



# KEMESS MINE 2021 ANNUAL IAAC REPORT

*Canadian Environmental  
Assessment Act, 2012*



**Submitted to:**

**Impact Assessment Agency of Canada**

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## EXECUTIVE SUMMARY

Aurico Metals Inc., a wholly own subsidiary of Centerra Gold Inc., obtained the Canadian Environmental Ministers Decision Statement on March 13, 2017 for the Kemess Underground Mine (KUG), an underground mine located in the mountains of north-central British Columbia (BC), 430 kilometres northwest of Prince George. The Implementation Schedule was provided to Aboriginal groups and the Impact Assessment Agency of Canada (IAAC) in 2017. Construction activities (road building, clearing, etc.) for the Kemess Underground Project Commenced July 16, 2018.

At the mine site, fish and fish habitat protection continues to be achieved through the implementation of erosion and sediment control (ESC) techniques as part of the Care and Maintenance phase of the project. Very limited construction activities are located within the mine site water management area (MSWMA). Runoff water from the East Pit Quarry continued to flow into the Kemess Underground (KUG) tailings storage facility (TSF).

All water that reports to the MSWMA is pumped back to the KUG tailings storage facility (TSF). Kemess implemented supplementary construction site water management and erosion control measures including the implementation of check dams, placement of rip-rap, and hydroseeding efforts.

In 2021, there was no discharge to Attichika Creek. Results from the 2021 Fish and Aquatic Effects Monitoring Study showed that condition of water quality, sediment quality, periphyton communities, and benthic invertebrate abundance, composition, and diversity in Attichika Creek remained within pre-discharge levels, and were consistent with those of healthy aquatic ecosystems in the region.

For the Fish Sentinel Species Survey in Attichika Creek with slimy sculpin, there were no changes in tissue metal concentrations, including selenium, that were attributable to discharge. For the bull trout samples collected from Thutade Lake, there was a slight increase in selenium concentrations relative to 2019 levels (while no change with respect to 2020 levels), but the concentrations were still below the BC guideline for the Protection of Aquatic Life (4 mg/kg dry weight).

During all snow-laden months in 2021, the Omineca Resource Access Road (ORAR) was not kept open by AuRico; therefore, there was no need for monitoring to ensure safe passage of ungulates exiting plowed roads. A Hunting, Fishing and Gathering Policy was implemented in 2018 to prohibit fishing, hunting, and trapping within the Project area.

No vegetation clearing was conducted in 2021, including in pond areas that could be suitable habitat for the Western Toad (*Anaxyrus boreas*). Similarly, no maternal roosts were discovered for little brown myotis (*Myotis lucifugus*) nor Northern myotis (*Myotis septentrionalis*). No furbearer dens or migratory bird nests were found. Furthermore, no wildlife mortalities were reported in 2021.

There was no advancement of construction activities during 2021. Furthermore, no heritage or archaeological sites were discovered in this period.

No accidents or malfunctions occurred in 2021 that had the potential to cause adverse environmental effects or trigger the emergency response plan.

## RÉSUMÉ

Aurico Metals Inc., une filiale en propriété exclusive de Centerra Gold Inc., a obtenu la déclaration de décision des ministres canadiens de l'environnement le 13 mars 2017 pour la mine souterraine Kemess (KUG), une mine souterraine située dans les montagnes du centre-nord de la Colombie-Britannique (Colombie-Britannique), à 430 kilomètres au nord-ouest de Prince George. Le calendrier de mise en œuvre a été fourni aux groupes autochtones et à l'Agence d'évaluation d'impact du Canada (IAAC) en 2017. Les activités de construction (construction de routes, déboisement, etc.) pour le projet souterrain de Kemess ont commencé le 16 juillet 2018.

Sur le site minier, la protection du poisson et de son habitat continue d'être assurée grâce à la mise en œuvre de techniques de contrôle de l'érosion et des sédiments (ESC) dans le cadre de notre phase de soins et d'entretien du projet. Des activités de construction très limitées sont situées dans la zone de gestion des eaux du site minier (MSWMA). Les eaux de ruissellement de la carrière East Pit ont continué de s'écouler dans l'installation de stockage des résidus (ISR) souterraine de Kemess (KUG).

Toute l'eau transmise au MSWMA est pompée vers l'installation de stockage des résidus du KUG (TSF). Kemess a mis en œuvre des mesures supplémentaires de gestion de l'eau et de contrôle de l'érosion sur le site de construction, notamment la mise en place de barrages de contrôle, de mise en place d'enrochements, et d'efforts d'hydroensemencement.

En 2021, il n'y a eu aucun rejet dans le ruisseau Attichika. Les résultats de l'étude de surveillance des effets sur les poissons et le milieu aquatique de 2021 ont montré que l'état de la qualité de l'eau, la qualité des sédiments, les communautés de périphyton et l'abondance, la composition et la diversité des invertébrés benthiques dans le ruisseau Attichika sont restés dans les niveaux d'avant le rejet et étaient conformes à ceux d'un des écosystèmes aquatique sains de la région.

Pour l'enquête sur les espèces sentinelles de poissons dans le ruisseau Attichika avec chabot visqueux, il n'y a eu aucun changement dans les concentrations de métaux dans les tissus, y compris le sélénium, attribuables aux rejets. Pour les échantillons d'ombles à tête plate prélevés dans le lac Thutade, il y a eu une légère augmentation des concentrations de sélénium par rapport aux niveaux de 2019 (aucun changement par rapport aux niveaux de 2020), mais les concentrations étaient toujours inférieures à la ligne directrice de la Colombie-Britannique pour la protection de la vie aquatique (4 mg/kg de poids sec).

