					a/a
CPC14-3	36508	522	537	-999		15									1		Block says: No recovery				
CPC14-3	36509	517	522	34	2.5	5	3.6	3.6	0	100	0	72	3	Oxide	1	1	a/a				a/a
CPC14-3	36510	515	517	34	2.5	2	1	1	0	40	0	50	4	Oxide	1	1	a/a				a/a
CPC14-3	36511	510	515	34	2.5	5	3.5	1.2	0	55	0	70	3	Oxide	1	1	a/a				as above
CPC14-3	36512	506	510	34	2.5	4	3.2	0.5	0	39	0	80	3	Oxide	1	1	a/a				Point Load not possible

Hole Number	RQD ID	Depth from	Depth to	Geotech lithology	Core diameter	Length	Length recovered	Rubble length	RQD length	Total fractures	RQD Percent	Core recovered	Joint roughness	Joint condition	Joint apperture	Hardness	RQD comments	Point length	Point depth	Point Load	Pt load comments	
CPC14-3	36513	497	506	34	2.5	9	9	0.5	1.5	75	17	100	4	Oxide	1	1	a/a	0.45	504.7	26		
CPC14-3	36514	487	497	34	2.5	10	10.2	0.3	2.2	80	22	102	4	Oxide	1	2	a/a	0.5	495.1	11		
CPC14-3	36515	477	487	34	2.5	10	9.8	0.9	2.6	86	26	98	4	Oxide	1	1	FeOx and weak clay on fxs	0.5	482.4	113		
CPC14-3	36516	469	477	34	2.5	8	8.4	0.8	2.9	57	36	105	4	Oxide	2	1		0.55	472.1	1144		
CPC14-3	36517	467	469	34	2.5	2	1.5	0.5	0	27	0	75	3	Oxide	1	1					as above	
CPC14-3	36518	466	467	34	2.5	1	1.3	0.6	0	31	0	130	4	Oxide	1	1					Point Load not possible	
CPC14-3	36519	457	466	34	2.5	9	5.8	2	0.7	50	8	64.444	5	Oxide	3	2	open cavities; microbx present	0.5	463.1	1058		
CPC14-3	36520	447	457	34	2.5	10	4	1	0	75	0	40	4	Oxide	1	1					a/a	
CPC14-3	36521	440	447	34	2.5	7	2.2	1.7	0	50	0	31.429	5	Oxide	2	1					as above	
CPC14-3	36522	137	440	-999	2.5	303											Hearsay is 137-440 was tri-coned					
CPC14-3	36523	127	137	34	2.5	10	0.3	0.3	0	9	0	3	2	Oxide	1	1					a/a	
CPC14-3	36524	117	127	34	2.5	10	0.4	0.4	0	11	0	4	4	Oxide	1	1	Dense network microfxs = shatter bx					a/a
CPC14-3	36525	107	117	34	2.5	10	3.4	0.7	0	39	0	34	5	Oxide	2	1					a/a	
CPC14-3	36526	97	107	34	2.5	10	0.5	0.5	0	15	0	5	4	Oxide	1	1					as above	
CPC14-3	36527	87	97	34	2.5	10	2.4	2	0	50	0	24	4	Oxide	1	1					Point Load not possible	
CPC14-3	36528	947	957	30	2.5	10	9.9	0	9.2	10	92	99	3	Clay	1	1	cream-wh clay on fxs	0.6	955.9	159		
CPC14-3	36529	937	947	30	2.5	10	10.2	0	8.6	14	86	102	3	Fresh	1	1		0.5	946.4	137		
CPC14-3	36530	927	937	34	2.5	10	10	0	7.4	21	74	100	3	Oxide	1	1	Lim and hem on fxs	0.7	936.5	57		
CPC14-3	36531	917	927	34	2.5	10	9.7	0	6.7	20	67	97	5	Clay	1	1	cream clay and red brn FeOx on fxs	0.55	922.4	89		
CPC14-3	36532	907	917	34	2.5	10	9.9	0	4.7	31	47	99	5	Clay	2	1	a/a	0.9	915.4	33		
CPC14-3	36533	897	907	34	2.5	10	10.2	0	3.6	36	36	102	6	Clay	1	1	red clay/FeOx on fxs	0.5	905.8	110		
CPC14-3	36534	887	897	34	2.5	10	9.9	0	6.7	18	67	99	5	Oxide	4	1	Gen FeOx - w minor crumbly red clay on fxs	0.9	894.9	307		
CPC14-3	36535	877	887	34	2.5	10	9.8	0	8.6	13	86	98	6	Oxide	2	1		0.65	886.3	820		
CPC14-3	36536	867	877	34	2.5	10	9.3	0	8.7	8	87	93	4	Oxide	1	1	wh clay on some fxs	0.5	876.1	25		
CPC14-3	36537	857	867	34	2.5	10	10	0	8.6	9	86	100	4	Oxide	1	1		0.45	866.8	138		
CPC14-3	36538	847	857	34	2.5	10	10.1	0	9.8	8	98	101	4	Oxide	1	2		0.55	854.9	845		
CPC14-3	36539	837	847	34	2.5	10	10	0	8.8	11	88	100	5	Oxide	1	1		0.5	844.6	412		
CPC14-3	36540	827	837	34	2.5	10	10	0	7.2	22	72	100	5	Clay	2	1	red clay, FeOx on fxs	0.7	835.6	1293		
CPC14-3	36541	817	827	34	2.5	10	10	0	6.8	9	68	100	5	Clay	3	1	minor fault at low <tca, red clay, bx	0.5	826.7	106		
CPC14-3	36542	807	817	34	2.5	10	10	0	7.1	17	71	100	5	Oxide	1	1	FeOx and weak l brn and wh clay on fxs	0.7	816.3	66		
CPC14-3	36543	797	807	34	2.5	10	10	0	7.3	9	73	100	5	Oxide	1	1		0.5	806.8	396		
CPC14-3	36544	787	797	34	2.5	10	10	0	8	20	80	100	3	Oxide	1	2	FeOx and weak l brn clay on fxs	0.65	796.5	5		
CPC14-3	36545	777	787	34	2.5	10	10.1	0	9	10	90	101	5	Oxide	1	1		0.6	786.7	574		
CPC14-3	36546	767	777	34	2.5	10	10	0	9.3	5	93	100	5	Oxide	1	1		0.7	775.8	536		
CPC14-3	36547	757	767	34	2.5	10	10	0	9.2	10	92	100	5	Oxide	1	1		0.7	767.7	167		
CPC14-3	36548	747	757	34	2.5	10	10	0	9.8	5	98	100	4	Oxide	2	1		0.75	756.6	432		

Hole Number	RQD ID	Depth from	Depth to	Geotech lithology	Core diameter	Length	Length recovered	Rubble length	RQD length	Total fractures	RQD Percent	Core recovered	Joint roughness	Joint condition	Joint aperture	Hardness	RQD comments	Point length	Point depth	Point Load	Pt load comments
CPC14-3	36549	737	747	34	2.5	10	10.1	0	8.4	12	84	101	4	Oxide	2	1	FeOx and weak red clay on fxs	0.6	745.8	153	
CPC14-3	36550	727	737	34	2.5	10	8.8	0	5	17	50	88	5	Oxide	1	2		0.9	730.2	174	
CPC14-3	36551	717	727	34	2.5	10	9.6	0	9.3	6	93	96	5	Oxide	1	2		0.65	726.3	1310	
CPC14-3	36552	957	967	34	2.5	10	9.9	0	9	11	90	99	5	Clay	1	1	a/a + FeOx	0.5	966.7	426	
CPC14-3	36553	1187	1197	21	2.5	10	9.9	0	8.8	9	88	99	3	Clay	1	1	a/a	0.8	1196	41	
CPC14-3	36554	1177	1187	21	2.5	10	9.8	0	8.9	5	89	98	3	Clay	1	1	weak clay on fxs	0.7	1185	341	
CPC14-3	36555	1167	1177	21	2.5	10	9.8	0.8	6.4	29	64	98	3	Oxide	1	1		0.8	1174	24	
CPC14-3	36556	1157	1167	21	2.5	10	10.1	0.4	5.6	22	56	101	3	Slick	1	1	wh clay slicks on fxs subparallel tca	0.55	1167	145	
CPC14-3	36557	1147	1157	21	2.5	10	10	1.1	4	50	40	100	3	Clay	1	1		0.5	1155	44	
CPC14-3	36558	1137	1147	21	2.5	10	10	0	9	10	90	100	3	Clay	1	1		0.4	1147	543	
CPC14-3	36559	1127	1137	21	2.5	10	10	0	6.9	13	69	100	2	Slick	1	1	wh clay slicks	0.7	1137	161	
CPC14-3	36560	1117	1127	21	2.5	10	10.1	0	8.7	10	87	101	3	Clay	1	1		0.6	1126	394	
CPC14-3	36561	1107	1117	22	2.5	10	10.3	0	6.3	17	63	103	3	Oxide	1	1	a/a	0.6	1116	129	
CPC14-3	36562	1097	1107	34	2.5	10	9.9	0.3	5	25	50	99	3	Oxide	1	1	FeOx on fxs	0.7	1106	78	
CPC14-3	36563	1087	1097	34	2.5	10	10	0.7	6	42	60	100	3	Clay	1	1	a/a	0.55	1095	43	
CPC14-3	36564	1084	1087	34	2.5	3	2.7	0.3	0	30	0	90	3	Clay	1	1	a/a				a/a
CPC14-3	36565	1077	1084	34	2.5	7	7	1.2	0	100	0	100	2	Clay	1	1	a/a				point load test not possible
CPC14-3	36566	1067	1077	34	2.5	10	9.7	0	9	5	90	97	3	Clay	1	2	wh clay on fxs	0.6	1074	131	
CPC14-3	36567	1057	1067	34	2.5	10	9.5	0.6	8.1	13	81	95	5	Oxide	4	2	gossanous material present	0.6	1064	326	
CPC14-3	36568	1047	1057	34	2.5	10	9.9	0	5.4	16	54	99	3	Oxide	1	1	wh clay and FeOx (seperate)	0.65	1052	81	
CPC14-3	36569	1037	1047	34	2.5	10	10.3	0	4.7	23	47	103	3	Clay	1	1	wh clay	0.7	1046	235	
CPC14-3	36570	1027	1037	34	2.5	10	9.5	1	6.3	56	63	95	5	Clay	1	1	red cly + FeOx, wh clay w slicks	0.5	1037	3	
CPC14-3	36571	1017	1027	34	2.5	10	10.1	0	6.9	12	69	101	3	Slick	1	2	wh clay slicks	0.7	1026	617	
CPC14-3	36572	1007	1017	34	2.5	10	9.9	0	8.2	8	82	99	5	Oxide	1	2	Red FeOx on fxs	0.9	1017	39	
CPC14-3	36573	997	1007	34	2.5	10	10	0	7.3	7	73	100	5	Oxide	1	1		0.7	1005	292	
CPC14-3	36574	987	997	34	2.5	10	10	0	9.2	7	92	100	6	Oxide	1	1	weak FeOx on fxs	0.6	996	642	
CPC14-3	36575	977	987	34	2.5	10	10.2	0	8.3	12	83	102	4	Oxide	1	1	minor fault at 986;	0.6	986.3	320	
CPC14-3	36576	967	977	34	2.5	10	10.1	0	8.9	14	89	101	9	Oxide	2	1		0.55	974.8	474	
CPC14-3	36577	1401	1407	31	2.5	6	6	5	0	75	0	100	3	Clay	1	1	Recovery no.s taken from blocks - should be as acc				(cont) urate, or more accurate than measuring
CPC14-3	36578	1399	1401	31	2.5	2	2	2	0	50	0	100	3	Clay	1	1					a/a
CPC14-3	36579	1396	1399	31	2.5	3	3	3	0	75	0	100	3	Clay	1	1					a/a
CPC14-3	36580	1392	1396	31	2.5	4	4	4	0	100	0	100	3	Clay	1	1					a/a
CPC14-3	36581	1387	1392	31	2.5	5	5	5	0	300	0	100	3	Clay	1	1	weak clay on fxs; "gravel rubble" (gen < 2cm)				a/a
CPC14-3	36582	1377	1387	31	2.5	10	10	8.5	0	100	0	100	3	Clay	1	1					a/a
CPC14-3	36583	1373	1377	21	2.5	4	4	4	0	75	0	100	3	Clay	1	1					a/a
CPC14-3	36584	1365	1373	21	2.5	8	8	8	0	100	0	100	2	Clay	1	1					a/a
CPC14-3	36585	1357	1365	7	2.5	8	8	5.9	0	75	0	100	2	Clay	1	1	smooth greasy fxs				a/a (as above)
CPC14-3	36586	1347	1357	31	2.5	10	10	7.9	0.5	100	5	100	2	Clay	1	1		0.5	1348	21	

Hole Number	RQD ID	Depth from	Depth to	Geotech lithology	Core diameter	Length	Length recovered	Rubble length	RQD length	Total fractures	RQD Percent	Core recovered	Joint roughness	Joint condition	Joint aperture	Hardness	RQD comments	Point length	Point depth	Point Load	Pt load comments
CPC14-3	36587	1337	1347	31	2.5	10	10	8.2	0	100	0	100	3	Clay	1	1	15 ft of rubble in box = 10 ft cored;				a/a
CPC14-3	36588	1331	1337	31	2.5	6	6	4.5	0	64	0	100	3	Clay	1	1	weak clay on most fxs				a/a
CPC14-3	36589	1327	1331	31	2.5	4	4	4	0	75	0	100	2	Clay	1	1					no point load reading possible
CPC14-3	36590	1317	1327	31	2.5	10	10	3	3.4	70	34	100	3	Clay	1	1		0.5	1320	4	
CPC14-3	36591	1307	1317	31	2.5	10	10.2	1.4	5	48	50	102	3	Slick	1	1		0.6	1315	22	
CPC14-3	36592	1297	1307	31	2.5	10	10	7	0	100	0	100	3	Clay	1	1	down from here: driller's Drill/Recovery no.s reli				(cont) ied on (as good as my measurements of rubbl
CPC14-3	36593	1287	1297	31	2.5	10	10.2	1	3.4	75	34	102	2	Clay	1	1	weak clay on fxs cont.	0.65	1290	55	
CPC14-3	36594	1277	1287	31	2.5	10	9.8	3.3	3.1	61	31	98	2	Clay	1	1	shatters/splinters on hammer impact	0.4	1286	27	
CPC14-3	36595	1267	1277	21	2.5	10	10	3.5	2.8	100	28	100	2	Clay	1	1	weak clay on fxs	0.45	1271	21	
CPC14-3	36596	1257	1267	21	2.5	10	10	1.8	5.6	50	56	100	5	Slick	1	1		0.45	1263	90	
CPC14-3	36597	1254	1257	21	2.5	3.5	3.7	0	3.2	6	91	105.71	3	Fresh	1	1		0.45	1257	176	
CPC14-3	36598	1247	1254	21	2.5	6.5	5.8	0.6	1.8	18	28	89.231	2	Slick	1	1		0.5	1252	228	
CPC14-3	36599	1237	1247	21	2.5	10	10	0	8.3	9	83	100	3	Clay	1	1	weak wh clay on fxs	0.6	1247	30	
CPC14-3	36600	1227	1237	21	2.5	10	10	0.7	5.8	36	58	100	3	Slick	1	1		0.6	1236	112	
CPC14-3	36601	1217	1227	21	2.5	10	9.8	0.5	7.9	23	79	98	5	Oxide	1	1		0.7	1225	153	
CPC14-3	36602	1207	1217	21	2.5	10	9.6	0.9	4.2	50	42	96	2	Slick	1	2		0.75	1217	68	
CPC14-3	36603	1197	1207	21	2.5	10	10.1	0	9.7	11	97	101	3	Clay	1	2	weak wh clay on fxs	0.65	1204	18	
CPC14-3	36865	1593	1598	34	2.5	5	5	3.5	0	100	0	100	3	Fresh	1	1	Recovery no.s not measured: highly fx'd core - rel				(cont) rely on drillers block notations (just as a
CPC14-3	36866	1585	1593	30	2.5	8	8	0	0	100	0	100	3	Fresh	1	1	IMPORTANT				a/a
CPC14-3	36867	1578	1585	30	2.5	7	7	1	0	60	0	100	2	Fresh	1	1					a/a
CPC14-3	36868	1573	1578	30	2.5	5	5	0	0	50	0	100	3	Fresh	1	1					a/a
CPC14-3	36869	1570	1573	30	2.5	3	3	1.8	0	50	0	100	2	Fresh	1	1					a/a
CPC14-3	36870	1563	1570	30	2.5	7	7	1	0	75	0	100	3	Fresh	1	1					a/a
CPC14-3	36871	1556	1563	30	2.5	7	7	1	0	75	0	100	2	Fresh	1	1					a/a
CPC14-3	36872	1551	1556	38	2.5	5	5	1	0.4	60	8	100	2	Fresh	1	1		0.4	1552	847	
CPC14-3	36873	1546	1551	38	2.5	5	5	0	0	60	0	100	3	Fresh	1	1					a/a
CPC14-3	36874	1538	1546	38	2.5	8	8	0	0	75	0	100	3	Fresh	1	1					a/a
CPC14-3	36875	1533	1538	38	2.5	5	5	1	0	50	0	100	3	Fresh	1	1					a/a
CPC14-3	36876	1531	1533	38	2.5	2	1.6	0	0	16	0	80	3	Fresh	1	1					a/a
CPC14-3	36877	1529	1531	38	2.5	2	0.4	0.4	0	2	0	20	3	Fresh	1	1	re-drilled material				a/a
CPC14-3	36878	1523	1529	30	2.5	6	0.4	0.4	0	5	0	6.667	3	Fresh	1	1					a/a
CPC14-3	36879	1515	1523	38	2.5	8	8	1.5	0	50	0	100	3	Fresh	1	1					a/a
CPC14-3	36880	1505	1515	30	2.5	10	10	3.3	0	100	0	100	3	Clay	1	1	fresh w minor weak clay on fxs				a/a
CPC14-3	36881	1501	1505	38	2.5	4	4	1.5	0	75	0	100	3	Fresh	1	1					a/a
CPC14-3	36882	1496	1501	38	2.5	5	5	1.7	0	75	0	100	3	Fresh	1	1					a/a
CPC14-3	36883	1487	1496	42	2.5	9	9	5.2	0	100	0	100	3	Clay	1	1	weak clay on fxs				a/a
CPC14-3	36884	1480	1487	30	2.5	7	7	3	0	75	0	100	3	Oxide	1	1					a/a
CPC14-3	36885	1476	1480	30	2.5	4	4	4.8	0	75	0	100	3	Oxide	1	1	a/a				a/a

Hole Number	RQD ID	Depth from	Depth to	Geotech lithology	Core diameter	Length	Length recovered	Rubble length	RQD length	Total fractures	RQD Percent	Core recovered	Joint roughness	Joint condition	Joint aperture	Hardness	RQD comments	Point length	Point depth	Point Load	Pt load comments
CPC14-3	36886	1471	1476	30	2.5	5	5	1.7	0	75	0	100	3	Oxide	1	1	weak FeOx on fxs				a/a
CPC14-3	36887	1464	1471	38	2.5	7	7	4.7	0	100	0	100	3	Fresh	1	1					a/a
CPC14-3	36888	1460	1464	38	2.5	4	4	1.9	0	75	0	100	3	Fresh	1	1					a/a
CPC14-3	36889	1452	1460	30	2.5	8	8	7.1	0	100	0	100	3	Oxide	1	1	a/a				a/a
CPC14-3	36890	1446	1452	31	2.5	6	6	1	0	75	0	100	3	Oxide	1	1	weak FeOx				a/a
CPC14-3	36891	1436	1446	31	2.5	10	10	5.2	0	100	0	100	2	Fresh	1	1					a/a
CPC14-3	36892	1427	1436	31	2.5	9	9	2.5	0	100	0	100	2	Oxide	1	1	weak FeOx				a/a
CPC14-3	36893	1418	1427	30	2.5	9	9	4.9	0	100	0	100	3	Clay	1	1	weak clay on fxs				a/a
CPC14-3	36894	1417	1418	31	2.5	1	0.4	0.4	0	30	0	40	3	Fresh	1	1	a/a				a/a
CPC14-3	36895	1414	1417	31	2.5	3	3	0.8	0	50	0	100	3	Fresh	1	1	fresh (w py) fxs - some w weak clay				a/a
CPC14-3	36896	1407	1414	31	2.5	7	7	2.3	0	40	0	100	3	Clay	1	1	cont) highly fx'd rock				no point load reading possible
CPC14-3	36922	1779	1783	31	2.5	4.5	4.5	2	0	75	0	100	3	Clay	1	1	weak wh clay on fxs				a/a
CPC14-3	36923	1773	1779	31	2.5	5.5	5.5	0.5	0	75	0	100	3	Fresh	1	1					a/a
CPC14-3	36924	1767	1773	31	2.5	6	6	0.5	0	75	0	100	3	Fresh	1	1					a/a
CPC14-3	36925	1761	1767	31	2.5	6	6	1	0	75	0	100	3	Clay	1	1	wh clay on fxs				a/a
CPC14-3	36926	1757	1761	31	2.5	4	4	0.5	0	60	0	100	3	Fresh	1	1					a/a
CPC14-3	36927	1751	1757	38	2.5	6	6	0.5	0	55	0	100	3	Fresh	1	1					a/a
CPC14-3	36928	1748	1751	34	2.5	3	3	2	0	75	0	100	3	Oxide	1	1	weak FeOx on fxs				a/a
CPC14-3	36929	1744	1748	38	2.5	4	3.5	1.5	0	75	0	87.5	3	Fresh	1	1	re-drilled material				a/a
CPC14-3	36930	1739	1744	38	2.5	5	5	0.5	0	50	0	100	3	Fresh	1	1					a/a
CPC14-3	36931	1736	1739	38	2.5	3	3	1	0	60	0	100	3	Fresh	1	1					a/a
CPC14-3	36932	1732	1736	38	2.5	4	4	1.5	0	75	0	100	3	Clay	1	1	a/a				a/a
CPC14-3	36933	1727	1732	34	2.5	5.5	5.5	1.5	0	60	0	100	3	Fresh	1	1					a/a
CPC14-3	36934	1717	1727	38	2.5	9.5	9.5	5	0	100	0	100	3	Clay	1	1	weak clay on fxs in crumbly zone				a/a
CPC14-3	36935	1709	1717	38	2.5	8	8	1	0	60	0	100	3	Fresh	1	1					a/a
CPC14-3	36936	1700	1709	34	2.5	9	9	8	0	150	0	100	3	Fresh	1	1	a/a cont				a/a
CPC14-3	36937	1697	1700	34	2.5	3	3	3	0	125	0	100	3	Clay	1	1	likely fault (crumbly shatter bx)				a/a
CPC14-3	36938	1692	1697	30	2.5	5	5	4.5	0	150	0	100	3	Clay	1	1					a/a
CPC14-3	36939	1682	1692	34	2.5	10	10	3	0	100	0	100	3	Fresh	1	1	likely fault immed below 1682 block (crush bx)				a/a
CPC14-3	36940	1674	1682	34	2.5	8.5	8.5	1.5	0	100	0	100	3	Fresh	1	1					a/a
CPC14-3	36941	1669	1674	34	2.5	4.5	4.5	2	0	100	0	100	3	Clay	1	1	clayey rubble = likely fault				a/a
CPC14-3	36942	1665	1669	34	2.5	4	4	1.5	0	75	0	100	3	Fresh	1	1					a/a
CPC14-3	36943	1662	1665	34	2.5	3	3	3	0	75	0	100	3	Fresh	1	1					a/a
CPC14-3	36944	1658	1662	34	2.5	4	4	2	0	75	0	100	3	Fresh	1	1					a/a
CPC14-3	36945	1652	1658	34	2.5	6	6	2	0	75	0	100	3	Fresh	1	1					a/a
CPC14-3	36946	1647	1652	34	2.5	5	5	2	0	75	0	100	3	Fresh	1	1					a/a
CPC14-3	36947	1644	1647	34	2.5	3.5	3.5	1	0	50	0	100	3	Fresh	1	1					a/a
CPC14-3	36948	1639	1644	34	2.5	4.5	4.5	3	0	100	0	100	3	Clay	1	1	clayey crush bx = likely fault				a/a
CPC14-3	36949	1637	1639	34	2.5	2	2	1.5	0	75	0	100	3	Fresh	1	1					a/a
CPC14-3	36950	1631	1637	34	2.5	6	6	2	0	75	0	100	3	Fresh	1	1					a/a
CPC14-3	36951	1625	1631	34	2.5	6	6	2.5	0	60	0	100	2	Slick	1	1					a/a

Hole Number	RQD ID	Depth from	Depth to	Geotech lithology	Core diameter	Length	Length recovered	Rubble length	RQD length	Total fractures	RQD Percent	Core recovered	Joint roughness	Joint condition	Joint aperture	Hardness	RQD comments	Point length	Point depth	Point Load	Pt load comments
CPC14-3	36952	1617	1625	34	2.5	8	8	5	0	100	0	100	3	Fresh	1	1					a/a
CPC14-3	36953	1614	1617	34	2.5	3	3	1	0	75	0	100	3	Fresh	1	1					a/a
CPC14-3	36954	1609	1614	34	2.5	5	5	2	0	75	0	100	3	Fresh	1	1					
CPC14-3	36955	1604	1609	34	2.5	5	5	1	0	75	0	100	3	Fresh	1	1					a/a (as above)
CPC14-3	36956	1598	1604	34	2.5	6	6	5	0	100	0	100	3	Fresh	1	1	cont) accurate if not more accurate.				no point load reading possible
CPC14-3	36957	1975	1985	31	2.5	10	10	2	0	100	0	100	3	Fresh	1	1	Recovery not measured: nos. from drill blocks				a/a
CPC14-3	36958	1967	1975	31	2.5	8	8	6	0	150	0	100	3	Fresh	1	1					a/a
CPC14-3	36959	1960	1967	31	2.5	7.5	7.5	7.5	0	175	0	100	3	Fresh	1	1					a/a
CPC14-3	36960	1953	1960	34	2.5	6.5	6.5	6.5	0	175	0	100	3	Fresh	1	1					a/a
CPC14-3	36961	1945	1953	34	2.5	8	8	8	0	200	0	100	3	Fresh	1	1					a/a
CPC14-3	36962	1936	1945	34	2.5	9	9	9	0	225	0	100	3	Fresh	1	1					a/a
CPC14-3	36963	1930	1936	34	2.5	6	6	6	0	150	0	100	3	Fresh	1	1					a/a
CPC14-3	36964	1926	1930	34	2.5	4	4	4	0	125	0	100	3	Fresh	1	1					a/a
CPC14-3	36965	1921	1926	34	2.5	5	5	5	0	100	0	100	3	Fresh	1	1					a/a
CPC14-3	36966	1917	1921	31	2.5	4	4	4	0	125	0	100	3	Fresh	1	1					a/a
CPC14-3	36967	1911	1917	31	2.5	6.5	6.5	6.5	0	150	0	100	3	Clay	1	1	clay = fresh w weak clay coating				a/a
CPC14-3	36968	1904	1911	31	2.5	6.5	6.5	6.5	0	125	0	100	3	Fresh	1	1					a/a
CPC14-3	36969	1901	1904	31	2.5	3	3	3	0	100	0	100	3	Fresh	1	1					a/a
CPC14-3	36970	1897	1901	31	2.5	4	4.5	4.5	0	125	0	112.5	3	Fresh	1	1					a/a
CPC14-3	36971	1894	1897	34	2.5	3	1	1	0	25	0	33.333	3	Fresh	1	1					a/a
CPC14-3	36972	1891	1894	31	2.5	3	3	3	0	75	0	100	3	Fresh	1	1					a/a
CPC14-3	36973	1886	1891	34	2.5	5	5	5	0	100	0	100	3	Fresh	1	1					a/a
CPC14-3	36974	1879	1886	34	2.5	7	7	7	0	150	0	100	3	Fresh	1	1					a/a (as above)
CPC14-3	36975	1876	1879	34	2.5	3	2.5	2.5	0	75	0	83.333	3	Fresh	1	1					no point load reading possible
CPC14-3	36976	1866	1876	31	2.5	10	10	9	0.45	125	5	100	3	Fresh	1	1		0.45	1873	90	
CPC14-3	36977	1863	1866	31	2.5	3	3	3	0	50	0	100	3	Fresh	1	1					a/a
CPC14-3	36978	1857	1863	34	2.5	6	6	6	0	125	0	100	5	Fresh	1	1					a/a
CPC14-3	36979	1853	1857	38	2.5	4.5	4.5	4.5	0	125	0	100	5	Clay	1	1					a/a
CPC14-3	36980	1847	1853	38	2.5	6	6	4.5	0	75	0	100	5	Clay	1	1					a/a
CPC14-3	36981	1844	1847	34	2.5	3	3	3	0	75	0	100	3	Fresh	1	1					a/a
CPC14-3	36982	1839	1844	38	2.5	4.5	4.5	4.5	0	100	0	100	5	Clay	1	1	clay = weak clay coating				a/a
CPC14-3	36983	1836	1839	34	2.5	3	3	3	0	50	0	100	5	Fresh	1	1					a/a
CPC14-3	36984	1835	1836	34	2.5	1	0.25	0.25	0	17	0	25	3	Fresh	1	1					a/a
CPC14-3	36985	1831	1835	34	2.5	4	4	4	0	200	0	100	5	Clay	1	1	weak clay coatings				a/a
CPC14-3	36986	1826	1831	31	2.5	5	5	5	0	125	0	100	3	Fresh	1	1					a/a
CPC14-3	36987	1824	1826	31	2.5	2	2	2	0	100	0	100	3	Fresh	1	1					a/a
CPC14-3	36988	1820	1824	34	2.5	4	4	4	0	100	0	100	3	Fresh	1	1	WHAT is AK (Drilling) DOING to this CORE? (rubble)				a/a
CPC14-3	36989	1817	1820	31	2.5	3	3	3	0	75	0	100	3	Clay	1	1	weak clay coating cont.				a/a
CPC14-3	36990	1813	1817	34	2.5	4	4	4	0	150	0	100	3	Fresh	1	1					a/a
CPC14-3	36991	1807	1813	34	2.5	6	6	5.5	0	125	0	100	3	Clay	1	1					a/a

