STATE OF COLORADO

**Cazier - DNR, Tim <tim.cazier@state.co.us>**

# M-2021-046 Response to SAR

1 message

**Angela Bellantoni** <angela@envalternatives.com> Mon, Apr 25, 2022 at 3:52 PM
To: "tim.cazier@state.co.us" <tim.cazier@state.co.us>
Cc: Loren <l.komperdo@shaw.ca>, Will Felderhof <will@votixcorp.com>, Dave Felderhof <david@zephyrminerals.com>

Hi Tim

I have the hard copy ready for binding and filing with Clerk in the morning.

***Dr. Angela M. Bellantoni***

**Office Phone: (719) 275-8951**

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April 28, 2022

Tim Cazier
CO Division of Reclamation Mining and Safety, Room 215
1001 E. 62nd Avenue
Denver, CO 80216

RE: Dawson Gold Mine, Permit No. M-2021-046

Dear Mr. Cazier,

On behalf of Mr. David Felderhof, please accept the following response to the Division's March 23, 2022 Second Adequacy Review of Exhibit G. Zephyr submits this focused response to Exhibit G's second adequacy review in order to obtain the Division's approval of the proposed monitoring locations and baseline study SAP/QAPP. As Zephyr has shared during meetings, upon approval, Zephyr will withdraw the mine application and proceed with constructing the wells and commence the baseline study.

Item 37: The legend and permit boundary are added to Figures 1 and 2. Wells 73772, 99071 and The Keller Well are shown on Exhibit C.

Item 39: The applicant's driller will provide the additional monitoring well construction detail as requested.

The construction details for the existing monitoring wells (North Well and South Well) are limited to the State's well permit file database and well construction forms. Based on those records and forms, the wells are not completed with a gravel pack, so there are no details to provide regarding the size and type of gravel pack installed in the wells. The permit files indicate that 40 feet of surface casing was installed and grouted into place for each well before the drilling of the lower boreholes and installation of 4.5-inch PVC casing in the open boreholes for the wells. The drilling approach and surface casings separated the grout seal from the open boreholes in the wells. The well sumps will not have an impact on the water level or water quality monitoring for the mine. Water level measurements and water quality samples will continue to be collected consistent with the monitoring plan.

The faulting discussed in Section 2.7.1 is the same faulting as the unnamed fault shown in the available geologic mapping (Miscellaneous Investigations Series Map I-869). Accordingly, it appears that the referenced unnamed faulting is the Wet Mountain Frontal Fault as indicated in Figure 2.4.2-1.

Regarding the use of a 5-foot cut-off in the modelling summary and the identified 20-foot water level change trigger, these values were determined independently. The modelling was first performed to identify potential changes in water level in the aquifers surrounding the mine as a result of the mine dewatering. The summary of the model output was truncated at 5 feet to facilitate that investigation and discussion. Well completion information for existing nearby wells was then reviewed. It was determined based on the existing well information that water levels would need to change by 20 feet or more to cause an impact to the operation of those neighboring wells. As highlighted by this discussion, we do not expect water level changes to occur in neighboring wells that would result in impacts to well operation. Water level measurements in the compliance well will be sufficient to monitor water level changes in the aquifer as a result of mining in the neighboring wells. Water level changes of 20 feet or more would need to be observed in the compliance well for there to be impact to the nearby neighboring wells

Item 40: The wells are identified as the Division recommended. Figure 1 revision for CW-1.

The text in Section 2.7.4.1 is revised to identify the compliance well as CW-1. Table 2.7.4-1 is revised to reflect analytical methods will be followed that detect dissolved metals.

Due to the inability to submit five quarters of data to the Division prior to the current decision date, upon the Division's approval of the location of the proposed new monitoring wells, compliance well and surface water monitoring locations, the application will be withdrawn. The subsequent application will include a revised affected area boundary that includes all monitoring well locations.

Figure 3 is revised to distinguish between surface and groundwater sampling locations.

As stated in Item 39 above, the monitoring well driller was not able to be reached to obtain regarding general construction details. The wells will be sampled as described in Section 6 of the QAPP. The anticipated formation of completion for the monitoring wells is provided on Figure 2 and in Table 2.7.4.1-1. The new monitoring wells will be constructed soon after the necessary funds are raised.

Item 41: The compliance well identification is CW-1. The last paragraph of Section 2.7.4.1 is revised as directed by the Division.

Item 42: During the baseline water quality investigation, Angela Bellantoni will be the designated QAO and Loren Komperdo will be the designated Dawson Gold Mine Manager. References to Appendix F are removed from the QAPP. Regarding groundwater monitoring, the QAPP supersedes the AMEC reports. The AMEC reports only pertain to the FTSF. This will be further clarified in the subsequent application that will be submitted after the monitoring wells have been constructed and sampling and monitoring has begun. The QAPP is revised to include Sections 5 and 6, the Sampling and Analysis Plan (SAP). The SAP includes by reference ASTM standards for groundwater sampling and monitoring procedures. The ASTM standard numbers and titles are provided in the SAP text as well as in References.

Item 43: Table 2.7.4-1 is revised to reflect analytical methods will be followed that detect dissolved metals.

Item 45: Figure 1 is revised to include Well 73772.

Exhibit C is revised to include all tributary water courses, wells, springs, stock water ponds, reservoirs and ditches on the affected land and on adjacent lands where such structures or water are within two (2) miles of the proposed affected lands.

Item 46: Mine pool monitoring, if present, will be addressed in a subsequent adequacy response. The SAP does not include monitoring of the mine pool since it does not exist at this time. The SAP will be revised in a subsequent submission to address monitoring of mine pool water quality, if mine pool exists.

Item 47: To provide clarification regarding potential impacts to Grape Creek resulting from the dewatering of the mine, we believe that Grape Creek could only theoretically be impacted in select areas and that impacts that could occur in these areas will be minimal and unmeasurable.

Depletions from the dewatering will not communicate across multiple faults and through multiple geologic units to impact the lower reaches of Grape Creek nor through the mapped faulting to impact the upper portions of Grape Creek. The general pattern of fractures in this area is north to south at right angles to the Wet Mountain Frontal Fault as such it is highly improbable that facture communication between the mine and Grape Creek is possible. Out of an abundance of caution, MW-5 will be located between the mine and this stretch of Grape Creek and can be used to observe potential changes in the water table that would be indicative of improbable but potential impacts to Grape Creek.

Regarding the surface water monitoring locations identified for Grape Creek, the sites have been located in publicly accessible areas and will measure background and future stream flow conditions at two monitoring sites on Grape Creek, an upstream and downstream site. Grape Creek is a surface water source that flows over and interacts with the underlying geology and water table along its course and, as discussed, has theoretical potential for impact from the mine dewatering. We expect those impacts will be minimal and unmeasurable, but stream flow will be measured to confirm this expectation and monitor any potential impact. Although the creek may be impacted at certain locations or over certain reaches along its course, those impacts, if they occur at measurable levels, can be measured in the stream anywhere downstream from the location of that impact. Accordingly, the proposed surface monitoring locations will measure stream flow in Grape Creek and will be sufficient to identify changes in stream flow associated with the mine dewatering, if they do occur at measurable levels, recognizing that stream flow fluctuates from year to year and over the course of a year. There is no need to update the surface monitoring point locations to account for an area of the creek that may be affected by mining where there are no barriers to flow between the mine and the creek. The Grape Creek surface water monitoring locations are sufficient to measure and observe stream flow conditions in the creek and investigate changes to stream flow that may occur as a result of the mine dewatering.

Please feel free to contact me directly with any questions.

Respectfully submitted,

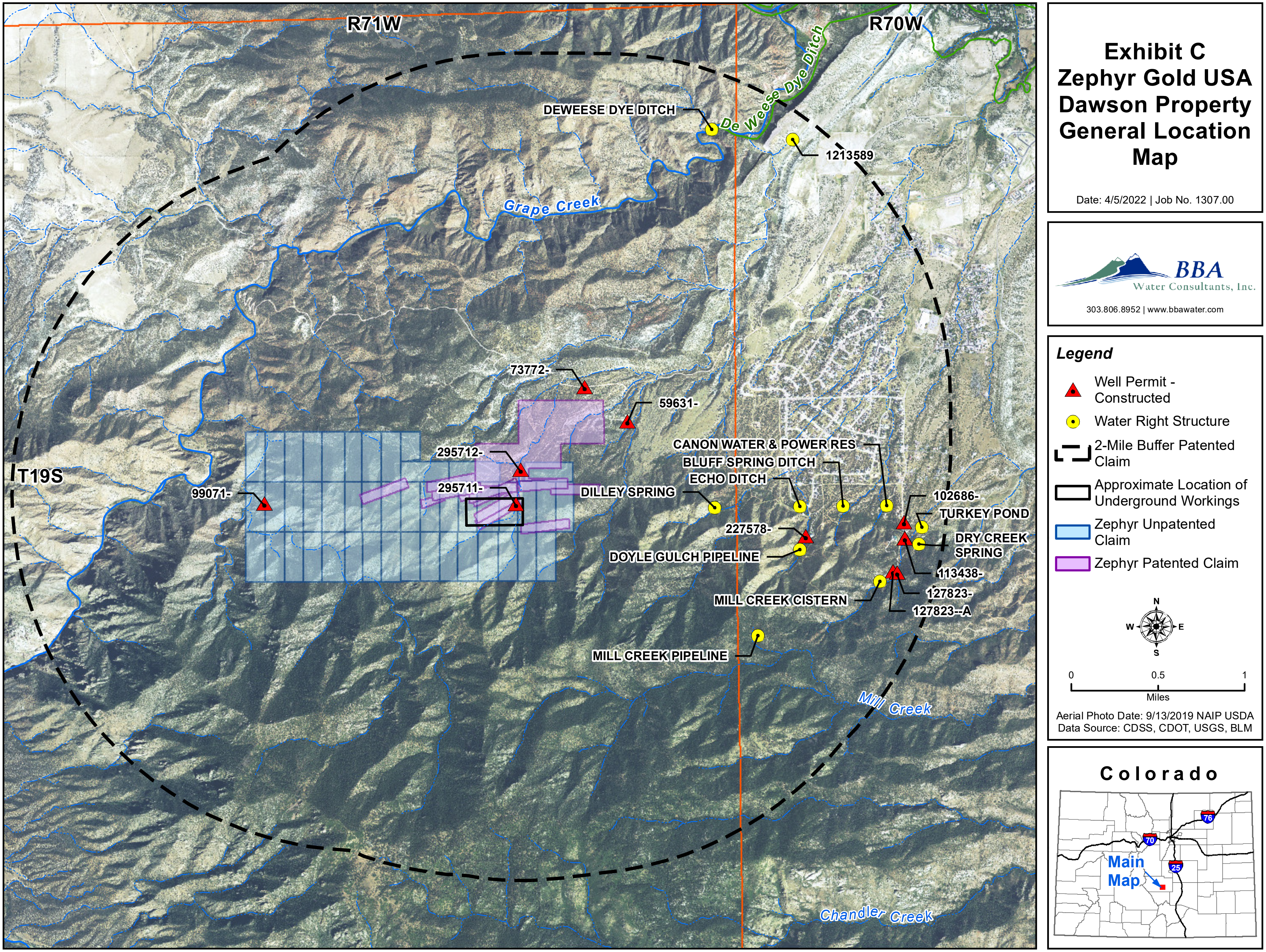
Angela M. Bellantoni

Angela M. Bellantoni Ph.D.

Cc: L. Komperdo, W. Felderhof and D. Felderhof, Zephyr

# Exhibit C
# Zephyr Gold USA Dawson Property General Location Map

Date: 4/5/2022 | Job No. 1307.00




BBA Water Consultants, Inc.

303.806.8952 | www.bbawater.com

Aerial Photo Date: 9/13/2019 NAIP USDA
Data Source: CDSS, CDOT, USGS, BLM

## 2.7 Exhibit G: Water Information

Bishop Brodgen and Associations, Water Consultants, specifically Timothy A. Crawford and Christopher J. Sanchez, prepared the contents of this exhibit on behalf of Zephyr USA.

As discussed below, the proposed mining operation is expected to intercept ground water and has the potential to affect surface or ground water systems at and in the vicinity of the proposed mine location. Provided below is information that describes the surface and ground water systems and provides details regarding potential impact on those systems as a result of the proposed mining. As summarized below, any impact that may result from the mine to ground and surface water systems is expected to be minimal and inconsequential.

### 2.7.1 Property and Water Information Summary

The proposed Zephyr Dawson property gold mine is located as presented in the attached Figure 1 which encompasses the affected land and adjacent land where impacts may potentially be observed. The proposed mine is located in Fremont County approximately 5.9 miles southwest of Canon City, Colorado.

Windy Gulch and Dawson Gulch flow through and around the mine in the immediately vicinity of the property and locally drain the foothills to the south and surrounding the property. These gulches are typically dry and only flow during large precipitation events. Grape Creek is a larger, perennial surface water feature that drains a larger basin to the west and southwest of the property The surface drainages are located as presented in Figure 1.

The surface geology at the property is mapped as Precambrian granodiorite consisting of massive to foliated, medium to coarse grained granodiorite and lesser amounts of quartz monzonite and quartz diorite (Miscellaneous Investigations Series Map I-869). The subsurface at the property contains part of a thin, but laterally extensive zone of gold and base-metal mineralization that trends east-northeast and dips to the south-southeast. This is the targeted gold seam. To the north of the property, the Precambrian granodiorite material contacts sedimentary bedrock including the Dakota formation and the Morrison Formation along an unnamed east-west, steeply dipping fault. Local terrace deposits (unconsolidated quaternary material) are also mapped in the general vicinity of the property. The mapped surface geology in the vicinity of the site is presented in Figure 2.

Available well data, including data from two monitoring wells at the property, indicate that the Precambrian granodiorite (a fractured hard rock unit, “Precambrian material”) and the Dakota formation are locally saturated and transmit water. For the purposes of this summary, the Precambrian material and the Dakota formation are considered aquifers. The extent of the saturation within the aquifer systems may be limited based on observations from the monitoring wells. Other geologic units identified in Figure 2 are not considered to be aquifers. Regional ground water gradients in the aquifers are generally towards the north in the Precambrian material from the mountainous areas south of the mine and towards the east/northeast in the Dakota formation towards the center of the Canon City Embayment.