Pendant tous les mois chargés de neige en 2021, la route d'accès aux ressources d'Omineca (ORAR) n'a pas été maintenue ouverte ; par conséquent, aucune surveillance n'était nécessaire pour assurer le passage en toute sécurité des ongulés sortant des routes déneigées. Une politique sur la chasse, la pêche et la cueillette a été mise en œuvre en 2018 pour interdire la pêche, la chasse et le piégeage dans la zone du projet.

Aucun défrichement de la végétation n'a été effectué en 2021, y compris dans les zones d'étangs

qui pourraient être un habitat convenable pour le crapaud de l'Ouest (*Anaxyrus boreas*). De même, aucun gîte maternel n'a été découvert pour la petite chauve-souris brune (*Myotis lucifugus*) ni pour la chauve-souris nordique (*Myotis septentrionalis*). Aucune tanière d'animaux à fourrure ni nid d'oiseau migrateur n'a été trouvé. De plus, aucune mortalité d'animaux sauvages n'a été signalée en 2021.

Il n'y a pas eu d'autres activités de construction en 2021. De plus, aucun site patrimonial ou archéologique n'a été découvert au cours de cette période.

Aucun accident ou défaillance susceptible d'avoir des effets environnementaux négatifs ou de déclencher le plan d'intervention d'urgence n'est survenu en 2021.

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## 1. Introduction

AuRico Metals Inc. (AuRico) is a wholly owned subsidiary of Centerra Gold, which operates the Kemess property. The Kemess Mine is located in north-central British Columbia, 430 kilometers northwest of Prince George in the Peace River Regional District. The closest communities to the Project by air are Kwadacha (also known as Fort Ware; 79 km), Tsay Keh (111 km), and Takla Landing (182 km). The Kemess South (KS) complex consists of an open pit mine, a processing mill and various ancillary support facilities, including maintenance shops and housing for 400 full-time employees during operations. The KS mine ceased operations in 2011. The Kemess Underground (KUG) Project is an approved 37,500 tonne per day copper and gold mine with a 17-year mine life. The KUG Project is designed to utilize the existing KS facilities, as well as newly constructed infrastructure. Construction of KUG began in 2018. In 2020, construction of the KUG project was paused and Kemess Mine was put into Care and Maintenance.

AuRico received both a BC provincial Environmental Assessment Certificate (#M17-01) and a Canadian Environmental Ministers Decision Statement in March of 2017. All the various provincial and federal permits required to construct the mine have been received. Surface Construction activities began at the Kemess Mine Site on July 16, 2018.

This report has been developed to meet Decision Statement Condition 2.9: *“the Proponent Shall, commencing in the reporting year during which the Proponent begins the implementation of the conditions set out in this Decision Statement, prepare an annual report”*. The report is laid out such that each heading addresses an annual reporting requirement defined within the sub-headings of Condition 2.9.



## **2. Condition 2.9: Annual Report**

*2.9 The Proponent shall, commencing in the reporting year during which the Proponent begins the implementation of the conditions set out in this Decision Statement, prepare an annual report that sets out:*

*2.9.1 the activities undertaken in the reporting year to comply with each of the conditions set out in this Decision Statement;*

*2.9.2 how the Proponent complied with condition 2.1;*

*2.9.3 for conditions set out in this Decision Statement for which consultation is a requirement, how the Proponent considered any views and information that the Proponent received during or as a result of the consultation;*

*2.9.4 the information referred to in conditions 2.4 and 2.5 for each follow-up program;*

*2.9.5 the results of the follow-up program requirements identified in conditions 3.7, 4.3, 5.1, 6.10, and 6.11; and*

*2.9.6 any modified or additional mitigation measures implemented or proposed to be implemented by the Proponent, as determined under condition 2.6.*

This report satisfies condition 2.9. The following sections in this report document compliance with each of the Decision Statement conditions, and speak to the sub-headings of Condition 2.9. Namely for Condition 2.9.3, the report identifies conditions which required consultation and how the Proponent (AuRico) has considered the views and information received as per the requirements set out in Condition 2.2.

*2.2 The Proponent shall, where consultation is a requirement of a condition set out in this Decision Statement:*

*2.2.1 provide a written notice of the opportunity for the party or parties being consulted to present their views and information on the subject of the consultation;*

*2.2.2 provide sufficient information on the scope and the subject matter of the consultation and a reasonable period of time to permit the party or parties being consulted to prepare their views and information;*

*2.2.3 provide a full and impartial consideration of any views and information presented by the party or parties being consulted on the subject matter of the consultation; and*

*2.2.4 advise in a timely manner the party or parties being consulted on how their views and information have been considered by the Proponent.*

### **3. Condition 3: Fish and Fish Habitat**

#### **3.1. Condition 3.1**

*The Proponent shall implement erosion and sedimentation control measures within the Project are during all phases of the Designated Project to avoid the deposit of deleterious substances in water frequented by fish.*

As per the Erosion Prevention and Sediment Control Plan, erosion and sediment control (ESC) techniques were implemented as part of all the KUG activities in 2021. There were ongoing stabilization earthworks performed in the Kemess Lake Valley (KLV) throughout the year, as well as hydroseeding being done in the fall before snowfall. In addition, the west bank on the road to the Attichika Creek Diffuser was stabilized and seeded. Furthermore, the overburden stockpile north of the WRD was also stabilized. Elsewhere, routine maintenance on roads, the runway and other surfaces were maintained at all times to protect against erosion and subsidence. All water that reports to the mine site water management area (MSWMA) is either pumped to the KUG Tailings Storage Facility (TSF) or flows to sediment settling features (i.e. settling ponds, check-dams) prior to release into the natural environment.

Settlement ponds were successful in reducing sediment transport within the MSWMA, verified by in-situ turbidity measurements at discharge points.