Hole Number	RQD ID	Depth from	Depth to	Geotech lithology	Core diameter	Length	Length recovered	Rubble length	RQD length	Total fractures	RQD Percent	Core recovered	Joint roughness	Joint condition	Joint aperture	Hardness	RQD comments	Point length	Point depth	Point Load	Pt load comments
CPC14-3	36992	1799	1807	34	2.5	8	8	7	0	125	0	100	3	Clay	1	1	clay = fresh w weak clay coating				a/a
CPC14-3	36993	1792	1799	34	2.5	7	7	5	0	125	0	100	3	Clay	1	1					a/a
CPC14-3	36994	1789	1792	34	2.5	3	3	3	0	100	0	100	5	Clay	1	1	fresh or weak clay				a/a
CPC14-3	36995	1786	1789	34	2.5	3	3	3	0	100	0	100	3	Fresh	1	1	(cont) from driller blocks (RUBBLE cont.)				a/a
CPC14-3	36996	1783	1786	34	2.5	3	3	3	0	75	0	100	3	Clay	1	1	a/a; IMPORTANT: recovery not measured; nos. taken				no point load reading possible
CPC14-3	36997	2167	2173	31	2.5	6	6	3.5	0	450	0	100	5	Fresh	1	1					a/a
CPC14-3	36998	2162	2167	34	2.5	5	5	4	0	350	0	100	5	Fresh	1	1					a/a
CPC14-3	36999	2157	2162	34	2.5	5	5	5	0	400	0	100	5	Fresh	1	1					a/a
CPC14-3	37000	2152	2157	34	2.5	5	5	5	0	400	0	100	5	Fresh	1	1					a/a no point load reading possible
CPC14-3	37001	2147	2152	34	2.5	5	5	5	0	300	0	100	5	Fresh	1	1					a/a
CPC14-3	37002	2137	2147	34	2.5	10	10	10	0	750	0	100	5	Fresh	1	1					a/a
CPC14-3	37003	2134	2137	34	2.5	3	3	3	0	250	0	100	3	Fresh	1	1					a/a
CPC14-3	37004	2127	2134	34	2.5	7	5	5	0	300	0	71.429	5	Fresh	1	1					a/a
CPC14-3	37005	2124	2127	34	2.5	3	3	2	0	150	0	100	5	Fresh	1	1					a/a
CPC14-3	37006	2116	2124	34	2.5	8	8	6	0	300	0	100	5	Fresh	1	1					a/a
CPC14-3	37007	2106	2116	-999		10	0					0									
CPC14-3	37008	2099	2106	34	2.5	7	7	5	0	225	0	100	5	Fresh	1	1					a/a
CPC14-3	37009	2094	2099	34	2.5	5	5	5	0	200	0	100	5	Fresh	1	1					a/a
CPC14-3	37010	2089	2094	34	2.5	5	5	5	0	175	0	100	3	Fresh	1	1					a/a
CPC14-3	37011	2083	2089	34	2.5	6	6	4	0	250	0	100	3	Fresh	1	1					a/a
CPC14-3	37012	2079	2083	34	2.5	4	4	4	0	150	0	100	5	Fresh	1	1					a/a
CPC14-3	37013	2074	2079	34	2.5	5	5	3	0	125	0	100	3	Fresh	1	1					a/a
CPC14-3	37014	2067	2074	34	2.5	7	7	5.5	0	250	0	100	5	Fresh	1	1					a/a point load reading not possible
CPC14-3	37015	2059	2067	31	2.5	8	8	8	0	400	0	100	3	Fresh	1	1					a/a
CPC14-3	37016	2055	2059	31	2.5	4	4	4	0	200	0	100	3	Fresh	1	1					a/a
CPC14-3	37017	2052	2055	31	2.5	3	3	3	0	200	0	100	3	Fresh	1	1					a/a
CPC14-3	37018	2046	2052	34	2.5	6	6	6	0	400	0	100	3	Fresh	1	1					a/a
CPC14-3	37019	2043	2046	34	2.5	3.5	3.5	3.5	0	100	0	100	3	Fresh	1	1					a/a
CPC14-3	37020	2038	2043	34	2.5	4.5	4.5	4	0	150	0	100	3	Fresh	1	1					a/a
CPC14-3	37021	2032	2038	34	2.5	6	6	4.5	0	250	0	100	3	Fresh	1	1					a/a
CPC14-3	37022	2029	2032	34	2.5	3	3	3	0	90	0	100	3	Fresh	1	1					a/a
CPC14-3	37023	2024	2029	34	2.5	5	5	5	0	300	0	100	3	Fresh	1	1					a/a
CPC14-3	37024	2020	2024	31	2.5	4	4	0	0	100	0	100	3	Fresh	1	1	highly fx'd but not actually rubble				a/a
CPC14-3	37025	2016	2020	31	2.5	4.5	4.5	4.5	0	200	0	100	3	Fresh	1	1					a/a
CPC14-3	37026	2010	2016	31	2.5	5.5	5.5	4.5	0	175	0	100	3	Fresh	1	1					a/a
CPC14-3	37027	2006	2010	31	2.5	4.5	4.5	1.5	0	100	0	100	3	Fresh	1	1					a/a
CPC14-3	37028	1998	2006	34	2.5	7.5	7.5	7.5	0	500	0	100	3	Fresh	1	1					a/a
CPC14-3	37029	1991	1998	34	2.5	7	7	4.5	0	400	0	100	5	Fresh	1	1	rubble like RC cuttings (< 1cm)				a/a
CPC14-3	37030	1988	1991	31	2.5	3	3	1	0	125	0	100	3	Fresh	1	1					a/a

Hole Number	RQD ID	Depth from	Depth to	Geotech lithology	Core diameter	Length	Length recovered	Rubble length	RQD length	Total fractures	RQD Percent	Core recovered	Joint roughness	Joint condition	Joint aperture	Hardness	RQD comments	Point length	Point depth	Point Load	Pt load comments
CPC14-3	37031	1985	1988	31	2.5	3	3	3	0	100	0	100	3	Fresh	1	1				a/a (no point load reading possible)	
CPC14-3	37032	2335	2345	-999	2.5	10											drill report notes 10' lost; End of AK hole;				a/a
CPC14-3	37033	2325	2335	34	2.5	10	0.75	0.75	0	25	0	7.5	5	Fresh	1	1	includes re-drilled material				a/a
CPC14-3	37034	2320	2325	34	2.5	5	3.5	3.5	0	175	0	70	3	Fresh	1	1					a/a
CPC14-3	37035	2317	2320	31	2.5	3	3	1.5	0	125	0	100	3	Fresh	1	1					a/a
CPC14-3	37036	2314	2317	31	2.5	3	3	1	0	75	0	100	3	Fresh	1	1					a/a
CPC14-3	37037	2307	2314	34	2.5	7	7	2	0	225	0	100	3	Fresh	1	1					a/a
CPC14-3	37038	2301	2307	34	2.5	6	6	6	0	375	0	100	5	Fresh	1	1					a/a
CPC14-3	37039	2296	2301	34	2.5	5	5	5	0	450	0	100	3	Fresh	1	1					a/a
CPC14-3	37040	2286	2296	31	2.5	10	10	7	0	800	0	100	3	Fresh	1	1					a/a
CPC14-3	37041	2279	2286	34	2.5	7.5	7.5	7.5	0	525	0	100	5	Fresh	1	1					a/a
CPC14-3	37042	2272	2279	31	2.5	7	7	6	0	450	0	100	5	Fresh	1	1	long sliver frags				a/a
CPC14-3	37043	2264	2272	31	2.5	7.5	7.5	6	0	525	0	100	5	Fresh	1	1					a/a no point load reading possible
CPC14-3	37044	2257	2264	31	2.5	7	7	5	0	450	0	100	5	Fresh	1	1	some "tabular sliver" fragments are curved				a/a
CPC14-3	37045	2247	2257	31	2.5	10	7	6	0	450	0	70	3	Fresh	1	1					a/a
CPC14-3	37046	2239	2247	34	2.5	8	8	8	0	650	0	100	5	Fresh	1	1					a/a
CPC14-3	37047	2235	2239	31	2.5	4	4	4	0	300	0	100	3	Clay	1	1	weak clay on some fxs				a/a
CPC14-3	37048	2227	2235	34	2.5	8	6	6	0	500	0	75	3	Fresh	1	1					a/a
CPC14-3	37049	2224	2227	34	2.5	3.5	3.5	3.5	0	150	0	100	5	Fresh	1	1					a/a
CPC14-3	37050	2219	2224	34	2.5	4.5	3.5	3.5	0	225	0	77.778	4	Fresh	1	1					a/a
CPC14-3	37051	2213	2219	34	2.5	6	6	6	0	500	0	100	5	Clay	1	1	clay = weak clay on some frags				a/a
CPC14-3	37052	2211	2213	34	2.5	2.5	2.5	2.5	0	175	0	100	3	Fresh	1	1					a/a
CPC14-3	37053	2206	2211	-999		4.5	0					0									
CPC14-3	37054	2200	2206	34	2.5	6	6	5	0	450	0	100	3	Fresh	1	1					a/a
CPC14-3	37055	2195	2200	34	2.5	5	5	3	0	250	0	100	3	Fresh	1	1					a/a
CPC14-3	37056	2190	2195	34	2.5	5	5	5	0	350	0	100	5	Fresh	1	1					a/a
CPC14-3	37057	2186	2190	34	2.5	4.5	4.5	4.5	0	300	0	100	3	Fresh	1	1					a/a
CPC14-3	37058	2180	2186	31	2.5	5.5	5.5	5.5	0	350	0	100	3	Fresh	1	1					a/a
CPC14-3	37059	2177	2180	31	2.5	3	3	2.5	0	300	0	100	3	Fresh	1	1					a/a
CPC14-3	37060	2173	2177	31	2.5	4	4	1.5	0	100	0	100	3	Fresh	1	1					a/a
CPC14-3	37061	2537	2547	31	2.5	10	9.8	0	8.8	8	88	98	3	Fresh	1	1	gyp/anhyd on fxs	0.8	2546	1234	
CPC14-3	37062	2527	2537	42	2.5	9.5	9.6	0	9.3	6	98	101.05	3	Fresh	1	1		0.75	2536	1534	
CPC14-3	37063	2517	2527	38	2.5	10	9.9	0	9.9	8	99	99	3	Fresh	1	1		0.6	2527	1186	
CPC14-3	37064	2507	2517	38	2.5	10	10	0	10	6	100	100	3	Fresh	1	1		0.7	2514	1514	
CPC14-3	37065	2497	2507	38	2.5	10	9.8	0	9.2	6	92	98	3	Fresh	1	1		0.6	2507	1073	
CPC14-3	37066	2487	2497	42	2.5	10	10.2	0	10	5	100	102	4	Fresh	1	2		1	2497	2357	
CPC14-3	37067	2477	2487	30	2.5	10	9.9	0	10	3	100	99	3	Fresh	1	1		0.55	2487	1450	
CPC14-3	37068	2467	2477	30	2.5	10	10	0	10	5	100	100	3	Fresh	1	3		0.5	2475	3634	
CPC14-3	37069	2463	2467	30	2.5	4.5	5	0	4.4	6	98	111.11	3	Fresh	1	3		0.8	2467	1527	
CPC14-3	37070	2457	2463	30	2.5	6	5.7	0	5.7	4	95	95	3	Fresh	1	2		0.5	2462	812	
CPC14-3	37071	2450	2457	30	2.5	6.5	6.1	0	6.1	3	94	93.846	5	Fresh	1	2		0.45	2456	2287	

Hole Number	RQD ID	Depth from	Depth to	Geotech lithology	Core diameter	Length	Length recovered	Rubble length	RQD length	Total fractures	RQD Percent	Core recovered	Joint roughness	Joint condition	Joint aperture	Hardness	RQD comments	Point length	Point depth	Point Load	Pt load comments
CPC14-3	37072	2444	2450	30	2.5	6.5	6.8	0	6.5	3	100	104.62	3	Fresh	1	3		0.7	2450	2428	
CPC14-3	37073	2434	2444	30	2.5	10	10	0	9.6	9	96	100	5	Fresh	1	2		0.45	2443	1071	
CPC14-3	37074	2424	2434	31	2.5	10	9.9	0	9.5	5	95	99	3	Fresh	1	1		0.7	2432	1284	
CPC14-3	37075	2413	2424	30	2.5	11	10	0	9.8	8	93	95.238	5	Fresh	1	1		0.45	2423	1574	
CPC14-3	37076	2403	2413	31	2.5	10	10	0	9.7	12	97	100	5	Fresh	1	2		0.5	2413	1859	
CPC14-3	37077	2393	2403	31	2.5	10	10	0	9.7	8	97	100	3	Fresh	1	2		0.5	2403	1172	
CPC14-3	37078	2383	2393	31	2.5	10	9.8	0	9	10	90	98	3	Fresh	1	2		0.65	2392	1249	
CPC14-3	37079	2373	2383	31	2.5	10	10.1	0	9.8	5	98	101	5	Fresh	1	2		0.5	2383	568	
CPC14-3	37080	2367	2373	31	2.5	6	6	0.4	4.6	38	77	100	3	Fresh	1	2	beginning of competent rock - (coincides w end AK	0.5	2373	1070	(cont) drilling - and different alt)
CPC14-3	37081	2366	2367	31	2.5	1	1	0.5	0	45	0	100	3	Fresh	1	1					a/a
CPC14-3	37082	2364	2366	31	2.5	2	2	0.5	0	75	0	100	3	Fresh	1	1					a/a
CPC14-3	37083	2362	2364	-999		2											no recovery				
CPC14-3	37084	2359	2362	31	2.5	3	1	1	0	60	0	33.333	3	Fresh	1	1					a/a
CPC14-3	37085	2357	2359	31	2.5	2	1	1	0	50	0	50	3	Fresh	1	1					a/a
CPC14-3	37086	2351	2357	31	2.5	6.5	1	1	0	100	0	15.385	3	Fresh	1	1	rubble to about 2364.5				a/a
CPC14-3	37087	2347	2351	31	2.5	3.5	1.5	1.5	0	45	0	42.857	3	Fresh	1	1	hole re-entry rubble				no point load reading possible
CPC14-3	37088	2345	2347	-999		2											1st Tonatec box labelled 2347-2367; 1st blk 2350.5				
CPC14-3	37089	2735	2745	38	2.5	10	9.9	0	8	14	80	99	3	Fresh	1	2		0.5	2744	2693	
CPC14-3	37090	2725	2735	20	2.5	10	9.9	0	9.5	8	95	99	3	Fresh	1	2	a/a	0.65	2734	1853	
CPC14-3	37091	2715	2725	20	2.5	10	9.9	0	9.4	10	94	99	3	Fresh	1	1	a/a	0.65	2725	1120	
CPC14-3	37092	2705	2715	22	2.5	10	10.2	0	9.4	11	94	102	5	Fresh	1	2		0.55	2712	851	
CPC14-3	37093	2701	2705	22	2.5	4	4	0	3.3	5	83	100	5	Fresh	1	2	a/a	0.5	2704	1246	
CPC14-3	37094	2700	2701	20	2.5	1.5	1	0	0.5	2	33	66.667	5	Fresh	1	2	a/a				point load reading not possible
CPC14-3	37095	2695	2700	20	2.5	4.5	4.8	0	4.5	3	100	106.67	3	Fresh	1	2	a/a	0.6	2699	1165	
CPC14-3	37096	2685	2695	22	2.5	10	10.1	0	9.1	8	91	101	5	Fresh	1	1		0.5	2695	2924	
CPC14-3	37097	2675	2685	22	2.5	10	9.8	0	8.4	12	84	98	3	Fresh	1	2	a/a	0.65	2685	2534	
CPC14-3	37098	2667	2675	30	2.5	8	8.2	0	7.6	6	95	102.5	5	Fresh	1	2		0.85	2675	2259	
CPC14-3	37099	2657	2667	30	2.5	10	9.9	0	7.4	16	74	99	3	Fresh	1	1		0.6	2666	2389	
CPC14-3	37100	2647	2657	36	2.5	11	10.1	0	8.4	12	80	96.19	3	Fresh	1	1	a/a	0.65	2654	855	
CPC14-3	37101	2637	2647	30	2.5	10	10.2	0	9	12	90	102	5	Fresh	1	2	gyp/anhyd on some fxs	0.65	2646	1507	
CPC14-3	37102	2627	2637	34	2.5	10	9.9	0	9.9	9	99	99	5	Fresh	1	2		0.5	2635	2593	
CPC14-3	37103	2617	2627	30	2.5	10	10	0	9.8	8	98	100	5	Fresh	1	1	a/a	0.7	2626	1461	
CPC14-3	37104	2607	2617	31	2.5	10	10.1	0	9.9	7	99	101	5	Fresh	1	2	a/a	0.7	2615	330	
CPC14-3	37105	2596	2607	31	2.5	11	10.3	0	10	6	95	98.095	3	Fresh	1	1	a/a	0.75	2606	1349	
CPC14-3	37106	2587	2596	30	2.5	9	9	0	8.5	9	94	100	5	Fresh	1	2	a/a	0.65	2596	871	
CPC14-3	37107	2577	2587	30	2.5	10	10.1	0	9.9	5	99	101	3	Fresh	1	2		0.5	2587	1200	
CPC14-3	37108	2567	2577	31	2.5	10	10.1	0	9.2	6	92	101	2	Fresh	1	1		0.75	2574	1042	
CPC14-3	37109	2557	2567	31	2.5	11	10.3	0	10.3	6	98	98.095	5	Fresh	1	2		0.75	2566	3473	
CPC14-3	37110	2547	2557	31	2.5	10	10.1	0	9.3	7	93	101	3	Fresh	1	1		0.6	2556	1563	
CPC14-3	37111	2785	2795	42	2.5	10	10	0	9.1	12	91	100	2	Fresh	1	1	a/a	0.75	2795	1204	
CPC14-3	37112	2775	2785	30	2.5	10	10	0	9.6	9	96	100	3	Fresh	1	1	a/a	0.5	2785	174	
CPC14-3	37113	2766	2775	30	2.5	9.5	10.2	0	9.5	8	100	107.37	5	Fresh	1	2	a/a	0.65	2775	1781	

Hole Number	RQD ID	Depth from	Depth to	Geotech lithology	Core diameter	Length	Length recovered	Rubble length	RQD length	Total fractures	RQD Percent	Core recovered	Joint roughness	Joint condition	Joint aperture	Hardness	RQD comments	Point length	Point depth	Point Load	Pt load comments
CPC14-3	37114	2756	2766	20	2.5	10	9.6	0	8.7	12	87	96	3	Fresh	1	1	a/a	0.45	2765	109	
CPC14-3	37115	2745	2756	38	2.5	11	10.1	0	9	13	86	96.19	3	Fresh	1	1	gyp/anhyd on some fxs	0.5	2755	773	
CPC14-3	37116	3047	3057	71	2.5	10	10.3	0	10	3	100	103	3	Fresh	1	1	a/a	0.6	3054	3660	
CPC14-3	37117	3037	3047	71	2.5	10	9.6	0	9.6	3	96	96	5	Fresh	1	2	BEDROCK?	0.9	3046	2768	pC block or in-situ?
CPC14-3	37118	3027	3037	63	2.5	10	9.9	0	10	4	100	99	3	Fresh	1	2	a/a	0.65	3037	488	bx with Tertiary matrix
CPC14-3	37119	3017	3027	64	2.5	10	10.2	0	10	3	100	102	5	Fresh	1	1	a/a	0.8	3027	662	a/a
CPC14-3	37120	3007	3017	64	2.5	10	10	0	10	5	100	100	3	Slick	1	1	a/a	0.5	3017	1181	a/a
CPC14-3	37121	2997	3007	64	2.5	10	9.9	0	9.9	3	99	99	3	Fresh	1	1	a/a	0.8	3006	1154	a/a
CPC14-3	37122	2987	2997	64	2.5	10	9.9	0	9.9	2	99	99	3	Fresh	1	1	a/a	0.7	2996	2307	a/a
CPC14-3	37123	2977	2987	71	2.5	10	10.2	0	10	6	100	102	3	Fresh	1	1	large blocks pC	0.5	2986	2090	a/a
CPC14-3	37124	2971	2977	43	2.5	6	6.6	0	6	5	100	110	3	Fresh	1	3		0.65	2977	898	PL on granite clast
CPC14-3	37125	2964	2971	43	2.5	7	6.7	0	6.7	3	96	95.714	3	Fresh	1	3		0.65	2969	2651	
CPC14-3	37126	2954	2964	43	2.5	10	9.8	0	9.1	7	91	98	5	Fresh	1	1	gyp/anhyd on some fxs	0.7	2963	1751	
CPC14-3	37127	2945	2954	71	2.5	9.5	10.1	0	9.5	3	100	106.32	5	Fresh	1	1	a/a	0.55	2954	1603	
CPC14-3	37128	2935	2945	71	2.5	10	9.4	0	9.4	4	94	94	3	Fresh	1	2	block pC (boulders, cobbles)	0.65	2944	910	
CPC14-3	37129	2925	2935	43	2.5	10	10	0	8.5	8	85	100	5	Fresh	1	3	a/a	0.6	2931	470	
CPC14-3	37130	2915	2925	43	2.5	10	10	0	10	5	100	100	3	Fresh	1	2	a/a	0.45	2924	1493	
CPC14-3	37131	2905	2915	43	2.5	10	10	0	10	6	100	100	5	Fresh	1	3	a/a	0.9	2914	980	
CPC14-3	37132	2895	2905	43	2.5	9.5	9.9	0	9.5	8	100	104.21	3	Fresh	1	3	a/a	0.6	2904	3670	
CPC14-3	37133	2885	2895	43	2.5	11	10.3	0	9.7	8	92	98.095	2	Fresh	1	1		0.7	2894	326	
CPC14-3	37134	2875	2885	43	2.5	9.5	9.6	0	8.3	9	87	101.05	2	Fresh	1	2	a/a	0.6	2884	1192	
CPC14-3	37135	2865	2875	43	2.5	10	9.8	0	9.8	5	98	98	2	Fresh	1	3	a/a	0.65	2874	3559	
CPC14-3	37136	2855	2865	43	2.5	10	9.9	0	8.9	18	89	99	2	Fresh	1	2	gyp/anhyd on some fxs	0.75	2865	1345	
CPC14-3	37137	2845	2855	43	2.5	10	9.7	0	9.1	11	91	97	2	Fresh	1	2		0.5	2853	416	
CPC14-3	37138	2835	2845	36	2.5	10	10.2	0	10	5	100	102	3	Fresh	1	1		0.65	2245	2640	
CPC14-3	37139	2825	2835	38	2.5	10	9.7	0	9.7	5	97	97	2	Fresh	1	1	a/a	0.8	2834	1675	
CPC14-3	37140	2815	2825	38	2.5	10	10.1	0	9.8	10	98	101	3	Fresh	1	1	a/a	0.7	2824	2031	
CPC14-3	37141	2805	2815	38	2.5	10	10	0	9.9	9	99	100	2	Fresh	1	3	a/a	0.45	2815	1777	
CPC14-3	37142	2795	2805	42	2.5	10	10	0	7.6	25	76	100	3	Fresh	1	3	a/a	0.75	2804	751	
CPC14-3	37346	3307	3317	38	2.5	11	10.2	0.7	6.5	36	62	97.143	5	Fresh	1	1	a/a	0.9	3315	1604	
CPC14-3	37347	3296	3307	38	2.5	11	10.2	0	10.5	3	100	97.143	5	Fresh	1	2	a/a	0.6	3305	1705	
CPC14-3	37348	3286	3296	38	2.5	10	10.2	0	9.7	5	97	102	3	Fresh	1	2	a/a	0.9	3296	2952	
CPC14-3	37349	3276	3286	64	2.5	10	10.2	0	10	3	100	102	2	Fresh	1	1	a/a (gyp/anhyd on some fxs)	0.55	3286	2269	
CPC14-3	37350	3266	3276	64	2.5	10	10.3	0	10	3	100	103	5	Fresh	1	1	a/a	0.55	3275	1791	
CPC14-3	37351	3257	3266	64	2.5	9	9.9	0	9	5	100	110	5	Fresh	1	2	a/a	0.55	3265	3050	
CPC14-3	37352	3247	3257	64	2.5	10	9.5	0	9.5	3	95	95	5	Fresh	1	2	a/a	0.7	3256	1022	
CPC14-3	37353	3237	3247	64	2.5	11	10	0	9.2	6	88	95.238	3	Fresh	1	2	a/a	0.75	3246	541	
CPC14-3	37354	3227	3237	64	2.5	10	10.2	0	9.9	6	99	102	3	Fresh	1	2	a/a	0.7	3236	247	
CPC14-3	37355	3217	3227	64	2.5	10	10.2	0	10	4	100	102	3	Fresh	1	1		0.5	3225	1985	
CPC14-3	37356	3207	3217	64	2.5	9.5	10.1	0	8.4	8	88	106.32	3	Fresh	1	2	a/a	0.5	3215	3026	(cont) for "self-correction" down-hole;
CPC14-3	37357	3197	3207	64	2.5	10	9.4	0	8.9	8	89	94	3	Fresh	1	2	a/a (blk misplaced? see photos; 3206-3266: footage	0.9	3206	3030	(cont) may be 0.5-1 ft off; NOT changed (hoping fo
CPC14-3	37358	3187	3197	64	2.5	10	10.2	0	9.9	6	99	102	3	Fresh	1	2	gyp/anhyd on some fxs	0.5	3195	799	

Hole Number	RQD ID	Depth from	Depth to	Geotech lithology	Core diameter	Length	Length recovered	Rubble length	RQD length	Total fractures	RQD Percent	Core recovered	Joint roughness	Joint condition	Joint aperture	Hardness	RQD comments	Point length	Point depth	Point Load	Pt load comments
CPC14-3	37359	3184	3187	22	2.5	3	2.9	0	2.6	3	87	96.667	2	Fresh	1	2		0.55	3184	316	a/a
CPC14-3	37360	3177	3184	22	2.5	7	7.2	0	7	5	100	102.86	2	Fresh	1	2	a/a	0.55	3182	1180	PL on Tert dike
CPC14-3	37361	3167	3177	64	2.5	10	9.7	0	9.3	9	93	97	3	Fresh	1	2		0.5	3176	107	
CPC14-3	37362	3157	3167	64	2.5	10	10.1	0	10	3	100	101	3	Fresh	1	1	a/a	1	3167	2645	
CPC14-3	37363	3147	3157	64	2.5	10	9.8	0	9.8	3	98	98	5	Fresh	1	1	a/a	0.5	3157	1706	
CPC14-3	37364	3137	3147	64	2.5	10	9.9	0	9.6	7	96	99	3	Fresh	1	2		0.6	3146	924	
CPC14-3	37365	3127	3137	64	2.5	10	10.1	0	10	4	100	101	3	Fresh	1	1	gyp/anhd on some fxs	0.9	3136	730	
CPC14-3	37366	3117	3127	64	2.5	10	10	0	8.6	13	86	100	3	Fresh	1	2		0.65	3125	2192	
CPC14-3	37367	3107	3117	64	2.5	10	10.1	0	8.9	10	89	101	3	Fresh	1	2		0.7	3116	1156	PL on leucogranite
CPC14-3	37368	3097	3107	22	2.5	10	9.9	0	8.2	12	82	99	2	Slick	1	1	4 ft Tert. dike	0.65	3101	825	PL on Tphd (dike)
CPC14-3	37369	3087	3097	71	2.5	10	9.7	0	8.9	5	89	97	3	Clay	1	3	weak clay/ gyp-anhyd on fxs	0.6	3095	2420	
CPC14-3	37370	3077	3087	71	2.5	10	10	0	9	5	90	100	3	Fresh	1	3		0.7	3085	511	
CPC14-3	37371	3067	3077	71	2.5	10	10.1	0	10	3	100	101	5	Fresh	1	2	a/a, untill noted otherwise	0.6	3077	534	
CPC14-3	37372	3057	3067	71	2.5	10	10.1	0	8.8	9	88	101	5	Fresh	1	2	bedrock? (caldera/maar basin basement)	0.7	3063	1188	
CPC14-3	37373	3457	3467	72	2.5	10	10.1	0	8.9	6	89	101	3	Fresh	1	1	a/a	0.7	3464	1122	
CPC14-3	37374	3447	3457	72	2.5	10	9.9	0	9.9	8	99	99	3	Fresh	1	1	a/a	0.55	3457	780	
CPC14-3	37375	3437	3447	72	2.5	10	10.2	0	10	3	100	102	3	Fresh	1	2	a/a	0.7	3447	1983	
CPC14-3	37376	3427	3437	38	2.5	10	9.9	0	9.9	4	99	99	3	Fresh	1	1	a/a	0.6	3437	2916	
CPC14-3	37377	3417	3427	71	2.5	10	10.3	0	9.8	5	98	103	5	Fresh	1	1	a/a (gyp/anhyd on some fxs cont)	0.6	3424	699	
CPC14-3	37378	3407	3417	71	2.5	10	10	0	10	5	100	100	3	Fresh	1	3	a/a	0.7	3417	2573	
CPC14-3	37379	3397	3407	71	2.5	10	10.2	0	10	5	100	102	3	Fresh	1	3	a/a	0.6	3406	1738	
CPC14-3	37380	3387	3397	71	2.5	10	9.8	0	9	6	90	98	3	Fresh	1	1	a/a	0.65	3395	1397	
CPC14-3	37381	3377	3387	71	2.5	10	10	0	10	4	100	100	3	Fresh	1	3	a/a	0.6	3387	354	
CPC14-3	37382	3367	3377	71	2.5	10	9.9	0	9.4	6	94	99	3	Fresh	1	1	a/a	0.5	3375	1517	
CPC14-3	37383	3357	3367	72	2.5	10	10.2	0	9	6	90	102	3	Fresh	1	2	a/a	0.85	3366	2760	
CPC14-3	37384	3347	3357	72	2.5	10	9.7	0	9.4	11	94	97	2	Fresh	1	2	a/a	0.6	3356	1059	
CPC14-3	37385	3337	3347	71	2.5	10	10	0	9.7	5	97	100	3	Fresh	1	2	a/a	0.6	3345	1243	
CPC14-3	37386	3327	3337	64	2.5	10	10.2	0	9.8	5	98	102	5	Fresh	1	1	a/a	0.5	3337	1489	
CPC14-3	37387	3317	3327	38	2.5	10	10.3	0	9.5	8	95	103	5	Fresh	1	2	a/a	0.5	3325	959	
CPC14-3	37388	3557	3567	42	2.5	10	10.3	0	8.5	10	85	103	3	Fresh	1	2		0.9	3566	2120	
CPC14-3	37389	3547	3557	42	2.5	10	10.3	0	9.4	4	94	103	3	Fresh	1	2	a/a	0.7	3555	2991	
CPC14-3	37390	3537	3547	42	2.5	10	10.2	0	9.3	5	93	102	3	Fresh	1	2	a/a, clear gyp vns > 1/2 core diameter	0.8	3544	157	PL on possible dike finger
CPC14-3	37391	3527	3537	42	2.5	10	10.2	0	10	3	100	102	3	Fresh	1	3	a/a	0.6	3536	2390	
CPC14-3	37392	3517	3527	42	2.5	10	10.3	0	9.4	6	94	103	3	Fresh	1	2	a/a with fluorite, py	0.45	3525	1417	
CPC14-3	37393	3507	3517	42	2.5	10	10	0	9.8	4	98	100	3	Fresh	1	2	a/a	0.6	3517	1774	
CPC14-3	37394	3497	3507	42	2.5	10	9.2	0	9.2	0	92	92				2		1	3506	1631	
CPC14-3	37395	3487	3497	42	2.5	10	10.1	0	9.5	4	95	101	5	Fresh	1	2	a/a	0.5	3497	1824	
CPC14-3	37396	3477	3487	71	2.5	10	9.7	0	9.4	2	94	97	3	Fresh	1	2	a/a	0.85	3483	2594	PL on sheared granitoid
CPC14-3	37397	3467	3477	38	2.5	10	10.1	0	10	4	100	101	3	Fresh	1	2	a/a	0.7	3477	1136	mixed lith w PL on leucogranite

