Quality Assurance Program Plan

For The

Dawson Gold Mine

Environmental Monitoring Program

Prepared by Frank Adamic

January 7, 2022

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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

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
- EPA Effluent Guidelines and Standards - Ore Mining and Dressing Effluent Guidelines, 40 CFR, Part 440, Subpart J

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 Monitoring Procedures

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 EAP Ground-Water and Surface-Water Sampling Guidelines (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*, 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 Groundwater Sampling* (SESDPROC-301-R4) and SESD *Operating Procedures for Surface Water Sampling* (SESDPROC-201-R4) and the EPA Office of Solid Waste and Emergency Response's *Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers* (EPA/542-S-02-001). All of which are incorporated herein by reference.

These basic sampling principles will be followed: use of pre-established sampling plans, use of clean uncontaminated containers, labeling of containers, decontamination of sampling equipment prior to sampling, preservation and field preparation of samples (when appropriate), adherence to established sample custody and chain of custody practices, sample data management and use of quality assurance samples (such as trip and equipment blanks when appropriate).

Exhibit G of the permit application addresses "baseline" monitoring of groundwater and surface water at established locations on the mine site and Grape Creek. Appendix F of the permit application addresses groundwater sampling of environmental monitoring wells, monitoring of water parameters in the contact water pond, monitoring of the Filtered Tailings Storage Facility (FTFS) underdrain flow, phreatic surface development, and integrity and stress level assessment. 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.

5.2 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 SAMPLE PROCESSING

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.

6.1 Field Practices

In this section field practices refer to those that are conducted by DGM personnel or their agents.

6.1.1 Sample Handling in the Field

6.1.1.1 Sample Acquisition

Sampling equipment will be properly decontaminated according to manufacturer's manual prior to sample acquisition.

6.1.1.2 Sample Labeling

The sample collector labels all sample containers with permanent ink at the time of sample collection. Each container is labeled with the sample date, sample location and chain of custody identification. Other information such as: project or special sample name, field preparation status, preservative addition, etc. may also be specified on the sample container and/or chain of custody document as prescribed by specific task sampling requirements. The individuals performing the sampling will provide this information.

6.1.1.3 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.

6.1.1.4 Sample Shipment

Shipment of all samples to third party laboratories will require that samples under go all prescribed preparation and preservation practices including maintenance of constant cold storage temperature and unbroken security seals on the shipping container throughout the duration of the shipping process up to the official documentation of sample reception and acceptance by the receiving laboratory.

6.1.2 Sample Field Documentation

6.1.2.1 Sample Collection Documentation

A field notebook or equivalent record documenting all sampling and sample collection activities, preservation and special handling, collection dates/times, sample field custody, and technician observations of environmental conditions and any other potentially pertinent information will be maintained as part of the project or task archive.

6.1.2.2 Chain of Custody Records

Chain of Custody (COC) forms are used for identification, documentation and tracking of all samples. Figure 7-1 provides an example of a COC form. Sample COC documentation is necessary for tracking and quality assurance of data. Sample identification is assigned in the field during the sampling process. Official sample COC documentation starts in the field through assignment of a unique sample identification and allows tracking of each sample from acquisition through the reporting of results. The sampling technician initiates the sample's COC documentation by initiating a COC form. The sampler, field custodian, and/or sample deliverer each enter required information on the COC form. The sampling technician may also record pertinent field data and comments on the form as well as in a field notebook or other type of record.

Figure 6-1 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.	ZML1266	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 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 10 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 12. 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 9-1. 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 9-2. 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 10 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.

8.2.2.1 System Evaluation/Audit Program

The System Evaluations/Audit Program is discussed in Section 11 of this document. This program establishes a quality assurance auditing function and is applied to both sampling and analytical procedures. Sampling data validation is accomplished through field auditing or evaluation of sampling procedures being followed in the field by sampling personnel. Likewise, procedural compliance with analytical procedures may be assessed through QAO auditing or evaluation of the specific contract laboratory's procedures as the analyses are conducted in that laboratory. The evaluation program determines whether the samples are acquired and or analyzed as described in the written procedures.

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.

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 QAe 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 12-1. Responses may be made using a suggested format similar to that of the Corrective Action - Improvement Response Form (CAIR's) shown in Figure 12-2. 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.