#### **3.2. Condition 3.2**

*The Proponent shall, taking into consideration Fisheries and Oceans Canada's Measures to Avoid Causing Harm to Fish and Fish Habitat Including Aquatic Species at Risk, implement mitigation measures when conducting Designated Project activities to avoid causing harm to fish and fish habitat, including timing work in or around water to respect the timing windows identified to protect fish.*

No in-stream works were conducted during the reporting period. To avoid and mitigate any potential for serious harm to fish, the following measures will be implemented when in-stream works are required:

- Works will be completed during the November- February low flow period;
- A qualified environmental professional will be present to monitor for the presence of fish in the immediate construction areas; and
- Riparian clearing will be kept to a minimum.

#### **3.3. Condition 3.3**

*The Proponent shall comply with the Metal Mining Effluent Regulations and subsection 36(3) of the Fisheries Act regarding the deposit of effluent from the Designated Project in water frequented by fish, taking into account the Canadian Council of Ministers of the Environment's Water Quality Guidelines for the Protection of Aquatic Life, from the start of construction to the*

*end of decommissioning. In doing so, the Proponent shall:*

*3.3.1 place all acid-generating and potentially acid-generating material into the tailings storage facility and submerge all such materials placed in the tailings storage facility under a permanent water cover; and*

During construction activities at the Kemess mine site prior to 2021, all acid-generating and potential acid-generating material was deposited into the KUG TSF under a permanent water cover. No construction occurred in 2021.

*3.3.2 collect and treat all waters affected by the Designated Project that do not meet the requirements of the Metal Mining Effluent Regulations and subsection 36(3) of the Fisheries Act, as applicable, prior to the affected waters being deposited in waters frequented by fish.*

Water quality sampling will take place as per the Metal and Diamond Mining Effluent Regulation (MDMER) and the *Fisheries Act*, when production triggers that requirement, and will be conducted in accordance with the Canadian Council of Ministers of the Environment's Water Quality Guidelines for the Protection of Aquatic Life.

Select seepage water from the NAG Waste Rock Dump, which has relatively high selenium concentrations, was originally collected in the Selenium Collection Pond (SeCP). This water was then pumped directly to the KUG TSF through a pump and pipeline system. The new Southern Collection System Pond (SCSP), which was completed and commissioned in September 2020, now receives flow by gravity from the SeCP via the Southern Collection Ditch (SCD). The SCSP, which allows for a greater quantity of seepage water from the NAG waste rock dump to be captured, including seepage points located to the west (SP7, SP7a) was continually pumped to the KUG TSF in 2021.

For the selenium monitoring program investigating seepage in and around the Kemess mine footprint, results from 2021 indicate selenium levels in environmental compartments of Waste Rock Creek continue to decrease relative to previous years, but in some instances still exceed provincial interim guidelines for the protection of aquatic life. However, it is important to note that despite some elevated selenium concentrations, there is no evidence of effects on biological communities of Waste Rock Creek.

### **3.4. Condition 3.6**

*The Proponent shall divert all runoff from the East Pit quarry into the tailings storage facility during construction and operation.*

Runoff from the East Pit Quarry drainage reports directly into the KUG TSF via existing drainage ditches. Most flow is captured by gravity, and the rest is collected in a ditch that reports to Dump Pond 1, which is then pumped to the KUG TSF. No additional measures or works were

implemented in 2021. Monitoring of the drainage pattern from the East Pit Quarry will continue through the construction and operations phases of the mine life in accordance with the Mine Site Water Management Plan.

### **3.5. Condition 3.7**

*Discuss consultation activities relative to Condition 3.7: The Proponent shall develop, prior to construction and in consultation with Indigenous groups, Gitxsan Wilp Nii Kyap, and relevant authorities, and implement, from the start of construction to the end of decommissioning, a follow-up program to verify the accuracy of the environmental assessment as it pertains to fish and fish habitat and to determine the effectiveness of mitigation measures referred to in conditions 3.1 to 3.6. As part of the follow-up program, the Proponent shall:*

*3.7.1 monitor quality of water discharged in Attichika Creek during the dewatering of the Kemess South Pit and treat that water to meet the requirements of subsection 36(3) of the Fisheries Act;*

*3.7.2 monitor surface water quality in Amazay Lake and groundwater movement between the subsidence zone identified by the Proponent during the environmental assessment and Amazay Lake;*

*3.7.3 monitor changes in channel form and sediment load downstream of the discharge location in Attichika Creek;*

*3.7.4 monitor changes in water quality in Waste Rock Creek and the tailings storage facility, including changes in selenium concentrations;*

*3.7.5 monitor the presence and use of spawning habitat by bull trout (*Salvelinus confluentus*) and rainbow trout (*Oncorhynchus mykiss*) downstream of the discharge location in Attichika Creek prior to and after the installation of the discharge pipeline into Attichika Creek. The Proponent shall offset any loss of spawning habitat for bull trout (*Salvelinus confluentus*) and rainbow trout (*Oncorhynchus mykiss*) in Attichika Creek if monitoring results show that spawning habitat loss has occurred; and monitor contaminants, including mercury, in the tissue of fish species harvested by Indigenous groups in Thutade Lake, including bull trout (*Salvelinus confluentus*).*

AuRico Metals submitted its permit application to the Major Mines Permitting Office (MMPO) on August 31, 2017. Prior to the official permit application submission, AuRico Metals consulted with Tsay Keh Nay (TKN) First Nations on the development of a Fish and Aquatic Effects Monitoring Plan (FAEMP), a Wildlife Management and Monitoring Plan (WMMP), and a Mine Site Water Management Plan (MSWMP); circulating draft copies of these plans on June 30, 2017, which was 60 days in advance of official permit application submission. These plans were developed in consideration of Condition 3.7. AuRico and TKN continued to consult on management plans through the permitting process and established collaboration and consultation methods espoused within the 2017 Impact Benefit Agreement (IBA). AuRico uses the quarterly IBA Environmental Management Committee (EMC) meetings to discuss

management plans, monitoring, and mitigation measures.