Hole Number	RQD ID	Depth from	Depth to	Geotech lithology	Core diameter	Length	Length recovered	Rubble length	RQD length	Total fractures	RQD Percent	Core recovered	Joint roughness	Joint condition	Joint aperture	Hardness	RQD comments	Point length	Point depth	Point Load	Pt load comments
CPC14-3	37398	3856	3857	38	2.5	1	3.8	0	1	1	100	380	3	Fresh	1	2	PROBLEM/Confusion: switch back to HQ; 3857 blk say	0.55	3857	192	(cont)s "D1, R3" (3.9) and "3866" blk says "D9/R9"
CPC14-3	37399	3847	3856	42	1.75	9	9.2	0	9	5	100	102.22	5	Fresh	1	2	a/a, gyp and fluorite on some fxs	0.6	3855	1532	End NQ core (for water test packers?)
CPC14-3	37400	3837	3847	42	1.75	10	9.2	0	9	4	90	92	3	Fresh	1	1	a/a	0.4	3846	1336	
CPC14-3	37401	3827	3837	42	1.75	10	10.2	0	10	2	100	102	5	Fresh	1	1	a/a	0.6	3837	1093	
CPC14-3	37402	3817	3827	42	1.75	10	9.8	0	9.8	5	98	98	5	Fresh	1	1		0.6	3826	2302	
CPC14-3	37403	3807	3817	42	1.75	10	9.7	0	9.7	2	97	97	3	Fresh	1	1		0.7	3815	1507	
CPC14-3	37404	3797	3807	42	1.75	10	9.5	0	9.5	1	95	95	5	Fresh	1	1	a/a (gyp/anhyd? on some fxs)	0.55	3806	1155	
CPC14-3	37405	3787	3797	42	1.75	10	9.9	0	9.6	3	96	99	5	Fresh	1	1		0.45	3796	1418	
CPC14-3	37406	3777	3787	42	1.75	10	10.2	0	9.7	2	97	102	3	Fresh	1	1		0.4	3787	1799	
CPC14-3	37407	3767	3777	42	1.75	10	9.9	0	9.9	0	99	99						0.6	3777	1171	PL immed adjacent to gyp vnl at 20 tca
CPC14-3	37408	3757	3767	42	1.75	10	10	0	9.7	4	97	100	3	Fresh	1	1	a/a	0.8	3766	1518	
CPC14-3	37409	3747	3757	42	1.75	10	10.1	0	10	4	100	101	5	Fresh	1	1	a/a	0.5	3757	1351	
CPC14-3	37410	3737	3747	42	1.75	10	10.2	0	10	2	100	102	3	Fresh	1	1	a/a	0.6	3747	1399	
CPC14-3	37411	3727	3737	42	1.75	10	9.9	0	9.6	7	96	99	3	Fresh	1	1	a/a	0.4	3737	127	
CPC14-3	37412	3717	3727	42	1.75	10	10	0	10	4	100	100	3	Fresh	1	2	a/a	0.7	3725	2171	
CPC14-3	37413	3707	3717	42	1.75	10	10	0	9.4	11	94	100	3	Fresh	1	2		0.55	3716	2301	
CPC14-3	37414	3697	3707	42	1.75	10	10.2	0	10	3	100	102	3	Fresh	1	1	a/a (gyp on fxs)	0.65	3704	1909	
CPC14-3	37415	3687	3697	42	1.75	10	9.8	0	9.5	5	95	98	3	Fresh	1	1	a/a; likely healed tectonic bx (fault)	0.7	3696	1787	
CPC14-3	37416	3677	3687	42	1.75	10	10.1	0	9.2	8	92	101	3	Fresh	1	1	a/a	0.5	3687	1796	
CPC14-3	37417	3667	3677	42	1.75	10	10	0	9.8	5	98	100	3	Fresh	1	1		0.55	3676	1333	
CPC14-3	37418	3657	3667	42	1.75	10	9.9	0	9.9	6	99	99	3	Fresh	1	1	a/a	0.4	3666	2001	
CPC14-3	37419	3647	3657	42	1.75	10	10.2	0	9.9	4	99	102	3	Fresh	1	1	a/a	0.7	3655	1484	
CPC14-3	37420	3637	3647	42	1.75	10	9.7	0	9.2	3	92	97	3	Fresh	1	1	a/a	0.65	3646	230	
CPC14-3	37421	3627	3637	42	1.75	10	9.7	0	9.7	2	97	97	5	Fresh	1	1	a/a	0.9	3636	1630	
CPC14-3	37422	3617	3627	31	1.75	10	10.2	0	8.8	8	88	102	3	Fresh	1	1	a/a	0.7	3625	1312	
CPC14-3	37423	3607	3617	42	1.75	10	10.1	0	9.1	7	91	101	3	Fresh	1	1	gyp/anhyd? on some fxs	0.5	3616	1480	
CPC14-3	37424	3604	3607	42	1.75	3	3	0	3	2	100	100	3	Fresh	1	1		0.7	3607	1278	NQ core 3600 - 3856;
CPC14-3	37425	3601	3604	-999		3															no recovery
CPC14-3	37426	3600	3601	42	1.75	1	0.7	0	0.3	2	30	70	3	Fresh	1		Reduce to NQ (44mm dia); use (2 x 1.45 ft =) 2.9 f				(cont) ft for RQD; no PL reading possible
CPC14-3	37427	3597	3600	42	2.5	3	2.4	0.7	0.9	25	30	80	3	Fresh	1	2		0.5	3600	1746	
CPC14-3	37428	3587	3597	42	2.5	10	10.2	0	9.8	4	98	102	3	Fresh	1	1		0.55	3596	2161	
CPC14-3	37429	3577	3587	42	2.5	10	9.9	0	9.9	4	99	99	3	Fresh	1	1	a/a	0.5	3586	3062	
CPC14-3	37430	3567	3577	42	2.5	10	10.1	0	8.1	6	81	101	3	Fresh	1	2	a/a gyp/anhyd? on some fxs cont.	0.7	3575	2693	
CPC14-3	37431	4007	4017	30	2.5	10	10	0	10	5	100	100	3	Fresh	1	2	a/a (gyp/anhyd? on some fxs cont.)	0.5	4017	2592	
CPC14-3	37432	3997	4007	30	2.5	10	10.3	0	10	3	100	103	5	Fresh	1	1	a/a, minor fault	0.75	4004	2720	
CPC14-3	37433	3987	3997	38	2.5	10	10	0	9.6	7	96	100	5	Fresh	1	1	a/a	0.6	3995	3525	
CPC14-3	37434	3977	3987	38	2.5	10	10.2	0	10	3	100	102	3	Fresh	1	2	a/a	0.5	3987	2524	

Hole Number	RQD ID	Depth from	Depth to	Geotech lithology	Core diameter	Length	Length recovered	Rubble length	RQD length	Total fractures	RQD Percent	Core recovered	Joint roughness	Joint condition	Joint aperture	Hardness	RQD comments	Point length	Point depth	Point Load	Pt load comments
CPC14-3	37435	3967	3977	30	2.5	11	9.9	0	9.7	5	92	94.286	3	Fresh	1	1	a/a (as above)	0.45	3976	3812	
CPC14-3	37436	3957	3967	38	2.5	10	10	0	9.5	6	95	100	3	Fresh	1	1	a/a	1	3965	2871	
CPC14-3	37437	3947	3957	38	2.5	10	9.7	0	10	5	100	97	3	Fresh	1	2	a/a	0.9	3956	1665	
CPC14-3	37438	3937	3947	34	2.5	10	10.2	0	10	3	100	102	3	Fresh	1	2	a/a	0.6	3947	1973	
CPC14-3	37439	3927	3937	38	2.5	10	10.2	0	10	2	100	102	3	Fresh	1	3	a/a	0.65	3936	3220	
CPC14-3	37440	3917	3927	38	2.5	10	10.2	0	10	1	100	102	3	Fresh	1	1	a/a	0.55	3925	2255	
CPC14-3	37441	3907	3917	38	2.5	10	9.4	0	9	4	90	94	5	Fresh	1	2		0.8	3915	1042	
CPC14-3	37442	3897	3907	38	2.5	10	10.2	0	9.5	6	95	102	5	Fresh	1	1	a/a	0.65	3905	2538	
CPC14-3	37443	3887	3897	38	2.5	10	10.1	0	10	0	100	101				2		0.5	3896	2023	
CPC14-3	37444	3877	3887	38	2.5	10	9.9	0	9.9	3	99	99	5	Fresh	1	1	gyp/anhyd? on some fxs cont.	0.65	3885	975	
CPC14-3	37445	3866	3877	38	2.5	11	10.2	0	10.2	6	97	97.143	3	Fresh	1	3	(cont) see photo;	0.6	3875	2965	
CPC14-3	37446	3857	3866	38	2.5	9	10.2	0	9	7	100	113.33	3	Fresh	1	1	(cont) but R10.2; decide to rely on 3866 blk; note	0.5	3865	2002	(cont) that NQ stub (3856) is @ beginning of box;
CPC14-3	37447	4134	4144	64	2.5	10	10	0	9.3	7	93	100	3	Fresh	1	2	gyp/anhy? on some fxs;	0.45	4242	2402	
CPC14-3	37448	4124	4134	64	2.5	10	9.8	0	9.5	5	95	98	3	Fresh	1	1		0.7	4134	1352	
CPC14-3	37449	4117	4124	64	2.5	7	7	0	6.7	5	96	100	3	Fresh	1	2	"basement" pC @~ 4120? (NO)	0.5	4124	2147	
CPC14-3	37450	4107	4117	72	2.5	10	10.1	0	10	4	100	101	3	Fresh	1	1	schist and leucogranite debris	0.6	4115	1612	
CPC14-3	37451	4097	4107	64	2.5	10	10.3	0	10	3	100	103	5	Fresh	1	1	gyp on fxs still present throughout	0.65	4107	1774	
CPC14-3	37452	4087	4097	42	2.5	10	10	0	8.7	10	87	100	5	Fresh	1	1	42 = tuff w granitic debris	0.75	4096	2426	
CPC14-3	37453	4077	4087	64	2.5	10	10	0	9.5	7	95	100	5	Fresh	1	2	a/a	0.6	4086	1065	
CPC14-3	37454	4067	4077	41	2.5	10	9.7	0	9.7	7	97	97	5	Fresh	1	1	xtl tuff and pC debris	0.65	4075	2362	
CPC14-3	37455	4057	4067	64	2.5	10	10.1	0	10	6	100	101	3	Fresh	1	1	a/a	0.7	4066	2612	
CPC14-3	37456	4047	4057	64	2.5	10	10	0	8.4	9	84	100	3	Fresh	1	1	71 is just dominant lith (in boulder congl/bx)	0.7	4056	934	
CPC14-3	37457	4037	4047	64	2.5	10	9.9	0	9.9	4	99	99	3	Fresh	1	1	a/a	0.6	4045	2111	
CPC14-3	37458	4027	4037	64	2.5	10	9.7	0	9.7	3	97	97	3	Fresh	1	1	this is a bx/congl w pC clasts and Tert matrix	0.65	4036	2289	
CPC14-3	37459	4017	4027	42	2.5	10	10	0	10	4	100	100	3	Fresh	1	1	a/a	0.5	4027	2434	
CPC14-3	37462	4366	4368	64	2.5	2	1.7	0	1.7	1	85	85	3	Fresh	1	1	4368 ft. Total Depth	0.7	4368	746	
CPC14-3	37463	4357	4366	64	2.5	9.5	9.8	0	9.5	4	100	103.16	3	Fresh	1	1		0.5	4366	2883	
CPC14-3	37464	4347	4357	64	2.5	9.5	9.2	0	9.2	8	97	96.842	2	Slick	1	1		0.5	4356	3828	
CPC14-3	37465	4337	4347	64	2.5	10	10.2	0	9.3	10	93	102	3	Fresh	1	2		0.6	4347	1338	
CPC14-3	37466	4327	4337	85	2.5	10	10.2	0	9.7	10	97	102	3	Fresh	1	2	gyp/anhyd? on some fxs	0.75	4336	997	
CPC14-3	37467	4320	4327	85	2.5	7	6.4	0.7	2.9	9	41	91.429	3	Fresh	1	3	much re-drilled core (spindles)				PL reading not possible
CPC14-3	37468	4316	4320	64	2.5	4.5	4.5	0	4.1	3	91	100	5	Fresh	1	1		0.6	4319	305	
CPC14-3	37469	4306	4316	71	2.5	10	10.2	0	10	4	100	102	3	Fresh	1	1	gyp/anhyd? on some fxs cont.	0.8	4314	3143	
CPC14-3	37470	4296	4306	85	2.5	9.5	9.2	0	9.2	4	97	96.842	5	Fresh	1	2	gyp/fluor on some fxs	0.6	4305	2235	
CPC14-3	37471	4286	4296	85	2.5	10	10.1	0	9.8	2	98	101	3	Fresh	1	1		0.5	4295	2613	
CPC14-3	37472	4276	4286	85	2.5	10	10.1	0	10	5	100	101	2	Fresh	1	1		0.75	4286	1345	

Hole Number	RQD ID	Depth from	Depth to	Geotech lithology	Core diameter	Length	Length recovered	Rubble length	RQD length	Total fractures	RQD Percent	Core recovered	Joint roughness	Joint condition	Joint apperture	Hardness	RQD comments	Point length	Point depth	Point Load	Pt load comments
CPC14-3	37473	4266	4276	85	2.5	10	9.8	0	9.8	3	98	98	5	Fresh	1	1		0.45	4275	1612	
CPC14-3	37474	4256	4266	85	2.5	11	10.2	0	10.2	4	97	97.143	5	Fresh	1	2		0.6	4265	2146	
CPC14-3	37475	4246	4256	85	2.5	10	10.2	0	10	1	100	102	2	Fresh	1	2		0.6	4256	2566	PL in dike-like material
CPC14-3	37476	4236	4246	85	2.5	10	10.2	0	9.8	3	98	102	3	Fresh	1	1		0.7	4245	1691	
CPC14-3	37477	4226	4236	85	2.5	10	9.4	0	9.4	2	94	94	3	Fresh	1	2		0.7	4234	3029	
CPC14-3	37478	4215	4226	85	2.5	11	10.2	0	10.2	2	97	97.143	5	Fresh	1	2	gyp/anhyd? on some fxs cont.	0.65	4225	1169	
CPC14-3	37479	4205	4215	85	2.5	10	10.2	0	9.6	7	96	102	3	Fresh	1	3		0.65	4214	439	
CPC14-3	37480	4195	4205	85	2.5	10	10.2	0	9.7	4	97	102	3	Fresh	1	2		0.5	4204	1802	
CPC14-3	37481	4185	4195	85	2.5	10	10.3	0	9.2	9	92	103	3	Fresh	1	2	gyp/anhyd? on some fxs cont.	0.7	4195	2124	
CPC14-3	37482	4175	4185	85	2.5	11	10.1	0	10	2	95	96.19	3	Fresh	1	2	"D10/R10" block: bad math	0.7	4184	1691	
CPC14-3	37483	4164	4175	85	2.5	11	10.1	0	9.9	3	94	96.19	3	Fresh	1	2	includes possible 2.7 ft Tphs dike	0.55	4173	1618	
CPC14-3	37484	4154	4164	85	2.5	10	10.2	0	9.9	6	99	102	3	Fresh	1	2		0.6	4163	1948	
CPC14-3	37485	4144	4154	85	2.5	10	10	0	9.5	5	95	100	5	Fresh	1	2	using 85 for pC "clast" bx - NOT "pC bx" (from cod	0.6	4154	3437	(cont) code table - outdated?

APPENDIX 2.4

CPC14-3 - CORE PHOTOGRAPHS

CRIPPLE CREEK AND VICTOR GOLD MINING COMPANY, EXPLORATION DEPARTMENT

NOTE: CORE PHOTOGRAPHS ARE AVAILABLE IN THE ELECTRONIC VERSION OF THIS REPORT

APPENDIX 3

CPC14-3 - SOLIDS SAMPLING

APPENDIX 3.1

CPC14-3 - SOLIDS ANALYSES

Appendix 3.1, CPC14-3 Solid Phase Sampling and Analysis Program Summary

Lab ID	Sample ID	Hole ID	From	To	Composite Static- Kinetic	ABA	NP	Sulfur Speciation	Carbon Speciation	NAG	NAG Metals	GrainSize	HCT
L24021-01	CPC14-3/440-600/Static	CPC14-3	440	600	Static	X	X	X	X	X			
L24195-01	CPC14-3/440-600/Static	CPC14-3	440	600	Static						X		
L24021-02	CPC14-3/600-800/Static	CPC14-3	600	800	Static	X	X	X	X	X			
L24195-02	CPC14-3/600-800/Static	CPC14-3	600	800	Static						X		
L24021-03	CPC14-3/800-1000/Static	CPC14-3	800	1000	Static	X	X	X	X	X			
L24195-03	CPC14-3/800-1000/Static	CPC14-3	800	1000	Static						X		
L24021-04	CPC14-3/1000-1200/Static	CPC14-3	1000	1200	Static	X	X	X	X	X			
L24195-04	CPC14-3/1000-1200/Static	CPC14-3	1000	1200	Static						X		
L24021-05	CPC14-3/1200-1400/Static	CPC14-3	1200	1400	Static	X	X	X	X	X			
L24195-05	CPC14-3/1200-1400/Static	CPC14-3	1200	1400	Static						X		
L24021-06	CPC14-3/1400-1600/Static	CPC14-3	1400	1600	Static	X	X	X	X	X			
L24195-06	CPC14-3/1400-1600/Static	CPC14-3	1400	1600	Static						X		
L24021-07	CPC14-3/1600-1800/Static	CPC14-3	1600	1800	Static	X	X	X	X	X			
L24195-07	CPC14-3/1600-1800/Static	CPC14-3	1600	1800	Static						X		
L24518-01	CPC14-3/1800-2000/Static	CPC14-3	1800	2000	Static	X	X	X	X	X			
L24879-01	CPC14-3/1800-2000/Static	CPC14-3	1800	2000	Static						X		
L24518-02	CPC14-3/2000-2200/Static	CPC14-3	2000	2200	Static	X	X	X	X	X			
L24879-02	CPC14-3/2000-2200/Static	CPC14-3	2000	2200	Static						X		
L24518-03	CPC14-3/2200-2400/Static	CPC14-3	2200	2400	Static	X	X	X	X	X			
L24879-03	CPC14-3/2200-2400/Static	CPC14-3	2200	2400	Static						X		
L24518-04	CPC14-3/2400-2600/Static	CPC14-3	2400	2600	Static	X	X	X	X	X			
L24879-04	CPC14-3/2400-2600/Static	CPC14-3	2400	2600	Static						X		
L24915-01	CPC14-3/2600-2800/Static	CPC14-3	2600	2800	Static	X	X	X	X	X			
L25074-01	CPC14-3/2600-2800/Static	CPC14-3	2600	2800	Static						X		
L24915-02	CPC14-3/2800-3000/Static	CPC14-3	2800	3000	Static	X	X	X	X	X			
L25074-02	CPC14-3/2800-3000/Static	CPC14-3	2800	3000	Static						X		
L24915-03	CPC14-3/3000-3200/Static	CPC14-3	3000	3200	Static	X	X	X	X	X			
L25074-03	CPC14-3/3000-3200/Static	CPC14-3	3000	3200	Static						X		
L24915-04	CPC14-3/3200-3400/Static	CPC14-3	3200	3400	Static	X	X	X	X	X			
L25074-04	CPC14-3/3200-3400/Static	CPC14-3	3200	3400	Static						X		
L24526-01	CPC14-3/3400-3600/Static	CPC14-3	3400	3600	Static	X	X	X	X	X			
L24881-01	CPC14-3/3400-3600/Static	CPC14-3	3400	3600	Static						X		
L24526-02	CPC14-3/3600-3800/Static	CPC14-3	3600	3800	Static	X	X	X	X	X			
L24881-02	CPC14-3/3600-3800/Static	CPC14-3	3600	3800	Static						X		
L24526-03	CPC14-3/3800-4000/Static	CPC14-3	3800	4000	Static	X	X	X	X	X			
L24881-03	CPC14-3/3800-4000/Static	CPC14-3	3800	4000	Static						X		
L24526-04	CPC14-3/4000-4200/Static	CPC14-3	4000	4200	Static	X	X	X	X	X			
L24881-04	CPC14-3/4000-4200/Static	CPC14-3	4000	4200	Static						X		
L24915-05	CPC14-3/4200-4400/Static	CPC14-3	4200	4400	Static	X	X	X	X	X			
L25074-05	CPC14-3/4200-4400/Static	CPC14-3	4200	4400	Static						X		
L24140-01	CPC14-3/440-1000/Kinetic	CPC14-3	440	1000	Kinetic	X	X	X	X	X			
L24142-01	CPC14-3/440-1000/Kinetic	CPC14-3	440	1000	Kinetic							X	X
L24454-02	CPC14-3/440-1000/Kinetic	CPC14-3	440	1000	Kinetic						X		
L24139-01	CPC14-3/1000-1800/Kinetic	CPC14-3	1000	1800	Kinetic	X	X	X	X	X			
L24141-01	CPC14-3/1000-1800/Kinetic	CPC14-3	1000	1800	Kinetic							X	X
L24454-01	CPC14-3/1000-1800/Kinetic	CPC14-3	1000	1800	Kinetic						X		
L24525-01	CPC14-3/1800-2600/Kinetic	CPC14-3	1800	2600	Kinetic	X	X	X	X	X		X	X
L24880-01	CPC14-3/1800-2600/Kinetic	CPC14-3	1800	2600	Kinetic						X		
L24916-01	CPC14-3/2600-3400/Kinetic	CPC14-3	2600	3400	Kinetic	X	X	X	X	X		X	X
L25074-06	CPC14-3/2600-3400/Kinetic	CPC14-3	2600	3400	Kinetic						X		
L24527-01	CPC14-3/3400-4200/Kinetic	CPC14-3	3400	4200	Kinetic	X	X	X	X	X		X	X
L24882-01	CPC14-3/3400-4200/Kinetic	CPC14-3	3400	4200	Kinetic						X		
TOTAL #						25	25	25	25	25	25	5	5

APPENDIX 3.2

CPC14-3 - LABORATORY REPORTS

May 26, 2015

Report to:

Jeffrey Winick
Schlumberger Water Services
1875 Lawrence Street
Suite 500
Denver, CO 80202

Bill to:

Accounts Payable
Adrian Brown Consultants, Inc.
130 W 4th Avenue
Denver, CO 80223

cc: Adrian Brown

Project ID:

ACZ Project ID: L24021

Jeffrey Winick:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on April 09, 2015. This project has been assigned to ACZ's project number, L24021. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L24021. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after June 25, 2015. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed
and approved this report.



Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/440-600/STATIC

ACZ Sample ID: **L24021-01**

Date Sampled: 04/02/15 00:00

Date Received: 04/09/15

Sample Matrix: Soil

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acid Generation Potential (calc on Sulfur total)	M600/2-78-054 3.2.4		9.7			t CaCO3/Kt	0.31	3.1	05/26/15 11:58	calc
Acid Neutralization Potential (calc)	M600/2-78-054 1.3		2.0			t CaCO3/Kt	1	5	05/26/15 11:58	calc
Acid-Base Potential (calc on Sulfur total)	M600/2-78-054 1.3		-7.7			t CaCO3/Kt			05/26/15 11:58	calc
Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR	1		U	*	%	0.1	0.5	05/11/15 17:38	cra
Carbon, total inorganic (TIC)	ASA No. 9 29-2.2.4 (calc TC - TOC)	1		U	*	%	0.1	0.5	05/11/15 17:38	cra
Carbon, total organic (TOC)	ASA No.9 29-2.2.4 Combustion/IR	1		U	*	%	0.1	0.5	05/11/15 17:38	cra
Net Acid Generation Procedure	Single NAG - EGI 2002									
NAG		1	5		*	Kg H2SO4/t	1	1	05/05/15 0:00	brd
pH After Oxidation		1	5.9		*	units	0.1	0.1	05/05/15 0:00	brd
Neutralization Potential as CaCO3	M600/2-78-054 3.2.3	1	0.2	B	*	%	0.1	0.5	05/07/15 13:30	spl
Sulfur Forms	M600/2-78-054 3.2.4-MOD									
Sulfur HCl Residue		1	0.18		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur HNO3 Residue		1	0.07	B	*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Organic Residual		1	0.07	B	*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Pyritic Sulfide		1	0.11		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Sulfate		1	0.13		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Total		1	0.31		*	%	0.01	0.1	05/07/15 0:00	cra
Total Sulfur minus Sulfate		1	0.18		*	%	0.01	0.1	05/07/15 0:00	cra

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				05/05/15 9:30	brd
Crush and Pulverize (Ring & Puck)	EPA-600/2-78-054 3.1.3				*				05/05/15 9:00	brd

Arizona license number: AZ0102

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/600-800/STATIC

ACZ Sample ID: **L24021-02**

Date Sampled: 04/02/15 00:00

Date Received: 04/09/15

Sample Matrix: Soil

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acid Generation Potential (calc on Sulfur total)	M600/2-78-054 3.2.4		17.2			t CaCO3/Kt	0.31	3.1	05/26/15 11:58	calc
Acid Neutralization Potential (calc)	M600/2-78-054 1.3		1.0			t CaCO3/Kt	1	5	05/26/15 11:58	calc
Acid-Base Potential (calc on Sulfur total)	M600/2-78-054 1.3		-16.2			t CaCO3/Kt			05/26/15 11:58	calc
Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR	1		U	*	%	0.1	0.5	05/11/15 22:46	cra
Carbon, total inorganic (TIC)	ASA No. 9 29-2.2.4 (calc TC - TOC)	1		U	*	%	0.1	0.5	05/11/15 22:46	cra
Carbon, total organic (TOC)	ASA No.9 29-2.2.4 Combustion/IR	1		U	*	%	0.1	0.5	05/11/15 22:46	cra
Net Acid Generation Procedure	Single NAG - EGI 2002									
NAG		1	4		*	Kg H2SO4/t	1	1	05/06/15 0:00	brd
pH After Oxidation		1	4.2		*	units	0.1	0.1	05/06/15 0:00	brd
Neutralization Potential as CaCO3	M600/2-78-054 3.2.3	1	0.1	B	*	%	0.1	0.5	05/07/15 14:15	spl
Sulfur Forms	M600/2-78-054 3.2.4-MOD									
Sulfur HCl Residue		1	0.38		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur HNO3 Residue		1	0.13		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Organic Residual		1	0.13		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Pyritic Sulfide		1	0.25		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Sulfate		1	0.17		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Total		1	0.55		*	%	0.01	0.1	05/07/15 0:00	cra
Total Sulfur minus Sulfate		1	0.38		*	%	0.01	0.1	05/07/15 0:00	cra

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				05/05/15 9:45	brd
Crush and Pulverize (Ring & Puck)	EPA-600/2-78-054 3.1.3				*				05/05/15 9:20	brd

Arizona license number: AZ0102

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/800-1000/STATIC

ACZ Sample ID: **L24021-03**

Date Sampled: 04/02/15 00:00

Date Received: 04/09/15

Sample Matrix: Soil

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acid Generation Potential (calc on Sulfur total)	M600/2-78-054 3.2.4		32.8			t CaCO3/Kt	0.31	3.1	05/26/15 11:58	calc
Acid Neutralization Potential (calc)	M600/2-78-054 1.3		0.0			t CaCO3/Kt	1	5	05/26/15 11:58	calc
Acid-Base Potential (calc on Sulfur total)	M600/2-78-054 1.3		-32.8			t CaCO3/Kt			05/26/15 11:58	calc
Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR	1		U	*	%	0.1	0.5	05/12/15 1:20	cra
Carbon, total inorganic (TIC)	ASA No. 9 29-2.2.4 (calc TC - TOC)	1		U	*	%	0.1	0.5	05/12/15 1:20	cra
Carbon, total organic (TOC)	ASA No.9 29-2.2.4 Combustion/IR	1		U	*	%	0.1	0.5	05/12/15 1:20	cra
Net Acid Generation Procedure	Single NAG - EGI 2002									
NAG		1	16		*	Kg H2SO4/t	1	1	05/06/15 0:00	brd
pH After Oxidation		1	2.9		*	units	0.1	0.1	05/06/15 0:00	brd
Neutralization Potential as CaCO3	M600/2-78-054 3.2.3	1		U	*	%	0.1	0.5	05/07/15 15:00	spl
Sulfur Forms	M600/2-78-054 3.2.4-MOD									
Sulfur HCl Residue		1	0.87		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur HNO3 Residue		1	0.23		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Organic Residual		1	0.23		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Pyritic Sulfide		1	0.64		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Sulfate		1	0.18		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Total		1	1.05		*	%	0.01	0.1	05/07/15 0:00	cra
Total Sulfur minus Sulfate		1	0.87		*	%	0.01	0.1	05/07/15 0:00	cra

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				05/05/15 10:00	brd
Crush and Pulverize (Ring & Puck)	EPA-600/2-78-054 3.1.3				*				05/05/15 9:40	brd

Arizona license number: AZ0102

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/1000-1200/STATIC

ACZ Sample ID: **L24021-04**

Date Sampled: 04/07/15 00:00

Date Received: 04/09/15

Sample Matrix: Soil

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acid Generation Potential (calc on Sulfur total)	M600/2-78-054 3.2.4		115			t CaCO3/Kt	0.31	3.1	05/26/15 11:58	calc
Acid Neutralization Potential (calc)	M600/2-78-054 1.3		0.0			t CaCO3/Kt	1	5	05/26/15 11:58	calc
Acid-Base Potential (calc on Sulfur total)	M600/2-78-054 1.3		-115			t CaCO3/Kt			05/26/15 11:58	calc
Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR	1		U	*	%	0.1	0.5	05/12/15 3:54	cra
Carbon, total inorganic (TIC)	ASA No. 9 29-2.2.4 (calc TC - TOC)	1		U	*	%	0.1	0.5	05/12/15 3:54	cra
Carbon, total organic (TOC)	ASA No.9 29-2.2.4 Combustion/IR	1		U	*	%	0.1	0.5	05/12/15 3:54	cra
Net Acid Generation Procedure	Single NAG - EGI 2002									
NAG		1	71		*	Kg H2SO4/t	1	1	05/06/15 0:00	brd
pH After Oxidation		1	2.3		*	units	0.1	0.1	05/06/15 0:00	brd
Neutralization Potential as CaCO3	M600/2-78-054 3.2.3	1		U	*	%	0.1	0.5	05/07/15 15:22	spl
Sulfur Forms	M600/2-78-054 3.2.4-MOD									
Sulfur HCl Residue		1	3.64		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur HNO3 Residue		1	0.11		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Organic Residual		1	0.11		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Pyritic Sulfide		1	3.53		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Sulfate		1	0.04	B	*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Total		1	3.68		*	%	0.01	0.1	05/07/15 0:00	cra
Total Sulfur minus Sulfate		1	3.64		*	%	0.01	0.1	05/07/15 0:00	cra

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				05/05/15 10:15	brd
Crush and Pulverize (Ring & Puck)	EPA-600/2-78-054 3.1.3				*				05/05/15 10:00	brd