Local recharge sources are mainly limited to precipitation that infiltrates the formations either as direct recharge or along drainages during runoff where they are present at the surface. Grape Creek to the north of the mine area appears to be in connection with the Precambrian material based on winter base flow conditions and the perennial nature of the creek. Based on the local topography, Grape Creek appears to be a gaining stream draining the Precambrian material immediately adjacent to it.

The mine will be completed in the Precambrian material, which is saturated below the water table based on nearby borehole data, including monitoring wells associated with the mine. The mine is expected to intercept some ground water within that material and will be dewatered to allow for mining. The Precambrian material beneath the mine has limited primary porosity (pores and spaces intrinsic to the rock unit) and ground water encountered by the mine will be water stored in fractures (secondary porosity) that drain into the mine. Dewatering of ground water encountered by the mine will be required to facilitate mining. The dewatering of the mine will lower the water level within the mine and cause water from nearby, connected fractures to enter the mine. The dewatering of the mine will also result in ground water gradients towards the mine, causing water in the aquifer around the mine to flow into the mine and through the dewatering system. This dewatering will be required over the life of the mine, but could require relatively low dewatering rates depending on the level of interconnectedness between the fracture system around the mine. When dewatering ceases, the fractured rock aquifer system adjacent to the mine is expected to refill to a pre-mining condition.

Any changes in water quality that occur within the mine or the affected area will be mostly captured or at least influenced by the mine dewatering that will cause any impact to the ground water system to be drawn towards and into the mine limiting the potential for changes in water quality to impact aquifers or wells at distance from the mine and the affected area.

Accordingly, the mine does have the potential to impact ground water systems in the vicinity of the proposed mine as a result of the mine dewatering in the form of water level changes in the aquifers. The ground water level changes have the potential to indirectly impact surface water systems in the form of stream depletions. The areas adjacent to the mine in which ground water or surface water could potentially be depleted was determined using a MODFLOW model which was used to simulate dewatering of the mine, ground water level changes in the aquifer system, and depletions to surface streams. Details regarding the MODFLOW modelling are presented in Appendix L. Based on the modelling investigation ground water level impacts potentially resulting from dewatering were limited to no more than 5 feet at a distance of approximately 1.1 miles from the mine assuming interception of ground water and constant dewatering operations over the life of the mine. Wells and surface water features outside of this approximately 1.1-mile radius will essentially not be impacted by ground water level changes caused by the mine dewatering.

Available Division of Water Resources well database information and mapping were used to identify wells located near the property and the results of a MODFLOW model of the mine dewatering were used to identify which of those wells were close enough that their potential for impact should be investigated further. This review identified 5 wells that should be investigated further. Information associated with these nearby wells are summarized in the table below.

Table 2.7.1-1: Existing wells identified for further investigation.

| Permit No. | Owner | Depth (ft) | Use | Distance from Underground Workings (ft) | Lithology |
|---|---|---|---|---|---|
| 295711 | Zephyr Gold USA LTD | 140 | Monitoring | N/A | Precambrian |
| 295712 | Zephyr Gold USA LTD | 220 | Monitoring | 813 | Dakota formation |
| 59631 | Keller Randy & Whited Jeri Jean | 88 | Domestic / Stock | 3,982 | Dakota formation |
| 73772 | Joe Spurgin | 231 | Household | 3,821 | Precambrian |
| 99071 | Ronald McClain | 60 | Domestic | 6,142 | Precambrian |

The first two wells are monitoring wells owned by Zephyr Gold USA LTD and are currently used and will continue to be used to monitor actual ground water level changes caused by the mining. The Well Construction and Test Report (GWS-31) are on file with the DWR and provided herein.

There are only two wells located within 1 mile of the mine, Permit No. 59631 (the Keller Well) and Permit No. 73772. These wells are located approximately 3,982 feet and 3,821 from the underground mine workings, respectively. These wells are generally located to the northeast of and downgradient from the mine workings and affected area. As presented, both of these wells are separated from the mine workings by faulting which will limit the potential for any changes in quantity or quality in the wells from the operation of the mine.

#### 2.7.1.1 Permit No. 295712

The well completed under Permit Number 295712 (the North Well) was completed in sedimentary bedrock material. The lithologic log for the well identifies clay, shale, slate and sandstone material. Based on the lithologic log for the well and the available geologic mapping (Miscellaneous Investigations Series Map I-869), the well is completed in the Lytle Sandstone Member of the Dakota Sandstone / Purgatoire Formation.

#### 2.7.1.2 Permit No. 2957111

The well completed under Permit Number 295711 (the South Well) was completed in granitic bedrock material. The lithologic log for the well identifies granite material. Based on the lithologic log for the well and the available geologic mapping, the well is completed in a Quartz Diorite or Migmatic Gneiss material.

#### 2.7.1.3 Permit No. 59631

Permit No. 59631 (the Keller Well) is located to the northeast of the property on the American Placer as shown in Figure 1, was permitted for domestic and stock uses, was constructed in September of 1972 to a total depth of 88 feet with steel casing and perforated sections. The well had an original static water level of 67 feet and reported a pumping rate of 14 gpm. The well is constructed in the sedimentary bedrock material neighboring the Precambrian material and, accordingly, is not completed in the same geologic material as the mine.

This well is located in a location indicated by the modelling that will experience less than 5 feet of water level change as a result of mining. The well is separated from the mine by faulting which may mute the projected impacts. The model conservatively assumed perfect hydraulic communication across the faulting which may not be the case in reality. The fault may act as either a barrier to ground water flow or as a potential source of water to the aquifer. Either condition would reduce the communication of water level changes across the faulting and to the neighboring well.

Although the water level in the aquifer may change slightly at the location of this well, the changes will be small and the well should still be capable of producing its permitted pumping rate. If water level changes do impact the pumping rate from the well (which is not expected) the well could be redrilled to a deeper depth.

The northern monitoring well which is completed in the Dakota and a proposed future downgradient monitoring well will provide insight regarding actual impacts experienced by this well.

The separation of the well from the mine by distance and the local faulting will limit any water quality impacts to the well.

#### 2.7.1.4 Permit No. 73772

Permit No. 73772 is also located to the northeast of the property as shown in Figure 1, was permitted for household uses, was constructed in November of 1974 to a total depth of 231 feet with steel casing and perforated sections. The well had an original static water level of 195 feet and reported a pumping rate of 1 gpm. The lithologic log for the well indicates it is also constructed in Precambrian material similar to the material targeted by the mine, but is located to the north and on the opposite side of the local faulting from the mine.

This well is located in a location indicated by the modelling that will experience less than 5 feet of water level change as a result of mining.

Although the water level in the aquifer will change, the changes will be small and the well should still be capable of producing its permitted pumping rate even during and at the end of mine operations when impacts will be the greatest. If water level changes do impact the pumping rate form the well (which is not expected) the well could be redrilled to a deeper depth.

The separation of the well from the mine by distance and the local faulting will limit any water quality impacts to the well.

#### 2.7.1.5 Permit No. 99071

Permit No. 99071 indicates a location to the west of the property as shown in Figure 1, was permitted for domestic uses and was constructed in June of 1956 (almost 65 years old) to a depth of approximately 60 feet. No construction details are available from the late registration filing for the well. The well would be expected to be constructed in the same the Precambrian material as the mine at the indicated location.

Based on available mapping, this well may be mislocated or may no longer be used. There is no residence at the location of the well indicated by the State's database nor any road to any residence in the general area. This well may not exist at the plotted location.

If the well exists, it is located in a location indicated by the modelling that will experience less than 5 feet of water level change as a result of mining.

Although the water level in the aquifer will change, the well, if it exists, should still be capable of producing its permitted pumping rate even during and at the end of mine operations when impacts will be the greatest. If water level changes do impact the pumping rate from the well (which is not expected) the well could be redrilled to a deeper depth.

### 2.7.2 Potential Surface Water Impacts

Windy Gulch and Dawson Gulch are mostly dry creeks and are separated from the ground water system beneath the mine. Accordingly, these local drainages will not be impacted by the mine operations. Grape Creek which appears to be in connection with the Precambrian material immediately adjacent to the creek, but is located outside of the area of ground water level change impact indicated by the modelling.

Grape Creek generally flows from the south/southwest to the north/northeast and is generally located to the west of the mine workings that will be dewatered. In its upper reaches, Grape Creek flows over Precambrian material and in its lower reaches flows over sedimentary units before discharging to the Arkansas River. The lower reaches of the creek are separated from dewatering activities in the mine due to the different geologic units between the mine and those reaches, but also due to the significant faulting in the area. Certain portions of the upper reaches of the creek may have potential for depletion where mapped faulting is not present between the mine and the creek. For example, depletions may occur in a portion of the creek as it flows through nearby Sections 20 and 16. This reach is located approximately 1.5 to 3 miles from the mine workings.

Grape Creek will not be directly impacted by the changes in water level in the aquifer. Grape Creek is considered a point of connection with the aquifer in the context of water rights in that some surface water feature must be identified as a point of depletion and this is the closest and most likely point of connection between the ground water system and the surface water system. Actual measurable impacts to Grape Creek are unlikely because physical impacts would require the complete interconnectedness of fractures between the mine and Grape Creek to allow for a physical pathway, which is unlikely.

No other springs, stock water ponds, reservoirs or ditches were identified within an approximate 1-mile area. Figure 1 presents the location of the affected property area as well as the locations of the identified tributary water courses and drainages and wells that could potentially be affected by the proposed mining operations.

### 2.7.3 FTSF Leachate

#### 2.7.3.1 FTSF Leachate Characterization

Acid base accounting results for the tailings and development rock samples classify all material as non-potentially acid generating. All but one sample had sulfide sulfur at or below the detection limit of 0.01 wt%. One development rock sample had 0.03 wt% sulfide sulfur. All tailings and development rock samples had a carbonate neutralization to acidity production ratio greater than 4. Material with a ratio greater than 2 is considered non-potentially acid generating. Paste pH for all samples ranged from 6.9 to 9.7, indicating no net acidity is currently being produced.

The FTSF leachate will be dominated by the quality of the tailings filtrate entrained in the tailings. Filtrate from altered and unaltered tailings, generated during the metallurgical testing that produced the tailings, was directly analyzed using ICP-MS. Results were compared to the EPA effluent criteria (40 CFR Part 440 Subpart J), surface water quality standard for Grape Creek (5 CCR 1002-32), groundwater quality standard (5 CCR 1002-41) and baseline groundwater quality at the site. The filtrate meets all three standards and is similar or less than the background groundwater quality, with the following exceptions:

- Nickel and selenium concentrations exceed the surface water quality standard; however, they meet the groundwater quality standard and are similar to background groundwater concentrations
- Manganese concentration exceeds the groundwater standard, but is similar to background groundwater concentrations
- Potassium concentration is greater than background groundwater concentrations; however, there are no surface nor groundwater standards for potassium.

The evolution of tailings leachate quality is currently being assessed through humidity cell testing. These tests are ongoing. To date, many metals have not been detected after the initial filtrate was flushed.

Metal release from development rock was assessed using the shake flask extraction (SFE) test. SFE tests were done on all 5 development rock samples. The SFE test is similar to the Synthetic Precipitation Leaching Procedure (SPLP), the difference being the SFE test is conducted at a 3:1 water to solid ratio for 24 hours whereas the SPLP test is conducted at a 20:1 water to solid ratio for 18 hours. All other aspects of the procedures are the same. The SFE test was chosen because it produces a more concentrated solution (without hitting solubility limits) that enables detection of some elements that could otherwise be missed. This is a more conservative approach to the State of Colorado's leach test requirement.

Results from the SFE tests show few detectable trace metals. Metals and metalloids detected include aluminum, antimony, arsenic, barium, copper, lead, manganese, molybdenum and uranium. All parameters met the water quality standard for Grape Creek and the groundwater quality standard. The exception is lead, where 3 of the 5 samples exceeded the water quality standard for Grape Creek. Lead concentrations ranged from <0.0005 mg/L to 0.0057 mg/L. The water quality standard for Grape Creek is 0.001 mg/L. All SFE tests produced slightly alkaline pH. No sulfate was detected.

#### 2.7.3.2 FTSF Seepage Quality

The seepage from the FTSF will comprise of filtrate introduced to the facility with the tailings, infiltration water that contacts the tailings and infiltration water that contacts the support buttresses (development rock). The contributions from development rock and tailings were combined in proportion to the tonnage of each material expected in the FTSF, utilising the seepage volume reported in “Pre-Feasibility Study Report – Dawson Filtered Tailings Storage Facility” (Amec Foster Wheeler, 2016). The estimated seepage quality thus derived was then compared to the groundwater quality standard and the baseline groundwater quality to ascertain its suitability for discharge.

In deriving the seepage quality estimate, a number of assumptions were made:

- All infiltration water contacting the tailings will acquire the quality of filtrate
- Leaching of development rock in the FTSF will occur at a 1:1 water to solid ratio
- The metal release in the SFE tests represent an ongoing release rate as opposed to total soluble metal available
- No elements precipitate out of solution
- The ratio of tailings volume to development rock volume is the same as the ratio of tailings footprint area to buttress footprint area.

The FTSF is expected to contain 500,000 short tons of tailings and 4,200 short tons of development rock. Tailings filtrate quality will dominate the FTSF seepage quality. The predicted seepage quality meets the groundwater quality standard, with the exception for manganese. However, the predicted manganese concentration (0.071 mg/L) is less than the background groundwater concentration (0.14 mg/L). The groundwater quality standard is 0.05 mg/L.

The predicted seepage quality presented herein would be reflective of short term and operating conditions. The seepage quality estimates for the long term will be developed once the kinetic tests on tailings are complete.

Test data and a detailed discussion of the geochemical characterization of the FTSF is provided in Appendix B.

### 2.7.4 Monitoring Well Network

The following monitoring program, including the QAPP in Appendix M, will be implemented to obtain groundwater quality and water level data for both baseline and during mill/mine operations. Water quality monitoring will occur quarterly and water level data will occur monthly throughout the life of the mine. Analytical results will be compared to the most restrictive groundwater standard in WQCD Regulation No. 41 provided in Tables 2.7.4-1 and 2.7.4-2.

An existing monitoring plan has been implemented at the property including two monitoring wells and two surface monitoring locations. The monitoring plan includes the collection of water levels in the existing wells, observation of surface flow conditions and the collection of water quality samples from both the surface and ground water systems. The existing monitoring plan monitors both of the surface drainages that cross the property and both of the aquifers identified beneath the property. The monitoring of these locations will be performed on a quarterly basis. The locations of the monitoring points have also been shown in Figure 1 (Permit Nos. 296711 and 296712). An additional proposed future downgradient monitoring well is planned for construction to allow for additional monitoring of water level changes in the aquifers.