During the permitting process, TKN, via their consultants at Environment Dynamics Incorporated (EDI), provided feedback on fish and fish habitat. TKN comments focused on the Selenium Management Plan, which outlines selenium monitoring, as well as mitigation measures for capturing flows with elevated selenium and addressing potential flow reduction in Waste Rock Creek. TKN is concerned that reduced flows in Waste Rock Creek may result in the environmental flow needs for fish and fish habitat not being met in Waste Rock Creek. In response, AuRico installed an additional monitoring station (WQ-14ds) in 2018 to gather flow data to verify model flow predictions; data from which will be used to inform management decisions if the environmental flow needs in Waste Rock Creek are not being met.

In 2021, there was no discharge to Attichika Creek through the pipeline and diffuser.

Results from the 2021 Fish and Aquatic Effects Monitoring Study showed that condition of water quality, sediment quality, periphyton communities, and benthic invertebrate abundance, composition, and diversity in Attichika Creek remained within pre-discharge levels, and were consistent with those of healthy aquatic ecosystems in the region.

For the Fish Sentinel Species Survey in Attichika Creek with slimy sculpin, there were no changes in tissue metal concentrations attributable to discharge. However, although selenium concentrations in slimy sculpin were comparable with pre-discharge values, selenium concentrations of benthic invertebrate tissues in Attichika Creek in 2021 were greater than pre-discharge values, which showed concentrations slightly above relevant provincial guidelines. These increased selenium concentrations were observed even though effluent was not discharged in 2021. However, the increased selenium concentrations may be the result of retained selenium in the food web from earlier discharges.

The TKN and AuRico IBA provides for capacity funding to support Additional Environmental Studies initiated by TKN through submission of proposals to AuRico. Initiated in 2017 by TKN, the Adult Bull Trout Radio Telemetry Study operated for four years and was completed in 2021. This study researched Bull Trout migration behavior and timing, spawner residence time, spawner survival estimates and critical habitats for spawning in relation to KUG diffuser operations in lower Attichika Creek. Results from the Adult Bull Trout Radio Telemetry Study indicate that operation of the KUG diffuser in lower Attichika Creek is not likely to threaten the productivity of the Bull Trout population. These results are shared between TKN and AuRico.

In terms of monitoring of metals in fish tissue, adult bull trout samples from Thutade Lake are collected annually by Chu Cho Environmental and analyzed by Hatfield Consultants. The results from the 2021 Fish and Aquatic Effects Monitoring Program showed that there was a slight increase in bull trout selenium concentrations relative to 2019 levels (while no change with respect to 2020 levels), but the concentrations were still below the BC guideline for the Protection of Aquatic Life (4 mg/kg dry weight).

Tissue mercury concentrations in bull trout samples were similar in 2021 in comparison to both 2019 and 2020, showing no increase in mercury bioaccumulation over the last three years.

## **4. Condition 4: Migratory Birds**

### **4.1. Condition 4.1**

*The Proponent shall carry out Designated Project activities in a manner that protects migratory birds and avoids harming, killing, or disturbing migratory birds or destroying, disturbing, or taking their nests or eggs. In this regard, the Proponent shall take into account Environment and Climate Change Canada's Avoidance Guidelines. The Proponent's actions in applying the Avoidance Guidelines shall be in compliance with the Migratory Birds Convention Act, 1994 and with the Species at Risk Act.*

In 2021, there was no clearing of vegetation nor construction activities that would impact nesting bird sites, furbearer dens or bat roosts.

On May 28, 2021, a survey of 12 previously used barn swallow nests showed that there were no adults and no activity. Over the course of the nesting season, no new nesting activity was reported on-site.

### **4.2. Condition 4.2**

*The Proponent shall deter migratory birds from accessing the tailings storage facility and seepage ponds until water quality is not harmful to migratory birds.*

Use of the KUG TSF and seepage ponds by migratory birds was monitored throughout the 2021 reporting year as part of the on-site wildlife reporting. No instances of birds accessing or inhabiting the KUG TSF or seepage ponds were reported in 2021. Monitoring for use by migratory birds will continue in 2022 and deterrent(s) will be implemented as necessary. Although the water quality of the KUG TSF does not meet guidelines for some parameters, it is not considered harmful to migratory birds.

### **4.3. Condition 4.3**

*The Proponent shall develop, prior to construction and in consultation with Indigenous groups and relevant authorities, a follow-up program to determine the effectiveness of the mitigation measures to avoid harm to migratory birds, their eggs, and nests, including the mitigation measures used to comply with conditions 4.1 and 4.2. The Proponent shall implement the follow-up program from the start of construction to the end of decommissioning.*

As discussed in Section 3.5, the WMMP was developed in consultation with the TKN. The WMMP details a follow-up monitoring program for migratory birds and mitigation measures corresponding to conditions 4.1 and 4.2. In 2021, there were no actions required to implement the follow-up program in condition 4.3 as construction did not occur and no birds were observed accessing the TSF and seepage ponds.

## 5. Condition 5: Human Health

### 5.1. Condition 5.1

*The Proponent shall develop, prior to construction and in consultation with Indigenous groups and relevant authorities, a follow-up program to verify the accuracy of the environmental assessment as it pertains to adverse effects on the health of Indigenous Peoples caused by changes in concentrations of contaminants of potential concern identified during the environmental assessment in air, soil, water, and sediment. The Proponent shall implement the follow-up program during construction and operation. As part of the development of the follow-up program, the Proponent shall:*

*5.1.1 identify levels of environmental change relative to established baseline conditions for contaminants of potential concern that would require the Proponent to implement modified or additional mitigation measure(s) to mitigate increased risks to human health; and*

*5.1.2 if monitoring results demonstrate that concentration levels for contaminants of potential concern are greater than the identified levels of environmental change, update the human health risk assessment for the consumption of traditional foods exposed to these contaminants and communicate the results of the updated human health risk assessment to Indigenous groups.*

AuRico Metals circulated the proposed Human Health Follow-up Program to TKN via email on March 20, 2018. A reminder of requests for feedback was discussed at the April 20, 2018 EMC meeting. To date no comments have been received. Health Canada provided comments for the Human Health Follow-Up program which AuRico has addressed.