Arizona license number: AZ0102

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/1200-1400/STATIC

ACZ Sample ID: **L24021-05**

Date Sampled: 04/07/15 00:00

Date Received: 04/09/15

Sample Matrix: Soil

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acid Generation Potential (calc on Sulfur total)	M600/2-78-054 3.2.4		175			t CaCO3/Kt	0.31	3.1	05/26/15 11:58	calc
Acid Neutralization Potential (calc)	M600/2-78-054 1.3		2.0			t CaCO3/Kt	1	5	05/26/15 11:58	calc
Acid-Base Potential (calc on Sulfur total)	M600/2-78-054 1.3		-173			t CaCO3/Kt			05/26/15 11:58	calc
Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR	1		U	*	%	0.1	0.5	05/12/15 6:28	cra
Carbon, total inorganic (TIC)	ASA No. 9 29-2.2.4 (calc TC - TOC)	1		U	*	%	0.1	0.5	05/12/15 6:28	cra
Carbon, total organic (TOC)	ASA No.9 29-2.2.4 Combustion/IR	1		U	*	%	0.1	0.5	05/12/15 6:28	cra
Net Acid Generation Procedure	Single NAG - EGI 2002									
NAG		1	93		*	Kg H2SO4/t	1	1	05/06/15 0:00	brd
pH After Oxidation		1	2.2		*	units	0.1	0.1	05/06/15 0:00	brd
Neutralization Potential as CaCO3	M600/2-78-054 3.2.3	1	0.2	B	*	%	0.1	0.5	05/07/15 15:45	spl
Sulfur Forms	M600/2-78-054 3.2.4-MOD									
Sulfur HCl Residue		1	5.30		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur HNO3 Residue		1	0.06	B	*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Organic Residual		1	0.06	B	*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Pyritic Sulfide		1	5.24		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Sulfate		1	0.29		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Total		1	5.59		*	%	0.01	0.1	05/07/15 0:00	cra
Total Sulfur minus Sulfate		1	5.30		*	%	0.01	0.1	05/07/15 0:00	cra

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				05/05/15 10:30	brd
Crush and Pulverize (Ring & Puck)	EPA-600/2-78-054 3.1.3				*				05/05/15 10:20	brd

Arizona license number: AZ0102

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/1400-1600/STATIC

ACZ Sample ID: **L24021-06**

Date Sampled: 04/07/15 00:00

Date Received: 04/09/15

Sample Matrix: Soil

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acid Generation Potential (calc on Sulfur total)	M600/2-78-054 3.2.4		116			t CaCO3/Kt	0.31	3.1	05/26/15 11:59	calc
Acid Neutralization Potential (calc)	M600/2-78-054 1.3		10.0			t CaCO3/Kt	1	5	05/26/15 11:59	calc
Acid-Base Potential (calc on Sulfur total)	M600/2-78-054 1.3		-106			t CaCO3/Kt			05/26/15 11:59	calc
Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR	1	0.1	B	*	%	0.1	0.5	05/12/15 9:02	cra
Carbon, total inorganic (TIC)	ASA No. 9 29-2.2.4 (calc TC - TOC)	1	0.1	B	*	%	0.1	0.5	05/12/15 9:02	cra
Carbon, total organic (TOC)	ASA No.9 29-2.2.4 Combustion/IR	1		U	*	%	0.1	0.5	05/12/15 9:02	cra
Net Acid Generation Procedure	Single NAG - EGI 2002									
NAG		1	82		*	Kg H2SO4/t	1	1	05/07/15 0:00	brd
pH After Oxidation		1	2.2		*	units	0.1	0.1	05/07/15 0:00	brd
Neutralization Potential as CaCO3	M600/2-78-054 3.2.3	1	1		*	%	0.1	0.5	05/07/15 16:07	spl
Sulfur Forms	M600/2-78-054 3.2.4-MOD									
Sulfur HCl Residue		1	3.58		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur HNO3 Residue		1	0.01	B	*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Organic Residual		1	0.01	B	*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Pyritic Sulfide		1	3.57		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Sulfate		1	0.14		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Total		1	3.72		*	%	0.01	0.1	05/07/15 0:00	cra
Total Sulfur minus Sulfate		1	3.58		*	%	0.01	0.1	05/07/15 0:00	cra

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				05/05/15 10:45	brd
Crush and Pulverize (Ring & Puck)	EPA-600/2-78-054 3.1.3				*				05/05/15 10:40	brd

Arizona license number: AZ0102

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/1600-1800/STATIC

ACZ Sample ID: **L24021-07**

Date Sampled: 04/07/15 00:00

Date Received: 04/09/15

Sample Matrix: Soil

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acid Generation Potential (calc on Sulfur total)	M600/2-78-054 3.2.4		107			t CaCO3/Kt	0.31	3.1	05/26/15 11:59	calc
Acid Neutralization Potential (calc)	M600/2-78-054 1.3		9.0			t CaCO3/Kt	1	5	05/26/15 11:59	calc
Acid-Base Potential (calc on Sulfur total)	M600/2-78-054 1.3		-97.6			t CaCO3/Kt			05/26/15 11:59	calc
Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR	1		U	*	%	0.1	0.5	05/12/15 11:36	cra
Carbon, total inorganic (TIC)	ASA No. 9 29-2.2.4 (calc TC - TOC)	1		U	*	%	0.1	0.5	05/12/15 11:36	cra
Carbon, total organic (TOC)	ASA No.9 29-2.2.4 Combustion/IR	1		U	*	%	0.1	0.5	05/12/15 11:36	cra
Net Acid Generation Procedure	Single NAG - EGI 2002									
NAG		1	76		*	Kg H2SO4/t	1	1	05/07/15 0:00	brd
pH After Oxidation		1	2.3		*	units	0.1	0.1	05/07/15 0:00	brd
Neutralization Potential as CaCO3	M600/2-78-054 3.2.3	1	0.9		*	%	0.1	0.5	05/07/15 16:52	spl
Sulfur Forms	M600/2-78-054 3.2.4-MOD									
Sulfur HCl Residue		1	3.18		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur HNO3 Residue		1	0.01	B	*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Organic Residual		1	0.01	B	*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Pyritic Sulfide		1	3.17		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Sulfate		1	0.23		*	%	0.01	0.1	05/07/15 0:00	cra
Sulfur Total		1	3.41		*	%	0.01	0.1	05/07/15 0:00	cra
Total Sulfur minus Sulfate		1	3.18		*	%	0.01	0.1	05/07/15 0:00	cra

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				05/05/15 11:00	brd
Crush and Pulverize (Ring & Puck)	EPA-600/2-78-054 3.1.3				*				05/05/15 11:00	brd

Arizona license number: AZ0102


Report Header Explanations

<i>Batch</i>	A distinct set of samples analyzed at a specific time
<i>Found</i>	Value of the QC Type of interest
<i>Limit</i>	Upper limit for RPD, in %.
<i>Lower</i>	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
<i>MDL</i>	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #5). Allows for instrument and annual fluctuations.
<i>PCN/SCN</i>	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
<i>PQL</i>	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
<i>QC</i>	True Value of the Control Sample or the amount added to the Spike
<i>Rec</i>	Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg)
<i>RPD</i>	Relative Percent Difference, calculation used for Duplicate QC Types
<i>Upper</i>	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
<i>Sample</i>	Value of the Sample of interest

QC Sample Types

<i>AS</i>	Analytical Spike (Post Digestion)	<i>LCSWD</i>	Laboratory Control Sample - Water Duplicate
<i>ASD</i>	Analytical Spike (Post Digestion) Duplicate	<i>LFB</i>	Laboratory Fortified Blank
<i>CCB</i>	Continuing Calibration Blank	<i>LFM</i>	Laboratory Fortified Matrix
<i>CCV</i>	Continuing Calibration Verification standard	<i>LFMD</i>	Laboratory Fortified Matrix Duplicate
<i>DUP</i>	Sample Duplicate	<i>LRB</i>	Laboratory Reagent Blank
<i>ICB</i>	Initial Calibration Blank	<i>MS</i>	Matrix Spike
<i>ICV</i>	Initial Calibration Verification standard	<i>MSD</i>	Matrix Spike Duplicate
<i>ICSAB</i>	Inter-element Correction Standard - A plus B solutions	<i>PBS</i>	Prep Blank - Soil
<i>LCSS</i>	Laboratory Control Sample - Soil	<i>PBW</i>	Prep Blank - Water
<i>LCSSD</i>	Laboratory Control Sample - Soil Duplicate	<i>PQV</i>	Practical Quantitation Verification standard
<i>LCSW</i>	Laboratory Control Sample - Water	<i>SDL</i>	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
L	Target analyte response was below the laboratory defined negative threshold.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

Method References

(1)	EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2)	EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3)	EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(4)	EPA SW-846. Test Methods for Evaluating Solid Waste.
(5)	Standard Methods for the Examination of Water and Wastewater.

Comments

(1)	QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2)	Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3)	Animal matrices for Inorganic analyses are reported on an "as received" basis.
(4)	An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
(5)	If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24021**

Carbon, total (TC)

ASA No.9 29-2.2.4 Combustion/IR

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383262													
WG383262PBS	PBS	05/11/15 12:30				U	%		-0.3	0.3			
WG383262LCSS	LCSS	05/11/15 15:04	PCN42342	4.19		4.2	%		80	120			
L24021-01DUP	DUP	05/11/15 20:12			U	U	%				0	20	RA

Carbon, total inorganic (TIC)

ASA No. 9 29-2.2.4 (calc TC - TOC)

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383262													
WG383262PBS	PBS	05/11/15 12:30				U	%		-0.3	0.3			
L24021-01DUP	DUP	05/11/15 20:12			U	U	%				0	20	RA

Carbon, total organic (TOC)

ASA No.9 29-2.2.4 Combustion/IR

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383262													
WG383262PBS	PBS	05/11/15 12:30				U	%		-0.3	0.3			
L24021-01DUP	DUP	05/11/15 20:12			U	U	%				0	20	RA ZQ

Net Acid Generation

Single NAG - EGI 2002

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383003													
L24021-01DUP	DUP	05/05/15 16:34			5	5.1	g H ₂ SO ₄ /				2	20	

Neutralization Potential as CaCO₃

M600/2-78-054 3.2.3

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383126													
WG383126PBS	PBS	05/07/15 12:45				U	%		-0.2	0.2			
WG383126LCSS	LCSS	05/07/15 13:07	PCN47543	4.96		4.98	%	100	80	120			
L24021-01DUP	DUP	05/07/15 13:52			.2	.2	%				0	20	RA
L24021-02MS	MS	05/07/15 14:37	SI141024-1	1	.1	1.15	%	105	70	130			

Sulfur Organic Residual

M600/2-78-054 3.2.4-MOD

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383076													
L24021-01DUP	DUP	05/07/15 9:00			.07	.08	%				13	20	RA

Sulfur Pyritic Sulfide

M600/2-78-054 3.2.4-MOD

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383076													
L24021-01DUP	DUP	05/07/15 9:00			.11	.1	%				10	20	

Sulfur Sulfate

M600/2-78-054 3.2.4-MOD

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383076													
L24021-01DUP	DUP	05/07/15 9:00			.13	.14	%				7	20	

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24021**

Sulfur Total

M600/2-78-054 3.2.4-MOD

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383076													
L24021-01DUP	DUP	05/07/15 9:00			.31	.32	%				3	20	
L24021-01MS	MS	05/07/15 9:00	PCN47988	1.1	.31	1.37	%	96	80	120			
WG383076LCSS	LCSS	05/07/15 9:00	PCN42342	4.07		4.27	%	105	80	120			
WG383076PBS	PBS	05/07/15 9:00				U	%		-0.03	0.03			

Total Sulfur Minus Sulfate

M600/2-78-054 3.2.4-MOD

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383076													
L24021-01DUP	DUP	05/07/15 9:00			.18	.18	%				0	20	

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24021**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L24021-01	WG383262	Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR	Q6	Sample was received above recommended temperature.
			ASA No.9 29-2.2.4 Combustion/IR	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
		Carbon, total inorganic (TIC)	ASA No. 9 29-2.2.4 (calc TC - TOC)	Q6	Sample was received above recommended temperature.
			ASA No. 9 29-2.2.4 (calc TC - TOC)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
			ASA No. 9 29-2.2.4 (calc TC - TOC)	ZQ	Analyte was not evaluated in the laboratory control standard. Either the analyte is not included in the scope of the analytical method or a commercial standard containing the analyte is not available.
		Carbon, total organic (TOC)	ASA No.9 29-2.2.4 Combustion/IR	Q6	Sample was received above recommended temperature.
	ASA No.9 29-2.2.4 Combustion/IR		RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).	
	WG383126	Neutralization Potential as CaCO3	M600/2-78-054 3.2.3	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG383076	Sulfur Organic Residual	M600/2-78-054 3.2.4-MOD	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	L24021-02	WG383262	Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR	Q6
ASA No.9 29-2.2.4 Combustion/IR				RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
Carbon, total inorganic (TIC)			ASA No. 9 29-2.2.4 (calc TC - TOC)	Q6	Sample was received above recommended temperature.
			ASA No. 9 29-2.2.4 (calc TC - TOC)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
			ASA No. 9 29-2.2.4 (calc TC - TOC)	ZQ	Analyte was not evaluated in the laboratory control standard. Either the analyte is not included in the scope of the analytical method or a commercial standard containing the analyte is not available.
Carbon, total organic (TOC)			ASA No.9 29-2.2.4 Combustion/IR	Q6	Sample was received above recommended temperature.
		ASA No.9 29-2.2.4 Combustion/IR	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).	
			ASA No.9 29-2.2.4 Combustion/IR	ZQ	Analyte was not evaluated in the laboratory control standard. Either the analyte is not included in the scope of the analytical method or a commercial standard containing the analyte is not available.
WG383126		Neutralization Potential as CaCO3	M600/2-78-054 3.2.3	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
WG383076		Sulfur Organic Residual	M600/2-78-054 3.2.4-MOD	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24021**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L24021-03	WG383262	Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR	Q6	Sample was received above recommended temperature.
			ASA No.9 29-2.2.4 Combustion/IR	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
		Carbon, total inorganic (TIC)	ASA No. 9 29-2.2.4 (calc TC - TOC)	Q6	Sample was received above recommended temperature.
	ASA No. 9 29-2.2.4 (calc TC - TOC)		RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).	
	ASA No. 9 29-2.2.4 (calc TC - TOC)		ZQ	Analyte was not evaluated in the laboratory control standard. Either the analyte is not included in the scope of the analytical method or a commercial standard containing the analyte is not available.	
	Carbon, total organic (TOC)	ASA No.9 29-2.2.4 Combustion/IR	Q6	Sample was received above recommended temperature.	
		ASA No.9 29-2.2.4 Combustion/IR	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).	
		ASA No.9 29-2.2.4 Combustion/IR	ZQ	Analyte was not evaluated in the laboratory control standard. Either the analyte is not included in the scope of the analytical method or a commercial standard containing the analyte is not available.	
	WG383126	Neutralization Potential as CaCO3	M600/2-78-054 3.2.3	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG383076	Sulfur Organic Residual	M600/2-78-054 3.2.4-MOD	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L24021-04	WG383262	Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR	Q6	Sample was received above recommended temperature.
			ASA No.9 29-2.2.4 Combustion/IR	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
		Carbon, total inorganic (TIC)	ASA No. 9 29-2.2.4 (calc TC - TOC)	Q6	Sample was received above recommended temperature.
	ASA No. 9 29-2.2.4 (calc TC - TOC)		RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).	
	ASA No. 9 29-2.2.4 (calc TC - TOC)		ZQ	Analyte was not evaluated in the laboratory control standard. Either the analyte is not included in the scope of the analytical method or a commercial standard containing the analyte is not available.	
	Carbon, total organic (TOC)	ASA No.9 29-2.2.4 Combustion/IR	Q6	Sample was received above recommended temperature.	
		ASA No.9 29-2.2.4 Combustion/IR	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).	
		ASA No.9 29-2.2.4 Combustion/IR	ZQ	Analyte was not evaluated in the laboratory control standard. Either the analyte is not included in the scope of the analytical method or a commercial standard containing the analyte is not available.	
	WG383126	Neutralization Potential as CaCO3	M600/2-78-054 3.2.3	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG383076	Sulfur Organic Residual	M600/2-78-054 3.2.4-MOD	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24021**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L24021-05	WG383262	Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR	Q6	Sample was received above recommended temperature.
			ASA No.9 29-2.2.4 Combustion/IR	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
		Carbon, total inorganic (TIC)	ASA No. 9 29-2.2.4 (calc TC - TOC)	Q6	Sample was received above recommended temperature.
			ASA No. 9 29-2.2.4 (calc TC - TOC)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
			ASA No. 9 29-2.2.4 (calc TC - TOC)	ZQ	Analyte was not evaluated in the laboratory control standard. Either the analyte is not included in the scope of the analytical method or a commercial standard containing the analyte is not available.
		Carbon, total organic (TOC)	ASA No.9 29-2.2.4 Combustion/IR	Q6	Sample was received above recommended temperature.
			ASA No.9 29-2.2.4 Combustion/IR	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
			ASA No.9 29-2.2.4 Combustion/IR	ZQ	Analyte was not evaluated in the laboratory control standard. Either the analyte is not included in the scope of the analytical method or a commercial standard containing the analyte is not available.
	WG383126	Neutralization Potential as CaCO ₃	M600/2-78-054 3.2.3	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG383076	Sulfur Organic Residual	M600/2-78-054 3.2.4-MOD	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L24021-06	WG383262	Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR	Q6	Sample was received above recommended temperature.
			ASA No.9 29-2.2.4 Combustion/IR	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
		Carbon, total inorganic (TIC)	ASA No. 9 29-2.2.4 (calc TC - TOC)	Q6	Sample was received above recommended temperature.
			ASA No. 9 29-2.2.4 (calc TC - TOC)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
			ASA No. 9 29-2.2.4 (calc TC - TOC)	ZQ	Analyte was not evaluated in the laboratory control standard. Either the analyte is not included in the scope of the analytical method or a commercial standard containing the analyte is not available.
		Carbon, total organic (TOC)	ASA No.9 29-2.2.4 Combustion/IR	Q6	Sample was received above recommended temperature.
			ASA No.9 29-2.2.4 Combustion/IR	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
			ASA No.9 29-2.2.4 Combustion/IR	ZQ	Analyte was not evaluated in the laboratory control standard. Either the analyte is not included in the scope of the analytical method or a commercial standard containing the analyte is not available.
	WG383126	Neutralization Potential as CaCO ₃	M600/2-78-054 3.2.3	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG383076	Sulfur Organic Residual	M600/2-78-054 3.2.4-MOD	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24021**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L24021-07	WG383262	Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR	Q6	Sample was received above recommended temperature.
			ASA No.9 29-2.2.4 Combustion/IR	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	Carbon, total inorganic (TIC)		ASA No. 9 29-2.2.4 (calc TC - TOC)	Q6	Sample was received above recommended temperature.
			ASA No. 9 29-2.2.4 (calc TC - TOC)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
			ASA No. 9 29-2.2.4 (calc TC - TOC)	ZQ	Analyte was not evaluated in the laboratory control standard. Either the analyte is not included in the scope of the analytical method or a commercial standard containing the analyte is not available.
	Carbon, total organic (TOC)		ASA No.9 29-2.2.4 Combustion/IR	Q6	Sample was received above recommended temperature.
			ASA No.9 29-2.2.4 Combustion/IR	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
			ASA No.9 29-2.2.4 Combustion/IR	ZQ	Analyte was not evaluated in the laboratory control standard. Either the analyte is not included in the scope of the analytical method or a commercial standard containing the analyte is not available.
	WG383126	Neutralization Potential as CaCO ₃	M600/2-78-054 3.2.3	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG383076	Sulfur Organic Residual	M600/2-78-054 3.2.4-MOD	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24021**

Soil Analysis

The following parameters are not offered for certification or are not covered by AZ certificate #AZ0102.

Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR
Carbon, total inorganic (TIC)	ASA No. 9 29-2.2.4 (calc TC - TOC)
Carbon, total organic (TOC)	ASA No.9 29-2.2.4 Combustion/IR
NAG	Single NAG - EGI 2002
Neutralization Potential as CaCO ₃	M600/2-78-054 3.2.3
pH After Oxidation	Single NAG - EGI 2002
Sulfur HCl Residue	M600/2-78-054 3.2.4-MOD
Sulfur HNO ₃ Residue	M600/2-78-054 3.2.4-MOD
Sulfur Organic Residual	M600/2-78-054 3.2.4-MOD
Sulfur Pyritic Sulfide	M600/2-78-054 3.2.4-MOD
Sulfur Sulfate	M600/2-78-054 3.2.4-MOD
Sulfur Total	M600/2-78-054 3.2.4-MOD
Total Sulfur minus Sulfate	M600/2-78-054 3.2.4-MOD

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR
Carbon, total inorganic (TIC)	ASA No. 9 29-2.2.4 (calc TC - TOC)
Carbon, total organic (TOC)	ASA No.9 29-2.2.4 Combustion/IR
NAG	Single NAG - EGI 2002
Neutralization Potential as CaCO ₃	M600/2-78-054 3.2.3
pH After Oxidation	Single NAG - EGI 2002
Sulfur HCl Residue	M600/2-78-054 3.2.4-MOD
Sulfur HNO ₃ Residue	M600/2-78-054 3.2.4-MOD
Sulfur Organic Residual	M600/2-78-054 3.2.4-MOD
Sulfur Pyritic Sulfide	M600/2-78-054 3.2.4-MOD
Sulfur Sulfate	M600/2-78-054 3.2.4-MOD
Sulfur Total	M600/2-78-054 3.2.4-MOD
Total Sulfur minus Sulfate	M600/2-78-054 3.2.4-MOD

Adrian Brown Consultants, Inc.

ACZ Project ID: L24021

Date Received: 04/09/2015 09:52

Received By: ear

Date Printed: 4/29/2015

Receipt Verification

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?	☐	☐	☒
2) Is the Chain of Custody or other directive shipping papers present?	☒	☐	☐
3) Does this project require special handling procedures such as CLP protocol?	☐	☐	☒
4) Are any samples NRC licensable material?	☐	☐	☒
5) If samples are received past hold time, proceed with requested short hold time analyses?	☒	☐	☐
6) Is the Chain of Custody complete and accurate?	☒	☐	☐
7) Were any changes made to the Chain of Custody prior to ACZ receiving the samples?	☐	☒	☐

Samples/Containers

	YES	NO	NA
8) Are all containers intact and with no leaks?	☒	☐	☐
9) Are all labels on containers and are they intact and legible?	☒	☐	☐
10) Do the sample labels and Chain of Custody match for Sample ID, Date, and Time?	☒	☐	☐
11) For preserved bottle types, was the pH checked and within limits? ¹	☐	☐	☒
12) Is there sufficient sample volume to perform all requested work?	☒	☐	☐
13) Is the custody seal intact on all containers?	☐	☐	☒
14) Are samples that require zero headspace acceptable?	☐	☐	☒
15) Are all sample containers appropriate for analytical requirements?	☒	☐	☐
16) Is there an Hg-1631 trip blank present?	☐	☐	☒
17) Is there a VOA trip blank present?	☐	☐	☒
18) Were all samples received within hold time?	☒	☐	☐

Chain of Custody Related Remarks

The 'Relinquished By' field on the COC was not completed. The project manager is contacting the client.

Client Contact Remarks

Shipping Containers

Cooler Id	Temp (°C)	Rad (µR/Hr)	Custody Seal Intact?
-----	-----	-----	-----
NA21575	14.6	20	N/A
NA21577	15.6	17	N/A

Was ice present in the shipment container(s)?

No - Wet or gel ice was not present in the shipment container(s).

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

Adrian Brown Consultants, Inc.

ACZ Project ID: L24021

Date Received: 04/09/2015 09:52

Received By: ear

Date Printed: 4/29/2015

¹ The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na₂S₂O₃ preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).



Laboratories, Inc. *L24021*

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

CHAIN of CUSTODY

Report to:

Name: JEFFREY WINICK

Company: SCHLUMBERGER WATER SERV.

E-mail: JWINICK@SLB.COM

Address: 1875 LAWRENCE STREET, SUITE 500

DENVER, CO 80215

Telephone: +1.303.244.8224

Copy of Report to:

Name: ADRIAN BROWN

Company: ADRIAN BROWN CONSULTANTS

E-mail: abrown@abch2o.com

Telephone: (303) 698-9080

Invoice to:

Name: ADRIAN BROWN

Company: ADRIAN BROWN CONSULTANTS

E-mail: lbrown@abch2o.com

Address: 130 W 4th Ave

Denver CO USA 80223

Telephone: (303) 698-9080

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?

YES

NO

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO"

is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

Are samples for CO DW Compliance Monitoring?

YES

NO

If yes, please include state forms. Results will be reported to PQL.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: CO HYDROGEOCHEMICAL STUDY

Project/PO #:

Reporting state for compliance testing:

Sampler's Name: Beverly Furfaro/ALS

Are any samples NRC licensable material? Yes No

SAMPLE IDENTIFICATION	DATE/TIME	Matrix	# of Containers	Total Metals	NAP (ABA)	NAG	NAG Lend Lease Metals	Total Carbon Leach	TDC Combustion IR	ABA Sulfur forms	Grain Size	HCT
1. CPC14-3/440-600/Static	2-Apr-15	SO	1kg	X	X	X	X	X	X	X		
2. CPC14-3/600-800/Static	2-Apr-15	SO	1kg	X	X	X	X	X	X	X		
3. CPC14-3/800-1000/Static	2-Apr-15	SO	1kg	X	X	X	X	X	X	X		
4. CPC14-3/1000-1200/Static	7-Apr-15	SO	1kg	X	X	X	X	X	X	X		
5. CPC14-3/1200-1400/Static	7-Apr-15	SO	1kg	X	X	X	X	X	X	X		
6. CPC14-3/1400-1600/Static	7-Apr-15	SO	1kg	X	X	X	X	X	X	X		
7. CPC14-3/1600-1800/Static	7-Apr-15	SO	1kg	X	X	X	X	X	X	X		
CPC14-3/1000-1800/Kinetic	7-Apr-15	SO	9kg	X	X	X	X	X	X	X	X	X
CPC14-3/440-1000/Kinetic	2-Apr-15	SO	9kg	X	X	X	X	X	X	X	X	X

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

Prior to ACZ analysis per quote and COC, from each static pulp comp., pls prepare 200g representative riffle split sample for each static composite for XRD. For each <1/4" kinetic comp., pls split 500g representative material. This should then be sub-split into 2, equal 250g split samples (1 sample for isotopes and 1 for mineral separations). Sample splits will be shipped to laboratories as designated by Jeff Winick. Please contact 303.244.8224 for further instruction.

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:

DATE/TIME

RECEIVED BY:

DATE/TIME

WPL

4-8-15 0950
4-9-15 0950

FRMAD050.01.15.09

White - Return with sample.

Yellow - Retain for your records.

May 26, 2015

Report to:

Jeffrey Winick
Schlumberger Water Services
1875 Lawrence Street
Suite 500
Denver, CO 80202

Bill to:

Accounts Payable
Adrian Brown Consultants, Inc.
130 W 4th Avenue
Denver, CO 80223

cc: Adrian Brown

Project ID:

ACZ Project ID: L24139

Jeffrey Winick:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on April 03, 2015. This project has been assigned to ACZ's project number, L24139. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L24139. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after June 25, 2015. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed
and approved this report.



Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/1000-1800/KINETIC

ACZ Sample ID: **L24139-01**

Date Sampled: 04/07/15 00:00

Date Received: 04/03/15

Sample Matrix: Soil

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acid Generation Potential (calc on Sulfur total)	M600/2-78-054 3.2.4		142			t CaCO3/Kt	0.31	3.1	05/26/15 12:03	calc
Acid Neutralization Potential (calc)	M600/2-78-054 1.3		5.0			t CaCO3/Kt	1	5	05/26/15 12:03	calc
Acid-Base Potential (calc on Sulfur total)	M600/2-78-054 1.3		-137			t CaCO3/Kt			05/26/15 12:03	calc
Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR	1		U	*	%	0.1	0.5	05/12/15 14:10	cra
Carbon, total inorganic (TIC)	ASA No. 9 29-2.2.4 (calc TC - TOC)	1		U	*	%	0.1	0.5	05/12/15 14:10	cra
Carbon, total organic (TOC)	ASA No.9 29-2.2.4 Combustion/IR	1		U	*	%	0.1	0.5	05/12/15 14:10	cra
Net Acid Generation Procedure	Single NAG - EGI 2002									
NAG		1	63		*	Kg H2SO4/t	1	1	05/18/15 0:00	brd
pH After Oxidation		1	2.5		*	units	0.1	0.1	05/18/15 0:00	brd
Neutralization Potential as CaCO3	M600/2-78-054 3.2.3	1	0.5		*	%	0.1	0.5	05/13/15 11:36	spl
Sulfur Forms	M600/2-78-054 3.2.4-MOD									
Sulfur HCl Residue		1	4.50		*	%	0.01	0.1	05/12/15 0:00	cra
Sulfur HNO3 Residue		1	0.14		*	%	0.01	0.1	05/12/15 0:00	cra
Sulfur Organic Residual		1	0.14		*	%	0.01	0.1	05/12/15 0:00	cra
Sulfur Pyritic Sulfide		1	4.36		*	%	0.01	0.1	05/12/15 0:00	cra
Sulfur Sulfate		1	0.05	B	*	%	0.01	0.1	05/12/15 0:00	cra
Sulfur Total		1	4.55		*	%	0.01	0.1	05/12/15 0:00	cra
Total Sulfur minus Sulfate		1	4.50		*	%	0.01	0.1	05/12/15 0:00	cra

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				05/08/15 16:00	pta/brd
Crush and Pulverize (Ring & Puck)	EPA-600/2-78-054 3.1.3				*				05/08/15 16:00	brd

Arizona license number: AZ0102



Report Header Explanations

<i>Batch</i>	A distinct set of samples analyzed at a specific time
<i>Found</i>	Value of the QC Type of interest
<i>Limit</i>	Upper limit for RPD, in %.
<i>Lower</i>	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
<i>MDL</i>	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #5). Allows for instrument and annual fluctuations.
<i>PCN/SCN</i>	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
<i>PQL</i>	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
<i>QC</i>	True Value of the Control Sample or the amount added to the Spike
<i>Rec</i>	Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg)
<i>RPD</i>	Relative Percent Difference, calculation used for Duplicate QC Types
<i>Upper</i>	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
<i>Sample</i>	Value of the Sample of interest

QC Sample Types

<i>AS</i>	Analytical Spike (Post Digestion)	<i>LCSWD</i>	Laboratory Control Sample - Water Duplicate
<i>ASD</i>	Analytical Spike (Post Digestion) Duplicate	<i>LFB</i>	Laboratory Fortified Blank
<i>CCB</i>	Continuing Calibration Blank	<i>LFM</i>	Laboratory Fortified Matrix
<i>CCV</i>	Continuing Calibration Verification standard	<i>LFMD</i>	Laboratory Fortified Matrix Duplicate
<i>DUP</i>	Sample Duplicate	<i>LRB</i>	Laboratory Reagent Blank
<i>ICB</i>	Initial Calibration Blank	<i>MS</i>	Matrix Spike
<i>ICV</i>	Initial Calibration Verification standard	<i>MSD</i>	Matrix Spike Duplicate
<i>ICSAB</i>	Inter-element Correction Standard - A plus B solutions	<i>PBS</i>	Prep Blank - Soil
<i>LCSS</i>	Laboratory Control Sample - Soil	<i>PBW</i>	Prep Blank - Water
<i>LCSSD</i>	Laboratory Control Sample - Soil Duplicate	<i>PQV</i>	Practical Quantitation Verification standard
<i>LCSW</i>	Laboratory Control Sample - Water	<i>SDL</i>	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
L	Target analyte response was below the laboratory defined negative threshold.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

Method References

(1)	EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2)	EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3)	EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(4)	EPA SW-846. Test Methods for Evaluating Solid Waste.
(5)	Standard Methods for the Examination of Water and Wastewater.