A new monitoring well network has been proposed with wells located as presented in Figure 3. The newly proposed monitoring well network, as presented, includes:

- Two sets of wells at the upgradient boundary to investigate ground water conditions entering the affected area. For each set of wells, one well will be completed in the Precambrian material upgradient of mapped faulting, and one well will be completed in the sedimentary materials down gradient of mapped faulting. These wells will help define how the existing faulting impacts ground water flow and ground water conditions entering the affected area.

- One well in the relative center of the affected area. This well will be completed in the sedimentary materials and will help investigate how ground water flow and quality may change as it flows through the affected area.

- One well below all of the surface mine workings. This well will be completed in the sedimentary materials and will help investigate the impact of the mine workings on the ground water flow and quality. This will be the last well above the point of compliance well discussed below.

This monitoring well network represents a more robust monitoring network that will provide additional data points (compared to the existing wells) to investigate ground water flows (quantity and quality) beneath the affected area. The wells will provide water level data that can be used to determine flow direction, monitor water level changes as mining progresses and investigate the impact of faulting on ground water flow as well as provide the opportunity for water quality sampling.

The monitoring wells completed in the Precambrian material at the upgradient boundary of the affected area will either be constructed to the total depth of the mine or will be competed such that they can be deepened in the future such that they can be used over the life of the mining (and dewatering) operations. The monitoring wells in the sedimentary wells will be completed to a depth of 200 feet or to fully penetrate the Dakota formation, which ever depth is shallower. This sedimentary well construction will allow for the monitoring of ground water conditions in the productive sedimentary units beneath the affected area throughout the life of the mining operations.

In addition, to monitor potential impacts to Grape Creek, a monitoring location has been located on Grape Creek, as presented in Figure 3. Stream gaging and water quality analyses will be performed at this location to monitoring conditions in the creek and potential impacts.

#### 2.7.4.1 Point of Compliance Well(s)

To meet the requirements of Rule 3.1.7(6), one or more down gradient wells shall be established as the location to demonstrate compliance with any condition established to protect ground water. For a new facility, such as the Zephyr Gold Mine, this includes a point of compliance at the hydrologically down gradient limit of the area below the facility potentially impacting ground water.

One point of compliance well location has been identified as presented in Figure 3 and identified as CW-1.

This point of compliance will be sufficient to demonstrate compliance with established ground water protection conditions as ground water will move northwards out of the Precambrian material into the sedimentary material, where ground water will then flow northeast towards the Canyon City Embayment and the identified point of compliance well location. The point of compliance well will be completed in the sedimentary rock units. The presented point of compliance well location is well suited to identify ground water conditions leaving the affected area.

If the point of compliance well exhibits a change in water level that indicates that a nearby domestic well would not be capable of producing a residential supply, the neighboring well owners will be contacted to confirm operating conditions in their well. If their well is exhibiting conditions associated with a decline in performance due to a depressed water level, the Applicant will work with the well owners to investigate the pumping conditions in their well and either 1) lower the pump equipment in the well or 2) replace the neighboring well with a deeper well. A water level change of at least 20 feet would need to be observed in the point of compliance well to indicate that mining operations are causing problematic water level changes in neighboring wells. Because of the distance between the mine and existing wells and the geologic separation between the mine and the wells, we believe that it is extremely unlikely that any such impacts will occur.

If the point of compliance well exhibits an exceedance of ground water quality conditions, the Applicant will contact the neighboring well owners and provide the Division a written report within five (5) working days. The Applicant will immediately initiate a groundwater investigation to determine the source of contamination and will begin groundwater mitigation efforts as soon as possible to prevent continued negative groundwater quality and/or quantity impacts. In addition, the neighboring wells will be monitored to confirm whether the condition is exceeded in the neighboring wells through water quality testing and a water supply will be delivered to a new cistern at the neighbor's residence for use until the exceedance is no longer present at the compliance well. Water will continue to be delivered until the exceedance is no longer present or until the end of the mining operations.

Table 2.7.4.1-1: Monitoring and Sampling Locations

| Monitoring Site | Type | Condition | UTM X | UTM Y |
|---|---|---|---|---|
| MW-1 | Ground Water | Proposed | 474437.2 | 4249815 |
| MW-2 | Ground Water | Proposed | 474195 | 4249568 |
| MW-3 | Ground Water | Proposed | 474069 | 4249264 |
| MW-4 | Ground Water | Proposed | 473680.2 | 4249533 |
| MW-5 | Ground Water | Proposed | 473166.2 | 4249480 |
| CW-1 (Compliance Well) | Ground Water | Proposed | 474894.5 | 4250058 |
| North Well | Ground Water | Existing | 474128 | 4249407 |
| South Well | Ground Water | Existing | 474083 | 4249087 |
| Grape Creek U/S | Surface Water | Proposed | 471532.4 | 4251102 |
| Grape Creek D/S | Surface Water | Proposed | 476722.2 | 4253345 |
| Dawson Surface Point | Surface Water | Existing | 474096.9 | 4249379 |

### 2.7.5 Dewatering and Runoff Pollution Protection Plan

Consistent with CDPHE and DRMS rules, the proposed mining will need to be performed in a manner to prevent unnecessary degradation of the property and adjacent lands.

Protection of the property and adjacent lands from runoff and dewatering / process water discharge impacts and pollution will be managed separately. Stormwater runoff water from surrounding land will be captured in stormwater channels and directed to the natural drainage; flowing from the area at historic rates. Stormwater runoff from the mill site will be channeled to the sedimentation pond/stormwater detention pond at the north end of the overburden stockpiles. Dewatering and process water not reused in the milling process will be discharged to the sedimentation pond.

#### 2.7.5.1 Stormwater Sedimentation and Detention Pond

Diversion channels, drainage ditches, culverts and sediment barriers will be implemented at the surface and around roadways to reduce sediment load and slow surface water runoff. All surface runoff will be diverted through sediment control devices such as silt fences, check dams, vegetated swales, rip rap or other appropriate devices before runoff enters any existing drainage.

Clean water will be routed around tailing piles and low seepage rates are expected from tailing pile areas. Tailing pile areas will include buttress and shell placement areas as well as underdrain systems that will capture any seepage from tailing areas and discharged to a geomembrane-lined contact water pond.

It is noted that the drainages that cross the property are mostly dry and flow only during high precipitation events.

A stormwater detention pond is proposed to control stormwater drainage at the property. Based on the Mile High Flood District's Urban Storm Drainage Criteria Manual Volume 2, the stormwater detention pond should be sized to temporarily store a minimum of 10% of the 100-year flood flow to achieve a reduction of 10% of the 100-year flood flow through the structure. The drainage above the property that will flow through the affected area is estimated to be approximately 330 acres in size. The 100-year precipitation event for the property area is estimated to be 4.75 inches over a 24-hour period. Accordingly, the 100-year flood event could introduce approximately 130 acre-feet to the drainage, but a significant portion of this precipitation will infiltrate the subsurface as opposed to flow in the drainages as live flow. Based on a conservative estimation that 50% of the precipitation of ta 100-year flood event infiltrates and the remaining 50% results in live stream flow, the stormwater detention pond should be sized for the storage of up to approximately 6.5 acre-feet or 2.1 million gallons should be adequate to control the potential stormwater runoff. There are no stream gages on Windy Gulch or Dawson Gulch to confirm the flow assumptions presented above.

#### 2.7.5.2 Dewatering Tanks

Two 5000 gallon tanks are proposed to receive dewatering water not utilized in the ore processing. Excess water from the tanks, not used in the mill process will be discharged in the natural drainage.

As mentioned above and based on the monitoring well data, saturated fractures exist in the subsurface at the property. As the mine is constructed, the mine workings will intercept and drain those saturated fractures which are hydraulically connected to the mine workings. Water that flows into the mine will be evacuated using a permanent pumping station that will be constructed at the bottom of the mine. Mine inflow water will be connected at the bottom of the mine in a system of overflow pools with connecting drain holes to allow for initial settling of the inflow water with the cleanest water from the last overflow pool being pumped to the surface for clarification and reuse. Water that is not reused will be discharge to a settling pond system at the surface that will further manage sediment from the dewatering.

Dewatering of the mine may initially require dewatering rates as high as 80 gpm. On average, dewatering rates will be approximately 55 gpm based on the modelling. These estimates are conservatively high in that they assumed the immediate dewatering of the mine form the bottom of the mine and assumes that the Precambrian material responds to pumping as a porous media and not a fractured rock aquifer. If the fractures in the Precambrian material are not connected, dewatering rates will be much lower once the fractures drain.

For the purpose of sedimentation pond sizing, the pond should be designed around a discharge rate of 55 gpm.

Based on the Mile High Flood District's Urban Storm Drainage Criteria Manual Volume 3, the sedimentation pond should include a minimum storage volume of approximately 1.8 acre-feet or 600,000 gallons to allow for the sedimentation of the discharge water. This volume represents the water quality capture volume for the property location and should be sufficient to manage the dewatering water and limited ore process discharge if it occurs. The proposed 100-foot by 150-foot sedimentation pond should be adequate for the detainment of discharges from mine dewatering and the ore process.

### 2.7.6 Water Requirements

The proposed mine facilities will require water for 1) drinking water purposes, 2) fire protection, 3) crushing, grinding and gravity separation processes, 4) rougher, clear flotation and regrinding processes, 5) tailings thickening and filtering, 6) gold concentrate thickening and filtering and 7) dust control.

During development, there will be minimal water demand, but during operations, the mine facilities will require approximately 130 gallons per minute when in operation. Water will be provided by the mine dewatering, water recycling and a groundwater well. The mine is proposed to operate 365 days per year and annual demands are estimated at approximately 200 acre-feet during operation. As noted, a significant portion, approximately 90%, of this water demand will be provided by the reuse of water supplies within the mining process so once the reclaim water, filtered water and potable water tanks are full, they will only need to be topped off periodically. This water recycling system reduces the water demand to approximately 20 acre-feet per year.

Dust suppression water will be provided using a truck with spreader bars using approximately 1.0 acre-feet per year.

During reclamation, there will be minimal water requirements at the property.

### 2.7.7 Water Supplies

The water supplies available to the property include 1) water dewatered from the mine and 2) a new water supply well to be constructed on the property. Recycling of the water used for mine processing also provides a significant supply of the water used in the processes. The new water supply well will provide water during the development stage. During mine operation, the water supply well and the dewatering of the mine will provide water to meet water demand. During mine operation, the process will mainly rely on the recycling of water with the water supply well used to top of the potable supply and the reclaim process water tank.  The mine dewatering will only be used to top of the reclaim process water tank.

An augmentation plan will be required to address the replacement of lagged stream depletions associated with the dewatering of the mine and the use of a new water supply well at the site.  A portion of the dewatering water will return to the ground water system through infiltration of the discharge water.  A portion will also be consumed in the potable system and the ore processing.  It is feasible to project lagged stream depletions from the proposed mine operations and to identify supplies to replace those lagged stream depletion using both the return flows form the site and additional offsite supplies.  As indicated above, Grape Creek will be identified as a point of depletion for augmentation purposes, but actual impacts are unlikely due the fractured rock geology at the site. The mine operator will implement the augmentation plan, including the acquisition and dedication of any necessary water rights to operate the plan. The augmentation plan will protect senior water rights from injury resulting from depletions to the surface water system.

### 2.7.8 National Pollutant Discharge Elimination System (NPDES) Permit

Although the drainages at the mine are typically dry and best practices will be used to control sediment and discharges from the property including diversion channels, drainage ditches, culverts, sediment barriers and sediment ponds, a National Pollutant Discharge Elimination System (NPDES) Permit will be required in case discharges are made and the drainages do flow.  Zephyr will acquire a NPDES permit from the Water Quality Control Division at the Colorado Department of Health and Environment before operations commence at the property.  It would be acceptable for this to be a condition of approval.