## **6. Condition 6: Current Use of Lands and Resources for Traditional Purposes**

### **6.1. Condition 6.1**

*The Proponent shall install and maintain, during construction and operation, ramps every 100 to 300 metres over the discharge line between the tailing storage facility and Attichika Creek to provide passage for moose (*Alces alces*), woodland caribou (*Rangifer tarandus caribou*), grizzly bear (*Ursus arctos*), and furbearers. The Proponent shall identify the locations of ramps in consultation with Indigenous groups and relevant authorities.*

The discharge line between the KUG TSF and Attichika Creek was installed in 2018. There are no other impediments relating to this condition. As the entire discharge line was buried at the time of installation, wildlife access has never been impeded, thereby eliminating the need for installation of ramps.

### **6.2. Condition 6.2**

*The Proponent shall create and maintain, during construction and operation, escape pathways along all access roads associated with the Designated Project, including the northern section of the Omineca Resource Access Road, to allow ungulates to exit the plowed roads. The Proponent shall identify the locations of escape pathways in consultation with Indigenous groups and relevant authorities.*

During all snow-laden months in 2021, the Omineca Resource Access Road (ORAR) was not kept open by AuRico; therefore, there was no need for monitoring to ensure safe passage of ungulates exiting plowed roads.

### **6.3. Condition 6.3**

*The Proponent shall, from the start of construction to the end of decommissioning, remove carrion within 24 hours of its discovery by the Proponent from all access roads associated with the Designated Project, including the northern section of the Omineca Resource Access Road.*

As per the Wildlife Management and Monitoring Plan (WMMP), AuRico tracked incidental wildlife occurrences on-site and on the ORAR corridor. All wildlife observations by Kemess staff and contractors were communicated to the Kemess environmental department via in-person communication, radio communication, or self-reporting. Employees have always been encouraged to submit photos along with the location, date and time of observation to help confirm the ID of the species and track movement. No carrion was observed on the ORAR during the summer months when it was being actively used. Carrion monitoring and removal will continue through the life of mine to the end of decommissioning.

#### **6.4. Condition 6.4**

*The Proponent shall prohibit employees and contractors associated with the Designated Project from fishing, hunting, and trapping within the Project Area, unless an employee or a contractor is provided access by the Proponent for traditional purposes or for exercising Aboriginal rights, to the extent that such access is safe.*

As per condition 6.4, AuRico created the No Fishing, Hunting and Gathering Policy on June 29, 2018, which is reviewed as part of the new worker mine site orientation. The Kemess Mine Fishing and Hunting Policy (FaHP) is designed to ensure safety of Kemess Mine personnel, contractors and the general public in the Kemess Mine area, as well as for the protection of fish, wildlife and plant resources at the mine site. The policy defines that hunting, fishing or trapping, mushroom, berry picking, or the gathering of plants is not permitted by mine personnel or contractors at the mine site at any time. The policy is communicated to all employees at the Kemess Mine site when undergoing mine site orientation. Supplementary signage is posted around site displaying the policy.

#### **6.5. Condition 6.5**

*The Proponent shall, prior to construction and in consultation with Indigenous groups and relevant authorities, conduct pre-clearing surveys to identify Western toad (*Anaxyrus boreas*) breeding habitat, and shall implement measures to mitigate the loss of Western toad (*Anaxyrus boreas*) breeding habitat caused by the Designated Project.*

Prior to the official permit application submission AuRico Metals consulted with Tsay Keh Nay (TKN) on the development of the WMMP. To date no comments on the Western Toad preclearing surveys have been received. AuRico and TKN continue to consult on management plans and follow up program development through established collaboration and consultation methods espoused within the 2017 IBA. AuRico uses the quarterly IBA Environmental Management Committee (EMC) meetings to discuss plans for any preclearing surveys and the subsequent results with TKN.

No vegetation clearing was conducted in 2021, including in pond areas that could be suitable habitat for the Western Toad (*Anaxyrus boreas*).

#### **6.6. Conditions 6.6, 6.7, 6.8**

*6.6 The Proponent shall conduct pre-clearing surveys to determine the distribution of little brown myotis (*Myotis lucifugus*) and Northern myotis (*Myotis septentrionalis*), and establish, in consultation with Indigenous groups and relevant authorities, buffer zones around active hibernacula and active roosts.*

*6.7 The Proponent shall install, prior to construction, and maintain, during construction and operation, roosting structures to offset any loss of little brown myotis (*Myotis lucifugus*) and*

*Northern myotis (Myotis septentrionalis) roosting habitat.*

*6.8 The Proponent shall develop and implement a follow-up program to monitor the little brown myotis (Myotis lucifugus) and Northern myotis (Myotis septentrionalis) usage of buffer zones and roosting structures to determine the effectiveness of the mitigation measures during construction and operation.*

During the permitting process, TKN, via their consultants at Environment Dynamics Incorporated (EDI), provided feedback on the bat pre-clearing surveys, submitting seven questions. TKN comments focused on the methodology used to identify what species of bat were roosting in the area and which roosting structures or nursery bat boxes were actively used.

The WMMP described in Section 3.5 prescribes bat mitigation and monitoring in response to Conditions 6.6 to 6.8. AuRico conducted initial bat habitat surveys in November of 2017 to inform the initial offsetting requirements for roosting structures. In April 2018, pre-clearing surveys were conducted prior to construction initiating in July and 35 nursery bat boxes were installed. Installed bat boxes will be subject to ongoing monitoring to determine usage and if active, will assist in identifying active hibernacula and active roosts and establishing buffer zones. During 2020, surveys of the bat boxes showed only one instance of bat activity at these sites.