Comments

(1)	QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2)	Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3)	Animal matrices for Inorganic analyses are reported on an "as received" basis.
(4)	An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
(5)	If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24139**

Carbon, total (TC)

ASA No.9 29-2.2.4 Combustion/IR

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383262													
WG383262PBS	PBS	05/11/15 12:30				U	%		-0.3	0.3			
WG383262LCSS	LCSS	05/11/15 15:04	PCN42342	4.19		4.2	%		80	120			
L24021-01DUP	DUP	05/11/15 20:12			U	U	%				0	20	RA

Carbon, total inorganic (TIC)

ASA No. 9 29-2.2.4 (calc TC - TOC)

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383262													
WG383262PBS	PBS	05/11/15 12:30				U	%		-0.3	0.3			
L24021-01DUP	DUP	05/11/15 20:12			U	U	%				0	20	RA

Carbon, total organic (TOC)

ASA No.9 29-2.2.4 Combustion/IR

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383262													
WG383262PBS	PBS	05/11/15 12:30				U	%		-0.3	0.3			
L24021-01DUP	DUP	05/11/15 20:12			U	U	%				0	20	RA ZQ

Net Acid Generation

Single NAG - EGI 2002

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383628													
L24121-01DUP	DUP	05/18/15 11:00			U	U	g H ₂ SO ₄ /				0	20	RA

Neutralization Potential as CaCO₃

M600/2-78-054 3.2.3

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383358													
WG383358PBS	PBS	05/13/15 10:24				U	%		-0.2	0.2			
WG383358LCSS	LCSS	05/13/15 11:00	PCN47543	4.96		5	%	101	80	120			
L24139-01DUP	DUP	05/13/15 12:12			.5	.45	%				11	20	RA
L24140-01MS	MS	05/13/15 13:24	SI141024-1	1	.2	1.13	%	93	70	130			

Sulfur Organic Residual

M600/2-78-054 3.2.4-MOD

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383299													
L24139-01DUP	DUP	05/12/15 10:00			.14	.14	%				0	20	

Sulfur Pyritic Sulfide

M600/2-78-054 3.2.4-MOD

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383299													
L24139-01DUP	DUP	05/12/15 10:00			4.36	4.11	%				6	20	

Sulfur Sulfate

M600/2-78-054 3.2.4-MOD

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383299													
L24139-01DUP	DUP	05/12/15 10:00			.05	.33	%				147	20	RA

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24139**

Sulfur Total

M600/2-78-054 3.2.4-MOD

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383299													
L24139-01DUP	DUP	05/12/15 10:00			4.55	4.58	%				1	20	
L24139-01MS	MS	05/12/15 10:00	PCN47988	1.1	4.55	5.94	%	126	80	120			M1
WG383299LCSS	LCSS	05/12/15 10:00	PCN42342	4.07		4.38	%	108	80	120			
WG383299PBS	PBS	05/12/15 10:00				U	%		-0.03	0.03			

Total Sulfur Minus Sulfate

M600/2-78-054 3.2.4-MOD

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383299													
L24139-01DUP	DUP	05/12/15 10:00			4.5	4.25	%				6	20	

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24139**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L24139-01	WG383262	Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR	Q6	Sample was received above recommended temperature.
			ASA No.9 29-2.2.4 Combustion/IR	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
		Carbon, total inorganic (TIC)	ASA No. 9 29-2.2.4 (calc TC - TOC)	Q6	Sample was received above recommended temperature.
			ASA No. 9 29-2.2.4 (calc TC - TOC)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
			ASA No. 9 29-2.2.4 (calc TC - TOC)	ZQ	Analyte was not evaluated in the laboratory control standard. Either the analyte is not included in the scope of the analytical method or a commercial standard containing the analyte is not available.
		Carbon, total organic (TOC)	ASA No.9 29-2.2.4 Combustion/IR	Q6	Sample was received above recommended temperature.
			ASA No.9 29-2.2.4 Combustion/IR	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
			ASA No.9 29-2.2.4 Combustion/IR	ZQ	Analyte was not evaluated in the laboratory control standard. Either the analyte is not included in the scope of the analytical method or a commercial standard containing the analyte is not available.
	WG383628	NAG	Single NAG - EGI 2002	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG383358	Neutralization Potential as CaCO ₃	M600/2-78-054 3.2.3	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG383299	Sulfur Sulfate	M600/2-78-054 3.2.4-MOD	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
		Sulfur Total	M600/2-78-054 3.2.4-MOD	M1	Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable.

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24139**

Soil Analysis

The following parameters are not offered for certification or are not covered by AZ certificate #AZ0102.

Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR
Carbon, total inorganic (TIC)	ASA No. 9 29-2.2.4 (calc TC - TOC)
Carbon, total organic (TOC)	ASA No.9 29-2.2.4 Combustion/IR
NAG	Single NAG - EGI 2002
Neutralization Potential as CaCO ₃	M600/2-78-054 3.2.3
pH After Oxidation	Single NAG - EGI 2002
Sulfur HCl Residue	M600/2-78-054 3.2.4-MOD
Sulfur HNO ₃ Residue	M600/2-78-054 3.2.4-MOD
Sulfur Organic Residual	M600/2-78-054 3.2.4-MOD
Sulfur Pyritic Sulfide	M600/2-78-054 3.2.4-MOD
Sulfur Sulfate	M600/2-78-054 3.2.4-MOD
Sulfur Total	M600/2-78-054 3.2.4-MOD
Total Sulfur minus Sulfate	M600/2-78-054 3.2.4-MOD

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR
Carbon, total inorganic (TIC)	ASA No. 9 29-2.2.4 (calc TC - TOC)
Carbon, total organic (TOC)	ASA No.9 29-2.2.4 Combustion/IR
NAG	Single NAG - EGI 2002
Neutralization Potential as CaCO ₃	M600/2-78-054 3.2.3
pH After Oxidation	Single NAG - EGI 2002
Sulfur HCl Residue	M600/2-78-054 3.2.4-MOD
Sulfur HNO ₃ Residue	M600/2-78-054 3.2.4-MOD
Sulfur Organic Residual	M600/2-78-054 3.2.4-MOD
Sulfur Pyritic Sulfide	M600/2-78-054 3.2.4-MOD
Sulfur Sulfate	M600/2-78-054 3.2.4-MOD
Sulfur Total	M600/2-78-054 3.2.4-MOD
Total Sulfur minus Sulfate	M600/2-78-054 3.2.4-MOD

Adrian Brown Consultants, Inc.

ACZ Project ID: L24139

Date Received: 04/03/2015 10:09

Received By: ddp

Date Printed: 5/6/2015

Receipt Verification

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?	☐	☐	☒
2) Is the Chain of Custody or other directive shipping papers present?	☒	☐	☐
3) Does this project require special handling procedures such as CLP protocol?	☐	☐	☒
4) Are any samples NRC licensable material?	☐	☐	☒
5) If samples are received past hold time, proceed with requested short hold time analyses?	☒	☐	☐
6) Is the Chain of Custody complete and accurate?	☒	☐	☐
7) Were any changes made to the Chain of Custody prior to ACZ receiving the samples?	☐	☒	☐

Samples/Containers

	YES	NO	NA
8) Are all containers intact and with no leaks?	☒	☐	☐
9) Are all labels on containers and are they intact and legible?	☒	☐	☐
10) Do the sample labels and Chain of Custody match for Sample ID, Date, and Time?	☒	☐	☐
11) For preserved bottle types, was the pH checked and within limits? ¹	☐	☐	☒
12) Is there sufficient sample volume to perform all requested work?	☒	☐	☐
13) Is the custody seal intact on all containers?	☐	☐	☒
14) Are samples that require zero headspace acceptable?	☐	☐	☒
15) Are all sample containers appropriate for analytical requirements?	☒	☐	☐
16) Is there an Hg-1631 trip blank present?	☐	☐	☒
17) Is there a VOA trip blank present?	☐	☐	☒
18) Were all samples received within hold time?	☒	☐	☐

Chain of Custody Related Remarks

The 'Relinquished By' field on the COC was not completed. The project manager is contacting the client.

Client Contact Remarks

Shipping Containers

Cooler Id	Temp (°C)	Rad (µR/Hr)	Custody Seal Intact?
-----	-----	-----	-----
NA21552	14	16	N/A

Was ice present in the shipment container(s)?

No - Wet or gel ice was not present in the shipment container(s).

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

Adrian Brown Consultants, Inc.

ACZ Project ID: L24139

Date Received: 04/03/2015 10:09

Received By: ddp

Date Printed: 5/6/2015

¹ The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na₂S₂O₃ preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).



Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

CHAIN of CUSTODY

Report to:

Name: JEFFREY WINICK

Company: SCHLUMBERGER WATER SERV.

E-mail: JWINICK@SLB.COM

Address: 1875 LAWRENCE STREET, SUITE 500

DENVER, CO 80215

Telephone: +1.303.244.8224

Copy of Report to:

Name: ADRIAN BROWN

Company: ADRIAN BROWN CONSULTANTS

E-mail: abrown@abch2o.com

Telephone: (303) 698-9080

Invoice to:

Name: ADRIAN BROWN

Company: ADRIAN BROWN CONSULTANTS

E-mail: lbrown@abch2o.com

Address: 130 W 4th Ave

Denver CO USA 80223

Telephone: (303) 698-9080

If sample(s) received past holding time (HT), or If Insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?

YES

NO

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO"

is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

Are samples for CO DW Compliance Monitoring?

YES

NO

If yes, please include state forms. Results will be reported to PQL.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: CO HYDROGEOCHEMICAL STUDY

Project/PO #:

Reporting state for compliance testing:

Sampler's Name: Beverly Furfaro/ALS

Are any samples NRC licensable material? Yes No

SAMPLE IDENTIFICATION	DATE TIME	Matrix	# of Containers	Total Metals	NMP (ABA)	NAG	NA6 Leachate Metals	Total Carbon Leach	TDC Combustion IR	ABA Sulfur forms	Grain Size	HCT
CPC143/440-600/Static	2-Apr-15	SO	1kg	X	X	X	X	X	X	X		
CPC14-3/600-800/Static	2-Apr-15	SO	1kg	X	X	X	X	X	X	X		
CPC14-3/800-1000/Static	2-Apr-15	SO	1kg	X	X	X	X	X	X	X		
CPC14-3/1000-1200/Static	7-Apr-15	SO	1kg	X	X	X	X	X	X	X		
CPC14-3/1200-1400/Static	7-Apr-15	SO	1kg	X	X	X	X	X	X	X		
CPC14-3/1400-1600/Static	7-Apr-15	SO	1kg	X	X	X	X	X	X	X		
CPC14-3/1600-1800/Static	7-Apr-15	SO	1kg	X	X	X	X	X	X	X		
CPC14-3/1800-2000/Kinetic	7-Apr-15	SO	1kg	X	X	X	X	X	X	X	X	
CPC14-3/440-1000/Kinetic	2-Apr-15	SO	1kg	X	X	X	X	X	X	X	X	

Matrix SW (Surface Water) - GW (Ground Water) - WW (Waste Water) - DW (Drinking Water) - SL (Sludge) - SO (Soil) - OL (Oil) - Other (Specify)

REMARKS

Prior to ACZ analysis per quote and COC, from each static pulp comp., pls prepare 200g representative riffle split sample for each static composite for XRD. For each <1/4" kinetic comp., pls split 500g representative material. This should then be sub-split into 2, equal 250g split samples (1 sample for isotopes and 1 for mineral separations). Sample splits will be shipped to laboratories as designated by Jeff Winick. Please contact 303.244.8224 for further instruction.

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:

DATE TIME

RECEIVED BY:

DATE TIME

		APL	5-6-15	1009

FRMAD050.01.15.09

White - Return with sample. Yellow - Retain for your records.

May 26, 2015

Report to:

Jeffrey Winick
Schlumberger Water Services
1875 Lawrence Street
Suite 500
Denver, CO 80202

Bill to:

Accounts Payable
Adrian Brown Consultants, Inc.
130 W 4th Avenue
Denver, CO 80223

cc: Adrian Brown

Project ID:

ACZ Project ID: L24140

Jeffrey Winick:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on April 03, 2015. This project has been assigned to ACZ's project number, L24140. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L24140. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after June 25, 2015. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed
and approved this report.



Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/440-1000/KINETIC

ACZ Sample ID: **L24140-01**

Date Sampled: 04/02/15 00:00

Date Received: 04/03/15

Sample Matrix: Soil

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acid Generation Potential (calc on Sulfur total)	M600/2-78-054 3.2.4		21.3			t CaCO3/Kt	0.31	3.1	05/26/15 12:05	calc
Acid Neutralization Potential (calc)	M600/2-78-054 1.3		2.0			t CaCO3/Kt	1	5	05/26/15 12:05	calc
Acid-Base Potential (calc on Sulfur total)	M600/2-78-054 1.3		-19.3			t CaCO3/Kt			05/26/15 12:05	calc
Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR	1		U	*	%	0.1	0.5	05/12/15 16:44	cra
Carbon, total inorganic (TIC)	ASA No. 9 29-2.2.4 (calc TC - TOC)	1		U	*	%	0.1	0.5	05/12/15 16:44	cra
Carbon, total organic (TOC)	ASA No.9 29-2.2.4 Combustion/IR	1		U	*	%	0.1	0.5	05/12/15 16:44	cra
Net Acid Generation Procedure	Single NAG - EGI 2002									
NAG		1	7		*	Kg H2SO4/t	1	1	05/18/15 0:00	brd
pH After Oxidation		1	3.1		*	units	0.1	0.1	05/18/15 0:00	brd
Neutralization Potential as CaCO3	M600/2-78-054 3.2.3	1	0.2	B	*	%	0.1	0.5	05/13/15 12:48	spl
Sulfur Forms	M600/2-78-054 3.2.4-MOD									
Sulfur HCl Residue		1	0.51		*	%	0.01	0.1	05/12/15 0:00	cra
Sulfur HNO3 Residue		1	0.20		*	%	0.01	0.1	05/12/15 0:00	cra
Sulfur Organic Residual		1	0.20		*	%	0.01	0.1	05/12/15 0:00	cra
Sulfur Pyritic Sulfide		1	0.31		*	%	0.01	0.1	05/12/15 0:00	cra
Sulfur Sulfate		1	0.17		*	%	0.01	0.1	05/12/15 0:00	cra
Sulfur Total		1	0.68		*	%	0.01	0.1	05/12/15 0:00	cra
Total Sulfur minus Sulfate		1	0.51		*	%	0.01	0.1	05/12/15 0:00	cra

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972								05/08/15 16:20	pta/brd
Crush and Pulverize (Ring & Puck)	EPA-600/2-78-054 3.1.3								05/08/15 16:30	brd

Report Header Explanations

<i>Batch</i>	A distinct set of samples analyzed at a specific time
<i>Found</i>	Value of the QC Type of interest
<i>Limit</i>	Upper limit for RPD, in %.
<i>Lower</i>	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
<i>MDL</i>	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #5). Allows for instrument and annual fluctuations.
<i>PCN/SCN</i>	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
<i>PQL</i>	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
<i>QC</i>	True Value of the Control Sample or the amount added to the Spike
<i>Rec</i>	Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg)
<i>RPD</i>	Relative Percent Difference, calculation used for Duplicate QC Types
<i>Upper</i>	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
<i>Sample</i>	Value of the Sample of interest

QC Sample Types

<i>AS</i>	Analytical Spike (Post Digestion)	<i>LCSWD</i>	Laboratory Control Sample - Water Duplicate
<i>ASD</i>	Analytical Spike (Post Digestion) Duplicate	<i>LFB</i>	Laboratory Fortified Blank
<i>CCB</i>	Continuing Calibration Blank	<i>LFM</i>	Laboratory Fortified Matrix
<i>CCV</i>	Continuing Calibration Verification standard	<i>LFMD</i>	Laboratory Fortified Matrix Duplicate
<i>DUP</i>	Sample Duplicate	<i>LRB</i>	Laboratory Reagent Blank
<i>ICB</i>	Initial Calibration Blank	<i>MS</i>	Matrix Spike
<i>ICV</i>	Initial Calibration Verification standard	<i>MSD</i>	Matrix Spike Duplicate
<i>ICSAB</i>	Inter-element Correction Standard - A plus B solutions	<i>PBS</i>	Prep Blank - Soil
<i>LCSS</i>	Laboratory Control Sample - Soil	<i>PBW</i>	Prep Blank - Water
<i>LCSSD</i>	Laboratory Control Sample - Soil Duplicate	<i>PQV</i>	Practical Quantitation Verification standard
<i>LCSW</i>	Laboratory Control Sample - Water	<i>SDL</i>	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
L	Target analyte response was below the laboratory defined negative threshold.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

Method References

(1)	EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2)	EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3)	EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(4)	EPA SW-846. Test Methods for Evaluating Solid Waste.
(5)	Standard Methods for the Examination of Water and Wastewater.

Comments

(1)	QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2)	Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3)	Animal matrices for Inorganic analyses are reported on an "as received" basis.
(4)	An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
(5)	If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24140**

Carbon, total (TC)

ASA No.9 29-2.2.4 Combustion/IR

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383262													
WG383262PBS	PBS	05/11/15 12:30				U	%		-0.3	0.3			
WG383262LCSS	LCSS	05/11/15 15:04	PCN42342	4.19		4.2	%		80	120			
L24021-01DUP	DUP	05/11/15 20:12			U	U	%				0	20	RA

Carbon, total inorganic (TIC)

ASA No. 9 29-2.2.4 (calc TC - TOC)

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383262													
WG383262PBS	PBS	05/11/15 12:30				U	%		-0.3	0.3			
L24021-01DUP	DUP	05/11/15 20:12			U	U	%				0	20	RA

Carbon, total organic (TOC)

ASA No.9 29-2.2.4 Combustion/IR

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383262													
WG383262PBS	PBS	05/11/15 12:30				U	%		-0.3	0.3			
L24021-01DUP	DUP	05/11/15 20:12			U	U	%				0	20	RA ZQ

Net Acid Generation

Single NAG - EGI 2002

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383628													
L24121-01DUP	DUP	05/18/15 11:00			U	U	g H ₂ SO ₄ /				0	20	RA

Neutralization Potential as CaCO₃

M600/2-78-054 3.2.3

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383358													
WG383358PBS	PBS	05/13/15 10:24				U	%		-0.2	0.2			
WG383358LCSS	LCSS	05/13/15 11:00	PCN47543	4.96		5	%	101	80	120			
L24139-01DUP	DUP	05/13/15 12:12			.5	.45	%				11	20	RA
L24140-01MS	MS	05/13/15 13:24	SI141024-1	1	.2	1.13	%	93	70	130			

Sulfur Organic Residual

M600/2-78-054 3.2.4-MOD

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383299													
L24139-01DUP	DUP	05/12/15 10:00			.14	.14	%				0	20	

Sulfur Pyritic Sulfide

M600/2-78-054 3.2.4-MOD

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383299													
L24139-01DUP	DUP	05/12/15 10:00			4.36	4.11	%				6	20	

Sulfur Sulfate

M600/2-78-054 3.2.4-MOD

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383299													
L24139-01DUP	DUP	05/12/15 10:00			.05	.33	%				147	20	RA

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24140**

Sulfur Total

M600/2-78-054 3.2.4-MOD

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383299													
L24139-01DUP	DUP	05/12/15 10:00			4.55	4.58	%				1	20	
L24139-01MS	MS	05/12/15 10:00	PCN47988	1.1	4.55	5.94	%	126	80	120			M1
WG383299LCSS	LCSS	05/12/15 10:00	PCN42342	4.07		4.38	%	108	80	120			
WG383299PBS	PBS	05/12/15 10:00				U	%		-0.03	0.03			

Total Sulfur Minus Sulfate

M600/2-78-054 3.2.4-MOD

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383299													
L24139-01DUP	DUP	05/12/15 10:00			4.5	4.25	%				6	20	

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24140**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L24140-01	WG383262	Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR	Q6	Sample was received above recommended temperature.
			ASA No.9 29-2.2.4 Combustion/IR	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
		Carbon, total inorganic (TIC)	ASA No. 9 29-2.2.4 (calc TC - TOC)	Q6	Sample was received above recommended temperature.
			ASA No. 9 29-2.2.4 (calc TC - TOC)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
			ASA No. 9 29-2.2.4 (calc TC - TOC)	ZQ	Analyte was not evaluated in the laboratory control standard. Either the analyte is not included in the scope of the analytical method or a commercial standard containing the analyte is not available.
		Carbon, total organic (TOC)	ASA No.9 29-2.2.4 Combustion/IR	Q6	Sample was received above recommended temperature.
			ASA No.9 29-2.2.4 Combustion/IR	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
			ASA No.9 29-2.2.4 Combustion/IR	ZQ	Analyte was not evaluated in the laboratory control standard. Either the analyte is not included in the scope of the analytical method or a commercial standard containing the analyte is not available.
	WG383628	NAG	Single NAG - EGI 2002	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG383358	Neutralization Potential as CaCO ₃	M600/2-78-054 3.2.3	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG383299	Sulfur Sulfate	M600/2-78-054 3.2.4-MOD	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
		Sulfur Total	M600/2-78-054 3.2.4-MOD	M1	Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable.

Adrian Brown Consultants, Inc.ACZ Project ID: **L24140**

Soil Analysis

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Carbon, total (TC)	ASA No.9 29-2.2.4 Combustion/IR
Carbon, total inorganic (TIC)	ASA No. 9 29-2.2.4 (calc TC - TOC)
Carbon, total organic (TOC)	ASA No.9 29-2.2.4 Combustion/IR
NAG	Single NAG - EGI 2002
Neutralization Potential as CaCO ₃	M600/2-78-054 3.2.3
pH After Oxidation	Single NAG - EGI 2002
Sulfur HCl Residue	M600/2-78-054 3.2.4-MOD
Sulfur HNO ₃ Residue	M600/2-78-054 3.2.4-MOD
Sulfur Organic Residual	M600/2-78-054 3.2.4-MOD
Sulfur Pyritic Sulfide	M600/2-78-054 3.2.4-MOD
Sulfur Sulfate	M600/2-78-054 3.2.4-MOD
Sulfur Total	M600/2-78-054 3.2.4-MOD
Total Sulfur minus Sulfate	M600/2-78-054 3.2.4-MOD

Adrian Brown Consultants, Inc.

ACZ Project ID: L24140

Date Received: 04/03/2015 10:10

Received By: ddp

Date Printed: 5/6/2015

Receipt Verification

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?	☐	☐	☒
2) Is the Chain of Custody or other directive shipping papers present?	☒	☐	☐
3) Does this project require special handling procedures such as CLP protocol?	☐	☐	☒
4) Are any samples NRC licensable material?	☐	☐	☒
5) If samples are received past hold time, proceed with requested short hold time analyses?	☒	☐	☐
6) Is the Chain of Custody complete and accurate?	☒	☐	☐
7) Were any changes made to the Chain of Custody prior to ACZ receiving the samples?	☐	☒	☐

Samples/Containers

	YES	NO	NA
8) Are all containers intact and with no leaks?	☒	☐	☐
9) Are all labels on containers and are they intact and legible?	☒	☐	☐
10) Do the sample labels and Chain of Custody match for Sample ID, Date, and Time?	☒	☐	☐
11) For preserved bottle types, was the pH checked and within limits? ¹	☐	☐	☒
12) Is there sufficient sample volume to perform all requested work?	☒	☐	☐
13) Is the custody seal intact on all containers?	☐	☐	☒
14) Are samples that require zero headspace acceptable?	☐	☐	☒
15) Are all sample containers appropriate for analytical requirements?	☒	☐	☐
16) Is there an Hg-1631 trip blank present?	☐	☐	☒
17) Is there a VOA trip blank present?	☐	☐	☒
18) Were all samples received within hold time?	☒	☐	☐

Chain of Custody Related Remarks

The 'Relinquished By' field on the COC was not completed. The project manager is contacting the client.

Client Contact Remarks

Shipping Containers

Cooler Id	Temp (°C)	Rad (µR/Hr)	Custody Seal Intact?
NA21553	17.1	16	N/A

Was ice present in the shipment container(s)?

No - Wet or gel ice was not present in the shipment container(s).

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

Adrian Brown Consultants, Inc.

ACZ Project ID: L24140

Date Received: 04/03/2015 10:10

Received By: ddp

Date Printed: 5/6/2015

¹ The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na₂S₂O₃ preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).

L24140



Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

CHAIN of CUSTODY

Report to:

Name: JEFFREY WINICK

Company: SCHLUMBERGER WATER SERV.

E-mail: JWINICK@SLB.COM

Address: 1875 LAWRENCE STREET, SUITE 500

DENVER, CO 80215

Telephone: +1.303.244.8224

Copy of Report to:

Name: ADRIAN BROWN

Company: ADRIAN BROWN CONSULTANTS

E-mail: abrown@abch2o.com

Telephone: (303) 698-9080

Invoice to:

Name: ADRIAN BROWN

Company: ADRIAN BROWN CONSULTANTS

E-mail: lbrown@abch2o.com

Address: 130 W 4th Ave

Denver CO USA 80223

Telephone: (303) 698-9080

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?

YES
NO

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO"

is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

Are samples for CO DW Compliance Monitoring?

YES
NO

If yes, please include state forms. Results will be reported to PQL.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: CO HYDROGEOCHEMICAL STUDY

Project/PO #:

Reporting state for compliance testing:

Sampler's Name: Beverly Furfaro/ALS

Are any samples NRC licensable material? Yes No

SAMPLE IDENTIFICATION	DATE TIME	Matrix	# of Containers	Total Metals	NMP (ABA)	NAG	NA6 Leachate Metals	Total Carbon Leach	TDC Combustion IR	ABA Sulfur forms	Grain Size	HCT
CPC143/440-600/Static	2-Apr-15	SO	1kg	X	X	X	X	X	X	X		
CPC14-3/600-800/Static	2-Apr-15	SO	1kg	X	X	X	X	X	X	X		
CPC14-3/800-1000/Static	2-Apr-15	SO	1kg	X	X	X	X	X	X	X		
CPC14-3/1000-1200/Static	7-Apr-15	SO	1kg	X	X	X	X	X	X	X		
CPC14-3/1200-1400/Static	7-Apr-15	SO	1kg	X	X	X	X	X	X	X		
CPC14-3/1400-1600/Static	7-Apr-15	SO	1kg	X	X	X	X	X	X	X		
CPC14-3/1600-1800/Static	7-Apr-15	SO	1kg	X	X	X	X	X	X	X		
CPC14-3/1800-2000/Kinetic	7-Apr-15	SO	9kg	X	X	X	X	X	X	X	X	X
CPC14-3/440-1000/Kinetic	2-Apr-15	SO	9kg	X	X	X	X	X	X	X	X	X

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

Prior to ACZ analysis per quote and COC, from each static pulp comp., pls prepare 200g representative riffle split sample for each static composite for XRD. For each <1/4" kinetic comp., pls split 500g representative material. This should then be sub-split into 2, equal 250g split samples (1 sample for isotopes and 1 for mineral separations). Sample splits will be shipped to laboratories as designated by Jeff Winick. Please contact 303.244.8224 for further instruction.

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:

DATE TIME

RECEIVED BY:

DATE TIME

		CIF	5/6/19	1/38

FRMAD050.01.15.09

White - Return with sample.

Yellow - Retain for your records.