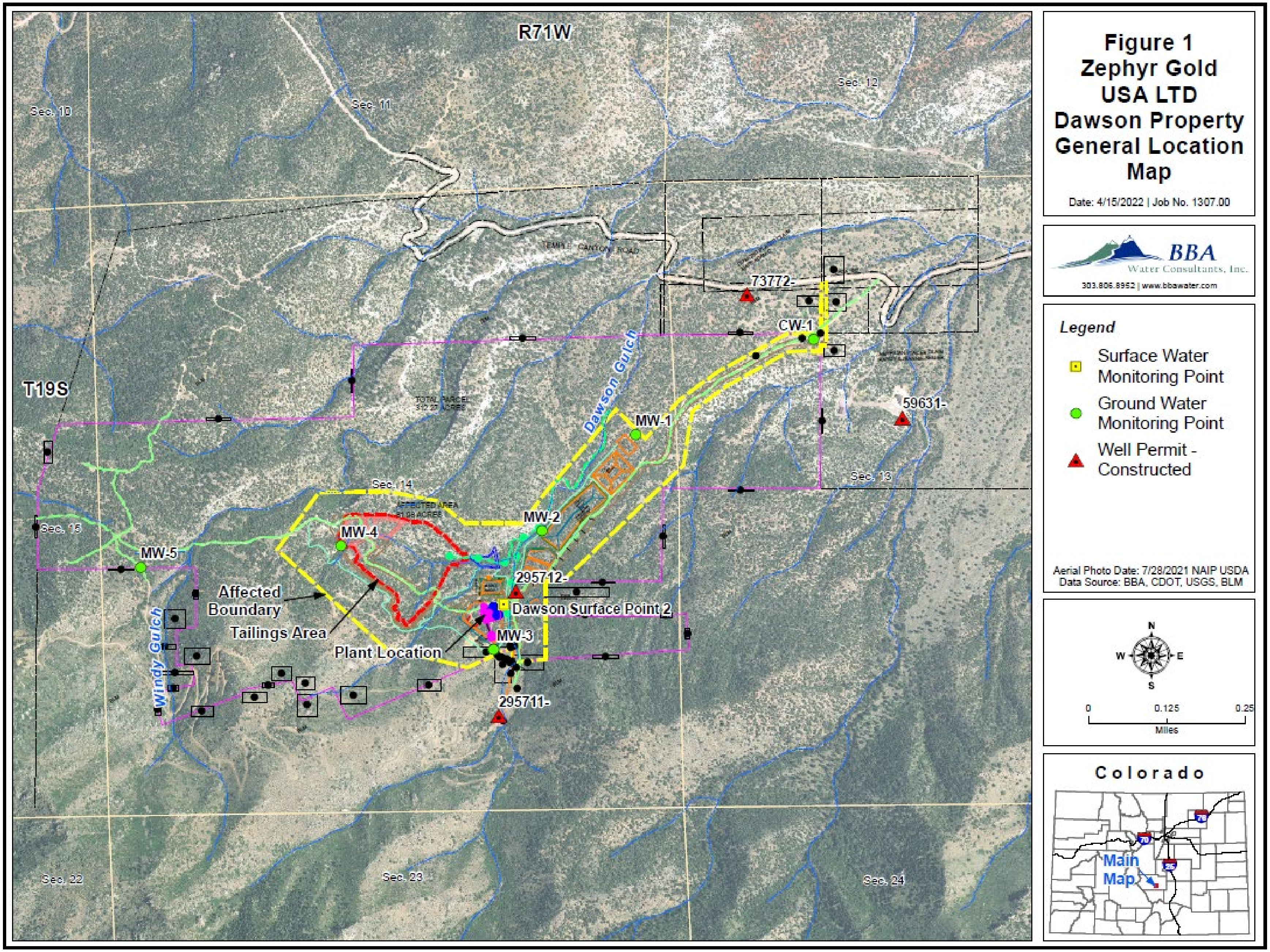
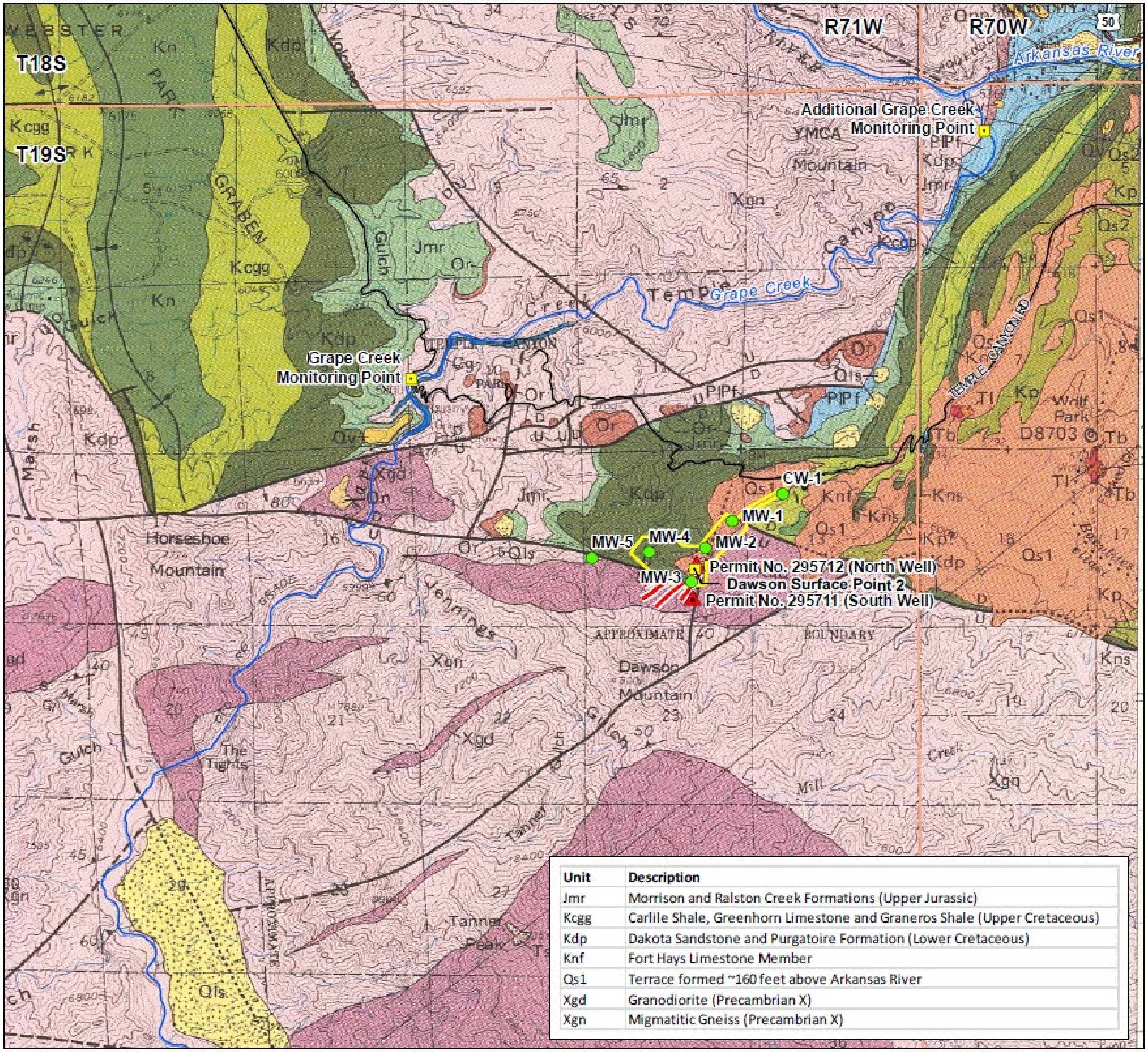


Figure 1
Zephyr Gold
USA LTD
Dawson Property
General Location
Map
Date: 4/15/2022 | Job No. 1307.00
BBA
Water Consultants, Inc.
303.806.8952 | www.bbawater.com
Legend
Surface Water Monitoring Point
Ground Water Monitoring Point
Well Permit - Constructed
Aerial Photo Date: 7/28/2021 NAIP USDA
Data Source: BBA, CDOT, USGS, BLM
N
W
E
S
0
0.125
0.25
Miles
Colorado
Main Map
R71W
T19S
Sec. 10
Sec. 11
Sec. 12
Sec. 13
Sec. 14
Sec. 15
Sec. 22
Sec. 23
Sec. 24
TEMPLE CANYON ROAD
73772-
CW-1
59631-
Dawson Gulch
MW-1
MW-2
MW-3
MW-4
MW-5
295712-
295711-
Dawson Surface Point 2
Affected Boundary
Tailings Area
Plant Location
Windy Gulch




| Unit | Description |
|---|---|
| Jmr | Morrison and Ralston Creek Formations (Upper Jurassic) |
| Kcgg | Carlile Shale, Greenhorn Limestone and Graneros Shale (Upper Cretaceous) |
| Kdp | Dakota Sandstone and Purgatoire Formation (Lower Cretaceous) |
| Knf | Fort Hays Limestone Member |
| Qs1 | Terrace formed ~160 feet above Arkansas River |
| Xgd | Granodiorite (Precambrian X) |
| Xgn | Migmatitic Gneiss (Precambrian X) |

# Figure 2
# Zephyr Gold USA LTD
# Dawson Property General Location Map

Date: 4/15/2022 | Job No. 1307.00

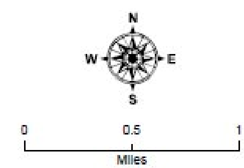
BBA Water Consultants, Inc.
303.806.8952 | www.bbawater.com

*Legend*

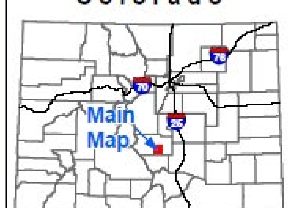
- Existing Well
- Surface Water Monitoring Point
- Ground Water Monitoring Point
- Additional Identified Faulting
- Affected Boundary

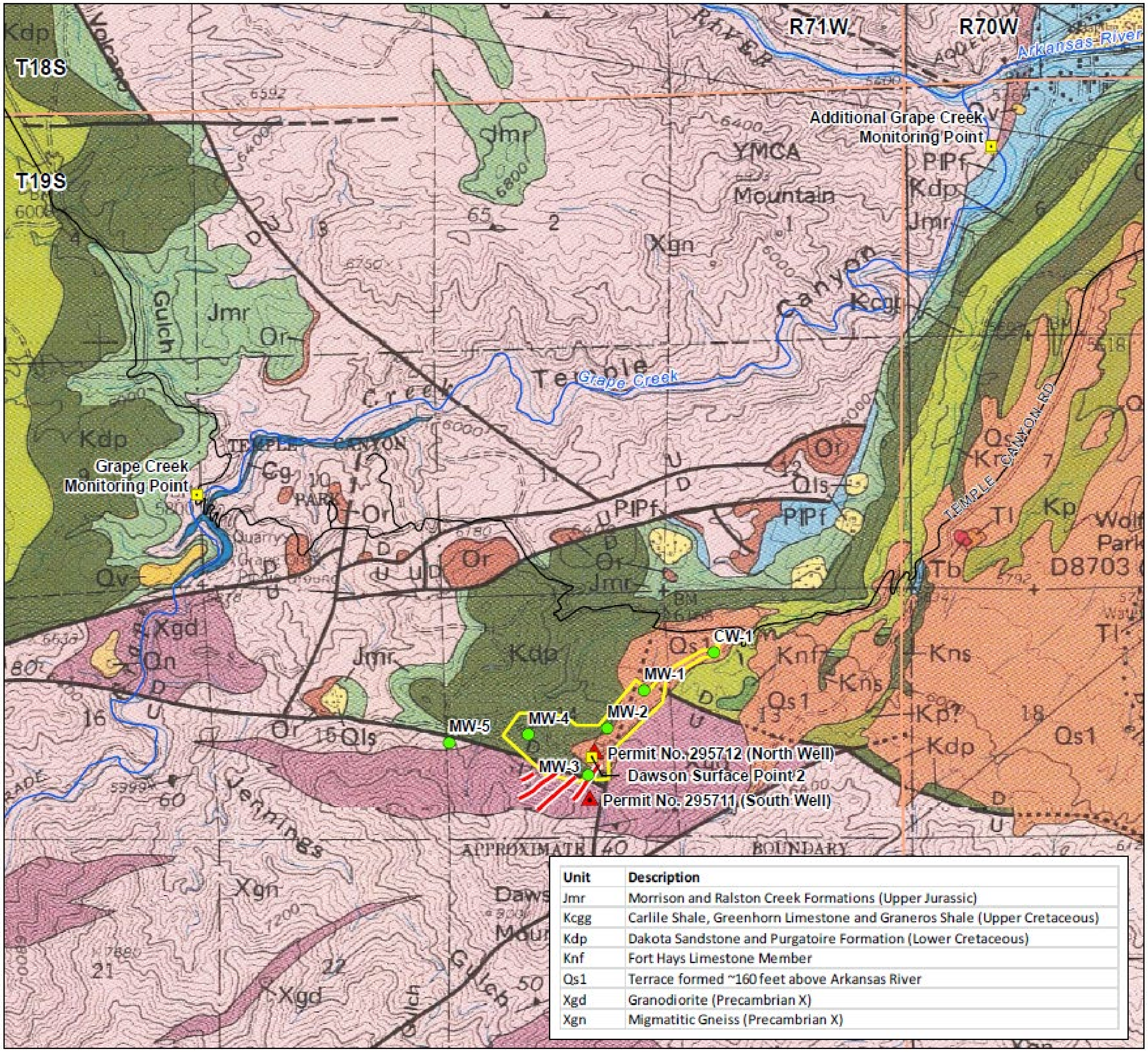
Background: Reconnaissance geologic map of the Royal Gorge quadrangle, Fremont and Custer Counties, Colorado. 1975. 1:62,500

Data Source: BBA, USGS, BLM




Colorado






| Unit | Description |
|---|---|
| Jmr | Morrison and Ralston Creek Formations (Upper Jurassic) |
| Kcgg | Carlile Shale, Greenhorn Limestone and Graneros Shale (Upper Cretaceous) |
| Kdp | Dakota Sandstone and Purgatoire Formation (Lower Cretaceous) |
| Knf | Fort Hays Limestone Member |
| Qs1 | Terrace formed ~160 feet above Arkansas River |
| Xgd | Granodiorite (Precambrian X) |
| Xgn | Migmatitic Gneiss (Precambrian X) |

**Figure 3**
**Zephyr Gold USA LTD**
**Dawson Property Monitoring Network**

Date: 4/15/2022 | Job No. 1307.00

BBA Water Consultants, Inc.
303.806.8952 | www.bbawater.com

*Legend*

- Existing Well
- Surface Water Monitoring Point
- Ground Water Monitoring Point
- Additional Identified Faulting
- Affected Boundary

Background: Reconnaissance geologic map of the Royal Gorge quadrangle, Fremont and Custer Counties, Colorado. 1975. 1:62,500

Data Source: BBA, USGS, BLM

N / E / S / W

0 1,500 3,000 Feet

Colorado

Main Map

Table 2.7-1: Water Level Data

| | North Well | | | South Well | | |
|---|---|---|---|---|---|---|
| Date | Time | Water Level (ft)* | Notes | Time | Water Level (ft)* | Notes |
| 10/1/2014 | 9:30 | 176 | | 10:00 | 45 | |
| 11/4/2014 | 10:30 | 163 | | 10:36 | 36 | |
| 12/1/2014 | 9:54 | 170 | | 10:04 | 37 | |
| 1/5/2015 | 10:48 | 173 | | 11:23 | 55 | |
| 2/3/2015 | 14:00 | 175 | | 14:06 | 46 | |
| 3/11/2015 | 11:22 | 42 | Severe cold weather. Believe probe was freezing to the interior of the well casing. | 11:34 | 51 | |
| 4/1/2015 | 9:15 | 172 | | 9:39 | 55 | |
| 5/4/2015 | 14:38 | 168 | | 14:45 | 55 | |
| 6/2/2015 | 8:47 | 174 | | 8:53 | 28 | |
| 7/1/2015 | 8:42 | 173 | | 9:06 | 27 | |
| 8/12/2015 | 9:23 | 173 | | 9:30 | 34 | |
| 9/1/2015 | 9:05 | 171 | | 9:13 | 37 | |
| 10/1/2015 | 9:03 | 168 | | 9:22 | 29 | |
| 11/5/2015 | 9:05 | 169 | | 9:12 | 39 | |
| 12/10/2015 | 8:49 | 169 | | 8:45 | 40 | |
| 3/9/2021 | 13:48 | 178 | | 13:57 | 55 | |
| 3/29/2021 | 9:00 | 178 | Wells sampled | 9:13 | 55 | |
| 4/27/2021 | 14:35 | 178 | | 15:11 | 55 | |
| 5/27/2021 | 11:30 | 178 | | 11:36 | 55 | |
| 6/24/2021 | 8:49 | 178 | Wells sampled | 9:05 | 55 | |
| 7/27/2021 | 15:57 | 177 | | 16:04 | 55 | |
| 8/18/2021 | 9:08 | 178 | | 9:14 | 55 | |
| 9/16/2021 | 11:05 | 177 | | 12:26 | 45 | |
| 10/20/2021 | 11:53 | 178 | | 11:59 | 55 | |