In 2021, the bat boxes were not checked. Therefore, in 2022 the boxes will be moved and new bat surveys will be initiated.

### **6.7. Condition 6.9**

*The Proponent shall, in consultation with Indigenous groups, undertake progressive reclamation of the habitats disturbed by the Designated Project. The Proponent shall use native species when undertaking that progressive reclamation.*

There was a total of 7.5 ha of reclamation activities conducted in 2021. A total of 6 ha was re-contoured within the KLV, of the 6 ha, 4 ha were hydroseeded and fertilized. Along the access road to the Attichika Diffuser, 0.2 ha have been hand seeded. Along ditches within the SCSP system, 1.5 ha have been re-vegetated as of August 2021. More extensive reclamation of KUG infrastructure will commence once it becomes obsolete for mining purposes.

### **6.8. Condition 6.10**

*The Proponent shall develop, prior to construction and in consultation with Indigenous groups and relevant authorities, a follow-up program to verify the accuracy of the environmental assessment as it pertains to the presence of hoary marmot (Marmota caligata), white-tailed ptarmigan (Lagopus leucura), and short-eared owl (Asio flammeus) within the subsidence zone identified by the Proponent during the environmental assessment and within a buffer area of 250 metres along the limits of that subsidence zone. The Proponent shall implement the follow-*

*up program during construction and operation.*

AuRico Metals submitted its initial draft permit application to the Major Mines Permitting Office (MMPO) on August 31, 2017. Prior to the official permit application submission, AuRico Metals consulted with Tsay Keh Nay (TKN) on the development of the WMMP and circulated a draft copy of the plan for comment and feedback on June 30, 2018, 60 days in advance of the official permit submission. To date, no specific feedback has been received on the subsidence zone follow-up program. AuRico and TKN continue to consult on management plans and follow up program development through the quarterly EMC meetings.

As per the WMMP, field surveys need to be conducted in areas deemed important habitat for the hoary marmot, white-tailed ptarmigan and short-eared owl prior to clearing and/or construction activities. In 2021, no clearing or construction activities were conducted whatsoever.

There were 16 sightings of white-tailed ptarmigan in November, 2021 and 5 of the same species in December, 2021.

## **6.9. Condition 6.11**

*The Proponent shall develop, prior to construction and in consultation with Indigenous groups and relevant authorities, a follow-up program to verify the accuracy of the environmental assessment as it pertains to the effects of changes caused by the Designated Project to the Chase herd of Southern mountain caribou (*Rangifer tarandus caribou*) and the Thudade herd of Northern mountain caribou (*Rangifer tarandus caribou*) on caribou hunting activities for traditional purposes and to determine the effectiveness of the mitigation measures. The Proponent shall implement the follow-up program from the start of construction to the end of decommissioning. As part of the follow-up program, the Proponent shall:*

*6.11.1 monitor, during construction and the first three years of operation, the use by moose (*Alces alces*), woodland caribou (*Rangifer tarandus caribou*), grizzly bear (*Ursus arctos*), and furbearers of the ramps referred to in condition 6.1 and of the escape pathways referred to in condition 6.2; and*

*6.11.2 monitor mortality of wildlife on all access roads associated with the Designated Project, including the northern section of the Omineca Resource Access Road.*

Follow up programs for conditions 6.11.1 and 6.11.2 are outlined in sections 6.1 and 6.2, respectively.

As part of the monitoring program prescribed by the WMMP, AuRico records all wildlife sightings observed on the mine site and ORAR by staff. In addition, there are game cameras set up at Kemess North, KLV, Attichika diffuser, and above the KUG TSF.

For caribou, bear and moose, there were the following sightings on the Kemess Mine site and

on the ORAR in 2021: **January:** 2 moose; **May:** 2 black bear; 12 grizzly bear; 5 moose; 16 caribou; **June:** 2 black bear; 28 grizzly bear; 11 moose; 10 caribou; **July:** 3 black bear; 10 grizzly bear; 2 moose; 20 caribou; **August:** 1 grizzly bear; 3 moose; 1 caribou; **September:** 30 grizzly bear; 1 moose; 1 caribou; **October:** 8 grizzly bear; **December:** 14 moose.

A graph showing the total number of wildlife sightings on the mine site for 2021 is presented in Appendix A.

There were no wildlife mortalities in 2021.

## **7. Condition 7: Physical and Cultural Heritage and Structures, Sites, or Things of Historical, Paleontological, or architectural Significance**

### **7.1. Condition 7.1**

*The Proponent shall, for any previously unidentified archeological structures, sites, or things of historical, archaeological, paleontological, or architectural significance discovered by the Proponent or brought to the attention of the Proponent by an Indigenous group, Gitxsan Wilp Nii Kyap, or another party during any phase of the Designated Project: 7.1.1 immediately halt work at the location of the discovery; 7.1.2 have a qualified individual conduct an assessment at the location of the discovery; 7.1.3 inform, forthwith, in writing, Indigenous groups and Gitxsan Wilp Nii Kyap of the discovery, and allow for monitoring by Indigenous groups and Gitxsan Wilp Nii Kyap during archeological work; and 7.1.4 comply with all applicable legislative or legal requirements and associated regulations and protocols respecting the discovery, recording, transferring, and safekeeping of previously unidentified archeological structures, sites, or things of historical, archaeological, paleontological, or architectural significance.*

In early August 2017, an Archeological Impact Assessment (AIA) of five ancillary development areas to the proposed KUG was conducted to ensure compliance with the Heritage Consultation Act (HCA) prior to any ground altering activities. A total of 70 ha of area was surveyed, 295 tests were excavated, and 15 exposures were inspected. The field crew consisted of Millennia personnel and members of Tsay Keh Dene, Kwadacha, and Takla Lake First Nations.