L24140 Chain of Custody

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/1000-1800/KINETIC

ACZ Sample ID: **L24141-01**

Date Sampled: 04/07/15 00:00

Date Received: 04/03/15

Sample Matrix: Soil

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sieve- 63 um (230 mesh)	ASA No.9, 15-4.2.2	1	6.4		*	% Passing	0.1	0.5	06/08/15 12:00	brd
Sieve- 125 um (120 mesh)	ASA No.9, 15-4.2.2	1	13.6		*	% Passing	0.1	0.5	06/08/15 12:00	brd
Sieve- 250 um (60 mesh)	ASA No.9, 15-4.2.2	1	20.2		*	% Passing	0.1	0.5	06/08/15 12:00	brd
Sieve- 500 um (35 mesh)	ASA No.9, 15-4.2.2	1	29.9		*	% Passing	0.1	0.5	06/08/15 12:00	brd
Sieve- 850 um (20 mesh)	ASA No.9, 15-4.2.2	1	39.3		*	% Passing	0.1	0.5	06/08/15 12:00	brd
Sieve- 2000 um (2.0 mm)	ASA No.9, 15-4.2.2	1	60.3		*	% Passing	0.1	0.5	06/08/15 12:00	brd
Sieve- 4000 um (4.0mm)	ASA No.9, 15-4.2.2	1	83.6		*	% Passing	0.1	0.5	06/08/15 12:00	brd

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Humidity Cell Test	D5744-12									
Grain Size		1	<6.3 mm						05/11/15 0:00	pta/rjv
Sample Weight		1	1000			g			05/11/15 0:00	pta/rjv

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/1000-1800/KINETIC-WEEK 0

ACZ Sample ID: **L24141-02**

Date Sampled: 05/12/15 17:00

Date Received: 04/03/15

Sample Matrix: Leachate

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.7 ICP	1	0.41		*	mg/L	0.03	0.2	05/14/15 14:12	jjc
Antimony, dissolved	M200.8 ICP-MS	1	0.0007	B	*	mg/L	0.0004	0.002	05/15/15 14:37	msh
Arsenic, dissolved	M200.8 ICP-MS	1	0.0004	B	*	mg/L	0.0002	0.001	05/15/15 14:37	msh
Barium, dissolved	M200.7 ICP	1	0.076		*	mg/L	0.003	0.02	05/14/15 14:12	jjc
Beryllium, dissolved	M200.8 ICP-MS	1	0.00048		*	mg/L	0.00005	0.0003	05/15/15 14:37	msh
Bismuth, dissolved	M200.7 ICP	1		U	*	mg/L	0.04	0.2	05/14/15 14:12	jjc
Boron, dissolved	M200.7 ICP	1	0.02	B	*	mg/L	0.01	0.05	05/14/15 14:12	jjc
Cadmium, dissolved	M200.8 ICP-MS	1	0.0148		*	mg/L	0.0001	0.0005	05/15/15 14:37	msh
Calcium, dissolved	M200.7 ICP	1	7		*	mg/L	0.1	0.5	05/14/15 14:12	jjc
Chromium, dissolved	M200.7 ICP	1		U	*	mg/L	0.01	0.05	05/14/15 14:12	jjc
Cobalt, dissolved	M200.7 ICP	1	0.07		*	mg/L	0.01	0.05	05/14/15 14:12	jjc
Copper, dissolved	M200.7 ICP	1	0.46		*	mg/L	0.01	0.05	05/14/15 14:12	jjc
Gallium, dissolved	M200.7 ICP	1		U	*	mg/L	0.1	0.5	05/14/15 22:20	aeb
Iron, dissolved	M200.7 ICP	1	0.07		*	mg/L	0.02	0.05	05/14/15 14:12	jjc
Lead, dissolved	M200.8 ICP-MS	1	0.0009		*	mg/L	0.0001	0.0005	05/15/15 14:37	msh
Lithium, dissolved	M200.7 ICP	1	0.018	B	*	mg/L	0.008	0.04	05/14/15 14:12	jjc
Magnesium, dissolved	M200.7 ICP	1	1.4		*	mg/L	0.2	1	05/14/15 14:12	jjc
Manganese, dissolved	M200.7 ICP	1	1.520		*	mg/L	0.005	0.03	05/14/15 14:12	jjc
Mercury, dissolved	M245.1 CVAA	1		U	*	mg/L	0.0002	0.001	05/14/15 12:07	mfm
Molybdenum, dissolved	M200.7 ICP	1		U	*	mg/L	0.02	0.1	05/14/15 14:12	jjc
Nickel, dissolved	M200.7 ICP	1	0.025	B	*	mg/L	0.008	0.04	05/14/15 14:12	jjc
Potassium, dissolved	M200.7 ICP	1	5.1		*	mg/L	0.2	1	05/14/15 22:20	aeb
Scandium, dissolved	M200.7 ICP	1		U	*	mg/L	0.1	0.5	05/14/15 14:12	jjc
Selenium, dissolved	M200.8 ICP-MS	1	0.0013		*	mg/L	0.0001	0.0003	05/15/15 14:37	msh
Silver, dissolved	M200.7 ICP	1		U	*	mg/L	0.01	0.03	05/14/15 14:12	jjc
Sodium, dissolved	M200.7 ICP	1	9.4		*	mg/L	0.2	1	05/14/15 14:12	jjc
Strontium, dissolved	M200.7 ICP	1	4.540		*	mg/L	0.005	0.03	05/14/15 14:12	jjc
Thallium, dissolved	M200.8 ICP-MS	1		U	*	mg/L	0.0001	0.0005	05/15/15 14:37	msh
Tin, dissolved	M200.7 ICP	1		U	*	mg/L	0.04	0.2	05/14/15 14:12	jjc
Titanium, dissolved	M200.7 ICP	1		U	*	mg/L	0.005	0.03	05/14/15 14:12	jjc
Vanadium, dissolved	M200.7 ICP	1		U	*	mg/L	0.005	0.03	05/14/15 14:12	jjc
Zinc, dissolved	M200.7 ICP	1	0.49		*	mg/L	0.01	0.05	05/14/15 14:12	jjc

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/1000-1800/KINETIC-WEEK 0

ACZ Sample ID: **L24141-02**

Date Sampled: 05/12/15 17:00

Date Received: 04/03/15

Sample Matrix: Leachate

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity--Humidity Cell Test	SM2510B	1	415		*	umhos/cm	1	10	05/11/15 13:30	rjv
End of leach volumes and mass	D5744-12									
Interstitial Weight		1	164			g			05/11/15 0:00	rjv
Leachate Volume Added		1	1000			mL			05/11/15 0:00	rjv
Leachate Volume Recovered		1	827			g			05/11/15 0:00	rjv
Oxidation Reduction Potential (Eh)	D1498-08	1	283		*	mv	1	1	05/11/15 15:20	rjv
pH, Humidity Cell Test	M9045D/M9040C									
pH		1	5.1			units	0.1	0.1	05/11/15 0:00	rjv
pH measured at		1	20.0			C	0.1	0.1	05/11/15 0:00	rjv

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidity as CaCO ₃	SM2310B - Titration	1	28		*	mg/L	10	20	05/13/15 11:49	id
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1		U	*	mg/L	2	20	05/14/15 0:00	abd
Carbonate as CaCO ₃		1		U	*	mg/L	2	20	05/14/15 0:00	abd
Hydroxide as CaCO ₃		1		U	*	mg/L	2	20	05/14/15 0:00	abd
Total Alkalinity		1		U	*	mg/L	2	20	05/14/15 0:00	abd
Sulfate	D516-02/-07 - Turbidimetric	5	48.3		*	mg/L	5	25	05/13/15 14:21	thf

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/1000-1800/KINETIC-WEEK 1

ACZ Sample ID: **L24141-03**

Date Sampled: 05/19/15 00:00

Date Received: 04/03/15

Sample Matrix: Leachate

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.7 ICP	1	0.76		*	mg/L	0.03	0.2	06/03/15 15:48	aeb
Antimony, dissolved	M200.8 ICP-MS	1		U	*	mg/L	0.0004	0.002	06/04/15 10:40	msh
Arsenic, dissolved	M200.8 ICP-MS	1	0.0004	B	*	mg/L	0.0002	0.001	06/04/15 10:40	msh
Barium, dissolved	M200.7 ICP	1	0.042		*	mg/L	0.003	0.02	06/03/15 15:48	aeb
Beryllium, dissolved	M200.8 ICP-MS	1	0.00079		*	mg/L	0.00005	0.0003	06/04/15 10:40	msh
Bismuth, dissolved	M200.7 ICP	1		U	*	mg/L	0.04	0.2	06/03/15 15:48	aeb
Boron, dissolved	M200.7 ICP	1	0.02	B	*	mg/L	0.01	0.05	06/04/15 10:42	aeb
Cadmium, dissolved	M200.8 ICP-MS	1	0.0169		*	mg/L	0.0001	0.0005	06/04/15 10:40	msh
Calcium, dissolved	M200.7 ICP	1	8.1		*	mg/L	0.1	0.5	06/03/15 15:48	aeb
Chromium, dissolved	M200.7 ICP	1	0.01	B	*	mg/L	0.01	0.05	06/03/15 15:48	aeb
Cobalt, dissolved	M200.7 ICP	1	0.07		*	mg/L	0.01	0.05	06/03/15 15:48	aeb
Copper, dissolved	M200.7 ICP	1	0.38		*	mg/L	0.01	0.05	06/03/15 15:48	aeb
Gallium, dissolved	M200.7 ICP	1		U	*	mg/L	0.1	0.5	06/03/15 15:48	aeb
Iron, dissolved	M200.7 ICP	1	0.14		*	mg/L	0.02	0.05	06/03/15 15:48	aeb
Lead, dissolved	M200.8 ICP-MS	1	0.0038		*	mg/L	0.0001	0.0005	06/04/15 10:40	msh
Lithium, dissolved	M200.7 ICP	1	0.016	B	*	mg/L	0.008	0.04	06/03/15 15:48	aeb
Magnesium, dissolved	M200.7 ICP	1	1.4		*	mg/L	0.2	1	06/03/15 15:48	aeb
Manganese, dissolved	M200.7 ICP	1	3.680		*	mg/L	0.005	0.03	06/03/15 15:48	aeb
Mercury, dissolved	M245.1 CVAA	1		U	*	mg/L	0.0002	0.001	06/11/15 16:28	mfm/nc o
Molybdenum, dissolved	M200.7 ICP	1		U	*	mg/L	0.02	0.1	06/03/15 15:48	aeb
Nickel, dissolved	M200.7 ICP	1	0.034	B	*	mg/L	0.008	0.04	06/03/15 15:48	aeb
Potassium, dissolved	M200.7 ICP	1	3.4		*	mg/L	0.2	1	06/03/15 15:48	aeb
Scandium, dissolved	M200.7 ICP	1		U	*	mg/L	0.1	0.5	06/03/15 15:48	aeb
Selenium, dissolved	M200.8 ICP-MS	1	0.0023		*	mg/L	0.0001	0.0003	06/04/15 10:40	msh
Silver, dissolved	M200.7 ICP	1		U	*	mg/L	0.01	0.03	06/03/15 15:48	aeb
Sodium, dissolved	M200.7 ICP	1	7.9		*	mg/L	0.2	1	06/03/15 15:48	aeb
Strontium, dissolved	M200.7 ICP	1	3.700		*	mg/L	0.005	0.03	06/03/15 15:48	aeb
Thallium, dissolved	M200.8 ICP-MS	1		U	*	mg/L	0.0001	0.0005	06/04/15 10:40	msh
Tin, dissolved	M200.7 ICP	1		U	*	mg/L	0.04	0.2	06/03/15 15:48	aeb
Titanium, dissolved	M200.7 ICP	1		U	*	mg/L	0.005	0.03	06/03/15 15:48	aeb
Vanadium, dissolved	M200.7 ICP	1		U	*	mg/L	0.005	0.03	06/03/15 15:48	aeb
Zinc, dissolved	M200.7 ICP	1	1.04		*	mg/L	0.01	0.05	06/03/15 15:48	aeb

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/1000-1800/KINETIC-WEEK 1

ACZ Sample ID: **L24141-03**

Date Sampled: 05/19/15 00:00

Date Received: 04/03/15

Sample Matrix: Leachate

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity--Humidity Cell Test	SM2510B	1	127		*	umhos/cm	1	10	05/18/15 13:30	rjv
End of leach volumes and mass	D5744-12									
Interstitial Weight		1	177			g			05/18/15 0:00	rjv
Leachate Volume Added		1	1000			mL			05/18/15 0:00	rjv
Leachate Volume Recovered		1	872			g			05/18/15 0:00	rjv
Oxidation Reduction Potential (Eh)	D1498-08	1	362		*	mv	1	1	05/18/15 15:20	rjv
pH, Humidity Cell Test	M9045D/M9040C									
pH		1	4.9			units	0.1	0.1	05/18/15 0:00	rjv
pH measured at		1	19.8			C	0.1	0.1	05/18/15 0:00	rjv

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidity as CaCO ₃	SM2310B - Titration	1	24		*	mg/L	10	20	06/02/15 12:08	id
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1		U	*	mg/L	2	20	05/20/15 0:00	abd
Carbonate as CaCO ₃		1		U	*	mg/L	2	20	05/20/15 0:00	abd
Hydroxide as CaCO ₃		1		U	*	mg/L	2	20	05/20/15 0:00	abd
Total Alkalinity		1		U	*	mg/L	2	20	05/20/15 0:00	abd
Sulfate	D516-02/-07 - Turbidimetric	5	51.5			mg/L	5	25	06/05/15 13:31	bsu

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/1000-1800/KINETIC-WEEK 2

ACZ Sample ID: **L24141-04**

Date Sampled: 05/26/15 17:00

Date Received: 04/03/15

Sample Matrix: Leachate

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, dissolved	M200.8 ICP-MS	1	0.0004	B	*	mg/L	0.0002	0.001	06/04/15 10:43	msh
Cadmium, dissolved	M200.8 ICP-MS	1	0.0205		*	mg/L	0.0001	0.0005	06/04/15 10:43	msh
Copper, dissolved	M200.7 ICP	1	0.45		*	mg/L	0.01	0.05	06/03/15 15:57	aeb
Iron, dissolved	M200.7 ICP	1	0.21		*	mg/L	0.02	0.05	06/03/15 15:57	aeb
Lead, dissolved	M200.8 ICP-MS	1	0.0031		*	mg/L	0.0001	0.0005	06/04/15 10:43	msh
Zinc, dissolved	M200.7 ICP	1	1.48		*	mg/L	0.01	0.05	06/03/15 15:57	aeb

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity--Humidity Cell Test	SM2510B	1	79.7		*	umhos/cm	1	10	05/25/15 13:30	brd
End of leach volumes and mass	D5744-12									
Interstitial Weight		1	163			g			05/25/15 0:00	brd
Leachate Volume Added		1	1000			mL			05/25/15 0:00	brd
Leachate Volume Recovered		1	893			g			05/25/15 0:00	brd
Oxidation Reduction Potential (Eh)	D1498-08	1	254		*	mv	1	1	05/25/15 15:20	brd
pH, Humidity Cell Test	M9045D/M9040C									
pH		1	4.9			units	0.1	0.1	05/25/15 0:00	brd
pH measured at		1	20.9			C	0.1	0.1	05/25/15 0:00	brd

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidity as CaCO ₃	SM2310B - Titration	1	30		*	mg/L	10	20	06/02/15 12:23	id
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1		U	*	mg/L	2	20	06/02/15 0:00	abd
Carbonate as CaCO ₃		1		U	*	mg/L	2	20	06/02/15 0:00	abd
Hydroxide as CaCO ₃		1		U	*	mg/L	2	20	06/02/15 0:00	abd
Total Alkalinity		1		U	*	mg/L	2	20	06/02/15 0:00	abd
Sulfate	D516-02/-07 - Turbidimetric	5	59.1			mg/L	5	25	06/05/15 13:31	bsu

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/1000-1800/KINETIC-WEEK 3

ACZ Sample ID: **L24141-05**

Date Sampled: 06/02/15 14:00

Date Received: 04/03/15

Sample Matrix: Leachate

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, dissolved	M200.8 ICP-MS	1	0.0003	B	*	mg/L	0.0002	0.001	06/04/15 10:50	msh
Cadmium, dissolved	M200.8 ICP-MS	1	0.0199		*	mg/L	0.0001	0.0005	06/04/15 10:50	msh
Copper, dissolved	M200.7 ICP	1	0.43		*	mg/L	0.01	0.05	06/03/15 16:00	aeb
Iron, dissolved	M200.7 ICP	1	0.17		*	mg/L	0.02	0.05	06/03/15 16:00	aeb
Lead, dissolved	M200.8 ICP-MS	1	0.0066		*	mg/L	0.0001	0.0005	06/04/15 10:50	msh
Zinc, dissolved	M200.7 ICP	1	1.60		*	mg/L	0.01	0.05	06/03/15 16:00	aeb

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity--Humidity Cell Test	SM2510B	1	69.8		*	umhos/cm	1	10	06/01/15 13:30	rjv
End of leach volumes and mass	D5744-12									
Interstitial Weight		1	156			g			06/01/15 0:00	rjv
Leachate Volume Added		1	1000			mL			06/01/15 0:00	rjv
Leachate Volume Recovered		1	895			g			06/01/15 0:00	rjv
Oxidation Reduction Potential (Eh)	D1498-08	1	372		*	mv	1	1	06/01/15 15:20	rjv
pH, Humidity Cell Test	M9045D/M9040C									
pH		1	4.5			units	0.1	0.1	06/01/15 0:00	rjv
pH measured at		1	20.9			C	0.1	0.1	06/01/15 0:00	rjv

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidity as CaCO ₃	SM2310B - Titration	1	24		*	mg/L	10	20	06/04/15 9:56	enb
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1		U	*	mg/L	2	20	06/02/15 0:00	abd
Carbonate as CaCO ₃		1		U	*	mg/L	2	20	06/02/15 0:00	abd
Hydroxide as CaCO ₃		1		U	*	mg/L	2	20	06/02/15 0:00	abd
Total Alkalinity		1		U	*	mg/L	2	20	06/02/15 0:00	abd
Sulfate	D516-02/-07 - Turbidimetric	5	50.0			mg/L	5	25	06/05/15 13:31	bsu

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/1000-1800/KINETIC-WEEK 4

ACZ Sample ID: **L24141-06**

Date Sampled: 06/09/15 17:00

Date Received: 04/03/15

Sample Matrix: Leachate

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, dissolved	M200.8 ICP-MS	1	0.0004	B	*	mg/L	0.0002	0.001	06/11/15 2:03	msh
Cadmium, dissolved	M200.8 ICP-MS	1	0.0211		*	mg/L	0.0001	0.0005	06/11/15 2:03	msh
Copper, dissolved	M200.7 ICP	1	0.46		*	mg/L	0.01	0.05	06/11/15 20:30	aeb
Iron, dissolved	M200.7 ICP	1	0.17		*	mg/L	0.02	0.05	06/11/15 20:30	aeb
Lead, dissolved	M200.8 ICP-MS	1	0.0036		*	mg/L	0.0001	0.0005	06/11/15 2:03	msh
Zinc, dissolved	M200.7 ICP	1	1.63		*	mg/L	0.01	0.05	06/11/15 20:30	aeb

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity--Humidity Cell Test	SM2510B	1	109		*	umhos/cm	1	10	06/08/15 13:00	rjv
End of leach volumes and mass	D5744-12									
Interstitial Weight		1	162			g			06/08/15 0:00	rjv
Leachate Volume Added		1	1000			mL			06/08/15 0:00	rjv
Leachate Volume Recovered		1	880			g			06/08/15 0:00	rjv
Oxidation Reduction Potential (Eh)	D1498-08	1	411		*	mv	1	1	06/08/15 14:43	rjv
pH, Humidity Cell Test	M9045D/M9040C									
pH		1	4.7			units	0.1	0.1	06/08/15 0:00	rjv
pH measured at		1	20.3			C	0.1	0.1	06/08/15 0:00	rjv

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidity as CaCO ₃	SM2310B - Titration	1	26		*	mg/L	10	20	06/11/15 12:15	id
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1		U	*	mg/L	2	20	06/10/15 0:00	abd
Carbonate as CaCO ₃		1		U	*	mg/L	2	20	06/10/15 0:00	abd
Hydroxide as CaCO ₃		1		U	*	mg/L	2	20	06/10/15 0:00	abd
Total Alkalinity		1		U	*	mg/L	2	20	06/10/15 0:00	abd
Sulfate	D516-02/-07 - Turbidimetric	5	47.0		*	mg/L	5	25	06/10/15 15:37	mss2

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/1000-1800/KINETIC-WEEK 5

ACZ Sample ID: **L24141-07**

Date Sampled: 06/16/15 17:00

Date Received: 04/03/15

Sample Matrix: Leachate

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, dissolved	M200.8 ICP-MS	1	0.0002	B	*	mg/L	0.0002	0.001	06/17/15 17:49	mfm
Cadmium, dissolved	M200.8 ICP-MS	1	0.0244		*	mg/L	0.0001	0.0005	06/17/15 17:49	mfm
Copper, dissolved	M200.7 ICP	1	0.53		*	mg/L	0.01	0.05	06/18/15 16:28	jjc
Iron, dissolved	M200.7 ICP	1	0.20		*	mg/L	0.02	0.05	06/18/15 16:28	jjc
Lead, dissolved	M200.8 ICP-MS	1	0.0040		*	mg/L	0.0001	0.0005	06/17/15 17:49	mfm
Zinc, dissolved	M200.7 ICP	1	1.80		*	mg/L	0.01	0.05	06/18/15 16:28	jjc

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity--Humidity Cell Test	SM2510B	1	163		*	umhos/cm	1	10	06/15/15 13:00	rjv
End of leach volumes and mass	D5744-12									
Interstitial Weight		1	159			g			06/15/15 0:00	rjv
Leachate Volume Added		1	1000			mL			06/15/15 0:00	rjv
Leachate Volume Recovered		1	882			g			06/15/15 0:00	rjv
Oxidation Reduction Potential (Eh)	D1498-08	1	407		*	mv	1	1	06/15/15 14:43	rjv
pH, Humidity Cell Test	M9045D/M9040C									
pH		1	4.5			units	0.1	0.1	06/15/15 0:00	rjv
pH measured at		1	20.8			C	0.1	0.1	06/15/15 0:00	rjv

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidity as CaCO ₃	SM2310B - Titration	1	18	B	*	mg/L	10	20	06/18/15 13:10	tms
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1		U	*	mg/L	2	20	06/17/15 0:00	abd
Carbonate as CaCO ₃		1		U	*	mg/L	2	20	06/17/15 0:00	abd
Hydroxide as CaCO ₃		1		U	*	mg/L	2	20	06/17/15 0:00	abd
Total Alkalinity		1		U	*	mg/L	2	20	06/17/15 0:00	abd
Sulfate	D516-02/-07 - Turbidimetric	5	51.6			mg/L	5	25	06/18/15 15:50	bsu

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/1000-1800/KINETIC-WEEK 6

ACZ Sample ID: **L24141-08**

Date Sampled: 06/23/15 17:00

Date Received: 04/03/15

Sample Matrix: Leachate

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.7 ICP	1	1.06		*	mg/L	0.03	0.2	06/24/15 17:19	aeb
Antimony, dissolved	M200.8 ICP-MS	1	0.0004	B	*	mg/L	0.0004	0.002	06/24/15 18:35	mfm
Arsenic, dissolved	M200.8 ICP-MS	1	0.0002	B	*	mg/L	0.0002	0.001	06/24/15 18:35	mfm
Barium, dissolved	M200.7 ICP	1	0.031		*	mg/L	0.003	0.02	06/24/15 17:19	aeb
Beryllium, dissolved	M200.8 ICP-MS	1	0.00143		*	mg/L	0.00005	0.0003	06/24/15 18:35	mfm
Bismuth, dissolved	M200.7 ICP	1		U	*	mg/L	0.04	0.2	06/24/15 17:19	aeb
Boron, dissolved	M200.7 ICP	1	0.02	B	*	mg/L	0.01	0.05	06/24/15 17:19	aeb
Cadmium, dissolved	M200.8 ICP-MS	1	0.0259		*	mg/L	0.0001	0.0005	06/24/15 18:35	mfm
Calcium, dissolved	M200.7 ICP	1	6.5		*	mg/L	0.1	0.5	06/24/15 17:19	aeb
Chromium, dissolved	M200.7 ICP	1		U	*	mg/L	0.01	0.05	06/24/15 17:19	aeb
Cobalt, dissolved	M200.7 ICP	1	0.07		*	mg/L	0.01	0.05	06/24/15 17:19	aeb
Copper, dissolved	M200.7 ICP	1	0.55		*	mg/L	0.01	0.05	06/24/15 17:19	aeb
Gallium, dissolved	M200.7 ICP	1		U	*	mg/L	0.1	0.5	06/24/15 17:19	aeb
Iron, dissolved	M200.7 ICP	1	0.24		*	mg/L	0.02	0.05	06/24/15 17:19	aeb
Lead, dissolved	M200.8 ICP-MS	1	0.0038		*	mg/L	0.0001	0.0005	06/24/15 18:35	mfm
Lithium, dissolved	M200.7 ICP	1	0.008	B	*	mg/L	0.008	0.04	06/24/15 17:19	aeb
Magnesium, dissolved	M200.7 ICP	1	1.5		*	mg/L	0.2	1	06/24/15 17:19	aeb
Manganese, dissolved	M200.7 ICP	1	6.440		*	mg/L	0.005	0.03	06/24/15 17:19	aeb
Mercury, dissolved	M245.1 CVAA	1		U	*	mg/L	0.0002	0.001	06/25/15 12:22	nco
Molybdenum, dissolved	M200.7 ICP	1		U	*	mg/L	0.02	0.1	06/24/15 17:19	aeb
Nickel, dissolved	M200.7 ICP	1	0.031	B	*	mg/L	0.008	0.04	06/24/15 17:19	aeb
Potassium, dissolved	M200.7 ICP	1	2.7		*	mg/L	0.2	1	06/24/15 17:19	aeb
Scandium, dissolved	M200.7 ICP	1		U	*	mg/L	0.1	0.5	06/24/15 17:19	aeb
Selenium, dissolved	M200.8 ICP-MS	1	0.0020		*	mg/L	0.0001	0.0003	06/24/15 18:35	mfm
Silver, dissolved	M200.7 ICP	1		U	*	mg/L	0.01	0.03	06/24/15 17:19	aeb
Sodium, dissolved	M200.7 ICP	1	1.2		*	mg/L	0.2	1	06/24/15 17:19	aeb
Strontium, dissolved	M200.7 ICP	1	3.360		*	mg/L	0.005	0.03	06/24/15 17:19	aeb
Thallium, dissolved	M200.8 ICP-MS	1		U	*	mg/L	0.0001	0.0005	06/24/15 18:35	mfm
Tin, dissolved	M200.7 ICP	1		U	*	mg/L	0.04	0.2	06/24/15 17:19	aeb
Titanium, dissolved	M200.7 ICP	1		U	*	mg/L	0.005	0.03	06/24/15 17:19	aeb
Vanadium, dissolved	M200.7 ICP	1		U	*	mg/L	0.005	0.03	06/24/15 17:19	aeb
Zinc, dissolved	M200.7 ICP	1	1.79		*	mg/L	0.01	0.05	06/24/15 17:19	aeb

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/1000-1800/KINETIC-WEEK 6

ACZ Sample ID: **L24141-08**

Date Sampled: 06/23/15 17:00

Date Received: 04/03/15

Sample Matrix: Leachate

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity--Humidity Cell Test	SM2510B	1	194		*	umhos/cm	1	10	06/22/15 11:00	rjv
End of leach volumes and mass	D5744-12									
Interstitial Weight		1	151			g			07/02/15 0:00	pta
Leachate Volume Added		1	1000			mL			07/02/15 0:00	pta
Leachate Volume Recovered		1	887			g			07/02/15 0:00	pta
Oxidation Reduction Potential (Eh)	D1498-08	1	394		*	mv	1	1	06/22/15 12:55	rjv
pH, Humidity Cell Test	M9045D/M9040C									
pH		1	4.7			units	0.1	0.1	06/22/15 0:00	rjv
pH measured at		1	20.5			C	0.1	0.1	06/22/15 0:00	rjv

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidity as CaCO ₃	SM2310B - Titration	1	30		*	mg/L	10	20	06/25/15 10:09	id
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1		U	*	mg/L	2	20	06/25/15 0:00	abd
Carbonate as CaCO ₃		1		U	*	mg/L	2	20	06/25/15 0:00	abd
Hydroxide as CaCO ₃		1		U	*	mg/L	2	20	06/25/15 0:00	abd
Total Alkalinity		1		U	*	mg/L	2	20	06/25/15 0:00	abd
Sulfate	D516-02/-07 - Turbidimetric	5	45.2		*	mg/L	5	25	06/24/15 9:58	mss2

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/1000-1800/KINETIC-WEEK 7

ACZ Sample ID: **L24141-09**

Date Sampled: 06/30/15 17:00

Date Received: 04/03/15

Sample Matrix: Leachate

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, dissolved	M200.8 ICP-MS	1	0.0003	B	*	mg/L	0.0002	0.001	07/01/15 22:20	mfm
Cadmium, dissolved	M200.8 ICP-MS	1	0.0250		*	mg/L	0.0001	0.0005	07/01/15 22:20	mfm
Copper, dissolved	M200.7 ICP	1	0.49		*	mg/L	0.01	0.05	07/02/15 11:39	jjc
Iron, dissolved	M200.7 ICP	1	0.23		*	mg/L	0.02	0.05	07/02/15 11:39	jjc
Lead, dissolved	M200.8 ICP-MS	1	0.0043		*	mg/L	0.0001	0.0005	07/01/15 22:20	mfm
Zinc, dissolved	M200.7 ICP	1	1.48		*	mg/L	0.01	0.05	07/02/15 11:39	jjc

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity--Humidity Cell Test	SM2510B	1	129		*	umhos/cm	1	10	06/29/15 10:08	cra
End of leach volumes and mass	D5744-12									
Interstitial Weight		1	142			g			07/02/15 0:00	pta/cra
Leachate Volume Added		1	1000			mL			07/02/15 0:00	pta/cra
Leachate Volume Recovered		1	885			g			07/02/15 0:00	pta/cra
Oxidation Reduction Potential (Eh)	D1498-08	1	303		*	mv	1	1	06/29/15 12:20	cra
pH, Humidity Cell Test	M9045D/M9040C									
pH		1	4.4			units	0.1	0.1	06/29/15 0:00	cra
pH measured at		1	22.8			C	0.1	0.1	06/29/15 0:00	cra

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidity as CaCO ₃	SM2310B - Titration	1	26		*	mg/L	10	20	07/02/15 9:03	enb
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1		U	*	mg/L	2	20	07/01/15 0:00	tms
Carbonate as CaCO ₃		1		U	*	mg/L	2	20	07/01/15 0:00	tms
Hydroxide as CaCO ₃		1		U	*	mg/L	2	20	07/01/15 0:00	tms
Total Alkalinity		1		U	*	mg/L	2	20	07/01/15 0:00	tms
Sulfate	D516-02/-07 - Turbidimetric	5	41.3		*	mg/L	5	25	07/02/15 13:24	bsu

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/1000-1800/KINETIC-WEEK 8

ACZ Sample ID: **L24141-10**

Date Sampled: 07/07/15 17:00

Date Received: 04/03/15

Sample Matrix: Leachate

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, dissolved	M200.8 ICP-MS	1	0.0004	B	*	mg/L	0.0002	0.001	07/08/15 17:34	mfm
Cadmium, dissolved	M200.8 ICP-MS	1	0.0281		*	mg/L	0.0001	0.0005	07/08/15 17:34	mfm
Copper, dissolved	M200.7 ICP	1	0.64		*	mg/L	0.01	0.05	07/09/15 19:37	jjc
Iron, dissolved	M200.7 ICP	1	0.35		*	mg/L	0.02	0.05	07/09/15 19:37	jjc
Lead, dissolved	M200.8 ICP-MS	1	0.0041		*	mg/L	0.0001	0.0005	07/08/15 17:34	mfm
Zinc, dissolved	M200.7 ICP	1	1.80		*	mg/L	0.01	0.05	07/09/15 19:37	jjc

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity--Humidity Cell Test	WG386710	1	***127***		*	umhos/cm	1	10	07/06/15 9:48	UPLD
End of leach volumes and mass	D5744-12									
Interstitial Weight		1	136			g			07/06/15 0:00	pta
Leachate Volume Added		1	1000			mL			07/06/15 0:00	pta
Leachate Volume Recovered		1	883			g			07/06/15 0:00	pta
Oxidation Reduction Potential (Eh)	WG386714	1	***266***		*	mv	1	1	07/06/15 11:40	UPLD
pH, Humidity Cell Test	M9045D/M9040C									
pH		1	***4.4***			units	0.1	0.1	07/06/15 0:00	UPLD
pH measured at		1	***22.5***			C	0.1	0.1	07/06/15 0:00	UPLD

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidity as CaCO ₃			*****							NEED
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1		U	*	mg/L	2	20	07/08/15 0:00	enb
Carbonate as CaCO ₃		1		U	*	mg/L	2	20	07/08/15 0:00	enb
Hydroxide as CaCO ₃		1		U	*	mg/L	2	20	07/08/15 0:00	enb
Total Alkalinity		1		U	*	mg/L	2	20	07/08/15 0:00	enb
Sulfate	D516-02/-07 - Turbidimetric	5	39.5		*	mg/L	5	25	07/08/15 14:30	mss2

Report Header Explanations

<i>Batch</i>	A distinct set of samples analyzed at a specific time
<i>Found</i>	Value of the QC Type of interest
<i>Limit</i>	Upper limit for RPD, in %.
<i>Lower</i>	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
<i>MDL</i>	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #5). Allows for instrument and annual fluctuations.
<i>PCN/SCN</i>	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
<i>PQL</i>	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
<i>QC</i>	True Value of the Control Sample or the amount added to the Spike
<i>Rec</i>	Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg)
<i>RPD</i>	Relative Percent Difference, calculation used for Duplicate QC Types
<i>Upper</i>	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
<i>Sample</i>	Value of the Sample of interest

QC Sample Types

<i>AS</i>	Analytical Spike (Post Digestion)	<i>LCSWD</i>	Laboratory Control Sample - Water Duplicate
<i>ASD</i>	Analytical Spike (Post Digestion) Duplicate	<i>LFB</i>	Laboratory Fortified Blank
<i>CCB</i>	Continuing Calibration Blank	<i>LFM</i>	Laboratory Fortified Matrix
<i>CCV</i>	Continuing Calibration Verification standard	<i>LFMD</i>	Laboratory Fortified Matrix Duplicate
<i>DUP</i>	Sample Duplicate	<i>LRB</i>	Laboratory Reagent Blank
<i>ICB</i>	Initial Calibration Blank	<i>MS</i>	Matrix Spike
<i>ICV</i>	Initial Calibration Verification standard	<i>MSD</i>	Matrix Spike Duplicate
<i>ICSAB</i>	Inter-element Correction Standard - A plus B solutions	<i>PBS</i>	Prep Blank - Soil
<i>LCSS</i>	Laboratory Control Sample - Soil	<i>PBW</i>	Prep Blank - Water
<i>LCSSD</i>	Laboratory Control Sample - Soil Duplicate	<i>PQV</i>	Practical Quantitation Verification standard
<i>LCSW</i>	Laboratory Control Sample - Water	<i>SDL</i>	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
L	Target analyte response was below the laboratory defined negative threshold.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

Method References

(1)	EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2)	EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3)	EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(4)	EPA SW-846. Test Methods for Evaluating Solid Waste.
(5)	Standard Methods for the Examination of Water and Wastewater.