# Table 2.7-2 Groundwater Quality Data

Zephyr Gold USA
Dawson Gold Mine, Fremont County, CO
Baseline Groundwater Quality Data

| unless otherwise noted | North Well 10/2014 Q1 | 1/1/2015 Q2 | 4/2015 Q3 | 7/2015 Q4 | 10/2015 Q5 | 3/2021 Q1 | 6/2021 Q2 | 9/2021 Q3 | Groundwater Quality Concentration **** | South Well 10/2014 Q1 | 1/1/2015 Q2 | 4/2015 Q3 | 7/2015 Q4 | 10/2015 Q5 | 3/2021 Q1 | 6/2021 Q2 | 9/2021 Q3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | <0.2 | <0.2 | 0.28 | <0.2 | 0.26 | ND | 0.57 | BD | 5 | <0.2 | <0.2 | <0.2 | 0.54 | 0.36 | ND | ND | ND |
| Arsenic | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | ND | ND | ND | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | ND | ND | ND |
| Beryllium | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | ND | ND | ND | 0.004 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | ND | ND | ND |
| Boron | 0.26 | 0.15 | 0.13 | 0.15 | 0.12 | 0.1 | 0.11 | ND | 0.75 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | ND | ND | 0.13 |
| Cadmium | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | ND | ND | ND | 0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | ND | ND | ND |
| Calcium | 52 | 61 | 63 | 72 | 67 | 58 | 59 | 57 | No Standard | 67 | 66 | 66 | 70 | 76 | 68 | 67 | 54 |
| Chromium | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | ND | ND | ND | 0.1 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | ND | ND | ND |
| Cobalt | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | ND | ND | ND | 0.05 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | ND | ND | ND |
| Copper | <0.01 | <0.01 | <0.01 | <0.01 | 0.018 | ND | ND | 0.016 | 0.2 | 0.012 | <0.01 | <0.01 | <0.01 | 0.02 | ND | ND | 0.036 |
| Iron | <0.1 | <0.1 | <0.1 | <0.1 | **0.13** | ND | **0.3** | ND | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | **0.52** | ND | ND | ND |
| Lead | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | ND | ND | ND | 0.05 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | ND | ND | ND |
| Lithium | 0.051 | 0.038 | 0.032 | 0.033 | 0.034 | 0.028 | 0.027 | ND | 2.5 | 0.013 | <0.01 | <0.01 | <0.01 | 0.011 | ND | ND | 0.036 |
| Magnesium | 20 | 24 | 23 | 26 | 23 | 24 | 24 | 16 | No Standard | 19 | 19 | 18 | 21 | 21 | 19 | 19 | 22 |
| Manganese | **0.1** | **0.089** | **0.11** | **0.17** | **0.072** | ND | 0.037 | ND | 0.05 | 0.036 | 0.013 | 0.014 | 0.029 | 0.023 | ND | ND | **0.12** |
| Mercury | < 0.0002 | < 0.0002 | < 0.0002 | < 0.0002 | < 0.0002 | ND | ND | ND | 0.002 | < 0.0002 | < 0.0002 | < 0.0002 | < 0.0002 | < 0.0002 | ND | ND | ND |
| Nickel | <0.02 | <0.02 | <0.02 | 0.037 | <0.02 | ND | ND | ND | 0.1 | <0.02 | <0.02 | <0.02 | 0.038 | <0.02 | ND | ND | ND |
| Potassium | 6.2 | 5.6 | 5.3 | 5.3 | 5.1 | 6.3 | 6.6 | 3.6 | No Standard | 4.9 | 4 | 3.7 | 3.5 | 3.5 | 4.3 | 4.9 | 6.1 |
| Selenium | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | ND | ND | ND | 0.02 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | ND | ND | ND |
| Sodium | 80 | 36 | 5.3 | 19 | 19 | 18 | 19 | 15 | No Standard | 27 | 15 | 14 | 14 | 15 | 16 | 17 | 19 |
| Vanadium | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | ND | ND | ND | 0.1 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | ND | ND | ND |
| Zinc | 0.025 | 0.11 | 0.03 | 0.12 | 0.057 | ND | 0.17 | 0.17 | 2 | 0.091 | 0.12 | <0.02 | 0.023 | <0.02 | ND | 0.3 | 0.54 |
| Bicarbonate as $CaCO_3$ | 260 | 230 | 230 | 220 | 210 | 200 | 190 | 210 | Reflected in pH | 220 | 210 | 210 | 200 | 210 | 210 | 210 | 200 |
| Carbonate as $CaCO_3$ | <20 | <20 | <20 | <20 | <20 | ND | ND | ND | Reflected in pH | <20 | <20 | <20 | <20 | <20 | ND | ND | ND |
| Total Alkalinity as $CaCO_3$ | 260 | 230 | 230 | 220 | 210 | 200 | 190 | 210 | Reflected in pH | 220 | 220 | 210 | 200 | 210 | 210 | 210 | 200 |
| pH (lab)* | 7.85 | 7.88 | 7.73 | 7.77 | 7.92 | 8.31 | 8.22 | 7.44 | 6.5-8.5 | 7.7 | 7.85 | 7.84 | 8.23 | 7.91 | 8.09 | 8.16 | 7.49 |
| pH (field) | **8.63** | 7.37 | **8.62** | 7.38 | **8.7** | 7.95 | 7.9 | 7.78 | 6.5-8.5 | 8.33 | 7.72 | 7.97 | 7.81 | **8.54** | 7.6 | 7.61 | 7.29 |
| Temperature °C (field) | 13.5 | 12.7 | 13.4 | 14.8 | 13.7 | 11.3 | 14.1 | 16.8 | No Standard | 13 | 11.8 | 12.9 | 14.3 | 12.6 | 11.8 | 14.3 | 16.2 |
| specific conductivity (lab)** | 779 | 653 | 621 | 567 | 561 | 504 | 555 | 527 | No Standard | 591 | 531 | 521 | 537 | 533 | 495 | 506 | 497 |
| electric conductivity (field)*** | 627 | 578 | 414 | 502 | 453 | 568 | 541 | 611 | No Standard | 433 | 406 | 469 | 468 | 449 | 541 | 571 | 598 |
| Total dissolved solids | 480 | 450 | 380 | 370 | 350 | 690 | 350 | 350 | 10,000 | 360 | 330 | 310 | 350 | 340 | 310 | 330 | 310 |
| Flouride | 2.4 | 1.9 | 2 | 1.8 | 2.1 | 1.8 | 1.5 | 1.7 | 4 | 1.8 | 1.5 | 1.6 | 2 | 2.1 | 1.9 | 1.8 | 1.8 |
| Chloride | 25 | 16 | 12 | 5.8 | 5.9 | 5.3 | 5.5 | 7.1 | 250 | 12 | 8.2 | 8.6 | 3.1 | 4.6 | 7.2 | 7.5 | 7.4 |
| Nitrite | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | ND | ND | 1.7 | 1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | ND | ND | 1.7 |
| Nitrate/Nitrite as N | <0.1 | <0.1 | <0.1 | 0.21 | <0.1 | ND | 0.18 | 1.9 | 10 | <0.1 | <0.1 | <0.1 | 1.6 | 1.5 | 0.26 | 0.3 | 1.9 |
| Nitrate as N | <0.2 | <0.2 | <0.2 | 0.21 | <0.2 | ND | 0.18 | 0.25 | 10 | <0.2 | <0.2 | <0.2 | 1.6 | 1.5 | 0.26 | 0.31 | 0.22 |
| Sulfate | 110 | 92 | 88 | 82 | 81 | 77 | 76 | 83 | 250 | 66 | 56 | 57 | 74 | 71 | 58 | 60 | 59 |
| Depth to Groundwater (ft from top of collar) | 176 | 173 | 172 | 173 | 168 | 178 | 178 | 177 | | 45 | 55 | 55 | 27 | 29 | 55 | 55 | 45 |

* pH measured in water at 25° Celsius
** Units in umhos/cm
*** uS/cm
**** The accepted standard is the most restrictive concentration/level in Regulation 41.

Table 2.7.4-1 Reg No. 41 Most Restrictive Groundwater Standards

## Most Restrictive Values - Regulation No. 41 Ground Water Standards

| Parameter | Standard | Value Source* |
|---|---|---|
| Coliforms,Total (30 day average) | 2.2 org/100 ml | TABLE 1 |
| Aluminum (Al) | 5 mg/l | TABLE 3 |
| Antimony(Sb) | 0.006 mg/l | TABLE 1 |
| Asbestos | 7,000,000 fibers/Liter | TABLE 1 |
| Arsenic (As) | 0.01 mg/l | TABLE 1 |
| Barium (Ba) | 2.0 mg/l | TABLE 1 |
| Beryllium (Be) | 0.004 mg/l | TABLE 1 |
| Beta and Photon Emitters | 4 mrem/year | TABLE 1 |
| Boron (B) | 0.75 mg/l | TABLE 3 |
| Cadmium (Cd) | 0.005 mg/l | TABLE 1 |
| Chlorophenol | 0.0002 mg/l | TABLE 2 |
| Chloride (Cl) | 250 mg/l | TABLE 2 |
| Chromium (Cr) | 0.1 mg/l | TABLE 1 |
| Cobalt (Co) | 0.05 mg/l | TABLE 3 |
| Color | 15 color units | TABLE 2 |
| Copper (Cu) | 0.2 mg/l | TABLE 3 |
| Corrosivity | Noncorrosive | TABLE 2 |
| Cyanide [Free] (CN) | 0.2 mg/l | TABLE 1 |
| Fluoride (F) | 2 mg/l | TABLE 3 |
| Foaming Agents | 0.5 mg/l | TABLE 2 |
| Gross Alpha Particle Activity | 15 pCi/l | TABLE 1 |
| Iron (Fe) | 0.3 mg/l | TABLE 2 |
| Lead (Pb) | 0.05 mg/l | TABLE 1 |
| Lithium (Li) | 2.5 mg/l | TABLE 3 |
| Manganese (Mn) | 0.05 mg/l | TABLE 2 |
| Mercury (inorganic) (Hg) | 0.002 mg/l | TABLE 1 |
| Molybdenum (Mo) | 0.21 mg/l | TABLE 1 |
| Nickel (Ni) | 0.1 mg/l | TABLE 1 |
| Nitrate (NO3) | 10.0 mg/l as N | TABLE 1 |
| Nitrite (NO2) | 1.0 mg/l as N | TABLE 1 |
| Nitrate+Nitrite, Total ($NO_2$+NO3) | 10.0 mg/l as N | TABLE 1 |
| Odor | 3 threshold odor numbers | TABLE 2 |
| pH | 6.5 - 8.5 | TABLE 2 |
| Phenol | 0.3 mg/l | TABLE 2 |
| Selenium (Se) | 0.02 mg/l | TABLE 3 |
| Silver (Ag) | 0.05 mg/l | TABLE 1 |
| Sulfate (SO4) | 250 mg/l | TABLE 2 |
| TDS, Background | 400 mg/l | TABLE 4 |
| Thallium (Tl) | 0.002 mg/l | TABLE 1 |
| Uranium (U) | 0.0168 mg/l | TABLE 1 |
| Vanadium (V) | 0.1 mg/l | TABLE 3 |
| Zinc (Zn) | 2 mg/l | TABLE 3 |

* TABLE 1 - Domestic Water Supply – Human Health Standards
TABLE 2 - Domestic Water Supply – Drinking Water Standards
TABLE 3 - Agricultural Standards
TABLE 4 - TDS Water Quality Standards
All metals are dissolved.

Table 2.4.7-2 Reg. 32 Stream Classification and Water Quality Standards



## REGULATION #32 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
## Upper Arkansas River Basin

14e. All tributaries to the Arkansas River, including wetlands, which are not on National Forest lands from the Chaffee/Fremont County line to immediately below the confluence with Chandler Creek (38.407024,-105.137940). Newlin Creek (except for listings in segment 15b), Mineral Creek, Adobe Creek, and Oak Creek, including all tributaries and wetlands which are not on National Forest Service Land.

| COARUA14E | Classifications |
|---|---|
| **Designation** | Agriculture |
| Reviewable | Aq Life Cold 1 |
| | Recreation E |

**Qualifiers:**

**Other:**

*chlorophyll a (mg/m$^2$)(chronic) = applies only above the facilities listed at 32.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 32.5(4).
*Uranium(acute) = See 32.5(3) for details.
*Uranium(chronic) = See 32.5(3) for details.

| Physical and Biological | | |
|---|---|---|
| | **DM** | **MWAT** |
| Temperature °C | CS-II | CS-II |
| | **acute** | **chronic** |
| D.O. (mg/L) | --- | 6.0 |
| D.O. (spawning) | --- | 7.0 |
| pH | 6.5 - 9.0 | --- |
| chlorophyll a (mg/m$^2$) | --- | 150* |
| E. Coli (per 100 mL) | --- | 126 |

| Inorganic (mg/L) | | |
|---|---|---|
| | **acute** | **chronic** |
| Ammonia | --- | --- |
| Boron | --- | 0.75 |
| Chloride | --- | --- |
| Chlorine | 0.019 | 0.011 |
| Cyanide | 0.005 | --- |
| Nitrate | 100 | --- |
| Nitrite | 0.05 | --- |
| Phosphorus | --- | 0.11* |
| Sulfate | --- | --- |
| Sulfide | --- | 0.002 |

| Metals (ug/L) | | |
|---|---|---|
| | **acute** | **chronic** |
| Arsenic | 340 | --- |
| Arsenic(T) | --- | 100 |
| Cadmium | TVS | TVS |
| Chromium III | TVS | TVS |
| Chromium III(T) | --- | 100 |
| Chromium VI | TVS | TVS |
| Copper | TVS | TVS |
| Iron(T) | --- | 1000 |
| Lead | TVS | TVS |
| Manganese | TVS | TVS |
| Mercury(T) | --- | 0.01 |
| Molybdenum(T) | --- | 150 |
| Nickel | TVS | TVS |
| Selenium | TVS | TVS |
| Silver | TVS | TVS |
| Uranium | varies* | varies* |
| Zinc | TVS | TVS |

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature

# Quality Assurance Program Plan

# For The

# Dawson Gold Mine

# Environmental Monitoring Program

Prepared by Frank Adamic and Angela Bellantoni Ph.D.