In 2018, an Archaeological Chance Find Procedure was developed for the Project. It provides a standard operating procedure should heritage sites, not identified during baseline studies, be discovered during Construction or Operations. The Archaeological Chance Find Procedure includes the following steps if personnel suspect archaeological, traditional use, and paleontological materials or human remains are discovered:

- Immediately contact the Environmental Superintendent or Construction Manager to implement a stop work order to reduce/minimize impacts to the site;
- Leave the material in place and protect and/or mark the area around the site, and do not disturb or collect any archaeological, paleontological, heritage materials, or human remains; and
- Report the discovery to their immediate Supervisor.

The General Manager and the Project Archaeologist will also be notified as outlined in the management plan. The Archaeology Branch and local Aboriginal groups/organizations will be advised of the discovery, if necessary. Final mitigation measures will be determined through consultation with the Archaeology Branch.

No new archaeological sites were identified in 2021 from chance encounters.

## **7.2. Condition 7.2**

*The Proponent shall not undertake any ground altering activities within 50 metres of the boundaries of archeological sites, unless authorized by relevant authorities.*

As per the Heritage Management Plan, all known archaeological sites within 150 m of the Project footprint have been clearly indicated on development maps in relation to the Project footprint components. If construction is occurring within 150 m of a protected heritage site, the site will be flagged or temporarily fenced to serve as a visible barrier. The Kemess Environment Monitors will monitor for archaeological site impacts or situations where construction activities occur less than 50 m from a site. Should impacts be anticipated or found to have occurred within 50 m of an archaeological site, the Project Archaeologist will be contacted to determine if additional mitigation measures are required. Environment Department staff members will be fully briefed on the HMP and resulting mitigation measures.

During construction activities, the preferred mitigation measure for archaeological sites is avoidance.

As no clearing or construction activities occurred in 2021, no monitoring was required.

## 8. Condition 8: Independent Environmental Monitor

### 8.1. Condition 8.1

*Prior to the start of construction, the Proponent shall retain the service of an independent environmental monitor, who is a qualified individual as it pertains to environmental monitoring of mining projects in British Columbia, to observe, record, and report on the implementation of the mitigation measures set out in this Decision Statement.*

Environmental Dynamics Inc. (EDI) has been retained as the KUG Mine Site independent environmental monitor (IEM) from 2018 to present. A formal Terms of Engagement Document was submitted to AuRico by EDI in April 2018.

### 8.2. Condition 8.2

*The Proponent shall give the independent environmental monitor the authority to stop Designated Project activities that do not comply with the conditions set out in this Decision Statement.*

As per the 2018 IEM Terms of Engagement document, the IEM will have authority for stop work and will keep record of all stop work orders where works are resulting in, or are at imminent risk of, causing material environmental damage, in accordance with the EA Certificate and applicable legislation.

A Stop Work Order may be issued under two circumstances:

- In the event where an environmental incident, or where the completion of works at or in proximity to the location of the incident, has the potential to cause material unauthorized environmental impacts.
- In the event that a lack of compliance with the Certificate conditions, authorizations/permits and management plans has the potential to cause unauthorized adverse material environmental effects and previous communications with the responsible parties have not led reasonable corrective action.

Under both circumstances, the IEM will inform the responsible parties, EAO, IAAC and the Holder of the issue within 24 hours and provide rationale and high-level options/considerations for achieving compliance as soon as possible. A recommendation to lift the stop work order will occur when the IEM is satisfied that the appropriate steps have been taken to ensure compliance.

To date, no stop work orders have been issued by the IEM.

### 8.3. Condition 8.3

*The Proponent shall require the independent environmental monitor to prepare reports that*



include:

*8.3.1 a description, including through photo evidence, of the Designated Project activities that occurred and the mitigation measures that were applied during the period covered by the report; and*

*8.3.2 if any, a description, including through photo evidence, of occurrences of non-compliance related to the implementation of mitigation measures set out in this Decision Statement Page 12 of 14 observed during the period covered by the report, the date of the occurrence(s) of non-compliance, whether Designated Project activities were stopped as a result of non-compliance, how the occurrence(s) of non-compliance was or were corrected by the Proponent, the date that the corrective action(s) was or were completed by the Proponent, or, if any, the status of pending occurrence(s) non-compliance that have not been corrected yet, and a description of any adverse environmental effect(s) associated with the occurrence(s) of non-compliance.*

Per the 2018 IEM Terms of Engagement document, a summary of compliance will be provided in a monthly report. The IEM will document, through written and photo documentation, any relevant inspections and communications pertaining to any non-compliance within the IEM checklist and the issue tracking log. Non-compliances will be closed out pending corrective action and removed from the issue tracking log in the subsequent report following indication of closure. Corrective actions by the Holder will be documented in the monthly report along with the date of corrective actions, the status of pending occurrences that have not been corrected yet, and a description of any adverse environmental effects associated with the occurrences of non-compliance.

The first IEM inspection occurred July 11-12, 2018.

In 2021, due to COVID-19 travel restrictions preventing the IEM from coming to site on a monthly basis, some inspections were done by questionnaire. The IEM conducted site visits in August, September, and November. In 2021, the IEM provided reports for January, April, May, August, September, and November.