Comments

(1)	QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2)	Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3)	Animal matrices for Inorganic analyses are reported on an "as received" basis.
(4)	An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
(5)	If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24141**

Acidity as CaCO₃

SM2310B - Titration

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383369													
WG383369PBW	PBW	05/13/15 9:00				18	mg/L		-20	20			
WG383369LCSW	LCSW	05/13/15 9:16	PCN48688	1090		1050	mg/L	96	90	110			
L24142-02DUP	DUP	05/13/15 12:23			10	U	mg/L				200	20	RA

Alkalinity as CaCO₃

SM2320B - Titration

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383489													
WG383489PBW1	PBW	05/14/15 17:51				4.2	mg/L		-20	20			
WG383489LCSW3	LCSW	05/14/15 18:08	WC150428-1	820.0001		824	mg/L	100	90	110			
WG383489LCSW6	LCSW	05/14/15 20:58	WC150428-1	820.0001		838	mg/L	102	90	110			
WG383489PBW2	PBW	05/14/15 21:04				U	mg/L		-20	20			
L24141-02DUP	DUP	05/14/15 22:24			U	U	mg/L				0	20	RA
WG383489LCSW9	LCSW	05/14/15 23:34	WC150428-1	820.0001		840	mg/L	102	90	110			
WG383489PBW3	PBW	05/14/15 23:41				U	mg/L		-20	20			
WG383489LCSW12	LCSW	05/15/15 2:13	WC150428-1	820.0001		848	mg/L	103	90	110			
WG383489PBW4	PBW	05/15/15 2:20				U	mg/L		-20	20			
WG383489LCSW15	LCSW	05/15/15 5:19	WC150428-1	820.0001		835	mg/L	102	90	110			

Aluminum, dissolved

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383471													
WG383471ICV	ICV	05/14/15 13:08	II150418-3	2		2.04	mg/L	102	95	105			
WG383471ICB	ICB	05/14/15 13:14				U	mg/L		-0.09	0.09			
WG383471LFB	LFB	05/14/15 13:27	II150425-2	1.0015		1.131	mg/L	113	85	115			
L22614-15AS	AS	05/14/15 13:37	II150425-2	1.0015	.07	1.149	mg/L	108	85	115			
L22614-15ASD	ASD	05/14/15 13:40	II150425-2	1.0015	.07	1.181	mg/L	111	85	115	3	20	

Antimony, dissolved

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383554													
WG383554ICV	ICV	05/15/15 14:17	MS150312-3	.02		.0207	mg/L	104	90	110			
WG383554ICB	ICB	05/15/15 14:19				U	mg/L		-0.0012	0.0012			
WG383554LFB	LFB	05/15/15 14:22	MS150429-2	.01001		.00997	mg/L	100	85	115			
L24102-03AS	AS	05/15/15 14:32	MS150429-2	.01001	U	.00947	mg/L	95	70	130			
L24102-03ASD	ASD	05/15/15 14:34	MS150429-2	.01001	U	.00946	mg/L	95	70	130	0	20	

Arsenic, dissolved

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383554													
WG383554ICV	ICV	05/15/15 14:17	MS150312-3	.05		.04868	mg/L	97	90	110			
WG383554ICB	ICB	05/15/15 14:19				U	mg/L		-0.0006	0.0006			
L24102-03AS	AS	05/15/15 14:32	MS150429-2	.0501	U	.04508	mg/L	90	70	130			
L24102-03ASD	ASD	05/15/15 14:34	MS150429-2	.0501	U	.04497	mg/L	90	70	130	0	20	

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24141**

Barium, dissolved

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383471													
WG383471ICV	ICV	05/14/15 13:08	II150418-3	2		2.0405	mg/L	102	95	105			
WG383471ICB	ICB	05/14/15 13:14				.0041	mg/L		-0.009	0.009			
WG383471LFB	LFB	05/14/15 13:27	II150425-2	.5		.5222	mg/L	104	85	115			
L22614-15AS	AS	05/14/15 13:37	II150425-2	.5	.005	.5074	mg/L	100	85	115			
L22614-15ASD	ASD	05/14/15 13:40	II150425-2	.5	.005	.5248	mg/L	104	85	115	3	20	

Beryllium, dissolved

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383554													
WG383554ICV	ICV	05/15/15 14:17	MS150312-3	.05		.04718	mg/L	94	90	110			
WG383554ICB	ICB	05/15/15 14:19				U	mg/L		-0.00015	0.00015			
WG383554LFB	LFB	05/15/15 14:22	MS150429-2	.05005		.050222	mg/L	100	85	115			
L24102-03AS	AS	05/15/15 14:32	MS150429-2	.05005	U	.052373	mg/L	105	70	130			
L24102-03ASD	ASD	05/15/15 14:34	MS150429-2	.05005	U	.052039	mg/L	104	70	130	1	20	

Bismuth, dissolved

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383471													
WG383471ICV	ICV	05/14/15 13:08	II150418-3	2		2.067	mg/L	103	95	105			
WG383471ICB	ICB	05/14/15 13:14				U	mg/L		-0.12	0.12			
WG383471LFB	LFB	05/14/15 13:27	II150425-2	1		1.041	mg/L	104	85	115			
L22614-15AS	AS	05/14/15 13:37	II150425-2	1	U	1.004	mg/L	100	85	115			
L22614-15ASD	ASD	05/14/15 13:40	II150425-2	1	U	1.053	mg/L	105	85	115	5	20	

Boron, dissolved

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383471													
WG383471ICV	ICV	05/14/15 13:08	II150418-3	2		2.08	mg/L	104	95	105			
WG383471ICB	ICB	05/14/15 13:14				.01	mg/L		-0.03	0.03			
WG383471LFB	LFB	05/14/15 13:27	II150425-2	.5005		.542	mg/L	108	85	115			
L22614-15AS	AS	05/14/15 13:37	II150425-2	.5005	.02	.532	mg/L	102	85	115			
L22614-15ASD	ASD	05/14/15 13:40	II150425-2	.5005	.02	.56	mg/L	108	85	115	5	20	

Cadmium, dissolved

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383554													
WG383554ICV	ICV	05/15/15 14:17	MS150312-3	.05		.04897	mg/L	98	90	110			
WG383554ICB	ICB	05/15/15 14:19				U	mg/L		-0.0003	0.0003			
WG383554LFB	LFB	05/15/15 14:22	MS150429-2	.05005		.05036	mg/L	101	85	115			
L24102-03AS	AS	05/15/15 14:32	MS150429-2	.05005	U	.05228	mg/L	104	70	130			
L24102-03ASD	ASD	05/15/15 14:34	MS150429-2	.05005	U	.05226	mg/L	104	70	130	0	20	

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24141**

Calcium, dissolved

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383471													
WG383471ICV	ICV	05/14/15 13:08	II150418-3	100		101.05	mg/L	101	95	105			
WG383471ICB	ICB	05/14/15 13:14				.1	mg/L		-0.3	0.3			
WG383471LFB	LFB	05/14/15 13:27	II150425-2	67.98862		73.93	mg/L	109	85	115			
L22614-15AS	AS	05/14/15 13:37	II150425-2	67.98862	1	72.9	mg/L	106	85	115			
L22614-15ASD	ASD	05/14/15 13:40	II150425-2	67.98862	1	75.39	mg/L	109	85	115	3	20	

Chromium, dissolved

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383471													
WG383471ICV	ICV	05/14/15 13:08	II150418-3	2		2.004	mg/L	100	95	105			
WG383471ICB	ICB	05/14/15 13:14				U	mg/L		-0.03	0.03			
WG383471LFB	LFB	05/14/15 13:27	II150425-2	.5005		.52	mg/L	104	85	115			
L22614-15AS	AS	05/14/15 13:37	II150425-2	.5005	U	.502	mg/L	100	85	115			
L22614-15ASD	ASD	05/14/15 13:40	II150425-2	.5005	U	.519	mg/L	104	85	115	3	20	

Cobalt, dissolved

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383471													
WG383471ICV	ICV	05/14/15 13:08	II150418-3	2.002		2.027	mg/L	101	95	105			
WG383471ICB	ICB	05/14/15 13:14				U	mg/L		-0.03	0.03			
WG383471LFB	LFB	05/14/15 13:27	II150425-2	.5005		.517	mg/L	103	85	115			
L22614-15AS	AS	05/14/15 13:37	II150425-2	.5005	U	.503	mg/L	100	85	115			
L22614-15ASD	ASD	05/14/15 13:40	II150425-2	.5005	U	.521	mg/L	104	85	115	4	20	

Conductivity--Humidity Cell Test

SM2510B

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383403													
WG383403LCSW1	LCSW	05/11/15 12:00	PCN48251	1424		1410	umhos/cm	99	90	110			
WG383403LCSW2	LCSW	05/11/15 18:00	PCN48251	1424		1440	umhos/cm	101	90	110			

Copper, dissolved

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383471													
WG383471ICV	ICV	05/14/15 13:08	II150418-3	2		2.017	mg/L	101	95	105			
WG383471ICB	ICB	05/14/15 13:14				U	mg/L		-0.03	0.03			
WG383471LFB	LFB	05/14/15 13:27	II150425-2	.499		.533	mg/L	107	85	115			
L22614-15AS	AS	05/14/15 13:37	II150425-2	.499	U	.517	mg/L	104	85	115			
L22614-15ASD	ASD	05/14/15 13:40	II150425-2	.499	U	.535	mg/L	107	85	115	3	20	

Gallium, dissolved

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383510													
WG383510ICV	ICV	05/14/15 21:58	II150418-3	2		2.09	mg/L	105	95	105			
WG383510ICB	ICB	05/14/15 22:04				U	mg/L		-0.3	0.3			
WG383510LFB	LFB	05/14/15 22:17	II150425-2	1		1.01	mg/L	101	85	115			
L24142-02AS	AS	05/14/15 22:26	II150425-2	1	U	1.03	mg/L	103	85	115			
L24142-02ASD	ASD	05/14/15 22:29	II150425-2	1	U	1.05	mg/L	105	85	115	2	20	

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24141**

Iron, dissolved

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383471													
WG383471ICV	ICV	05/14/15 13:08	II150418-3	2		2.04	mg/L	102	95	105			
WG383471ICB	ICB	05/14/15 13:14				U	mg/L		-0.06	0.06			
WG383471LFB	LFB	05/14/15 13:27	II150425-2	1.0001		1.068	mg/L	107	85	115			
L22614-15AS	AS	05/14/15 13:37	II150425-2	1.0001	U	1.038	mg/L	104	85	115			
L22614-15ASD	ASD	05/14/15 13:40	II150425-2	1.0001	U	1.077	mg/L	108	85	115	4	20	

Lead, dissolved

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383554													
WG383554ICV	ICV	05/15/15 14:17	MS150312-3	.05		.04938	mg/L	99	90	110			
WG383554ICB	ICB	05/15/15 14:19				U	mg/L		-0.0003	0.0003			
WG383554LFB	LFB	05/15/15 14:22	MS150429-2	.05005		.04931	mg/L	99	85	115			
L24102-03AS	AS	05/15/15 14:32	MS150429-2	.05005	U	.05088	mg/L	102	70	130			
L24102-03ASD	ASD	05/15/15 14:34	MS150429-2	.05005	U	.05085	mg/L	102	70	130	0	20	

Lithium, dissolved

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383471													
WG383471ICV	ICV	05/14/15 13:08	II150418-3	2		2.066	mg/L	103	95	105			
WG383471ICB	ICB	05/14/15 13:14				U	mg/L		-0.024	0.024			
WG383471LFB	LFB	05/14/15 13:27	II150425-2	1.001		1.044	mg/L	104	85	115			
L22614-15AS	AS	05/14/15 13:37	II150425-2	1.001	U	1.009	mg/L	101	85	115			
L22614-15ASD	ASD	05/14/15 13:40	II150425-2	1.001	U	1.046	mg/L	104	85	115	4	20	

Magnesium, dissolved

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383471													
WG383471ICV	ICV	05/14/15 13:08	II150418-3	100		96.79	mg/L	97	95	105			
WG383471ICB	ICB	05/14/15 13:14				U	mg/L		-0.6	0.6			
WG383471LFB	LFB	05/14/15 13:27	II150425-2	50.00339		50.32	mg/L	101	85	115			
L22614-15AS	AS	05/14/15 13:37	II150425-2	50.00339	.4	49.3	mg/L	98	85	115			
L22614-15ASD	ASD	05/14/15 13:40	II150425-2	50.00339	.4	50.99	mg/L	101	85	115	3	20	

Manganese, dissolved

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383471													
WG383471ICV	ICV	05/14/15 13:08	II150418-3	2		2.0152	mg/L	101	95	105			
WG383471ICB	ICB	05/14/15 13:14				U	mg/L		-0.015	0.015			
WG383471LFB	LFB	05/14/15 13:27	II150425-2	.499		.5171	mg/L	104	85	115			
L22614-15AS	AS	05/14/15 13:37	II150425-2	.499	U	.5005	mg/L	100	85	115			
L22614-15ASD	ASD	05/14/15 13:40	II150425-2	.499	U	.5147	mg/L	103	85	115	3	20	

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24141**

Mercury, dissolved M245.1 CVAA

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383455													
WG383455ICV	ICV	05/14/15 11:55	II150422-1	.005		.00511	mg/L	102	95	105			
WG383455ICB	ICB	05/14/15 11:57				U	mg/L		-0.0002	0.0002			
WG383455LRB	LRB	05/14/15 11:59				U	mg/L		-0.00044	0.00044			
WG383455LFB	LFB	05/14/15 12:01	II150416-2	.002		.00181	mg/L	91	85	115			
L24142-02LFM	LFM	05/14/15 12:11	II150416-2	.002	U	.00188	mg/L	94	85	115			
L24142-02LFMD	LFMD	05/14/15 12:13	II150416-2	.002	U	.00191	mg/L	96	85	115	2	20	

Molybdenum, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383471													
WG383471ICV	ICV	05/14/15 13:08	II150418-3	2		2.059	mg/L	103	95	105			
WG383471ICB	ICB	05/14/15 13:14				U	mg/L		-0.06	0.06			
WG383471LFB	LFB	05/14/15 13:27	II150425-2	.4995		.55	mg/L	110	85	115			
L22614-15AS	AS	05/14/15 13:37	II150425-2	.4995	U	.525	mg/L	105	85	115			
L22614-15ASD	ASD	05/14/15 13:40	II150425-2	.4995	U	.554	mg/L	111	85	115	5	20	

Nickel, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383471													
WG383471ICV	ICV	05/14/15 13:08	II150418-3	2		2.0265	mg/L	101	95	105			
WG383471ICB	ICB	05/14/15 13:14				U	mg/L		-0.024	0.024			
WG383471LFB	LFB	05/14/15 13:27	II150425-2	.501		.5215	mg/L	104	85	115			
L22614-15AS	AS	05/14/15 13:37	II150425-2	.501	U	.512	mg/L	102	85	115			
L22614-15ASD	ASD	05/14/15 13:40	II150425-2	.501	U	.5263	mg/L	105	85	115	3	20	

Oxidation Reduction Potential (Eh) D1498-08

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383411													
WG383411LCSW1	LCSW	05/11/15 14:40	PCN46773	219		214	mv	98	190	250			
WG383411LCSW2	LCSW	05/11/15 18:00	PCN46773	219		218	mv	100	190	250			

Ph M9045D/M9040C

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383404													
WG383404ICV	ICV	05/11/15 14:34	PCN46630	4		4	units	100	3.9	4.1			

Potassium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383510													
WG383510ICV	ICV	05/14/15 21:58	II150418-3	20		19.49	mg/L	97	95	105			
WG383510ICB	ICB	05/14/15 22:04				U	mg/L		-0.6	0.6			
WG383510LFB	LFB	05/14/15 22:17	II150425-2	99.93386		99.02	mg/L	99	85	115			
L24142-02AS	AS	05/14/15 22:26	II150425-2	99.93386	12.1	110.9	mg/L	99	85	115			
L24142-02ASD	ASD	05/14/15 22:29	II150425-2	99.93386	12.1	111.6	mg/L	100	85	115	1	20	

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24141**

Scandium, dissolved

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383471													
WG383471ICV	ICV	05/14/15 13:08	II150418-3	2		2.05	mg/L	103	95	105			
WG383471ICB	ICB	05/14/15 13:14				U	mg/L		-0.3	0.3			
WG383471LFB	LFB	05/14/15 13:27	II150425-2	.999		1.07	mg/L	107	85	115			
L22614-15AS	AS	05/14/15 13:37	II150425-2	.999	U	1.03	mg/L	103	85	115			
L22614-15ASD	ASD	05/14/15 13:40	II150425-2	.999	U	1.07	mg/L	107	85	115	4	20	

Selenium, dissolved

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383554													
WG383554ICV	ICV	05/15/15 14:17	MS150312-3	.05		.04939	mg/L	99	90	110			
WG383554ICB	ICB	05/15/15 14:19				.00017	mg/L		-0.0003	0.0003			
WG383554LFB	LFB	05/15/15 14:22	MS150429-2	.05015		.05042	mg/L	101	85	115			
L24102-03AS	AS	05/15/15 14:32	MS150429-2	.05015	U	.05551	mg/L	111	70	130			
L24102-03ASD	ASD	05/15/15 14:34	MS150429-2	.05015	U	.05364	mg/L	107	70	130	3	20	

Silver, dissolved

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383471													
WG383471ICV	ICV	05/14/15 13:08	II150418-3	1.001		1.004	mg/L	100	95	105			
WG383471ICB	ICB	05/14/15 13:14				U	mg/L		-0.03	0.03			
WG383471LFB	LFB	05/14/15 13:27	II150425-2	.502		.512	mg/L	102	85	115			
L22614-15AS	AS	05/14/15 13:37	II150425-2	.502	U	.43	mg/L	86	85	115			
L22614-15ASD	ASD	05/14/15 13:40	II150425-2	.502	U	.439	mg/L	87	85	115	2	20	

Sodium, dissolved

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383471													
WG383471ICV	ICV	05/14/15 13:08	II150418-3	100		97.34	mg/L	97	95	105			
WG383471ICB	ICB	05/14/15 13:14				U	mg/L		-0.6	0.6			
WG383471LFB	LFB	05/14/15 13:27	II150425-2	100.0188		100.6	mg/L	101	85	115			
L22614-15AS	AS	05/14/15 13:37	II150425-2	100.0188	.2	98.17	mg/L	98	85	115			
L22614-15ASD	ASD	05/14/15 13:40	II150425-2	100.0188	.2	101.4	mg/L	101	85	115	3	20	

Strontium, dissolved

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383471													
WG383471ICV	ICV	05/14/15 13:08	II150418-3	2		2.012	mg/L	101	95	105			
WG383471ICB	ICB	05/14/15 13:14				U	mg/L		-0.015	0.015			
WG383471LFB	LFB	05/14/15 13:27	II150425-2	.5005		.5362	mg/L	107	85	115			
L22614-15AS	AS	05/14/15 13:37	II150425-2	.5005	.012	.528	mg/L	103	85	115			
L22614-15ASD	ASD	05/14/15 13:40	II150425-2	.5005	.012	.546	mg/L	107	85	115	3	20	

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24141**

Sulfate

D516-02/-07 - Turbidimetric

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383420													
WG383420ICB	ICB	05/13/15 9:01				U	mg/L		-3	3			
WG383420ICV	ICV	05/13/15 9:01	WI150512-6	20		19.9	mg/L	100	90	110			
WG383420LFB	LFB	05/13/15 13:54	WI150302-1	10.01		10	mg/L	100	90	110			
L24143-02AS	AS	05/13/15 14:14	WI150302-1	10.01	U	11.6	mg/L	116	90	110			M1
L24142-02DUP	DUP	05/13/15 14:21			40.1	40.2	mg/L				0	20	RA

Thallium, dissolved

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383554													
WG383554ICV	ICV	05/15/15 14:17	MS150312-3	.05		.05065	mg/L	101	90	110			
WG383554ICB	ICB	05/15/15 14:19				U	mg/L		-0.0003	0.0003			
WG383554LFB	LFB	05/15/15 14:22	MS150429-2	.0501		.05025	mg/L	100	85	115			
L24102-03AS	AS	05/15/15 14:32	MS150429-2	.0501	U	.05178	mg/L	103	70	130			
L24102-03ASD	ASD	05/15/15 14:34	MS150429-2	.0501	U	.05168	mg/L	103	70	130	0	20	

Tin, dissolved

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383471													
WG383471ICV	ICV	05/14/15 13:08	II150418-3	2		2.091	mg/L	105	95	105			
WG383471ICB	ICB	05/14/15 13:14				U	mg/L		-0.12	0.12			
WG383471LFB	LFB	05/14/15 13:27	II150425-2	1.001		1.051	mg/L	105	85	115			
L22614-15AS	AS	05/14/15 13:37	II150425-2	1.001	U	1.025	mg/L	102	85	115			
L22614-15ASD	ASD	05/14/15 13:40	II150425-2	1.001	U	1.057	mg/L	106	85	115	3	20	

Titanium, dissolved

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383471													
WG383471ICV	ICV	05/14/15 13:08	II150418-3	2		2.0328	mg/L	102	95	105			
WG383471ICB	ICB	05/14/15 13:14				U	mg/L		-0.015	0.015			
WG383471LFB	LFB	05/14/15 13:27	II150425-2	1.005		1.053	mg/L	105	85	115			
L22614-15AS	AS	05/14/15 13:37	II150425-2	1.005	U	1.022	mg/L	102	85	115			
L22614-15ASD	ASD	05/14/15 13:40	II150425-2	1.005	U	1.06	mg/L	105	85	115	4	20	

Vanadium, dissolved

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383471													
WG383471ICV	ICV	05/14/15 13:08	II150418-3	2		2.06	mg/L	103	95	105			
WG383471ICB	ICB	05/14/15 13:14				U	mg/L		-0.015	0.015			
WG383471LFB	LFB	05/14/15 13:27	II150425-2	.5		.5419	mg/L	108	85	115			
L22614-15AS	AS	05/14/15 13:37	II150425-2	.5	U	.5318	mg/L	106	85	115			
L22614-15ASD	ASD	05/14/15 13:40	II150425-2	.5	U	.5501	mg/L	110	85	115	3	20	

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24141**

Zinc, dissolved

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG383471													
WG383471ICV	ICV	05/14/15 13:08	II150418-3	2		2.033	mg/L	102	95	105			
WG383471ICB	ICB	05/14/15 13:14				U	mg/L		-0.03	0.03			
WG383471LFB	LFB	05/14/15 13:27	II150425-2	.5005		.545	mg/L	109	85	115			
L22614-15AS	AS	05/14/15 13:37	II150425-2	.5005	U	.533	mg/L	106	85	115			
L22614-15ASD	ASD	05/14/15 13:40	II150425-2	.5005	U	.55	mg/L	110	85	115	3	20	

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24141**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L24141-02	WG383554	Arsenic, dissolved	M200.8 ICP-MS	N1	See Case Narrative.
	WG383369	Acidity as CaCO ₃	SM2310B - Titration	Q6	Sample was received above recommended temperature.
			SM2310B - Titration	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG383489	Bicarbonate as CaCO ₃	SM2320B - Titration	Q6	Sample was received above recommended temperature.
		Carbonate as CaCO ₃	SM2320B - Titration	Q6	Sample was received above recommended temperature.
		Hydroxide as CaCO ₃	SM2320B - Titration	Q6	Sample was received above recommended temperature.
	WG383420	Sulfate	D516-02/-07 - Turbidimetric	M1	Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable.
			D516-02/-07 - Turbidimetric	Q6	Sample was received above recommended temperature.
			D516-02/-07 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG383489	Total Alkalinity	SM2320B - Titration	Q6	Sample was received above recommended temperature.
			SM2320B - Titration	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).

Adrian Brown Consultants, Inc.

ACZ Project ID: **L24141**

Metals Analysis

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Aluminum, dissolved	M200.7 ICP
Antimony, dissolved	M200.8 ICP-MS
Arsenic, dissolved	M200.8 ICP-MS
Barium, dissolved	M200.7 ICP
Beryllium, dissolved	M200.8 ICP-MS
Bismuth, dissolved	M200.7 ICP
Boron, dissolved	M200.7 ICP
Cadmium, dissolved	M200.8 ICP-MS
Calcium, dissolved	M200.7 ICP
Chromium, dissolved	M200.7 ICP
Cobalt, dissolved	M200.7 ICP
Copper, dissolved	M200.7 ICP
Gallium, dissolved	M200.7 ICP
Iron, dissolved	M200.7 ICP
Lead, dissolved	M200.8 ICP-MS
Lithium, dissolved	M200.7 ICP
Magnesium, dissolved	M200.7 ICP
Manganese, dissolved	M200.7 ICP
Mercury, dissolved	M245.1 CVAA
Molybdenum, dissolved	M200.7 ICP
Nickel, dissolved	M200.7 ICP
Potassium, dissolved	M200.7 ICP
Scandium, dissolved	M200.7 ICP
Selenium, dissolved	M200.8 ICP-MS
Silver, dissolved	M200.7 ICP
Sodium, dissolved	M200.7 ICP
Strontium, dissolved	M200.7 ICP
Thallium, dissolved	M200.8 ICP-MS
Tin, dissolved	M200.7 ICP
Titanium, dissolved	M200.7 ICP
Vanadium, dissolved	M200.7 ICP
Zinc, dissolved	M200.7 ICP

Soil Analysis

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Conductivity--Humidity Cell Test	SM2510B
Oxidation Reduction Potential (Eh)	D1498-08

Wet Chemistry

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Acidity as CaCO ₃	SM2310B - Titration
Bicarbonate as CaCO ₃	SM2320B - Titration
Carbonate as CaCO ₃	SM2320B - Titration
Hydroxide as CaCO ₃	SM2320B - Titration
Total Alkalinity	SM2320B - Titration

Adrian Brown Consultants, Inc.

ACZ Project ID: L24141

Date Received: 04/03/2015 10:09

Received By: ddp

Date Printed: 5/6/2015

Receipt Verification

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?	☐	☐	☒
2) Is the Chain of Custody or other directive shipping papers present?	☒	☐	☐
3) Does this project require special handling procedures such as CLP protocol?	☐	☐	☒
4) Are any samples NRC licensable material?	☐	☐	☒
5) If samples are received past hold time, proceed with requested short hold time analyses?	☒	☐	☐
6) Is the Chain of Custody complete and accurate?	☒	☐	☐
7) Were any changes made to the Chain of Custody prior to ACZ receiving the samples?	☐	☒	☐

Samples/Containers

	YES	NO	NA
8) Are all containers intact and with no leaks?	☒	☐	☐
9) Are all labels on containers and are they intact and legible?	☒	☐	☐
10) Do the sample labels and Chain of Custody match for Sample ID, Date, and Time?	☒	☐	☐
11) For preserved bottle types, was the pH checked and within limits? ¹	☐	☐	☒
12) Is there sufficient sample volume to perform all requested work?	☒	☐	☐
13) Is the custody seal intact on all containers?	☐	☐	☒
14) Are samples that require zero headspace acceptable?	☐	☐	☒
15) Are all sample containers appropriate for analytical requirements?	☒	☐	☐
16) Is there an Hg-1631 trip blank present?	☐	☐	☒
17) Is there a VOA trip blank present?	☐	☐	☒
18) Were all samples received within hold time?	☒	☐	☐

Chain of Custody Related Remarks

The 'Relinquished By' field on the COC was not completed. The project manager is contacting the client.

Client Contact Remarks

Shipping Containers

Cooler Id	Temp (°C)	Rad (µR/Hr)	Custody Seal Intact?
NA21552	14	16	N/A

Was ice present in the shipment container(s)?

No - Wet or gel ice was not present in the shipment container(s).

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

Adrian Brown Consultants, Inc.

ACZ Project ID: L24141

Date Received: 04/03/2015 10:09

Received By: ddp

Date Printed: 5/6/2015

¹ The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na₂S₂O₃ preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).

Preliminary

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

CHAIN of CUSTODY

Report to:

Name: JEFFREY WINICK

Company: SCHLUMBERGER WATER SERV.

E-mail: JWINICK@SLB.COM

Address: 1875 LAWRENCE STREET, SUITE 500

DENVER, CO 80215

Telephone: +1.303.244.8224

Copy of Report to:

Name: ADRIAN BROWN

Company: ADRIAN BROWN CONSULTANTS

E-mail: abrown@abch2o.com

Telephone: (303) 698-9080

Invoice to:

Name: ADRIAN BROWN

Company: ADRIAN BROWN CONSULTANTS

E-mail: lbrown@abch2o.com

Address: 130 W 4th Ave

Denver CO USA 80223

Telephone: (303) 698-9080

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?

YES

NO

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO"

is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

Are samples for CO DW Compliance Monitoring?

YES

NO

If yes, please include state forms. Results will be reported to PQL.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: CO HYDROGEOCHEMICAL STUDY

Project/PO #:

Reporting state for compliance testing:

Sampler's Name: Beverly Furfaro/ALS

Are any samples NRC licensable material? Yes No

SAMPLE IDENTIFICATION DATE TIME Matrix

CPC143/440-600/Static 2-Apr-15 SO

CPC14-3/600-800/Static 2-Apr-15 SO

CPC14-3/800-1000/Static 2-Apr-15 SO

CPC14-3/1000-1200/Static 7-Apr-15 SO

CPC14-3/1200-1400/Static 7-Apr-15 SO

CPC14-3/1400-1600/Static 7-Apr-15 SO

CPC14-3/1600-1800/Static 7-Apr-15 SO

CPC14-3/1800-2000/Kinetic 7-Apr-15 SO

CPC14-3/440-1000/Kinetic 2-Apr-15 SO

# of Containers	Total Metals	NMP (ABA)	NAG	NA6 Leachate Metals	Total Carbon Leach	TDC Combustion IR	ABA Sulfur forms	Grain Size	HCT
1kg	X	X	X	X	X	X	X		
1kg	X	X	X	X	X	X	X		
1kg	X	X	X	X	X	X	X		
1kg	X	X	X	X	X	X	X		
1kg	X	X	X	X	X	X	X		
1kg	X	X	X	X	X	X	X		
1kg	X	X	X	X	X	X	X		
9kg	X	X	X	X	X	X	X	X	X
9kg	X	X	X	X	X	X	X	X	X

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

Prior to ACZ analysis per quote and COC, from each static pulp comp., pls prepare 200g representative riffle split sample for each static composite for XRD. For each <1/4" kinetic comp., pls split 500g representative material. This should then be sub-split into 2, equal 250g split samples (1 sample for isotopes and 1 for mineral separations). Sample splits will be shipped to laboratories as designated by Jeff Winick. Please contact 303.244.8224 for further instruction.