January 7, 2022
Revised April 25, 2022

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**Section** **Page Number**

## FIGURES

## Frank Adamic Credentials and Experience

Frank Adamic received his Bachelor of Science Degree in Chemistry in 1972. He became an employee of Cotter Corporation N.S.L. at its Cotter Corporation Canon City Uranium Milling Facility in Canon City, Colorado beginning in 1974 and retired in 2016. During this time span the Cotter Mill and nearby Lincoln Park were designate as a Superfund Site by the EPA. The subsequent Consent Decree and Remedial Action Plan of 1988 required development of a Quality Assurance Plan and QA oversight compliant with Colorado Department of Public Health and Environment, U.S. Environmental Protection Agency, and U.S. Nuclear Regulatory Commission guidance. In 1992 Frank Adamic accepted the position of Quality Assurance Coordinator at the Cotter Corporation Mill. He was in charge of the QA/QC oversight of the environmental monitoring and analytical laboratory activities at the mill until his retirement as Quality Assurance Officer. During his tenure at Cotter he oversaw and participated in three five-year rewrite/revision updates of the Cotter Site's Quality Assurance Plan:

- *Cotter Corporation Canon City Mill Remedial Action Plan - Quality Assurance Plan* (June 1993)
- *Quality Assurance Program Plan for the Cotter Corporation Canon City Mill Environmental Sampling and Monitoring Studies (QAPP Manual)* (March 1999)
- *Quality Assurance Program Plan for Environmental and Occupational Sampling and Monitoring Studies for the Cotter Corporation, Canon City Milling Facility and Lincoln Park, Colorado Superfund Site* (May 2009)

# Section 1 INTRODUCTION

Zephyr Gold USA Ltd.'s Dawson Gold Mine (DGM) has the potential to impact vicinity water resources from underground mining, surface milling and tailings storage. Underground mining involves operating equipment underground that extracts the mineralized ore and transports the ore to the surface for milling. Surface milling will occur inside an industrial building with outside storage of supplies and equipment. Mill tailings will be placed in the FTSF. Other activities of concern include accidents and spills that occur during transportation of supplies and ore.

This Quality Assurance Program Plan (QAPP) describes the quality assurance and quality control practices employed for site characterization and environmental monitoring at the Zephyr Gold USA Ltd.'s Dawson Gold Mine (DGM). This QAPP is designed to assure the quality of 112d-2 Designated Mining Operation Reclamation Permit M-2021-046 requirements for environmental monitoring sampling and analyses. It focuses quality assurance applications on meeting the requirements of the permit to define various environmental conditions and/or trends at the site.

The permit requires consideration and incorporation of applicable guidelines and requirements for sampling and analysis established by the United States Environmental Protection Agency (EPA) Water Quality Criteria and tailored by the Colorado Division of Reclamation, Mining and Safety (DRMS) to assure the data credibility of the sampling and monitoring needs of the permit. These guidelines, incorporated by reference, include:

- Colorado Department of Public Health and Environment (CDPEH), Water Quality Control Commission Regulation No. 32 - Classifications and Numeric Standards for Arkansas River Basin (5 CCR 1002-32)
- Colorado Department of Public Health and Environment Water Quality Control Commission Regulation No. 41 - The Basic Standards for Ground Water (5 CCR 1002-41)
- Colorado Division of Reclamation, Mining and Safety Mineral Rules and Regulations of the Colorado Mined Land Reclamation Board for Hard Rock, Metal, And Designated Mining Operations

This QAPP is intended to be a dynamic document allowing for ongoing and continuous improvement.

## Section 2 QUALITY OBJECTIVES

The objectives of this QAPP are:

- To assure that the activities of the environmental monitoring and specific project plans are performed correctly, accurately, completely, with precision and in a timely manner.
- To assure that all environmental monitoring and investigation activities are conducted in a manner to produce results of the highest achievable quality.
- To assure the quality of environmental monitoring data.
- To obtain a high degree of confidence in the results of the monitoring program so as to assure its validity.
- To identify deficiencies in any area affecting the quality of environmental monitoring and investigation work product so that corrective action can be taken or improvement can be made.
- To document instances of corrective action taken or action taken for improvement as result of this program.
- To promote the philosophy of continuous improvement in all areas to which this QAPP may be applied.
- To provide verification that field programs and projects are conducted according to written plans.

## Section 3 QUALITY ASSURANCE PROGRAM PLAN DESCRIPTION

This QAPP assures the quality of environmental monitoring programs required for compliance with DRMS Dawson Gold Mine Permit No. M-2021-046. The Zephyr Gold USA Ltd.'s DGM Environmental Monitoring Quality Assurance Program Plan is designed and managed to assure the quality of the Environmental Protection Plan.

As new environmental monitoring and protective needs arise; these emerging environmental operations are also subject to the quality assurance and quality control (QA/QC) practices set out in this document.  Principles of QA/QC are to be considered during the planning and development of these new projects so that quality assurance will be incorporated into the design of each new activity plan.

This QA/QC program is applied to all of the above described project activities to assure consistent high quality data and work product.

## Section 4 QUALITY ASSURANCE PROGRAM PLAN ORGANIZATION AND RESPONSIBILITY

The organizational structure of this QA program includes two participant categories.

The first category applies to those persons who actively participate in the program through performing QA and/or QC functions and/or the generation of QA/QC documents. The QA/QC functions of the program are maintained by the active participation of the designated QA Officer(s) and other “Key Individuals”. Key individuals are assigned to conduct program tasks such as field measurements, sample procurement, sample analysis, and data documentation. They assure the quality of their work product through adherence to accepted QA/QC practices and documented procedures. The designated Quality Assurance Officer (QAO) maintains the overall surveillance of the program, including guidance and direction. The QAO reports the findings and status of the QA/QC program and the determined need for any corrective action or improvement to the General Manager.

The second participant category applies to personnel who serve in a review and/or management capacity. Specifically, this second category consists of those individuals who manage various aspects of the Zephyr Gold USA Ltd. DGM’s activities and/or supervise the active QA/QC participants, and/or review QA/QC reports. The DGM’s General Manager (Site Manager) has overall responsibility for the conduct, direction, and supervision of the environmental programs at the mine. The General Manager is familiar with all aspects of this QAPP and the QA/QC activities conducted at the mine. He reviews results and findings of the monitoring activities and QA/QC reports and in conjunction with QA/QC personnel, takes appropriate administrative action as necessary to insure compliance with this document’s requirements.

It is expected that most environmental monitoring QA/QC activities are to be conducted and documented by Surface Operations Personnel who in this QAPP are considered Key Individuals. The QAO is also considered a Key Individual. Zephyr Gold reserves the right to assign QAO and/or other Key Individual duties and responsibilities to one or more of its personnel or designated agents, provided that these individuals do not oversee (in a QA capacity) activities that they are directly responsible for supervising.

All key individuals must have either completed training related to the tasks they are assigned to perform or have had adequate related experience. Key individuals are required to familiarize themselves with this QAPP document, with the applicable job procedures and documents, and with all inspection, report, and log forms related to their duties. Specialized training may be required for some tasks or projects.

## Section 5 SAMPLING AND MONITORING

Two aspects of sampling and monitoring are addressed in this section: 1) procedures and 2) equipment. Sampling and monitoring procedures are written descriptions of how specific samples are taken, how monitoring is performed, and how measurements are taken. Sampling and monitoring equipment include tools, installations, devices and instruments used in sample acquisition and monitoring of study conditions.

### 5.1 Sampling and Analysis Plan (SAP)

The purpose of this sampling and analysis plan (SAP) is to document field sampling procedures and laboratory methods that will be used to ensure that consistent and representative data is collected, and that a uniform method of data reporting to the agencies is established.

This SAP will serve as guidance for the baseline study as well as ongoing sampling and monitoring during mining and milling operations. Prior to commencement of surface or mine development, baseline water quality and groundwater level is required by DRMS. To establish baseline conditions, water quality monitoring and sampling data will be collected over five (5) calendar quarters. Upon approval of the mining application and prior to construction of the portal or underground stopes, monitoring and sampling will recommence and continue through the life of the mine.

The primary objective of this SAP is to identify proper field data collection and data management procedures to: provide consistency in data collection; allow uniform and efficient data handling and transfer; and provide clear documentation of sample locations, field procedures, and analytical methods.

All sampling and monitoring procedures in use under this plan apply techniques designed to provide reproducible and defendable data. Unless specified otherwise within task specific descriptions, all sampling and monitoring is subject to the QA/QC functions described within this QAPP. Water sampling and monitoring procedures are developed with the goal of meeting the general guidelines provided in ASTM standard procedures and US EPA Science and Ecosystem Support Division (included by reference) and providing quality samples whose analytical results can be compared to CDPHE Water Quality Control Division Regulation 32 (Surface Water) and Regulation 41 (Ground Water) most restrictive standards and other standards as required and specified.

Examples of good general water sampling procedure guidance and sampling methodology considerations include ASTM Standard D7069 - *Standard Guide for Field Quality Assurance in a Groundwater Sampling Event*, D4448-01 *Standard Guide for Sampling Ground-Water Monitoring Wells*, D6089-19 *Standard Guide for Documenting a Groundwater Sampling Event*, D6452-18 *Standard Guide for Purging Methods for Wells Used for Ground Water Quality Investigations*, ASTM D5358-93(2019)

*Standard Practice for Sampling with a Dipper or Pond Sampler* and associated referenced ASTM standards as well as guidance offered by the U.S. Environmental Protection Agency include the EPA Science and Ecosystem Support System Division's SESD *Operating Procedures for Surface Water Sampling* (SESDPROC-201-R4). All of which are incorporated herein by reference.

## 5.2 Sampling Locations

Monitoring and sampling will occur at groundwater monitoring wells and surface stream/drainage locations. The baseline water quality study will monitor at the locations provided in Table 5.2 Baseline Water Quality Study Monitoring and Sampling Locations. It is anticipated that as construction and operations commence, activities such as monitoring of sedimentation storm water detention pond contents and discharge will require procedure development.

## 5.3 Sampling and Monitoring Frequency

During the baseline water quality study, monitoring and sampling will occur quarterly for five calendar quarters. Water level monitoring in the monitoring wells will occur monthly during the baseline study. Monitoring and sampling will resume upon commencement of site development and continue through the life of the mine. Based on the current understanding of the groundwater system, monitoring wells will be monitored and sampled quarterly. The frequency of surface water sampling during site development and mine operations will be dependent on the data and observations during the baseline study.

## 5.4 Sampling and Monitoring Equipment – Use and Preventive Maintenance

Proper sampling and monitoring equipment will be used in all sampling, monitoring, and measurement tasks. Task procedures may require specific or special equipment necessary for a specific task. All sampling and monitoring instruments and equipment will be properly maintained and calibrated. The specific calibration frequencies, procedures, maintenance practices, and documentation requirements for field sampling, monitoring, and measurement equipment and instruments are described in the manufacturer's operating manuals.

Preventive maintenance will be practiced. The goal of preventive maintenance is to assure work product completeness and validity by increasing equipment reliability. It is the equipment operator's responsibility to perform the preventive maintenance tasks that may include cleaning, lubrication, reconditioning, adjusting, calibrating, testing, and component replacement. Preventive maintenance of field and laboratory equipment is accomplished in accordance with the operating manuals and schedules provided by the equipment manufacturers or developed through routine experience.

# Section 6 SAMPLING PROCEDURES

Two aspects of sample processing from field acquisition through laboratory analysis are addressed in this section: 1) sample handling and 2) sample documentation. Sample handling implies routine field and lab handling practices. Sample documentation includes sample record and data management. These aspects are inter-related. The following procedures will be used to collect groundwater samples from designated groundwater monitoring wells and surface water monitoring locations. Samples will be collected by properly trained field personnel with knowledge of standard industry practices

## 6.1 Field Preparation and Mobilization

Field preparation and mobilization includes tasks that must be conducted prior to the start of field activities. Field preparation tasks will include either procurement of all necessary field instruments from a third party vendor with calibration documentation or calibration of field instruments that are owned by the mine or sampling entity. Sampling equipment, including pre-cleaned sample containers with required sample preservatives, will be obtained from the analytical laboratory in a return shipping cooler.

Information collected at the monitoring well or surface water location is provided on the Figure 6-1 Field Data Monitoring/Sampling Report.

## 6.2 Equipment Calibration

The calibration process is necessary to ensure that the instrument is working properly, and that the results are within the range of acceptability as determined by the manufacturer's specifications. Calibration time and date will be recorded to maintain a record of the calibration and proof of acceptability.

Equipment used to collect field measurements will be calibrated at the start of each day. More frequent calibration is commonly necessary, depending on the reliability and inherent stability of the instrumentation, extreme field conditions (weather/climate), continuous or heavy use, or high concentrations of monitored parameters. Where field calibration is possible, calibration should be verified and documented at the end of the day.

## 6.3 Water Level Measurement

Depth to groundwater will be measured with an electronic water-sensing device. The measurement will be made to the top of the well collar, i.e. PVC casing and will be recorded to the nearest one foot. The total depth of the well will also be recorded during each monitoring event.  These measurements will be used to calculate the water volume that needs to be purged prior to sampling.

## 6.4 Well Purging

Purging can be considered complete when a sufficient volume of water has been removed from the well and/or stabilization of select groundwater parameters has been achieved. It is important to record the circumstances surrounding each sample collection event. These records can help resolve analytical discrepancies.

Each monitoring well has a known well completion depth and depth to water. Based on the purge volume calculation below, one casing volume of water will be purged using either a disposable bailer or stainless steel bailer that has been properly decontaminated/rinsed prior to collecting a groundwater sample. In addition, a groundwater stabilization parameter (temperature, pH, and/or specific conductance) will be recorded after removal of one half and one casing volume of water.

Minimum Purge Volume = (total well depth – depth to water) X well capacity; where total well depth and depth to water is in feet and where well volume (gallons per foot) is based on well diameter as follows:

2 inch well = 0.163 gallons per linear foot
4 inch well = 0.653 gallons per linear foot
6 inch well = 1.47 gallons per linear foot
8 inch well = 2.61 gallons per linear foot

## 6.5 Sample Collection

Groundwater samples will be collected immediately after purging the well. The sample will be collected using either a stainless steel baler or a disposable baler. When using a stainless steel baler, prior to collecting the sample, the baler will be rinsed with deionized water that will be collected in a clean container for submission for analysis along with the groundwater samples.