REFERENCES - SOURCES

ASTM Standard D5358-93(2019), "Standard Practice for Sampling with a Dipper or Pond Sampler," ASTM International, West Conshohocken, PA,1993, DOI:10.1520/D5358-93R19, www.astm.org

ASTM Standard D7069 – 04 (Reapproved 2015), "Standard Guide for Field Quality Assurance in a Groundwater Sampling Event," ASTM International, West Conshohocken, PA, 2004, DOI:10.1520/D7069-4R15, www.astm.org

Bellantoni, Angela, Environmental Alternatives Inc; 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; Revised May 22, 2009

Cazier, Timothy A.; October 14, 2021; "Re: Dawson Gold Mine, Permit No. M-2021-046; Preliminary Adequacy Review"; Colorado Department of Natural Resources, Division of Reclamation, Mining and Safety; https://dnrweblink.state.co.us/drms/0/edoc/1344569/2021-10-14_PERMIT%20FILE%20-%20M2021046.pdf?searchid=4f9c48f2-a252-4df8-bec6-af8adb165266

Colorado Department of Public Health and Environment Water Quality Control Commission Regulation No. 31 – The Basic Standards and Methodologies for Surface Water (5 CCR 1002-31)

Colorado Department of Public Health and Environment 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 Effective July 15, 2019; (2 CCR 407-1)

EPA Effluent Guidelines and Standards - Ore Mining and Dressing Effluent Guidelines, 40 CFR, Part 440, Subpart J; https://www.ecfr.gov/current/title-40/chapter-I/subchapter-N/part-440

EPA U.S. Environmental Protection Agency's *Contract Laboratory Program (*EPA-CLP) Statement of Work for Inorganic Analysis Multi-media Multi Concentration Document Number ILMO3.0 (1993) and ILMO5.3 (2004)

EPA (U.S. Environmental Protection Agency). 2004. Multi-Agency Radiological Laboratory Analytical Protocols Manual (MARLAP). NUREG-1576; EPA 402-B-04-001A.

Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers, Ground Water Forum Issue Paper, Technology Innovative office, Office of Solid Waste and Emergency Response, US EPA, Washington, DC, May 2002, EPA/542-S-02-001 https://www.epa.gov/sites/default/files/2015-06/documents/gw_sampling_guide.pdf

Quality Assurance Program Plan for the Cotter Corporation Canon City Mill Environmental Sampling and Monitoring Studies, Revised March 5, 1999 for Colorado Department of Colorado Department of Public Health and Environment Radioactive Materials License No. 369-01 Condition 26.3.

Uniform Federal Policy for Quality Assurance Project Plans Evaluating, Assessing, and Documenting Environmental Data Collection and Use Programs Part 1: UFP-QAPP Manual" (March 2005) (EPA Publication Number: EPA-505-B-04-900A) "Part 2A: UFP-QAPP Workbook" (August 2003) and "Part 2B, Quality Assurance Quality Control Compendium: Minimum QA/QC Activities" (August 2003) (EPA Publication Number: EPA-505-B-04-900B).

U.S. Environmental Protection Agency Science and Ecosystem Support Division Athens, Georgia, (SESD) Region 4; SESD Operating Procedure for Ground Water Sampling, SESDPROC-301-R4, Groundwater Sampling (301) _AF-R4, April 26, 2017 version, https://www.epa.gov/sites/default/files/2017-07/documents/groundwater_sampling301_af.r4.pdf

U.S. Environmental Protection Agency Science and Ecosystem Support Division Athens, Georgia, (SESD) Region 4; SESD Operating Procedure for Surface Water Sampling, SESDPROC-201-R4, Surface Water Sampling_AF-R4, December 16, 2016 version, https://www.epa.gov/sites/default/files/2017-07/documents/surface_water_sampling201_af.r4.pdf

Zephyr Gold USA Ltd.'s Designated Mining Regular (112d) Operation Reclamation Permit Application for Dawson Gold Mine Fremont County, CO Application and Exhibits Submitted June 30, 2021

Zephyr Gold USA Ltd.'s Designated Mining Regular (112d) Operation Reclamation Permit Application for Dawson Gold Mine Fremont County, CO Appendices Submitted June 30, 2021