#### **8.4. Condition 8.4**

*The Proponent shall require the independent environmental monitor to retain the reports referred to in condition 8.3 until the end of decommissioning. The Proponent shall require the independent environmental monitor to provide the reports referred to in condition 8.3 to the Agency, Indigenous groups, and relevant federal authorities within 10 days of their production. If occurrence(s) of non-compliance are observed by the independent environmental monitor, the Proponent shall require the independent environmental monitor to report all occurrence(s) of non-compliance directly to the Agency, Indigenous groups, and relevant federal authorities immediately.*

AuRico has communicated the requirement for the IEM to retain compliance reports until the

end of decommissioning. The IEM and IEM Support will be tasked with documenting compliance with the Certificate conditions and management plan commitments throughout all Project phases. The IEM will provide information to EAO, IAAC, Ministry Energy and Mines (MEM), Ministry of Environment (ENV), Forests, Lands, Natural Resources Operations & Rural Development (MFLNRORD) and to Aboriginal Groups as directed by EAO and set out in the Decision Statement. The IEM will not provide such information or reports to the Holder in advance of providing such information or reports to the EAO and IAAC. The IEM will submit monthly (or following their site visit) a report to the Holder, the EAO, and IAAC simultaneously via email. Information or reports related to non-compliance will not be submitted to the Holder in advance of providing the information to the EAO and IAAC.

## 9. Condition 9: Accidents and Malfunctions

### 9.1. Conditions 9.1, 9.2, 9.3, 9.4

*9.1 The Proponent shall take all reasonable measures to prevent accidents and malfunctions that may result in adverse environmental effects.*

*9.2 The Proponent shall, prior to construction, consult with Indigenous groups and relevant authorities on the measures to be implemented to prevent accidents and malfunctions.*

*9.3 The Proponent shall, prior to construction and in consultation with Indigenous groups and relevant authorities, develop an emergency response plan in relation to the Designated Project.*

*9.4 In the event of an accident or malfunction with the potential to cause adverse environmental effects, the Proponent shall implement the emergency response plan referred to in condition 9.3 and shall:*

*9.4.1 notify Indigenous groups, Gitxsan Wilp Nii Kyap, and relevant authorities of the accident or malfunction as soon as possible, and notify the Agency in writing;*

*9.4.2 implement immediate measures to mitigate any adverse environmental effects associated with the accident or malfunction;*

*9.4.3 submit a written report to the Agency no later than 30 days after the day on which the accident or malfunction took place. The written report shall include:*

*9.4.3.1 a description of the accident or malfunction and of its adverse environmental effects;*

*9.4.3.2 the measures that were taken by the Proponent to mitigate the adverse environmental effects of the accident or malfunction;*

*9.4.3.3 any views received from Indigenous groups, Gitxsan Wilp Nii Kyap, and relevant authorities with respect to the accident or malfunction, its adverse environmental effects, and measures taken by the Proponent to mitigate adverse environmental effects; Page 13 of 14*

*9.4.3.4 a description of any residual adverse environmental effects and any modified or additional measures required by the Proponent to mitigate residual adverse environmental effects;*

*9.4.3.5 details concerning the implementation of the emergency response plan referred to in condition 9.3; and*

*9.4.4 submit a written report to the Agency, no later than 90 days after the day on which the*

*accident or malfunction took place, on the changes made to avoid a subsequent occurrence of the accident or malfunction, and on the implementation of any modified or additional measures to mitigate and monitor residual adverse environmental effects and to carry out any required progressive reclamation, taking into account the information in the written report submitted pursuant to condition 9.4.3.*

AuRico Metals submitted its permit application to the Major Mines Permitting Office (MMPO) on August 31, 2017. Prior to the official permit application submission, AuRico Metals consulted with Tsay Keh Nay (TKN) on the development of the Emergency Response Plan, circulating a draft copy of the plan for comment and feedback on June 30, 2018, which was 60 days in advance of the official permit submission. The Mine Emergency Response Plan (MERP) is developed in consideration to conditions 9.3 and 9.5.

To date, no comments from TKN have been received on the draft Mine Emergency Response Plan or the draft Accidents and Malfunctions Communication Plan.

AuRico and TKN continue to consult on management plans through the permitting process and through established collaboration and consultation methods espoused within the 2017 Impact Benefit Agreement. AuRico uses the quarterly IBA Environmental Management Committee (EMC) meetings to discuss management plans, monitoring, and mitigation measures.

Regarding Condition 9.5, AuRico circulated the draft Accidents and Malfunctions Communication Plan to Gitxsan Wilp Nii Kyap on December 22, 2017.

During the 2021 reporting year, the ERP was not invoked as there were no events that had the potential to cause adverse environmental effects.

## **9.2. Condition 9.5**

*The Proponent shall develop and implement a communication plan in consultation with Indigenous groups and Gitxsan Wilp Nii Kyap. The Proponent shall develop the communication plan prior to construction and shall implement and maintain it up to date from the start of construction to the end of decommissioning. The plan shall include:*

*9.5.1 the types of accidents and malfunctions requiring the Proponent to notify the respective Indigenous groups and Gitxsan Wilp Nii Kyap;*

*9.5.2 the manner by which Indigenous groups and Gitxsan Wilp Nii Kyap shall be notified by the Proponent of an accident or malfunction and of any opportunities for the Indigenous groups and Gitxsan Wilp Nii Kyap to assist in the response to the accident or malfunction; and*

*9.5.3 the contact information of the representatives of the Proponent that the Indigenous groups and Gitxsan Wilp Nii Kyap may contact and of the representatives of the*

*respective Indigenous groups and Gitxsan Wilp Nii Kyap to which the Proponent provides notification.*

As per condition 9.5, the Accidents and Malfunctions Communication Plan was developed in 2018 to guide the co-ordination of communications between the organization and any applicable outside agencies (e.g. regulatory agencies, stakeholders, and the public) in the event of an accident and/or malfunction resulting from the KUG Project.

This plan identifies the types of accidents and malfunctions requiring notification to external stakeholders and the timeframe of notification (including updates subsequent to the initial notification) to each Aboriginal Group community and other users of the area that could be affected by the accident and/or malfunction.

## 10. Closure

This report summarizes 2021 compliance with the Federal Decision Statement conditions issued to AuRico Metals Inc. for the Kemess Underground Project.

Respectfully,

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# **APPENDIX A**

## ***Wildlife Sightings at Kemess Mine and on the Omineca Resource Access Road***