Groundwater sampling will be conducted by personnel with the proper training and experience. The sampler should wear a new pair of disposable, powder-free 'exam-type' gloves in order to reduce cross contamination of the samples prior to sampling. In addition, gloves should be changed between sampling locations.

Unfiltered samples will be collected directly from the sampling point into clean, laboratory-provided, and preserved (if required) sampling containers. Care should be taken when collecting the sample to minimize agitation when filling the sampling containers, and not to overfill sample containers containing preservatives. Samples collected for volatile constituents will be collected into VOA vials with no headspace. If air bubbles are observed after placing on the cap, a new sample will be collected into a fresh bottle.

## 6.6 Sample Handling

Follow laboratory requirements for sample containers and preservatives. Sample containers will be stored in a cool, dry location, separate from any VOC-containing materials. Sample containers containing laboratory prepared preservatives will not be used if held on-site for an extended period of time or if exposed to extreme temperature conditions. Once opened, the sample containers will be used immediately. If the container is used for any purpose other than sample collection, it will be discarded.

Samples will be identified with a unique sample identification (GW ID) number. Sample containers will be labeled using waterproof ink and will indicate the sampler, sample ID, date, time, matrix, and preservatives and analysis requested.

After labeling, samples will be placed in an insulated cooler on ice until packed for shipment to the laboratory. Sample containers will be placed in Ziploc-style freezer storage bags and then wrapped in protective packing material (bubble wrap); do not use foam blocks many labs ship the VOA vials in. The foam will insulate the vials and the proper temperature for the sample will not be achieved. Sample containers will then be placed in the insulated cooler in an up-right position (with the exception of the dissolved gas samples) and surrounded with sufficient ice to maintain a 4$^{o}$ Celsius cooler temperature during shipping. Ice will be double bagged into Ziploc-style freezer storage bags. If the cooler contains a drain outlet, it must be sealed over with tape on the inside and the outside of the cooler prior to sample packing.

A chain of custody form (COC) (Figure 6-2) will be placed in a Ziploc-style freezer storage bags and taped to the underside of the cooler lid. The cooler will be sealed with a custody seal and tape and either hand delivered to the laboratory, or shipped by overnight carrier for delivery to the analytical laboratory. The temperature of all coolers will be measured upon receipt at the laboratory. Therefore, a temperature blank will be included with each cooler.

## 6.7 Chain of Custody Procedures

Samples will be shipped under COC procedures to document the custody, transfer, handling, and shipping of samples. The sampler will be responsible for filling out the COC form and will sign the COC when relinquishing the samples to anyone else. One COC form will be completed for each cooler of samples collected. The COC will contain the following information:

- Sampler's signature
- Project number
- Date and time of collection
- Sample identification number
- Sample type
- Analyses requested

- Number of containers
- Preservatives
- Requested turn-around time
- Observations on sample condition that may be pertinent (i.e effervescence)
- Signature of persons relinquishing custody, dates, and times
- Signature of persons accepting custody, dates, and times
- Method of shipment and shipping air bill number (if appropriate)

The person responsible for delivery of the samples to the shipping company will sign the COC form, retain a copy of the COC form, document the method of shipment (shipper/air bill number) and send the original and the second copy of the COC form with the samples. Copies of the final COC forms from the laboratory documenting sample custody will be kept with the sampling information.

6.8 Field Documentation

All purging data will be recorded on the Sampling and Monitoring Form and Calibration Form using permanent ink marker. The forms are located at the end of this section. The Sampling and Monitoring Form will contain a complete record of all equipment used, activities conducted, measurements of field parameters (pH, temperature and conductivity), purging calculations, and observations including weather and water odor, color and clarity and. The information must be sufficient to allow the purging procedure to be reconstructed in sufficient detail to evaluate adequacy of the purging procedure. Field notes will also include explanations of problems encountered during well purging and sampling and an explanation of any trouble-shooting techniques that were used.

Field water quality parameters of pH, temperature in $^{o}C$ and conductivity in µS/cm, will be taken at each sampling location/event. Measurements will be made from a separate aliquot of water taken in the field. Field parameters will not be taken from sample containers in the field or from reopened sample containers prior to shipping.

6.9 Decontamination

Decontamination of non-dedicated or non-disposable equipment is necessary to prevent cross- contamination of sample locations. Dedicated or disposable equipment should be used whenever possible. All non-disposable equipment (e.g. instruments, buckets, non-dedicated pumps) must be decontaminated prior to use and between sample locations by using the following procedures:

1) Remove any visible surface contamination with a brush (sludge, sediment, etc) and rinse with tap water.
2) Wash with a dilute solution of tap water and non-phosphate laboratory grade detergent such as Alconox or equivalent. Pumps and non-disposable tubing must have water pumped through them.
3) Rinse with tap water.
4) Rinse with distilled or deionized water.

5) Allow to air dry.

Decontaminated equipment should be placed on aluminum foil to allow to dry and then stored in sealed containers when not in use to prevent contamination from airborne particles.

6.10 Investigation Derived Waste

Disposable field equipment (gloves, filters, valves, tubing) will be bagged and disposed of as municipal solid waste. Unused sampling containers and preservatives will be returned to the laboratory, or disposed of as municipal waste after disposing of the preservatives into a municipal sewer system diluted with water. Preservatives should not be disposed of in concentrated form or directly into the ground. Purge water will be discharged onto the ground at least 20-feet from and down-gradient of the water source and/or in a location designated by the landowner. Decontamination water should be collected and disposed of down-gradient from the water source. Purge water and decontamination water, if disposed of onto the surface, will be discharged in a location to allow for infiltration of the water.

6.11 Sample Security

Individuals performing the various sampling tasks are responsible for maintaining sample security from the time of sample collection until the time the sample is received by the laboratory. Once the sample has been collected and until it is transmitted to the laboratory for analysis it will be in the sampler's possession under his attention, kept in a secure location, or within a container which has been secured through the provision of a security seal.

Figure 6-1 Field Data Monitoring/Sampling Report

# Field Data Monitoring/Sampling Report

| | | | |
|---|---|---|---|
| **Monitoring/Sampling Date** | | **Well Purging Calculations** | |
| **Sample Location** | | **A. Depth to Water (ft.) Date/Time** | |
| **Weather conditions** | | **B. Total Well Depth (ft.)** | |
| **Sampling Team Names** | | **C. Water Well Volume A-B** | |
| | | **D. Well Diameter (Circle One)** | 2 inch = 0.163 gallons per linear foot<br>4 inch = 0.653 gallons per linear foot<br>6 inch = 1.47 gallons per linear foot |
| **Total volume purged Date/Time Sampler's Initials** | | **____________ X ___________ = _______________ gallons**<br>**C D Purge Volume** | |
| **Water Quality Field Data** | | **Notations/Observations** | |
| **pH/Time** | | **Well depth point of reference:** | |
| **Temperature (°C)/Time** | | **Well and Vicinity Changes or Observations:** | |
| **Conductivity (µS/cm)/Time** | | **Probable sources of contamination if observed:** | |
| **Color** | | **Sampling Event** | |
| **Odor** | | **Sampling Time** | |
| **Clarity** | | **pH/Time** | |
| **Foam** | | **Temperature (°C)/Time** | |
| **Oil sheen** | | **Conductivity (µS/cm)/Time** | |
| **Other** | | **Number of Sampling Jars** | |

SIGNATURE OF SAMPLE HANDLER________________________________ Title_________________

Figure 6-2 Instrument Calibration Report

# Field Instruments Calibration Report

| **Date of Calibration** | | **Date of Sampling/Monitoring Event** | | |
|---|---|---|---|---|
| **Instrument** | **Make** | **Calibration/Test** | **Result** | **Notes** |
| Water Level Meter | | Battery Check | Yes No | |
| pH Meter | | pH Standard 4.0 | | |
| | | pH Standard 7.0 | | |
| | | pH Standard 10.0 | | |
| Conductivity Meter | | Standard 1413 μS/cm | | |
| Temperature | | | | |
| Other | | | | |

SIGNATURE ____________________________________ Title________________________

# Figure 6-3 Chain of Custody Form

**ALS Environmental**

225 Commerce Drive, Fort Collins, Colorado 80524
TF: (800) 443-1511 PH: (970) 490-1511 FX: (970) 490-1522

**Chain-of-Custody**

Form 202r6

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLER | Angela Bellantoni | DATE | 3/29/2021 | PAGE | 1 of 1 |
| PROJECT NAME | Zephyr Gold USA | SITE ID | Dawson Mine | TURNAROUND | SLOOOW | DISPOSAL | By Lab or Return to Client |
| PROJECT No. | ZML1265 | EDD FORMAT | | | | WORKORDER # | 2103556 |
| | | PURCHASE ORDER | | | | | |
| COMPANY NAME | Environmental Alternatives Inc. | BILL TO COMPANY | Environmental Alternatives Inc. | | | | |
| SEND REPORT TO | Angela Bellantoni | INVOICE ATTN TO | Angela Bellantoni | | | | |
| ADDRESS | P.O. Box 326 | ADDRESS | P.O. Box 326 | | | | |
| CITY / STATE / ZIP | Cañon City, CO 81215 | CITY / STATE / ZIP | Cañon City, CO 81215 | | | | |
| PHONE | 719-275-8951 | PHONE | 719-275-8951 | | | | |
| FAX | NA | FAX | NA | | | | |
| E-MAIL | angela@envalternatives.com | E-MAIL | angela@envalternatives.com | | | | |

| Lab ID | Field ID | Matrix | Sample Date | Sample Time | # Bottles | Pres. | QC | cations Method 6010 or 200.7 | Hg Method 7470 or 245.1 | pH Method 150.1 | Specific Conductivity Method 120.1 | Anions Method 300.0 | Alkalinity Method 310.1 | TDS Method 160.1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | North Well | W | 3/29/2021 | 9:08 AM | 2 | | x | x | x | x | x | x | x | x |
| 2 | South Well | W | 3/29/2021 | 9:31 AM | 2 | | x | x | x | x | x | x | x | x |

*Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

**For metals or anions, please detail analytes below.**

**Comments:**

Please see attached analytical suite.

| QC PACKAGE (check below) | |
|---|---|
| X | LEVEL II (Standard QC) |
| | LEVEL III (Std QC + forms) |
| | LEVEL IV (Std QC + forms + raw data) |

Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035

| | SIGNATURE | PRINTED NAME | DATE | TIME |
|---|---|---|---|---|
| RELINQUISHED BY | [signature] | Angela M. Bellantoni | 3/29/21 | 10:45A |
| RECEIVED BY | [signature] | Tyler Mossor | 3/30/21 | 1000 |
| RELINQUISHED BY | | | | |
| RECEIVED BY | | | | |
| RELINQUISHED BY | | | | |
| RECEIVED BY | | | | |

## Section 7 LABORATORY ANALYSIS AND ANALYTICAL PARAMETERS

Laboratory analyses will be performed by an accredited laboratory. The laboratory quality assurance program will include analytical procedures, sample handling and preservation techniques. Tier II QA/QC reports will be requested on each COC. Laboratory analytical reports will be received and maintained electronically.

Constituents of analysis are listed in Exhibit G, Section 2.7, Table 2.7.4-1 of the DRMS application. All metals are dissolved unless otherwise noted. Based on baseline data, analytical constituents may be discontinued at the direction of the Division. Analytical methods are provided in Table 7-1 Analyses and Method.

Table 7-1 Analyses and Method

| Requested Analyses | Matrix | Method |
|---|---|---|
| Table 1 | | |
| Total Coliform | WATER | SM9222 |
| METALS | WATER | 6020 |
| Asbestos | WATER | TEM |
| Anions (F, NO2, NO3) | WATER | 300.0 |
| NITRATE/NITRITE | WATER | 353.2 |
| Cyanide | WATER | SM4500CNC |
| Gross Alpha/Beta | WATER | 900.0 |
| Table 2 | | |
| Chloride, Sulfate | WATER | 300.0 |
| METALS | WATER | 6020 |
| Corrosivity as pH | WATER | SM4500-H |
| Color | WATER | 2120 |
| Foaming Agents | WATER | 5540 |
| Organics | WATER | 8270 |
| Table 3 | | |
| METALS | WATER | 6020 |
| Flouride | WATER | 300.0 |
| NITRATE/NITRITE | WATER | 353.2 |
| Table 4 | | |
| TDS | WATER | SM2540C |

# Section 8 DATA HANDLING AND REDUCTION

In this manual data handling and reduction include the processes of data collection, organization, and processing to reduce data to usable results that are reported to the data user. The QA functions of data verification and validation are included in this process.

## 8.1 Laboratory Data Records and Data Processing

All third party or contracting laboratory sample results should be supported with electronic records maintained on more than one secure server.

## 8.2 Dawson Gold Mine Data Review

Once DGM receives the laboratory's report the report's contents undergo DGM's QAO review and data user review. The QAO performs a review of the analytical lab's sample result report for data quality acceptability. While reviewing the analytical data packets the QAO checks to see that the measurement performance criteria and quality control requirements listed in QAPP Section 8 or the particular laboratory procedure are either met or addressed.

During sample and analysis data quality review, data validity may require investigation and follow up. This QAPP document provides two methods to accomplish these actions: a Data Verification – Assay Correction (DVR-ACF) System described below and the Corrective Action - Improvement Request (CAIR) System described in Section 9. Both systems provide a mechanism to investigate perceived quality problems and respond to them. The DVR-ACF system is applied only to questions of specific sample data quality. The CAIR system may also be applied to more general sampling and analytical procedure activities and other unrelated issues.

### 8.2.1 Data Verification

Data verification is the confirmation that the sampling and analytical requirements have been completed and are reported correctly. Data verification answers the questions: Is the data complete? Is all necessary recorded data present and correctly processed?

Sampling data is verified by the QAO's review and approval of the assembled COC packet. During COC review the QAO checks for the completion of the required COC document. He also checks for the presence of all required support data and documentation such as field notes being present as attachments. The COC packet must also identify the constituents to be analyzed for and any special treatment required for each sample listed.

The completeness of analytical data is verified through review of the laboratory's sample results report and associated analytical data package. During review of the analytical data packets the QAO verifies that all necessary components of each analytical sample batch are present and acceptable.