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:

DATE TIME

RECEIVED BY:

DATE TIME

FRMAD050.01.15.09

White - Return with sample.

Yellow - Retain for your records.

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/440-1000/KINETIC

ACZ Sample ID: **L24142-01**

Date Sampled: 04/02/15 00:00

Date Received: 04/03/15

Sample Matrix: Soil

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sieve- 63 um (230 mesh)	ASA No.9, 15-4.2.2	1	3.6		*	% Passing	0.1	0.5	06/08/15 19:00	brd
Sieve- 125 um (120 mesh)	ASA No.9, 15-4.2.2	1	7.4		*	% Passing	0.1	0.5	06/08/15 19:00	brd
Sieve- 250 um (60 mesh)	ASA No.9, 15-4.2.2	1	11.2		*	% Passing	0.1	0.5	06/08/15 19:00	brd
Sieve- 500 um (35 mesh)	ASA No.9, 15-4.2.2	1	17.4		*	% Passing	0.1	0.5	06/08/15 19:00	brd
Sieve- 850 um (20 mesh)	ASA No.9, 15-4.2.2	1	24.4		*	% Passing	0.1	0.5	06/08/15 19:00	brd
Sieve- 2000 um (2.0 mm)	ASA No.9, 15-4.2.2	1	44.2		*	% Passing	0.1	0.5	06/08/15 19:00	brd
Sieve- 4000 um (4.0mm)	ASA No.9, 15-4.2.2	1	74.8		*	% Passing	0.1	0.5	06/08/15 19:00	brd

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Humidity Cell Test	D5744-12									
Grain Size		1	<6.3 mm						05/11/15 0:00	pta/rjv
Sample Weight		1	1000			g			05/11/15 0:00	pta/rjv

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/440-1000/KINETIC-WEEK 0

ACZ Sample ID: **L24142-02**

Date Sampled: 05/12/15 17:00

Date Received: 04/03/15

Sample Matrix: Leachate

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.7 ICP	1	0.14	B	*	mg/L	0.03	0.2	05/14/15 14:15	jjc
Antimony, dissolved	M200.8 ICP-MS	1		U	*	mg/L	0.0004	0.002	05/15/15 14:39	msh
Arsenic, dissolved	M200.8 ICP-MS	1		U	*	mg/L	0.0002	0.001	05/15/15 14:39	msh
Barium, dissolved	M200.7 ICP	1	0.147		*	mg/L	0.003	0.02	05/14/15 14:15	jjc
Beryllium, dissolved	M200.8 ICP-MS	1	0.00009	B	*	mg/L	0.00005	0.0003	05/15/15 14:39	msh
Bismuth, dissolved	M200.7 ICP	1		U	*	mg/L	0.04	0.2	05/14/15 14:15	jjc
Boron, dissolved	M200.7 ICP	1	0.02	B	*	mg/L	0.01	0.05	05/14/15 14:15	jjc
Cadmium, dissolved	M200.8 ICP-MS	1	0.0007		*	mg/L	0.0001	0.0005	05/15/15 14:39	msh
Calcium, dissolved	M200.7 ICP	1	2		*	mg/L	0.1	0.5	05/14/15 14:15	jjc
Chromium, dissolved	M200.7 ICP	1		U	*	mg/L	0.01	0.05	05/14/15 14:15	jjc
Cobalt, dissolved	M200.7 ICP	1		U	*	mg/L	0.01	0.05	05/14/15 14:15	jjc
Copper, dissolved	M200.7 ICP	1	0.10		*	mg/L	0.01	0.05	05/14/15 14:15	jjc
Gallium, dissolved	M200.7 ICP	1		U	*	mg/L	0.1	0.5	05/14/15 22:23	aeb
Iron, dissolved	M200.7 ICP	1		U	*	mg/L	0.02	0.05	05/14/15 14:15	jjc
Lead, dissolved	M200.8 ICP-MS	1	0.0008		*	mg/L	0.0001	0.0005	05/15/15 14:39	msh
Lithium, dissolved	M200.7 ICP	1	0.026	B	*	mg/L	0.008	0.04	05/14/15 14:15	jjc
Magnesium, dissolved	M200.7 ICP	1	0.5	B	*	mg/L	0.2	1	05/14/15 14:15	jjc
Manganese, dissolved	M200.7 ICP	1	0.030		*	mg/L	0.005	0.03	05/14/15 14:15	jjc
Mercury, dissolved	M245.1 CVAA	1		U	*	mg/L	0.0002	0.001	05/14/15 12:09	mfm
Molybdenum, dissolved	M200.7 ICP	1		U	*	mg/L	0.02	0.1	05/14/15 14:15	jjc
Nickel, dissolved	M200.7 ICP	1		U	*	mg/L	0.008	0.04	05/14/15 14:15	jjc
Potassium, dissolved	M200.7 ICP	1	12.1		*	mg/L	0.2	1	05/14/15 22:23	aeb
Scandium, dissolved	M200.7 ICP	1		U	*	mg/L	0.1	0.5	05/14/15 14:15	jjc
Selenium, dissolved	M200.8 ICP-MS	1	0.0007		*	mg/L	0.0001	0.0003	05/15/15 14:39	msh
Silver, dissolved	M200.7 ICP	1		U	*	mg/L	0.01	0.03	05/14/15 14:15	jjc
Sodium, dissolved	M200.7 ICP	1	8.5		*	mg/L	0.2	1	05/14/15 14:15	jjc
Strontium, dissolved	M200.7 ICP	1	7.430		*	mg/L	0.005	0.03	05/14/15 14:15	jjc
Thallium, dissolved	M200.8 ICP-MS	1	0.0002	B	*	mg/L	0.0001	0.0005	05/15/15 14:39	msh
Tin, dissolved	M200.7 ICP	1		U	*	mg/L	0.04	0.2	05/14/15 14:15	jjc
Titanium, dissolved	M200.7 ICP	1		U	*	mg/L	0.005	0.03	05/14/15 14:15	jjc
Vanadium, dissolved	M200.7 ICP	1		U	*	mg/L	0.005	0.03	05/14/15 14:15	jjc
Zinc, dissolved	M200.7 ICP	1	0.04	B	*	mg/L	0.01	0.05	05/14/15 14:15	jjc

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/440-1000/KINETIC-WEEK 0

ACZ Sample ID: **L24142-02**

Date Sampled: 05/12/15 17:00

Date Received: 04/03/15

Sample Matrix: Leachate

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity--Humidity Cell Test	SM2510B	1	378		*	umhos/cm	1	10	05/11/15 15:00	rjv
End of leach volumes and mass	D5744-12									
Interstitial Weight		1	194			g			05/11/15 0:00	rjv
Leachate Volume Added		1	1000			mL			05/11/15 0:00	rjv
Leachate Volume Recovered		1	826			g			05/11/15 0:00	rjv
Oxidation Reduction Potential (Eh)	D1498-08	1	309		*	mv	1	1	05/11/15 16:00	rjv
pH, Humidity Cell Test	M9045D/M9040C									
pH		1	4.8			units	0.1	0.1	05/11/15 0:00	rjv
pH measured at		1	19.7			C	0.1	0.1	05/11/15 0:00	rjv

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidity as CaCO ₃	SM2310B - Titration	1	10	B	*	mg/L	10	20	05/13/15 12:06	id
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1		U	*	mg/L	2	20	05/14/15 0:00	abd
Carbonate as CaCO ₃		1		U	*	mg/L	2	20	05/14/15 0:00	abd
Hydroxide as CaCO ₃		1		U	*	mg/L	2	20	05/14/15 0:00	abd
Total Alkalinity		1		U	*	mg/L	2	20	05/14/15 0:00	abd
Sulfate	D516-02/-07 - Turbidimetric	5	40.1		*	mg/L	5	25	05/13/15 14:21	thf

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/440-1000/KINETIC-WEEK 1

ACZ Sample ID: **L24142-03**

Date Sampled: 05/19/15 00:00

Date Received: 04/03/15

Sample Matrix: Leachate

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.7 ICP	1	0.13	B	*	mg/L	0.03	0.2	06/03/15 16:04	aeb
Antimony, dissolved	M200.8 ICP-MS	1		U	*	mg/L	0.0004	0.002	06/04/15 10:53	msh
Arsenic, dissolved	M200.8 ICP-MS	1		U	*	mg/L	0.0002	0.001	06/04/15 10:53	msh
Barium, dissolved	M200.7 ICP	1	0.199		*	mg/L	0.003	0.02	06/03/15 16:04	aeb
Beryllium, dissolved	M200.8 ICP-MS	1	0.00006	B	*	mg/L	0.00005	0.0003	06/04/15 10:53	msh
Bismuth, dissolved	M200.7 ICP	1		U	*	mg/L	0.04	0.2	06/03/15 16:04	aeb
Boron, dissolved	M200.7 ICP	1	0.02	B	*	mg/L	0.01	0.05	06/04/15 10:51	aeb
Cadmium, dissolved	M200.8 ICP-MS	1	0.0006		*	mg/L	0.0001	0.0005	06/04/15 10:53	msh
Calcium, dissolved	M200.7 ICP	1	1.7		*	mg/L	0.1	0.5	06/03/15 16:04	aeb
Chromium, dissolved	M200.7 ICP	1		U	*	mg/L	0.01	0.05	06/03/15 16:04	aeb
Cobalt, dissolved	M200.7 ICP	1		U	*	mg/L	0.01	0.05	06/03/15 16:04	aeb
Copper, dissolved	M200.7 ICP	1	0.06		*	mg/L	0.01	0.05	06/03/15 16:04	aeb
Gallium, dissolved	M200.7 ICP	1		U	*	mg/L	0.1	0.5	06/03/15 16:04	aeb
Iron, dissolved	M200.7 ICP	1		U	*	mg/L	0.02	0.05	06/03/15 16:04	aeb
Lead, dissolved	M200.8 ICP-MS	1	0.0009		*	mg/L	0.0001	0.0005	06/04/15 10:53	msh
Lithium, dissolved	M200.7 ICP	1	0.019	B	*	mg/L	0.008	0.04	06/03/15 16:04	aeb
Magnesium, dissolved	M200.7 ICP	1	0.2	B	*	mg/L	0.2	1	06/03/15 16:04	aeb
Manganese, dissolved	M200.7 ICP	1	0.034		*	mg/L	0.005	0.03	06/03/15 16:04	aeb
Mercury, dissolved	M245.1 CVAA	1		U	*	mg/L	0.0002	0.001	06/11/15 16:34	mfm/nc o
Molybdenum, dissolved	M200.7 ICP	1		U	*	mg/L	0.02	0.1	06/03/15 16:04	aeb
Nickel, dissolved	M200.7 ICP	1		U	*	mg/L	0.008	0.04	06/03/15 16:04	aeb
Potassium, dissolved	M200.7 ICP	1	6.8		*	mg/L	0.2	1	06/03/15 16:04	aeb
Scandium, dissolved	M200.7 ICP	1		U	*	mg/L	0.1	0.5	06/03/15 16:04	aeb
Selenium, dissolved	M200.8 ICP-MS	1	0.0006		*	mg/L	0.0001	0.0003	06/04/15 10:53	msh
Silver, dissolved	M200.7 ICP	1		U	*	mg/L	0.01	0.03	06/03/15 16:04	aeb
Sodium, dissolved	M200.7 ICP	1	4.7		*	mg/L	0.2	1	06/03/15 16:04	aeb
Strontium, dissolved	M200.7 ICP	1	5.480		*	mg/L	0.005	0.03	06/03/15 16:04	aeb
Thallium, dissolved	M200.8 ICP-MS	1		U	*	mg/L	0.0001	0.0005	06/04/15 10:53	msh
Tin, dissolved	M200.7 ICP	1		U	*	mg/L	0.04	0.2	06/03/15 16:04	aeb
Titanium, dissolved	M200.7 ICP	1		U	*	mg/L	0.005	0.03	06/03/15 16:04	aeb
Vanadium, dissolved	M200.7 ICP	1		U	*	mg/L	0.005	0.03	06/03/15 16:04	aeb
Zinc, dissolved	M200.7 ICP	1	0.04	B	*	mg/L	0.01	0.05	06/03/15 16:04	aeb

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/440-1000/KINETIC-WEEK 1

ACZ Sample ID: **L24142-03**

Date Sampled: 05/19/15 00:00

Date Received: 04/03/15

Sample Matrix: Leachate

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity--Humidity Cell Test	SM2510B	1	165		*	umhos/cm	1	10	05/18/15 15:00	rjv
End of leach volumes and mass	D5744-12									
Interstitial Weight		1	176			g			05/18/15 0:00	rjv
Leachate Volume Added		1	1000			mL			05/18/15 0:00	rjv
Leachate Volume Recovered		1	901			g			05/18/15 0:00	rjv
Oxidation Reduction Potential (Eh)	D1498-08	1	380		*	mv	1	1	05/18/15 16:00	rjv
pH, Humidity Cell Test	M9045D/M9040C									
pH		1	5.1			units	0.1	0.1	05/18/15 0:00	rjv
pH measured at		1	20.2			C	0.1	0.1	05/18/15 0:00	rjv

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidity as CaCO ₃	SM2310B - Titration	1		U	*	mg/L	10	20	06/02/15 12:38	id
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1		U	*	mg/L	2	20	05/20/15 0:00	abd
Carbonate as CaCO ₃		1		U	*	mg/L	2	20	05/20/15 0:00	abd
Hydroxide as CaCO ₃		1		U	*	mg/L	2	20	05/20/15 0:00	abd
Total Alkalinity		1		U	*	mg/L	2	20	05/20/15 0:00	abd
Sulfate	D516-02/-07 - Turbidimetric	1	28.9			mg/L	1	5	06/05/15 13:24	bsu

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/440-1000/KINETIC-WEEK 2

ACZ Sample ID: **L24142-04**

Date Sampled: 05/26/15 17:00

Date Received: 04/03/15

Sample Matrix: Leachate

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, dissolved	M200.8 ICP-MS	1		U	*	mg/L	0.0002	0.001	06/04/15 10:56	msh
Cadmium, dissolved	M200.8 ICP-MS	1	0.0007		*	mg/L	0.0001	0.0005	06/04/15 10:56	msh
Copper, dissolved	M200.7 ICP	1	0.07		*	mg/L	0.01	0.05	06/03/15 16:07	aeb
Iron, dissolved	M200.7 ICP	1		U	*	mg/L	0.02	0.05	06/03/15 16:07	aeb
Lead, dissolved	M200.8 ICP-MS	1	0.0010		*	mg/L	0.0001	0.0005	06/04/15 10:56	msh
Zinc, dissolved	M200.7 ICP	1	0.05		*	mg/L	0.01	0.05	06/03/15 16:07	aeb

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity--Humidity Cell Test	SM2510B	1	36.3		*	umhos/cm	1	10	05/25/15 15:00	brd
End of leach volumes and mass	D5744-12									
Interstitial Weight		1	171			g			05/25/15 0:00	brd
Leachate Volume Added		1	1000			mL			05/25/15 0:00	brd
Leachate Volume Recovered		1	893			g			05/25/15 0:00	brd
Oxidation Reduction Potential (Eh)	D1498-08	1	269		*	mv	1	1	05/25/15 16:00	brd
pH, Humidity Cell Test	M9045D/M9040C									
pH		1	4.8			units	0.1	0.1	05/25/15 0:00	brd
pH measured at		1	21.0			C	0.1	0.1	05/25/15 0:00	brd

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidity as CaCO ₃	SM2310B - Titration	1	12	B	*	mg/L	10	20	06/02/15 12:52	id
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1		U	*	mg/L	2	20	06/02/15 0:00	abd
Carbonate as CaCO ₃		1		U	*	mg/L	2	20	06/02/15 0:00	abd
Hydroxide as CaCO ₃		1		U	*	mg/L	2	20	06/02/15 0:00	abd
Total Alkalinity		1		U	*	mg/L	2	20	06/02/15 0:00	abd
Sulfate	D516-02/-07 - Turbidimetric	1	28.6			mg/L	1	5	06/05/15 13:24	bsu

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/440-1000/KINETIC-WEEK 3

ACZ Sample ID: **L24142-05**

Date Sampled: 06/02/15 14:00

Date Received: 04/03/15

Sample Matrix: Leachate

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, dissolved	M200.8 ICP-MS	1		U	*	mg/L	0.0002	0.001	06/04/15 10:58	msh
Cadmium, dissolved	M200.8 ICP-MS	1	0.0008		*	mg/L	0.0001	0.0005	06/04/15 10:58	msh
Copper, dissolved	M200.7 ICP	1	0.09		*	mg/L	0.01	0.05	06/03/15 16:10	aeb
Iron, dissolved	M200.7 ICP	1		U	*	mg/L	0.02	0.05	06/03/15 16:10	aeb
Lead, dissolved	M200.8 ICP-MS	1	0.0016		*	mg/L	0.0001	0.0005	06/04/15 10:58	msh
Zinc, dissolved	M200.7 ICP	1	0.07		*	mg/L	0.01	0.05	06/03/15 16:10	aeb

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity--Humidity Cell Test	SM2510B	1	38.9		*	umhos/cm	1	10	06/01/15 15:00	rjv
End of leach volumes and mass	D5744-12									
Interstitial Weight		1	190			g			06/01/15 0:00	rjv
Leachate Volume Added		1	1000			mL			06/01/15 0:00	rjv
Leachate Volume Recovered		1	879			g			06/01/15 0:00	rjv
Oxidation Reduction Potential (Eh)	D1498-08	1	369		*	mv	1	1	06/01/15 16:00	rjv
pH, Humidity Cell Test	M9045D/M9040C									
pH		1	4.6			units	0.1	0.1	06/01/15 0:00	rjv
pH measured at		1	21.0			C	0.1	0.1	06/01/15 0:00	rjv

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidity as CaCO ₃	SM2310B - Titration	1		U	*	mg/L	10	20	06/04/15 10:16	enb
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1		U	*	mg/L	2	20	06/02/15 0:00	abd
Carbonate as CaCO ₃		1		U	*	mg/L	2	20	06/02/15 0:00	abd
Hydroxide as CaCO ₃		1		U	*	mg/L	2	20	06/02/15 0:00	abd
Total Alkalinity		1		U	*	mg/L	2	20	06/02/15 0:00	abd
Sulfate	D516-02/-07 - Turbidimetric	1	28.5			mg/L	1	5	06/05/15 13:24	bsu

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/440-1000/KINETIC-WEEK 4

ACZ Sample ID: **L24142-06**

Date Sampled: 06/09/15 17:00

Date Received: 04/03/15

Sample Matrix: Leachate

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, dissolved	M200.8 ICP-MS	1		U	*	mg/L	0.0002	0.001	06/11/15 2:06	msh
Cadmium, dissolved	M200.8 ICP-MS	1	0.0009		*	mg/L	0.0001	0.0005	06/11/15 2:06	msh
Copper, dissolved	M200.7 ICP	1	0.09		*	mg/L	0.01	0.05	06/11/15 20:33	aeb
Iron, dissolved	M200.7 ICP	1		U	*	mg/L	0.02	0.05	06/11/15 20:33	aeb
Lead, dissolved	M200.8 ICP-MS	1	0.0013		*	mg/L	0.0001	0.0005	06/11/15 2:06	msh
Zinc, dissolved	M200.7 ICP	1	0.07		*	mg/L	0.01	0.05	06/11/15 20:33	aeb

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity--Humidity Cell Test	SM2510B	1	45.3		*	umhos/cm	1	10	06/08/15 14:00	rjv
End of leach volumes and mass	D5744-12									
Interstitial Weight		1	166			g			06/08/15 0:00	rjv
Leachate Volume Added		1	1000			mL			06/08/15 0:00	rjv
Leachate Volume Recovered		1	929			g			06/08/15 0:00	rjv
Oxidation Reduction Potential (Eh)	D1498-08	1	421		*	mv	1	1	06/08/15 15:16	rjv
pH, Humidity Cell Test	M9045D/M9040C									
pH		1	4.6			units	0.1	0.1	06/08/15 0:00	rjv
pH measured at		1	20.4			C	0.1	0.1	06/08/15 0:00	rjv

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidity as CaCO ₃	SM2310B - Titration	1		U	*	mg/L	10	20	06/11/15 12:26	id
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1		U	*	mg/L	2	20	06/10/15 0:00	abd
Carbonate as CaCO ₃		1		U	*	mg/L	2	20	06/10/15 0:00	abd
Hydroxide as CaCO ₃		1		U	*	mg/L	2	20	06/10/15 0:00	abd
Total Alkalinity		1		U	*	mg/L	2	20	06/10/15 0:00	abd
Sulfate	D516-02/-07 - Turbidimetric	1	28.0			mg/L	1	5	06/10/15 15:31	mss2

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/440-1000/KINETIC-WEEK 5

ACZ Sample ID: **L24142-07**

Date Sampled: 06/16/15 17:00

Date Received: 04/03/15

Sample Matrix: Leachate

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, dissolved	M200.8 ICP-MS	1		U	*	mg/L	0.0002	0.001	06/17/15 17:52	mfm
Cadmium, dissolved	M200.8 ICP-MS	1	0.0008		*	mg/L	0.0001	0.0005	06/17/15 17:52	mfm
Copper, dissolved	M200.7 ICP	1	0.09		*	mg/L	0.01	0.05	06/18/15 16:31	jjc
Iron, dissolved	M200.7 ICP	1		U	*	mg/L	0.02	0.05	06/19/15 19:43	jjc
Lead, dissolved	M200.8 ICP-MS	1	0.0013		*	mg/L	0.0001	0.0005	06/17/15 17:52	mfm
Zinc, dissolved	M200.7 ICP	1	0.06		*	mg/L	0.01	0.05	06/18/15 16:31	jjc

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity--Humidity Cell Test	SM2510B	1	98.2		*	umhos/cm	1	10	06/15/15 14:00	rjv
End of leach volumes and mass	D5744-12									
Interstitial Weight		1	159			g			06/15/15 0:00	rjv
Leachate Volume Added		1	1000			mL			06/15/15 0:00	rjv
Leachate Volume Recovered		1	891			g			06/15/15 0:00	rjv
Oxidation Reduction Potential (Eh)	D1498-08	1	420		*	mv	1	1	06/15/15 15:16	rjv
pH, Humidity Cell Test	M9045D/M9040C									
pH		1	5.0			units	0.1	0.1	06/15/15 0:00	rjv
pH measured at		1	21.0			C	0.1	0.1	06/15/15 0:00	rjv

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidity as CaCO ₃	SM2310B - Titration	1		U	*	mg/L	10	20	06/18/15 13:24	tms
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1		U	*	mg/L	2	20	06/17/15 0:00	abd
Carbonate as CaCO ₃		1		U	*	mg/L	2	20	06/17/15 0:00	abd
Hydroxide as CaCO ₃		1		U	*	mg/L	2	20	06/17/15 0:00	abd
Total Alkalinity		1		U	*	mg/L	2	20	06/17/15 0:00	abd
Sulfate	D516-02/-07 - Turbidimetric	1	24.8			mg/L	1	5	06/18/15 15:43	bsu

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/440-1000/KINETIC-WEEK 6

ACZ Sample ID: **L24142-08**

Date Sampled: 06/23/15 17:00

Date Received: 04/03/15

Sample Matrix: Leachate

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.7 ICP	1	0.12	B	*	mg/L	0.03	0.2	06/24/15 17:34	aeb
Antimony, dissolved	M200.8 ICP-MS	1	0.0007	B	*	mg/L	0.0004	0.002	06/24/15 18:43	mfm
Arsenic, dissolved	M200.8 ICP-MS	1		U	*	mg/L	0.0002	0.001	06/24/15 18:43	mfm
Barium, dissolved	M200.7 ICP	1	0.178		*	mg/L	0.003	0.02	06/24/15 17:34	aeb
Beryllium, dissolved	M200.8 ICP-MS	1	0.00008	B	*	mg/L	0.00005	0.0003	06/24/15 18:43	mfm
Bismuth, dissolved	M200.7 ICP	1		U	*	mg/L	0.04	0.2	06/24/15 17:34	aeb
Boron, dissolved	M200.7 ICP	1	0.02	B	*	mg/L	0.01	0.05	06/24/15 17:34	aeb
Cadmium, dissolved	M200.8 ICP-MS	1	0.0008		*	mg/L	0.0001	0.0005	06/24/15 18:43	mfm
Calcium, dissolved	M200.7 ICP	1	1.8		*	mg/L	0.1	0.5	06/24/15 17:34	aeb
Chromium, dissolved	M200.7 ICP	1		U	*	mg/L	0.01	0.05	06/24/15 17:34	aeb
Cobalt, dissolved	M200.7 ICP	1		U	*	mg/L	0.01	0.05	06/24/15 17:34	aeb
Copper, dissolved	M200.7 ICP	1	0.08		*	mg/L	0.01	0.05	06/24/15 17:34	aeb
Gallium, dissolved	M200.7 ICP	1		U	*	mg/L	0.1	0.5	06/24/15 17:34	aeb
Iron, dissolved	M200.7 ICP	1		U	*	mg/L	0.02	0.05	06/24/15 17:34	aeb
Lead, dissolved	M200.8 ICP-MS	1	0.0013		*	mg/L	0.0001	0.0005	06/24/15 18:43	mfm
Lithium, dissolved	M200.7 ICP	1		U	*	mg/L	0.008	0.04	06/24/15 17:34	aeb
Magnesium, dissolved	M200.7 ICP	1	0.6	B	*	mg/L	0.2	1	06/24/15 17:34	aeb
Manganese, dissolved	M200.7 ICP	1	0.068		*	mg/L	0.005	0.03	06/24/15 17:34	aeb
Mercury, dissolved	M245.1 CVAA	1		U	*	mg/L	0.0002	0.001	06/25/15 12:24	nco
Molybdenum, dissolved	M200.7 ICP	1		U	*	mg/L	0.02	0.1	06/24/15 17:34	aeb
Nickel, dissolved	M200.7 ICP	1		U	*	mg/L	0.008	0.04	06/24/15 17:34	aeb
Potassium, dissolved	M200.7 ICP	1	3.6		*	mg/L	0.2	1	06/24/15 17:34	aeb
Scandium, dissolved	M200.7 ICP	1		U	*	mg/L	0.1	0.5	06/24/15 17:34	aeb
Selenium, dissolved	M200.8 ICP-MS	1	0.0004		*	mg/L	0.0001	0.0003	06/24/15 18:43	mfm
Silver, dissolved	M200.7 ICP	1		U	*	mg/L	0.01	0.03	06/24/15 17:34	aeb
Sodium, dissolved	M200.7 ICP	1	0.6	B	*	mg/L	0.2	1	06/24/15 17:34	aeb
Strontium, dissolved	M200.7 ICP	1	8.120		*	mg/L	0.005	0.03	06/24/15 17:34	aeb
Thallium, dissolved	M200.8 ICP-MS	1		U	*	mg/L	0.0001	0.0005	06/24/15 18:43	mfm
Tin, dissolved	M200.7 ICP	1		U	*	mg/L	0.04	0.2	06/24/15 17:34	aeb
Titanium, dissolved	M200.7 ICP	1		U	*	mg/L	0.005	0.03	06/24/15 17:34	aeb
Vanadium, dissolved	M200.7 ICP	1		U	*	mg/L	0.005	0.03	06/24/15 17:34	aeb
Zinc, dissolved	M200.7 ICP	1	0.06		*	mg/L	0.01	0.05	06/24/15 17:34	aeb

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/440-1000/KINETIC-WEEK 6

ACZ Sample ID: **L24142-08**

Date Sampled: 06/23/15 17:00

Date Received: 04/03/15

Sample Matrix: Leachate

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity--Humidity Cell Test	SM2510B	1	102		*	umhos/cm	1	10	06/22/15 12:00	rjv
End of leach volumes and mass	D5744-12									
Interstitial Weight		1	192			g			07/02/15 0:00	pta
Leachate Volume Added		1	1000			mL			07/02/15 0:00	pta
Leachate Volume Recovered		1	834			g			07/02/15 0:00	pta
Oxidation Reduction Potential (Eh)	D1498-08	1	409		*	mv	1	1	06/22/15 13:30	rjv
pH, Humidity Cell Test	M9045D/M9040C									
pH		1	4.8			units	0.1	0.1	06/22/15 0:00	rjv
pH measured at		1	20.6			C	0.1	0.1	06/22/15 0:00	rjv

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidity as CaCO ₃	SM2310B - Titration	1	14	B	*	mg/L	10	20	06/25/15 10:20	id
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1		U	*	mg/L	2	20	06/25/15 0:00	abd
Carbonate as CaCO ₃		1		U	*	mg/L	2	20	06/25/15 0:00	abd
Hydroxide as CaCO ₃		1		U	*	mg/L	2	20	06/25/15 0:00	abd
Total Alkalinity		1		U	*	mg/L	2	20	06/25/15 0:00	abd
Sulfate	D516-02/-07 - Turbidimetric	1	21.4		*	mg/L	1	5	06/24/15 9:52	mss2

Adrian Brown Consultants, Inc.

Project ID:

Sample ID: CPC14-3/440-1000/KINETIC-WEEK 7

ACZ Sample ID: **L24142-09**

Date Sampled: 06/30/15 17:00

Date Received: 04/03/15

Sample Matrix: Leachate

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, dissolved	M200.8 ICP-MS	1		U	*	mg/L	0.0002	0.001	07/01/15 22:29	mfm
Cadmium, dissolved	M200.8 ICP-MS	1	0.0007		*	mg/L	0.0001	0.0005	07/01/15 22:29	mfm
Copper, dissolved	M200.7 ICP	1	0.07		*	mg/L	0.01	0.05	07/02/15 11:42	jjc
Iron, dissolved	M200.7 ICP	1		U	*	mg/L	0.02	0.05	07/02/15 11:42	jjc
Lead, dissolved	M200.8 ICP-MS	1	0.0021		*	mg/L	0.0001	0.0005	07/01/15 22:29	mfm
Zinc, dissolved	M200.7 ICP	1	0.04	B	*	mg/L	0.01	0.05	07/02/15 11:42	jjc

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity--Humidity Cell Test	SM2510B	1	70.6		*	umhos/cm	1	10	06/29/15 11:17	cra
End of leach volumes and mass	D5744-12									
Interstitial Weight		1	162			g			07/02/15 0:00	pta/cra
Leachate Volume Added		1	1000			mL			07/02/15 0:00	pta/cra
Leachate Volume Recovered		1	901			g			07/02/15 0:00	pta/cra
Oxidation Reduction Potential (Eh)	D1498-08	1	325		*	mv	1	1	06/29/15 13:00	cra
pH, Humidity Cell Test	M9045D/M9040C									
pH		1	4.6			units	0.1	0.1	06/29/15 0:00	cra
pH measured at		1	22.6			C	0.1	0.1	06/29/15 0:00	cra

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidity as CaCO ₃	SM2310B - Titration	1		U	*	mg/L	10	20	07/02/15 9:20	enb
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1		U	*	mg/L	2	20	07/01/15 0:00	tms
Carbonate as CaCO ₃		1		U	*	mg/L	2	20	07/01/15 0:00	tms
Hydroxide as CaCO ₃		1		U	*	mg/L	2	20	07/01/15 0:00	tms
Total Alkalinity		1		U	*	mg/L	2	20	07/01/15 0:00	tms
Sulfate	D516-02/-07 - Turbidimetric	1	20.7		*	mg/L	1	5	07/02/15 13:18	bsu