8.2.1.1 Data Verification Request – Assay Correction System

Questionable or anomalous data is investigated through DVR-ACF system. An example of a Data Verification Request Form is shown in Figure 7-1. This form is to be used by any data reviewer to request verification of reported data. The data verification request should be channeled through the QAO. The QAO sees that the appropriate party is contacted and tracks and documents the investigation. The QAO acts as liaison between the request originator and the reporting laboratory or other reporting entity. The QAO contacts the reporting entity and initiates and records a request for investigation of the questioned data. The QAO reviews the results of the investigation once it is completed and reported. The QAO then completes an Assay Correction Form to document the results of the investigation. An example of an Assay Correction Form is shown in Figure 7-2. A copy of this report is given to the originator of the data verification request. Each DVR-ACF investigation sequence and any required follow-up will be documented in the QAO's QA records.

8.2.2 Data Validation

Data validation is a sampling and analytical process that includes evaluating compliance with method, procedure, or contract requirements. The QAO may make an initial assessment of procedural compliance during quality review of the COC and analytical data packets. During review of the analytical data packets the QAO checks to see that the measurement performance criteria or QC requirements listed in QAPP Section 8 or the particular laboratory procedure are either met or addressed. The QAO finalizes data review by initialing and dating the analytical data packet once he is satisfied that it meets all quality requirements.

8.3 Data Usability Assessment

The EPA defines usability assessment as the "determination of the adequacy of data, based on the results of validation and verification, for the decisions being made. The usability step involves assessing whether the process execution and resulting data meet project quality objectives documented in the QAPP."

The analyzing laboratory is expected to test sample batch QC sample result data for compliance with established acceptance criteria or control limits prior to reporting. Sample batch data associated with QC sample data that does not meet the predetermined acceptance criteria are considered to be qualified. Qualified data may not be considered fully useable.

The DGM QAO determines if the data meets the general quality objectives of the QAPP and is therefore usable. This determination is based on his review of the analytical data packages including any qualifying statements made in the case narrative if present or exceedance of acceptance limits in the packet's QC report. If the general quality objectives of the QAPP are met, the QAO documents approval of the data packet for use with his initials and the date. Any inadequacies or qualifying statements shall also be recorded within the data packet in the appropriate location and initialed and dated by the person making the statement. It is the responsibility of the data user to review the data reported to him, to be familiar with the general quality objectives of the QAPP, and to determine if the QAPP's quality objectives compare with the quality objectives of the specific project for which the data user intends to use the reported data.

# Figure 8-1 Data Verification Request

## DATA VERIFICATION REQUEST - DVR

**DVR/ACF #** ________________

**ANALYSIS SOURCE:** ________________________________

**TYPE OF SAMPLE:** ________________________________

**REQUEST – EXPLANATION - COMMENTS**

________________________________ **Date:**________________

**Request Originator**

________________________________ **Date:**________________

**Quality Assurance Officer**

________________________________ **Date:**________________

**Laboratory Contact**

**DVR**

Figure 8-2 Assay Correction Form

**ASSAY CORRECTION FORM - ACF**

**DVR/ACF #** ________________

**ANALYSIS SOURCE:** ______________________________

**TYPE OF SAMPLE:** ______________________________

**CORRECTION – EXPLANATION - COMMENTS**

______________________________ **Date:**________________
**Laboratory Contact**

______________________________ **Date:**________________
**Quality Assurance Officer**

______________________________ **Date:**________________
**Request Originator**

**ACF**

Figure 8-3 Data Request Form

# Data Request

Request Number ______________________________
Date ______________________________
Request By Who ______________________________
Data Source ______________________________
Response Expected From ______________________________
Response Due Date ______________________________

## DATA DESCRIPTION

Sample Date ______________________________
Sample Location ______________________________
Sample I.D. ______________________________

Date of Analysis ______________________________
Analysis/Data Type Requested ______________________________

Report Format Requested ______________________________
Deliver Data To ______________________________

## DATA REPORT

Data Reporter ______________________________
Date Data Reported ______________________________
Quality Assurance Officer Sign-off ______________________________
Acceptance by Requesting Person ______________________________

## COMMENTS OR REQUIRED FOLLOW UP

Data Request

# Section 9 DATA QUALITY INDICATORS AND ASSESSMENT

Data quality indicators reflect the quality of measurement data. Evaluation of this quality is based on evaluation of those indicators addressed throughout this and other sections of this QAPP. These indicators vary from more subjective QA indicators to distinctly objective and measurable QC indictors. There is some overlap of these characteristics among the various data quality indicators.

All field sampling programs require the collection of additional samples to provide quality control for the field or laboratory procedures. These include field duplicates, trip blanks, equipment rinsate blanks, and several kinds of field blanks.

## 9.1 Quality Assurance Indicators

Some data quality indicators do not lend to objective measurement but are used to provide subjective indications of data quality, these are referred to as QA indicators and are used to assure sample and analytical data quality and usability. Various blank, blind, and other samples are utilized for QA purposes. Some monitor field variables, others are designed to monitor procedural variables, and others provide indication of laboratory data quality. The sample type and sampling procedure determine which QA indicator sample is appropriate and required. These samples are monitored for trends or anomalies.

### 9.1.1 Quality Assurance Indicators of Field Sampling Performance

QA field samples are QA samples taken to investigate possible contamination or anomalies resulting from field sampling practices or field conditions.

#### 9.1.1.1 Equipment Blank – Sampling Equipment Decontamination Effectiveness

On the day that water sampling is conducted, an equipment blank is collected to insure that non-dedicated sampling devices and filtration equipment have been cleaned effectively. This is accomplished by flushing ASTM Type II reagent grade water through the sampling and filtration equipment and collecting a sample of the water in an appropriate sample container. This sample is collected after the sampling equipment has been decontaminated preferably after sampling a location known to have relatively high levels of constituents of concern or contaminants. The sample is submitted to the laboratory for analysis like any other sample.

#### 9.1.1.2 Blind Samples - Field Parameter Measurement Verification

The validity of the field parameter measurements of pH and conductivity may be verified using blind samples on a non-scheduled basis.

- A blind sample may be submitted by the QAO to the Sample Technician for field pH determination. The blind sample may be a pH buffer standard or a pH sample obtained from a reliable source such as EPA or a commercial vendor.

An acceptable pH measurement will be either +/- 0.2 pH units or 2 standard deviations from the known value, whichever is most restrictive.

- A blind sample may be submitted by the QAO to the Sample Technician for specific conductance determination. This sample may be prepared from stock potassium chloride by an analytical laboratory or obtained from a commercial source. Results are deemed acceptable when the RPD between the known value and the measured value is less than +/- 10% for conductivity greater than 500 µmho and less than +/- 20% for conductivity less than 500 µmho.

9.1.1.3 Field Duplicates – Sampling Procedure Repeatability and Precision

A field duplicate sample is a separate sample collected at the same time and location as the original sample to which it is compared. Field duplicates are collected and analyzed to provide an assessment of sample collection consistency and associated sample result variability. At least one field duplicate of a sample type should be collected by the Sample Technician during each sampling episode or for each twenty samples collected. For example, in the case of DGM baseline determination sampling, one field duplicate would be collected during the quarterly groundwater sampling of less than twenty sample locations unless specified otherwise.

9.1.2 Quality Assurance Indicators of Analytical Laboratory Performance

9.1.2.1 Unknown Samples

A standard solution may be submitted by the QAO to the analytical laboratory as an unknown or in place of a routine sample. The reported analytical result can provide a qualitative indicator of acceptable laboratory performance.

9.1.2.2 Independent Performance Evaluations

The results of a laboratory's participation in subscribed independent proficiency testing and inter-laboratory exchange performance evaluation programs should provide qualitative indications of acceptable laboratory performance for a wide range of analytes. The third party laboratory should be willing to provide their performance evaluation results for inspection by DGM personnel or their agents upon request.

9.2 Quality Control Indicators – Measurement Performance Criteria

QC indicators are determined, prepared, monitored, and reported by the third party laboratory performing and reporting analytical results. These data quality indicators or measurement performance criteria provide objective measurement of the sensitivity, accuracy, and precision to provide an indication of the reliability of the analytical results to which they are applied. They may include instrument detection limits, lower limit of detection, method detection limit and minimum detectable activity

### 9.3 Quality Control of Analytical Results - Accuracy/Bias Samples

According to the EPA IDQTF UFP-QAPP Manual: “Accuracy is the degree of agreement between an observed value and an accepted reference value. Bias describes the systemic or persistent distortion associated with a measurement system." QC accuracy and bias determination samples are discussed in some detail here to provide data reviewers of DGM environmental monitoring sample analytical reports insight for evaluating reported data. QA/QC samples are included in laboratory analysis to provide a basis for evaluation of the validity of the analytical data. The functions of the QC samples are to detect interference or biases and to provide an indication of analytical accuracy and precision. The third party laboratory must include at least one of each of the following QC samples associated with each 20 samples being analyzed in a sample batch preparation blank, laboratory control sample, spiked sample, and a duplicate sample.

During and audit of the contracting laboratory, DGM personnel should be given access to review the labs statistical analyses of QC data related to the mine’s environmental monitoring sample results.

## Section 10 CORRECTIVE ACTION – IMPROVEMENT REQUEST AND RESPONSE SYSTEM

### 10.1 Purpose of a Corrective Action – Continuous Improvement System

The focus of this quality assurance program is quality. Quality can only be maintained or improved if action is taken 1) to correct deficiencies when noted or 2) to improve the system or program when the potential for improvement is discovered. It is essential to this QA program that this process be documented. The Corrective Action - Improvement Request and Response (CAIR) System is the primary vehicle that this QAPP uses for formally initiating and documenting corrective actions and improvements. It is intended that this system be implemented upon approval of this QAPP and also be actively employed at the outset of any subsequent environmental related activities.

The principle of continuous improvement is essential to contemporary QA philosophies. One purpose of the CAIR System is to promote continuous improvement. The philosophy of continuous improvement of quality requires that all Key Individuals be continuously on the lookout for ways to correct deficiencies in any system and improve their work product. The need for correction or improvement may be detected through personal involvement, observation, communication, formal evaluation, etc. The need for action may be evident as insufficient, inappropriate or incorrect data, improper conclusions or no conclusion possible, no work product or improper work product, inefficient or inadequate work systems, system failures, adequate work product with obvious need for improvement, or potentially dangerous circumstances. During normal quality assurance evaluations, the QAO may discover opportunities for improving quality more often than conditions in need of correction. In either case some action may be appropriate. These actions must be communicated to all parties involved.

### 10.2 Responsibilities and Duties

Each work system participant is responsible for the credibility and quality of their work. Therefore, any Key Individual or their supervisor may initiate a request for CAIR. The QAO is responsible for coordinating corrective action or action requested for improvement by overseeing and maintaining the CAIR System. The QAO may determine the required level of involvement of supervisors and department head depending on type of action requested. He also informs the General Manager of requests, action taken, and significant findings of any follow-up. It is ultimately the General Manager's responsibility to assure that corrective action or action requested for improvements are accomplished expeditiously and that these actions alleviate any deficiencies when their need is recognized.

### 10.3 CAIR System Operation and Documentation

The operating sequence of the CAIR begins when a need for action is detected. A CAIR request is documented and sent to the QAO. A responsible party is identified and notified through the organizational chain of command. The responsible party evaluates the request, determines a response and appropriate follow-up action, and then replies with his/her response via a CAIR Response through the organizational chain of command. The QAO documents the response. The QAO routes the CAIR through the facility's organizational chain of command for approval or disapproval of the request, response, and any action.

The CAIR System is documented with forms using a standard format. Requests may be made using a suggested format similar to that of the Corrective Action - Improvement Request Form (CAIR) shown in Figure 9-1. Responses may be made using a suggested format similar to that of the Corrective Action - Improvement Response Form (CAIR's) shown in Figure 9-2. Attachments may be made to the forms. All requests and responses must be routed through the QAO to assure documentation and tracking. The QAO is ultimately responsible for assuring the request-response sequence coordination between the participants. The QAO assigns a unique identification number to each CAIR sequence. Since each requested action is unique each requires custom routing. The QAO determines the routing and circulation of the requests and responses as they are first recorded. Each participant's activity in this system is documented on the CAIR forms. The QAO insures that the appropriate signatures are obtained during documentation routing. The QAO maintains a record of the request-response sequence that includes the request ID numbers, filing dates, responsible parties, response due dates, actual date of response, and response completion status. The QAO files all completed CAIR Request-Response documentation forms in the CAIR System section of the QA records.

Figure 10-1 Corrective Action - Improvement Request

## CORRECTIVE ACTION – IMPROVEMENT REQUEST

## CAIR No. __________

Responsible Person:

Department/Organization:

Response Due Date:

STATE NATURE OF NEED:

Attachments [ ]

WHEN WAS NEED IDENTIFIED?

Attachments [ ]

RECOMMENDED ACTION:

Attachments [ ]

________________________________________
Request Originator - Date

------------------ Quality Assurance Review/Circulation ------------------

________________________________________
Quality Assurance Officer -- Date

________________________________________
Supervisor/ Department Head/Project Manager/Other --- Date

________________________________________
Supervisor/ Department Head/Project Manager/Other --- Date

CAIR Request

Figure 10-2 Corrective Action - Improvement Response

# CORRECTIVE ACTION – IMPROVEMENT RESPONSE

## CAIR's No. __________

Response Due Date:

Date of Response:

Request Originator:

Responsible Person:

RESPONSE - ACTION PLANNED:

Attachments [ ]

Type of Action: [ ] Permanent [ ] Temporary

______________________________
Response Submitted By - Date

Department/Organization:

------------------ Quality Assurance Review/Circulation ------------------

______________________________
Quality Assurance Officer -- Date

______________________________
Supervisor/ Department Head/Project Manager/Other --- Date

______________________________
Supervisor/ Department Head/Project Manager/Other --- Date

CAIR Response

## Section 11 QUALITY ASSURANCE REPORTS TO MANAGEMENT

Once site activity has commenced, the QAO will submit a monthly report to the DGM General Manager. This report summarizes routine Environmental Monitoring QA/QC activities conducted for the month. The summary will also mention any unusual circumstances requiring environmental monitoring or quality assurance oversight. Important or unusual findings will be mentioned in this report. A quarterly summary report will also be prepared to address QA/QC activities and findings associated with the scheduled quarterly ground and surface water sampling and available analytical results. An annual Environmental Monitoring Quality Assurance Program Report will summarize QA/QC activities conducted throughout the year and provide an assessment of the status of the program.

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